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Cultural Geography and Interregional Contacts in Prehistoric Liangshan (Southwest China)

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Cultural Geography and Interregional Contacts in Prehistoric Liangshan (Southwest China)

A dissertation submitted in partial satisfaction of the

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by

Anke Marion Hein

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ABSTRACT OF THE DISSERTATION

Cultural Geography and Interregional Contacts in Prehistoric Liangshan (Southwest China)

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Anke Marion Hein

Doctor of Philosophy in Archaeology

University of California, Los Angeles, 2013

Professor Lothar von Falkenhausen, Chair

The identification of cultural groups in the archaeological record, and the reasons for and mechanisms of contact between them, have been major topics of discussion in archaeology since its beginnings as a discipline. The methodological and theoretical aspects of these questions have largely been argued on the basis of ethnographic studies and socio-anthropological theories, but they are notoriously difficult to apply to archaeological research. To bridge this gap between socio-anthropological models and the material record, this dissertation starts from a concrete body of archaeological material that reflects the lives and movements of various groups of people living at a crossroad of different contact routes.

The Liangshan area in Southwest China is located at the intersection of several cultural-geographic regions and is crisscrossed by many rivers connecting it to places in the far north and south, while the high mountain ranges divide it into many microclimates. In spite of many different kinds of contact and exchange over long distances, most cultural phenomena therefore tend to be localized, making the Liangshan region an ideal case study for research on cultural groups and their relationship with the local environment on the one hand, and directions and mechanisms of short and long-distance contacts on the other.

Research in the region has been hampered by the fact that a multitude of groups that have lived in, passed through, and intermingled here since the late Neolithic, leaving a complex archaeological record that is still not well understood. For the first time, this study compiles a comprehensive catalog of all prehistoric material of the Liangshan area, providing separate analyses of all types of artifacts and archaeological features, and offering a chronological scheme for the whole region. Furthermore, this study relates the archaeological material to the geographical context and discusses local, regional, and supra-regional cultural developments.

This study starts at the micro-level of single objects, considering their technical properties of production and function, before widening the scope to the intermediate level of sites and features, and finally moving toward the regional and supra-regional picture. At each level this study questions the geographic preconditions and patterns of human-environment interaction that contribute to the formation of the archaeological record. One of the main methods employed in this endeavor is computer-aided spatial analysis (GIS) together with traditional archaeological methods of typology and statistics. This combined approach gives a third, spatial dimension to problems of chronology and cultural assignation, on which traditional approaches of classification and multivariate analyses provide insight.

Through the application of a variety of methods to this very special body of material, this study is able to re-conceptualize the objects and features in their geographical, temporal, and cultural context, and sketch out local developments, while at the same time answer questions about the mechanisms and underlying reasons for inter-group contact. This study thus makes valuable contributions both to theoretical and methodological discussions on the nature of cultural groups and inter-group contacts, and their identification in the archaeological record.

The dissertation of Anke Marion Hein is approved.

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David Schaberg

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Gewidmet Hans Jürgen Eggers, Rolf Hachmann und Manfred Hein, deren Anregungen zum methodischen Denken mich seit Beginn meines Studiums begleitet haben.

Table of Contents

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2013 "Graves as Composite Objects? Developing a Model and Method of Analysis." Paper presented at the Third Annual UCLA Cotsen Institute of Archaeology Conference, Los Angeles, April 26-27 2013.

2013 "The Special Case of the Bronzes of Yanyuan: Outside Influences and Local Particularities." Paper presented at the 78th Annual Meeting of the Society for

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2012 “Moving along the Western Part of the Crescent-Shaped Exchange Belt – The Liangshan Area in Southwest Sichuan.” Paper presented at the Conference of the Society of East Asian Archaeology, Fukuoka, Japan, June 6–10, 2012

2011 “Prehistoric Cultures of the Liangshan District - Disentangling Identities and Geographic Preconditions in a Multiregional Interaction Sphere.” Paper Presented at the 76th Annual Meeting of the Society for American Archaeology, March 30 – April 3, 2011

2011 “Liangshan diqu de shiqian wenhua – jiexi duoyuan wenhua diqu de shenfen rentong yu dili yinsu 凉山州的史前文化—解析多元文化地区的身份认同与地理因素." Invited Lecture at Sichuan University, Chengdu, March 2011.

2007 “Encountering the ‘Fuzziness’ of Past Realities: Typology and Nomenclature in Chinese Archaeology.” Paper presented at the First China Undisciplined Graduate Student Conference, UCLA May 30-31, 2008

2006 “(Re-)Establishing Texts? – The Question of the ‘Authenticity’ of the Chinese Textual Heritage as seen from Excavated and Received Material on the Guicang.” Paper Presented at the Conference on Chinese Palaeography: The Present and the Future at the University of Chicago, May 14, 2006.

2006 Entries on Tang Ceramics and Metal Objects in the Exhibition Catalogue *Xi’an – Kaiserliche Macht im Jenseits, Kunst- und Ausstellungshalle der Bundesrepublik Deutschland, 21. April bis 23. Juli 2006*. Mainz: Philipp von Zabern.

I. Introduction

The identification of cultural groups in the archaeological record, and the reasons for and mechanisms of contact between them, have been major topics of discussion in archaeology since its beginnings as a discipline.[1] The methodological and theoretical aspects of these questions have so far largely been argued on the basis of ethnographic studies and socio-anthropological theories. As the kind of information available to cultural anthropologists and sociologists is very different from what the archaeologist is faced with, such studies are notoriously difficult to apply in archaeological research. What promises to be more useful from the archaeological point of view, is a discussion of different forms of identity and contact situations with a concrete body of archaeological material at hand that reflects the lives and movements of various groups of people living at a crossroad of different contact routes.

I have therefore chosen the Liangshan area in Southwest China as a case study, as the region is located at the intersection of the Sichuan Plain, the Qinghai-Tibet and the Yunnan-Guizhou Plateau and is thus a connection point of several different cultural-geographic regions. The area is furthermore crisscrossed by many rivers connecting it to places far north and south, while the high mountain ranges divide it into many micro-areas with very different environmental characteristics. In spite of exchange over long distances, most cultural phenomena therefore tend to be localized, making the Liangshan region an ideal case study for research on cultural groups and their relationship with the local environment on the one hand, and directions and mechanisms of short- and long-distance inter-group contact on the other.

Research in the region has been hampered by the fact that the multitude of different groups that have lived in, passed through, and intermingled here since the late Neolithic have left a complex archaeological record that is still not well understood. In particular, comprehensive

[1] The history of these discussions will be introduced in greater detail in Chapter I.4.

research on the relationship between these different groups and the ecologically diverse sub-regions they inhabited is still lacking. This study for the first time compiles a comprehensive catalog of all prehistoric material of the Liangshan area; it provides separate analyses of all types of artifacts and archaeological features, and suggests a chronological outline for the whole region. Furthermore, the study relates the archaeological material to the geographical context and discusses local, regional, and supra-regional developments and connections between the different parts of the Liangshan area and surrounding regions. The very complex geography and equally complex cultural patchwork characterizing this area in past and present times indeed make it an ideal platform for addressing theoretical and methodological questions in research on human-environment as well as human-human interaction, addressing mechanisms of and reasons for cultural contact, exchange, and influence.

Taking advantage of this potential, I pursue a twofold aim: to advance the understanding of the archaeology of the immediate study area in the context of Southwest China, and to present a methodologically strongly self-reflective case study for multi-dimensional research in a highly complex cultural-geographic region focusing on questions of human-environment interaction and on mechanisms of inter-group contact. In this fashion, my study contributes to general theoretical and methodological discussions on fundamental archaeological concepts of "culture," "group," "identity," and "contact" and their reflection in material remains.

The nature of cultural groups and their reflection in the material record has long been a heated topic of discussion in archaeological research. While within the Anglo-American tradition of anthropological archaeology until the 1960s it was generally held that the repetitive occurrence of similar typological or stylistic traits in the archaeological record could be identified with specific cultures, and the cultural unit equaled an ethnic and linguistic unit (e.g., Kossinna 1911, Childe 1929:v-vi), it soon became apparent that differences in material remains had no such clear-cut boundaries. Later approaches therefore direct attention to smaller communities and identity groups, signaling their distinctiveness through commonalities and differences in behavior, which in turn are reflected in the material record (e.g., Hodder 1982).

My study thus starts at the object level, considering the technical properties of production and function, before widening the scope to the level of features and sites. These are considered by type and finally compared with each other to provide an overall regional analysis. Only when the local conditions are sufficiently clear does it become possible to advance to the level of inter-regional contact networks. Another set of questions to be addressed on all levels of analysis are geographic preconditions and patterns of human-environment interaction that contribute to the formation of the archaeological record.

One of the main methods I employ in this endeavor is computer-aided spatial analysis using Geographic Information Systems (GIS) together with traditional archaeological methods of typology and statistics. This combined approach provides an additional dimension to problems of chronology and cultural assignation, which are addressed using classification, typological comparison, and multivariate analyses. Through this combination of various methods applied to this very special body of material it becomes possible to re-conceptualize the objects and features in their geographical, temporal, and cultural context, sketching out local developments while at the same time answering questions of inter-group contact, its mechanisms and underlying reasons. This approach allows to gain insight into this special case, but it also enables extrapolation to regions and cultures elsewhere in the world. With this study, I thus attempt to contribute to theoretical and methodological discussions on the nature of cultural groups and inter-group contacts, and their identification in the archaeological record.

I.1. Spatial and Temporal Scope of the Dissertation

Geographically, the dissertation focuses on southwest Sichuan, the area covered by the Liangshan Yi Autonomous Prefecture, including Panzhihua and adjacent counties in northwest Yunnan (Figures 1.1-1.5 and 1.7).[2] Located between longitude 100°15′ and 103°53′E and latitude 26°03′ and 29°27″ N, this area is circumscribed by the high mountains of Muli in the Northwest, the Daduhe 大渡河 river in the North, and the Jinshajiang 金沙江 river in the South. These clear natural boundaries make it a well-defined geographic entity covering an area of about 81,434 km^2, i.e., a little smaller than South Carolina (82,931. km^2) or Austria (83,855 km^2).

Chronologically, I concentrate on the material pre-dating the onset of large-scale Han influence during the 1st century AD, which brought about dramatic cultural and social changes that are clearly reflected in the material record. From the historical point of view, the conquest of the Southwest by Han Wudi 漢武帝 in 111 BC could be seen as the historical starting point for intensified exchange. In the material record, however, it is only during the Eastern Han (25-220 AD) that the local archaeological cultures are replaced by Han material.[3] The inclusion of the Liangshan area into the Han realm marks the beginning of the historical era for this region; it is thus a major caesura and a fitting endpoint for this study. As the chronological sequence for archaeological phenomena predating this time is still unclear, all prehistoric finds will be taken into consideration. Most settlement material currently known is dated by the excavators to the late Neolithic to Bronze Age (about 2500 BC to 900 BC), while most of the graves are attributed to a later phase. Nevertheless, as the date of settlement sites only known through surface survey is often ascribed in an impressionistic fashion, a revision of the chronology will be provided in

[2] The Chinese characters for these administrative units are provided in Figures 1.1-1.5 and will therefore not be repeated in the main text.

[3] Chen Wanquan 陳万全 and his colleagues suggest that this was possibly due to the defeat of Ren Gui 任貴, which put an end to the occupation of the area by local Qiong people 邛族 (Liangshan Yizu 1987:200).

Chapter VII. For this purpose, all pre-Eastern Han sites will be considered together without attempting to draw distinctions based on their supposed dates. Tentative suggestions for a relative and absolute chronology will be made only after considering the complete corpus of material. The overall time span covered extends from the mid third to the end of the first millennium BC.

I.2 History and Preconditions of Archaeological Research in the Liangshan Area[4]

Whereas other parts of Sichuan have been explored by archaeologists since the late 19th century, the first observations of archaeological phenomena in the Liangshan region were only recorded during the 1930s, and systematic archaeological work in the Liangshan area did not start until the 1970s. From 1974 to 1975, a first survey of the Anning river valley and adjoining areas was conducted, covering most of nowadays Liangshan Prefecture and Panzhihua City.[5] This survey revealed a broad range of different feature and site types. In the beginning the archaeologists' main interest was directed at the most eye-catching type of monuments found, i.e., the megalithic graves; other grave types and finally settlement sites came into focus only at a later point. According to the shifts in the focus of interest, three phases of archaeological research can be distinguished, which are discussed in the following sections.

I.2.1 Research until the Mid-80s: The Megalithic Graves

During the earliest period of research extending until the mid-80s, the main focus of research were the so-called megalithic graves (*dashimu* 大石墓). As early as 1928, Feng Hanji

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[4] For a chronological list of discoveries, excavations, and research institutions involved, please see Table 1.1. The Chinese characters for all names of institutions and sites are listed here as well as in the catalog and are therefore not repeated in the text.

[5] Liu Hong 劉宏, director of the Liangshan Prefecture Museum, personal communication, Fall 2010.

馮漢驥 observed a number of such monuments at Mianning Sankuaishi, but unlike his research in the Chengdu Plain 成都平原 and the Upper Minjiang 岷江上游, his observations on the Liangshan area remain unpublished.[6] During the 1940s and 1950s, several scholars mentioned the large number of ancient constructions made of huge stones to be found in Sichuan as well as northern China (Xu Zhiliang 1958, Zheng Dekun 1957: 24-29). Overall, there was considerable interest in what at the time was called the "Chinese megalithic culture" 中國的巨石文化, and its comparison with similar finds in Europe.[7]

A first report on a survey dedicated to these graves was published in 1958 (Xu Zhiliang 1958), but the first excavation of a megalithic grave took place only in 1975, at Mianning Sanfentun, a site that had been discovered by Feng Hanji nearly 50 years earlier. This excavation marks the beginning of a very active period of research on megalithic tombs. The same year saw excavations at Mianning Chengguan and Beishanba as well as Dechang Guoyuan; the material from all three sites remains unpublished until today.[8] The particularly well preserved graves of Xichang Bahe Baozi were the first to be published in preliminary excavation reports. These reports coined the term *dashimu*, megalithic graves, which has been used in all publications since (Sichuansheng Jinshajiang 1976, Xichang Diqu et *al.*1978a). This was also the first time that an estimate for their date was proposed, suggesting the time period between late Warring States (475-221 BC) and early Western Han (206 BC - AD 9). Furthermore, the authors of these early

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[6] Feng's discovery is mentioned by Xu Zhiliang (1958:58); Feng's own publications do not refer to these discoveries (Feng Hanji 1961a, 1961b, Feng and Tong 1973, Feng 1945).

[7] This question also featured in a general discussion of long-distance contacts between Europe and Asia and questions of diffusionism as proposed by Robert Heine-Geldern and other Western scholars (Heine-Geldern 1959 (1996)). However, at that time the main published examples at hand were finds from Southeast Asia and Central Europe. When the Anning river survey was conducted, such theories had already largely fallen out of favour and there was thus not much of a response in the Western scholarly world.

[8] They are listed in related publications among further excavated megalithic graves, some of them giving details as to their measurements or content, however, separate publication reports were never published.

studies suggested a connection with the ethnic group of the Qiongdu Yi 邛都夷 mentioned in the Hanshu 漢書 (Sichuansheng Jinshajiang 1976:330). These two issues — chronology and ethnic attribution — remain the main point of discussion in Chinese archaeology until today, although the focus has shifted from megalithic graves to other types of archaeological remains.

During the late 1970s and early 1980s, over 40 megalithic graves were excavated (Liangshan Yizu 1987), but some of them remain unpublished until today. Most remarkable among them are Xichang Lizhou Chenyuancun and Lizhou Zhongxue. The megalithic graves at these two sites overlie earlier earth-pit graves and settlement remains. Lizhou Zhongxue was explored in several campaigns between 1974 and 1976, focusing mainly on the early earth-pit graves and later Han burials. [9] The settlement finds are only briefly mentioned in a very short publication, and as the objects and field notes have been lost, an assessment of the material is no longer possible. Although settlement remains were reported also from other sites, no further settlement excavations were conducted during this period. [10] Additionally, a few earth-pit graves were excavated.[11] Furthermore, archaeologists have reported different kinds of graves with stone installations, either termed *shiguanzang* 石棺葬, literally "stone coffin burials," but usually translated as "stone-cist graves" in English publications, or *shibanzang* 石板葬, or *shibanmu* 石

[9] The date of the excavation of the megalithic graves is unclear. The other material was published in: Lizhou Yizhi 1980a, 1980b, Zhao Dianzeng 1981).

[10] In 1975 settlement remains were discovered at Mianning Sanfentun (Liangshan Yizu 2006) and in Huili Washitian (Tao and Zhaodian 1981), and 1977 surface scatters were reported from Yanyuan Yanhai Gongshe (Xichang Diqu 1978, Huang Chengzong 1983). Furthermore, in 1980 Puge Tianba, Puge Zhongcun, Puge Tuantian, and Puge stone collection site were recorded during a general survey of Puge County (Liangshan and Puge 1982a and 1982b).

[11] These sites are Huili Washitian, Xichang Yangjiashan (Tao and Zhaodian 1981, Liu Shixu 1981), and Puge Wadaluo (Liangshan Yizu 1983).

板墓, i.e. "stone slate burials" or "stone slate graves."[12] In Zhaojue alone, a total of fourteen cemeteries of what the excavators called stone slate graves were discovered, containing altogether over 200 graves, 20 of which were excavated at the time.[13]

I.2.2 Research from the Late 80s to the Mid-90s: Stone Graves

During what might be termed the second phase of fieldwork in the Liangshan area, the focus shifted from the megalithic graves to other kinds of burial sites. This new phase commenced with the "Survey of Cultural Relics of the Liangshan Prefecture" 涼山州文物普查, conducted from March 1987 to August 1988. Only very few excavations of megalithic graves were conducted after the late 1980s. The main reason was that such projects were cumbersome and time-consuming, and in most cases revealed only a very small number of objects.[14] During the following decades, excavations were generally rare, but several surveys were conducted. These surveys covered the Anning River Valley, which had already been the main focus during the earlier stage of research, as well as the mountain regions further east and west. They revealed a large number of graves with different kinds of stone installations. Mainly located at Zhaojue but also at Yanyuan, these graves were described either as stone-cist graves, stone-cover graves, or earth-pit graves with stone installations. In addition, several cemeteries containing large numbers of stone-cist and earth-pit graves were reported from Huili, but only some of the more

[12] So-called stone-slate graves have been discovered at Yanyuan Yanhai Gongshe (Liangshan diqu 1978b, Huang Chengzong 1983) in 1977 and at Yanyuan Jiaodingshan (Liangshan diqu 1978b) in the early 1980s, while those reported from Yanbian Yumen Wanxiao (Dukoushi Wenwu 1986) have been called stone slate graves.

[13] The 14 cemeteries were discovered in the districts of Fucheng, Zhuke, and Sikai. 12 graves were excavated at Zhaojue Zhukequ Erba Keku, 5 at Zhaojue Zhuhequ Wazhaishan, 3 at Zhaojue Fucheng (Liangshan Yizu 1981, Liangshan Yizu 1977).

[14] Personal communication by Liu Hong 劉宏, director of the Liangshan Prefecture Museum 涼山州博物館館長.

severely disturbed graves have been excavated.[15] A small number of bronze deposits were discovered at the same time; these were more carefully researched. Settlement finds, as well, are mentioned in the reports, but they were neither excavated nor surveyed in detail.

I.2.3 Research Since the Late 1990s: Settlement Material in Focus

Fieldwork has intensified again since the late 1990s and especially in recent years. During this third phase of research, which is still ongoing, the focus has been on settlements, which are mainly explored through surveys, augmented by test trenches and small-scale follow-up excavations. Earth-pit and stone-construction graves are excavated only if they are heavily disturbed or otherwise in danger of being destroyed, while megalithic graves are usually not touched. This change in approach has several reasons: on the administrative side, the official directive is one of preservation, not excavation, inhibiting the excavation of better-preserved remains and favoring surveys and small-scale projects over large-scale excavations.[16] Furthermore, financial resources in the Liangshan area are fairly limited, and the local culture bureaus (*wenguansuo* 文管所) of the individual prefectures and larger cities are generally staffed with non-archaeologists, who are nevertheless responsible for archaeological work. This is also

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[15] The main graves with stone installations excavated during those years were those of Yanyuan Laolongtou. Four graves excavated in 1988, further excavations were conducted since 1999 (Liu and Tang 2001, Zhong Yali 2002, Liu and Tang 2006, Liangshan Yizu 2009). Further graves came to light at Yanyuan Shuanghe Township Maojiaba, where three graves were excavated in 1988 (Liu and Li 1991, Liu Shixu 1991). The main sites where earth-pit graves were excavated during those years are Huili Fenjiwan (150 graves excavated from 1989 to 1992 in 4 excavation seasons; Tang Xiang 1992, Huilixian, Liangshan, and Sichuansheng 2004, Sichuansheng, Liangshan, and Huilixian 2009), and Yanyuan Shuanghe Township Maojiaba 盐源县雙河鄉毛傢垻 (1 earth-pit grave excavated in 1988, Liu and Li 1991, Liu Shixu 1991).

[16] Many sites have been labelled as “Cultural Monuments under State Protection” 文物保護單位, which cannot be excavated, while even for other sites special permission needs to be granted by the Archaeological Institute of the Chinese Academy of Social Sciences 中國科學院考古研究所 before excavations can be conducted. These permissions are cumbersome to obtain, while survey work and the excavation of disturbed and endangered culture relicts can be conducted with much less administrative procedure, as I learned from personal communications by Zhao Deyun 昭德云, Assistant Professor of the History Department at Sichuan University 四川大學歷史係副教授.

the reason why field-research projects are mainly conducted in cooperation with higher-level research institutions and universities.[17] A second, research-driven reason for the new focus on settlement remains is the question of chronology, which can only be solved with the help of multi-layered stratigraphies. Since most sites in the research area are graves or single-phase settlement sites, the general practice at present is a combination of surveying and test trenches; in this way, archaeologists hope to discover evidence of stratigraphic overlay that may imply multi-phase sites, or that may at least improve their understanding of the range and spatial distribution of different cultural phenomena.[18]

New discoveries made during recent years have greatly advanced our understanding of both chronology and cultural sequence, but these issues remain still far from solved. Xichang Henglanshan gave the name to the Henglanshan Culture, considered to be the earliest Neolithic culture known so far in the area.[19] Another important discovery is Mimilang, where idiosyncratic remains predating the megalithic graves were found.[20] Furthermore, several multi-phase sites containing settlement remains, various types of graves, and object pits have been excavated,

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[17] These are the Museum of the Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館 [Liangshan Museum], which participates in virtually all research projects, sometimes the Sichuan Provincial Museum 四川省博物館 [Sichuan Museum], but more often the History Department of Sichuan University 四川大學歷史係 [Sichuan University] leading its archaeology students to field work, the Archaeological Institute of Sichuan Province 四川省考古研究院 [Sichuan Institute], and in recent years especially the Archaeological Institute of the City of Chengdu 成都市文物考古研究所 [Chengdu Institute], whose researchers have taken a great interest in the region. As an outsider, I am not very well informed on the administrative and political background of the respective choice of cooperation partners at different times, but I am aware that they exist. The working of these mechanisms, however, would require and warrant a separate study.

[18] During the last few years, the different institutions mentioned above have conducted surveys with trial-excavations and short-term excavations of already know sites at very regular intervals once or twice a year. The results of these excavations have all been rather fully published usually within a years time. According to current plans, this will continue to be the work rhythm for many years to come.

[19] See Xichangshi Wenwu 1998, Chengdu Wenwu 2004, and Liu and Wang 2007.

[20] See Liangshan, Chengdu, and Xichangshi 2004 for further information.

including Xichang Dayangdui,[21] Qimugou[22] and Yingpanshan.[23] A number of additional settlement sites in various parts of the research area that were surveyed and partially excavated during the last few years have helped to fill in some of the remaining gaps.

Research on different kinds of earth-pit graves with or without stone installations, on the other hand, has not made much progress. For the most part, only single severely damaged graves have been excavated. Only two cemeteries were more fully explored: Yanyuan Laolongtou[24] and Huili Fenjiwan. Laolongtou, like most grave sites in Yanyuan and many in Zhaojue, had unfortunately already been largely destroyed by grave robbers; as to Fenjiwan, it has so far been published only in a very brief preliminary excavation report.[25] The chronological and cultural relationships between the different grave types and the settlement material are therefore still unclear. The excavations undertaken in the spring of 2010 at the site of Yongsheng Duizi in Yunnan, a multi-phase site containing settlement remains as well as earth-pit, stone-construction, and megalithic graves, promise to yield valuable clues that, once published, might solve some of the most pressing questions of chronology.[26]

In general, new discoveries and excavations are now published rapidly and in considerable detail, facilitating research immensely. A few comprehensive publications have been compiled, such as the volume on Yanyuan Laolongtou, which also describes all known

[21]This site held settlement remains, earth-pit graves, urn pits, and megalithic graves (Xichangshi Wenwu 2004, Jiang Xianjie 2007, Sichuansheng and Liangshan 2006).

[22] Qimugou revealed settlement remains, earth-pit graves, and urn pits (Chengdu, Liangshanzhou, and Xichangshi 2006, Sichuansheng, Liangshan, and Xichangshi 2006b, Chengdu, Liangshanzhou, and Xichangshi 2009).

[23] Yingpanshan held settlement remains and urn pits (Chengdu, Liangshan, and Xichangshi 2007).

[24] See Zhong Yali 2002, Liu and Tang 2001, Liu and Tang 2006, Liangshan Yizu 2009.

[25] This report only introduces a few typical ceramics and grave forms, but does not provide further details, or even the exact number of graves and objects discovered (Huilixian Wenguansuo 2004).

[26] The material was only presented at a conference in Chongqing in November 2010. Additionally, I was allowed to take a brief look at the — still largely unopened — boxes of material kept in Yongsheng during a short stay in May 2011. However, so far the material has not been analyzed ,and it is unclear when it might be published.

bronzes from Yanyuan (Liangshan and Chengdu 2009), and a volume collecting all excavation reports of stone-cist graves and related material in western China (Aba and Chengdu 2009). Furthermore, the research on megalithic graves was brought to a preliminary conclusion: from June to October 2004, a survey of all known megalithic graves of the Anning river valley was conducted and their locations, measurements, and state of preservation were recorded. In connection with this survey, six more megalithic graves were excavated: four at Dechang Arong and two at Xichang Wanao. In these excavations, the grave fill was carefully removed layer by layer, recording the location of all objects and features in great detail and thus considerably advancing the understanding of their construction and use.[27] Furthermore, all objects connected with megalithic graves excavated so far were re-cataloged, drawn, photographed, and published. The resulting volume, entitled "The Megalithic Graves Along the Anninghe River" 安寧河流域大石墓, includes chapters on geography, chronology, and cultural contact, summarizing the current state of research on these remains (Sichuansheng, Liangshan, and Xichangshi 2006a.).

In 2009 the Sichuan volume of the Second National Culture-Relics Survey 第二次全國文物普查 was published;[28] the much more extensive Third National Cultural Survey 第三次全國文物普查, underway from June 2007 to December 2010, promises to give an even broader and updated overview of the range of extant archaeological remains. This time, GPS points were taken for every site surveyed, providing quite accurate location data and therefore a good basis

[27] While during previous excavations the megalithic graves had oftentimes been emptied out without recording their original location, now more attention was paid to layering and relative location of the different objects and bones (Sichuansheng, Liangshanzhou, and Xichang 2006).

[28] See Zhongguo Wenwuju 2009. Here, also the results of the First National Cultural Survey and a few later discoveries were incorporated.

for research on site distribution and human-environment interaction.[29] Although the results are as yet unpublished, it has already become apparent that a large number of sites, especially prehistoric features protruding on the surface such as megalithic or stone-cist graves, have been destroyed since the last survey.[30] Hence the results of earlier surveys, although less detailed and complete, remain invaluable sources of information for estimates of the original nature and distribution of these kinds of remains.

In spite of the greater availability of material, comprehensive studies on the prehistory of the Liangshan region are still lacking. Even the summary publications mentioned above are usually restricted to one sub-region and/or cultural phenomenon. Furthermore, these publications are intended to serve as find reports only, and do thus not attempt in-depth analyses. A first overview of the whole archaeological record — although again only of the Anning river valley — is provided in the most recent book by Liu Hong 劉弘 (2009); however, as he covers all archaeological material from the earliest prehistory to the Song Dynasty (960-1279 AD) within a small-sized 257-page volume, the treatment of the different periods and cultural phenomena inevitably remains general. So far, only one Master's thesis has been devoted to the Liangshan area, focusing solely on the Laolongtou grave material (Lang Jianfeng 2006). All other interpretive research is limited to brief essays addressing specific problems based on subsets of the data, such as date or cultural affiliation of a specific grave type, or short remarks within preliminary excavation reports. Much work remains to be done, especially on the level of small-scale analysis, but there is also a great need for comparative research at the macro-level. This

[29] Currently, the results of this survey have only a very limited circulation and are carefully guarded, while it is not clear if they will ever be made public. If so, they will probably not contain any GPS-coordinates or other information that could give to precise a guidance to grave robbers.

[30] For example, of the significant number of megalithic graves recorded previously in Puge, which had been described as being of a very particular type, not a single one remained when the area was re-surveyed in 2009 (Personal communication by Liu Hong 劉宏, director of the Liangshan Prefecture Museum 涼山州博物館館長).

study will venture to do both and more, compiling for the first time a comprehensive catalog of all available pre-Eastern Han archaeological material from the Liangshan area, and providing separate analyses of all types of artifacts and archaeological features. This enables me to propose a chronological outline for the entire region. Furthermore, I am relating the material to the geographical context as part of a discussion of local, regional, and supra-regional developments and connections between the different parts of the Liangshan area and surrounding regions.

I.2.4 Summary: General Preconditions of Research in the Liangshan Area[31]

There is a significant imbalance in the amount of prehistoric material known from different parts of the research area.[32] While for some regions the lack of known archaeological sites might be a reflection of actual scarcity of early human activity due to high elevations or unfavorable climate, for other regions this might not be the case. The precipitous cold mountains in Muli, for instance, are not very suitable for either agriculture or pasture land, but Huidong and Ningnan have wide fertile valleys and an agreeable climate. Nevertheless, discoveries from the latter two are surprisingly few, suggesting that the areas might be underrepresented in research. One major issue in all these areas is probably a lack of a modern infrastructure: local archaeologists and funds that enable their work are notoriously scarce in these not very affluent hinterlands. Excavation work therefore centers around the prefecture capital of Xichang and other affluent centers like Dechang or Mianning, situated in close proximity to main research institutions, avenues of trans-regional communication, and workforce.

[31] For an overview on the number and type of sites arranged by county see Table 1.2.

[32] No pre-Han sites are known from Butuo, Gange, Leibo, Muli, and Huaping. Only very few from Jinyang (2), Huidong (4), and Ningnan (4), 10-22 from Ninglang (10), Yanbian (13), Yuexi (14), Miyi (15), Meigu (16), Panzhihua (16), Puge (20), Yongsheng (21), and Xide (22), a rather significan number at Mianning (30), Yanyuan (53), and Zhaojue (63), while by far the most known sites are located in Huili (95), Dechang (96) and above all the Xichang area (156).

Major pull factors for researchers into the Anning river valley are the less rugged terrain and more favorable climatic conditions as compared to the cold high mountains to the East and West. Rainfall is seasonal throughout the whole research area, allowing excavations only during brief periods in the fall and spring in between the long rain season in the summer and the low temperatures of the winter months. In the cold mountains of Muli and Zhaojue, this seasonal window is even smaller: here winter comes early, lasts long, and can be very harsh, reducing even the possibilities for survey work to a minimum. The heavy summer rains, on the other hand, lead to growth spurts in the already lush vegetation of the valleys, making it hard to spot even megalithic graves; furthermore, the rains often bring about landslides that wash away the winding roads of steep slopes. Thus whole areas become inaccessible during the summer, while in the fall traffic is hindered by road repairs. Although this suggests a certain harshness of life in these regions also in the past, it does not mean that they were necessarily as inhospitable as they appear today. Massive landslides, for example, are a fairly recent phenomenon brought about by large-scale deforestation and climate change. The evaluation of site distribution in relation to environmental characteristics therefore requires a detailed review of geographic preconditions and paleoenvironmental background, which is provided in Chapter II.

Local geographic preconditions and climate furthermore influence excavation and survey work considerably. Given that the time suitable for fieldwork is so short, while financial means and manpower of the local institutions are very limited, a rather hurried procedure has become customary. Cemeteries are hardly ever excavated in their entirety; instead, only single severely disturbed graves are unearthed. By nature, their assemblages are already incomplete and thus far from representative, leading to lacunae in our knowledge base.

Settlement excavations are small in extent, covering ten to fifteen pits of 5 x 5 m within less than two weeks, the hurried schedule sometimes interfering with accurate observation. On the other hand, settlement sites in this area tend to have very shallow cultural deposits with very few layers and homogeneous contents, thus not warranting long excavation projects in the first place. Furthermore, many sites are very small in extent, but there are exceptions such as Xichang Lizhou and Henglanshan, and Yongsheng Duizi, which will be discussed in greater detail in Chapters IV and V. A general problem with settlement excavations lies in the fact that, partly due to time pressure, soil-samples for paleobotanical and chronometric analyses are not habitually collected, and radiocarbon dates are usually obtained from single samples of charcoal, leading to inconsistent results.[33]

An additional problem hampering research on this region is the incomplete state of publication and the limited access to original objects and field-work documentation. As mentioned, the material from most early excavations has only been presented in short preliminary reports or remains unpublished to date, and in many cases both objects and documentation have gone missing. In recent years, however, the main research institutions working in this area have usually published the material in a very comprehensive manner within a year, making it relatively easy to gain an overview on the current state of research. Furthermore, these institutions are generally open to cooperate with outside researchers and allow them to access their storerooms. Material from neighboring areas in Yunnan, on the other hand, is notoriously difficult to obtain. Finds are usually published with a long time lag and in a very insufficient manner or not at all, and access to local archives is much more cumbersome than in

[33] Judging from the research that is currently being done in other parts of Sichuan, there is a growing interest not only in paleobotany and archaeometry, but also in zooarchaeology. However, this kind of research would require long-term excavation projects at more complex sites than usually not possible in the Liangshan area.

Sichuan. The problem of skewed representation has to be kept in mind throughout the reminder of this study, especially when conducting spatial analysis.

I.3 Range of Field Research and Material Collection

The two major sources for the archaeological information I am presenting here are published accounts and extensive visits to local archives. The publications consulted include excavation reports, lists of unexcavated or otherwise unpublished material in the *Zhongguo wenwu dituji: Sichuan fence* 中國文物地圖集·四川分冊 that summarizes the results of the First and Second National Culture Relics Survey, and some smaller surveys conducted up to 2008, as well as lists in other summary papers and publications.[34] I visited Xichang and Chengdu twice in 2006 and 2008 to gain a first overview of the material and gauge the potential of access to primary sources. From September 2010 to June 2011 I spent 10 months participating in archaeological work in the Liangshan area and accessing archives and libraries in Sichuan, Yunnan, and Beijing. During this time, I was furthermore able to obtain copies of some internal communications circulating within the main archaeological research institutions named above.

I participated in a survey with test excavations conducted by the Chengdu Institute and the Liangshan Museum from October 16 to 21 at four sites in Mianning, including Luguzhen Hujiazui, Zhaojiawan, Gaopo, and Sanfentun, and in an excavation campaign at Dechang Dongjiapo, which took place from October 24 to 30.[35] Subsequently, I took part in ordering and drawing the excavated material. In November, I participated in a short survey at Zhaojue Sikai, evaluating the possibilities for future excavations and a long-time survey project of the area,

[34] These are mainly Liu Hong 2009 and Sichuansheng, Liangshan, Xichangshi 2006a.

[35] These projects were all conducted by the Chengdu Institute in conjunction with the Liangshan Museum and the local culture bureaus under the directive of Zhou Zhiqing 周志清 from the Chengdu Institute.

which started in early April 2011 and will continue for several years. On the outcome of this project I continue to receive updates.[36]

The director of the Liangshan Museum, Liu Hong, provided me with a driver and members of his staff to guide me to the most important sites in the Anning river valley and adjoining areas within one-day driving distance of Xichang, enabling me to take GPS-coordinates and other measurements, make pictures, field sketches and notes on the archaeological findings and natural environment.[37] Overall, I took GPS coordinates of 23 sites, all of them in Xichang, Dechang, Mianning, Xide, and Yanyuan, while other coordinates were obtained from excavation reports, amounting to an overall number of 34 sites containing 55 features with known coordinates.[38] I was also able to get an impression of the landscape of a number of other counties that will feature in the description of the geographic background and GIS-analyses below.[39] I furthermore visited Gansu, as well as several counties in northern Sichuan and Yunnan, travelling from there into the Liangshan area to explore possible routes of contact.[40] During these travels, I had the opportunity to view some archaeological material bearing resemblance to cultural phenomena from the area under research.[41]

[36] This survey project is conducted by Sichuan University under Zhao Deyun 趙德云 in cooperation with the Liangshan Museum and local culture institutes. Further details will be mentioned in connection with the presentation of the archaeological material below.

[37] For a list of sites and feature I was able inspect personally and take GPS coordinates of, please see Table 1.3. I could take coordinates at overall 23 sites. 7 sites held more than one type of feature, 10 held megalithic graves, and I was able to record 16 individual graves. 12 were sites were settlement sites, 5 earth-pit grave sites and 5 stone-cist grave sites, though for the latter two I was not able to record individual graves.

[38] For a list of sites and features with known GPS coordinates, see Table 1.4. The number of sites amounts to 34, among them 11 with several types of features, 24 sites with settlement features, 13 with megalithic graves, 12 with earth-pit graves, 8 with stone-cist graves, 2 with stone slate graves, 2 with urn pits and one metallurgical site. 41 megalithic graves, 2 earth-pit graves, 9 stone-cist graves and 2 stone slate graves have been recorded individually.

[39] I spent two to four days each in Huili, Yongsheng, and Ninglang, a day each in Muli, Ningnang, and Panzhihua, while I passed through Miyi and Yanbian. Counties I could not visit were Butuo, Gange, Meigu, Huidong, Jinyang, Yuexi, and Huaping.

[40] I travelled from Lanzhou 蘭州 in Gansu 甘肅省 to Ruo'ergai 若爾蓋 in Aba 阿壩藏族自治州 in Sichuan, continued towards Ma'erkang 馬爾康, but was not allowed to continue as the area has been closed to foreigners for

As far as material remains from the research area itself are concerned, I was generously given free access to all ceramic finds housed at the Liangshan Museum in Xichang, and was also shown a selection of metal objects, stone tools, and personal ornaments. In most cases I could not obtain the original documentation of the excavations and surveys.[42] Places where I could access published and unpublished original material were Huili[43] and Yanyuan.[44] For the adjoining areas of Yunnan, the case proved to be more difficult. Here I was only able to see a selection of previously published objects, while for the unpublished site of Yongsheng Duizi mentioned above, I was only granted a brief survey of the boxes of unsorted material.

Overall, I was able to collect information on 313 sites.[45] Most of them are located in the Xichang area, plus a significant number of sites in Dechang, Huili and Zhaojue. No pre-Han sites are known to me from Butuo, Gange, Leibo, and Muli, and only a small number in Huidong, Jinyang and Ningnan. Of these 313 sites, only 71 (23%) have been excavated to some extent, while the others have only been recorded during surface surveys. Only 36 sites can be described as well-published; for these, information on form, measurement, extent, and number of objects,

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most of the year. In a separate trip, I therefore travelled from Danba 丹巴 in Garzi 甘孜藏族自治州 to Kangding 康定, continuing to Shimian 石棉 and Mianning and from there to Xichang. I was furthermore able to travel from Xichang through Yanyuan to Lake Lugu 瀘沽湖 and from there to Lijiang 麗江, Dali 大理 and Jianchuan 劍川, as well as to Zhongdian 中甸, Yuanmou 袁謀, Zhaotong 昭通, and Ludian 魯甸 to inspect connecting roads, landscape, sites, and objects.

[41] Most notably these were Maoxian 茂縣, Zhonglu 中路, and Hanyuan 漢源 in Northwest Sichuan, as well as Zhaotong 昭通, Ludian 魯甸, Yuanmou 袁謀, Dali 大理, Lijiang 麗江, Diqing 迪慶, and Zhongdian 中甸 in Yunnan 雲南, and Zhongshui 中水 in Guizhou 貴州.

[42] The only exception is Huili Fenjiwan, a grave site published only in a preliminary excavation report, for which I was allowed to I make copies at least of the grave plans, though the other documentation was not accessible.

[43] I could inspect and take picture of a selection of finds from Huili Guojiabao, Houzidong, Raojiadi, Guantianshan, Yuanbaoshan, Xiaoyingpan, Liantang, Dongzui, Leijiashan, Xiao'aozi, Miaozi Laobao, and Washitian. Furthermore, I was provided with and was also given copies of drawings previously made of the ceramics from Fenjiwan and could handle these objects myself.

[44] In Yanyuan I could inspect a number of unprovenienced bronze and ceramic objects confiscated by the police on the black market.

[45] For an overview please see Table 1.3.

features, and their placement are publically available, albeit often in preliminary excavation reports and not in book-form. 34 more sites have been published in that fashion but have some flaw in their description, like describing the finds summarily without concrete numbers or listing all finds from all graves together without making clear how many objects of which type came from which grave. The overwhelming majority of sites have merely been listed in publications like the Zhongguo Wenwu Dituji 中國文物地圖集 with some remarks as to their location, date, and cultural characteristics (178 sites, 57%) or been mentioned in passing in other publications (32 sites), and 33 sites remain unpublished.

Through fieldwork participation and work in various archives I was able to add significantly to the data retrievable from published accounts. I could collect first-hand data from 58 sites, six of them previously unpublished and 30 of them only briefly mentioned, while for the other 28 sites I could add details not mentioned in the publications. All the information thus gathered — be it from published or unpublished sources — I have collected in a database that connects the different types of objects, features, and location through the common denominator of the find unit (i.e., layer, grave, or other feature), and which furthermore contains "metadata" on the state of research and publication for each of these units (Table 1.5). In response to the great variety in both object and feature types, which all require different sets of attributes to describe them, I have created separate tables for them, connecting them through the attributes they share to allow for queries on all relevant categories. Furthermore, the database contains geographic coordinates, allowing to incorporate the information into a geodatabase for GIS analyses. References to illustrations are provided as well, but as including the pictures themselves in the database would have enlarged it exponentially and made it unwieldy and prone to failure, I decided against it, but this could be changed if necessary for future studies. This flexible and complex structure combined with the considerable amount of detail recorded for each unit allows for complex queries and analyses both for this study and future research on this region. Within the framework of this dissertation, the database serves not only as a catalog and reference but also forms the basis for all statistical and spatial analyses. Before conducting any automated queries and draw inferences from them, it is necessary to consider the nature of the units of analysis and the relevance of the various attributes for the questions to be answered.

I.4 Preliminary Theoretical and Methodological Considerations

As far as the archaeological material at hand is concerned, this study has four major research objectives:

1. to distinguish between different local groups that can be culturally, socially, or chronologically defined;
2. to draw inferences on their relationship with each other as well as with the local environment;
3. to shed light on local chronological and cultural developments; and
4. to identify signs of outside contact and its nature.

By addressing these topics, I furthermore make a contribution to discussions on the nature of different kinds of identity groups and the contacts between them as well as the reflection of both in the material record.

I.4.1 Culture, Objects, and the Archaeological Record

The problem of how to identify past cultural groups based on the material record has been a major issue in archaeology since its beginnings as a discipline. Proponents of the culture-historical school prevalent in the 19th and early 20th century held that the repetitive occurrences of similar typological or stylistic traits (i.e., archaeological cultures), were identical with past cultural groups, which shared a common language and ethnic identity (Kossinna 1911, Childe

1929:v-vi). The boundaries between different archaeological cultures, however, are not very clear-cut, as Gordon V. Childe himself remarked in later publications (Childe 1956). David L. Clarke therefore proposed a polythetic model of culture, with the distribution of different artifact categories overlapping only in part, forming diffuse units of an archaeological cultures. Nevertheless he still held that archaeological cultures mapped real entities, even though these were not identical to historic, political, linguistic, or ethnic units (Clarke 1968).

This raises the question what these archaeological cultures map, what causes these specific distributions of materials and material traits, and what kind of conclusions they allow for. Answers to this set of questions were sought in the discussion on style that was started in the 1960s and conducted with increased intensity especially in the late 1970s and early 1980s. Already in 1960, Irving Rouse proposed to treat cultures and types as mental templates in the minds of the original makers and users of artifacts. He suggested using seriation to arrange complexes of artifact types and sequences to infer on people acting in production and use of objects. James Sackett (1977), elaborating on this, proposed the still widely used concept of isochrestic versus iconological variation. Assuming that stylistic variation reflected social variation and therefore represented ethnic differences, he held that the passive, isochrestic aspect of stylistic variation reflected ethnic or group identities in a non-reflected way and could therefore be used to identify ethnic or cultural groups; the iconological aspect, on the other hand, according to Sackett expressed the conscious, personal aspect of identity.

Drawing on ethnographic examples of the use style in projectile points to express group identities, Polly Wiessner (1983) spoke of emblematic and assertive instead of isochrestic and iconological variation, with the demarcations being roughly the same. Wiessner furthermore emphasized the active element of style in mediating social relations, holding that style and its diffusion was a measurement of contact. The latter thought is going back to the culture-historical approach that explained change in the material record through migration and diffusion; however, while it was earlier believed that cultural units could be equated with a staple repertoire of cultural traits easily identifiable as intrusions into foreign contexts, Wiessner and many other scholars since the 1980s pointed out the active role of style and material objects in social negotiations within and between groups. While Wiessner, William A. Longacre (1991) and others still held that interaction intensity could be measured from stylistic similarity, ethnographic and ethnoarchaeological observations showed that this holds true only for some objects and stylistic attributes (e.g., Stanislawski 1978, Hodder 1982).

Frederik Barth (1969) had pointed out that ethnic distinctions depended on social interaction and that archaeologists should therefore focus on the boundaries between groups, instead of on the cultural elements they enclose. His publications led to a new focus on boundaries as areas of interaction and negotiation, treating them as regions in themselves that reflected the continuous process of contact and negotiation of identities. To eliminate the danger of creating firm lines where there is fluidity, Geoff Emberling (1995) therefore proposed to talk about differences rather than boundaries.

At present, most scholars agree that ethnic and cultural identities are not an inherent attribute of individuals or groups, but manipulated and transformed according to context in an ongoing process of identification and differentiation in which material culture and style are used (e.g., Emberling 1997, Jones 1997, Brubaker 2004, Díaz-Andreu 2005). These thoughts are based on the theory of style as information exchange proposed by Marin Wobst (1977). Based on ethnographic observations on the function of dress as visible markers of identity and differentiation, Wobst describes the function of style as one of boundary maintenance, expressing social and ethnic differentiation in very simple, highly visible, and repetitive ways, with forms signifying specific social groups being displayed most visibly. This indicates that an archaeologist who wants to know about larger social units has to pay particular attention to recurring messages in various highly visible media that have similar distributions. This theory allows using style and types to map distributions that are overlapping and therefore indicating identities in the sense of Clarke's polythetic model of culture.

The problem remains how to identify objects or aspects that are related to expressions of group identities in contact with and expressing their distinctiveness from other groups. It is generally agreed that not all objects are suitable to serve as markers of identity, but Wobst holds that it is mainly objects not preserved in the archaeological record such as clothes — in his ethnographic example, widely visible headdresses — that broadcast the broader group identities, while the objects archaeologists usually rely on, such as pottery, are too confined to the household sphere and not visible enough to serve as such markers. This would mean that stylistic analysis of pottery is not very helpful in identifying group identities. Nevertheless, the way pottery is formed or decorated is based on a group-internal understanding of how things should be made, which may not be consciously reflected but is guided both by the producers' training and perception and by the consumers' demands and needs. These standards may be very different between different material categories, and we therefore cannot expect for the distribution patterns of styles and forms in ceramics, stone tools, personal ornaments, etc., to overlap completely. In other words, the material consistently refuses to form the neatly distinguished "culture circles" (*Kulturkreise*) that early proponents of what was later termed the culture-historical school of thought were trying to display in their distribution maps (e.g.

Frobenius 1897, 1898, Gräbner 1911). It is therefore necessary to consider different bodies of material and the conditions of their production and usage separately in their respective contexts.

A promising approach that has gained popularity since the 1990s is based on the chaîne opératoire, the different elements involved in the process of procurement, production, use, and in later works on the subject, also discard.[46] As this approach has an active element to it and is informed by practical as well as cultural choices, it is a very promising avenue for understanding both stylistic and technological aspects of object production and use. Additionally, the different ways that material culture is used in inter-group and inter-person contact as well as the conditions of its discard and occurrence in the archaeological record need to be considered. If all these aspects are taken into account, however, the emerging picture becomes highly complex and therefore murky. Which aspects are relevant therefore still has to be decided on a case-by-case basis, considering locational and situational preconditions. This study therefore starts from the scale of single object groups and their production and usage in different contexts before moving to the level of features and sites and finally suggesting an overall picture of developments on the regional level. Such a procedure makes it possible to identify different forms of small-scale identity groups that might not equate to the broad picture of archaeological cultures traditionally painted in archaeology, but in the end it is only a large number of such low-level studies that will eventually allow for broader conclusions on the middle-range and macro levels. Even so, there remains the problem of what kind of identity groups we are identifying in this manner. As the usual mode of interpretation of the material from Southwest China equates archaeological cultures and ethnic groups, in the following I will discuss the problem of ethnicity in the context of archaeological research in greater detail.

[46] The term itself was coined by Leroi-Gourhan (1946 and 1964) in the 1950s but the approach gained wide popularity in archaeological research only at a later point in time.

I.4.2 Identity and the Material Record: Questions of Ethnicity, Culture, and Social Differentiation

The archaeological investigation into ethnicity has been highly problematic since its beginnings. The cultural-historical school of research considered tribes, races, and peoples to be unified wholes with clear-cut boundaries between them that they saw as identical with linguistic boundaries and distribution patterns in the archaeological record. The use of such models in nationalistic and colonial discourses, however, led to an abandonment of these categories after the Second World War. Instead of tribe or race, now the term ethnic group was used to avoid political and potentially racist connotations. Archaeologists like David Clarke furthermore realized that archaeological cultures as a functional whole mapped by a set of well-defined diagnostic types were not necessarily identical with historical, political, linguistic, or racial entities (Clarke 1968). While Clarke was content with concentrating on archaeological cultures as real entities and leaving any identification with past identities aside, other scholars have continued to discuss the adequacy of the use of concept of ethnicity in the archaeological context.

Proponents of the processual school of thought mainly agree with Clarke in not addressing the ethnicity question as they focus on the systemic context and outer constraints to human actions. With culture being defined as man's extrasomatic means of adaptation (White 1949), talking about individual or group identity in the sense of self-perception and perception by others becomes superfluous. Nevertheless, processual archaeologists point out that past societies were not self-contained static entities but continuously interacted with other groups, other systems or subsystems, and that therefore a multivariate and contextual approach is needed to explain variability and patterns in the material record. In this they agree with the post-processual school of thought as represented by Hodder (1982) and other scholars, who see the individual self-perception and the perception by others as produced, re-created, and maintained in inter-group and interpersonal contact as the main defining factor in the formation of ethnic and other forms of identity.

Already in the 1960s Barth (1969) proposed a similar definition of ethnic identities as mainly formed by such a process of ascription by outsiders and self-identification of the group. In this process, he believed, not all objective differences between groups are significant, but only those regarded by the actors as significant—those which are articulated in the course of social interaction. This emphasis on individual and group perception immediately raises the question of how "perceptions" might be reflected in the material record. The main approach open to archaeologists is to consider the spatial distribution of different aspects of material culture and traces of human behavior as it changes over time and space. The relationship between objects, spatial distribution, and identity, however, is not straight-forward but highly complex.

Ian Hodder (1978 and 1982), cautioned by his ethnoarchaeological research, holds that there is no simple correlation between resource distribution, material culture patterning, and degrees of economic competition, as different groups manipulate material culture boundaries in different ways, with cultures not always equaling ethnic units. Nevertheless, he believes that areas of cultural similarity reflect areas of high social interaction and that we can use spatial analysis to analyze these distributions, as statistical analysis can distinguish between random clustering and meaningful distributions. He therefore holds that we can use such techniques as regression and association analysis to measure whether any traits show discontinuities or breaks in their distribution. Furthermore, he argues that stress and competition, especially for resources, lead to the overt expression of ethnic differences and to the formation of clear cultural boundaries, and that "it may be possible to interpret such boundaries as being related to an enhanced consciousness of ethnic differences with increased competition between ethnic groups" (Hodder 1982:187). The "may" in his statement alerts us that caution is nevertheless in order; Hodder is all too aware that stress might not lead to ethnic differences in all cases.

But how are we supposed to decide in which cases the patterning in our data indicates the existence of ethnic groups and when there are other reasons behind it? Thomas Eriksen (1991) argues that ethnicity, although being manipulated and transformed according to context, is not infinitely malleable. Once an individual or group has chosen a certain ethnic identity, its behavior is shaped by this attribution, even though it might not be emphasized in all situations. Eriksen sees ethnic distinctions as being rooted in perceptions of differences between lifestyles and other behavioral patterns. The effects of these behaviors and their differences should be visible in the archaeological record.

Even if we accept that identities are reflected in the material record and can therefore be recognized, mapped, and put in relation to each other, the question remains how we can distinguish between ethnic and other forms of identity. Ethnic identity as defined for example by Siân Jones is only one aspect of a person's self-conceptualization, which results from identification with a broader group in opposition to others, i.e. in the context of action and inter-action, and is based on perceived cultural differentiation and/or common descent (Jones 1997). This definition alone raises a multitude of problems. If it is only one aspect of a person's identity, how do we then know which of the multiple patterns that we see in the archaeological record is actually related to ethnic identity and which to other forms of identity such as race, gender, or affiliation with groups that are defined on the basis of non-ethnic criteria. It is generally agreed that ethnicity as based on common culture or descent need not be important in all contexts and to all groups of people, but mainly arises in contact situations—especially in contact situations that involve conflicts and competition. As a consequence, several scholars have categorically questioned the applicability of the ethnicity concept in archaeology.

As Michael Rowlands (1980) has pointed out, prehistoric groups probably were much smaller than those known from present-day ethnographic research, and although they were inevitably in contact with other groups, they did not necessarily experience such situations of open conflict where ethnic differentiation might have arisen. Ethnoarchaeological research in the Baringo district in Kenya led him to realize that in that part of the world the emphasis on blood relations was a relatively new phenomenon probably induced by influence through colonial contact. He and many others have concluded, therefore, that in prehistoric research the concept of ethnicity is not a valid one. Some scholars (e.g., Gellner 1983) see it as an entirely modern phenomenon that started only with industrialism, replacing class identity or village-community affiliation that had previously been the main distinguishing factor between individuals and groups. Early historical texts, however, — be they from ancient Rome or Greece or China — indicate a perception of, and emphasis on, ethnic differences by the inhabitants of powerful states when drawing contrasts between themselves and surrounding groups. Therefore Anthony Smith (1987), Geoff Emberling (1995), and others believe that ethnicity emerges with the formation of early states, with ethnic groups arising in their peripheries as a reaction against this new entity.

Given that ethnic identity is generally accepted as something that arises situationally during instances of contact, drawing a strict boundary between state societies as "having ethnic identities" and pre-state societies as lacking them, does not seem to be very useful. I therefore agree with Jones that ethnicity is something that cannot be assumed to exist but has to be tested for in every context. However, her bird's eye view, in which the distribution patterns of different cultural practices of a particular group are supposed to show overlapping ethnic boundaries constituted by representations of cultural difference, resembles suspiciously the obsolete idea of clearly defined archaeological cultures corresponding to ethnic groups as proposed by the school of cultural history, even if for Jones the borders are more blurred. I therefore propose, instead, to do what Freeman (1968) suggested already in the 1960s: to define material differences at a variety of levels, starting from the small in-site level of distribution, then moving on to inter-cluster spatial associations, and finally reaching cluster size. In case of the material at hand, I will start from the smallest unit of single objects, their production and usage; in a second step, I will discuss these object in context of the features that contained them, which in turn have to be set in relation both to each other and to the surrounding environment, before questions of sub-regional, regional, and supra-regional connections can be addressed. Only such a painstaking operation will make it possible to identify regular associations of materials, to infer their connections with specific materials, and to clarify their significance and interconnection — as opposed to random association — in their specific contexts.

Given that ethnicity is but one aspect of a person's identity, and that it is relevant only in particular situations and at particular times, such a basic-level analysis to me seems to be the only way to entangle the different strands of identity, be they related to gender, age, or different forms of group identity. As group identities refer to a shared way of doing things (i.e., *habitus* as defined by Pierre Bourdieu 1977), which in turn leave recoverable traces in the material record, at least some forms of identity should be identifiable through such the careful methods of classification, description, and material analysis that have been developed in the history of the archaeological discipline. The identification of self-conscious ethnic groups claiming a common descent, however, is less feasible, especially in the absence of written records as in the case of the material at hand. I do therefore not endeavor to equate the material clusters emergent from my archaeological analysis with specific ethnic groups mentioned in ancient textual sources. Gender identity, as well, is difficult to reconstruct due to the absence of sufficiently well-preserved skeletal material in the research area. Instead, my main focus lies on communities, cultural groups, and social strata. I am using the term “communities” to refer to people living together in a specific place (e.g., a settlement), while cultural groups are larger entities showing similar behavioral patterns in object production and usage, as well as subsistence and modes of burial that indicate a shared identity. Within these groups, social differentiation can be observed through differences in dress and object assemblages in burials, which make up the main part of the archaeological assemblage under investigation in this study. The relationship between the burial record and different forms of identity groups has been the subject of much debate and thus requires some further discussion here.

I.4.3 Burial Analysis and the Identification of Cultural Groups

Most excavation reports describing and interpreting burial material from Southwest China tend to associate grave type with archaeological culture; hence their urgent desire to arrive at a clear classification of burial types; however, as the discussion on the relationship between archaeological remains and past identities above has shown, the case is not this simple. As numerous ethnographic studies have shown, one cultural or ethnic group can be characterized by a number of different burial rituals, while other practices might be common across such boundaries. Ucko therefore suggests switching attention “away from one exclusive burial form (e.g. cremation vs. inhumation) to the exceptional and possibly diagnostic cultural trait […] or the varying proportions of different burial practices within a particular group or area, in order to construct any sort of diagnostic typology of funerary customs” (1969:257).

Just as all other parts of the material record, burial data are not a passive reflection of other aspects of life, but are meaningfully constructed by funeral participants and therefore have to be interpreted in relationship to other aspects of the archaeological record. Morris (1992) highlights that no single feature of burial evidence can be isolated and treated on its own, but that they always have to be seen in context. He furthermore points out that what we can actually find in the archaeological record is largely determined by the actors in the burial rituals executed in the past. We first have to understand the logic and processes by which the archaeological record was created before embarking on any analyses.

In Chapter V, I propose and test a scheme of analysis that treats burials as composite objects, considering their various elements separately in their respective life histories. My analysis starts from the artifact level, dissecting burials into their different components such as the grave, the body, and the objects, before placing them in spatial and temporal relationship to each other. Instead of focusing on firm units of objects and grave types supposedly representing cultural units, my object of analysis are different kinds of behavior and the traces they leave in the archaeological record. The main units of behavior concern:

The selection of:

1) grave location and orientation;
2) grave construction (outer form, inside installations, additional outside markers);
3) burial ritual (body treatment, orientation, sacrifices and offerings, object assemblage);
4) personal belongings and bodily attributes.

The various research objectives of this study — identification of group boundaries, inter-group contact, but also human-environment interaction as well as chronology — each require a focus on different aspects of the burial record, particularly the intersection of the aspects of:

(1) location, geographical preconditions, and the availability of material resources;
(2) grave form, orientation and layout;
(3) body treatment and information on age and sex / gender as far as known; and
(4) artifacts and artifact combinations.

The methods I am using to make inferences on the relationship of these different aspects of the burial record are different kinds of statistical analysis that help to overcome the problem of the overwhelming complexity of the material.[47] Given the large amount of information that can be recorded for graves, multivariate techniques such as correlation coefficients, factor analysis, principal component analysis, and correspondence analysis seem a natural choice. In general, they are very useful tools for pattern recognition in large bodies of data with many variables, but they can neither be expected automatically to generate useful typologies, nor can they be considered objective just because they operate with mathematical procedures. The results of complex analyses are necessarily complex in themselves and can be easily misinterpreted, especially if the mechanisms of analysis at work are not well understood.

As Stephen Shennan (1997:218) has pointed out, the use of multivariate methods "presupposes that we have an appropriate description of the object of interest we are analysing." But the categories and variables are not naturally-given categories but are chosen by the archaeologist. To overcome this problem of subjectivity, there is a general tendency to use as many variables as possible and enter everything into what Feldor McHugh has termed the "black box" (1999:62) of multivariate analysis, hoping that significant patterns will naturally emerge. The presence of a large number of irrelevant variables can easily distort the overall picture and thus lead to erroneous results. Furthermore, the great variability of the material record in the case of the material at hand, combined with its uneven reliability and extensiveness, make it impossible simply to conduct cluster analysis on all variables and hope for significant groupings to emerge. Such a procedure would probably result in nearly every grave being defined as a separate type of its own. In general, no method, however sophisticated, can relieve the

[47] The software used to run these analysis and display them visually are Excel for the generation of tables and basic exploratory analyses, while SPSS and Past are used for complex calculations.

archaeologist of the final responsibility of making a judgment on the relevance of the different potential variables. This is what Dwight Read (2007:304) calls the "double bind problem" characterizing quantitative methods: they require a dataset already "dissected by precisely the dimensions our analysis is aimed at delineating."

The only possible way out of this dilemma seems to be a constant back and forth between analysis and variable selection and definition, combined with clear statements on the questions posed and the variables relevant in their solution. The system of coding of the data is therefore vitally important and needs to be revisited over and over again throughout the analysis, and "the importance of the hard *archaeological* work of thinking through our description cannot be over-emphasized" (Shennan 1997:218). This naturally applies not only to the material retrieved from graves but to all archaeological data and observations, which have to be considered first separately by category and then jointly, exploring their spatial, temporal, and cultural relationships. The following considerations therefore have to be made in reference to the whole body of material and not only the graves.

I.5 Methods of Analysis and Structure of the Dissertation

Apart from constantly needing to think through all descriptions and analyses as Shennan stipulates, it is necessary to go back and forth between theory, method, and material, a process that is usually masked in books and dissertations by the habit of placing the theory section in front of and separate from all analyses. In this chapter, I have therefore discussed only general problems of the identification of identity groups in the archaeological record and questions of the application of statistical and spatial methods of analysis that apply to all chapters. Other theoretical issues are discussed separately in the following chapters. In particular, questions of typology are addressed in connection with the descriptions of the different sorts of objects found (Chapter III); the concept of burials as composite objects is expounded in the chapter on burial analysis (Chapter V); and the mechanisms of cultural contact are conceptualized in the chapter dealing with the description and analysis of signs for such contact (Chapter VIII). In conclusion, the usefulness of the chosen methods will be evaluated in Chapters VII and VIII.

After setting the stage by giving a detailed overview of the geographical background, including some remarks on paleoenvironmental research (Chapter II), I start from the smallest unit of single objects, classifying them primarily by material type to clarify the conditions of their production, and then providing separate typologies for each kind of material to establish usage types (Chapter III). In a next step, I place the objects in their contexts, introducing and analyzing the different feature types, their content, and geographical location separately in Chapters IV (settlement sites), V (graves), and VI (object pits and single finds). A detailed catalogue of the material is provided in an appendix at the end of the dissertation. Being the basis for all the analyses conducted here, this appendix is a crucial part of this study; it is presented separately as a source of reference in order to avoid cluttering the argumentative part of the text with too many details. Wherever possible, tables and lists provide an overview on different parts of the material collection and the results of various analyses.

For all types of archaeological contexts, I describe the material separately according to the main spheres of observation, i.e., feature form and dimensions, object types and combinations, and object (and in the case of burials also body) treatment and placement, if intentional as in graves or object pits. While the material from settlements and object pits is relatively limited and can thus be evaluated through simple summary statistics and qualitative assessments, the burial data are too complex and extensive for such simple measures. In the case of the grave data, exploratory data analysis on both individual variables from various spheres of observation and pairs of variables as well as their graphic display has allowed me to draw conclusions on their nature, reformulate them if necessary, and make initial groupings. This has helped me in deciding which variables are relevant for the various questions posed. More complex statistical methods such as principal component and factor analysis give indications on the relationship between different variables and units of analysis and show general trends in the data. These methods can help reduce redundancy among variables and conclude on a set of variables along which most of the variation occurs.[48] Only once this was done I applied cluster analysis, correspondence analysis, and other multivariate techniques in a meaningful way.

After these separate analyses of the various spheres of observation, I have broadened the scope of inquiry and searched for correlations between them, using various statistical methods to identify connections, e.g., between different grave construction types and various aspects of the burial ritual that might indicate common beliefs or identities. For, as Ucko (1969) has pointed out, in some cases burial practice may characterize particular "societies" or other kinds of groups. The interconnectivity of regions and grave forms or particular grave furnishings, which can be made clear through GIS analysis, is another possible sign of group affiliation. But the relationship between different burial practices and ethnic, social, or other kinds of groups and identities can vary significantly from region to region and from culture to culture as well as between different time periods, and might even be influenced by questions of varying material availability in different regions. The factors of location and chronology have therefore to be taken into account as well. This naturally also applies to material from settlement sites and object pits. In the case of settlements, their position in relation to geographic factors such as elevation,

[48] See Read 2007:137-141 and Shennan 1997:297-300 for further details on the uses of principal component analysis.

soil quality, slope, aspect, river courses, as well as various natural resources requires particular attention. For these questions, spatial analysis is of particular importance.

A further important element that can signal group affiliation as well as other forms of identity is the object assemblage at any type of site. In graves, the most important source of information on individual but also different kinds of group identity are personal ornaments and clothing items (*Mitgaben* after Hachmann and Penner 1999), while objects placed in the grave to be used in the afterlife by the deceased (*Beigaben*) and objects discarded in the course of the burial ritual (*Nachgaben*) more readily reflect group identities. In Chapter V, therefore, I test for the re-occurrence of specific combinations of objects to identify artifact groups or assemblages indicative of particular "reference groups"[49] or identities. To find out what kind of identity these elements might signify, their interconnectivity with other elements like age, sex, and body treatment has to be examined. Patterns of object placement and other aspects of burial ritual can be informative as well. The spatial distribution of specific object types or object groups throughout all sites, which can again be identified through spatial analysis, are important for the identification of regional groups, their "habitat," and signs of contact between them.

The congruence and mutual exclusion of these different factors, especially when viewed on a regional level, would indicate the existence of discrete units that could be equated with cultural groups. It is not, however, very realistic to expect such congruence. Instead of discrete units, I expect to find a range of different overlapping, intersecting, and only in some cases exclusive patterns of behavior that can be interpreted as different spheres of identity (*Identitätskreise*) mirrored in the archaeological record. This rather unstable notion of groups and identities might be difficult to handle in analysis and interpretation, but it has prevented me from

[49] I use the term here in the sense established by Blom (1969:84) who pointed out that "ethnic boundaries do not depend on cultural differences on the level of form, but rather on culture at a more fundamental level, i.e. specific codification of these differences into complimentary statuses which differentiate a population into reference groups."

painting the standard static picture of “monolithic” cultural groups (*Kulturkreise*). Instead, it allows me to provide an image of the ever-changing realities of past life and past identities.

Such conclusions have been reached in Chapter VII through a comparison of the assemblages from different kinds of sites and their relative geographic distribution. The comparison allowed me to develop a tentative chronology of the research area, and finally combining everything into a “big picture” of regional groups, geographic preconditions, and chronological developments. At that point, it becomes possible to reconsider concepts of group, culture, and identity discussed above. Only after establishing the local developments within the research area and reaching an understanding of the nature of cultural and social groups does it become feasible to discuss interactions between them both on the local and regional as well as the supra-regional level of medium- and long-distance contacts. Chapter VIII describes and analyses the main indicators for different kinds of contacts, suggesting various intra- and inter-regional contact networks and placing them into their geographic context. The main emphasis here is on practical matters of inter-group exchange, such as possible routes and their traversability, as well as on kinds of contact and their motivation. In this context, the crucial questions of the nature of different kinds of identity groups and their interactions both with each other and the natural environment posed in the beginning are revisited, thus closing the circle back to the theoretical and methodological discussions of the present chapter.

II. Geographic Background – Setting the Stage

II.1 Geology, Tectonics, and Natural Resources

II.1.1 Plate Movements and Tectonics

Situated at the intersection of the Qinghai-Tibet青藏高原 and the Yunnan-Guizhou Plateau 雲貴高原, and bordering on the Sichuan Plain 四川盆地, the Liangshan region is a crossroad between several different cultural-geographic regions. It is furthermore characterized by a highly varied topography, ecology, and climate (Figures 2.1-2.2). The mountain ranges of western China emerged from the continuous movement of the Indian plate into the Eurasian plate since the early Tertiary. The general uplift of the Qinghai-Tibet plateau commenced in the late Neogene and accelerated in the late Pleistocene, with multiple gradual uplift events taking place even in the late Quaternary (Cheng Jianwu 2011). This motion continues until today; it is not only an uplift but also a clockwise motion that produces highly complex geological structures and makes the area one of the most active tectonic zones in Eurasia (Figures 2.3-2.4).[1] Earthquakes are a common occurrence in the region, and the epicenters of strong earthquakes usually are located along the Anninghe, Zemuhe, and Maoniushan-Xigeda faults.[2] The most unstable areas are the middle to upper Anning river valley between Mianning and Huangshui 黃水, the Jinshajiang area in southernmost Huili and Panzhihua, and the area around Yantang 鹽塘 on the Yalongjiang in between Yanyuan and Huili (Li Xingtang 1988). Seismically sub-stable areas are located between Xide and Xichang, around Dechang, in the Dukou-Miyi region, in the Yanyuan basin, around Huaping, and along the Yalongjiang in Panzhihua.

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[1] See Wei at al. 2007, Wang Hui et al. 2010, and He and Ikeda 2007 for more detailed information.

[2] For historical times, they have been documented in the Forest of Earthquake Stelae of Xichang (*Xichang dizhen beilin* 西昌地震碑林) which holds over a hundred stelae, recording earthquakes in the area of Xichang, Mianning, Ganluo, and Ningnan (Liu Hong 2006). Since 116 AD, 38 strong earthquakes of a magnitude of over 5 have been recorded, with two of them being over 7 and ten being between 6 and 7 (Wang Sijing 1993: 2-41).

Aside from generating earthquakes, continuous tectonic movements also significantly influence the overall geography of the area. The high-peaked mountains of the Hengduanshan mountain chain formed during the Mesozoic and accentuated by the Himalayan uplift in the late Tertiary. These long parallel gorges with the high mountains and deep river-valleys are perfectly unique on a worldwide scale and have attracted much attention by geographers and geologists. The Hengduan Mountains consist of three major north-south oriented chains that are separated by the deep river valleys of the Nujiang 怒江 (Salween), the Lancang 瀾滄江 (Mekong), and the Jinshajiang, with the latter two running through the Liangshan area. They all originate from the Qinghai-Tibet plateau, and flow in strong currents through extremely narrow river gorges (Chaplin 2005). Originally, these might have been tributaries to a single southward flowing river system that drained into the South China Sea until it was disrupted by the uplift and rotation of the Tibetan plateau, leading to the very peculiar patterns and sinistral offset of the eastern plateau rivers (Qiu et al. 2011, Clark et al. 2004). The major lakes were formed by tectonic movements as well, mainly through geological faultage and landslide damming due to earthquakes. In addition to tectonic movements, climatic changes also played a part in the formation of the landscape. Warming during the last interglacial period, with its increased rainfalls and vegetation, led to higher river levels and sediment volume, resulting in the deep-cut narrow river valleys of today (Cheng Jianwu 2011:134).

II.1.2 Geological Composition

This interplay of tectonic movements and climatic change has formed the highly complex geological pattern which characterized the region (Chengdu Jianwu 2011, He and Ikeda 2007). Deposits of different geological eras appear next to each other, mainly in long north-south oriented bands along the main fault. Some of them are of very old age, others dating to the Tertiary or Quaternary (Figure 2.5).[3] The Yanyuan area is dominated by larger extensions of Triassic deposits; east of Xichang there are wide extensions of Jurassic formations; in the higher mountains different older periods left their imprint, and in the south we see a complex patchwork of remains from many different epochs (Ma Lifang et. al 2002: esp. 277). A complex mixture of igneous, metamorphic, and magmatic rocks can be found along the fault zone, while the valleys are dominated by gravel terraces that have emerged in connection with terminal moraines.

Between the two branches of the fault system, a tableland measuring 3 by 57 km has formed. It consists of Pre-Sinian gneiss, Early Sinian rhyolite, Late Triassic and Early Jurassic sandstone and shale, overlain by the Xigeda formation. The Late Cenozoic fluvial-lacustrine Xigeda sequence formed along the main rivers: the Daduhe, Anninghe, Jinshajiang, and Yalongjiang (He and Ikeda 2007:574). It consists of thick sediments and fertile loess deposits, which are especially pronounced along the Anninghe (Yao et al. 2007). The same kind of deposits can be found in the Yanyuan basin, where they overlie a layer of tertiary psepholite clay.

The mountains in the Northwest and Northeast are dominated by Triassic deposits of crystalline schist, sandstone, and, in some places, limestone. In the Northwest, they are intermingled with volcanic, igneous rocks, bands of Permian sandstone and limestone, phyllite, tuff, and Silurian slate, and some Carboniferous limestone, mudstone and dolomite. In the Northeast, at lower elevations Jurassic deposits can be found, while at higher elevations Permian deposits of sandstone, limestone, and volcanic rock are intermingled with the Triassic formations. The southwest is even more complex, with all kinds of deposits intermingled within a very small area. The layering is very complex, with different metamorphic, volcanic, and conglomerate

[3] If not explicitly cited otherwise, the description of the geology follows Sichuansheng Difangzhi 1992, Compilation Committee 2002, and Sichuansheng Cehuiju 1981.

formations overlaying each other (Ma Lifang et. al 2002:277). The southwest as well as much of the direct fault zone with its mantle-derived magma provided good preconditions for mineralization and ore formation, especially for vanadiu-titaniferous magnetite deposits, copper-nickel sulphide deposits, iron-copper deposits, niocium-tantalium-zirconium minerals, coal, and evaporates such as gypsum and salt (Zhang, Luo, Yang 1990:355-390).

II.1.3 Natural Resources

The geological resources of the Panzhihua-Xichang (Panxi) Rift Valley are abundant and of high quality. They appear at a shallow depth, making their recovery relatively unproblematic. Endogamic mineral deposits (e.g., granite, basalt, gold, and copper) are mainly concentrated in the axial uplift area of the Panxi rift zone, while exogenic mineral deposits (e.g., coal, copper-bearing sandstone, and salt) are flanking the endogamic deposits on both sides (Figure 2.7).[4]

Iron deposits are very rich, ranking first in Sichuan and second in China. When the last local gazetteer of the Liangshan Prefecture was published in 2002, there were 314 known iron sources, some of them exceptionally large. The largest one currently exploited is located in Panzhihua (Liangshan Yizu 2002). Around Miyi and in western Huili along the fault, there are several clusters of deposits. Numerous large deposits can also be found in Huidong, Xichang, Mianning and Yuexi, while mid-sized deposits are known from Ganluo, Yanyuan, Xide, and Ningnan, and relatively small ones are located in Zhaojue, Gange, Xide, and Muli. Iron deposits are thus mainly distributed along the Anninghe fault belt, as are most other ores.

There are also over 350 known copper deposits, over a fifth of them associated with other minerals. The deposits in Huili are the largest and the most numerous, holding nearly 70% of the

[4] The information on natural resources was extracted from Zhongguo Dizhi 1993, Sichuansheng Difangzhi 1992, Liangshan Yizu 2002, Sichuansheng Cehuiju 1981, Chengdu Ditu 2010, Yang and Que 1987, Yang Yingxuan a.o. 1988, Yao Jiadong 1988.

overall copper reserves of Sichuan. Other reserves are in neighboring Huidong, as well as around Xichang there are considerable deposits, with smaller ones in Gange, Zhaojue, Dechang, and Yanyuan. Lead, nickel, and zinc deposits are even more widely distributed, appearing in all counties except for Meigu and Zhaojue. The richest deposits are in Huili and Huidong, with considerable findings also located in Ningnan, Butuo, Jinyang, Leibo, and Gange. The tin deposits in the Liangshan region are the richest within Sichuan, centering mainly in Huili and Mianning, with a few more occurrences in Puge, Dechang, and Xide. Precious metals are also distributed across the research area. They include gold and silver, as well as platinum group metals and silver, which can mainly be found in Huili. Other places holding silver in larger quantities are Huidong and Ningnan. Gold is a very common precious metal as well, appearing as placer deposits in the Daduhe, Yalongjiang, and Jinshajiang rivers, as well as in their tributaries and in other smaller rivers. Gold mines exist in greater number in Muli, but also in Huili, Huidong, Mianning, Xichang, and Yanyuan. Rich coal resources are located all over Panzhihua, but also in Huili, Yanyuan, and in smaller amounts at Ningnan, Meigu, Puge, and Jinyang. Of great importance until very recently were furthermore the salt sources of Yanyuan, which have now fallen into disuse due to the lack of iodine in the salt composition.

As far as potential raw material for stone tools is concerned, different types of sandstone, some associated with limestone and volcanic rocks, are most widely distributed (Figure 2.5). Shale is more rare, occurring in narrow north-south aligned bands together with sandstone or dolomite, mainly along the Anning River as well as on the southern rim of the Yanyuan basin, where it is positioned between layers of fine tough slate of dark-grey color. Among igneous rocks, different types of granite are most common, occurring northwest of Mianning and between Huili and Panzhihua. Dolomite appears in Yanbian, but also in Dechang and Xide, while basalt is observable along the whole northeastern part of the area and around Yanyuan. Gabbro is distributed in small pockets over most of the south, except for Huidong, and in larger amounts along the Anning River. A few volcanic deposits, embedded in sandstone or psepholite, appear dispersed throughout most of the area, but obsidian has not been reported. Diabase always occurs embedded in sandstone, mudstone, and coarse conglomerates not very suitable for stone tools. Scattered deposits of basalt have been reported from Yunnan, but not from the research area itself. Serpentinite occurs on the northwestern rim of the Chengdu Plain southeast of Wenchuan, as well as in the far west of Sichuan on the border to Tibet, south of Batang and north of Litang. Flint or chert have not been recorded, but large deposits of quartz diorite are known from Panzhihua and along the whole extent of the Anning river, with some quartz syenite west of Xichang, and some quartz diorite in Yongsheng. Overall, lithic material adapted to knapping is rare, while grindeable material and coarse-grained stones with abrasive qualities are widely distributed. Additionally, the rivers contain naturally smoothed cobbles that can easily be worked into tools. So far, systematic studies on lithic material for tool production in the area are lacking, and further research is needed before reliable inferences on specific sources can be drawn.

II.2 Connecting and Dividing Factors: Rivers and Mountains[5]

Another abundant but not sufficiently exploited resource is hydropower. The natural drop of the Yalongjiang is as high as 1,290 m, that of the Jinshajiang is 667 m (Guo Jinghui et al. 1985:74-79). Numerous other rivers are running through the area, some of them both fast and powerful (Figure 2.6) (Sichuansheng Difangzhi 1992:107-188; Zhongguo Kexueyuan Dili

[5] Information on hydrology was extracted from Guo Jinghui et al. 1985:74-79, Sichuansheng Difangzhi 1992:107-188, Wang and Zuo 2010, Zhao Songqiao 1986 and 1994, Zhongguo Kexueyuan Dili 1999.

1999:157). It has been estimated that there is a possible energy capacity of about 3.7x10^7 kW, making the Liangshan area the foremost natural hydropower region in China (Wang Sijing 1993:4-65). This, however, is true only in theory, as the area's hydropower potential is far from being fully realized.[6] Hydropower as an energy resource was probably not of much interest to the prehistoric people living in the area, but the sheer power of these rivers, their velocity and limited navigability, made them a barrier. They are hardly navigable for the most part, and a dangerous source of flooding during the summer rains. The density of river courses is very high. In the southern and northeastern parts of the study area, rivers are mainly rain-fed; they are thus largely dry in the winter, but they are gushing and fast in the summer. The rivers of the western part of the area, on the other hand, coming from the Qinghai-Tibet Plateau, are fed both by rainfall and melted snow, experiencing high waterflow at different points of the year. Except for the rivers, there are also over thirty lakes within the research area, the most prominent of them being Qionghai 邛海, which is also the second-largest freshwater lake in Sichuan; located in Xichang, the lake is at an elevation of 1510 m and has a surface of 29.3 km^2, a maximum depth of 34 m, and an average depth of 14 m, with a water capacity of 320 million m^3.[7] Other important lakes include Mahu 馬湖 in Leibo, located at an elevation of 1101 m, with a surface of 7.32 km^2, an average depth of 65.7 m, and a water capacity of 481 million m^3; Luguhu 瀘沽湖, located at an elevation of 2685 m directly at the border between Yanyuan and Ninglang in Yunnan, with a water surface of 49.5 km^2, an average depth of 40 m, and a water capacity of 950

[6] Nine large-scale hydro-power stations are in planning (e.g. Xiluduo, Baihetan, Wudongde, two at Jinping, Guandi, Pubugou), adding up to a total capacity of 43,3000,000 KW. Currently, the main places where hydropower resources have already been built are Miyi, Yanbian, Panzhihua, Zhaojue, and Huili.

[7] Information on the lakes and rivers was taken from Liangshan Yizu 2002 and Xinan Shifan 1982.

million m^3, and Chenghai 稱海 in Yongsheng in Yunnan, located at an elevation of 1503 m, with a surface of 77.2 m^2, an average depth of 25.9 and a water capacity of 1.987 billion m^2.

Overall, water resources are abundant in most of the area except for the northwest, which is relatively dry. In modern times also the northeast is suffering from dryness, as the annual precipitation cannot compensate the strong, deforestation-induced water runoff eroding the mountains.[8] The Anninghe delta is characterized by pore water in unconsolidated deposits with high water abundance; for the South, pore-fissure water in clastic rocks is characteristic, with overall low water abundance. Northeast of Xichang, fissure and pore water on lateric ground with low water abundance can be found, and the Northwest is characterized by fissure karst water with low water abundance (Figure 2.8). It is thus mainly the northern areas that experience water scarcity, induced partially by the low amount of precipitation, partially by the low water retention ability of the ground. Erosion-endangered precipitous slopes and water runoff aggravate the situation, particularly in the largely deforested and heavily eroded northeastern mountains. Along most of the Jinshajiang and other rivers in narrow beds there is much river runoff, [9] taking with it the fertile soils that are so unevenly distributed throughout the area.

This combination of low water-retention, steep slopes, and deforestation makes debris flow disasters extremely common along most rivers, with medium activity and thin debris flow along the Yalongjiang, but also along the Jinshajiang and along other rivers throughout the area. The whole eastern part of the research area up to Yalongjiang river is especially endangered; this is particularly true for most of Zhaotong, Meigu, Xide, and Mianning in the Northeast

[8] The annual runoff depth is for the most part between 600 and 800 mm, with especially high values along the Jinshajiang, while further south and in the utmost West the runoff ranges between 500 and 600 mm, and even further south between 400 and 500 mm per annum (Wang Sijing 1993:4-64; Wang and Zuo 2010:38).

[9] The river runoff coefficient if seen in comparison to annual precipitation values in Zhaojue region is 0.7%, along parts of the Jinshajiang it is 0.2-0.3 %, but also other areas are problematic.

(Zhongguo Kexueyuan Dili 1999:187-8). Landslides are another significant problem for most of the area except for the extreme Northwest, which is only sparsely inhabited and therefore still has its soil-preserving forests and other natural vegetation cover. Particularly large land slides occur along the Jinshajiang (> 1000 10^4 m^3), as well as along the Yalongjiang, the Anninghe, and other rivers (> 101-999 10^4 m^3), while smaller landslides of 10-100 10^4 m^3 tend to occur all over the southern and eastern part of the region (Zhongguo Kexueyuan Dili 1999:186). Only the extreme Northwest is relatively unaffected by landslides.

The most endangered areas are the karst landforms, which are distributed mainly in the eastern and western mountains. Karst environments are extremely fragile because of their thin soils and their small water holding capacity. These characteristics are particularly exacerbated in places where slopes are steep: the steeper the slope, the more the soil moisture content is reduced, and the soil cover is usually thinner and easier washed away (Chen et al 2009). The frequent strong seismic activities destroy the stability of such slopes even more and thus induce collapses and landslides. Debris flow already occurred before the onset of significant human modification of the landscape, mainly due to climatic oscillations or tectonic movements. An example of this is the 100-2000 m thick debris flow deposits from the last glaciations and early Holocene in the Hengduan mountains (Zhang, Cheng, and Li 2006). They were created by deglaciation under the influence of the enhanced monsoon during the Pleistocene and Holocene, leaving large amounts of glacial debris and moving weathering bedrock from the valley walls into the valley floor fans (Zhang, Cheng, and Li 2006:130). Large fans and terraces are thus very common in the high valleys of the Hengduan Mountains, as are Late Quaternary mudflow deposits, appearing throughout the whole area, especially in the vicinity of rivers or lakes (Yang and Liang 2004).

Nevertheless, the rivers are not only a source of danger and a dividing factor, but they also connect the research area to faraway regions to the north, south, and east (Figure 2.9). This is especially true of the Jinshajiang, which constitutes the southern, southwestern and southeastern border of the Liangshan area. The Jinshajiang is in fact the upper reaches of the Changjiang 長江. It is a major artery that connects northwest China not only with southwest China, but also with central China and eventually with the coast. Within southwest China, it flows in a loop from Tanggulashan 唐古拉山 in Tibet, first eastward through southern Qinghai, then turning south and running along the western border of Sichuan into Yunnan, and then turning once more east in the Lijiang area 麗江 and forming the southern and eastern border of the Liangshan Prefecture before turning east toward Yibin 宜賓 and Chongqing 重慶. It should be noted, however, that the Jinshajiang is navigable only from Yibin onwards; within southwest China, it flows in narrow gorges that can be over 1000 m deep, making it cumbersome or even impossible to travel. Its tempestuous currents can only be crossed at very few points. This river therefore constitutes a considerable barrier towards the south and west, a border that circumscribes the southern part of the research area.[10] The Daduhe, on the other hand, which forms the northern border of the study area, provides both north-south and east-west connections. It comes from Aba 阿垻 and Ganzi 甘孜, turns east around Shimian 石棉, and touches on the northernmost tip of Ganluo 甘儸 on its way towards Leshan 樂山, where it merges with the Minjiang 岷江, a tributary of the Yangzi.[11]

[10] The portion of the Jinshajiang flowing through the Liangshan area is 598.7 km long, with an average width of 239 m and an overall water surface of 24,890 km^2. Its main tributaries within the Liangshan are Chenhe 尘河, Heishuihe 黑水河, Shuiluohe 水落河, Liutonghe 溜筒河, Xixihe 西溪河, Canyuhe 鯵魚河.

[11] The Daduhe is one of the mean streams belonging to the Minjiang river network. The part that runs through Liangshan Prefecture is 35 km long, 130 m wide, and has a water surface of 45,260 km^2. The main tributary running north into the main area of the prefecture are Nirihe 尼日河 and Nanyahe 南椏河 in Mianning.

Other important waterways dominating the region are the Yalongjiang 雅礱江, the Litanghe 理塘河, and the Anninghe 安寧河 with their many tributaries. The Yalongjiang, although not as wild as the Jinshajiang, is likewise largely not navigable and therefore a dividing as well as connecting factor in the local geography. Originating is southern Qinghai, it runs parallel with the Jinshajiang and the Anninghe through Muli, Mianning, and along the border between Yanyuan and Xichang into Miyi and Yanbian, where it flows into the Jinshajiang. At a length of 1,323 km, it covers a sizeable drainage area of about 144,000 km^2 and divides the territory into two geographically and culturally fairly different areas east and west of it.[12]

The Litanghe, which belongs to the Yalongjiang river system, originates in Litang County 理塘縣 in the Xueshan Mountains 雪山, flows through Muli in north-south direction, where it connects with other smaller rivers flowing north through Yanyuan and up to Panzhihua, as well as further west where the streams connect with the Yalongjiang[13]. Its currents are rapid, flowing through a narrow riverbed, and are likewise largely not navigable.

Of much greater importance for transportation purposes is the Anninghe, the main artery running in a north-south direction through the center of Liangshan Prefecture. It springs from the southern foot of Mount Gongga 貢嘎山 in the northernmost part of Mianning and traverses the counties of Xichang, Dechang, Miyi and Yanbian, where it connects with the Yalongjiang and the Jinshajiang. With it length of 320 km and a drainage area of 11,000 km^2, it drains 18% of Liangshan Prefecture, and the prefecture's most fertile agriculture soils are distributed on its banks. Its tributaries are numerous and – as is the case also for the tributaries of the other main

[12] Its main tributaries are Anninghe, Litanghe, Sunshuihe 孫水河, Woluohe 卧落河

[13] The part of the river flowing through the Liangshan area is 242.3 km long, 66 m wide at average, and has a water surface of 10,850 km^2.

rivers mentioned above – they are largely not navigable and highly seasonal, sometimes completely dry in winter and rather violent after the summer rains.

While its many rivers thus connect the area to faraway regions to the north, south, and east, the high mountain ranges of the Hengduanshan 橫斷山脈 with the highest peaks in Muli reaching nearly 6000 m, divide the region into many small micro-areas with rather different environmental characteristics (Figures 2.10-2.11). Throughout the entire Hengduan Mountains, there is a peculiar vertical ecological zoning along the deep river valleys, which are running in a north-south direction. While alpine meadows prevail at higher elevations, the valleys can be temperate or even tropical in nature.[14] Due to the complex topography, there is also a great variety in soil types, resulting in different kinds of vegetation, but also in different preservation conditions for archaeological material. This places very different environments in immediate proximity to each other, requiring different forms of human adaptation and therefore possibly inducing very different lifeways to emerge in close vicinity of each other. These soils and the vegetation growing on them shall be described in the following section.

II.3 Present-Day Environmental Conditions: Soil, Climate, Vegetation, and Land Use

II.3.1 Soil Types: Their Emergence, Distribution, and Main Characteristics[15]

The complex geology described above does not only lead to the abundant emergence of various minerals and other resources, but it also provides a vast range of different parent materials for soil formation. Most local soils have developed from weathered material of sedimentary and igneous rock types such as shale, granite ceric ultisoils, and sandstone occurring

[14] Ren, Yang, and Bao 1985: 136f. and 314-344.

[15] If not cited otherwise, information on soils in the study area was extracted from Thorp 1936, Zhongguo Kexueyuan Nanjing 1986, Zhao 1986, Sichuansheng Difangzhi 1992, Zhao 1994, Zhang Rongzu 1997, Zhongguo Kexueyuan Dili 1999, Liangshan Yizu 2002, Shi, Yue, and Shi 2002, and Chengdu Ditu 2010.

on parent material with low base saturation (Zhongguo Kexueyuan Dili 1999:109). Other parent materials are weathered limestone, appearing in small patches over the whole area, but especially in the northeastern mountains towards the rim of the Chengdu Basin, Crystalline rock is the most common soil parent material also along the Anninghe, parts of the Lancangjiang and Daduhe and along some smaller rivers in the Northwest.

The soil types emerging from them are even more varied, varying not only by geographical area but also by elevation, or even between different sides of the same mountain (Figures 2.12-2.13). The pH, nutrients, minerals, and microorganisms determining soil quality can even vary within the same soil type and within the same patch of soil depending on depth and recent human and natural influences (Scheffer and Schachtschabel 2002). Especially rice paddies, as they can be found in the Anning River Valley, alter the quality of the soil so extensively via podolization that it is hard to infer on the quality of the soil that previously covered this area.[16] Overall, the vast anthropogenic modification of the vegetation has lead to significant changes in the soil, making it difficult to use present-day maps for inferences on past conditions. Furthermore, most published soil maps of Southwest China are coarse-grained and/or use non-standard terminologies that often only describe soil color, location, or properties, using, e.g., 'alpine cold desert soil' or similar generic terms, which are hard to connect with standard terminologies.[17] The description of soil properties in the following therefore has to remain very general as well. Wherever possible, I will use the terminology of the World Reference Base for

[16] Personal communication by Jade d'Alpoim Guedes. See Bray 1994 for further details on the process of podolization.

[17] There are different soil classification systems. The one generally used in US surveys is the USDA Soil Taxonomy developed by the United States Department of Agriculture and the National Cooperative Soil Survey. The World Reference Base for Soil Resources, on the other hand, is the international standard taxonomic soil classification system used by the International Union of Soil Sciences (IUSS), replacing the previous FAO soil classification. For further literature on soil classification see Eswaran et al. 2003, Deckers, Nachtergaele, and Spaargaren 1998, and Scheffer and Schachtschabel 2002.

Soil Resources, also relating the major terms used in Chinese publications; depending on the literature, however, I will have to limit myself to a description of colors and other properties.

Different kinds of plants require different kinds of nutrients and soil qualities, but in general, thick topsoil, high humus content, and a slightly acid pH of 6.3-6.8 are favorable for plant growth.[18] In the following discussion, I will therefore mainly rely on soil organic matter and pH to judge the soil fertility in different areas.[19] The southern part of the Liangshan area, which is heavily cultivated has, has 1-1.5% of organic matter, the Anning river valley holds 2-4%, a north-south oriented stretch of land east of Xichang even has 4-7%, while the northeast with its eroded hills is especially poor in organic matter, and the northwest has 4-7% in the parts that are still thickly forested (Zhongguo Kexueyuan Nanjing 1986:27-28). The pH increases from south to north and from east to west, with most soils having a pH of 5.0-6.0 with a base saturation of 20-60%, while in the Northwest and Northeast the pH is a little higher with 6.0-7.0 and a base saturation of 60-90% (Zhongguo Kexueyuan Nanjing 1986:27-28).

Most of the middle and southern part of the research area are dominated by acrisols, which encompass what in Chinese publications is referred to as red earth, yellow earth, and lateritic soil, depending on their color and variety (Figures 2.14-2.15). Acrisoils are generally widely distributed in humid and subtropic areas, and they are subject to laterization, argillation and leaching, which leads to a low humus content of less than 1% and a pH of below 5.0-6.0, with the danger of becoming acid under heavy cultivation. In the valleys, intermontane basins, and lacustrine plains, gleysols (also referred to as meadow soils or paddy soils) are most

[18] Organic matter is the highest in forest soils with usually 7-10% and the lowest in deserts with below 0.5%. Soils that have been under cultivation for a long time usually have 2% more organic matter, while paddy soils are richer than upland soils (Scheffer and Schachtschabel 2002, Birkeland 1984).

[19] Information on organic matter, soil pH, as well as minerals and nutrients was taken from Zhongguo Kexueyuan Nanjing 1986:21-50 and Zhongguo Kexueyuan Dili 1999:111-114.

common. They are reddish, brown or yellowish wetland soils emerging on Pleistocene and Holocene fluvial and lacustrine sediments. The banks of the upper and middle Anning river valley are dominated by these alluvial soils, grey-brown in the upper, yellow-reddish in the lower part. Yellow clay of old alluvial deposits runs in parallel bands slightly further to the west, probably being holdovers from previous tectonic movements and shifts of the river course. The Yanyuan basin is characterized by yellow-reddish alluvial soils stemming from the river network running through it. The lower part of the Anninghe, as well as Jinshajiang, parts of Yalongjiang and other rivers are flanked by old alluvial deposits of red earth, and also in other river valleys and the whole south red earth dominates, partially with yellow or purplish admixtures.[20] These soils are generally high in water content, have naturally a very rich humus content in the top layer,[21] a nitro content of 0.1-0.5 %, and are overall very fertile. Therefore, they are used for wet rice cultivation where the climate allows, like for example in the southern part of the research area.

Over the Tertiary and Jurassic, geological formations of limestone and marble characterizing a large north-south extended band east of Xichang, as well as the area between Huili and Huidong, regosols have built; these encompass purple soils, mostly red-purple, surrounded by grey-brown varieties at lower elevation where they border on red earth. These regosols are among the most fertile soil deposits in Sichuan, but are highly susceptible to erosion, especially if intensively used for agriculture. At higher elevation, they are bordered by different types of mountain soils, like cambisols (subalpine meadow soil), lithosols (soils of mountainous areas), and luvisols. Luvisols, which are very common throughout the Northwest and parts of the

[20] To distinguish it from the red earth south of the Changjiang, the red soil that can be found in southwest China is called mountain plateau red earth (Ren, Yang, and Bao 1985:323).

[21] Only heavily cultivated areas like the Anning River Valley have a rather low humus content of 2-4%.

Northeast, are dark-brown forest soils, which have formed mainly in connection with mixed broad- and needle-leaved forests. Luvisols are highly fertile, with a medium to slightly acid pH of 5-6.5 and high water retention capacity, but especially in the Northeast and also the Northwest they have been badly damaged by deforestation, followed by erosion and landslides.

Cambisols are especially common in the northwester part of the research area, from where they extend into Northwest Sichuan and onto the Qinghai-Tibetan plateau, where they appear in combination with xerosols. Lithosols are usually very thin with an extremely low content and they thus remain mostly barren, while xerosols, developing in the transition zone between semiarid and arid region, are the major soil of the plateau desert-steppe and have also a low humus content of 1-2% in the topsoil. Cambisols, on the other hand, can be very fertile and are widely distributed, especially in temperate climates, however, they vary widely in characteristics by climate, topography, and parent material. The cambisols in Southwest China are classified as humic cambisols, having a humus layer of 15-20 cm with over 5% humus content.[22] Cambisols are most suitable for forestry, less so for agriculture, partially also because of the steep slope and the high elevation on which they appear.

On the karst landforms dominating the easternmost and western part of the research area, thin layers of rendzinas (limestone soil) and ferric luvisols are the main surface cover. The pH values of rendzinas are high (5-7), i.e. they have an alcalic tendency, are humus-rich (10-20%) and have a good soil-climate, but a high calcium carbonate content (1-30%), which is unfavorable for soil fertility,[23] while their thinness prevents retention of water and nutrients. The

[22] Cambisols are very young soils, derived from many different kinds of rocks, but mainly in alluvial, colluvial and aeolian deposits accumulating, e.g., in mountain areas with active erosion like the Hengduanshan Mountain ranges.

[23] Soils containing much calcium carbonate are usually low in organic matter and available nitrogen. In these soils, the pH levels are high, so that phosphate becomes unavailable due to the formation of calcium phosphate apatite, and also micronutrients like zinc or iron as well as potassium and magnesium can become insufficiently available, which are all needed for plant growth (Zhongguo Kexueyuan Nanjing 1986: 26-30).

underlying clastic rocks lead to low water abundance, while the steep slopes make the Karst environment even more fragile.[24] The frequent strong seismic act ivies furthermore destroy the stability of slopes and thus induce collapses and landslides, becoming even more vulnerable in case of deforestation and intensification of land use.[25]

Soil type and quality as well as the availability of ground suitable for agriculture is thus very uneven throughout the area, and varies with elevation and even direction of the mountain slope, as this determines the amount of rain, wind, and sunshine a given patch of soil will receive. All of these factors influence the vegetation, which in turn determines soil formation processes. The ecology is also determined by latitude and elevation, which affect precipitation (Aldenderfer and Zhang 2004:11), making it necessary to consider all these factors together.

II.3.2 Climate: General Trends and Local Variations

The Liangshan region is a transition zone between the temperate flora of north China, the subtropical lowland flora of south China, and the subalpine highland flora of the Qinghai-Tibet Plateau (Sichuan Zhibei 1980:341). The large landmasses of the plateau influence the climate locally as well as globally. They weaken the Westerlies by splitting them into a northern and a southern branch, thus allowing the summer monsoon to extend further north beyond a latitude of 30° N (Jarvis 1993:14). These landmasses furthermore prevent the cold air from the Siberian-

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[24] A study conducted in Guizhou shown that the soil moisture content decreases significantly on bare soil compared to forest or shrub and grassland, so does hydraulic conductivity. The reduction is even more severe if deforestation leads to strong rock desertification (Chen et al 2009).

[25] As the mudflow deposits of Late Quaternary and earlier times show, debris flow has always been a very common occurrence, but problems of erosion and landslides have vastly increased during the last 60 years. Since the onset of deforestation and agricultural activities and especially with the intensification of cultivation since the 1950s, problems with debris flow have increased. They naturally appear especially along fracture zones and seismic belts, in transition zones between different morphological regions like basins and mountains, and between topographical ladders of Qinghai-Tibet and Yunnan-Guizhou Plateau and Sichuan Basin as well as the Hengduan mountains, while strong monsoonal rainfalls add to the problem, making it the main debris flow area in China (Yang and Liang 2004)

Mongolian High that bring cold winters to southeast China from proceeding further west, leading to mild winters, while the cooling effect of the Tibetan High keeps the monsoon from entering Southwest China until the plateau has warmed in early summer. Therefore southwestern China is significantly drier in the spring and early summer than southeastern or central China, which receive the influence of the eastern monsoon much earlier than the southwest or Indian monsoon reaches southwest China (Figures 2.17) (Zhang et al. 2004).

The climate has thus marked dry and wet seasons with 90% of the rain falling between July and October, carried by the Southwest Asian monsoon, while during winter the southern branch of the Westerlies leads to clear, cold, and dry weather. The temperatures begin to rise already in March, with the overall climate being relatively mild throughout the year (Figures 2.18-2.22). The annual variation in temperature is relatively low, but fluctuation throughout the day is high, with cold nights and warm days. These temperature differences are particularly high in winter when the skies are clear, especially in colder mountainous regions, with their high sunshine intensity and cold air. Overall, the region has 1600 to 2400 sunshine hours per year and an annual thermal radiation of 110-140 kcal/cm^2, but both sunshine intensity and hours diminish from southwest to northeast, with especially high values for the Yanyuan area for both, and very high sun intensity but a medium number of sunshine hours in Panzhihua (Figure 2.23).[26]

The average temperatures for most areas lie between 14 and 18° C, but the temperatures are significantly lower in the Northeast and Northwest, where they range between 8 and 12° C, and increase towards the south, with 20° C in Panzhihua and along southern parts of the Jinshajiang river valley, especially around Qiaojia 巧傢, which is known for its hot summers. Temperatures in January are generally high in the south and the Anning river valley with 8-12° C,

[26] The information presented here on climate conditions was compiled from Sichuansheng Cehuiju 1981:19-24, Zhongguo Kexueyuan Nanjing 1986:5-6, Sichuansheng Difangzhi 1992:6-44, and Chengdu Ditu 2010:18f..

but much lower in the Northeast and Northwest with an average of 2-6°. In July, the average in the South and along the Anninghe is about 22-24°, with only Huili being a little cooler, while the Northeast experiences temperatures of 18-22° and the Northwest reaches 14-20° C, however, these are only average temperatures, while the variation throughout the day is usually high, and there are considerable micro-climatic differences, with temperatures decreasing from low to high elevation by about 0.57 ºC per 100 meters elevation (Figure 2.24) (Fan 2009:15).

Precipitation is generally ample with an annual rainfall of 600-1,400 mm, but unevenly distributed throughout the region (Figures 2.25-2.26). The highest amount of precipitation is measured in the upper Anning River Valley, the least in Yanyuan and along the Jinshajiang, but also the northern regions are overall relatively dry. In the western regions, springs are particularly dry, with hardly any precipitation falling between late October and late July, while in the Northeast precipitation is more evenly distributed throughout the yea. This is mainly due to geomorphological reasons. The deeply incised gorges of the Hengduan Mountains create passages for the monsoonal air to pass through, slowly diminishing its power along the way and leading to sharp differences in moisture gradient from southeast to northwest.[27] These differences in climate lead to stark regional differences in surface cover.

II.3.3 Vegetation: Present-Day Surface Cover and Spatial Correlates[28]

As sclerophyllous plants are adapted to water deficiency, high light intensity, and nitrogen deficiency, which all characterize the Liangshan region, *Pinus* and evergreen

[27] The heated Tibetan Plateau pushes monsoonal air masses from the Bay of Bengal to flow north along the river gorges where they induce heavy rain fall (Fan 2009:15).

[28] If not cited otherwise, the information below was compiled from Wang 1961, Sichuan Zhibei 1980, Sichuansheng Cehuiju 1981, Zhongguo Kexueyuan Nanjing 1986, Sichuansheng Difangzhi 1992, Ren, Yang, and Bao 1995, Li 1993, Zhongguo Kexueyuan Dili 1999, Liangshan Yizu 2002, and Chengdu Ditu 2010.

sclerophyllous oak types (*Quercus cf. sclerophylldrys*, and *Quercus cyclobalanopsis*) are dominant throughout all of the research area (Figures 2.27-2.28).[29] Other common genera are fir (*Abis*) and spruce (*Picea*) in the cooler climates of higher elevation areas, while on highest altitudes birch (*Betula*), alder (*Alnus*), and different types of rhododendron can be found, and hemlock (*Tsuga*) inhabits cool and moist pockets of the area. Speaking by latitude, the South, middle, and most of the East are dominated by subtropical semi humid evergreen broadleaf forest with *Pinus Yunnanensis* on the mountain slopes and dry-hot valley vegetation in the canyons. In the Northwest plateau mountains, on the other hand, cold-temperate and needle leaf temperate forest and evergreen sclerophyllous tree woodland with *Picea*, *Abies* forest and evergreen sclerophyllous *Quercus* forest are the main land cover.

As far as micro-regional distribution is concerned, the southern parts of Jinshajiang, Yalongjiang, and their tributaries, are dominated by subtropical and tropical savannah shrubs unless the ground is agriculturally used (Figures 2.29-2.30). Much of the south is covered by rice paddies and other kinds of agricultural fields, especially along the rivers. Further away from the rivers and at higher elevations, subtropical and tropical mixed evergreen and deciduous broadleaf scrubs and grassland prevail, with patches of subtropical needle-leaf forest dominated by *Pinus Yunnanensis* and subtropical zone broadleaf evergreen sclerophyllous woodland (mainly *Quercus aquitolioides*), and at higher elevations Yunnan needleleaf forests of pine and fir.[30] The Southwest is generally rich in subtropical needle-leaf forests with much *Pinus yunnanensis*. On higher elevations broadleaf evergreen forests and broadleaf evergreen and deciduous scrubs dominate, while the river deltas are covered by fertile agricultural fields (Sichuan Zhibei 1980).

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[29] Overall, sclerophyllous plants, which are generally more tolerant to aridity, appear in large number (Jarvis 1993:44).

[30] Mainly different types of Yunnan pine (Pinus yunnanensis) can be found throughout the area, while around Xichang *Pinus massoniana* forest with *Exochorda gardii* and *Symplocos paniculata* is most common.

The natural surface cover of the northeast is broadleaf evergreen sclerophyllous woodlands, mainly of *Quercus aquitolioides*, further north and at higher elevations displaced by temperate and warm temperate mountain microphyllous deciduous forest (mainly *Betula albo-sinensis, Betula plaiphylla*), and patches of subtropical zone broadleaf evergreen forest (mainly *Cyclobalano psis glauca, Castanopsis eyrei, C. sclerophylla*); however, nowadays the area is largely deforested, with only a few scrubs, low trees, and dry grasses remaining. Most of the Northwest, on the other hand, is still densely covered with tropical subalpine need-leaf forest (*Pinus yunnanensis* forest with shrub layer, *Abies georgeri, and Picea ilkiagensis*). At higher elevations in Muli broadleaf evergreen and deciduous scrubs and strips of warm temperate, subtropical subalpine evergreen leather-leaf scrub (*Rhododendron fastigiatum, R. litangense*) on alpine grass and forb meadows are the most common land cover (Sichuan Zhibei 1980).

Along the Anninghe, Jinshajiang and other main rivers, none of the natural vegetation remains, but everything is covered with agricultural fields (Chengdu Ditu 2010, Sichuansheng Difangzhi 1992). Only along the upper Anninghe at a little distance from the river and at higher elevations, patches of needle-leaf forest can still be found, in some places dominated by fir, in others by pine. Broadleaf evergreen forests, subalpine sclerophyllous broadleaf evergreen scrubs, subalpine needleleaf evergreen scrubs, and broadleaf evergreen and deciduous scrubs and forests are common at higher elevations, with some grass and forb meadows on the highest slopes. The very fertile Yanyuan basin is largely covered by agricultural fields as well, which are bordered by a broad band of broadleaf evergreen and deciduous scrubs in the Southeast (Sichuan Zhibei 1980). At higher elevations on all sides there are subalpine sclerophyllous broadleaf evergreen forests and scrubs (esp. *Rhododendron*), needle-leaf forest with a dominating pine element, sclerophyllous broadleaf evergreen forests and scrubs, small patches of needle-leaf forest with *Pinus densata, Picea, and Abies*, and at even higher elevations grass and forb meadows.

II.3.4 Overview on Patterns of Present-Day Land-Use[31]

As became clear above, the vegetation cover as well as the degree of suitability for agriculture varies greatly by sub-region and elevation (Figures 2.28-2.30). Today, most of the land that is located in river valleys and basins below 2000 m is covered with agricultural fields. The most intensively used farmland can be found in the Anning river valley as well as the wider parts of the valleys of Jinshajiang and Yalongjiang and some of the intermontane basins and lakes, which are mostly characterized fertile alluvial sediments and gentle slopes.

The ground suitable for agriculture is fairly limited and unevenly distributed throughout the area. It is concentrated along the Anninghe and Huili with their first rate agricultural soil, in the Yanyuan Basin and in some smaller valleys in between, where second-rate agricultural soil can be found (Wang and Zuo 2009:154). The northwestern regions are suitable for forestry, with some second-rate pastureland in river-valleys and on plateaus, while most of the eastern parts of the research area as well as the smaller river valleys throughout are suitable for both forestry and animal husbandry. In Yanyuan and much of the North, there are limitations to agriculture due to cold as well as to slope, and some areas in the West are additionally limited by water scarcity.

The effective irrigated area is very low in the western part of the research area but much higher in the East (Institute of Remote Sensing 1997:24-25). Paddy rice fields are mainly concentrated on the upper and middle Anninghe between Mianning and Dechang, and also along the lower reaches of the same river between Miyi and Yanbian. Some other river valleys have

[31] Information on land-use was extracted from Sun and Sun 1962, Institute of Remote Sensing 1997, Sichuan Zhibei 1980, Zhongguo and Chengdu 1981, Xinan Shifan 1982, Sichuansheng Difangzhi 1992, Cheng Chushu 1993, Zhongguo Kexueyuan Dili 1999, Liangshan Yizu 2002, Shi, Yue, and Shi 2006, and Wang and Zuo 2009.

limited amounts of wetland rice agriculture as well, e.g. the Cemuhe 側木河 in Puge, the Heishuihe 黑水河 in Ningnan, the Chenghe 城河 in Huili, the Yangpinghe 羊坪河 in Yongsheng, and the area around lake Chenghai 稱海 in Yongsheng. In the South, two and sometimes even three crops of rice per year are possible. Rice fields of lesser quality can also be found at higher elevation in smaller and larger basins and valleys throughout the whole research area, especially in the south and west, with the highest paddy rice fields being located in northeast Yunnan close to the Sichuan border.

Growing rice at such high elevation is only possible because of the high sunshine intensity characterizing the region, combined with the influence of the southwestern monsoon, which brings a humid warm climate to the southern slopes of the Himalaya. Certain varieties of rice can grow on altitudes of up to 2100-2700 m where not more than 18 frost days occur; for rice it is most important that during the whole period of growth temperatures do not sink below 10°C. [32] Therefore, in northeast Yunnan, the upper limit for rice cultivation is up to 500 m higher than in other regions, and there are considerable differences between the windward and leeward sides of the mountains, as they receive uneven amounts of rain, wind, and sunshine (Yu 1984).

While paddy fields are mainly located on low terraces, higher terraces and hill slopes are suitable for dry field agriculture. Wheat fields are the dominant type of agricultural fields in the eastern river valleys and most prominently the Yanyuan basin, which is even more well known for its apple and walnut orchards. The main staple grown in the mountains of Southwest Sichuan is spring or winter wheat, at higher altitudes and colder areas in the Northwest and Northeast also barley, buckwheat, and potato. Another major crop is corn, which is grown even at altitudes of

[32] Depending on the rice variety, annual average temperature should be between 10-12°C, and the warmest moth during its ripening must be 16-20°C warm, with an average annual accumulated temperature of over 3000° (for a few varieties 2000° C can suffice) (Yu 1984)

3000 m and above. In the Anning river valley, rice is the most prominent among the grains, making up 50% of the crops, accompanied by 20-25% of wheat and 5-15% corn. In the Southeast, 20-30% of the ground is taken up by rice fields, 20% by wheat, and 20% by corn. For the Northeast and Northwest, the percentage of paddy rice fields lies well below 5%, wheat makes up below 10%, while corn amounts to 25-40%, the rest of the agricultural ground being covered by barley, yen oat, and other grains, as well as potato.[33] Because of the steep slopes characterizing most of the area, the level of agricultural mechanization is extremely low until today, with the exception of the Xichang area and Miyi, where the Anning River Valley is particularly flat and wide, providing enough level agricultural land to make the use of machines possible and profitable (Institute of Remote Sensing 1997:28-29).

Apart from these staples, there are large tobacco fields in most areas except for the Northwest, where the low temperatures and steep hills are not suitable for such plantations. Other important crops are rape, broad bean, pea, soybean, peanut, and in southern areas such Huili, Huidong, or Panzhihua sugar-cane, as well as citrus fruits, bananas, and other tropical fruit. Cold-adapted fruits such as apple as well as walnut are grown in Yanyuan and the northwestern areas. Until the cutting ban implemented by the government in the 1990s for reasons of erosion protection, forestry was another important income source (Fan 2009:25). Even today, most of the western and especially northwestern mountains are still covered with forest, but human influence has changed their nature up to an altitude of 3000 m. At even higher elevations, the natural vegetation is shrub savannah, while the dry mountain valleys and the largely deforested and badly eroded areas in the Northeast are only covered by low-quality scrubland meadow. Although these areas would be suitable pastureland, livestock rearing is only a sideline of

[33] For detailed information on the economic output see Sichuansheng Tongjiju 2011 and National Bureau of Statistics 2011. For earlier trends see Sichuansheng Difangzhi 1993.

production. Throughout most of the research area, animals (usually pigs, goat, sheep and cattle) are kept in shelters largely for personal use or additional income, while only in the Northwest cattle and goats are grazed on open pastureland as a main income source. The dominant kind of large livestock are different types of cattle, with water buffalos in the south and yak in the utmost northwest, while sheep and goat are most important among the smaller livestock, especially on steeper slopes at higher altitude, while in the valleys pigs are being kept in many households.

II.4 The Vertical Zonation of the Landscape

The description of climate, soils, and surface cover provided above, is rather general, and local variations are high, especially for precipitation.[34] Vast differences in sunshine hours, rainfall, and winds between windward and leeward or the sun-facing and sun-opposing sides of the same mountain in turn lead to different soil and vegetation developments.[35] The most studied example of this phenomenon is Mount Gongga 貢嘎山, from which the Anninghe springs.[36] Here, the same soils and vegetation bands start on a much lower level on the eastern slope, and reach much higher on the opposite side of the mountain (Table 2.1). For areas further west and further south, the picture is even more complex.

The climate and vegetation of the Hengduan mountain range have been studied extensively, leading to very different results for different mountains:[37] The western slope of the Gaoligong mountains 高黎貢山 in western Yunnan, for example, has a sequence of subtropical

[34] This is especially true for the precipitous Hengduan mountain ranges, where correlation between different weather stations is relatively high as far as annual temperatures are concerned, but vary greatly for precipitation, indicating a strong influence of the topography on rainfall distribution (Fan 2009: Table 2.2).

[35] There is even a proverb referring to this situation, saying that "on one mountains there are four seasons, and the weather is not the same within a distance of ten *li*"一山有四季，十裏不同天 (Ren, Yang, and Bao 1985:321).

[36] e.g. Messerli and Ives 1984, Zhao, Yang, and Shen 1990, Zhong, Zhang, and Luo 1999

[37] The studies I am referring to here are those by Liu, Xu, and Zhang (1984) and Yao Yonghui and his colleagues (2010).

evergreen coniferous forest (1600-2800), broad-leaved and coniferous mixed forest (2800-3000 m), dark coniferous forest (3000-3600 m), subalpine/ alpine bush and meadow belt (3600-4000 m), and alpine desert. On the eastern slope, similar vegetation belts start at a higher altitude. Here subtropical evergreen coniferous forest (1700-2600 m), evergreen broad-leaved forest (2600-2800 m), small-leaved forest (2800-2900 m), and broad-leaved and coniferous mixed forest (2900-3200 m) follow each other, ending in dark coniferous forest (3200-3600 m), subalpine/ alpine bush and meadow belt (3600-4000 m), and alpine desert like on the western slope at roughly similar altitude.[38] The picture for Nusha mountains is similar, but with somewhat different vegetation, while for Meili Xueshan 梅裏雪山, Baimang Xueshan 白茫雪山, and Taiyang Mountain 太陽山 in Muli, the starting point for vegetation in common between both sides is again lower on the eastern than on the western slope (Figures 2.31).

Furthermore, some kinds of vegetation belts can appear at very different elevations in different places on opposite slopes (Tables 2.2 and 2.3). This is probably due to differences in latitude, wind direction, and mountain alignment. South of 28° N and west of 101° E, i.e. southwest of Muli, the western slopes are windward slopes, which are usually more moist, as shown by the presence of humid evergreen broad-leafed forests, while the eastern side is generally dominated by drier evergreen coniferous forests. South of 28°N and east of 101°E, i.e. southeast of Luguhu, the eastern slopes are windward, so the situation is inversed (Yao Yonghui et al. 2010). Overall, west of the Jinshajiang, the upper limit of the same taxa is higher on eastern slopes, while east of the Jinshajiang circumstances are inversed. The forest line is lower on the western slopes west of the Jinshajiang, while the situation is reversed east of the Jinshajiang. Montane coniferous and broad-leaved mixed forest is more common on eastern slopes between

[38] There are different classification systems used for the vegetation types of southwestern Sichuan and northwestern Yunnan. Here, I am largely following Jarvis 1993, Sichuan Zhibei 1985, and Zhongguo Kexueyuan Nanjing 1986.

Lancangjiang and Jinshajiang, and between Lancangjiang and Yalongjiang montane evergreen leather-leaved shrub belt and montane temperate coniferous forest dominate.

Studies on the upper limit of rice cultivation in China have furthermore shown, that in Lijiang, i.e. in the southwestern part of the research area and further south, the overall annual temperature difference between windward and leeward slope is 400° C, while the annual average temperature differs by 1.2°C, and the upper limit differs by 300 m (Yu 1984:50). Other microclimatic differences need to be taken into account, as well, for example lakes and other warmth-preserving or cooling geographic features. As Yu Xiao-Gan has pointed out, Rugu lake in the Yongning basin for example, with its 53 km^2 water surface preserves so much warmth, that nights temperatures at the lake are generally 2° higher than in the surrounding areas, raising the altitude above sea level at which rice can be grown (Yu 1984:50).

A more detailed study on the western bank of the Jinshajiang in the Hengduan Mountains furthermore shows, that the line between the different vegetation and soil types is often not easy to draw and many taxa appear throughout many different vegetation belts (Tables 2.4-2.6).[39] Here, on the western slope from 2100-2800 m subtropical arid folial scrub are predominant, from 2800 to 300 m warm temperate semi-arid folial scrubs with some pine and oak prevail, while from between 3000 and 3300 m pine forest with some oak is most common. 3300-3500 m is covered by spruce forest with a high percentage of oak and pine, at 3500-4000 m we find fir forest, at 4000-42000 rhododendron scrubs dominate, at 4200-4600 m we mainly find meadow with some dry shrubs, mainly rhododendron, at 4600-4900 drift stone slopes, and above 4900 m permanent ice. Furthermore, yellow oak (*Quercus muehlbergii*) forest, distributed widely between 3000 and 3900 m, takes up a large part of the overall vegetation spectrum. On the

[39] This example is taken from a study by Liu Lunhui, Yu Youde, and Zhang Jianhua (1984).

eastern slope, the sequence is a little different, with subtropical arid folial scrubs between 2050 and 2800 m, temperate semi-arid folial scrub with much pine and oak between 2800 and 3300 m, spruce forest between 3300 and 3550 m with much oak, pine, and rhododendron, fir forest still containing much oak from 3550 to 3900 m, and above 3900 m high-altitude meadow with sparse dry bush vegetation dominated by rhododendron. The vegetation spectrum is thus less wide than on the western bank, but still largely similar.

Overall, the wide altitudinal distribution of some taxa, the limited range of others, and the different places where they can appear on opposing slopes,[40] creates a highly complex picture. This is due to differences in latitude, climate, solar radiation, wind direction and intensity, as well as rain, hydrology, soil parent material, slope aspect, and other natural but also human influences. While forest line, snow line, and upper limit for dark coniferous forest are related to latitude and longitude in a straightforward manner,[41] the other distribution patterns are less clear.

Usually, dry and cold resistant plants like fir (*Abies*) and spruce (*Picea*) are on leeward slopes, wet and cold resistant plants on the windward slopes. Forest of Yunnan pine (*Pinus yunnanensis*), on the other hand, generally only appears on the red earth of warm, western slopes and dry hill tops (Sichuan Zhibei 1980:55). Otherwise, the eastern slopes seem to be more complex than their western counterparts, where many taxa and vegetation belts are missing (5-7 instead of 7-9 belts per slope). In general, the same vegetation belts are also higher in the south than in the north,[42] while the vegetation becomes more complex the further one moves west

[40] For example, a specific kind of oak, *Quercus longispicia*, was observed only around 2800 m on the western slope, but between 3300 und 3500 m on the eastern slope (Liu, Yu, and Zhang 1984).

[41] Generally, the upper and lower limits of altitudinal belts increase from high towards low latitudes, from the coasts to the inland, and from humid to dry areas. For the Hengduan Mountains, the timberline falls from east to west, reaching its lowest point between 99.5° - 101° E for both slopes. In the opposite direction, the upper limit of dark coniferous forest falls, reaches its low at 99.5-101°, then rises again with longitude (Yao Yonghui et al. 2010).

[42] E.g. the evergreen deciduous forest zone is 200-500 m higher in northeastern Yunnan than it is on the southeastern rim of the Tibetan Plateau (Figure 2.7) (Yu 1984:50).

within the Hengduan mountain range, meaning that this complexity is not only related to moisture and sun exposure, but also to latitude. Nevertheless, the relationship does not seem to be straightforward. Yao Yonghui and his colleagues have suggested a close relationship with moisture-exposure, more so than with sun-exposure. They point out, that on closely spaced and parallel mountain ranges like the Hengduan mountains, for example, moisture-laden air masses coming in at a nearly right angle can lead to different combinations of altitudinal belts on different flanks and even on the same flank in different places (Yao Yonghui et al. 2010:124). The hyperbolic-paraboloid model that Yao and his colleges have produced, although fairly complex, is still not complex enough to meet the reality of mixed influences and complex results, as the authors themselves have pointed out. Yao and his colleges see the solution in adding moisture exposure into the equation, but this leaves out factors like sunshine intensity, slope, soil base material and many other factors. Currently, neither a very fine-grained picture nor general rules can be proposed, but I will instead try to paint a broad picture of the overall distribution of different types of vegetation throughout the research area.

For all of western Sichuan and northern Yunnan, such a simplified model has previously been suggested (Table 2.2). [43] According to this general account, at elevations below 2000 m (in some cases 3000 m) dry shrubs on drab soil or drab red earth are dominant on both sides. Above that zone, the windward slope up to 2100 (2800) m is covered by evergreen broadleaf forest on yellow-brownish earth, while the leeward slope displays red and drab red earth, on which Yunnan pine forest grows up to an elevation of 3200 (3000) m. Above that, dark needle-leaf forest on mountain dark brown earth and mixed needle-leaf and broadleaf forests on mountain brown earth are typical for both sides, on the windward side starting from 2100 m at the lowest,

[43] Sichuan Zhibei 1980:74f., Guo Jinhui et al. 1985:8, Ren, Yang, and Bao 1985:331f.

on the eastern side only from 3000 m onwards. The highest two zones - alpine shrub meadow or subalpine meadow soil up to 4300 (4600) m and alpine cold desert soil above that - show the same picture on both sides. Li Wenhua (1933:34) has suggested an even more simplified model covering all of southwestern Sichuan, Yunnan, and the southeastern margins of the Tibetan Plateau. The sequence of vegetation bands he proposes starts with tropical evergreen forest, followed by subtropical evergreen forest, mixed coniferous broad-leaved forest, sub-Alpine coniferous forest, up to Alpine scrub, and finally Alpine meadow, and on sunny slopes evergreen sclerophyllous oak forests and different species of pine forest.

Adding in a few details of climate, land-use, and elevation, we can thus say that below 1,300 m a southern subtropical climate prevails with a mean annual temperature of 19.5-20.5°C, allowing for a vegetation consisting mainly of grassy slopes with some thick shrubs and woods growing on fertile reddish soil.[44] Here two to three harvests a year are possible, the main crops being rice, wheat, temperate vegetables, temperate, and subtropical and even subtropical fruits, sugarcane and tobacco. Elevations of up to 2,600 m generally have a typical subtropical climate with average annual temperatures of 12-18°C with forests of *Pinus yunnanensis* and sclerophyllous broadleaved forest growing on red soil.[45] At least in the river valleys and the south, two harvests are possible, with suitable crops being rice and other grains, while fruits and vegetables are generally grown in cool and temperate areas. Between 2500 and 3000 m, with northern subtropical and temperate humid climates, the average annual temperature is 8-11°C, with a January mean of 2-3°C with a relatively long frost period, and a July mean of 13°C,

[44] The information presented here was compiled from Sichuan Zhibei 1980, Sichuan 1985, Jarvis and Clay-Poole 1992, Jarvis 1993, and Wang Sijing 1993.

[45] Other species except for different types of *Pinus yunnanensis* are hemlock (*Tsuga spp.*) deciduous oaks (*Quercus dentata var. oxyloba* and *Q. variabilis*) and *Betula albo-sinensis* (Sichuan Zhibei 1980). Most of the sclerophyllous taxa appear only on an elevation of over 2000 m, while the few stands found below are usually *Cyclobalanopsis glaucoides*, *Castanopsis orthacantha, Keteleeria evelyniana, Cunninghamia lanceolata, C. unicanaliculata* and members of the *Leguminosae, Euphorbiaceae and Lauraceae* (Jarvis and Clay-Poole 1992:341f.).

transitional forest of hemlock (*Tsuga dumosa*) and deciduous oak (also called subtropical evergreen conifer forest) grow on yellow-brown soil.[46] The main crops are dry-land grains. Between 3000 and 4000 m, where the mean annual temperatures range around 3.5°C, the January temperatures are about -4°C, and those in July around 10°C. Here, the vegetation is dominated by montane sclerophyllous evergreen broad-leaved forest and subalpine evergreen conifer forest.[47] Above 4000 m, where mean annual temperatures are around 0°C and mean July temperatures below 7°C, the main vegetation are *Rhododendron* and shrub meadows.[48]

II.5 Remarks on Biodiversity and Patterns of Endemism

The complex geography and climate patterns described above lead to a high biodiversity in the area: it harbors almost half of the total plant species in China, among them many species long extinct in other regions.[49] The north-south orientation of the mountain ridges of the Hengduanshan with its deep valleys with steep slope profiles eroded in by swiftly flowing rivers, lead to a more moderate climate than common in other areas of similar latitude (Chaplin 2005:527). During the last glacial maximum (LGM), therefore even the high mountains of the

[46] The main species at higher elevations are different types of hemlock (*Tsuga forrestii, T. dumosa and T. chinensis. T. dumosa*), deciduous oaks (e.g. *Quercus variabilis* and *Q. dentata var. oxyloba*), larch (*Larix potaninii*), *Lithocarpus spp., Betula*, other deciduous hardwoods (e.g. *Acer, Juglans, Salix, Fraxinus and Pyrus*), more rarely *Celtis bungeana* and walnuts (*Juglans*), which have been planted up to 3400 m. At mid- and low-elevations it is mainly *Pinus, Lithocarpus spp*., evergreen oaks (*Quercus gilliana* (1500 to 3100 m), *Q. senescens* (1900 to 3300 m), *Q. rehderiana* (1500 to 4000 m), and *Cyclobalanopsis glaucoides* (1200 to 2500 m)), *Ilex*, *Aralia*, *Alnus (Alnus ferdinandii-coburgii* (2000 - 2600 m) and *A. cremastogyne* (500-3000 m), *Corylus (C. chinensis* (2400 to 2700 m) and *C. ferox* (1900 to 3600 m)), arboreal *Rhododendron spp*. different from those growing on higher elevation, and appear mainly on north-facing slopes, but also *Coriaria, Rhus, Ulmus, Carpinus, Corylopsis*, *Salix* and *Pterocarya*, accopanied by *Schima, Myrica, Symplocos, Rosaceae*, and *Mallotus* (Jarvis and Clay-Pole 1992:248)

[47] Here, montane evergreen oaks (*Quercus rehderiana* and *Q. aquifolioides*) and different kinds of high elevation rhododendron species predominate (Sichuan Zhibei 1980). Other species are fir (*Abies*) and spruce (*Picea*).

[48] Other species are different kinds of rosaceous like *Spiraea alpina*, *Rosa omeiensis and Docynia spp*., as well as *Spiraea, Thalictrum, Rhamnaceae cf. Rhamnus* and *cf. Bercheria, Sabina*, and herbs like *Anaphalis flavescens*, *Leontopodium spp., Anemone trullifolia var. linearis* and *Gentiana straminea*. Above 4500 m, the surface cover consists mainly herbs and grasses (Sichuan Zhibei 1980).

[49] The Gaoligong Mountains, a part of the Hengduanshan Mountain Range in Northwest Yunnan, for example has been recognized as a World Heritage Site for its biodiversity (Chaplin 2005).

Hengduanshan below 4,250 m were completely free of ice, making them a refuge for many plant and animal species, as the fossil record and modern-day species diversity show (Frenzel, Bräuning, and Adamczyk 2003; Fan 2009:20; Zhang et al. 2009:713, Qiu, Fu, and Comes 2011).

The mountains of Southwest China have been designated as one of the 34 biodiversity hotspots in the world (Franzel Bräuning, and Adamczyk 2003; Xu and Wilkes 2004). By definition, the area is thus rich in plant diversity and has a high degree of endemism.[50] As has become clear above, the complex topography and wide range of climatic conditions lead to a wide variety of vegetation types. Furthermore, the physical barriers of the mountain ranges has created a large number of distinctive mini-hotspots with very distinct flora and fauna each harboring many endemic species, giving rise to the widest range of temperate vegetation worldwide with over 12,000 species of vascular plants, representing 40% of all species in China, 3,500 of them endemic.[51] Among them, old species extinct in other parts of the world, different sub-species of the genera *Rhododendron*, *Rhodiola*, *Kingdonia*, and *Circaeaster* are rather prominent, with more than a quarter of the world's rhododendron species (230 different species) being represented (Conservation International 2011). Rare herbs and medical plants can be found mainly in the Hengduanshan Mountains, while 84 rare or endangered plant species belonging to 49 families and 84 genera can be found in northwestern Yunnan alone (Xu and Wilkes 2004).

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[50] To be designated as a hotspot, an area must have at least 1,500 species of endemic plants, i.e. plants occurring only in this area, but many places have much more. The mountains of Southwest China, encompassing an area of 262,446 km^2 with 20,996 km^2 of remaining vegetation, hold 12,000 plant species, 3,500 of them endemic, making up 1.2 % of the world total of endemic species. Another important indicator is the percentage of endemic plants compared to the total plant diversity of a place, which with about 29% is in a medium region (Madagascar and the Indian Ocean Islands, for example, have 89% endemics). Endemic threatened fauna, on the other hand, is much more limited, with only two species of endemic threatened birds, and 3 types of each endemic threatened mammals and amphibians (Conservation International 2011).

[51] Furthermore, over 20 genera of vascular plants, 100 kinds of ferns and 20 gymnosperms, and 2 plant families (*Circaeasteraceae* and the monotypic *Acanthochlamydaceae*) are endemic, including about 100 endemic ferns and 20 endemic gymnosperms (Conservation International 2011)

Over 600 bird species occur in the Southwestern Chinese mountains, although only one of them is strictly endemic to the Hengduan mountains alone, but many of them are endemic to Southwest China as a whole. Most noteworthy here is the rich variety of pheasants and related species. Among mammals, different kinds of monkeys, antelope, and deer are important species commonly living in Muli and adjoining areas but rare or extinct in other parts of the world. Overall, there are more than 230 mammal species, five of them endemic, as well as over 90 reptile species as well as amphibians and fish, some of them endemic and threatened. Some of these species have a very narrow distribution even within the Hengduan Mountains, appearing only in a few separate refugia, which are not necessarily connected.[52] The complex topography of the area thus provides a complex network of refugia and sub-refugia, leading to the high level of genetic diversity that can be observed even today.

Due to the large number, isolated habitats formed by the fragmented topography, the relatively young evolutionary history, and the low immigration of species, regions of high elevation usually have a high degree of endemism. Nevertheless, in the Hengduan Mountain Range the greatest degree of endemism is not always found at the highest elevations or in the most remote areas, but "appear to be correlated with the evolutionary history and route of dispersal of species along the elevational gradient" (Zhang et al 2009:712). According to analyzes conducted by Zhang and his colleges, total and endemic species richness are highest at middle elevations. This might be due to the fact that middle elevations were the point of migration between high and low elevations in glacial and warm periods, allowing plants to come into contact, devolve, become isolated, and even develop into new species, leading to explosive speciation in the area (Wu 1988, Sun Hang 2002). The recent uplift of the Tibetan Plateau has

[52] One example that has been studied in greater detail is the large white-bellied rat *Niviventer excelsior*, a rodent endemic to the Hengduan Mountains (Chen et al. 2010).

influenced this patterns of endemism, building geological barriers to east-west migration and leading to vibrant endemic speciation in the areas around it; furthermore, the north-south running mountain ranges have served as a dispersal route for plants and animals (Yang et al. 2009).

Many of the species found in the Hengduan Mountains have a short evolutionary history, leading to a very narrow range of distribution, some of them being restricted to a single mountain.[53] Compared to the rest of China, the eastern fringe of the Tibetan Plateau, on which the Liangshan area lies, has been called the "evolutionary front" because of its high number of neoendemics, while paleoendemics are more common in the east (López-Pujol et al. 2011:1270).[54] López-Pujol and his colleagues attribute this to the continuous uplift of the Tibetan plateau since the late Neogene as compared to the tectonic stability of central and northern China.

As many of these developments are recent by evolutionary standards, with major landscape changes taking place throughout human history and even during the last few hundred years, it is not possible to use the modern-day landscape as a proxy for research on human-environment interaction in the past. In the following, I will therefore review the main results of paleoecological research on Southwest China in general and the research area in particular.

II.6 Past Conditions: Paleoenvironmental Data and Indicators for Past Patterns of Land-Use

[53] More than half of the species in the Hengduan Mountains, are restricted to this region (Sherman et al. 2007).

[54] Paleoendemics are taxa that were formally more widespread, but due to Neogene and Quaternary, climatic changes have survived only in a small part of their original distribution area. Neoendemics are taxa that have recently come into existence and are only limited to one specific area because they did not have the opportunity to spread beyond their region of origin, yet (López-Pujol et al. 2011:1270). López-Pujol and his colleagues have identified northwestern Yunnan and Western Sichuan region as major centers of endemism with low occurrence of palaeo- and high occurrence of neoendemics, southeastern Yunnan and southwestern and northeastern Guangxi as major centers with high occurrence of palaeo- and medium occurrence of neoendemism, and northwestern Sichuan and Gansu as minor center with medium amount of plaeo- and neoendemics (López-Pujol et al. 2011:Table 1).

The natural vegetation and past climate in the Liangshan area are not yet well understood. For all of Southwest China, paleoenvironmental research is still in its infancy and centers mainly on the pollen record and sediments of the lakes of central and western Yunnan and stalagmite records from Guizhou. In recent years, much work has been done on ice cores and lake sediments from the Tibetan plateau, which can furnish valuable information on world-wide climate developments. Small-scale reconstruction of the paleoenvironment of sub-regions useful for archaeological research, have been published on Lake Erhai 洱海 in Yunnan and for Mianning, where lake sediment analyses have been conducted in the early 1990s. In recent years, the Hengduan mountain range has also received much attention, with studies centering on climate and vegetation change both in recent years and on a longer time-scale. The results of these studies, as far as they are relevant to this dissertation, shall be summarized below.

II.6.1 Temperature Fluctuations and Climate Development

As far as climate developments are concerned, it is now generally agreed that the period from 25,000-10,000 B.P. was cold and arid because of weaker summer and stronger winter monsoons (Zhang et al 2004; Shen et al. 2005; Morrill et al. 2006; Dearing et al. 2008). While in other parts of China the general warming started directly after the Last Glacial Maximum, southwestern China does not seem to have been under the effect of the Younger Dryas (12,000-11,000 B.P.) but remained cold and dry until about 10,000 B.P. (Jarvis 1993, Xiao et al 2010). Only during the early Holocene (10,000-6,000 B.P.) did the southwest monsoon strengthen, bringing wetter and warmer conditions during summer and winter, while from 6,000 B.P. onwards, the southwest monsoon weakened again (Jarvis 2003, Shen et al. 2005, Morrill et al.

2006, Dearing et al. 2006, Hodell et al. 1999).[55] Temperature fluctuations seem to have differed significantly from region to region and even from season to season. Between 7,000 and 6,000 B.P. temperatures in South China were about 1°C higher than today, in North China it were about 3°C, while on the Tibetan Plateau they were 4-5° higher than today, with the winter temperature rise having been much greater than the annual average temperature (Shi et al. 1993).

Stalagmite records from Guizhou suggest a summer monsoon maximum at 7.7-5.8 ka B.P., a summer monsoon weakening period at 5.8-3.8 ka, a weakened summer monsoon and high amplitude of climate fluctuations at 3.8-0.15 ka (Cai et al 2001), and new strengthening of the monsoon during the last 1,000 years, with an especially rapid increase from AD 1720 onwards (He et al. 2005, Dykoski et al. 2005), as well as significant climate fluctuations between 3,800 and 1,500 B.P. (Cai et al. 2001, Wang et al. 2005). A number of cold events were identified at 10,910 B.P., 8,270 B.P. and 4,750 B.P., with a drop in temperature of 2-5°C (Qin et al. 2005), and dry periods at 8,300, 7,200, 6,300, 5,500, 4,400, 2,700, 1,600 and 500 B.P. (Wang et al. 2005, Dykoski et al. 2005). These dry periods, however, are not clearly reproduced in adjacent areas and might thus only be a local phenomenon (Dearing et al. 2008).

Studies on pollen data from the lakes on the Qinghai-Tibet plateau provide further information on long-term climate developments (Thompson et al. 1990; Xu and Zhao 1997; Yang, Bräuning, and Shi 2003; Herzschuh et al. 2006; Yu et al 2006; Yang et al. 2010; Yan, Yu, and Zhao 2011). Yang and his colleges have been able to identify six stages of development. I. a warm and wet period (11.5 ka to 9.0 ka) corresponding to the onset of the Holocene; II. an arid period from 9.5 ka to 6.0 ka with two substages, first a decrease in temperature, tree species, and

[55] One of the main sources for this kind of information are lake levels, with lakes found near stream divides furnishing the best information, as they often have restricted outlets and are thus very sensitive to precipitation (An et al. 2000:747). Lake levels in Southwest China were generally high between 12,000 and 10,000 B.P. for 84% of the lakes, only 56% had high water levels between 10,000 and 9,000 B.P., while since 9,000 B.P. intermediate lake levels were dominant, with only a single lake having higher levels between 6,000-3,000 B.P. (An et al. 2000:747)

elevation of tree line until 8.5 ka, and then a progressively warmer climate with rising tree lines; III. a colder period (6.0-5.3 ka) with dryer conditions; IV. a temperate stage with wet climate (5.3-4.0 ka); V. another arid period culminating at 1.2 ka (4.0-0.73 ka); VI. wetter climate but low concentration of vegetation, probably due to human influence (Yang et al. 2010). Similar studies of Qinghai lake sediments show a heightened monsoon around 10,000-7,000 B.P., a very dense forest cover during the Holocene optimum at 7.5-4 ka B.P., which declined during the long dry period in 4,200-2,300 B.P. (Yu 2005). A study of the central Zoïge Basin by Zhao and his colleges showed large-magnitude fluctuations over the last 3000 years, both locally and regionally. The Holocene optimum was reached at 6.5-4.7 ka, i.e., much later than in other parts of China, probably due to a combination of remnant ice sheets and other large-scale boundary conditions (Zhao, Yu, and Zhao 2011). Similar observations of a delayed onset of the Holocene were also made on the Diancang Massif (Yang et al. 2010). A study from Eastern Tibet shows a somewhat different picture with a general warming at 11.5-8.2 B.P. and various cold events, the biggest shift occurring at 6.2 B.P., with a general cooling after 5.5 B.P. (Yu et al 2006). The Dunde ice core records, on the other hand, indicate an increase in temperatures throughout 4200-850 B.P., but with a dip in temperatures around 1,800 B.P. (Thompson et al. 1990).

Evidence from lakes in Yunnan (i.e., Erhai, Xingyun Hua, Qilu Hu, and Dianchi) shows that the Holocene optimum there was reached significantly earlier than on the Tibetan Plateau, lasting from around 8,400 to at least 6,370 B.P. (Shen et al. 2006). A pollen-based temperature reconstruction from Mount Luoji in Xichang covering the time between 11,000 and 1,500 B.P. (Wang et al. 1990) indicates rising temperatures after 12,000 B.P., with a plateau from 6,000 B.P. onwards, some decline after 4,000 B.P., and a slight increase after 2,000 B.P. (Dearing et al. 2008:10). The Holocene optimum thus reached a maximum at different times throughout China, occurring in southwest China already at 11,000 B.P., i.e. significantly earlier than elsewhere (An et al. 2000: Figure 13).[56] This was probably due to the influence of the Indian summer monsoon, which peaked around that time, while the rest of China was influenced by the gradual southeastward shift of the East Asian summer monsoon, whose peak precipitation is usually used to define the Holocene optimum elsewhere (An et al. 2000:745). Southwest China has therefore a somewhat different climate regime and paleoenvironmental development than other parts of China. The Guliya ice core and Tibetan lacustrine deposits furthermore show that climatic variations in western China as a whole are much larger than those further east (He et al 2004: 64).

II.6.2 Evidence for Changes in Vegetation Cover

Besides large-scale differences between East and West, there are significant variations in surface cover between different sub-regions of Southwest China itself, as the pollen profiles from different lakes throughout the area show. So far, sediment analyses have been conducted at Lake Shayema and Bog Yi in Mianning, Lake Hong, Dazhaizi, and Maomao at Luoji Mountain in Xichang, Xihu, Dianchi, and Erhai in Yunnan, Caohai in Weining, Guizhou, and Lake Qinghai in Qinghai Province, as well as various lakes on the Tibetan Plateau.

For Lake Dianchi in Kunming (1886 m), the most significant changes in Holocene vegetation took place between 10,000 and 7,000 B.P. Before, montane conifers prevailed, with *Tsuga* as a dominant element and a large variety of deciduous and humid evergreen broadleaved trees, indicating less seasonality in precipitation than today (Sun et al. 1986, Lin et al. 1986, Walker 1986). Montane conifers declined between 10,000 and 9,500 B.P., while between 9,500 and 8,000 B.P. *Tsuga* was replaced by evergreen oaks, showing increased temperatures in

[56] About 10,000-8000 B.P. in northeastern China, 10,000-7000 B.P. in north-central and northern east-central China, ca. 7000-5000 B.P. in the middle and lower reaches of the Yangtze River, and ca. 3000 B.P. in southern China (An et al. 2000:755).

summer as well as winter, but still fairly even distribution of precipitation (Sun et al. 1986:467). From 8,000 to 7,000 B.P. *Pinus* decreased, showing less spring droughts than before or after. From 7,000 onwards, mesic deciduous broadleaved trees decreased, while from 4,000 B.P. sclerophyllous taxa increased significantly, showing the onset of the seasonality of rainfall that is in place today. The picture visible from Xihu, Eryuan, in northwestern Yunnan (1980 m), is much less complex (Lin et al. 1986). Going back to 14,000 B.P., the lake sediments reflect a mixture of high- and low-elevation deciduous trees until 10,500 B.P. with *Tsuga* being dominant, followed by the complete extinction of deciduous oaks, while other mesic conifers became rare, and pines and evergreen oaks dominated. Up to 7,500 B.P., pines increased at the expense of evergreen oaks, and from 7,500 B.P. onwards the vegetation was already largely similar to today with sclerophyllous broadleaved forest and a large percentage of pine trees (Lin et al. 1986).

The data from Lake Shayema (2400 m elevation) in Mianning indicates that from 11,000 to 9,100 B.P. the climate was cold and dry, as the dominating pollen of cold-tolerant species like *Abies*, *Betula*, and deciduous oak show.[57] There is an increase in summer temperatures with the southern monsoon penetrating earlier and further into southwest Sichuan from 10,000 onwards, leading to a decline in *Betula*, the entrance of several deciduous broadleaved taxa, and the rapid increase of *Pinus*, which was unimportant before. The forests at the time mainly consisted of *Abies* and *Betula* like those of modern northwest Sichuan in areas where the original vegetation is still preserved. From 9100 B.P., the warming climate and increased precipitation lead to an abrupt decrease in deciduous oaks, while *Tsuga* and mesic deciduous species increased. There is overall a great diversity of taxa otherwise known from warm temperate deciduous broadleaved and evergreen subtropical forests in China. The first appearance of *Tsuga* and *Cunninghamia*

[57] The studies I am citing here are Jarvis 1931a, 1931b, Jarvis and Clay-Poole 1992, Jarvis and Liu 1993, Liu and Wang 1984, Liu and Li 2011.

show the onset of a more humid climate, with colder winters and warmer summers. From 7,800 to 4,000 B.P. spring-drought adapted sclerophyllous species increased, while mesic deciduous plants declined, indicating that the precipitation became more seasonal while summer and winter monsoons gradually weakened, especially after 5000 B.P. The overall decrease in total pollen influx from 7800 B.P. onwards furthermore shows an abrupt lowering of lake levels.

From 5300 B.P., drought-tolerant evergreen-broadleaved sclerophylla began to replace mesic deciduous taxa, indicating a moderate winter climate coupled with a dry period in spring and early summer, as summer monsoon precipitation was decreasing. *Tsuga* was abundant in middle Holocene due to the increased precipitation, but was decreased and supplanted by *Pseudotsuga* and evergreen sclerophyllous taxa after 4800 B.P., showing the decrease in precipitation during growing season (Liu and Wang 1984, Liu et al 1990; observed at Bog Yi). This was thus the transition period from maximum warmth and increased precipitation to period of strongly seasonal rainfall and decreased differences in summer and winter temperatures. From 4000 B.P. the system of dry and wet seasons was already rather similar to today. From 4000 to 1000 B.P., the pollen of sclerophyllous plants reached its greatest abundance; evergreen oaks had the highest percentage, broad-leaved sclerophylla and mesic deciduous pollen taxa vanished nearly completely, and *Pseudotsuga* was consistently high. Furthermore, the sclerophyllous taxa diversified and dominated, indicating that the extreme seasonality of precipitation and mild winter temperatures we can see today were firmly in place already around 4000 B.P., with rains arriving later and with less water than before. Nevertheless, the drought-adapted taxa still dominated until 1000 B.P.. From then onwards there is a rapid increase of signs of human disturbances in the range of plants[58] as well as in the laminae of clay and sand resulting from hill erosion probably due to deforestation. Crop plants such as *Fagopyrum exculatum* (buckwheat) and *Cannabis sativa* show increased cultivation. *Juglans* pollen (walnut) reaches their highest influx values, and pollen and spores of plants and weeds increase widely in abundance. Until very recently, the local Yi population as well as other minority groups practiced slash ad burn agriculture, with buckwheat and potatoes being their main crops, combined with hemp on lower elevation, and the pollen of both buckwheat and hemp are visible in the pollen record from 1000 B.P. onwards, together with *Plantago*, which is a common disturbance taxa (Jarvis 1993a:334).

Bog Yi (2250), although only 20 km north of Lake Shayema, shows a somewhat different picture in a much shorter chronology starting only from 6700 B.P. onwards. Similar to Lake Shayema, in Bog Yi sclerophyllous broadleaved forest can be observed as well, but with a much stronger dominance of *Tsuga*, replaced after 4,500 B.P. by *Pseudotsuga* and increase of sclerophyllous taxa, which was caused by a decrease in precipitation during growing season (Liu and Wang 1984, Liu and Lin 2011). The very distinct shift to drier, hotter conditions around 4000 B.P. observable at Lake Shayema cannot be seen at Bog Yi. Lake Yi, although adjacent to Bog Yi, shows a slightly different picture. The overall sequence is largely similar with that of Lake Shayema, but the decline of evergreen oak pollen at 7800-7500 B.P. obvious at Lake Shayema, cannot be observed at Lake Yi. Jarvis proposes several difference explanations: 1. Possibly the evergreen oaks did actually not decrease, but there was a local increase in pine pollen at Lake Shayema; 2. Local changes in the sediment type influenced the picture; 3. There might have been an actual local decrease in evergreen oaks at Lake Shayema but not at Lake Yi, possibly induced by local fire disturbance; 4. The earlier abundance of evergreen oak pollen at

[58] There are rapid fluctuations in pollen-percentage for *Pinus*, *Alnus*, evergreen oaks, with an abrupt decrease in *Picea* and *Tsuga* pollen. It is generally the removal of forest cover that also leads to an increase in *Alnus*, *Artemisia*, *Gramineae*, *Pteridium*, *Pteris*, together with minimal amounts of *Tsuga* and *Picea* (Jarvis 1993a:334).

Lake Shayema was predominantly from montane evergreen oaks, which — due to the lower elevation — were not to be seen in the pollen profile of lake Yi (Jarvis 1993b). No matter which the actual explanation might be, this significant difference even within a micro-area shows that we can expect much local variation in surface cover even before the onset of human influence.

Pollen data from three lakes at Luoji Mountain, Xichang (3660-3800 m), show a different picture. The very long sequence at Lake Hong commences at 12,4000 B.P. with a significant presence of pine, deciduous oaks, and some herbs of *Artemisia*, *Gramineae*, some rhododendron directly around the lake, and a small amount of scattered *Abies* pollen probably blown up from lower elevations, as Li and Liu suggest (Li and Liu 1988). Around 12,000 B.P. the abrupt decrease of pine and oak, and the appearance of *Abies rhododendron* coupled with rising tree lines show the onset of the Holocene. The transition to evergreen oaks with mesic deciduous taxa with *Tsuga* and *Abies* happens earlier and more gradual than at Lake Shayema, (10,000 B.P. to 7,600 B.P.). The vegetation then changes to sclerophyllous broadleaved taxa with mesic conifers and mesic deciduous taxa; the simultaneous rise of the tree line indicates higher temperatures. On Luojishan the vegetation remains the same until about 2,000 B.P., when the tree line began to move to lower elevation together with a sharp drop in pollen concentration, maybe due to unfavorable climate, maybe due to human activities or both.[59]

In the Hengduan Mountains as a whole, the spreading of forests to higher elevations from 11,700 B.P. onward mark the beginning of the transition to a warmer climate (Kramer et al 2010). The climate optimum here prevailed from 10,700 to 4,400 B.P. with a maximum monsoonal strength reflected in open *Abies/Betula* forests around Lake Naleng, temperatures 2-3°C warmer and a tree line 400-600 m higher than today. This development was disturbed by a few cold

[59] Unfortunately, the samples are not very securely dated, as overall only four radiocarbon dates were taken while the other dates are extrapolated, making these results somewhat questionable.

event, e.g. around 8,100-7,200 B.P. with temperatures 1-2°C lower than before and retreating forests, and a further cold event around 6,000 B.P. The late Holocene cold reversal, however, only set in around 4,400 B.P., and abruptly in some areas, with a significantly colder and drier climate leading to severe droughts and retreating forests, and decrease of *Betula* and conifers, which in some areas become replaced by subalpine rhododendron shrubs. Evidence from Lake Naleng furthermore shows clear grazing indicators from 3,400 B.P. onward, leading Kramer and her colleges to suggest that the rapid tree line shift may have been only partly due to climate changes and partially caused by human activities (Kramer et al. 2010:37). Miehe and his colleges attribute the forest retreats after 6,000 B.P. to human influence as well, suggesting that slashing and burning was used in southern and southwestern Tibet to obtain good pasture land (Miehe et al. 2006), but evidence for extensive fires during that phase is lacking (Kramer et al. 2010; Kaiser 2009). At least during the late Holocene, various human factors did indeed accelerate the forest retreat, which in turn may have influenced the strength of the monsoon, accelerating the overall climate change and leading to the present-day pattern.

II.6.3 Evidence for Human Influence on the Environment

In Yunnan, clear evidence for human activity can be observed for much earlier periods. First evidence for human impact around Lake Erhai can be seen around 6,370 B.P. with an early phase of forest clearance visible from a replacement of Tsuga with some deciduous broad-leaved trees and Abies/Picea on high altitude and evergreen broad-leaved trees with some needle-leaf forest on the foot of the hills were replaces by secondary pine forest, which Shen Ji and his colleges interpret as evidence for a sustained period of shifting agriculture (Shen et al. 2006). Simultaneously, there was an increase in herbage pollen, the appearance of *Graminae* (Poaceae family), showing near-bank cultivation, and *Plantaginaceae* and *Labiatae* showing stockbreeding, as well as weeds usually growing on wasteland. The trend towards cooler and drier climate around 3,200 B.P. was additionally befinicial to pine trees, which are more drought- and cold-resistant than other taxa previously dominating the area, and would soon have covered previously cleared land that had become unfavorable for cultivation due to the cooler and drier climate. Around 2,140 B.P., there was a rapid decrease of total pollen count, showing a decrease in vegetation density due to more rapid deforestation, accompanied by an increase of *Graminae*, indicating an intensification of agriculture, and coarse particles and carbonic ions showing erosion and run-off into the lake. At the same time, heavy metal elements (Fe, Zn, Pb, Cu, Ni, Ti, V) appear in the sediment record, with lead being especially high, reflecting early mining activities starting of the large-scale immigration of Han population (Shen et al 2005:358, and Figures 6-9). These processes accelerated after 1,100 B.P., with a rapid decline in *Pinus* and increase in deciduous taxa (e.g. *Betula, Ulmus, Juglans, Quercus*), indicating intensification of agriculture and early urbanization, a trend that continues until the present. With the Erhai catchment area developing into an important center, large-scale immigration followed by intensification in agriculture led to rapid gully erosion from 1,400 B.P. onward (Dearing 2008). Nevertheless, for a long time settlements staid restricted to the piedmonts and people moved to the basin only after the level of the Erhai Lake declined. During the Han and Jin dynasties, settlements were mostly located at 2000-2200 m, in the Tang and Song, cities appeared at 2000-2100 m, and only during the Yuan did people begin to settle below 1975 m, i.e. in the basin around lake Erhai

For the area around Lhasa, strong human influence has been proven only from 4,600 B.P. onward, with cereal pollen types occurring with a simultaneous decrease of *Juniper, Cypressus* and *Prunus* pollen, creating the desertic pasture land known today (Kaiser et al. 2009). As Miehe and his colleagues have pointed out, the amount of annual precipitation and temperatures indicate that the natural vegetation should be forest, and thus conclude that it was indeed human activity more so than climate change that led to forest decline during the Holocene environment of today might not actually be the natural land cover but the outcome of human activities like forest clearing and agriculture (Miehe et al 2006, Kaiser et al. 2006).

Due to deforestation, throughout the whole area elevations below 2700 m are today largely free of forest, and the mixed forests at 2700-3000 m are highly influenced by human activities as well, especially due to forestry but also due to clearing for pasture.[60] Only on high mountains does considerable forest remain, especially in Muli, which is in large parts extremely high in elevation with steep slopes, while more easily accessible parts have been protected since the logging ban of 1997 has been put in place. Most of the area is thus very different today from what it would have been like in prehistoric times.

II.6.4 Climatic Preconditions for and Indicators of Early Land-Use

In spite of all local variation, a few general trends in the development of climate and surface cover within the research area become apparent. The climate would have been relatively cold and dry before ca. 10,000 B.P. with *Abies*, *Betula*, and deciduous oak dominating the area, especially at higher elevations. The Southwestern monsoon strengthened around 10,000-6,000 B.P. (maximum at 7,700-5,800 B.P.), leading to a warmer and wetter climate, veining again between 5,800 and 3,800 B.P., followed by significant climatic fluctuations. The increase in

[60] In the Hengduan mountains, timber used to be one of the main sources of income for local people and local government tax revenue until a cutting ban was implemented by the government in the 1990s for watershed and erosion protection (Fan 2009:25). Furthermore, forest fires - partially accidental, partially planned in the still ongoing practice of swidden agriculture and general clearing for grazing land have diminished the forest resources.

summer temperatures from 10,000 B.P. onward combined with cold winters and evenly distributed rainfall resulted in an increased abundance and diversity of mesic deciduous taxa and conifers, with evergreen oaks dominating until about 8,000 B.P.. The Holocene optimum occurred at different times and with different intensity in different areas: from around 11,000 B.P. in some parts of southwest China, from around 6,500 B.P. on the Tibetan Plateau, but overall with much larger climate variations in western China than could be observed further east. During this period, the climate became warmer and more humid, with maximal monsoonal strength and thus seasonal precipitation, which lead to the rise of tree lines and increase in spring-drought tolerant sclerophyllous taxa. The decrease of monsoonal intensity from 5,800 B.P. onward was the onset of a general decline in temperatures during the late Holocene, leading to a decrease of *Tsuga* and similar taxa, and an increase in trees tolerant to extreme rainfall seasonality. From 4,000-3,500 B.P., the seasonality of the rainfalls and the temperatures were similar to present-day circumstances, but the vegetation patterns have changed much, mainly because of deforestation, agricultural intensification, and other human influences, which furthermore changed soil quality, lake levels, overall landscape patterns, and even the climate.[61] These broad trends were interrupted by several cold events and dry periods (e.g., the cooling events around 8,100-7,200 B.P., 6,000 B.P., and 3,200 B.P.), some of which may have been local.

The warmer and wetter climate during the Holocene optimum combined with a still largely intact natural vegetation and no considerable damage through erosion combined with a large variety in edible plants as well as animal population would have provided favorable preconditions for a hunting and gathering life-style at higher altitudes than today. The fertile soils in the river valleys and around the many lakes as well as on flat plateaus would have

[61] For further information on developments from the Han period onward, see Dearing 2008, He and Zhang 2005, Dearing et al 2007, Elvin et al 2002, Liu et al 1986.

provided good ground for agricultural fields, especially after the reduction in forest cover during the late Holocene. The fertile but relatively thin forest soils and the small patches of only mildly sloped ground at higher altitudes would have been good areas for swidden agriculture, as it has been practiced in the area until fairly recently, albeit probably not at as high altitudes as it would have been possible during the Holocene optimum. The pollen data indicate the exploitation of locally naturally occurring nuts and fruit as well as buckwheat and hemp at least from 1,000 B.P. onward. Neither plant remains nor faunal data have been systematically collected from archaeological sites of the Liangshan region, but charred remains of rice have been retrieved from grave M1 at Xichang Bahe Baozi, which probably dates to the Warring States period, and a piece of dried clay with impressions of rice straw was found in pit H4 at Huili Dongzui, a site dating to the pre-Qin period. Carbonized rice grains have also been found at the site of Dadunzi 大墩子 in Yuanmou 元謀 (~3,200 B.P.), which is located only slightly south of the research area (Yunnansheng Bowuguan 1977). Today, rice agriculture, both in wet and dry-land form, are practiced in parts of the research area, mainly in its southern expanses and the Anning River Valley, but the past subsistence practices are still largely unclear.

The only site from a region immediately adjacent to the research area that has yielded large amounts of paleobotanical data, is the site of Haimenkou, in Jianchuan, Yunnan 雲南劍川海門口 (Yunnansheng, Dalizhen, and Jianchuanxian 2009a and 2009b; d’Alpoim Guedes 2013). The site also held large amounts of faunal remains, but these have not been analyzed yet. The paleobotanical data found in layer 3 to 10 comprises mainly rice, foxtail and broomcorn millet, wheat, buckwheat, barley, soybean, cannabis, soybean, and *Chenopodium* in varying proportions (Jin 2012, d'Alpoim Guedes 2013). In the earliest layers (10 and 9, 1600-1400 BC), only rice and foxtail millet were found, with layer 10 containing only rice and layer 9 mainly foxtail millet; in layer 8 small amounts of wheat are combined with about even proportions of millet and rice; in layer 7, 6, and 5 (1400-1100 BC), rice decreased significantly while wheat increased; in layer 4 (~800 BC), rice vanished nearly completely and millet was reduced as well, while now wheat increasingly dominates, making up over 90% of the assemblage in layer 3. Buckwheat and barley appear from layer 8 onward, but in small proportions. *Chenopodium* increases from layer 7 onward, but decreases sharply in layer 5.

Interestingly, according to an analysis of growing degree days and risk of crop failure for different kinds of plants in Southwest China according to modern-day climate conditions conducted by Jade D'Alpoim Guedes (2013), Haimenkou is outside of the range of rice cultivation at least for *Oryza japonica*, with a considerable risk of crop failure. D’Alpoim Guedes (2013) argues that rice was soon abandoned as a crop in favor of foxtail millet with its shorter growing season and tolerance of colder and drier climates, finally being replaced by wheat, whose winter varieties are still common crops in the area. Nevertheless, today the steep mountain slopes of Yunnan are known for their irrigated rice terraces, which have transformed the landscape considerably. This was mainly possible because of the later introduction of varieties of rice with lower growing degree days (i.e., *O.Indica*, temperate varieties of *O. japonica*, Champa rice) and extensive irrigation. The weed flora at Haimenkou and other prehistoric sites in Southwest China indicates that rice cultivated in thia area was of wetland variety (d'Alpoim Guedes 2013), which requires large stretches of flat land, availability of large amounts of water, and considerable labor investment, limiting such fields to wide river valleys and lake areas, which are rare in the research area. It is therefore likely, that dry field cultivation in a slash-and-burn economy as it has been practiced by the Yi until fairly recently and can still be found in Southeast Asia, was the more common mode of rice planting. T (Spencer 1966, Pelzer 1978, Kunstadter et al. 1978).

Judging by growing degree days and risk of failure, the northwestern part of the research area is not suitable for planting temperate or tropical varieties of *O. Japonica*, and much of the Southwest and North would only have been suitable during the Holocene optimum but not during colder phases (Figures 2.32-2.33). Rainfed fields require an annual rainfall of at least 800-1000 mm (Yoshida 1981), which makes most of the western part as well as the South and Northeast unsuitable for such fields. Only the area of Xichang, Dechang, Puge, and parts of Huili would therefore have been very suitable for rice cultivation, while foxtail millet could have been grown without any difficulties throughout the whole research area (Figures 2.34-2.35).

Millet requires relatively high temperatures, but has a very short growing season, and can grow in dry climates and fairly high altitudes as they characterize much of the research area. Buckwheat has a very short growing season as well, can withstand dry climates, and grows well on poor soils, making it an ideal and widely used crop in the mountains of the Liangshan area (Gardner, Pearce, and Mitchell 1985). Barley and wheat have an even higher tolerance to frost than millet, ripen faster and at lower temperatures, and can withstand droughts after germination (Gardner, Pearce, and Mitchell 1985). Barley has a growing season of only 60-100 days and can withstand frost fairly well, while wheat can bear even lower temperatures, especially in its spring variety that can be grown even on the Tibetan Plateau (Figures 2.36-2.39). Nevertheless, in these marginal environments agriculture would have been a risky affair, which was probably met with a combination of trial-and-error planting of new crops and diversification as can be seen at the site of Haimenkou (Jin 2012, d'Alpoim Guedes 2013).[62]

[62] For an overview of the ethnographic and historical literature on agricultural risk management and a discussion of the two main approaches to managing risk see Marston 2011.

So far, very little research has been done on early animal exploitation and hunter-gatherer economies in Southwest China. Paleolithic sites have mainly been reported from Guizhou and parts of Yunnan, but research on subsistence practices at these sites is lacking (Song Shikun 2000; Yang, Wan, and Hu 2009). The analysis of the faunal assemblage from Tangzigou in Baoshan, Yunnan 雲南省保山塘子溝村 (8-7,000 B.P.) indicates a hunter-gatherer butchery site, with hunting activities concentrating on small (56% of all large mammals) and large *Cervidae* (24%), and large *Bovidae* (205%) (Jin 2010). There is no mark extraction or other processes of resource intensification indicates the lack of resource stress, which is usually seen as a precursor to the subsistence shift from hunting and gathering to farming (Outram 2001). As most evidence for a sedentary life style with agricultural subsistence from the area occurs only after 4,000 B.P. (Higham 2002), Tangzigou might just date to early for any such indicators. It is interesting to note, however, that resources seem to have been ample at least during this early period.

The many small ecological niches of the Hengduan Mountain range with its ecological diversity provide a variety of different resources that could be exploited by hunting and gathering without much need for a shift to large-scale agriculture. Furthermore, relying on a variety of different resources instead of one or two major crops would have minimized the risk of crop failure that the highly varied and in some areas relatively harsh environment would have presented. Even today, a large variety of different crops is grown side by side in small fields especially in the mountainous areas of Southwest Sichuan and northern Yunnan.[63] Overall, subsistence practices in the past probably did not only vary significantly throughout the area but a variety of different subsistence practices might have been combined at the same site. This will have to be kept in mind when analyzing the settlement material from the research area.

[63] Personal observation throughout the Liangshan area, especially in Muli. Similar observations have been made by Meadow around Haimenkou as cited in d'Alpoim Guedes 2013.

II.7 Summary: General Trends and Geo-Climatic Sub-Regions

From this description of the geo-climatic preconditions of the Liangshan area, it becomes apparent that past and present conditions of geography and climate vary greatly not only from North to South and East to West, but also between mountain tops and river valleys. The peculiar vertical ecological zonation prevailing throughout the Hengduan Mountain chain produce a complex environment. While at the mountain tops alpine meadows prevail, the valleys can be temperate or even tropical. Due to the complex geology and topography, there is a great variety in soil types and vegetations even within one region. This places very different environments in immediate proximity to each other that require various forms of human adaptation and therefore might induce different life ways, economically as well as culturally speaking.

In spite of the high local diversity, there are general differences between various parts of the Liangshan area. The downward slope in altitude from northwest to southeast coupled with the deep Anning river valley in its middle, divides the Liangshan area into five main climato-geographical zones: the high mountains with their alpine-steppe climate in the Northwest, the more moderate mountains of the Northeast with their continental climate, the Anning river valley with its temperate climate, the low mountains of the temperate-subtropical Southeast, and the subtropical low-altitude areas of the Southwest. Below, each of them is introduced in turn.

II.7.1 The Northwest

The Northwest, comprising Muli, Yanyuan, and the northern and western parts of Mianning, is dominated by towering north-south oriented mountain ranges of 3,500-5,959 m, which are intersected by a multitude of narrow river valleys cutting deep ridges into the landscape. The steep slopes make the area prone to landslides and not easy traversable. At elevations of over 4,000 m, alpine cold desert and shrub meadow prevail, allowing only for a use as pastureland. At lower levels, especially Muli is densely forested, making it the foremost timber source of Sichuan. At 3,000-3,500 m, some of the forest has already been cleared away, leaving a very weathered and acidic reddish podzolic soil not very suitable for agriculture. Below 3,000 m, the deforestation process is even more advanced, leaving a poor yellowish mountain soil with only a few patches of more fertile lateritic soils in the river valleys supporting wheat and other crops. Flat arable land is sparse[64] and mainly concentrated in the river valleys and especially in the depression of Yanyuan, which also has a more favorable climate, with cool summers, mild winters, and the largest amount of sunshine hours and sun intensity in the whole Liangshan area. Above 2,500 m , temperate climate brings cool, rainy summers, six months of heavy frost and snow, while some peaks remain snow-covered all year around. With around 8000 mm / year, the average annual rain fall in the overall area is lower than in the Anning river valley, but still with well-marked rain- and dry-seasons. The main resources the mountains provide are timber, medical plants, and rare species; the lower southern areas of Yanyuan are not only favorable for agriculture but also rich in mineral resources (e.g., coal, iron ore, copper, granite, gold), and used to be the Liangshan area's main resource of the salt that gave it its name.

II.7.2 The Northeast

The northeastern counties with Zhaojue in their center are dominated by high mountain ranges as well, but they are significantly lower than those in the west, averaging around 2000-2500 m They nevertheless run in North-South direction and are dissected by narrow river

[64] Level ground only makes up below 0.2 % of the area of Muli.

valleys. The highest peaks rise to 3,300-4,300 m, and are mainly barren or used as pasturelands. The reddish mountain soils on elevations of 2,500-3,300 m nourish some remainders of fir and spruce forests, which at lower elevations are mixed with Yunnan pine and oak. Due to large-scale logging, especially the hillsides around the Zhaojue plain are largely deforested and heavily eroded; the acidic yellow-reddish soils have lost most of their fertility and can only support hardy coarse crops like barley and potato. In the southern river valleys with an elevation below 1000 m, fertile patches of reddish-purple soil allow for cultivating wheat, maize, and vegetables, but flat arable land is very limited.

Given the wide range of elevation, the climate varies highly within a fairly small space. The northern mountains experience long periods of heavy frost and temperatures that hardly ever reach 20°C even in the summer, but the lower river valleys especially further south have a mild temperate climate with temperatures that hardly ever drop below the freezing point. Overall, the northeast has the lowest amount and intensity of sunshine in the whole Liangshan area, but even here there are exceptions. Parts of Puge, for example, experience over 2000 hours of sunshine per year, a wide range of temperatures between 1°C and over 30°C, and a higher precipitation than the average 800-1000 mm. Overall, the northeast has nevertheless a relatively high number of rain days with less well-marked dry- and rain-seasons than can be observed further south. Besides timber, the Northeast is also very rich in mineral resources, mainly copper, iron, zinc, limestone, dolomite, gypsum, silver, and a number of other metallic- and non-metallic deposits.

II.7.3 The Anning River Valley

The valley formed by the Anning river and its tributaries is the largest mountain plain in the area and the second largest in Sichuan. In its upper reaches, the river flows in a very narrow delta at high elevation starting from over 4,000 m at its source, through the wide plain around Xichang at an altitude of around 1,500 m, to below 800 m in Panzhihua. At its widest point around Jingjiu 經久, the river valley measures around 11 km, with an average of 6-7 km, while the riverbed can be as wide as 1 km but is much narrower at its upper reaches. Over time, the riverbed has moved gradually west, altering the geography and the archaeological record significantly. Being the main agricultural strip of the Liangshan area, the landscape in this plain has also heavily been transformed by human hands, and nowadays only secondary and tertiary vegetation of agricultural crops, low scrubs, and some deciduous trees can be seen. Rich purple soils are widely distributed and can bear up to two crops of rice a year. The most fertile patches of earth are located east of the Yalongjiang around Xichang, and the temperate climate with marked but mild wet and dry seasons, warm winters, mild summers, a high sunshine intensity and abundant rain, allow for a large variety of produce. The main mineral resources are hematite, iron, copper, limestone, and kaolin, but they are mainly to be found in the lower reaches of the river, while the actual riches of the area lie in its fertile soil and favorable climate.

II.7.4 The Southeast

The Southeast comprises the counties of Huili, Huidong, and Ningnan. Towards the north, still mountains prevail, and the difference in elevation between mountain peaks and river valleys is rather marked, raging from over 3,000 m to below 900 m. The river valleys are wider than in the north, developing into wide planes towards the south, while high mountains separate the area from the Anning river valley as well as from the Northeast. Only Ningnan is closely connected with Puge, but its river valleys lie at a much lower altitude and also belong to a different, subtropical climate zone. The difference between the Northeast and the Southeast is thus more one in climate and average elevation than one in general geomorphology. The southern reaches are temperate-subtropical with short mild winters largely without frost, and warm but mild summers. Amount and intensity of sunshine as well as rain are similar to the Anning river valley, but with even more well-marked rain- and dry-season.

II.7.5 The Southwest

The Southwest consists of Panzhihua and the adjacent counties of Yunnan, with Panzhihua being significantly lower in elevation than the areas further south and thus also significantly warmer. Overall, the altitude mainly lies between 600 and 900 m, with only a few peaks in the north rising significantly higher. The climate is subtropical with warm, frost-free winters and summer temperatures regularly rising over 40°C. With 2300-2700 hours of annual sunshine and very intense radiation, Panzhihua is thus the hottest place in Sichuan and also one of the driest, with an annual precipitation of ~800 mm and well-marked dry- and rain-seasons.

Throughout the whole south, the relatively flat land of the river valleys is dominated by fertile purple and reddish soils that allow for a wide range of crops. Additionally, the whole south, is very rich in natural resources, with copper, zinc, iron, titanium, silver, barite, marble, asbestos, graphite, limestone, and gold being found throughout most of the area.

II.7.6 Conclusion

Overall, arable land is very unevenly distributed throughout the research area and climate and vegetation vary greatly between and within the sub-regions identified above. Past climate changes would likewise have had varying effects in the different areas, which at the current state of research cannot be adequately assessed. Nevertheless, it is reasonable to assume that the main centers of early agriculture and settlement would have been the fertile Anning River Valley, possibly the Yanyuan basin, the flat areas of Huili, Huidong, and Yongsheng, and to a lesser extent also the river valleys in Zhaojue. Rice agriculture was presumably restricted mainly to the middle and southern parts of the Anning River Valley as well as other flat expanses of land in the South and the East. Medium-level forested mountain slopes throughout the area would have provided good ground for hunting and foraging strategies, especially considering the great species richness characterizing the area, which also includes different kinds of edible nuts. Pastoralism would have been an option for example in the mountainous Northwest, but mixed forms of economy with potentially semi-permanent settlements or seasonal migration would have been possible as well. As the recent history of Yi economic practices and many present-day groups in Yunnan and throughout Southeast Asia show, slash-and-burn agriculture is a very common form of adaptation to mountainous tropical and subtropical regions. This form of subsistence goes along with frequent changes of settlement location, oftentimes leaving only superficial traces in the archaeological record, which can be hard to detect.

Further factors to keep in mind are the vast erosion problems especially in the northeastern mountains, and the shifting river courses, which might have destroyed sites or at least give a faulty impression as to the original distance between settlements and rivers. Furthermore, paleoecological research is still lacking, and the studies conducted so far indicate that significant changes in vegetation and soil quality took place, partially due to climate changes, partially due to human influences,. Indeed, even the present-day complex pattern of soils, vegetation covers, and microclimates is not well researched yet. Inferences on human-environment interaction in the past therefore have to be drawn very carefully and might have to be revised once more paleoecological information is available.

Nevertheless, the very particular environment is such an important variable in the development of local culture groups and can thus not be disregarded. Furthermore, the distribution of various natural resources, have to be kept in mind and evaluated in relation to site location and exchange networks. Given the great variety of soils and surface covers, the small-scale variation, and the lack of detailed research and adequate maps, spatial analyses using GIS or other tools can therefore not be applied in an automated manner over the whole area but will have to be checked on a case-by-case basis for every location in question. This problem will be discussed in greater detail in Chapter VII in connection with spatial analyses. Given the lack of paleobotanical data and the fairly imprecise soil maps, the range of tools and ceramics found in the archaeological assemblage are a very important indicator as to the kind of subsistence practiced at a given site. As a first step, below I will therefore describe and categorize the range of objects retrieved from sites in the research area, paying particular attention to questions of function as well as raw material, which both connect the material back to their natural surroundings.

III. Systematic Description of the Source Material: Object Typologies

In the following, I shall describe the source material of this study, starting from the micro-level of objects, then widening the scope to the intermediate level of sites and features, and finally turning to the macro-level of inter-regional contact networks. Both objects and sites must be organized in a systematic manner before a general overview as well as specific analyses are possible. As a first step, therefore, I shall turn towards some theoretical and methodological issues in the study of classification and typology.

As K.C. Chang wrote in 1967: “It is reasonable to estimate that 80 or 90 percent of an archaeologist’s time and energy is spent in classifying his material, the remaining 10 or 20 percent being consumed in doing something intelligent and useful with the resultant categories” (Chang 1967a:71). Absorbed in masses of data, one easily forgets that classification is not an end in itself, but only the first step in a three-part process: it situates the material in time and space in order to provide a basis for inferences on past human behavior. What kind of human behavior will be the focus of a given study largely depends on the nature of the material at hand, but also on the preferences of the individual archaeologist. To ensure that the time consumed in classificatory work is well spent, we must therefore first clearly state the aim and underlying assumptions of our typologies and make clear their potential as well as their limitations. Only then does it become possible to arrange our material in a meaningful way. Throughout the whole process, we have to remain aware that the natural incompleteness of the archaeological material make every type "a tentative, hypothetical class to be re-examined, corrected, and amplified from time to time, as evidence accumulates", as Rice has pointed out in connection with ceramic classification (Rice 1987 [2005]:316). However, typologies are often presented without much information on how exactly they were devised, so that it becomes hard to identify possible weak points or strengths. In order to maximize the transparency of the results of the present study, I will therefore describe in great detail the underlying reasons for my classifications, as well as the procedures through which the classifications were arrived at. In doing so, it is my aim to make a methodological contribution: I intend to show one possible way in which a complex and heterogeneous archaeological assemblage such as the one under discussion can be ordered and analyzed systematically and thereby be transformed into a basis for valid inferences on past human behavior.

III.1 Classification and Typology: Theoretical and Methodological Considerations

Typology and classification have been at the core of archaeology since its beginnings as an academic discipline. The large amount of material usually found in excavations requires some kind of organization before it can be used in scientific analysis. It is generally agreed that classification is the organizing of a complete set of phenomena into groups or categories according to their similarities and dissimilarities.[1] A typology is a special kind of systematic classification that divides a group of phenomena into discrete types according to their common characteristics.[2] Unlike taxonomies, which are hierarchical and monothetic in nature, typologies can be polythetic, i.e., they identify types on the basis of an overall set of variables and attributes, of which each of their constituent types has to possess a sufficient number but not any one of them in particular. By contrast, in a monothetic classification every phenomenon classified must exhibit a fixed set of attributes to be assigned to one specific type. Commonly, in an archaeological classification, the main types are monothetically defined, while subtypes or

[1] e.g. Sokal 1974:1116, Adams and Adams 1991: throughout, but esp. 55 and 333; Read 2007:19ff.

[2] As Adams and Adams (1991:366) put it, "types differ from classes more generally in that they must always be mutually exclusive", i.e. "each entity can be a member of one and only one type."

varieties can by polythetic in nature.[3] Single entities are not types but instantiations of types, which are idealized and simplified forms consisting of a patterned combination of the most significant attributes observable on individual entities.[4]

Although the necessity for typologies and classification in archaeology is widely accepted, there are major disagreements on their nature and significance. While some scholars hold that typologies are arbitrarily imposed by the researcher and only a means of ordering the material (e.g. Brew 1946, Dunnell 1984), others believe that we can actually discover culturally salient types that tell us about the underlying conceptual system of the artisans (e.g. Rouse 1960, Read 2007). This discussion on the "emic" vs. "etic" significance of typologies was the essence of the Ford-Spaulding debate in the 1950s, in which Albert Spaulding (1953) claimed that the aim of classification in archaeology should be the discovery of attributes relevant to the makers, while James Ford (1954) held that it was impossible to attain such an emic perspective. Spaulding emphasized that each project needed its own classification system and that statistical techniques were the most useful tool to discover recurring combinations of attributes that had been important to the makers and users of the objects under analysis. Ford argued, in contrast, that archaeological cultures were an arbitrary construct and that statistical analysis could never reliably discover the patterns of thought in the minds of the ancients, as cultural change was not regular and gradual but prone to jumps and unpredictable factors. Spaulding (1954) replied that he had not claimed that statistical tests would automatically produce emic types but just significant clusters of attributes that then had to be interpreted by the archaeologist in a three-level scheme of types, only the last of which would finally show functional types. In reality, the

[3] For an extensive discussion see Read 2007:134f.

[4] Very similar definitions to this have been proposed e.g. by Chang (1967a:79) Rouse (1972:48 and 300), Adams and Adams (1991:370), and Read (2007: 150).

two scholars were talking past each other as they had very different aims in mind: Spaulding wanted to discover patterns of co-variation of attributes that would help him to understand a particular past group, while Ford concentrated on continuous variation over space and time that would help him to establish a spatial-temporal framework for his area of research.[5] In pointing this out, Willey and Phillips argued that the two positions were not completely antagonistic. They held that all archaeological types were "likely to possess some degree of correspondence" to past norms of how to make a specific artifact, and that increasing the correspondence between etic and emic types "must be the constant aim of typology" (Willey and Phillips 1958:13).

Nevertheless, the debate between the emic and etic interpretations of classification systems continues until today, partially because these terms are interpreted differently by different scholars. Adams and Adams, for example, define emic types as reflecting the "mind-set of makers and users," and criticize the search for such types as an unattainable goal (1991:283). Read, on the other hand, argues that emic means "culturally salient" (2007:74), i.e. reflecting "shared notions of what constituted appropriate morphological form" (2007:249). K.C. Chang made a similar point already in 1967, arguing that typologies should aim at trying to find those categories that "approximate the natives' own thinking about how the physical world is to be classified, *consciously or unconsciously, explicitly or implicitly,* within which framework they accordingly act" (1967a:78, emphasis added), which is not the same as trying to replicate the classification system that past people may have used.[6] As Chang showed, there are a large number of possible and equally valid ways of classifying any given assemblage, one or several of

[5] For further discussions see Ewen 2003:69-71 and Read 2007:57-62.

[6] There is a subtle difference between the statements by Chang and Read quoted here: Chang refers to the natives' classification of objects that are already, while Read and also Rouse are discussing conceptualizations involved in the production of the objects. However, they both agree that the goal should not be to determine the classification system used in the past, but to find out about the kinds of distinctions they acted on, be it on existing objects or processes producing these objects (personal communication Dwight Read).

which might have been originally employed by its users, though this could only be ascertained with the help of historical or ethnographic sources.[7] As research on so-called folk classifications has shown, the definition and nomenclature for different objects can vary from artisan to artisan and from user to user; even if recoverable, the classifications in use in a given society at any given time are therefore neither likely to be systematic nor necessarily helpful for research into any underlying social structures or behavioral patterns (e.g. Kempton 1981). A case in point is K. C. Chang's comparison between the standard archaeological classification for Chinese bronzes and the terminology used in the inscriptions on the vessels themselves. Chang shows the former to be very systematic and fine-grained, while the latter is much more coarse and self-contradictory (Zhang Guangzhi 1986). Trying to enter the heads of ancient people through the classification of artifacts therefore seems to be neither an achievable nor a useful task.

It does not follow, however, that all archaeological typologies are arbitrary. After all, objects have undeniable physical properties that are the basis as well as the control for any typology. Furthermore, as artifacts are the outcome of actions in the past, object forms and features should allow for inferences on past human behavior. I therefore agree with K.C. Chang that culturally meaningful typologies can be constructed based on physically observable differences, simply because that was also how past humans discriminated among them (1967b:228). Although we will never be able to know or understand the actual thoughts of ancient people, it is nevertheless possible to use typologies as "an organizational tool which will enable the investigator to group specimens into bodies which have demonstrable historical meaning in terms of behavior patterns," in the words of Krieger's (1944:272) definition of the

[7] K.C. Chang illustrates this by giving different possible classification schemes for US coins and comparing them with the actual, popular classification system. One of the several classifications he makes according to physical properties turns out to be the same as the one that is actually used, but he could not judge this from the objects alone (Chang 1967a:76-85).

purpose of classification in archaeology. Thus, classifications are useful and necessary tools for ordering material remains and for conducting further analyses on them.

The problem remains that a large number of possible typologies are attainable solely from the physical properties of the entities under analysis. This perplexing phenomenon is largely due to the complex nature of artifacts, whose final form, function, and place of deposition are influenced by a large number of different factors ranging from material constraints and practical considerations of usability and labor expense to group-specific or culture-specific expectations as well as the personal abilities and decisions on the part of the artisan. To expect one single typology to reflect all of these aspects is not realistic. Depending on the aim of the analysis, the material can be arranged in different ways, each highlighting the morphological features relevant to a given study.

But how are we supposed to know which variables are going to be of importance in answering a particular question? One possible answer is the so-called chaîne opératoire approach, which reconstructs the production process for an object or a class of objects from raw material acquisition to discard, taking into account material preconditions as well as cultural and mental processes.[8] This approach has mainly been used in the classification of stone tools, as lithic material is worked in a purely reductionist technique that is very much preconditioned by the material used and can be easily reconstructed from the objects themselves, supported by

[8] The term chaîne opératoire, sometimes translated as ' operational sequence, was first coined by the French archaeologist André Leroi-Gourhan in 1966, and can be defined as reconstructing "the different stages of tool production from the acquisition of raw material to the final abandonment of the desired and/or used objects. By reconstructing the operational sequence we reveal the choices made by ... humans" (Bar-Yosef et. al. 1992, 511). However, this approach does not limit itself to technical aspects only, but tries "to describe and understand all cultural transformations that a raw material had to go through" including all "actions and mental processes required in the manufacture", maintenance, and discard (Sellet 1993:106), and can therefore serve to identify aspects under the control of the artisan as opposed to those determined by the nature of the raw material.

observations from practical experiments and the ethnographic record.[9] Nevertheless, the chaîne opératoire approach can be helpful also for other kinds of objects because, as von Falkenhausen following Kubler has pointed out, every step taken in the production process of any object "prefigures and at the same time limits the next" (Falkenhausen 1993:192.[10] Furthermore, awareness of the technical constraints in the production as well as in usage of different kinds of objects can help one distinguish between those aspects predetermined by the nature of the raw material as opposed to those under control of the artisan. However, even after determining this "functional design space," as Read calls it (2007:229), we still have to find a way to identify which attributes and types are culturally salient. Read suggests turning to quantitative variables: An artisan might have specific dimensions for projectile points in mind, but will not be able to match them exactly with every object he produces. Instead, these measurements will vary slightly around a specific, "ideal" value that can be ascertained in a comparative way from the aggregate of the whole assemblage.

The problem remains that such an ideal value might reflect technical, practical, or culturally driven choices, or a combination of those factors. Read suggests distinguishing between functional, isochrestic, truncated, and neutral traits, and translates them into different expected patterns of frequency distributions: He argues that a functional trait can be expected to be reflected in an unimodal frequency distribution, an isochrestic or stylistic trait would result in a multi-modal distribution indicates, which is culturally learned, while an uneven distribution, possibly limited to a certain range, indicating technical constraints or limits of the artisan's skills

[9] Such and approach was taken for example by Leng Jian and Charles L. Shannon in their research on the development of Early Paleolithic typologies in China and India (Leng and Shannon 2000).

[10] Von Falkenhausen bases this idea on Georg Kubler, who stated in connection with the fine arts: "The artist is not a free agent obeying only his own will. His situation is rigidly bound by a chain of prior events. The chian is invisible to him, and it limits his mootion … . … his decision is not a free one: it is dictated by prior event of which he sensen only dimly and indirectly the overpowering urgency, and by his own congenial puculiarities of temperament" (Kubler 1962:50).

or preferences, is the marker of a truncated or neutral trait (Read 2007:271-279). Although this may seem to be a straight-forward solution to answering the question of cultural saliency, the case is hardly as simple, as Read points out when warning that "separating individual individual intentionality from intentionality arising through shared concepts may depend on criteria other than the pattern of values in the histogram" (2007:213).

Indeed, the shape of a given artifact is determined by a large number of different factors, and a unimodal distribution might just as well show functional as culture-specific or personal aspects, depending on the range of material within which the artifact is observed, i.e. whether it is considered as part of an assemblage containing material from several cultures or social groups, from one culture, from a single village, or even only one workshop. The same holds true for value distributions with no apparent regularity that might be due to a conflation of a large number of very different assemblages or types, or a sign of an artisan-dependent variable. Furthermore, even functional traits can be bi-modally distributed — a short and squat knife, for instance, has other functions than a long and thin knife. This difference could simultaneously serve as cultural or social markers, distinguishing those people that use short knives from those that have long knives. Additionally, many different variables are interconnected and limit each other: A certain base width for a projectile point requires a certain minimum length if the object is to serve its intended function. Thus, not all variables are independent, which is a matter of great significance in statistical evaluations. Statistical analyses therefore cannot be applied unequivocally over all objects and measurements, but have to be preceded and accompanied by qualitative evaluations. The question of cultural salience vs. technical necessity, for example, might be resolved by comparing different assemblages with each other. Spatial and temporal distributions can likewise help to distinguish between cultural factors and particularities of particular artisans, as Krieger (1944) argued.

The main solution is thus a contextual analysis, taking into account local preconditions, deposition context, and nature of the raw material. However, the possibility — indeed, likelihood — that different cultural, chronological, and/or social groups might be conflated in one assemblage remains a major problem. This is what Read calls the "double bind problem" characterizing analytical and especially quantitative methods: they require a homogenous dataset that is already "dissected by precisely the dimensions our analysis is aimed at delineating" (2007:304). The two most common solutions, which are often used in combination, are to start from single assemblages that can be assumed to be spatially, culturally, and temporarily less heterogeneous,[11] and/or to start sorting according to the most obvious qualitative criteria in an impressionistic way to attain preliminary descriptive types, which can then be modified by statistical or other means and/or by the addition of new data. Adams and Adams (1991:58) hold that these initial types, "disclosed by intuitive gestalts … are usually unaffected by any conscious sense of purpose." However, this does not seem to be very likely, because we are inevitably guided by the aims we have in mind as well as by other typologies we have knowledge of, including the "folk classifications" we employ in our own daily life and culture context.

Being aware of this dilemma, how can we make the initial classification more deliberate and less intuitive? Taking into account all possible variables, as suggested by Sabloff and Smith (1969) , is intrinsically impossible, but even maximizing the number of variables will not necessarily lead to more clearly distinguished groups but may actually lead to greater

[11] Every data set, for which a classification or typology is necessary, is naturally heterogeneous by virtue of our assumption that there are multiple types within the assemblage of artifacts. The double-bind problem therefore always remains, but can be lessened by choosing single assemblages that are spatially, culturally and temporally the same, and therefore less heterogeneous, but never completely homogeneous.

fuzziness.[12] Creating a mathematical representation of the object outline is even less helpful, given the natural variation of hand-made products as well as the fragmentary nature of many artifacts and the archaeological record as a whole.[13] A more reasonable goal is to compile a "nonredundant and sufficient list of variables whose measurement values completely characterize a given shape", so that the shape could be re-created from the description, as Read demands (2007:156). What these necessary measurements are will vary widely between different assemblages, as well as between different kinds of raw material.

In my analysis, I shall therefore start with an initial grouping by raw material, followed by an overview of the physical restrictions, as well as the chaîne opératoire for each of these groups, which will provide indications as to which aspects would have been under the control of the artisan and which are preconditioned by material characteristics and functional constraints. Function is a very complex matter, especially if understood as referring not only to an object's utilitarian aspects, but also to its overall performance in society. Sackett (1977:370) therefore distinguishes between technofunction (i.e., the utilitarian aspect), sociofunction, and ideofunction, all of which influence the artifact's overall form and design. Of these three, the technofunctional aspects are most easily observable and will be explored first, in order to ascertain which variables are relevant for questions of technology or practical usage as opposed to cultural and social aspects, and which might be important for both.

As a second step, I will sort the objects by overall shape, which is often done either through attribute clustering with the help of statistical analyses, or through object clustering, which groups objects intuitively by visual impression using the gestalt approach mentioned above. If the statistical sorting is based solely on cluster analyses, it requires an ideal dataset of

[12] A mathematical proof of this is provided in Read 2007:306-309.

[13] As for example proposed by Gero and Mazzullo (1984) and criticized by Read (2007:174-7).

largely complete objects, which is not very common in the archaeological record, and most certainly not in the case of the material under inspection in this study. Furthermore, a statistical program would require complicated algorithms, and it would be unable to distinguish between important and unimportant dimensions, leading to a classification that may be mathematically correct but most certainly culturally meaningless. As Read has made very clear, the only way of forming a typology relevant to understanding production decisions made in the past, is to work from qualitative to quantitative distinctions, considering variable by variable, dividing and subdividing the material and re-doing the analyses on each sub-set. As the human eye and mind are effective in identifying patterning fast and reliably, the initial intuitive sorting is a useful and valid shortcut. The results must, however, be rationalized and systematized as typological analysis proceeds further.

To achieve this, the preliminary types resulting from the initial impressionistic sorting must be described in a non-redundant manner, identifying the most important features and compiling them into an overall list of variables and attributes.[14] It should be stressed that, just as the underlying types, this list is preliminary in nature. For the description of the object outlines, I will refer to geometric forms, as these describe the general impression of an object in the easiest and most readily understandable way. Other important features are edges and breaks or discontinuities in the direction of outlines. These are all aspects that will influence us even in intuitive sorting according to visual impression or "gestalt." Making them explicit is necessary for the purpose of objectifying and communicating the results of the classification process. Furthermore, such lists of variables and attributes are helpful in questionable cases, for fragmented objects, or when dealing with large amounts of material.

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[14] A variable, as described by Adams and Adams, is a "feature or characteristic, such as color, which varies from one entity to another, and which is taken into account in the definition and/or description of types" (1991:370). Particular manifestations of a variable - such as red or yellow in the case of color - are referred to as attributes.

Subsequently I revise these provisional categories, arranging them into full-fledged types, always with reference to, and under modification of, the list of variables describing them, as well as under consideration of material preconditions and technical requirements. For well-defined populations,[15] e.g., a specific type or subtype, quantitative variables can now be taken into account as well. Once these measurements within the different groups have been analyzed, they can be compared across groups. Depending on the specific research question addressed to them, the categories and types will have to be regrouped and even redefined, resulting in a number of different classifications, appropriate for answering different kinds of questions. At this point, the aims of the study might also have to be modified according to the nature of the material at hand. For not all assemblages can be used to answer the same kinds of questions, but their potential will only become apparent in the course of classifying them. The resulting typologies and classifications, as well as the underlying lists of variables, will always remain preliminary and have to be reconsidered and, if necessary, reworked whenever new material is incorporated or a different research question is addressed. This dissertation presents the end result of my analyses of the material. I shall therefore spare the reader an exhaustive enumeration of all the preliminary aims discarded or changed, but I shall describe only the final types and subtypes.

The research questions addressed in this dissertation as a whole have already been described above. The more specific topics I want to address through the process of classification are the following:

- understanding and outlining the chronological sequence of archaeological phenomena in the research area;
- identifying different cultural groups as marked by different material remains structured through different kinds of behavior;
- identifying intrusive material or elements as indicators of outside contact;

[15] I am following Read in using the term 'well-defined population' or 'well-defined data set' as "data having the form of a set of artifacts homogeneous with respect to an underlying process for dimensional patterning" (Read 2007:37).

- understanding the function of different objects in their respective contexts.

To be able to address these issues, it is necessary to organize the overall material record in a systematic fashion, not just artifacts, which are usually the main subject of classification. I will therefore also propose classification schemes for different kinds of sites as well as graves. As the object assemblage is one of the basic variables to be used in the definition of such site or grave types, I will start from the micro-perspective of single artifacts, gradually widening the view to include artifact assemblages, and the whole features and finally site unites, which can be sorted into typologies of their own.

III.2 Preliminary Remarks on Object Nomenclature

Before turning to the objects themselves, I shall first make a few general remarks on nomenclature. Throughout this study, my aim is to ensure consistency in object terminology. Deciding on object names is always problematic as they generally contain a certain amount of interpretation, sometimes even going so far as to assign specific functions such as "burial urn" or "cooking pot." One might consider using number-letter codes instead, but this would be detrimental to easy comprehension, besides implying a false sense of objectivity. After all, we are using these terms in a present-day dialogue about present-day research questions, albeit directed at understanding past processes. Using a limited amount of present-day vocabulary improves the clarity of discourse, as long as the terminology is clearly defined. It still seems advisable to avoid expressions carrying strong functional implications, especially binominal terms such as "storage jar" or "burial urn." Instead, I will use general terms such as "bowl" or "jar," always defining their main characteristics and shape. The choice of terms will be based on common usage as defined in the Concise Oxford English Dictionary (2011 edition) and the

Oxford Concise Dictionary of Archaeology (2003 edition), as well as previous archaeological scholarship in the area. These two sources of nomenclature are not easy to reconcile, as nearly all previous scholarship on this topic is in Chinese and will require some form of translation. Additionally, there are discrepancies within the Chinese nomenclature itself. The object terminology in Chinese archaeology was largely formed in the Central Plains, and many names have been adopted from early texts that refer to objects—mainly ritual bronzes—used in the Central Plains during Shang and Zhou times (1600-221 BC).[16] Given the time gap between the period of usage of the bronzes and the time when the texts discussing them were composed, this nomenclature is already problematic for material from the Central Plains, let alone for objects from different areas with their own cultural traditions.

What complicates matters further is that modern-day folk-classification becomes intermingled with traditional terminology: The term *hu* 壺, for example, originally referred to a specific kind of wine vessel, whereas in modern-day language it is a term used to describe a spouted pot, e.g., a teapot, and in excavation reports both usages are intermingled. As many ceramic vessels do not have a later bronze equivalent, archaeologists have come to refer to them by a number of very general terms, such as *guan* 罐 (pot or jar) or *bei* 杯 (cup), which are applied to so many different forms that their classificatory power is significantly reduced. After

[16] This is due to the history of Chinese archaeology, which has some of its earliest beginning in Song dynasty (960–1279 AD) antiquarianism. In search for the lost golden age and its culture and rituals in the hope of finding guidelines for the present, Song scholars collected and classified mainly ancient bronze vessels, but also weapons and jades. In their inventory-type catalogues and research essays, Song antiquarians tried to document not just physical properties but also meanings and function. The main catalogues that today are still extant are the *Kaogutu 考古圖* (preface dated 1092) compiled by Lü Dalin 呂大臨 (1046－1092) (Lü Dalin 1092 (1992)), and the *Xuanhe bogutu 宣和博古圖* compiled in the early 1120s by Wang Fu 王黼 (Wang Fu 1123 (1991)). Both arrange their works according to functional vessel types – food vessels first, and then drinking vessels. Within those categories the types are arranged according to their prominence in written as well as in actual material sources. Within the types the single vessels are arranged according to date. In this endeavor they relied exclusively on textual material – i.e. transmitted texts or inscriptions on the objects themselves – to name and categorize them according to their supposed former function.

several decades of research, area-specific terminologies have become established in every part of China; they are used in excavation reports and other publications without further explanation, but the reader must be aware that the same terms may refer to completely different kinds of objects. In the area under consideration in this dissertation, as well, the meanings of the vessel names commonly used in the scholarly literature should not automatically be equated with the meanings that are associated with such names in the Central Plains, or even in neighboring areas.

This "secret code" leaves foreign scholars at a loss as to how to refer to the objects they are analyzing. One common tactic is to let the Chinese names stand, which avoids awkward translations but does not solve the problems just illustrated, while also hampering communication with scholars working in other parts of the world. On the other hand, relying solely on translations, or proposing a completely new and possibly elaborate English terminology would make it difficult to draw the connection with previous publications in Chinese. I will therefore use a combination of Chinese and English terms, trying to reconcile the rather broad terminology used in Chinese publications on material from Southwest China with a classification system of my own. I have, for example, differentiated "*guan* jars" from "*guan* beaker" and "*guan* urns," as separate types, based on salient differences in form, even though all three kinds of vessels are usually grouped together in Chinese publications. I will explain my choice of specific English terms for different types, differentiating between the subtypes not only by a system of letters and number as is customary, but by the used of a fixed set of epithets such as "wide-bottomed" or "round-bodied." The aim of this verbal terminology is to improve clarity and ease communication.

III.3 The Ceramic Assemblage

The material collected here contains information on 1443 pottery vessels of identifiable shape, from both graves and settlement sites, 1071 diagnostic sherds, mainly from settlement finds, and 453 unidentifiable objects. Because of the uneven state of preservation and the stark differences between finds from graves and settlement finds, complete vessels and diagnostic sherds cannot easily be fitted into the same typology. I will therefore classify them separately and then compare them in a third step. Additionally, there are 113 small implements and decorative objects made from ceramic material, for which I have compiled a separate list of variables and attributes different from those used in vessel classification. Material and technical factors of production and practical use, however, are largely similar, and will therefore be described together in the next section.

III.3.1 Material Preconditions, Manufacture, and Use

The main technical steps in the ceramic production process are:[17]

1. *procurement of raw material*: clay, temper,[18] water, possibly salt,[19] fuel for firing, pigments for paint;[20]
2. *preparation of raw materials*: purifying, tempering, homogenizing by kneading;
3. *forming the vessel*: 1. primary forming of the vessel body (pinching, drawing, slab building, coil building, molding, wheel throwing, or a combination of several techniques), 2. thinning the vessel body (scraping, trimming, turning), 3. forming of additional parts (handles, spouts, necks or collars, appliqués), 4. finishing (joining parts, smoothing through beating, paddling, compaction with hammer-and-anvil)[21]

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[17] Described in greater detail by Shepard 1968, Rice 1987 (2005), Orton, Tyers, and Vince 1992, and other authors.

[18] Possible kinds of temper are sand, pulverized rock, crushed and burnt bone and shell, crushed sherds (grog), chopped fibrous material such as straw, rice-husks, chaff or hair (described in Rye 1981:31-36).

[19] Adding salt water inhibits heat fracture and allows firing at higher temperatures (Rye 1981:36).

[20] In the case of ceramics, conclusions on raw material sources are difficult, as there are numerous small clay occurrences in most places, and only very special kinds of clay can be identified as foreign or local. The sources of certain kinds of temper, like sand or gravel, as well as pigments for paint, is more easily ascertainable, but would require detailed microscopic and petrographic studies, that would require a separate study. As ethnographic studies have shown, both clay and temper are usually obtained from sources nearby (largely within 1 km, or maximum 7 km, Rice 1987 (2005):116), while pigments for painting can come from much more remote sources, and would be an important subject of study for questions of long-distance contact and exchange.

[21] These techniques and the traces they leave have been described in detail in Rye 1981:70-95.

4. *pre-firing surface treatment* (optional, either pre- or post-drying): trimming, scraping, burnishing, slipping, incising, impressing, painting;
5. *drying;*
6. *constructing the kiln;*
7. *firing*: open pit firing, updraft kiln, downdraft kiln;[22]
8. *cooling;*
9. *post-firing treatment*: decoration, glazing, coating, polishing, painting; and
10. *second firing*: potentially necessary for glazing.

The main factors that allow inferences on the production process are the amount and quality of temper as visible from the frequency, size, sorting, and form of the inclusions; the hardness and color of the ceramic material, which indicates firing temperature and atmosphere; the surface texture showing pre- and post-firing treatment; and sometimes traces of the forming process such as coiling marks or impressions on the bottom, if they have not been completely obliterated by smoothing.[23] Discerning such traits often requires microscopic investigation, or at least the close inspection of a fresh breakage, which was not possible for the material under analysis. Inferences as to technical processes therefore have to remain rather general. Very useful in reconstructing ceramic techniques are also remains of kilns or firing pits. In the present study, such remains have been observed only at the site of Xichang Lizhou. The one kiln observed there consists of a firing pit and a long fire corridor filled with charcoal fragments and a mixture of red-baked earth and grass fiber, presumably the firing material. Additionally, nine fire pits of 0.5-1 diameter and 0.2-0.5 m depth have been reported at Lizhou. The walls of the pits were burned grey for a depth of 1-2 cm, indicating a relatively short firing time and low temperatures, which fits well with the

[22] A temperature of 500-800°C that is minimally needed to break down the clay material and transform it into ceramic, is possible in open pit firing, which in places can reach over 1000°C, depending on the construction of the pit and the fuel used. In open pit firing, fuel and vessels intermingle, while in a kiln they are separated. A kiln is necessary to reach higher temperatures producing stoneware or porcelain. Updraft kilns tend to have an uneven heat distribution and cannot easily produce a reducing atmosphere. Downdraft kilns allow temperatures of up to 1300°C and a good control of the atmosphere and are necessary for stoneware production (described after Rice 1987 (2005):152-163). For less highly fired ceramics, it is difficult to suggest the type of kiln used, and only excavations of actual kiln remains can give clear indications.

[23] For further details see e.g. Orton, Tyers, and Vince 1993;132-151.

soft, reddish-brown, and very coarse ceramics that were found at that site. In what kind of kilns the ceramics from other sites were produced remains unclear. Unevenly colored reddish-brown to yellow-brown ceramics are commonly found in settlement sites and also in many graves; it is obvious that they were fired at low or medium-high temperatures, and very simple pits or even an open fire would have been sufficient to produce them. The high-fired black or grey ceramics found in some graves, on the other hand, would have required more sophisticated kiln constructions, but the exact layout of these kilns remains unclear.

By comparison to their manufacturing process, the function, in the sense of technofunction, of ceramic vessels is easier to address solely based on the objects themselves. The main practical purposes for which pottery vessels can be used are food preparation — with or without heat, for liquids or solids; serving — of liquids or solids, hot or cold, for a single person or different-sized groups of people; transport — of liquids or solids, hot or cold, for long or short distances; and storage — again, of liquids or solids, for shorter or longer periods of time. The main factors influencing practical usage are:[24]

- *capacity*: deducible from vessel volume;
- *stability/ resistance to tipping*: depends on the relative height of the center of gravity, and the size and flatness of the base;
- *accessibility of content*: depends on the orifice (neck constriction, rim form) in relation to vessel depth;
- *transportability*: depends on weight (determined by vessel size and wall thickness), and "graspability" (Rice 1987 (2005):226) (determined by overall vessel form, presence or absence of handles, roughness of vessel surface);
- *resistance to mechanical stress*: overall form (complex forms and sharp angles are more prone to breakage), wall thickness;
- *resistance to thermal stress*: depends on wall thickness (thin walls more resistant and more permeable), ceramic quality (porosity, temper quality, material homogeneity, clay quality), vessel form (percentage of vessel in contact with fire during heating), surface treatment; and

[24] This list has been compiled with reference to technological studies of ceramics largely based on ethnoarchaeological research, microscopic analyses, and experimental archaeology (Shepard 1968, Smith 1985, Smith 1988, Rice 1987(2005), Sinopoli 1991, Skibo 1992, Orton, Tyres, and Vince 1993).

- *porosity*: ceramic quality, temper, surface treatment (slip, coating, glazing, compaction through beating).

Most of these factors are hard to measure. Determining the center of gravity, for example, requires complex calculations, while ascertaining relative "graspability" seems to be a rather subjective matter. Furthermore, most of the criteria listed above can be ambiguous: Porosity, though possibly leading to leakage, increases thermal conductivity and might even be favorable to the short-term storage of cold liquids in hot areas, as the evaporation will have a cooling effect.[25] Instability, usually a negative trait, might actually be desirable if the container under question is used for pouring out liquids; in that case, a center of gravity in the upper part of the vessel would be useful.

The relationship between form and function is therefore not straightforward and cannot be calculated in a formulaic manner. Although several authors have tried to devise schemes of correlation, all these schemes remain fairly coarse, and they consider only a small number of very general vessel functions and features.[26] Marion F. Smith is one of the few scholars who have suggested a system of complex measurements for ascertaining vessel function, but even her list of over 20 numerical and in part highly complex variables fails to produce a reliable predictive model.[27] Instead, her conclusions remain rather general, suggesting that vessels for serving liquids will not have inward-curving rims, while vessels for the transport of liquids will have small orifices, and similar ideas, which mostly could have been reached by the simple visual observation of the form. It follows, therefore, that an estimate of function still must be based on a relatively small number of measurements and overall visual assessment. What we can

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[25] Suggested e.g. by Rice 1987 (2005):230.

[26] e.g. Rice 1987 (2005):Table 7.2.

[27] The variables include for example volume, stability (measured as pot weight x vertical distance through which the center of gravity must be raised so that the pot will tip), and leverage factor (vertical distance from rim to center of gravity divided by distance from center of gravity to the base, measuring ease of pouring or instability) (Smith 1985).

ascertain, however, is the range of variables that can give indications as to vessel function. These variables and the aspects they influence are:

- ceramic quality (type of temper, hardness, estimated firing temperature) => thermal and mechanical stress resistance;
- surface treatment => handling, change of thermal behavior and mechanical stress resistance;
- thickness of walls => weight, thermal and mechanical stress resistance;
- overall vessel form including presence / absence of handles or spouts => handling, ease of access, volume, stability;
- rim/lip form => ease of access, pouring behavior;[28]
- orifice size => "grain size" of content, physical manipulation of content, duration of storage / frequency of access;
- shoulder form => stability, volume;
- base size and form => kind of placement, storage, stability, handling;
- relative measurements (ratio height to maximum diameter, maximum diameter to rim diameter, rim diameter to height, height to base diameter) => ease of access, stability, volume, duration of storage, distance of transport, size of group involved;
- decoration (presence / absence, nature) => context of use;
- frequency of occurrence => frequency of use, number of people involved (directly or indirectly);
- deposition context => actual final use, socio- and ideofunction; and
- use-wear (scratching, soothing, cracks) => contact with sharp or abrasive objects, subjected to abrasive processes, subject to direct or indirect heat, subject to thermal or mechanical stress.

Aside from these variables, which can be ascertained through simple measuring or macro-observation, there is a large array of possible micro-analytical procedures that can give much more reliable clues, especially residue-analysis, x-ray diffraction, fluorescence spectrometry, mineralogical and petrographic analyses, radiography, and many more,[29] but for reasons explained above, they have not been applied in this dissertation.

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[28] Rim forms are rather complex in their emergence and function: they influence the pouring behavior in the case of liquids and in general the accessibility of the vessel content, but can also have a decorative function, while a thickening of the lip below the rim might just be a "chance redistribution of access clay", as Shepard has pointed out (1968:246). The shape of the lip is thus a minor variation partially determined by the tool used and the angle at which it is applied, but could as well be induced by conscious or unconscious personal or cultural decision. As an indicator for technical function, it should therefore be treated with caution.

[29] Described e.g. in Rice 1987 (2005).

Another very important factor in the overall interpretation of vessel function is the natural environment, as the range and kind of vessels needed will be determined by local temperature, humidity, and seasonality of the climate, as well as spatial dispersion, abundance, and the overall nature of food resources (Smith 1985:307). On the other hand, methods of processing and overall economy do also depend on cultural and social factors not easily measurable. Many variables have several dimensions: Surface treatment influences technical properties, but also carries possible decorative value or assigned meaning; the same is true of rim and lip shape, flanges and handles, and overall form. Furthermore, vessels - as all other objects used by humans - might be employed for a number of different functions, including many for which they might not have been originally intended, or indeed suitable. Conversely, the same functions can also be fulfilled by various other objects. Technological parameters are therefore only indicators and have no predictive quality, as the decisions on form and function made by past humans had many different reasons, and did "not always adhere to the principles of modern materials science", as Rice (1987 (2005):237) has pointedly remarked.

This is where factors of socio- and ideofunction come into play. Indicators for both can be obtained through a study of material characteristics, especially from the presence or absence and kind of decoration, including surface treatment; the fragility and complexity of form; the workmanship and care taken in execution; the deposition context; the number of occurrence of a certain vessel type; and the cultural and personal style of execution, which might even override functional considerations. Such complex questions of social and cultural significance cannot be answered from observations of single artifacts alone, but require the aggregate of a whole assemblage and inter-site and interregional comparisons, which will be conducted in Chapter VII.

In the following, the technical preconditions will be made clear as a first step in staking out the "functional design space" in which the artisans did their work.

III.3.2 Raw Material and Technical Details

A full description of the ceramic assemblage requires remarks on raw material, manufacture, form, and decoration. The following details of ceramic quality and manufacture may be noted:

- *ware texture*: sand-tempered pottery (*jiashatao* 夾砂陶), fine sand-tempered pottery, coarse sand-tempered pottery, fine ware (*nizhitao* 泥質陶);
- *ware color*: red, red-brown, red-yellow, yellow-brown, yellow, brown, yellow-grey, grey, grey-brown, black, black-grey, grey-white, black-brown;[30]
- *temper*: fine sand, small stones, stones and coarse sand, coarse stones, glittering inclusions;
- *manufacture technique*: hand-thrown, slow-wheel, fast-wheel, molded, coil-built;
- *surface finish:*[31] black slip, red slip, burnished, polished, black slip and polished; and
- *hardness*: soft, medium, hard.

Furthermore, the color, hardness, and porosity of the material allow for inferences on firing atmosphere and temperature. The difference in color between surface and core as visible from a fresh break allows one to distinguish between an oxidizing, reducing, and neutral atmosphere, but as the atmosphere can vary during the firing process, and the surface color is prone to significant post-firing changes, these estimates are relatively vague (Rye 1982:114-119). Ceramics fired at a low temperature are more porous and coarse than those fired at higher

[30] A very precise and rather common way of recording colors is the use of Munsell soil color charts (explained e.g. in Rice 1987 (2005):338-343). But for the material at hand information on colors often stems from descriptions in excavation reports, which do not make use of the Munsel system. Therefore, here we can only make a rough distinction between the main colors listed here. The surface color can give some indication on firing conditions (Shepard 1968:105-107), but pottery from the same tradition, potter, or even firing can vary significantly, leading Rye to conclude that a "classification based on color alone is culturally and technologically meaningless" (Rye 1982:119). This variable becomes meaningful only in connection with other variables such as shape or decoration, if any correlation can be shown.

[31] Following Shepard, I am separating surface finish, including smoothing, slipping and polishing, from decoration, which encompasses all kinds of impresso, incision, painting, and application, except for handles (Shepard 1968:186ff.). Though both might be done for decorative purposes, surface finish influences the handling and practical use of the vessel and will therefore be considered separately under 'technical details'.

temperatures, while the colors depend both on heat and general firing atmosphere, as well as composition of raw material.[32] For the present study we can distinguish between three general categories: low-fired vessels, which are coarse, porous, usually yellow or reddish wares probably fired below 750° C; vessels of an intermediate category that are fired at a temperature of 750-850°C resulting in a firmer, reddish-brown ware; and high-fired ceramics, which were fired at temperatures above 850°C; the latter are very hard and blackish-brown in color.

As only part of the original ceramic material was available for first-hand observations, technical details will not be used as variables in the object typology, but be kept separate and used at a later stage of analysis.

III.3.3 Ceramic Vessels and their Form

The choice of variables used in the organization and description of the different types in my classification system were inspired by several handbooks on ceramics in archaeology, especially the very comprehensive work by Prudence M. Rice (1987 [2005]), but also the systematic introductions to this field by Anna O. Shepard (1968), Carla M. Sinopoli (1991), and Clive Orton, Paul Tyers, and Alan Vince (1993). The choice of sub-categories for each attribute was developed from the material itself. The variables and attributes are the following:

- *body*[33] *profile*: cylindrical, upright ellipsoid, globular, hemispherical, hyperboloid, pointed-bottom ovoid, rounded-bottom ovoid, recumbent ellipsoid, conical, irregular,

[32] A minimum temperature of 550° C is required to let all chemically combined water from the clay molecules evaporate and to convert the clay into ceramics. Ceramics fired below 700°C may still contain some remains of organic matter; they are usually very porous and of a reddish color. At 750-850°C, the last organic material is burned out, though the material is still rather porous and reddish in color, while ceramics fired at higher temperatures tend towards brownish colors and greater hardness, and over 850°C brown-black colors can appear under reducing firing conditions. At higher temperatures a number of irreversible chemical transformations take place, which make the material less porous and harder, as well as changing its color. Especially beyond 1050°C porosity diminishes dramatically, with earthenware and terracotta turning into stoneware at 1200-1350°C, and finally into porcelain (Sinopoli 1991:12-14 and 27-21; Rice 1987 (2005):102-107 and 343-345).

[33] The body is the main part of the vessel between orifice and the base.

carinated/biconical; for spindle whorls: disk-shaped, rhomboid, flattened rhomboid, flat-top cone (Figure 3.1, after Shephard 1968: Figures 23 and 24);

- *body opening / orifice:*[34] restricted (diameter less than the maximum vessel diameter), unrestricted, straight (Figure 3.2, after Figure 21 from Shephard 1968:229);
- *rim*:[35] wide outward-flaring, curved outward-flaring, moderate outward-flaring, angular everted (< 90°), rectangular everted (≥90°), slightly everted, curved inward, oblique outward-flaring, hooked outward-flaring, trumpet-shaped, dish-shaped, straight (Figure 3.3);
- *lip*: pointed, round, square, beveled, oval thickening, round thickening, square thickening (Figure 3.4);
- *neck*[36] *profile*: straight, curved, slightly outward-flaring, inward-leaning, constricted, carinated, none (Figure 3.5);
- *neck proportions*: very high (neck height > 1/2 of vessel height), high (1/2 > neck height > 1/3), medium (1/3 > neck height > 1/4), short (< 1/4), none;
- *shoulders*:[37] high, rounded, downward-sloping, carinated, angular, straight;
- *base*: simple flat (angular, rounded, outward-flaring, foot-like protruding), thickened (slightly thickened, round thickened, triangular protruding), small flat foot (rounded, angular), ring-foot (faux ring-foot/ indented, full ring-foot), pedestal (middle-constricted pedestal, hollow trumpet-shaped stem, hollow-conical stem, round bowl-shaped foot, round-pointed bottom, high solid stem;
- *lid*: conical, round rim; conical, square rim; high domed; high domed with indented wedge-shaped knob; high domed with rim-foot pedestal-shaped knob; high domed with wedge-shaped knob; shallow collared; shallow domed; bowl-shaped with knob-handle;
- *handle number*: 0, 1, 2, 3, 4;
- *handle shape*: flat band-handle, band-handle made of several clay strips, thin rounded clay-strip, lug-handle, horn-shaped handle, knob, short horizontal knobbed band (Figure 3.6);[38]
- *handle position*: above lip to shoulder (starting at lip, curving above lip, connecting to shoulder), lip to shoulder (starting directly at the lip and connecting down to the

[34] The term opening or orifice here refers to the opening of the main part of the body, to which a neck may be added that can be of an open, straight or closed form itself. *Guan* jars are therefore by definition closed vessels but always have a neck, which usually has an outward flaring form.

[35] The terms rim and lip are often used interchangeably and not distinguished in description as it is not always easy to say where one begins and the other one ends. The lip is the edge of the mouth of the vessel and therefore also the edge of its rim. The lip can thus either be a smooth continuation of the rim or show a significant change in form, size, or direction. To point out such changes or continuities, rim and lip are therefore distinguished here.

[36] The neck is the vessel part in between shoulder and rim, added on top of the vessel body, usually beginning above the maximum vessel diameter, with the two of them meeting in an angle or a curve in the throat. The neck is usually much smaller in diameter than the body at its widest extent; otherwise the term collar is used instead of neck. The throat is the base of the neck or collar and the point of its smallest diameter.

[37] The shoulder is the upper part of the body of a restricted vessel between the maximum body diameter and the opening or the neck.

[38] A handle as defined here encompasses all appendages attached to body or neck that might facilitate carrying or handling the vessel. This also includes lugs so small that they could not have been grabbed but might have served as supports for a cord or band wound around the vessel to lift it or hang it up.

shoulder), neck to shoulder, lip to neck, rim to neck, rim to shoulder, shoulder, below rim to shoulder, shoulder to belly, belly, lip to belly;

- *spout*: present, absent; and
- *spout shape*: long tubular or slightly conical (angular, straight upward-pointing), short tubular and angular, short irregular-trapezoidal, duck-beak shaped coil-built.

Additionally, a maximum of twelve measurements was taken per vessel including: rim diameter, rim angle, neck diameter, belly diameter, base diameter, base height, neck height, height at belly, total height, spout length, spout diameter, average wall thickness. From these, several sets of proportions were inferred, i.e. rim diameter / total height (proportions I), rim / belly diameter (proportions II), rim / foot diameter (proportions III), (belly diameter + rim diameter + foot diameter)/3 x total height (proportions IV, i.e. volume I), total height x rim diameter (proportions V, i.e. volume II), wall thickness / diameter (proportions VI). These proportions were used to draw inferences on relative dimensions and size categories, which differ by vessel types. As statistical methods require homogenous datasets, they were only applied to well-defined sub-sets of the data, such as types or subtypes, e.g., to distinguish between larger and smaller versions.

III.3.3.1 *Guan/Weng* Urn and *Guan* Jar and Beaker

One of the most widely used terms is *guan* 罐, usually translated as vessel, pot, jar, or beaker. The vessels thus labeled are of varying size, have a tripartite body with a restricted orifice and a neck of various forms and dimensions, and have their widest point around the belly. In excavation reports, large specimens of this kind are either labeled as *guan* or *weng* 甕, i.e. urn, while for smaller vessels the difference between *guan* and *bei* 杯, i.e. cup or goblet, is not very clear. The term "urn" generally refers to a vase or jar-like vessel with a round body, narrow neck, and a height greater than the maximum diameter (Darvill 2003:448), while "jar" refers to a "vessel with a constriction at the neck whose width is usually less than its height" (Darvill 2003:202). A beaker is a "drinking vessel of suitable size and shape to hold in the hands" (Darvill 2003:42), and a cup is a small, bowl-shaped container likewise used as a drinking vessel. The term "cup" is therefore not an adequate translation for *guan*, while the other terms are not very precise as to the exact vessel form but are more helpful in distinguishing vessel sizes. As there is a significant difference in sizes as well as form for the vessels usually referred to as *guan*, I will assign them to different types with different English terms attached to them. The largest kind that usually measures between 30 and 60 cm in height and has a pointed-bottom form with wide shoulders and small to medium-sized vessel opening will be referred to as *guan/weng* urn. 85 vessels belong in this category and the subtypes are as follows (Figure 3.1):

Type A: very large, pointed-bottom ovoid body, small to medium-sized flat bottom, constricted neck, angular outward-flaring rim, wide opening (38-62 cm height, 21-60 cm belly diameter, 22-60 cm rim diameter, 11-22 cm bottom diameter) (38 specimens);
- Type Aa: wide downward-sloping shoulders;
  - Type AaI: horn-shaped lug-handles around rim;
  - Type AaII: appliqué-band with fingertip-impressions;
  - Type AaIII: no handles;
- Type Ab: wide high round shoulders, no handles;
- Type Ac: stout body, wide high round shoulders, downward-slanting sides, no handles, small bottom, short straight neck, hook-shaped outward-curving rim;

Type B: very large, pointed-bottom ovoid body, short curved neck, curved outward-flaring rim, flat bottom, round high shoulders, small opening (32-40 cm height, 25-34 belly diameter, 16-30 cm rim diameter, 7-10 bottom diameter) (6);
- Type Ba knob-like lug-handles on shoulders;
- Type Bb no handles;

Type C: large, pointed-bottom ovoid body, very small flat bottom, high round shoulders, very high straight collar, small outward-curing rim (4);

Type D: medium-sized upright ellipsoid or pointed-bottom ovoid body, downward-sloping shoulders, angular flat bottom, constricted or very short curved neck, short outward-flaring rim, wide opening (20-28 cm height, 13-21 cm belly diameter, 14-23 cm rim diameter, 6-10 cm bottom diameter) (34);
- Type Da: knob-like lug-handles on shoulders;
  - Type DaI: stout body;
  - Type DaII: elongated body;
- Type Db: knobbed appliqué-band;
- Type Dc: small ring-handle on shoulder;

Type DcI: lug-handle on opposite shoulder;
Type DcII: no lug-handle;
Type Dd: no handles, and
Type E: small pointed-bottom ovoid, flat bottom, no neck, angular outward-flaring rim, knobbed appliqué-band (16 cm height, belly, and rim diameter, 7.5 cm bottom diameter) (1);

As opposed to a *guan weng*/urn, a *guan* jar has a large bottom, a wide opening, an upright ellipsoid body, an S-curved profile, and is of medium size (16-24 cm high, 16-21 cm belly diameter, 14-24 cm rim diameter, 6-11 cm bottom diameter). This category also includes the vessel type referred to as "*tan*壇," usually translated as "jug" or "jar."[39] There are 460 vessels in this category and the subtypes are as follows (Figures 3.2-3.3):

Type A: upright ellipsoid body, S-curved profile, flat bottom, wide opening (26);
Type Aa: wide opening, curved medium-high neck, moderately angular outward-flaring rim;
Type AaI: lug-handle on shoulder, flat angular bottom;
Type AaII: no lug-handle foot-like protruding flat bottom;
Type Ab: globular-thickened middle with extended bottom and top, narrowed neck;
Type AbI: elongated form, flat medium-sized bottom, no handles;
Type AbII: globular form, very small irregular bottom, four triangular knobs on shoulders;
Type B: high angular outward-flaring collar, constricted neck, angular slightly foot-like protruding flat bottom (39);
Type Ba: pointed-bottom ovoid;
Type BaI: elongated form;
Type BaII: stout form;
Type BaIII: very wide;
Type Bb: very high upright-ellipsoid body, foot-like narrowing flat bottom;
Type C: small stout vessel with angular shoulders, wide mouth, angular outward-flaring rim, large flat foot (25);
Type Ca: very high straight sides (collar-like), rectangular outward-flaring rim, no neck;
Type Cb: globular body with angular shoulders, S-Shaped profile, curved short to medium-high neck, angular outward-flaring rim;
Type CbI: stout, moderately outward-flaring rim;
Type CbII: medium-high, wide outward-flaring rim;
Type Cc: high shoulders, foot-like protruding bottom, constricted neck, very wide outward-flaring rim;
Type Cd: globular body, flat bottom, high straight neck/collar, straight rim;
Type D: round-bottom ovoid with wide-protruding angular shoulders, flat bottom, constricted neck, wide angular outward-flaring rim (9);

[39] Lizhou 1980.4: Figure 10.17, described on p. 451.

Type Da: small narrow form;
Type Db: wide form;
Type E: globular body, flat bottom, outward-flaring rim (60);
Type Ea: short curved neck, moderately outward-flaring rim;
Type EaI: high shoulders, angular outward-flaring rim;
Type EaII: regular-curved globular body, curved outward-flaring rim;
Type Eb: constricted neck, angular outward-flaring rim;
Type EbI: triangular thickened large bottom;
Type EbII: large angular flat bottom;
Type EbIIa: short curved neck, short curved outward-flaring rim;
Type EbIIb: straight high rim/collar, four perforated knob-handles;
Type Ec: large angular flat bottom, constricted neck, wide angular outward-flaring rim, stout body;
Type Ed: slightly foot-like protruding bottom, wide opening, slightly constricted neck, funnel-shaped outward-flaring very high and wide rim;
Type Ef: high trapezoidal foot-like protruding flat bottom, short curved neck, outward-flaring rim;
Type EfI: angular shoulders, wide angular outward-flaring rim;
Type EfII: round shoulders, moderately curved outward-flaring rim;
Type F: upright ellipsoid body, flat bottom, constricted or short curved neck, outward-flaring rim (64);
Type Fa: S-shaped profile, triangular thickened bottom, medium-high curved neck, trumpet-shaped outward-flaring rim;
Type Fb: nearly straight sides, slightly angular shoulders, constricted neck;
Type FbI: downward-slanting sides, foot-like protruding flat bottom, moderately angular outward-flaring short rim;
Type FbII: angular flat foot, only slightly protruding, wide angular outward-flaring rim;
Type Fc: moderately curved sides, neck-area only slightly curved inward (no clear neck), angular outward-flaring rim;
Type FcI: moderately outward-flaring rim, foot-like protruding flat bottom;
Type FcII: wide outward-flaring rim, flat angular bottom;
Type G: squat vessels with wide opening and large flat bottom (48);
Type Ga: squat pointed-bottom ovoid with high angular shoulders, high straight or slightly outward-flaring collar;
Type GaI: very large;
Type GaII: medium-sized;
Type GaIII: small, knob-appliqué on shoulders;
Type Gb: recumbent ellipsoid body, high round shoulders, short straight neck, slightly outward-curving rim, downward-narrowing body, large flat bottom:
Type GbI: very large bottom, squat form, body only slightly downward-narrowing;
Type GbII: very pronounced shoulders, body elongated, downward-narrowing;
Type Gc: low elongated recumbent-ellipsoid body, strongly ring-like protruding middle, S-curved profile, foot-like protruding bottom, short straight neck, angular outward-curving small rim;

Type Gd: low elongated recumbent ellipsoid body, angular shoulders, foot-like protruding bottom, constricted neck, angular outward-flaring rim;

Type H: globular body, high shoulders, outward-flaring rim (63);

Type Ha: medium-high neck, angular outward-flaring rim;

Type Hb: short neck, curved outward-flaring rim, and

Type Hc: constricted neck, slightly curved outward-flaring rim.

In contradistinction to *guan weng*/urn and *guan* jar, I use the term *guan* beaker to refer to relatively small vessels of a shape and size that can be held comfortably with one hand (10-14 cm high, 6-9 cm belly diameter, 6-11 cm rim diameter, 4-8 cm bottom diameter). They have a wide mouth, flat bottom, and only moderately S-curved sides with an outward-curving lip. 57 vessels belong in this category and they fall under the following subtypes (Figure 3.4):

Type A: stout pointed-bottom ovoid, flat bottom, constricted neck, moderately angular outward-flaring small rim (2);

Type B: globular body, short curved or constricted neck, slightly curved or angular outward-flaring small rim, flat bottom (15);

Type Ba: pronounced high shoulders, curved rim;

Type BaI: flat angular bottom, rounded shoulders;

Type BaII: triangular thickened flat bottom, angular shoulders;

Type Bb: mildly curved shoulders, angular rim;

Type C: round-bottom ovoid body, flat bottom, constricted neck, slightly outward-flaring small rim (29);

Type Ca: elongated body, angular outward-flaring rim;

Type Cb: very squat body, curved outward-flaring rim, foot-like protruding or triangular thickened flat bottom;

Type CbI: triangular knobs on shoulder;

Type CbII: no knobs;

Type D: upright ellipsoid body, flat bottom (11);

Type Da: short to medium-high straight neck, downward-narrowing, medium-sized bottom, slightly angular outward-flaring rim;

Type Db: narrow-elongated body, mildly curved shoulders, large flat angular bottom, constricted neck;

Type DbI: regular sides;

Type DbII: high shoulders;

Type DbIII: downward-sloping shoulders;

Type Dc: upright ellipsoid body, nearly straight shoulders, large flat bottom, wide opening, no neck;

Type DcI: straight rim;

Type DcII: slightly angular outward-curving rim, slightly thickened bottom, and

Type DcIII: inward-curving rim, slightly thickened bottom;

Aside from the 667 *guan* vessels without handles, there are 476 vessels of similar form with one to four handles. In excavation reports, they are usually simply referred to as *guan* as well, but as the addition of handles changes the way these vessels were handled, I have assigned them to two separate types. The majority of handled *guan* is of a medium size, justifying the term "*guan* jar" (10-17 cm high, 8-13 cm belly diameter, 7-11 cm rim diameter, 4-9 cm bottom diameter). Only 24 vessels, i.e. about 7.5 %, are larger, measuring up to 35 cm in height and up to 23 cm in belly diameter. The difference in vessel size is reflected in their assignation to different subtypes with "large" referring to vessels of 18-25 cm height and "very large" to vessels of around 30 cm height. The types and subtypes for the single-handled *guan* jars are (Figures 3.5-3.7):

Type A: round-bottomed ovoid body, lower part squat, curved neck, funnel-shaped outward-flaring rim, long band-handle from rim to body (2);
Type B: small, globular body with high shoulders, high wide curved neck, slightly everted lip (21):
- Type Ba: small ring-handle from lip to body, flat bottom;
- Type Bb: small ring-handle from shoulder to body, low ring-foot;

Type C: globular body (15);
- Type Ca: constricted neck, small slightly everted lip, flat angular bottom;
  - Type CaI: band-handle made of 2-5 clay strips, from lip to shoulder;
  - Type CaII: ring-handle from high part of shoulder to body;
  - Type CaIII: ring-handle from above lip to shoulder, knob on opposite shoulder;
- Type Cb: medium-high curved neck, flat angular bottom, ring-handle from lip to shoulder;
  - Type CbI: medium-sized;
  - Type CbII: large;
- Type Cc: high straight neck, band-handle made of 3-5 clay strips, from lip to shoulder, small ring-foot;
- Type Cd: constricted neck, wide angular outward-flaring broad rim, foot-like protruding flat bottom, long band-handle from above lip to body;

Type D: upright ellipsoid body, flat bottom, ring-handle (14);
- Type Da: very straight high-narrow form, wide mouth, small rim;
  - Type DaI: handle made of 3 clay-strips from above lip to shoulder;
  - Type DaII: ring-handle from neck to lower part of shoulder;
  - Type DaIII: rim strongly angular outward-flaring, thickened bottom;
- Type Db: S-shaped profile, short curved neck, angular outward-flaring lip;
  - Type DbI: ring-handle from lip to shoulder, medium to large-sized;
    - Type DbIa: regular curved sides, wide opening, only slightly outward-flaring rim;
    - Type DbIb: high shoulders, wide angular outward-flaring rim;

Type DbII: ring-handle from lower part of the shoulder to body;

Type Dc: angular shoulders, constricted neck, high angular outward-flaring rim, ring-handle from high part to low part of shoulder;

Type DcI: downward-sloping shoulders;

Type DcII: high shoulders;

Type E: stout pointed-bottom ovoid body, band-handle from lip to shoulder, curved neck, wide opening, slightly angular outward-flaring rim (11);

Type Ea: flat bottom;

Type Eb: slightly indented bottom (faux ring-foot);

Type F: small stout body, globular form, short curved neck, wide opening, slightly angular outward-flaring rim, ring-handle from above lip to shoulder, slightly thickened bottom (5);

Type Fa: regular S-curved sides;

Type Fb: downward-sloping shoulders;

Type G: high pointed-bottom ovoid with very wide shoulders and strongly constricted bottom, contracted neck, angular outward-flaring rim, ring-handle from lip to shoulder (2);

Type Ga: high flat foot-like protruding bottom;

Type Gb: solid trapezoidal pedestal base;

Type H: high pointed-bottom ovoid body, flat bottom (4);

Type Ha: narrow opening, curved neck, angular outward-flaring rim, small band-handle made of four clay-strips, running from lip to high part of shoulder;

Type Hb: wide opening, slightly angular outward-flaring rim, small ring-handle from below rim to shoulder, large rim;

Type Hc: high pronounced shoulders, curved neck, wide outward-flaring broad rim;

Type I: large vessel, high pointed-bottom ovoid body, flat bottom, small ring-handle (6);

Type Ia: constricted neck; small angular outward-flaring rim; handle from below lip to high part of shoulder;

Type Ib: short to medium-high concave neck, angular outward-flaring rim, handle from lip to high part of shoulder;

Type Ic: wide high neck, only slightly outward-flaring rim, handle from shoulder to body;

Type J: recumbent ellipsoid body, flat bottom, long band-handle made of four clay-strips from lip to shoulder (3);

Type Ja: very high downward-widening neck, vey wide angular outward-flaring rim;

Type Jb: wide high downward-widening neck, angular outward-flaring rim;

Type K: rhombic body, angular shoulders, constricted neck, high outward-flaring collar, band-handle from lip to body, very small flat or slightly rounded bottom (21);

Type Ka: high shoulders, short collar;

Type Kb: medium-high collar;

Type Kc: very high funnel-shaped collar, and

Type L: small stout pointed-bottom ovoid body, very high curved neck, funnel-shaped outward-flaring very high collar, flat bottom, ring-handle from neck to shoulder (3).

The types and subtypes for the 344 double-handled *guan* jars are (Figures 3.8-3.10):

Type A: long thin band handles, from rim to belly (5);

Type Aa: large round-bottom ovoid body, flat bottom, high broad funnel-shaped collar;

Type AaI: high body, medium-high collar;

Type AaII: medium-high body, very high collar;

Type Ab: globular body, high downward-widening neck, slightly everted rim;
Type Ac: recumbent ellipsoid body, flat bottom, high shoulders;
Type AcI: large body, high slightly downward-widening neck, angular outward-flaring rim;
Type AcII: small body, medium-high straight neck;
Type B: loop handles, flat bottom, band of net-pattern on shoulder (5);
Type Ba: handles from above lip to shoulder, upright ellipsoid body, flat foot-like protruding bottom, broad angular outward-flaring rim, constricted neck;
Type BaI: elongated body;
Type BaII: stout body;
Type Bb: handles from rim to shoulder, stout body;
Type Bc: cylindrical body, ring handles attached at body;
Type C: band-handle made of several clay strips, from neck to shoulder, curved outward-flaring rim (62);
Type Ca: globular body, high shoulders, high broad straight neck;
Type CaI: flat foot-like protruding angular bottom;
Type CaII: faux ring-foot, foot-like protruding;
Type CaIII: small ring-foot;
Type CaIV: flat foot;
Type Cb: globular to recumbent ellipsoid body, high shoulders, slightly curved neck;
Type CbI: faux ring-foot, foot-like protruding;
Type CbII: small ring-foot;
Type CbIII: flat foot;
Type Cc: pointed-bottom ovoid, medium-high curved neck;
Type CcI: ring-foot;
Type CcII: flat foot;
Type Cd: round-bottom ovoid, constricted neck;
Type CdI: flat bottom;
Type CdII: ring-foot;
Type D: band-handle made of several clay strips, from lip to shoulder, curved outward-flaring rim (85);
Type Da: globular body, medium-high downward-widening neck;
Type DaI: flat bottom;
Type DaII: flat foot-like protruding angular bottom;
Type DaIII: faux ring-foot, foot-like protruding;
Type DaIV: small ring-foot;
Type Db: pointed-bottom ovoid body, medium-high straight neck;
Type Dc: pointed-bottom ovoid body, short curved neck;
Type DcI: flat foot-like protruding angular bottom;
Type DcIa: small size;
Type DcIb: large size;
Type DcII: small ring-foot;
Type Dd: globular body, high shoulders, short curved neck, flat bottom;
Type DdI: regular form;
Type DdII: very irregular, coarse;
Type De: round-bottom ovoid, no neck, flat bottom;

Type Df: upright ellipsoid body, very small, short curved neck, ring-foot;

Type E: broad band-handle with protruding sides, from lip to body (105);

Type Ea: bottom-pointed ovoid, medium-high slightly curved neck, flat bottom;

Type EaI: undecorated body;

Type EaIa: small size;

Type EaIb: very large size;

Type EaII: impressed awl-pattern around body;

Type EaIIa: small size;

Type EaIIb: large size;

Type EaIII: protruding double-spiral on body emerging from protruding lines on handles (ram's-head design?), middle outward-protruding rim building oval to rhombic opening, large vessel size;

Type Eb: recumbent ellipsoid body with high shoulders and pronounced middle section, medium-high slightly curved neck;

Type EbI: flat bottom;

Type EbII: pedestal-base, middle of rim outward-protruding;

Type EbIIa: undecorated;

Type EbIIb: impressed awl-pattern around body at point of largest diameter;

Type EbIIc: incised double-spiral pattern connecting to handles (ram's-head design?);

Type Ec: large globular body, broad band-handles, high neck;

Type EcI: flat bottom;

Type EcIa: handle made of 4-6 clay strips, shoulder decorated;

Type EcIb: red-and-white painted double-spiral pattern (ram's-head design?) on body, middle outward-protruding rim building oval to rhombic opening;

Type EcII: trapezoidal ring-foot, incised double-spiral pattern connecting to handles (ram's-head design?);

Type Ed: large pointed-bottom ovoid body, high neck, curved outward-flaring rim, wide band-handles with middle-strut;

Type EdI: flat bottom, red-and-black painted double-spiral pattern connecting to handles (ram's-head design?);

Type EdII: angular shoulders, trapezoidal ring-foot, undecorated;

Type Ee: very narrow high form, long straight neck, outward-curving rim, broad band-handles from lip to body;

Type EeI: pointed-bottom ovoid, flat bottom, large body;

Type EeIa: handles close to body;

Type EeIb: handles wide curved with middle-strut;

Type EeII: round-bottom ovoid, small ring-foot, large to medium-sized;

Type EeIIa: handles close to body;

Type EeIIb: handles wide curved with middle-strut;

Type EeIII: very small and coarse, no break between neck and body, round bottom;

Type F: upright ellipsoid rounded body, constricted neck, curved outward-flaring rim, band-handles from lip to lower part of the shoulder, flat bottom, small (1), and

Type G: small globular body, very high funnel-shaped straight outward-flaring neck, two flat band-handles from rim to base of the neck, flat foot-like protruding bottom (2).

Apart from vessels well enough preserved to assign them to one of the types listed above, 14 fragments of handled vessels have been reported that might belong to one- or double-handled vessels. They can be grouped in following types (Figure 3.11):

Type A: short handle from lip to shoulder, slightly curved outward-flaring rim (6);
- Type Aa: short neck, high shoulders;
  - Type AaI: ring-handle;
  - Type AaII: band-handle made of 3 clay-strips;
- Type Ab: short narrow neck, wide globular body, band-handle;
- Type Ac: no neck, globular body, downward-sloping shoulders, band-handle, and

Type B: short curved neck, very short straight rim, plain band-handle from below rim to shoulder upright ellipsoid or ovoid body (1).

Additionally, there are a number of special forms, such as two round-bodied *guan* jars with four handles, two squat *guan* jars with horn-handles, and three small double-vessels. The different types of four-handled *guan* jars are (Figure 3.12):

Type A small globular body with round bottom (12.2 cm high), constricted neck, angular outward-flaring rim, four band-handles from base of neck to body (1)
Type B large pointed-bottom ovoid body (21 cm high), high curved neck, flat foot-like protruding bottom, band-handles from lip to shoulder (1)

The *guan* jars with horn-shaped handles all have a low-recumbent ellipsoid body, a straight medium-high neck, and a horn-shaped upward-curving handle with pointed end attached to widest point of body. The are 10 cm high, have a rim diameter of 10 cm, a belly diameter of 13 cm, and a foot diameter of 6-9 cm. Two types can be distinguished (Figure 3.13):

Type A faux ring-foot bottom, angular outward-flaring short lip (1)
Type B foot-like protruding flat bottom, straight lip (1)

The double-jars are of medium size with a height of 16-19 cm and 6-7 cm rim diameter for each opening. The types and subtypes are (Figure 3.14):

Type A: two small connected jars with rounded upright ellipsoid body, constricted neck, angular outward-flaring rim, two band handles from shoulder to body; body diameter 25-26 cm, bottom diameter 19-23 cm (2), and

Type B: one upright ellipsoid vessel body, two trumpet-shaped outward-flaring openings, one small lug handle, body diameter 10 cm, bottom diameter 5.4 cm (1).

III.3.3.2 *Bo* and *Wan* Bowl, *Pen* Basin, and Stemmed *Dou* Bowl

Two other very common vessels, especially in settlement contexts, are *bo* 缽 and *wan* 碗 bowls, the former having a closed restricted form, the later an open unrestricted form. As there are no such fine distinctions in the English language, I will refer to the former kind of object as "*bo* bowl" (120 objects) and the later as "*wan* bowl" (120 vessels). The category of *wan* bowls also includes the small funnel-shaped bowls sometimes called "*zhan* 盞." The term "bowl" as used in the English language refers to vessels that are generally wider than deep, with a height of 1/3 to equal the height of its maximum diameter, some of them having a collar but never a neck. Both types of bowls are usually 4-7 cm high, with only a few measuring up to 13 cm. There is some variation in bowl diameters, with small vessels measuring 6-10 cm, medium-sized ones 11-18 cm, large ones 20-26 cm, and very large ones around 30 cm. For *bo* bowls, we can distinguish between the following types and subtypes (Figure 3.15):

Type A: shallow-bodied, carinated bo bowl, straight or slightly inward-curving sides (28);
- Type Aa: carinated bo bowl with straight rim;
  - Type AaI: recumbent ellipsoid body;
    - Type AaIa: flat bottom;
    - Type AaIb: small flat rounded foot, inside bottom flat;
    - Type AaIc: shallow ring-foot, stepped straight foot, large diameter;
  - Type AaII: globular body, shallow ring-foot, large diameter;
    - Type AaIIa: stepped straight foot;
    - Type AaIIb: pedestal base;
- Type Ab: carinated bo bowl with outward-flaring rim;

Type B: straight-collared bo bowl (18);
- Type Ba: shallow-bodied, short collar, large diameter;
- Type Bb: medium-bodied, high collar;
  - Type BbI: large diameter;
  - Type BbII: medium diameter;
- Type Bc: narrow bottom, wide top, medium-high straight collar, large diameter;

Type C: shallow bo bowl with inward-curving rim, large diameter (6);
Type D: round-bodied bo bowl with straight sides or slightly inward-curving lip (10);
  Type Da: large diameter;
  Type Db: medium diameter;
  Type Dc: small diameter;
Type E: globular-bodied deep bo bowl (41);
  Type Ea: angular bottom, inward-curving rim;
    Type EaI no handle;
      Type EaIa: large diameter;
      Type EaIb: medium diameter;
      Type EaIc: small diameter;
    Type EaII: small ring-handle (decorative);
  Type Eb: rectangular outward-pointing small rim;
    Type EbI: very large diameter;
    Type EbII: large diameter;
    Type EbIII: small diameter;
  Type Ec: angular outward-flaring broad rim, large diameter;
Type F: small high bo bowl, angular bottom (5);
  Type Fa: high globular body, slightly inward-curving rim;
  Type Fb: squat body, straight sides, and
  Type Fc: globular body, inward-curving rim, triangular protruding edge in rim (spout).

Among the *wan* bowls, the following types can be distinguished (Figure 3.16):

Type A: recumbent ellipsoid body, slightly inward-curving rim (9);
  Type Aa: undecorated, very large;
  Type Ab: appliqué band at 2/3 of the vessel height, large;
Type B: conical body (108);
  Type Ba: slightly inward-curving rim;
    Type BaI: large diameter;
    Type BaII: medium diameter;
  Type Bb: straight rim, straight angular foot;
    Type BbI: medium-high bowl, height: diameter = 1:2;
    Type BbII: high bowl, height: diameter > 1:2;
      Type BbIIa: medium diameter;
      Type BbIIb: small diameter;
  Type Bc: angular foot-like protruding bottom;
    Type BcI: shallow bowl, height: diameter = 1:3;
    Type BcII: bowl of medium height, height: diameter = 1:2.25, angular outward-flaring small rim, large diameter;
    Type BcIII: high bowl, height: diameter > 1:2;
      Type BcIIIa: medium diameter;
      Type BcIIIb: small diameter;
Type C: high rectangular body, outward-flaring rim (3);
  Type Ca: medium diameter, and
  Type Cb: small diameter.

The terms "*die* 碟," "*pen* 盆," and more rarely "*pan* 盤" are all used for shallow flat containers with an open body, straight or outward flaring sides, and a height of 1/5 to 1/3 of its rim diameter. In everyday language, *die* and *pan* both refer to a plate, i.e., a very flat dish with a rim height below 1/7 of its diameter; whereas *pen* describes a basin whose the walls are higher than 1/7 of the diameter but not higher than 1/3, which describes the vessels of the Liangshanzhou assemblage. Therefore, I will use the term *pen* basin for the 17 reported vessels of this shape. The main *pen basin* types and their characteristics are as follows (Figure 3.17):

Type A: oval basin, open form, rounded angles, large size (4.5 cm height, 22 cm diameter) (1);
Type B: round basin, open form, angular lip and bottom (11);
- Type Ba: 45° wall angle, very large size (8.4 cm height, 42.8 cm diameter);
- Type Bb: nearly straight, slightly outward-opening walls, medium size (2.5 cm height, 12 cm diameter), and

Type C: round basin, carinated, open form, high collar, angular everted lip, large size (6 cm height, 27 cm diameter) (4).

Bowl-shaped vessels mounted on a stem are usually referred to as *dou* 豆. The body of this kind of vessels has a height equaling at most the maximum diameter and at least a third of the body diameter. The body can either be funnel-shaped, globular, or round-bottom ovoid in shape, suggesting the terms "goblet," "cup," or "bowl." Cups do usually not have a stem, while for goblets the stem tends to be relatively high to allow for easy handling as a drinking-vessel, I have classified bowl-shaped vessels with a short stem as *dou* bowls while grouping those with a high stem together with other stemmed vessels as goblets. The *dou* bowls vary significantly in size, some having a rim diameter of only 9 cm, others as much as 39 cm, but the majority measures 12-20 cm in diameter and 10-20 cm in height. The main types and subtypes are as follows (Figures 3.18-3.19):

Type A: conical body (11);
- Type Aa: low body;
  - Type AaI: trapezoidal ring-foot;
    - Type AaIa: medium size;

Type AaIb: small size;

Type AaII: closed ring-foot with oval holes all around, large size;

Type Ab: high body;

Type AbI: trapezoidal ring-foot, large size;

Type AbII: high solid stem with round hollow foot, medium size;

Type B: hemispherical body, hollow foot (8);

Type Ba: trapezoidal stem, medium size;

Type BaI: stem with straight sides;

Type BaII: stem with concave sides;

Type Bb: small pedestal foot, medium size;

Type Bc: small trapezoidal ring-foot (*gui* 簋-shaped);

Type BcI: round shoulders, angular inward-leaning rim, medium size;

Type BcII: round shoulders, straight rim, hooked outward-curing lip, very large size;

Type BcIII: angular shoulders, constricted neck, angular everted lip;

Type BcIIIa: medium size;

Type BcIIIb: small size;

Type C: globular body, closed ring-foot with oval holes all around, medium size (1), and

Type D: shallow round basin-shaped body with straight sides, high trapezoidal foot, medium size (1).

III.3.3.3 *Dou*, *Bei*, and *Gu* Goblet, and *Bei* Cup

The category of goblets is fairly broad and can be applied to a large number of different vessels that consist of a cup-, beaker-, or bowl-shaped body and a stem. They usually are of medium size (10-20 cm height, 5-10 cm body diameter, 6-16 cm rim diameter, 4-8 cm bottom diameter), which allows one to hold them comfortably in one or two hands; and they have an outward-flaring rim that allows for pouring or drinking, making the name goblet an appropriate choice. Within the Chinese terminology, such vessels are placed in a variety of different categories without any consistency; globular vessels with an S-shaped body, an outward-flaring rim, and a short pedestal foot can be found labeled as *bei* 杯, *guan*, *dou*, *gu* 觚, or *gui* 簋 depending on the excavation report, even though the general form is very similar. Furthermore, the term *bei*, for example, is widely applied to vessels with or without a pedestal foot or stem and with or without a handle, while the body of *bei* can be conical and open, or S-curved with high collar, or tulip-shaped, or even tubular. By contrast, I have placed *bei* vessels into different categories depending on their form, and I use the Chinese terminology for subtypes were it seems appropriate. Proceeding in this fashion, I have arrived at the following eight goblet types with subtypes (Figures 3.20-3.21):

Type A: stemmed *dou* goblet, high trapezoidal stem with straight sides (32);
- Type Aa: hemispherical body with slightly inward-curving rim;
- Type Ab: pointed-bottom ovoid body with slightly inward-leaning rim;
- Type Ac: low conical body with straight collar and angular inward-leaning rim;
- Type Ad: high conical body;
- Type Ae: shallow conical body with curved sides;
- Type Af: high conical body with slightly curved sides, constricted neck;
  - Type AfI: small angular outward-flaring lip (gui-shaped);
  - Type AfII: wide angular outward-flaring lip (zun-shaped);

Type B: stemmed S-shaped high-collared *bei* goblet with trapezoidal foot with straight sides (22);
- Type Ba: globular body with knobs on shoulders, high concave neck, concave outward-flaring rim;
- Type Bb: globular body with angular shoulders, high concave neck;
  - Type BbI: concave outward-flaring rim;
  - Type BbII: slightly outward-flaring rim;
- Type Bc: recumbent oval body, high concave neck, slightly outward-flaring rim;
  - Type BcI: long body;
  - Type BcII: short narrow body;
- Type Bd: recumbent oval body, high straight neck, straight rim;

Type C; high-stemmed *bei* goblet (23);
- Type Ca: tulip-shaped body;
  - Type CaI: high-elongated form with high stem;
    - Type CaIa: round bottom, wide straight outward-flaring sides;
    - Type CaIb: angular bottom, curved wide outward-flaring sides;
  - Type CaII: short squat body, short stem;
  - Type CaIII: curved sides, high straight rim;
- Type Cb: upright ellipsoid body, high thin stem, round bottom, straight sides;
- Type Cc: stemmed goblet with straight sides and medium-high to low stem;
  - Type CcI: upright ellipsoid body, straight sides, medium-high stem;
  - Type CcII: hyperboloid body, trapezoidal wide pedestal base;

Type D: *gu* goblet (5);
- Type Da: hyperboloid body, hollow trapezoidal base;
  - Type DaI: very high elongated form;
  - Type DaII: medium-high body;
- Type Db medium-high, upright ellipsoid body;

Type E: *guan* goblet, globular, S-shaped body, short pedestal foot (24);
- Type Ea: globular body, wide trumpet-shaped outward-flaring high neck, large;

Type Eb: round-bottom ovoid body, curved neck, slightly outward-curving rim, 2-4 small handles on shoulder, medium-sized;
Type EbI: elongated body, trapezoidal foot;
Type EbII: squat form, small pedestal base;
Type Ec: pointed-bottom ellipsoid body, trapezoidal base;
Type EcI: wide angular outward-flaring rim;
Type EcIa: large;
Type EcIb: medium-sized;
Type EcII: short curved outward-flaring rim, small pedestal foot;
Type EcIIa: medium-sized;
Type EcIIb: small;
Type EcIII: straight short collar, trapezoidal base, medium-sized;
Type Ed: globular body, small trumpet-shaped pedestal base;
Type EbI: high form;
Type EbII: squat form (*gui*-shaped), small;
Type F: small egg-cup shaped goblet with small pedestal foot (4);
Type Fa: small trapezoidal foot;
Type Fb: triangular thickening bottom;
Type G: small tulip-shaped goblet, slightly outward-curving sides, high solid stem (1), and
Type H: high conical goblet with small triangular foot (1).

Some of these types require further explanations. The *gu* goblet has a bipartite shape of distinctly hyperboloid character that distinguishes it clearly from the *bei* goblet, but both have overall similar dimensions, a high round foot, a long funnel-shaped body at least double the height of its foot and more than twice the size of its foot diameter, and a trumpet-shaped opening, so that both can be referred to as goblet. The *gu* goblets do not have a globular to ovoid belly, but are very similar in form to the bronze vessels from the Central Plains after which the type was named. There is much variation among vessels of the *guan* goblet type. Most are of medium-size but some are significantly large with a height of over 25 cm or much smaller, measuring only around 8 cm in height. Type Ea furthermore has a very wide trumpet-shaped outward-flaring high neck and rim, while all other vessels have a medium-high collar or rim, but since the shape of their bodies and feet are very similar, they can still be assigned to the same type. Moreover, the egg-cup shaped goblet type (F) – called either *dou* or *bei* in excavation reports – and the small tulip-shaped goblet (G) are noteworthy for their very small sizes and unusual shapes. Like the high conical goblets with small triangular feet, which are of medium size, they have shapes that remind of footed bowls, but they are higher than is common for bowls, and I have therefore categorized them as goblets.

The *bei* cup, as well, is a somewhat problematic category due to the overlap in shape with *guan* beakers and *bo* and *wan* bowls. The main differences are, first, the location of the widest point, which is usually at the rim in case of the *bei* cup, but around the belly for the *guan* vessel; and, second, the relative dimensions of height to width, with *bo* and *wan* bowls being shallow and *bei* cup deep. Only the handled *bei* cups are rather shallow, with the body resembling a *wan* bowl. The *bei* cup always has an unrestricted form and a flat bottom. Vessels in this category are usually of small to medium size (7-15 cm height, 7-14 cm rim diameter, 7-12 cm belly diameter, 4-9 cm bottom diameter), except for a small number of extremely small and coarse vessels with a height of only 5-6 cm and a width of 3-4 cm. The types and subtypes are (Figure 3.22):

- Type A: double-handled high cup (7);
- Type B: cup with short band-handle (19);
  - Type Ba: low conical body;
    - Type BaI: low body, straight sides;
      - Type BaIa: flat bottom;
      - Type BaIb: flat foot-like protruding bottom;
    - Type BaII: concave sides, inward-curving rim, straight bottom;
    - Type BaIII: mildly S-shaped sides, flat bottom;
      - Type BaIIIa: handle made of 3-4 clay-strips;
      - Type BaIIIb: plain band- or ring-handle;
  - Type Bb: high body, flat bottom;
    - Type BbI: high tubular body;
      - Type BbIa: slightly S-curved sides, angular outward-curving rim;
      - Type BbIb: straight sides;
    - Type BbII: broad pointed-bottom ovoid to globular body;
- Type C: cup without handles (52);
  - Type Ca: conical form, flat bottom;
    - Type CaI: short;
    - Type CaII: high, lug handles on sides (decorative);
  - Type Cb: slightly outward-flaring straight sides;
    - Type CbI: foot-like protruding bottom;
    - Type CbII: flat downward-narrowing bottom;

Type Cc: upright ellipsoid body, straight or slightly outward-flaring short rim;
Type CcI: short body;
Type CcII: elongated body;
Type CcIIa: flat bottom;
Type CcIIb: small ring-foot;
Type Cd: very small rounded cup, flat bottom;
Type CdI: high rounded shoulders, inward-curving rim;
Type CdII: low, downward-flaring shoulders, inward-curving rim, and
Type CdIII: narrow upright ellipsoid body, round bottom.

III.3.3.4 *Hu* Ewer and *Ping* Vase

As mentioned above, the term *hu* is problematic, referring to both a modern-day spouted pot and an old bronze vase form with neither spout nor handle. Here I use the term *hu* only in the modern-day sense, referring to a vessel with a spout, usually accompanied by a wide or trumped-shaped opening, a wide belly, a high neck, a flat or sometimes ring-footed bottom, and in some cases a handle. As the terms jug or pitcher do not indicate a spout, the translation as ewer is most appropriate. Most vessels in the category *hu* ewer are large or very large in size (20-33 cm high, 10-20 cm belly diameter, 9-20 cm rim diameter, 5-10 cm bottom diameter) with only very few being of medium-size (15-16 cm height). The reported 37 vessel of this category fall into the following types and subtypes (Figure 3.23):

Type A: very large pointed-bottom ovoid body, high broad curved neck, trumpet-shaped outward-flaring rim, flat angular bottom, long thin band-handle from lip to shoulder, long tubular spout set at 45° angle on the shoulder (3);
Type B: large upright ellipsoid body, high narrow neck, long tubular spout set at 45° angle on the shoulder, no handle;
Type Ba: flat angular bottom (9);
Type BaI: wide dish-shaped rim, end of spout inward-curving (5);
Type BaII: curved outward-flaring rim, end of spout slightly outward-flaring (4);
Type Bb: small pedestal base, spout with straight end, high funnel-shaped neck and rim (7);
Type BbI: rounded body (3);
Type BbII: narrow-elongated body (4);
Type C: large globular body, short curved neck, curved outward-flaring short rim, thin short spout set at 45° angle high on the shoulder, flat angular bottom (3);
Type Ca: elongated body (1);

Type Cb: stout body (1);

Type D: very large body, short trumpet-shaped spout at the neck, flat bottom (15);

Type Da: globular body, horizontal spout (8), and

Type Db: upright ellipsoid body, spout set at 45° angle (7).

Objects of a similar shape (long-oval body, high neck, trumpet-shaped opening), but without a spout, are usually referred to as *hu*, *zun* 尊 or *ping* 瓶, the latter meaning vase or bottle. Both English terms refer to a high container without handles or spout and the widest diameter around the body and a neck that is narrower than body or shoulders. While bottles usually have a very narrow neck and a very small opening, vases can have a wider rim. In this case, the term "vase" is more appropriate and will be coupled with the Chinese term *ping* to avoid confusing it with the *hu* ewer or the bronze *hu* and *zun* form from the Central Planes, which are also different in form. Although the basic form of the *ping* vase resembles the *guan* beaker, the vase is significantly higher and more elongated, with the ratio of belly diameter / height around 1:2, while the *guan* forms are much stouter, with a ratio of 2:3 verging on 1:1. The majority of vases is high (20-25 cm) or very high (29-43 cm), while some are of medium size (13-19 cm), and only a few are relatively small (6-12 cm). 148 vessels fall into the category of *ping* vase, and the types and subtypes are (Figures 3.24-3.25):

Type A: very high, narrow, pointed-bottom ovoid / upright ellipsoid body, flat foot, slightly outward-flaring lip (8);

Type Aa: funnel-shaped outward-flaring neck, wide high shoulders, small bottom, very large;

Type Ab: straight medium-high neck, narrow body;

Type AbI: very large;

Type AbII: medium-sized;

Type Ac: upright ellipsoid body, constricted neck, funnel-shaped outward-flaring short collar, large;

Type B: large upright ellipsoid body, wide round middle-section, narrow straight neck, flat foot (11);

Type Ba: high neck, small foot-like protruding bottom;

Type BaI: angular outward-flaring small rim;

Type BaII: very high neck, slightly outward-flaring rim;

Type Bb: short neck, small foot-like protruding bottom, slightly outward-flaring rim;

Type BbI: angular outward-flaring lip, appliqué-band with fingertip-impressions below lip;
Type BbII: no appliqué, very large;
Type Bc: short downward-widening neck, straight rim, high and wide shoulders, indented bottom;
Type C: globular or upright ellipsoid body with wide rounded middle, medium-high straight neck, foot-like protruding flat bottom (33);
Type Ca: medium-high neck;
Type CaI: high form, slightly outward-flaring rim, very large;
Type CaII: round body, angular outward-flaring rim, large;
Type Cb: high neck, wide outward-flaring short rim;
Type D: recumbent ellipsoid body, medium-high straight neck, foot-like protruding flat bottom, wide outward-flaring short rim (4);
Type Da: no handle;
Type DaI: medium-sized;
Type DaII: small;
Type Db: two small ring-handles;
Type DbI: on top of shoulder, small vessel;
Type DbII: from neck to shoulder, large vessel;
Type E: very high straight, rounded body, ring-foot, very large (5);
Type Ea: recumbent ellipsoid body, short foot, straight pronounced rim;
Type Eb: globular body, high trapezoidal foot, angular outward-flaring rim;
Type F: high upright ellipsoid body, flat bottom, high straight neck, trumpet-shaped outward-flaring rim, very large vessel (16);
Type Fa: angular flat bottom;
Type FaI: two small ring-handles on shoulder;
Type FaII: no handles;
Type Fb: triangular thickened flat bottom;
Type G: large upright ellipsoid body, constricted neck, funnel-shaped outward-flaring collar, flat bottom (49);
Type Ga: angular shoulders;
Type Gb: high shoulders;
Type GbI: slightly flattened bottom, no handles;
Type GbII: angular flat bottom, ring handles from lower part of shoulder to body;
Type H: *zun*-shaped wide-mouthed vase with flat bottom and outward-flaring rim (12);
Type Ha: round-bottom ovoid body, foot-like protruding bottom, wide high curved neck, trumpet-shaped outward-flaring rim;
Type HaI: large vessel;
Type HaII: medium-sized;
Type HaIII: small;
Type Hb: medium-sized upright ellipsoid body, short neck, angular everted small rim, triangular thickened bottom;
Type Hc: small upright ellipsoid body straight high collar, no neck, flat angular bottom;
Type Hd: medium-sized pointed-bottom ovoid body, no neck;
Type HdI: inward-leaning rim, triangular outward-flaring bottom;
Type HdII: small straight rim, flat angular bottom;

Type I: medium-sized double-stacked hexagon form, foot-like protruding bottom, constricted neck, angular outward-flaring rim (1);
Type J: medium-sized simple-curved vase with two middle-perforated knobs on upper part of shoulder (5);
  Type Ja: globular body, indented flat bottom (faux ring-foot), upward-extended shoulders;
    Type JaI: high curved neck, moderately outward-curing rim;
    Type JaII: no neck, short straight rim;
  Type Jb: narrow upright ellipsoid body, flat angular bottom, slightly constricted neck, short straight rim;
  Type Jc: round-bottom ovoid, slightly foot-like protruding flat bottom;
    Type JcI: no neck, and
    Type JcII: constricted neck, wide outward-flaring rim.

III.3.3.5 *Zun* Vat, *Fu* and *Mou* Pot

The term *zun* mentioned above is usually used to refer to a specific type of bronze or more rarely ceramic vessel dating to the Shang that was used to hold wine. It has a vase-like round or square form and a wide outward-flaring lip, resembling one of the subtypes of what I have classified as *ping* vase. In excavation reports from Southwest China, the term *zun* is furthermore applied to high straight-walled or nearly straight-walled coarse vessels, some of which have a long thin band-handle reaching from one shoulder to the other. They would therefore be more accurately described as buckets. Within the assemblage at hand, 32 vessels fall into the category of *zun* vat. They vary in height between 8 cm and 17.3 cm and can be grouped into the following types and subtypes (Figure 3.26):

Type A: small cylindrical form, slightly curved bottom, curved outward-flaring rim, no neck (6);
Type B: medium-sized hyperboloid form, flat angular bottom, inward-leaning sides, constricted neck, angular outward-flaring wide rim (2), and
Type C: large pointed-bottom ovoid body, high angular shoulders, long thin band-handle connecting one rim with the other in a rounded triangular form (6).

Two other object forms are the *fu* 釜 and the *mou* 鍪, which are otherwise mainly known from Qin and Han contexts in the Chengdu Plain. Both kinds of vessels have a round base, a deep rounded stout body, a short or constricted neck, and a medium-high angular outward-flaring rim, and the *mou* additionally has a ring-handle on the neck or shoulder. The types differ in size, the *fu* being large with a height of 15-25 cm, a rim diameter of 11-22 cm, and a belly diameter of 18-27 cm, while *mou* range from 6-10 cm in height, 8-11 cm around the rim, and 8-13 cm around the belly. Both terms are usually translated as pot or kettle, i.e. a large round-bottomed vessel with a wide mouth and sometimes a broad rim. Here, I will therefore use the terms *fu* pot and *mou* pot for these two kinds of vessels. For the *fu* pot, the types and subtypes are (Figure 3.27):

Type A: downward-sloping shoulders, short rim (6), and
Type B: round shoulders, medium-high rim (1).

The types and subtypes for the *mou* pot are (Figure 3.28):

Type A: thin handle from above lip to base of neck (3), and
Type B: thick handle from shoulder to body (1).

III.3.3.6 Lid and Vessel Stand

Two object types, for which the translation of the Chinese names is completely unproblematic, are *qigai* 器蓋 and *qizuo* 器座, which can simply be literally rendered as "lid" and "vessel stand." Both kinds of objects are rare (22 and 2 specimens each) and it is unclear to which kind of objects each of them belonged. Lids measure 3-5 cm in height and round 16 cm in diameter and the types and subtypes are (Figure 3.29):

- Type A: shallow collared lid (5);
- Type B: domed lid (13);
  - Type Ba: shallow domed (2);
    - Type BaI: shallow domed with rounded knob (1);
  - Type Bb: high domed (11);
    - Type BbI: high domed with wedge-shaped knob (1);
    - Type BbII: high domed with indented wedge-shaped knob (3);
    - Type BbIII: high domed with rim-foot pedestal-shaped knob (4);
- Type C: conical lid (4);
  - Type Ca: conical, round rim (1);
  - Type Cb: conical, square rim (2), and
  - Type Cc: conical, flattened rim (1).

The one well-preserved vessel stand measures 20.5 cm in height, 20.2 cm around the rim, and 24.6 cm at the base. It has a semiglobular body, a wide high straight neck, a dish-shaped rim, and a round lip.

III.3.3.7 Diagnostic Sherds: Handle, Spout, Bottom, Rim and Wall Sherds

Apart from information on complete vessels, this study has also collected measurements and drawings of 1071 diagnostic sherds, which fall into the categories of handle, spout, bottom, rim, and wall sherds. The 44 wall sherds could not be further divided into types, but they provide some information on vessel decoration. The 12 spouts fall into the following types and subtypes (Figure 3.30):

Type A: long tubular to slightly conical (4);
- Type Aa: long, angular;
  - Type AaI: straight walls inside and outside;
  - Type AaII: end curving inward;
  - Type AbIII: end slightly widening;
- Type Ab: long, straight upward-pointing;

Type B: short tubular, angular (3);
- Type Ba: straight walls inside and outside;
- Type Bb: straight walls outside, inside widening towards the end;

Type C: irregular-trapezoidal, short, angular, one wall built by rim and lip (1), and
Type D: duck-beak shaped, coil-built, angular (4).

Type A and B can be easily attributed to the ewers of type A and B described above, but the exact subtype remains unclear. The type C spout somewhat resembles the spout characteristic of ewers of type D, but it belongs to a different vessel type that resembles a pitcher or jug. Neither has a complete vessel of this type been discovered, nor have similar spout fragments been found elsewhere; the overall vessel form therefore remains unclear. The large coarse spouts of type D have been reported in large numbers from Mianning Gaopo, but only from a settlement context, and the original vessel form remains unclear. The 60 handle fragments fall into the following types and subtypes (Figure 3.31):

Type A: flat band-handle (20);
- Type Aa: plain;
- Type Ab: with middle-ridge;
- Type Ac: decorated;

Type B: band-handle made of several vertical clay strips (28);
- Type Ba: 2 clay strips;
  - Type BaI: no appliqué;
  - Type BaII: small drop-shaped appliqué on top;
- Type Bb: 3-5 clay strips;
- Type Bc: 4-5 vertical clay strips with one horizontal clay strip above;
  - Type BcI: no appliqués;
  - Type BcII: two drop-shaped appliqués on top;
- Type Bd: 4-6 vertical clay strips, outside ones folded over and crossing in middle;

Type C: thin rounded clay-strip (1);
Type D: lug (1), and
Type E: horn-shaped handle (7).

Most of these different handle forms can easily be connected with specific vessel-forms described above: All handles of type A and B belong to vessels of the single- or double-handled *guan* jar type, while type D and E fit with the *guan/weng* urn category. Only type C, the thin round clay-strip, is harder to pin down to any specific vessel type, as similar small handles have been reported with both single- and double-handled *guan* jars, as well as with *bei* cups of types A and B, and even with Eb goblets. The vessel bottoms could likewise belong to a wide variety of different vessels. The main types and subtypes are (Figures 3.32-3.33):

Type I: flat bottom (284);
- Type IA: simple flat (241);
  - Type IAa: angular (189);
    - Type IAaI: inside bottom flat;
    - Type IAaII: inside bottom rounded;
    - Type IAaIII: bulb inside;
  - Type IAb: small slightly rounded flat bottom, inside bottom flat (6);
  - Type IAc: angular, slightly outward-flaring (30);
    - Type IAcI: inside bottom flat;
    - Type IAcII: inside bottom rounded;
  - Type IAd: foot-like protruding (11);
    - Type IAdI: bulb inside;
    - Type IAdII: inside bottom rounded;
    - Type IAdIII: inside bottom flat;
- Type IB: thickened (12);
  - Type IBa: slightly thickened, inside bottom flat (4);

Type IBb: round thickened (7);
Type IBbI: inside bottom flat;
Type IBbII: inside bottom rounded;
Type IBbIII: bulb inside;
Type IBc: triangular protruding, inside bottom flat (1);
Type IC: small flat foot (31);
Type ICa: rounded foot (12);
Type ICaI: inside bottom flat;
Type ICaII: inside bottom rounded;
Type ICaIII: bulb inside;
Type ICb: angular, inside bottom flat (7);
Type ICc: angular, slightly outward-flaring (12);
Type II: ring-foot (50);
Type IIA: faux ring-foot (indented) (25);
Type IIAa: no foot, inside bottom flat (9);
Type IIAb: slightly thickened, inside bottom flat (3);
Type IIAc: small foot (13);
Type IIAcI: inside bottom flat;
Type IIAcII: inside bottom rounded;
Type IIAcIII" small foot, bulb inside;
Type IIB: ring-foot, inside foot rectangular, inside bottom flat (25);
Type IIBa: shallow ring-foot, pronounced / stepped straight foot (21);
Type IIBb: shallow ring-foot, not stepped (1);
Type IIBc: high ring-foot, pronounced / stepped foot (3);
Type IIBcI: straight foot;
Type IIBcII: outward-flaring foot;
Type III: pedestal (48);
Type IIIA: middle-constricted pedestal, inside flat bottom 911);
Type IIIAa: small and low, with outward-flaring sides, height: bottom width < 1:2 (10);
Type IIIAaI: inside foot rounded;
Type IIIAaII: inside foot angular;
Type IIIAb: wide and low, with outward-flaring sides, height: bottom width < 1:6, inside foot angular (1);
Type IIIB: hollow trumpet-shaped stem, outward-flaring bottom, bottom flat to curved, inside foot curved (24);
Type IIIBa: low, height: bottom width < 1:1 (9);
Type IIIBb: high, height: bottom width > 1:1 (13);
Type IIIBbI: hollow stem;
Type IIIBbII: half-hollow stem;
Type IIIC: hollow conical stem, straight sides, downward-widening (13);
Type IIICa: high stem (7);
Type IIICb: medium-high stem (6);
Type IV: round bowl-shaped foot with narrow stem (1);
Type V: round-pointed bottom (1), and
Type VI: high solid stem (1).

Most bottoms have a diameter of 5-10 cm, with only very few measuring 12-17 cm, most of them of the simple flat-bottom type (i.e. four specimens of type IAaI and one of type IIAcI), suggesting a base or large flat-bottomed bowl. The 616 rim fragments that have been recorded for this study fall into the following types and subtypes (Figures 3.34-3.35):

- Type A: curved outward-flaring rim (201);
  - Type Aa: wide curved outward-flaring rim (76);
    - Type AaI: high straight neck, large vessel;
      - Type AaIa: with fingertip-impressed appliqué band below rim;
      - Type AaIb: no appliqué;
    - Type AaII: medium-high neck;
      - Type AaIIa: round shoulders, small size [Hb guan jar];
      - Type AaIIb: downward-flaring shoulders, medium-sized;
  - Type Ab: moderately outward-flaring rim (75);
    - Type AbI: high straight neck;
      - Type AbIa: with fingertip-impressed appliqué band below rim;
      - Type AbIb: no appliqué;
    - Type AbII: medium-high downward-widening neck, high shoulders, globular body [Hc guan jar];
    - Type AbIII: very short or constricted neck;
      - Type AbIIIa: downward-sloping shoulders, pointed-bottom ovoid body;
      - Type AbIIIb: high round shoulders, globular body;
  - Type Ac: slightly curved outward-flaring (50);
    - Type AcI: short curved neck, rounded shoulders;
    - Type AcII: constricted neck, rounded shoulders;
- Type B: angular everted rim (191);
  - Type Ba: medium-high straight neck (37);
    - Type BaI: round high shoulders, globular body [type H guan jar];
  - Type Bb: short straight neck (31);
    - Type BbI: very small rim, downward-widening shoulders;
    - Type BbII: wide rim;
      - Type BbIIa: high round shoulders;
      - Type BbIIb: downward-sloping shoulders;
  - Type Bc: constricted neck (74);
    - Type BcI: high round shoulders;
      - Type BcIa: with fingertip-impressed appliqué band below rim;
      - Type BcIb: no appliqué;
    - Type BcII: downward-sloping shoulders;
      - Type BcIIa: wide body;
      - Type BcIIb: narrow body;
  - Type Bd: no neck, downward-sloping shoulders (22);
  - Type Be: slightly everted rim, slightly constricted neck, downward-sloping shoulders (26);

Type C: short rectangular everted rim (42);
    Type Ca: medium-high slightly downward-widening neck (5);
        Type CaI: rounded shoulders;
        Type CaII: downward-sloping shoulders;
    Type Cb: no neck, narrow downward-sloping shoulders (37);
        Type CbI: pointed lip;
        Type CbII: hooked lip;
        Type CbIII: rounded lip;
Type D: straight upward-pointing or slightly everted rim, no neck (66);
    Type Da: medium-high rim, slightly widening (35);
        Type DaI: pointed lip;
        Type DaII: round square-thickened lip;
            Type DaIIa: high round shoulders;
    Type Db: short rim/collar (28);
        Type DbI: straight rim/collar, wide high shoulders;
        Type DbII: slightly everted rim/collar, downward-sloping shoulders;
            Type DbIIa: lug-handles on shoulders;
            Type DbIIb: no lug-handles;
Type E: dish-shaped rim (50);
    Type Ea: small dish-shaped rim, high round shoulders, globular body (8);
    Type Eb: wide dish-shaped rim (42);
        Type EbI: high neck, curved transition from neck to rim;
        Type EbII: angular transition from neck to rim;
Type F: trumpet-shaped outward-flaring rim/neck (60);
    Type Fa: very wide outward-flaring rim (25);
        Type FaI: high straight to slightly rounded neck, rounded shoulders;
    Type Fb: moderately wide outward-flaring rim (34), and
        Type FbI: high neck.

A correlation between these rim forms and the vessel types described above can only be made in a few cases. The rims of type AaI all belong to large vessels with a very wide opening (18-48 cm rim diameter), especially those with a fingertip-impressed appliqué band below the rim. The form reminds of large jars or urns, but no complete vessels of this size and form and a similar opening have been found. Type AbI rims are very similar in form but less wide outward-flaring and combined with rounded shoulders. The vessels these rims belonged to, had a large urn- or jar-shape as well, similar in form to Aa or Ha *guan* jars but larger, with rim diameters of mostly 28-32 cm. Type AaII rims belong to much smaller vessels (8-12 cm rim diameter) with high shoulders, a short neck, an outward-flaring rim, and a wide opening, reminding of type Hb *guan* jars. Moreover, type AbIII rims can be connected with urn- and jar-vessels, some of them very large such as Aa *guan* urns, others medium-sized such as Dd *guan* urns. Type Ac rims occur in a wide variety of different sizes, but most measure 14-18 cm in diameter with high or downward-flaring shoulders and a very small rim that is only slightly outward-curving. Vessel with similar openings have only been reported from settlement finds and never in complete form.

The angular everted rims of type Ba are of varying size (10-24 cm diameter) and the overall body form remains unclear. Only type BaI can be connected with type Ha *guan* jars with their high and wide shoulders, a narrow neck, a globular body, a medium-high neck and an angular everted small rim. Type Bb rims could belong to Aa type *guan* jars, and the much wider rims of type BcI with appliqué bands (28-32 cm rim diameter) resemble *guan* urns of type Aa. Type BcII rims belong to smaller vessels (14-20 cm rim diameter) resembling Dd *guan* urns, some of them being narrow, the others wide in body form. For type Bd and type Be, there are no equivalents among the complete vessels from grave sites.

Type Ca rims belong to medium-sized (16-20 cm diameter) vessels with round shoulders, globular body, and medium-high neck, indicating some sort of jar form but not resembling any of the jars found in graves. The same holds true for Cb rims, which belong to vessels of similar form and size (13-24 cm diameter) but with straight sides. The Da rims belong to collared jars with curved shoulders that can be grouped into three different size categories (10-16 cm, 18-22, and 28-38 cm rim diameter); they, as well, cannot be connected with any vessel form known from graves. Type Db rims, on the other hand, somewhat resemble type AaI or DaII *guan* urns, but as the exact diameter of these rims is unclear, it is not possible to decide between those two alternatives. Dish-shaped rims (type E) have not been observed with any fully preserved vessels, but most of them belonged to large vessels (22-38 cm rim diameter) and the high shoulders associated with type Ea rims indicates an urn-like vessel body, while the downward-sloping shoulders associated with Eb rims remind of vase-shapes. The trumpet-shaped outward-flaring rims of type F can be clearly associated with vase-shaped vessel forms. Type Fa rims could belong to *ping* vases of type FaI, and Fb rims could be connected to vases of type FaII. For these rims, two size categories can be distinguished: very large vessels with a rim diameter of 30-36 cm, and medium-sized vessels with a 16-24 cm rim diameter. All rims, that could be attributed to specific vessel forms, have been relabeled according to this evaluation of vessel forms, while the remaining sherds have been given the general term *guan* and the subtypes as defined for rims.

III.3.4 Other Ceramic Objects

Aside from vessels, some utilitarian and some decorative objects were made of ceramic material as well. The utilitarian objects include small perforated disks of 2-5 cm diameter and a height of 0.8-1.8 cm that probably served as spindle whorls (*fanglun* 紡輪) and small oval ceramic objects with a ridge in the center that might have been net weights (*wangzhui* 網墜). The spindle whorls are relatively uniform in shape and dimension with a disk-shaped body, a height of 1.5-2.5 cm, and an outer diameter of 2.5-4 cm. The main types and subtypes are the following (Figures 3.36):

Type A: low disk-shaped, middle perforated (43);
- Type Aa: top and bottom flat, sides angular (10);
- Type Ab: top and bottom flat, sides convex or straight (30);
- Type Ac: top convex, bottom concave, sides convex (1);
- Type Ad: top flat, bottom concave, sides angular (2);

Type B: high disk-shaped (27);
- Type Ba: top and bottom flat, sides angular (11);
- Type Bb: top and bottom flat, sides convex (10);
- Type Bc: top and bottom flat, sides straight or irregular (2);
- Type Bd: top flat, bottom convex, sides angular (2);
- Type Be: top and bottom flat, sides angular, angles in lower third of the sides (2);

Type C: high-trapezoidal (12);

Type Ca: top and bottom flat, sides straight downward-widening (6);
Type Cb: top flat, bottom convex, sides slightly curved (1);
Type Cc: top flat, bottom concave, sides slightly concave or straight (4);
Type Cd: inverted trapezoidal with slightly curved top and flat bottom (1);
Type D: pill-shaped (5);
Type Da: football-shaped (4);
Type Db: with flattened bottom (1);
Type E: rhomboid with flattened top and bottom (4), and
Type F: extended-octagonal / box-shaped (1).

The two net weights fall into two very different types (Figure 3.37):

Type A: long-oval with rounded ends and cross-shaped incisions (8.4 cm length, 2.5 cm middle diameter)
Type B: small-oval with middle-incision (4 cm length, 3 cm maximum diameter)

Non-utilitarian ceramic objects include two perforated drop-shaped items that might be labeled as pendants and were described as "peach-shaped ornaments" (*taoxingshi* 桃形飾) in the excavation report; a small fragment of low-fired clay of irregular vaguely triangular shape that has been described as "ram's-head shaped ornament" (*yangshou xingshi* 羊首形飾); a tubular perforated glazed object that has been referred to as an "ear pendant" (*liuli erdang* 琉璃耳璫); and tubular beads of sintered material or frit (*shaoliaozhu* 燒料珠) (Figure 3.38).[40] All these different kinds of ornaments are relatively rare, but they are similar in form to ornaments made of bone, tooth, shell, or stone, and they will therefore be treated together in section III.6.

III.3.5 Decoration

Decoration as defined here is the enhancement of the object surface by means of different kinds of incision, impressions, coloring, or appliqué. Lug handles and surface slips - though having a decorative potential - are not included as they change the technical properties and

[40] These beads have a smooth glaze-like surface of white color and probably consist of sintered clay, but further technical details have not been published and the original material has been lost.

therefore the handling and practical use of the object in question. Surface slip is therefore listed under technical details and lug and knob handles under form elements. Of course, decoration is not devoid of function either, but has a cultural, social, and sometimes ritual or religious meaning. The term "decoration" is therefore used here in the sense of "surface treatment or addition not influencing the basic form or physical properties." A judgment as to meaning and/or socio- or ideo-function can only be made based on contextual analysis in Chapters IV, V, and VI.

About 29% of all ceramics in this study are decorated, 35% are undecorated, and for 37% the surface treatment is unknown (Table 3.1). Disregarding the last category, about 45% of all ceramics are decorated and 55% are undecorated (Table 3.2). For the ceramic material from graves and urn pits, the numbers are roughly the same with 42/46% decorated and 58/54% undecorated vessels. For settlement finds, the percentage of decorated ceramic objects appears significantly higher than for graves or urn pits, but this number has been distorted by the process of archaeological sorting and publication: In most cases, only diagnostic parts (rim, bottom, handle, spout) or decorated rim sherds are kept and reported, while undecorated vessel fragments are not always counted. For the material at hand, all excavation reports mention that the settlement material is largely undecorated, and for the seven sites where exact figures are provided, the percentages of undecorated ware range between 81.5% and 99.66% (median of 93.45%), depending on the site and layer reported.[41] In general, we can therefore say that nearly half of the ceramics interred in graves and urn pits are decorated and about 90% of all settlement ceramics were undecorated.

[41] Dechang Maojiakan layer 4: 99.59% undecorated, layer 5: 99.66% undecorated; Huili Dongzui: layer 4a: 88% undecorated, layer 4b: 90% undecorated, layer 4c, 89% undecorated, layer 5: 95% undecorated; Mianning Sanfentun: 92.7% undecorated; Xichang Henglanshan: layer 3: 92.6% undecorated, layer 4: 93% undecorated; Xichang Mimilang: layer 3 94.9% undecorated, layer 4: 89.8% undecorated, layer 5: 94.5% undecorated; Xichang Qimuguo: layer 3: 81.5% undecorated, layer 4: 88.1% undecorated; Xichang Yingpanshan: layer 6: 98% undecorated, layer 5: 94.6% undecorated.

In classifying the different kinds of ornaments, three factors had to be taken into account: decoration technique, decoration placement, and decorative elements. On a single vessel, several types of decorations can appear at the same time in different places or within the same decoration zone. I have therefore developed a code system to identify decoration types. The decoration zones are labeled in the following way:

IV	Inside Vessel (1 case, 0.08%, impressed points only)
L	Lip (58, 4.48%)
BR	Below Rim (166, 12.81%)
N	Neck (154, 11.88%)
S	Shoulder (346, 26.70%)
B	Body (130, 10.03%)
H	Handle (116, 8.95%)
F	Foot (78, 6.02%)
BT	Bottom (247, 19.06%)

The different decoration techniques and their codes are the following:

ap	appliqué (140, 10.81%)
im	impressed (both tool and fingertip) (469, 36.22%)
in	incision (428, 33.05%)
cu	cutting (25, 1.93%)
ic	incrustation (1, 0.08%)
co	red and white coloring (1, 0.08%)
apim	appliqué and impressed (129, 9.96%)
apin	appliqué and incision (86, 6.64%)
inim	incision and impressed (4, 0.31%)
cuin	cutting and incision (12, 0.93%)

Each technique is used for a separate set of decorative elements with little overlap. The decorative elements are therefore described separately under each decoration technique (Table 3.3). The decorative elements occurring the most often are impressed leaf-vein pattern, followed by horizontal appliqué bands and incised horizontal lines, while zigzag patterns of impressed points and horizontal lines of impressed points are also very common; cord pattern, incised net pattern, water-ripple-pattern, horizontal lines of pairs of impressed points, cut-out triangles, and incised transverse lines are relatively frequent as well, whereas all other types occur more rarely.

In the majority of cases, only one kind of decoration motif is used per decoration area, but in 342 cases (26.33% of all decorations), several decoration motifs and techniques have been combined (Table 3.4). By far the most common combined decoration motif are horizontal appliqué-bands with fingertip-impressed decoration (35.67%), followed by incised horizontal lines and water-ripple pattern, bundles of incised water-ripple pattern with vertical appliqué band with fingertip-impressed decoration, whereas bands of water-ripple pattern with recumbent S-appliqué in the middle, combinations of incised horizontal lines, water-ripple pattern, and various geometric motifs, as well as combinations of cut-out and incised motifs are less frequent.

The part of the vessel that most often features decoration is the shoulder (23.64%), followed with a wide margin by bottom (17.06%), rim (12.64%), neck (11.68%), and body (10.54%) (Table 3.5). Handle and foot, where present, are also nearly always decorated, while lip decoration is relatively rare, and the inside of the rim is decorated in only one case, with incised points arranged in lines and zigzag-pattern. The most common decoration at the lip are different kinds of impressions (50), especially cord pattern (31), followed at a considerable distance by horizontal lines of impressed points (13).

Appliqué-bands with fingertip-impressed decoration the rim appear nearly exclusively on the rim, just below the lip, and are by far the most common decoration motif on the rim, followed with a wide gap by various kinds of impression and incision motifs. On the neck, various kinds of impressions and incisions are nearly equally common - especially incised horizontal lines and lines of impressed points, and more rarely net pattern, cored ware, and pairs of impressed points - while other kinds of decorations occur very rarely. The shoulder is the most common area for combinations of different motifs to appear, followed by body and neck. On the shoulder, different forms of incision are still the most common, especially incised lines, followed by vertical lines and net pattern. Impression motifs - especially lines of single or double impressed points - are likewise common, and a combination of all the motifs just mentioned. Handles are nearly exclusively decorated with short appliqué bands, and very rarely with small point-like appliqués or incisions. In vessels that have a high hollow foot, the foot is usually decorated with a combination of different kinds of incised and impressed patterns, sometimes compared with cut-out geometric forms. The latter also frequently occur on their own. The bottom, if decorated, nearly always bears a leaf-vein impression, but also a small number of incisions have been reported.

Conversely, short horizontal appliqué bands without fingertip impressions have nearly exclusively been observed on handles, and so have small decorative appliqué points. Knob- or horn-like appliqués on body or shoulder can be as long as 4-6 cm and relatively sturdy; they have therefore been classified as lug-handles. Horizontal appliqué bands (with or without fingertip-impressions) on the shoulder and especially on the body may have had a practical function: A rope could have been fastened below them to allow for the transportation or securing of a vessel. The leaf-vein impressions on many vessel-bodies might have a practical explanation as well: During production, the vessels might have been placed on inverted leaves to prevent them from sticking to the floor while they were being formed or dried. This, however, cannot apply to all vessels with a leaf-vein pattern on the bottom, as a few of them seem to have been incised rather than impressed. Incised patterns indicate deliberate decoration while an impressed leaf-pattern might be the outcome of placing the vessels on a leaf for drying. The leaf-vein motif on vessel bottoms might thus be a case of a feature that had a practical explanation originally but secondarily evolved into a pure decoration motif. At this point, this is only a suggestion, but future microscopic studies can bring more certainty. Aside from their presence on ceramic vessels, leaf-vein impressions appear also on 21% of the 81 ceramic spindle whorls, and in four cases, the leaf-vein pattern might actually have been incised rather than impressed. One single spindle whorl furthermore shows cloth impressions on one side, indicating that it might have been placed on a piece of cloth for drying, while deliberate decoration in such a way is unlikely.

Most other impressed and incised motifs occur on all body parts, but most often on the shoulder, followed by neck and body for incisions and by neck and lip for impressions. Cut-out motifs have been observed nearly exclusively on high hollow stems and once on a rim. Color and incrustation, if applied, cover the vessel body. The most complex decorations occur on shoulders and stems; the richly decorated stems where only observed with material from the single rich grave Huili Leijiashan M1, which skews the numbers significantly.

Aside from decoration motifs, some ceramics also had a surface finish, most often a slip or burnishing/polishing (Table 3.6). The difference between burnishing and polishing is that the one is executed with a smooth stone and the other with a soft cloth, but in the literature the difference is not always made and both can therefore be combined into one category.[42] About 10% of all ceramics from object pits have a black slip, but none are polished or burnished. For graves, only about 7% of the vessels have a black slip and/or are polished or burnished, while red and white slip occur very rarely and only one earring - a faïence object - is glazed. Hardly any vessels from a settlement context have a black slip but some are burnished. All the slips observed are very smooth, and the different colors indicate that they may have had a decorative rather than a purely practical function. Nevertheless, as any kind of slip helps to condense the surface, making it less porous and therefore making the vessels more reliable as liquid containers, the

[42] In 278 cases, burnishing was reported (159 cases from settlements and 119 from grave finds), and in 28 cases the term polishing was used (all from grave finds).

surface finish, especially in the case of vessels found at settlements, might also have had a practical dimension.

III.3.6 Connecting Decoration and Object Form

Tracing the combination of different kinds of decoration on the same vessel and relating both to specific vessel types is a very complex matter, in which combination statistics produce only fuzzy clouds. The only feasible option is therefore to look at the data directly. Starting from the vessel bottom, it becomes clear that bottom decoration – i.e., leaf-vein impressions in over 90% of all cases - occurs most often on otherwise undecorated vessels (191 of 250 cases, i.e. 76.4%, or 116 out of 173 cases, or 66.3% when disregarding all cases where only the bottom was preserved). Bottom decoration of this kind is most common on single- and double-handled *guan* jars and on smaller *guan* varieties lacking handles, and they sometimes also occur on cups and beakers, while they are rare on large vessels such as urns and vases, and uncommon on bowls. It is usually only on double-handled *guan* jars that leaf-vein impressions on the bottom are combined with other decoration motifs; the latter may include handle decoration and water-ripple pattern, horizontal lines, and S-appliqués on the shoulder or body of the *guan* jars. Decorated handles - all of the broad-band kind and mostly with short strip appliqués and sometimes two small knobs on top - can be found nearly exclusively on these kinds of vessels: 125 out of 133 vessels with decorated handles, i.e. 94%, are *guan* jars, and more than half of all double-handled *guan* jars have decorated handles (125 out of 239 vessels for which descriptions or drawings of the handles were available, i.e. 31.5%).

Foot decoration naturally can only occur on vessels that have a pronounced foot, such as goblets and bowls with a stem or pedestal base; in practice, pedestal bases are never decorated, leaving only goblets and *dou* bowls. D*ou* bowls only rarely have cut-out ovals or triangles on their stem (3 out of 20 bowls, i.e. 15%), but about half of the goblets have a decorated stem (63 out of 128, i.e. 49%). The decoration of the goblet stems consists mostly of horizontal bands of various kinds, or of incised and impressed geometric and line pattern (41), sometimes combined with cut-out geometric forms (12) or only cutting (16); in 21 cases, such decoration is combined with similar incised and impressed decoration over the whole vessel body (this is true of about 1/3 of all goblets with decorated stems).

Shoulder decoration is the most common kind of decoration for all vessel types (363 cases), mainly in the form of horizontal bundles of water-ripple or line-pattern, sometimes combined with recumbent S-appliqué or a vertical clay-strip that may or may not have finger-tip impression on it. Sometimes these appliqués are seen by themselves without the water-ripple or line pattern; nearly all cases of this (12) occur on double-handled *guan* jars (142 out of 187 cases, i.e. 76%). Such shoulder decoration is mostly combined with decorated handles and leaf-vein impressions on the vessel bottom, but only rarely with line incisions, which, if they occur, are limited to a vessel's rim, lip, or sometimes neck and never extend to the vessel body. Other vessels with similar decoration motifs include *guan* jars and, even more frequently, beakers with or without a single handle. The other kinds of vessels featuring shoulder decoration - bowls, goblets, larger kinds of *guan* from settlement contexts, ewers, and vases - are mostly decorated with simple horizontal lines, lines impressed points, transverse lines, zigzag, net-pattern; more rarely, corded pattern is seen, and *bo* bowls and urns sometimes have horizontal clay-strips on their shoulders that, as discussed above, may either have a decorative or a practical function. For vases, ewers, and bowls, these kinds of shoulder decoration are often combined with incisions and impressions on body and/or neck. With larger types of *guan*, such decoration on the shoulder is often combined with cord pattern or horizontal lines of points around the neck (48 out of 66 cases, i.e. 73%) and sometimes rim or even lip.

Body decoration is much more rare (134 cases) than shoulder decoration; this suggests that the vessels were usually viewed from a slightly elevated viewpoint - be it during production, in use, or both - rather than from below. On goblets, body decoration, usually combined with decoration on the stem, is rather common (33); both portions of the vessel are commonly covered with a combination of incised water-ripple and line pattern, or more rarely with a fish-bone or net pattern, or with rows of impressed points. Vases and ewers likewise can be decorated in the same manner. For lack of a shoulder, *wan* bowls and lids usually carry their decoration on the vessel body; that decoration, where present, most often consists of thin horizontal appliqué bands (10 bowls, 2 lids), but also sometimes of single horizontal lines, either incised or made of impressed points (5). Most bowls remain undecorated, however. Although body decoration occurs also with other kinds of vessels, instances are far and few between and no frequently recurring combinations of vessel forms and body decoration seem to exist.

Rim (167) and neck (152) decoration is somewhat more common than embellishment of the body, but still much rarer than shoulder decoration; lip decoration is the rarest. Embellishment of this upper vessel register is most common on large and medium-sized *guan* vessels from settlement contexts, and more rarely with bowls, vases, and ewers. On the lip, impressed decoration is most common (52 cases), usually in the form of cord pattern, transverse lines, or point pattern; in one case this decoration is placed on the inside rather than on the outside of the lip. Other decoration motifs for the lip are bundles of short incised lines (4) and zigzag motifs (2). These modes of lip decoration can be combined with all other kinds of decoration in other portions of a vessel, or they may occur alone, but they have never been reported from handled vessels that feature their characteristic water-ripple pattern. Neither does rim decoration occur on handled vessels, but neck decoration -mainly impressed point pattern or incised lines - can appear on the neck of double- or single-handled *guan* jars (9 and 3 instances). The large majority of decorated necks carry horizontal line patterns, either incised or made of impressed points. Net pattern, as well, is rather common, while cord pattern and zigzag are rare and not connected with any specific vessel form. Nearly half of the vessels with neck decoration also have decorated shoulders (74) and sometimes a decorated body (18), usually all of them with point-pattern.

By far the most common form of rim decoration is a thin horizontal clay-band right below the rim (115), in most cases featuring fingertip-impressions (107). This motif is mainly seen on very large *guan* urns and jars from settlement contexts (100). In settlements, these fingertip-impressed appliqué bands below the rim are so common on large vessels that they can be used to define subtypes. Very rarely, such bands occur also on ewers, goblets, vases, and *bo* bowls, but often without fingertip-impressions. These bands can be combined with line patterns on neck or shoulder (18), but mostly they occur on vessels that are otherwise undecorated. Rim decoration types that are more commonly combined with shoulder, neck, lip, or body decoration include various kinds of incisions and impressions, mainly consisting of horizontal or transverse lines, as well as zigzag, fishbone, and net-pattern, cord pattern, and very rarely water-ripples. All of these are most common on medium-sized *guan* jars from settlement context, but have also been reported from vases, ewers, and bowls.

Burnishing or polishing of the whole vessel body can be seen in combination with all kinds of decoration techniques and motifs, no matter in what part of the vessel they may be applied; there is no apparent regularity in the combination of these features. Burnishing or polishing can be observed on a wide variety of different vessel types; the strongest correlation seems to be with context of discovery rather than with object type or mode of decoration.[43] One type of vessel that is nearly always burnished/polished is the double-handled *guan* jars enhanced by large double-spirals on the body, which usually extend to the vessel's shoulder, neck, and rim into the handles. On five of these specimens such decoration is executed as a prominent appliqué pattern; one particularly large case (15-26 cm height, 10-15 cm belly diameter) is further distinguished by red incrustation, while the decoration on three other vessels is incised, and on one specimen, it is executed in red and white paint. The latter four vessels are of medium size (11-17 cm height, 7-14 cm belly diameter); three of them were found in Yanyuan, the fourth one coming from Dechang Maojiaba M1.

Viewed from the angle of the object instead of the individual decoration motifs and their placement, the following picture emerges: The kind of vessels that were most often decorated, are the different *guan* forms, especially the double-handled variety. In that last category, 40-50% of all specimens have some amount of decoration, mostly consisting of line- and water-ripple pattern on the shoulder or body combined with decoration on the handles (Table 3.7). Double-handled *guan* also have the largest percentage of burnishing and black slip, both usually in combination with other kinds of decoration. *Bo* bowls are also often burnished, but rarely feature any other type of decoration or slip; while goblets often have a black slip but lack any further decoration. The kind of vessels that most often remain undecorated are larger and coarser types such as vats, jars, basins, and small cups, but also *wan* bowls, which instead are more often burnished. Moreover, *wan* bowls are largely undecorated, with only some simple line decoration

[43] Most burnished/polished objects were found in Xichang Dayangdui, Mimilang, Yingpanshan, Mianning Gaopo, Sanfentun, Yanyuan, while slipped vessels have been reported most prominently from Xichang Qimugou, but also Xichang Henglanshan, Wanao, Dayangdui, Lizhou, Mianning Gaopo, Yongsheng Duizi, and Ninglang Daxingdzhen.

or appliqué bands ever appearing on their body and/or rim, especially on specimens of type A. *Dou* bowls are rarely decorated, and if they are, they mostly feature cut-out motifs on the stem or simple line decoration or polishing on the body. Spouted ewers are for the most part decorated, mostly with a combination of incised fishbone pattern and horizontal lines or impressed points, which are sometimes combined with impressed points on lip or rim. In addition, many vases carry decoration on their neck, rim, and most often shoulders, again mainly consisting of horizontal lines and point pattern, while fish-bone or water-ripple pattern and zigzag lines are rarely seen. Net pattern or transverse lines are even less common, and vases of type F and G usually remain undecorated.

An even larger percentage of goblets, mostly of type A, B, and E, are lavishly decorated on both body and stem, while type C and D usually have a black slip instead, and type F goblets are undecorated. Cups, *guan* beakers, and single-handled *guan* jars are largely simple in form and execution, and they are undecorated except for leaf-vein impressions on the bottom; such impressions occur in all types but not with all instantiations of each type. Moving on to the medium-sized *guan* reported from graves, the distribution of leaf-vein pattern is similar and decoration is rare overall, but specimens of type Ga and Gb can have simple line incisions on the shoulder, and type Gc and Gd as well as some instantiations of type Ea are marked by black slip. The same ornamentation is seen on urns of various types, but only on specimens from the site of Dayangdui. Line incisions occur on the shoulders of urns of all form types, but not very frequently, and a few particularly large urns of type AaII have finger-tip impressed clay strips on the shoulder (2) or below the rim (2). This harmonizes very well with the large urn-like *guan* types from settlement context, which very often carry such a clay strip below the rim (mostly type Aa, but also type Bc and Bd). Simple line incisions and net and point pattern on shoulder and/or neck occur with all types, but only on less than a third of all vessels; the same is true of burnishing/polishing and of slip. Only most instantiations of type CbI carry rows of impressed points on neck and shoulder.

III.3.7 Connecting Form and Technical Details: Inferences on Production and Function

The majority of ceramics described here are tempered with sand and tiny stones (84.7%), while clay-tempered ceramics are much more rare (15.3 %). For most clay-tempered ceramics, the method of forming has not been observed, but for sand-tempered ceramics, it is clear that the majority is hand-thrown (60%), with a sizable number of wheel-thrown (26.7%) and coil-built (13.6%) specimens (Table 3.8). The vast majority of clay-tempered ceramic is high-fired (85%), while most sand-tempered ceramics are low-fired (46.5%) and some are fired unevenly (9.1%) (Table 3.9). As to the firing atmosphere, the color gives some indication: Clay-tempered ceramics are mostly black or grey (78%), indicating a reducing atmosphere, while sand-tempered ceramics are more variegated in color but mostly reddish-brown, sometimes with grey streaks (50-67%), indicating a mainly oxidizing atmosphere as well as an more iron-rich clay. Yellowish ceramics, which occur in smaller numbers, are also sand-tempered and fired in an oxidizing atmosphere (Tables 3.9-10). The differences in surface color thus indicate firing atmosphere and temperature as well as differences in raw material sources. The nature of the inclusions is also of interest: Where reported or observed, it is mainly small stones or a mixture of stones and coarse sand, but a small number of ceramics also have glittering inclusions, indicating a temper made of gold-sand as can be found in certain sections of the Jinshajiang (Table 3.12)

Combining the information on temper, color, method of forming, and firing temperature, it becomes clear that high-fired fine ware is in all cases grey and black and formed by hand or on the fast wheel. For very fine ware without any noticable inclusions, the fast wheel is the most common production tool. Among clay-ceramics, low-fired and unevenly fired wares are in the minority; these are always formed by hand or coil-built and reddish-brown or grey in color. For sand-tempered pottery, the high- or medium-fired varieties are usually wheel-thrown, while unevenly-fired and low-fired specimens are mostly hand-thrown and sometimes coil-built. The color in all cases is largely reddish-brown or sometimes yellow with streaks of grey, but hardly ever red. These patterns indicate at least two different traditions of ceramic production.

When considering the vessel types in relation to these technical details, it becomes clear that most vessel types are largely made of sand-tempered ceramics fired at low temperatures in an oxidizing atmosphere (Table 3.13). As an exception from this rule, most goblets (76.6%) and about half of the single-handled jars are made of clay-tempered ceramic material as well (49%). Among clay-tempered ceramics, goblets are in the majority (24.2%), followed by various kinds of *guan* with or without handles. Single-handled jars, in particular, are often made of clay-tempered ceramic material (49% of all single-handled jars). Both single-handled jars and goblets, furthermore, are mostly fired at high temperatures and in a reducing atmosphere.

Among sand-tempered ceramics, *guan* forms without handles are even more well-represented than among clay-ceramics (54.6%), but as these vessels generally make up the majority of all ceramics, this is not surprising. It is interesting to note, however, that all beakers, nearly all urns, and other *guan* jars without handles found in settlement contexts are made of sand-tempered material as well, indicating a functional difference. Moreover, all the different *guan* forms except for the single-handled jars are usually fired at low temperatures and in an oxidizing atmosphere, indicating some connection between these technical details and function. The majority of spindle whorls, as well, are made of low-fired reddish sand-tempered ceramic material, but a considerable number (34.52%) consists of high-fired black or grey clay-ceramic material, all of them from graves, suggesting a difference not only in function but also on the ideational level. Nevertheless, as the occurrence of clay-tempered ceramics seems to be conditioned by locational and possibly chronological factors as well, these questions have to be reconsidered in connection with spatial and chronological analyses in Chapter VI. Some differences in material also correspond with differences in subtypes: all *wan* bowls of type D are made of grey fine ware, but this is the only case where such a clear correlation can be made.

The strongest indicator of vessel function, aside from use-wear, is vessel form in connection with hardness and porosity of the vessel surface. The function of the basin is relatively straightforward. Large, flat, and made of coarse sand-tempered pottery, this vessel type was probably a serving tray or plate holding solid food. The majority or specimens were found in groups of 2-4 placed at one end of a grave, indicating that they might have held some kind of food offering. *Bo* bowls are more varied in size and form, but their higher body and slightly inward-curved rim suggests that they might have held liquids but not pour them. Only type Fc has a small spout-like protrusion, showing that it was a pitcher. All three bowl types vary significantly in size, from vessels of only 6-7 cm diameter and about 4 cm height, to large objects of 20-30 cm rim diameter and up to 12 cm height. While the larger vessels are most likely to have been used in serving or holding food with at least some liquid components, the small *bo* bowls with a straight rim and especially the outward-flaring *wan* and *dou* bowls of smaller size might have been used as drinking vessels. W*an* bowls are nearly exclusively made of low-fired sand-tempered pottery, but some of the *bo* and *dou* bowls are of high-fired fine ware. This is true mostly of *bo* of types E and F, which come in varying sizes; they are no more lavishly decorated than their sand-tempered counterparts, and they come both from grave and settlement contexts. The differences in temper might thus have a regional or chronological explanation rather than a functional one.

Goblets of all types, on the other hand, are almost exclusively made of high-fired fine ware, but as most of them were found in Huili, there might be a locational bias as well. Goblets of type EcI, EcII, Ed, and F, however, are made of sand-tempered pottery and mainly come from Huili as well, indicating that temporal differences might play a role. There are some differences in sizes between the different types: some are more outward-flaring and thus have a larger rim diameter, while others have a rounder body and thus a wider belly diameter; but on the whole, the height usually varies around 10-18 cm with a belly diameter of 10-15 cm and a rim diameter of 6-9 for subtypes with a straight rim and of 12-16 cm for outward-flaring varieties. Most of these goblets could therefore be used as drinking vessels, held in one or both hands. Especially for the long-stemmed types A, B, and C, a usage as personal drinking vessels seems probable, as their everted rim, open body form, and long narrow stem would allow for easy tipping, while the relatively small size makes it unlikely that they were used for pouring. Type F, G, and H, although having a very short stem, are small enough to serve as drinking vessels as well, but they are of a coarser variety and not as lavishly decorated as the vessels of the other types just mentioned. *Gu*-shaped goblets, on the other hand, are overly high and have a short squat stem and wide outward-flaring body, which changes the tipping point and pouring performance. These vessels might thus have been used in serving rather than in ingesting liquid. Moreover, type Ea goblets are similar in form to *gu*-shaped goblets and therefore probably similar in function, the only major difference being the fact that type Ea specimens have a globular instead of a hyperboloid body. Goblets of type Eb are smaller and narrower, making them more apt to have functioned as drinking than as pouring or serving vessels. For type Ec and Ed, the case is less clear. All of these vessels are fairly high (up to 25.5 cm) and have a wide belly (up to 21 cm), but the rim is only moderately everted. With their small foot, all these attributes give them a low tipping point, making them not very practical for serving but more so for storing or transporting liquids without spilling them. These vessels are much coarser in quality and bear less intricate decorations than goblets of most of the other forms, which are notable for being nicely worked and decorated, indicating that they were reserved for special occasions. That all of them were found in graves and usually in pairs or groups also indicates a ritual-social function.

The various types of cups - with or without handle, flat-bottomed, largely undecorated, and nearly exclusively made of sand-tempered low-fired pottery - are likely to represent everyday drinking vessels. The only exception are a few examples of types CaI, CaII, and CbI, conical vessels of high-fired clay-tempered ceramic material and coming from only two graves that overall mainly held clay-ceramics, so this again might be a locational / chronological difference, not a functional one.[44] The cups without handle bear some resemblance with *guan* beakers, but the cups have straight or only slightly curved sides, while the beakers have an S-curved profile. Nevertheless, the usage as drinking vessel might have been the same, because form, size (10-14 cm height, 5-12 cm rim and 6-12 cm belly diameter), and the everted rim make it a very handy mug-shaped container without a handle. All vessels of this type are made of low-fired sand-tempered pottery and have been retrieved from a small number of graves.

Single-handled *guan* jars are very different from single-handled cups: They are relatively high and have a short handle, which would make them very awkward for drinking, but - combined with their outward-flaring rim - useful for pouring liquids. There is some variety in their size and shapes, with some types being more squat or deep-bellied and others high-narrow

[44] These graves are Xide Lake Sihe and Xichang Bahe Baozi.

in form, but the measurements range largely around 10-17 cm in height, with 5-11 cm in rim and 8-16 cm in belly diameter. Only type I sticks out as particularly large (21-33 cm height, 12-15 cm rim and 15-24 cm belly diameter), indicating a use for larger amounts of liquid. The majority of *guan* jars are made of sand-tempered pottery with no clear correlation between the use of fine ware and specific pottery forms, except for the small pitcher-like vessels of type K, which are usually made of high-fired fine fine ware but fired in a reducing atmosphere, resulting in a red surface color; this surface has furthermore been polished, thus attaining a nice luster, but also a greater material density that would have prevented liquid from evaporating or leaking out. It is remarkable that most of the single-handled *guan* jars - those of sand-tempered and those of clay-pottery alike - are fired at high temperatures, which could be an indicator for their usage as liquid containers for longer periods of time. For personal drinking vessels, evaporation or slight leaking of liquid would not have been of much consequence, but for holding and transporting liquid even for the duration of a meal or feast, any such loss would be undesirable.

The majority of double-handled jars are likewise fired at a high or medium-high temperature, although there is considerable variety between different sites for all subtypes, indicating again spatial and temporal differences. For these vessels, sand-tempered pottery is also rather common, but they are much more nicely worked, usually polished or burnished as well as decorated, showing that they were probably not objects of everyday use. The only exception are double-handled *guan* jars of type DdII, which are so small and irregular in form, and also fired at such low temperatures, that the excavators have interpreted them as *mingqi* 明器— objects especially produced to be used in burials as symbolic substitutes for "real" vessels that could have actually been used. This seems to be a likely supposition, but as all four instantiations of this type were retrieved from the art market, no information about their original context is available that could potentially be used to test this hypothesis.[45] The function of double-handled *guan* jars in general is unsure. It may be assumed that the form and the location of the handles makes a difference in use, as they change the tipping point and handling of the vessel, but it is still unclear how they were used or what they contained. The globular body and only moderately outward-flaring rim would potentially but not necessarily mark them as drinking vessels. The size of most vessels (8-16 cm height, 6-14 cm belly and 4-12 cm rim diameter) would also allow for using them as drinking goblets or beakers. Only some types occur both in large and small versions (type DcIa and b, EaIa and b, EaIIa and b), and vessels of type A and E are overall special in form: Type E double-handled jars can be very large (up to 25.8 cm height, 20.4 cm belly and 13 cm rim diameter) and many of them have a very particular double-spiral decoration that is sometimes referred to as ram's-head decoration. The handles are remarkable as well: broad and long, they curve from above the rim to the belly, making these vessels much easier to hold with both hands than the other types with their sometimes very small handles. These small handles would indeed have made drinking out of these jars fairly cumbersome, while for type E vessels, this would be unproblematic even for the larger specimens. This observation applies also to type Aa and Ab vessels, which have very long band-handles as well that reach from the rim all the way to the low belly. These handles are very thin and the overall vessel form differs significantly from those of type E, but also the type Aa vessels are fairly large (20-25 cm height, 14-18 cm belly and 12-13 cm rim diameter), but not too large to be used for drinking with both hands. Nevertheless, the rims of type A vessels are nearly straight and the point of gravity is extremely low, making drinking or pouring less likely. The larger and also the squat varieties of type A, in particular, might thus have been used to contain grain or a similar commodity that

[45] If they came indeed from graves, it would be important to know if they were associated with any 'real' vessels or other remarkable objects that could help in interpreting the function of these four alleged *mingqi*.

could be carried or poured but was not completely liquid or used for drinking. Still, without residue or use-wear analyses, it is hard to decide what was originally contained in these vessels.

Other forms of handled jars are the two miniature double-jars of probably symbolic function, the jars with one horn-handle, and the jars with four handles. The two jars with horn-handle - both from Xichang Lizhou, one from an early earth-pit grave, the other from a Han grave - are squat, medium-sized (10 cm eight, 10 cm rim and 13 cm belly diameter), and of a globular form with wide opening. The upward-curving handle is easy to grip, but the actual function of the vessel remains obscure. For the two four-handled jars, the case is much easier, as their globular body, small opening, large size, and coarse quality suggest a function as storage vessel. Most other potential storage vessels have no handles or only a number of horn-shaped or triangular lug knobs around the body, which could have helped to secure a rope for lifting and transport. They are most common with the large pointed-bottom urns mainly known from settlement context. The very large varieties (30-60 cm height, type A, B, and C *guan* urn, AaI rim, AbIII rim) where exclusively used in settlements and also in special object pits and urn burials that were probably ritual in nature, while the medium-sized versions (17-28 cm height, type D and E *guan* urn, AbI rim) sometimes also occur in graves, maybe as containers for food provided for the deceased. Except for type B, they all have a very wide opening; combined with the large size and the relative stability of the vessels, this suggests that the goods stored in there - possibly grain or similar staples - had to be taken out with the help of a bowl or large ladle or taken out piece by piece, but were probably not poured out. The less frequently occurring urns with inward-drawn shoulders and smaller opening probably contained goods that were either liquid or not supposed to be exposed to air or light, although this could also have been avoided by placing a lid on the vessels or sealing them in some other fashion. The fingertip-impressed band below the rim of many of the large urns from settlement context might have served to secure such a seal made of hide or other material, but the band might just as well have only decorative character.

All urns and the vast majority of what has been classified as *guan* jars are made of low-fired sand-tempered ceramic material. Type A is similar in form with the urns, but significantly smaller and with a regular-curved profile instead of the wide shoulders and narrow bottom of the urns. They have an even wider opening, so do most other *guan* jars. Together with their medium size (mostly 10-20 cm high, 8-16 cm rim and 8-18 cm belly diameter), this indicates mid-term storage, while the large and bulky urns are more likely to have been used for long-term storage. Only some jars can be as large as the small urns, but they differ significantly in form: Type B jars all have a wide angular outward-flaring collar and very wide opening with less pronounced widening at the bottom. Some are very squat (type BaIII), others tall and narrow (type), but overall they tend to be rather large (up to 28 cm high). Type D jars are very squat and wide-bottomed, with type Da being small, Db of medium size, and Dc very high but also rather wide (21-24 cm high, 15-17 cm belly diameter). The globular-bellied jars of type E and H also occur in small, medium and large versions (up to 21-24 cm high), and so does type F with its significantly wider outward-flaring rim. All of them are found both in settlement and grave context and are probably food containers of some kind, the larger ones serving for long-term or bulk-storage, the smaller ones possibly for transfer or for things that would be kept in smaller quantities. Wide outward-flaring varieties (e.g. type Ed and F) are more likely to have been used for pouring out the contents, indicating that they may have been liquid, others had a straight rim and narrower opening, restricting access and contact with air (e.g. type EbIIb). For the latter type, aside from storage, use for fermentation also comes to mind. The very squat large-bottomed vessels of type Ga and Gb would have been very suitable for such tasks as well, but type Gc, although of similar form, would have been much too small. Most vessels of type C are likewise relatively small and remarkable for the deliberate coarsening of the vessel surface with corded-ware impressions and possibly a coarse slip for the larger varieties of type Ca and Cb, while the very small vessels of type Cd and also some type Cb vessels are much more finely made and have nice surface decoration. Although their overall form is otherwise not too different from type A jars, albeit being a little more squat and rounded, they are therefore much more likely to have been serving vessels, maybe for pouring as the wide outward-flaring rim of some suggests. The single small high-fired fine ware vessel of type Da with its wide bottom and narrower form seems likewise to have served rather as a pitcher or even in a decorative function, rather than for storage of any kind. It is also remarkable that all these smaller and nicely-worked vessels were found in graves while many but by far not all of the larger and coarser varieties were reported from settlement contexts.

Although reported only from grave finds, vats also belong to the coarser medium-sized vessels with a likely utilitarian function. With their large bottom and their relatively straight sides, they might have held a wide variety of items, but they could also have served as cooking vessels, for none of the vessel types mentioned so far are particularly suitable for cooking or indeed show any scorch marks. *Fu* and *mou* vessels with their round bottom, globular body, roughened surface in the lower part, suggest an interpretation as pots; in the case of *fu*, this is further confirmed by their larger size (up to 21 cm height and 26 cm belly diameter) combined with their mottled surface-color and high-fired body. Nevertheless, as such vessels are very few in number, it remains unclear how cooking at settlement sites was usually done. There is a clear preponderance of vessels for long- and short-term storage of both liquids and solids as well as drinking and eating equipment, but cooking vessels remain elusive.

The vase and ewer forms can also be clearly connected with the serving, transporting, or holding of liquids. The ewers are specifically suited to the task of pouring liquids. The wide funnel-shaped opening on the top allows for easy filling without spillage, while the long spout of type A and B and to a lesser extend C facilitate directed pouring into narrow vessels, maybe filling alcoholic or other special beverages into various types of goblets or beakers, while the short spout on the globular vessels of type D would have been more suited for filling shallow drinking-bowls. The ewers come in different sizes (very large (26-38 cm height), large (19-22 cm height), medium-sized (14-15 cm height)), but only types A and D are always very large, while the other types occur in various forms. The ewers also vary in quality and decoration, but these differences seem more site-specific than form-specific. In contrast to the storage vessels described before, most of the ewers do have some kind of decoration, some being completely covered by geometric patterns, indicating a representative function of these vessels quite apart from their practical usage. Globular vases of type Ca are decorated in a similar fashion, but most vases have no or very limited decoration.

All vases are high-narrow in form with an S-curved body and flat bottom, but otherwise there is much variation in size and form. Vases of type F have a remarkably high neck and wide outward-flaring rim and are particularly large (30-43 cm high), which might have made them a little awkward to handle if full of liquid, for the rim form suggests that they were meant for pouring. Type G vases are likewise very big, but at least in some subtypes, small perforated knob-handles and the band that was probably drawn through them would have facilitated handling, tipping and pouring. This also applies to type J vases, whose wide bottom would have required some lever for tipping it over and use it to pour the content of the vessel out. Type J vases are only of small to medium size (12-20 cm height), so are those of type H, which are furthermore much more moderately curved and have a significantly more open form than the other types. Type C, D, and especially type B have a narrow opening. In the case of type B, the neck is narrowly constricted and can be fairly high, while the mouth is very small and the rim only slightly everted, giving the vessel a flask-like form. Most are of medium height, but especially those from settlement context can also be significantly taller. They would have been ideal for directed pouring, but only in a fashion that would not have required lifting the heavy vessel too far up, for the wide belly and the large amounts of liquid it could have held would make it very heavy. The very high varieties of type A would also have been cumbersome to lift, but there are also remarkably small vessels of similar form but only around 11 cm height. None of these vase types is associated with a specific type [or mode] of decoration or ceramic quality, but low-fired sand-tempered ceramics outweigh finely-made high-fired clay-tempered ceramics.

Overall, we can thus identify a broad range of storage-vessels of different sizes, as well as vessels for serving and drinking liquids in more or less formal contexts. Some serving and eating plates and bowls can also be distinguished. The vast majority of medium-size vessels with a more or less pronounced S-shaped profile could have fulfilled a large number of different functions, and no specific role can be assigned to them without microscopic analyses. Many of the larger vessels, as well, could have contained a variety of different goods, not all of them necessarily food items. Cooking vessels are either very rare or have not been recognized. Furthermore, we have to keep in mind that containers made of organic materials might have played an important role in food preparation, consumption, and transport. At this point, further insight into the function of ceramic vessels can best be reached by an analysis of the different object groups in their deposition contexts, i.e. within the respective settlement or grave assemblages. This will be done in Chapters IV and V.

III.4 The Lithic Assemblage

The material presented here contains information on 1868 stone objects from 110 settlement sites and 799 stone objects from 130 graves from 43 sites. Complete measurements could be obtained for 847 objects from 38 settlement sites and 217 objects from 72 graves from 32 sites. Drawings – either published or made from the original material – are available for 528 objects from settlement contexts and 170 from graves, while for the other objects only measurements and descriptions have been published. For 303 of the stone objects from settlements and 93 of the objects from graves, photographs allow for inferences on raw material and some production details.

III.4.1 Material Preconditions, Manufacture, and Use

The use of different stone raw material types depends on the intended function of the tool. For example, flaked-stone tools require a material that has a small grain size, homogeneity, isotropy, sharpness, brittleness, and the ability of the material to hold an edge. The stone needs to be brittle enough to flake easily but not so brittle that it cannot hold an edge; it has to be homogenous and fine-grained, so that mechanical force travels through it in a regular way, allowing for targeted application of force resulting in predictable breakages. Percussion tools such as axes, on the other hand, are usually made of sturdy, heavy material that does not break easily. Grinding tools need to have porous, abrasive, and usually coarse-grained surfaces. For ornaments, the requirements are less specific, but usually fine-grained hard stones of conspicuous color are preferred. For buildings — be it houses, grave constructions, statues, or other monuments — durable stone is used.

The choice of raw material for a specific tool or weapon type depends not only on general function (cutting vs. percussion vs. projection) but also on the use (e.g., hunting smaller or larger animals, cutting wood or cutting reeds, etc.), the nature of other objects involved (e.g. the type of bows used, the kind of tool to produce, or the variety of food to be prepared), the degree of mobility of the group or person involved, the degree of specialization of tool production, and - most importantly - the availability of different types of raw material.

Another important aspect is the nature of the production process. While metals and clay are highly malleable and are worked in an additive process that allows the production of a wide range of forms, lithic tools are worked in a subtractive manner from very hard materials that allow only for a limited amount of modification. In the case of ceramics, smoothing and other surface enhancements can mask the traces of the production process, and use-wear - aside from breakage - is minimal. In contrast, the surface of flaked-stone tools shows a very clear record of both production process and use-life. In ground-stone tools, which are formed by grinding and polishing coarse-grained rocks, the traces of the production process become largely obliterated or at least blurred, and the production sequence is thus harder to reconstruct than for flaked-stone tools; but use-wear is usually more pronounced than on ceramics.

Flaked-stone tools are produced by flaking off pieces from a stone core through direct or indirect percussion in a process called lithic reduction. The techniques used are direct hard-hammer percussion (using ground-stone tools of granite, basalt, or flint), direct soft hammer percussion (using batons/billets made of elongate pieces of antler, bone, or wood), a bipolar technique with anvil and hammer-stone, indirect percussion (using punch and hammer), and pressure-flaking.[46] The aim of production can either be a core-tool or various kinds of blade-tools, such as scrapers. A core tool is given shape by flaking off all excess material from a piece of rock, while blades are removed from a previously prepared core that is exhausted until no more flakes of adequate shape and size can be removed. For flaked-stone tools, hard, brittle, homogenous materials such as chert, quartz, and obsidian are ideal, but other rocks with a high silica content may also be used: the greater the silification, the harder and more brittle the material, and the better it is for flaked tool production. Suitable varieties include silica conglomerate, quartz (=silicon dioxide), feldspar, chalcedony, flint / chert, jasper, agate, hornstone, lithic sandstone, feldspatic greywacke, silificated argillaceous mudrock, and even silified limestone or dolomite, though the latter two cannot keep their edge for long. Of these, flint or chert is most widely used for flaked-stone tools, while quartz is only common where fine-grained cherts and obsidian are not available; for quartz has many flaws in its crystal structure, resulting in small, irregularly shaped tools. Jasper and agate are more commonly used for ornaments than for tools.

For grinding tools, sandstone as well as coarse igneous rocks such as some types of basalt are ideal, while for percussion tools, tough coarse material such as gneiss, basalt, gabbro, dolomitic limestone, and even schist and gneiss, are appropriate choices.[47] Banded material such as slate makes thin fine-cutting and sawing tools but also small arrowheads, while projectile points made of chert would be sharper and heavier, producing more force upon impact and leading to ballistic differences. Being hard and dense, basalt and other mafic volcanic igneous rocks are preferred material for buildings, but they can also be used for grinding or percussion

[46] Described in great detail e.g. in Kooyman 2000.

[47] Here and in the following, the information on stone types and their characteristics was taken from Kooyman 2000:25-37, Odell 2004:15-21, Rapp and Hill 2006:210, and Rapp 2006.

tools. The basic form of ground-stone tools can be obtained through flaking or by using naturally smoothed cobbles. These base forms can then be worked with any combination of cutting (with abrasive sands, a block of sandstone, a wire-strung bow saw, a lap-wheel or similar tools), drilling, pecking, grinding, abrading, or polishing (with or without an abrasive sand and water as a lubricant), with the last step obliterating nearly all traces of the preceding ones.[48] Sometimes pre-forms and half-finished products as well as rejects are present, giving some insight into the production process. Some stone tools are natural cobbles that are only slightly pecked or completely unaltered; these can be identified as artifacts only by their use-wear and/or based on their context of deposition.[49]

Use-wear analysis can reveal a great deal about stone tools, especially ground-stone tools. The different techniques of use-wear analysis fall into macroscopic, low-power, and high-power techniques.[50] Macroscopic analysis with the naked eye or a hand-lens shows only coarse traces such as striation, grinding and percussion marks, but does not allow for distinguishing use-wear from post-depositional damage. Low-power microscopes can help assess direction and kind of motion, but not the exact material used. For the latter, high-power techniques are needed. Residue analysis identifying plant residue, starch grain, phytoliths, blood residues, also belongs into the realm of high-power analysis. Within the scope of this study, the most important source of information on former usage are drawn from macroscopic observations, identifying striation, irregular breakages, percussion marks (especially on the working edge or end), signs of grinding, and other wear. A few excavation reports additionally mention sickle-gloss, a silica-residue caused by the wear of a blade against the phytoliths in silica-rich stems of grass and cereal plants.

[48] Described in greater detail in Adams 2002.

[49] The term 'artifact' is here used in the sense of in the sense of "material object conceptualized by the members of a social group as belonging to a category that is part of the cultural repertoire for that group" (Read 2007:187).

[50] Described in Odell 2004:135-173.

For assigning an object's intended function, the most important source of information besides use-wear is the nature of the objects themselves, their material characteristics such as hardness, sharpness, and surface quality, their overall form, size, weight, balance, the kind of working surface or edge, edge position, and edge angle. Here, I list the range of uses for stone, the main object types falling into these functional categories, and the material characteristics determining their functionality:[51]

Function	Examples of Tool Types	Material Characteristics
woodworking	axe, adze, hammer, chisel, gouge	weight, balance, angle, position, and sharpness of cutting edge
planting	shovel, hoe	weight, balance, overall form
harvesting	knife, sickle	sharpness, angle of cutting edge, "graspability"
food processing	millstone, muller/grinding stone, pestle, handstone	size, form, abrasive quality, "graspability"
tool and object production	drill, saw, awl, groove abrader, polishing stone, anvil, scraper, point, hammerstone	hardness, abrasive quality, overall form, ease of handling;
spinning and weaving	spindle whorls, other weights, needles	weight, balance, overall form
fishing, hunting, warfare	net weights, projectile points, knives, axes	sharpness, weight, angle and position of cutting edge, balance
personal adornment	pendant, ornament, earring, bracelet, finger ring, (hair) needle, bead	decoration, overall form, visual appeal, meaning
ritual objects	natural stones, figurines, objects of any shape	overall form, ornamentation, visual appeal, meaning
containers	bowl, tray	smoothness of surface, overall shape
structural stones		stability, form, and visual appeal

Many aspects listed above are related to function in a technical sense. They describe an overall impression of the object form rather than exact measurement classes that would allow assigning function in a mechanical way. Both use-wear analyses and ethnographic studies have shown that flaked stone tools were often multi-purpose tools and could be modified for specific tasks when needed. For Paleolithic assemblages, it is therefore common to avoid assigning tool types such as "arrowhead" or "scraper" but instead keep to formal descriptions such as "retouched flake." This

[51] The list of basic functions was composed with reference to the categories proposed by Adams 2002, Bennett 2002, and Cunnar 2007.

kind of caution is surely appropriate for large Paleolithic and Mesolithic assemblages of flaked stone tools containing mainly flakes and small debris. For most ground-stone tools and core tools worked with both flaking and grinding, intended function can be much more reliably assigned. Ethnographic research and experimental archaeology coupled with use-wear analysis have served to establish basic stone tool types, which form the basis of the typology proposed below.[52]

III.4.2 Raw Material and Technical Details

Given the large number of technical constraints connected with the production of stone tools, raw material and production technique are essential criteria in organizing the material. As none of the stone tools have been analyzed by a petrographer or stone-tool specialist, and thin-sections could not be taken, the assignations of material have to remain rather general. Raw material, texture, and color were recorded for each specimen. Below is a list of raw material types and colors observed in the assemblage:

- *material*: igneous rock (basalt, granite, gabbro, obsidian), sedimentary rocks (shale, chert, agate, sandstone, limestone, mudstone), metamorphic rocks (slate, quartzite, gneiss, schist, serpentinite), minerals (quartz, nephrite, turquoise, serpentine), or unclear.
- *color*: transparent, white, yellow, yellow-white, yellow-red, yellow-brown, yellow-grey, red, reddish-white, purple, brown, grey, grey-brown, grey-green, grey-white, grey-yellow, grey-red, grey-black, and black.

As far as technological aspects are concerned, it is common to distinguish between the two main categories of flaked 打制 and ground 磨制stone tools, although both kinds of techniques can be used on the same object: Especially in the production process of ground-stone tools, flaking can be a first step to obtain the basic form, often followed by pecking, before the actual grinding

[52] A seminal study on prehistoric technology was written by Semenov (Semenov 1964). For more recent literature see Whittaker 1994, Adams 2002, Odell 2004, Andrefsky 2008 a.o.

process starts, potentially followed by polishing.[53] Half-finished products discarded during the production process might therefore show different degrees of polishing, while in other cases, the aim of the production process might not have been a finely-polished tool, but a coarsely-flaked object with only some polishing at the blade, making it hard to assign the object to either category. Therefore I have decided to express the technical aspects in several categories:

- *primary manufacture techniques*: flaking, pecking, grinding, polishing, sawing, drilling, thermal alterations;
- *secondary manufacture technique*: flaking, pecking, grinding, polishing, sawing, drilling, thermal alterations;
- *drilling technique* (for holes): pecked, drilled from one side, drilled from both sides, unclear;
- *texture*: very coarse, coarse, medium, smooth, very smooth, undetermined;
- *polishing degree*: very high, high, medium, low, and unpolished;
- *hafting anchor*: hole in the middle, rectangular stem, side-notched, basal-notched, corner-notched, none;
- *use-wear*: striation, percussion marks on working end, percussion marks on butt end, percussion marks on both ends, damaged on sides, damaged on surface, damage on all sides, surface hollowed out through grinding, ground smooth, none;
- *preservation*: complete, broken, unclear, and
- *preservation percentage*: 0-100%, unclear.

Most of these categories apply to stone objects primary worked by grinding, which make up the majority of the stone assemblage (62% of the settlement material and over 82% of the objects from burials). Flaked-stone tools require a different set of categories. Applicable only to flaked stone tools are the following parameters:

- *manufacture location*: ventral face, dorsal face, ventral edge, dorsal edge, point, distal, proximal, right lateral margin, left lateral margin;
- *amount of cortex*: < 50%, ≥ 50%, 100 %, absent, unclear;
- *flaked stone type*: retouched flake, utilized flake, debitage, exhausted core, prepared core, core tool, flake tool;
- *number of retouched edges*: 0, 1, 2, 3, 4, unclear;
- *extend of retouch*: short, long, invasive, covering;
- *position of retouch*: direct, bifacial, alternate, inverse, and
- *flake form*: feather, step, scale, outrepassé/overshot.

[53] For a detailed description of the process, see Sankalia 1964:78-82.

III.4.3 Object Forms

The characteristics of object form that are applicable to most stone objects are the following:

- *basic measurements*: extant length, max. complete length, max. width, thickness, inner diameter (if applicable), outer diameter (if applicable), edge angle (if applicable);[54]
- *body form*: oval, round, rectangular, rectangular-pointed, square, trapezoidal, triangular, ellipsoidal, pentangular, long-oval, long-pointed, long-rectangular, bi-point, D-shaped, crescent-shaped, leaf-shaped, shouldered, ring-shaped, band-shaped, staff-shaped, disk-shaped, drum-shaped, tubular-shaped, tongue-shaped, kidney-shaped, irregular, oval-irregular, rectangular-irregular, round-irregular, square-irregular, trapezoidal-irregular, triangular-irregular, broken, and
- *cross section*: bi-point, bi-concave, concave-convex, triangular, trapezoidal, hexagonal, round, oval, long-oval, triangular, pentangular, rectangular, d-shaped, leaf-shaped, drum-shaped, half-circle, irregular, rectangular-irregular, broken.
- *blade-form*: concave, convex, straight, broken;
- *blade type*: single-sided, double-sided, broken;
- *base*: concave, convex, pointed, straight, slightly curved, flat, triangular-indented, irregular, broken;
- *top*: concave, convex, flat, indented, pointed, rounded, slanted, slightly curved, straight, flat-irregular, broken;
- *sides*: concave, convex, straight, irregular;
- *number of holes*: 0, 1, 2, 3, 4, and
- *hole location*: middle; middle, upper 1/3, upper rim, upper right-hand corner.

For ornaments, decoration also has to be taken into consideration:

- *decoration*: yes, no, unclear; and
- *decoration type*: spirals, horizontal lines, vertical lines, transverse lines, zigzag lines, net-pattern, points, circles, triangles, encrustation.

The same kinds of ornaments occur in a number of different materials, including stone, bone, and tooth, and they are therefore be described together under "III.6 Decorative Objects". Here, I instead focus on weapons and tools as well as potential ritual objects made of stone material.

[54] The range of measurements is 0-180°. See Odell (1989:339-340, Figure 7) and Kooyman (2000: Figure 7.24) for edge measurement techniques. As I had access only to part of the original material, here only rough estimates can be provided, resulting in four categories of > 60, between 30 and 60, < 30, and unclear. As Kooyman (2000:94f.) has pointed out, the edge angle is naturally of great significance for the functioning of tools that have such an edge, with a fairly acute angle being necessary for cutting. However, ethnographic examples show some irregularity. Especially for scrapers the edge angle varies widely from place to place from 60-90° in some parts of Australia, 56-113° in others, and around 125° in parts of Ethiopia. The values for chopping tools have a similarly wide range, but they are generally much larger than those for cutting knives and flake saws, that tend to have angles under 60°, and more often around 30°, while on average adzes, chopping tools, and scrapers tend to have angles between 60 and 90° (summarized in Koozman 200:94f.). There might thus be some regularity, though it is not easily measurable

III.4.3.1 Weapons and Tools

The overall assemblage of stone weapons and tools on which some form of information is available consists of 1868 objects. For 1021 cases, the objects are only described in brief reports mentioning stone tool types, sometimes with numbers and a brief description of material type or techniques used. More precise details on measurements and form could be obtained for 847 specimens. The overall number of stone objects found at each site is rarely mentioned in the excavation reports, and for each object type as defined by the excavator usually only one or two examples have been published.[55] Although this level of detail is not suitable for fine-grained statistical calculations of exact percentages, it still gives an indication on "much" vs. "little" and allows for inferences on the presence and absence of different tool types, especially in the context of intra-site comparison. 1160 of the 1868 reported stone objects were primarily worked through grinding; 708 primarily through flaking. The number of flakes and microliths is very small, adding up to 151 specimens coming from seven sites,[56] while all other stone tools - flaked and/or ground - are core tools.

The main tool types identified for the assemblage under consideration are implements for woodworking (axes, adzes, chisel), followed by different kinds of knives, some of which were possibly used as harvesting tools, as well as a few other types of tools clearly associated with agriculture (shovel, borer, plow, ring stone/ digging stick weight), fishing (net weights), or hunting (arrowhead, spearhead). Very common are also different kinds of grinding tools (grinding slab, grinding roller, handstone) and pounding implements (pestle, hammerstone)

[55] Information on the original number of stone objects retrieved from the respective sites was available - either through publication or access to the original material - for Dechang Dongjiapo, Maojiakan, Huili Fenjiwan, Houzidong, Liantang, Xiao'aozi, Renhe Xicaoping, Xichang Lizhou and Qimugou.

[56] These sites are Dechang Maojiakan, Wangjiatian, Huili Yangjia Wuji, Renhe Gonghe, Huilongwa, and Xicaoping, and Xiqu Yanwan, all of them except for Renhe Xicaoping and Xiqu Yanwan also containing microliths.

probably used in food production, as well as smaller numbers of tools probably used for the production of clothes (spindle whorl, needle, borer). While most of the objects named so far were completely or at least partially polished, some sites also held substantial amounts of flaked-stone tools, mainly coarse choppers and scrapers, but also thin flakes and in rare cases even microliths. At some sites half-finished products, different kinds of pre-forms, and exhausted cores could be identified, indicating local tool production. Molds for bronze arrowheads and other tools have been found at one site, while a small number of settlement sites and a considerable number of graves held decorative items. The main object types will be described below arranged by main functional categories. I describe their main features and suggest types and subtypes. The range of stone material and production techniques chosen for each type will also be mentioned.

III.4.3.1.1 Woodworking Tools

The main woodworking tools are axes, adzes, and chisels. While chisels can usually be easily distinguished by their long and narrow form, axes and adzes tend to be fairly similar in build. The main difference is in the position of the blade relative to the handle: the blade of an adze is set at a right angle to the handle, while the blade of an axes is in line with the handle. If no traces of hafting such as grooves or perforation can be seen, the distinction can be made according to the cross-section shape of the working-edge. Axes have symmetrical cross-sections, usually lens-shaped or sometimes rectilinear, and the working-edge is located in the middle. Adzes have the working-edge skewed towards the lower end of the implement.[57] Given the differences in force used, adzes are generally smaller and lighter than axes, and also more finely polished. For the material at hand, axes have average measurements of 11.6 x 5.8 x 2.6 cm, the

[57] For ethnographic and experimental accounts on the usage of axes and adzes see Semenov 1964:126-134.

length ranging between 6 cm and 28.3 cm, while for adzes the average measurements are 7.1 x 4 x 1.3 cm, with lengths between 3.8 cm and 17 cm. There is therefore some overlap in size. Coarse and fine specimens appear both among axes and adzes, but axes tend to be more coarsely worked and most adzes have received some form of surface grinding and polishing. Chisels are even more thoroughly ground than either of the other two types.

Nevertheless, for both axes and adzes, some form of grinding - at least for the blade - is common, and for about two thirds of both tool types most traces of the initial flaking process during tool production have been ground away. There is also no apparent correlation between artifact size and degree of grinding and polishing, or between any of these factors and the different subtypes identified below. However, there is some correlation between degree of polishing and stone material chosen. The few chert and basalt objects identified within the adze/axe-spectrum are all highly polished axe types. Igneous rock, basalt, serpentinite, or slate were used for both kinds of objects and polished to varying degrees. Gabbro was usually only coarsely worked and used only for medium-sized axes, while slate was rarely used and nearly exclusively for adzes of small or medium size. For the 168 axe specimens available for this study, four different types with subtypes can be distinguished (Figure 3.39):

Type A: rectangular, stout, with straight sides, concave, convex, or straight butt (42);
- Type Aa: convex blade;
- Type Ab: straight blade;

Type B: long-rectangular, corners often rounded (37);
- Type Ba: convex blade, straight sides, straight, convex, or concave butt;
- Type Bb: straight blade, straight sides, straight, convex, or concave butt;
- Type Bc: long-oval, convex sides, convex blade;

Type C: trapezoidal, convex or rarely straight blade (77);
- Type Ca: straight sides;
- Type Cb: slightly outwards-curved sides;
- Type Cc: concave or slightly inward-curved sides;
- Type Cd: inverted trapezoidal, straight sides and blade;

Type D: triangular (4);
- Type Da: convex blade, straight or concave sides;

Type Db: straight blade, straight sides, and

Type E: shouldered axe, straight sides and right angles, straight blade (1).

For adzes (144 specimens), four different types with subtypes can be distinguished (Figure 3.40):

- Type A: rectangular, with straight sides, convex, or straight butt (35);
  - Type Aa: convex or slightly curved blade;
  - Type Ab: straight blade;
- Type B: long-rectangular, corners often rounded, straight or slightly curved sides, concave, convex, or straight butt (17);
  - Type Ba: convex or slightly curved blade;
  - Type Bb: straight blade;
- Type C: trapezoidal, straight or slightly curved sides (80);
  - Type Ca: convex or slightly curved blade;
  - Type Cb: straight blade;
- Type D: triangular (11);
  - Type Da: convex or slightly curved blade, straight or slightly curved sides, and
  - Type Db: straight blade, straight sides.

Chisels are on average more finely polished than axes or adzes. They are made of slate, fine igneous rock, serpentinite, very rarely high-polished chert or nephrite, and sometimes tough forms of sedimentary rock. Only very few chisels still show traces of the flaking-process that usually precedes refinement through grinding and polishing. Chisels vary widely in size, the smallest measuring only 5.2 x 1.1 cm, the largest 27.2 x 2.9 cm. Most specimens range around 6-12 cm in length, while the width usually amounts to only 1/6-1/3 of the length. All objects are flat and thin, with a very thin blade. Overall, four types with subtypes can be distinguished among the 64 specimens, on which sufficient information was available (Figure 3.41):

- Type A: long-rectangular (33);
  - Type Aa: straight working-edge, sides straight, slightly slanted, or curved;
  - Type Ab: slightly curved working-edge, sides straight or slightly curved;
- Type B: tongue-shaped (21);
  - Type Ba: straight sides, convex or slightly curved working-edge;
  - Type Bb: slightly curved sides, convex or slightly curved working-edge;
- Type C: triangular, sides slanted, working-edge straight or slightly curved (9), and
- Type D: pentangular, with angular sides, straight working-edge (1).[58]

[58] Type D occurs only once and might be just an irregular version of type A.

As no residue analyses or microscopic observations were possible, it is not completely certain that all objects classified here as axes, adzes, and chisels were indeed used for woodworking or at which angle they were hafted. Those specimens with small and broad blades might as well have been inserted into a digging stick as used by modern-day groups practicing slash-and-burn agriculture, although this kind of usage for these object forms is infrequent even according to ethnographic accounts.[59] To determine the actual kind of material worked with specific stone tools, further microscopic analyses would be necessary.

III.4.3.1.2 Agricultural Tools

Tools possibly used in an agricultural context include plows (2 specimens), shovels (11), ring-stones/digging-stick weights (2), and knives (148), although the latter likely served multiple functions, including food processing and possibly also object production (Figures 3.42-3.43). Plows are usually very coarse and fall into two varieties: objects with a thickened top and pointed bottom (type A) and tools of upright rhombic form (type B). Shovels are flaked and only partially polished objects of igneous rock or tough limestone of about 9-14 cm length, 6-8 cm width, and 3 cm thickness. They are rectangular or square in overall shape, rectangular in cross-section, and have a curved or straight single-sided blade. They are often hard to distinguish from half-finished products of large adzes or axes, and have only been identified at Huili Fenjiwan.

Another group of objects possibly associated with agriculture are ring-shaped round or oval sandstone-implements that have been interpreted as net-weights, but might actually be ring-stones used as digging-sticks. Their size, the material choice of sandstone instead of a more hardwearing material, and the lack of marks of striation or other damage common to net-weights

[59] For an illustration and explanations see Mazoyer and Roudart 2006:11. For a discussion see Odell 1977:187.

make it more likely that they were actually ring-stones placed on digging-sticks. Such tools are commonly used for planting in slash-and-burn agriculture. The objects addressed as borers are coarsely flaked pieces of igneous rock or serpentinite, leaf-shaped or bi-pointed in shape, and 8-12 cm long with a maximum width of 3-4 cm and one pointed end. Given their coarseness, they might also have been used as agricultural tools or in object production.

Knives, which appear at many sites in greater number, might also have been used in an agricultural context. Nearly all specimens show striation along the blade and in some cases traces of sickle-gloss have been reported, indicating a usage as harvesting-tools, possibly for cutting rice-straw or other grassy plants. The majority of knives are perforated in the middle of the upper third of the object, usually with two holes that are aligned parallel to the rim and were perforated from both sides. A string drawn through these holes and attached around the wrist would have allowed for a more secure grip in cutting. Very few knives have only one perforation or none at all. The un-perforated knives make up about 20% of the overall number of knives reported, and they tend to be a little smaller in size and more coarsely made. Overall, the following knife types and subtypes can be distinguished (Figure 3.44):

- Type A: bi-point knife, single- or double sided blade (10);
  - Type AI: 2 holes in upper 1/3;
  - Type AII: 1 hole in the middle;
- Type B: crescent-shaped (sickle-shaped) (8);
  - Type BI: convex blade, 2 holes in upper 1/3;
  - Type BII: concave blade, 1 hole in upper 1/3;
- Type C: D-shaped (39);
  - Type CI: straight or slightly curved blade, convex back;
    - Type CIa: 3-2 holes;
    - Type CIb: 1 hole;
    - Type CIc: no holes;
  - Type CII: convex blade, straight back;
    - Type CIIa: 2 holes;
    - Type CIIb: 1 hole;
    - Type CIIc: no holes;
- Type D: long-oval (51);

Type DI: 2 holes;
Type DII: 1 hole;
Type DIII: 0 holes;
Type E: oval (11);
Type EI: 2 holes;
Type EII: 1-2 holes;
Type EIII: no holes;
Type F: rectangular (9);
Type FI: 2 holes;
Type FII: 1-2 holes;
Type FIII: no holes;
Type G: broken (20);
Type GI: 2 holes;
Type GII: 1-2 holes, and
Type GIII: no holes.

All knives are fairly thin, well-polished, and measure on average 11 x 4 cm, the smallest being squat in their dimensions (5.6 x 5.5 cm), the largest elongated (16.8 x 6.4 cm), but the relation of length to width is usually around 3:1. Most specimens are made from fine grey slate, and only for some reddish fine igneous rock or metamorphosed shale or slate were chosen as raw material.

III.4.3.1.3 Fishing and Hunting

Other tools for food procurement are those used for fishing and hunting, but arrowheads may also have been employed in armed conflicts. Indicators for fishing are mainly net-weights, of which 15 have been reported and described. They are usually oval flat cobbles with indentations pecked into the middle of both long-sides, giving them a kidney-shape. The objects are very smooth, probably made from naturally-smoothed river cobbles that did not require any further grinding or polishing. The net-weights fall into two size classes: large (type A, 9.8-14.5 x 6.5-9 cm, 12 specimens) and small (type B, 5.6-8 x 3.6-5.1 cm, 3 specimens). Some are stout, others more elongated, but that probably depends on the exact form of the cobbles available (Figure 3.45). All net-weights have striations and signs of damage over the whole object, indicating rough handling. The material chosen tends to be tough, i.e., igneous rock, limestone, or sedimentary rock with a high silica content, which can withstand such treatment.

For arrowheads, fine slate is the preferred raw material type, while fine igneous rock is more rarely used. Arrowheads made of stone (139 specimens) and bronze (125 specimens) occur about equally often, while three bone specimens and two wooden arrows have been reported as well. The forms for all four types of raw material are essentially the same, and they have therefore been classified together. Overall, arrowheads fall into two main categories with several subtypes: stemmed (type I) and not-stemmed (type II) (Figures 3.46-3.48):

- Type I: stemmed (33 stone);
    - Type A: staff-shaped (33 stone, 3 bronze);
        - Type Aa: long stem (1 stone, 1 wood);
        - Type Ab: short stem (32 stone, 1 bronze, 1 wood);
    - Type B: leaf-shaped head (9 bronze);
        - Type Ba: thin staff-shaped massive stem (4 bronze);
        - Type Bb: thick outward-flaring hollow stem (5 bronze);
    - Type C: lanceolate head (5 bronze);
    - Type D: triangular double-winged head (54 bronze);
        - Type Da: ~45° tip angle (7 bronze);
        - Type Db: ~25° tip angle (48 bronze);
            - Type DbI: without hook (43 bronze);
            - Type DbII: with hook (4 bronze);
    - Type E: triangular head, not winged (6 bronze);
    - Type F: small triangular head, long staff (1 bronze);
    - Type G: fish-shaped double-winged head (20 bronze);
        - Type Ga: outward-flaring wings (16 bronze);
        - Type Gb: downward-pointing wings (4 bronze);
- Type II not-stemmed (102 stone);
    - Type A: narrow bi-point (50 stone);
        - Type Aa: pointed bottom (19 stone);
        - Type Ab: straight bottom (26 stone);
            - Type AbI: middle-thickened (15 stone);
            - Type AbII: bottom-thickened (11 stone);
    - Type B: lanceolate (38 stone, 2 bronze);
        - Type Ba: straight base (17 stone, 2 bronze);
            - Type BaI: straight sides (5 stone, 2 bronze);
            - Type BaII: downwards narrowing (12 stone);
        - Type Bb: convex base (5 stone);
            - Type BbI: straight sides (4 stone);

Type BbII: downwards narrowing (1 stone);
Type Bc: concave base (2 stone);
Type Bd: sharply triangular-indented base (1 stone);
Type C: broad leaf-shaped (12);
Type Ca: convex base (2 stone);
Type Cb: straight base (10 stone);
Type CbI: downward-narrowing (1 stone);
Type CbII: straight base, straight sides (7 stone);
Type CbIII: straight base, s-shaped or double s-shaped sides (2 stone), and
Type D: narrow triangular, slightly curved sides, round cross-section (2 stone, 2 bronze).

The measurements for arrowheads of all types and material are generally similar with an average length of 4-5 cm and a width of 1-2 cm, but the stone arrowheads are all rather thin with 0.2-0.3 cm, while those made of metal can be as thick as 1 cm. Most arrowheads are elongated and the relationship of length to width is usually around 3:1, but arrowheads of type B can be considerably longer (length: width = 5:1 to 8:1). Accordingly, the edge angle is fairly narrow in all cases, but even more so for type B. Several stone specimens show signs of striation – probably traces of the manufacturing process and re-sharpening – or have broken bases or tips, pointing to impact when hitting a target. There is a certain preference for certain materials for specific types: Both wooden arrowheads and all but four bronze arrowheads have a stem, but 2/3 of all stone arrowheads have no stem (Table 3.19). The majority of long-stemmed staff-shaped arrowheads (type IAb as classified above under III.4.3.1.3) were made of stone, while there is a greater variability in those made of bronze, with a certain preference for type IDbI, i.e. triangular double-winged arrowheads with a narrow tip and no hook. For stone arrowheads without a stem, narrow bi-point (type IIA) and lanceolate forms with a straight base (type IIBa) occur about equally often, while all other forms are rare. Two of the four bronze arrowheads without a stem also belong to type IIBa, but in the variety with straight sides and not downward-narrowing, while the other two bronze arrowheads are of type IID, i.e. narrow-triangular with slightly curved sides, a relatively rare type that nevertheless occurs both in stone and bronze.

The preference for a very long stems and narrow shape for wooden arrowheads can be easily explained, as this form would give them more force and allow them to penetrate a target in spite of the softer raw material. Such arrowheads are likely to have been used on very small game such as birds. The preference for narrow staff-shaped forms with stemmed bone arrowheads might have a similar functional explanation. Bronze arrowheads usually have a slightly wider blade, but also here narrow tip angles of around 25° are preferred. Considering the usual form of molds in which arrowheads are made – large molds making about a dozen arrowheads at a time, all of them connected at the stem and forming a tree to allow for easy pouring and distribution of the molten metal – stemmed arrowheads are the natural choice, while stone arrowheads without a stem are easier to make and less prone to breaking then stemmed ones. The correlation between specific forms and certain kinds of raw material can therefore easily be explained by practical concerns, but cultural and temporal factors might have played a role as well. This question can best be examined through distribution maps and find context, a question that will be addressed in Chapter VI.

Larger stone projectile-points of a very different character were reported only from the site of Dechang Dongjiapo: They are coarsely flaked, lanceolate in form with a straight base and pointed tip, and measure around 6.8 x 3.5 x 0.8 cm. As they are very coarse and show no signs of use-wear, it is unclear if they are really spearheads as the excavation report claims or half-finished products for knives or other kinds of objects (Figure 3.49).

III.4.3.1.4 Processing Tools

Unlike the tools for food procurement described so far, most stone tools that can be associated with food processing are very coarse, consisting mainly of roughly flaked choppers and scrapers and different kinds of grinding equipment.

Choppers are coarse tools that can be hand-sized or larger, and mostly measure around 7-12 cm in both length and width, leading to a square or round form. Only some are as small as 4 x 3 cm, or as big as 17.4 x 17.4 cm.[60] Most choppers are about 3.4 cm thick, but some larger specimens can measure over 5 cm in thickness. Three types with subtypes can be distinguished among the 66 specimens collected for this study (Figure 3.50):

> *Type A*: round (plate-shaped) or round-irregular form; flat to convex bottom and smaller flat top; coarsely chopped all around and sometimes on top; medium-sized to big (diameter = 8-17.4 cm) (46);
>> Type AI: large-sized, diameter 10-17.4 cm (27);
>> Type AII: medium-sized, diameter 7.3-9.8 cm (19);
>
> *Type B*: square or rectangular-irregular form; flat to convex bottom and smaller flat top; coarsely chopped all around or only on three sides; small to medium-sized (length = 5-11 cm, width = 4-9.5 cm) (11);
>> Type BI: large-sized, length 10-11 cm (2);
>> Type BII: medium-sized, length 8-9.5 cm (7);
>> Type BIII: small-sized, length 6-7.9 cm (2), and
>
> *Type C*: oval shape; flat or irregular bottom; top and sides coarsely chopped; large-sized, 9-12.6 cm length (9).

Choppers are usually made of igneous rock or more rarely coarse serpentinite. Scrapers are made of the same kind of material but they are usually small in size, varying in length between 2.5 and 6.3 cm, with an average length of 4.3 cm, an average width of 3.4 cm, with values ranging around 2.2-6 cm, and an average thickness of 1.3 cm with not much variation. Most scrapers have a triangular cross-section, a thin convex single-sided blade, and tend to be a little longer than wide, with a ratio of around 4:3. Only some specimens are much longer, with a

[60] Measurements were available for 65 specimens from nine sites, mainly Xichang Lizhou and Qimugou, but also Dechang Dashipai, Maojiakan, Huili Liantang, Washitian, Houzidong, Mianning Sanfentun, and Xichang Yingpanshan.

ratio approaching 2:1 in some cases and or below 1:1 for others. Overall, four types can be distinguished (Figure 3.51):

Type A: oval form, convex blade (7);
- Type AI: small-sized, 2-4 cm length (6);
- Type AII: large-sized, 8 cm length (1);

Type B: long-oval to long-rectangular form, slanted slightly curved blade (7);
- Type BI: small-sized, 4-5.5 cm length (5);
- Type BII: large-sized, 9-9.5 cm length (2);

Type C: trapezoidal, convex to slanted blade, small-sized, 2.5-4 cm length (7), and

Type D: trapezoidal to triangular-irregular, with irregular blade (4).

A microlithic industry has been reported from seven sites, but detailed descriptions or measurements are only available for 17 objects from four sites.[61] Most specimens are made of quartzite, and from Dechang Maojiakan obsidian has also been reported. Various kinds of flakes, choppers, and cores can be distinguished (Figures 3.52-3.53). The flakes are irregular, with a roughly oval, rectangular, trapezoidal or triangular shape and measurements of 1.7-3.1 x 0.9-2.8 x 0.2-1 cm. The triangular or rectangular specimens have a curved or more rarely straight working edge and have probably served as scrapers. The function of the other flakes is less clear: They are mostly irregular-oval or sometimes rectangular, trapezoidal, or triangular in shape, have a triangular cross section and a thin sharp working edge that is either curved, slanted, or straight, but always somewhat irregular. These objects might thus have served as cutters or scrapers.

Flakes made of other material – mainly fine and a few coarse varieties of igneous rock – have been mentioned at four sites including Dechang Maojiakan, Huili Yangjia Wuji, Huili Leijiashan, and Renhe Huilongwa. Information on forms and sizes is only available for a small sample of 22 flakes from Maojiakan and one flake from Leijiashan, all of them with much intact cortex on one side and no signs of retouch or usage, indicating that they were surface-removal

[61] Details on form and measurements have been reported for microliths mainly from Dechang Maojiakan and Wangjiatian, as well as Xichang Qimugou and Huili Leijiashan. Huili Yangjia Wuji, Renhe Huilongwa and Gonghe held some microliths as well, but of their actual shape nothing is known.

flakes that emerged in the process of stone-tool production. Further indicators for on-site stone-tool production are cores reported from four sites, some of them microlithic in size.[62] Half-finished products, mainly of knives, but also of chisels, axes, adzes, and spindle whorls have been reported from a number of sites, allowing some insights into production process and location.[63] The large number of fragments at the three sites of Dechang Maojiakan and Wangjiaping as well as Huili Dongzui might also be the remains of tool production.

Other tools probably connected to food-processing or other production processes are different kinds of grinding equipment, which have been reported from a large number of sites. The main tool groups that fall into this category are grinding slabs, grinding rods, and handstones. They are mostly made of sandstone and more rarely of igneous rock, granite, gneiss, or in one case slate. The grinding slabs are usually fairly large, mostly 10-28 cm long, 4-20 cm wide, and 2-5 cm thick, although the largest was as thick as 10 cm.[64] Four main types with subtypes can be distinguished (Figure 3.54):

Type A: round to oval regular indentation on the top (15);
- Type Aa: oval;
- Type Ab: rectangular;
- Type Ac: trapezoidal;

Type B: long-oval indentation with striations in middle (3);
- Type Ba: long-oval;
- Type Bb: long-rectangular;

Type C: long striations and grooves (1); and
Type D: ground flat (10).

Most of the grinding slabs are rectangular (type Ab) and only a few are trapezoidal (type Ac) or oval (type Aa), with a flat, curved, or irregular base, and a rectangular but somewhat irregular cross-section. The sides are often not worked, while the top shows a clear indentation,

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[62] These sites are Dechang Maojiakan and Wangjiatian, Huili Tianbacun and Washitian.

[63] These sites are Dechang Dongjiapo, Maojiakan, Wangjiaping, Huili Dongzui, Fenjiwan, Yingpanshan, Mianning Fenjiwan, Gaopo, and Yunnan Duizi.

[64] This specimen measures 27 x 20 x 10 cm and comes from Xichang Mahuangkan.

hollowed out by repetitive grinding, which shows that the object was indeed used as grinding tool. One specimen, the exceptionally large one from Xichang Mahuangkan just mentioned, additionally shows striation (type B), while another specimen is marked by groves and abrasions (type C). The latter object which was found at Xichang Henglanshan, is also relatively long (20 x 7.5 x 1.8 cm) and made of slate, indicating that it might have served as a groove shaft abrader, rather than having been used in food-preparation. Grinding slabs are usually coupled with large handstones, which fall into the following types and subtypes (Figure 3.55):

Type A: flat, bottom worn-down in middle, round to oval form (2);
Type B: flat, bottom flattened through grinding (4)
    Type Ba: oval shape;
    Type Bb: rectangular shape;
Type C: flat, bottom worn-down into a convex shape (2);
Type D: upright d-shaped (9);
    Type Da: butt-end worn-down in the middle; and
    Type Db: butt-end smoothed down into a convex shape.

Grinding slabs vary in size from small stones that easily fit in the palm of one hand (7.4 x 4.8 x 2 cm) to rather large specimens that would have required the use of two hands (28 x 15 x 2.3 cm). However, most are of medium size (15-20 x 8-17 x 1-5.5 cm) that would be heavy enough for efficient grinding but not too large to handle. Four rectangular objects from the early settlement layers of Xichang Lizhou, which have been classified as "handstones" by the excavators, were perforated in the upper right-hand corner. This perforation combined with the thinness and small size of the object (5 x 3.8 x 0.2 cm) and the straight blade-like sides, indicate that the object was not intended for grinding but for cutting or sawing, identifying it as a cutter. All four known specimens are very similar in form, and made of ground and polished yellow-green sandstone.

The grinding-rollers are either narrow-oval or leaf-shaped in form, have a flat-oval, D-shaped or nearly rectangular cross-section, a flattened or rounded tip, and measure 12-18 cm in length and 2-4 cm in width. All specimens show striation and wear on one side and in some cases also on the tip, indicating a sliding more rather than a rolling motion, so that the term "grinding rod" or "stick" seems more appropriate than the established term "roller." I have therefore classified these objects as grinding rods, distinguishing between the following types and subtypes (Figure 3.57):

- Type A: perforated (25);
  - Type Aa: long-oval (16);
    - Type AaI: tip flattened/ground-down on top;
    - Type AaII: tip not flattened;
  - Type Ab: leaf-shaped, top thickened, bottom pointed (6);
    - Type AbI: long;
    - Type AbII: short;
  - Type Ac: short-oval (3);
    - Type AcI: tip flattened/ground-down on top;
    - Type AcII: tip flattened/ground-down on top;
- Type B: unperforated (21);
  - Type Ba: long-oval (19);
    - Type BaI: tip flattened/ground-down on top;
    - Type BaII: tip not flattened; and
  - Type Bb: short-oval (2).

About half of the grinding rods are perforated at one end, and the hole was in all cases drilled from both sides. The resulting hole is fairly narrow, indicating that a string or strap was drawn through it, but the grinding motion makes it unlikely that this was meant for fastening the tool around the wrist of the user as in the case of the knives. As nearly all of the grinding rollers were found in graves (39 out of 46, i.e. 84.8%) and usually in the hip area of the dead, it is likely that they were fastened on the belt or kept in a pouch. The object form and degree of use-wear suggest that in life these grinding rods might have been used for sharpening tools or weapons, while their placement in graves indicates that they had become part of the attire of a certain group of people that could not be removed after death. All specimens were furthermore made of highly-polished, very homogenous, smooth, dark-grey material, which might have been chosen not only for its mechanical properties but also for its visual appeal. It is also remarkable that nearly all perforated grinding rods were made of slate or shale, while the un-perforated were mainly of sandstone, gneiss, or other sedimentary rock. These two groups do also mostly come from different areas, the perforated ones mainly from Huili and Yanyuan, the un-perforated ones from Puge and Xichang, with only some overlap: single perforated specimens occur both in grave and settlement context in Puge and Xichang, and un-perforated grinding rods were found in graves in Yanyuan.

Aside from grinding equipment, there are also different kinds of pounding tools, namely pestles and hammerstones. The pestles – all of them long-oval and with convex ends, that were in some cases partially flattened – measure on average 13.9 x 4.7 x 3.2 cm, with only one specimen from Xichang Qimugou being considerably larger (23 x 7 x 3.7 cm). Three main types of pestles can be distinguished (Figure 3.56):

Type A: slightly elongated oval (9);
- Type Aa: rounded ends;
- Type Ab: one flattened end;

Type B: stick with round to oval cross-section and percussion-marks on one or both ends (12); and
Type C: elongated oval thickened on one or two ends (8).

Objects clearly identifiable as hammerstones vary considerably in form and dimensions: Only very few specimens have been worked into refined tools with middle-perforation for hafting (type A), while most are very coarse (type B) and were probably largely left un-worked, only smoothing down some unwanted edges. Grouping the specimens by both refinement in production and object form, one arrives at the following types and subtypes (Figure 3.58):

Type A: refined hammer, regular oval form with middle-perforation (2);
Type B: irregular hammerstones (14);
- Type Ba: flat-oval with percussion-marks on one or both ends (9);
- Type Bb: flat-round with percussion-marks along the edge (1); and
- Type Bc: irregular-elongated with one convex and one slanted end (4).

Specimens falling into type B usually measure around 11.4 x 7 x 4.3 cm, but the standard-deviations for length and width are high, the largest hammerstone measuring 17 x 9 x 6 cm, and the smallest 5.8 x 3.8 x 2.5 cm. Flat-oval hammerstones of type Ba, which are the most common form, occur both in medium and large sizes, and specimens of type Bc can be small or very large. All specimens are made of fine igneous rock, sandstone, limestone, or other heavy sedimentary rock that does not break easily and allows developing considerable force in striking. These objects could have been used in food processing but also in other kinds of production activities, and stand therefore between the two categories of processing and production tools.

III.4.3.1.5 Production Tools

Of the tools mentioned above, hammerstones, scraper, chopper, and knives, might have been employed in non food-related production activities, such as tool-production, hide-scraping and cutting. Tools clearly associated with the production of clothes are spindle whorls and needles, while borers and saws might have served in tool production, and molds can clearly be identified as objects used in tool and weapon production.

Saw-like objects were only found at Xichang Lizhou, all of them flat, nearly square, thin sandstone objects with a single perforation in the upper right-hand corner. These objects could have served as cutting tools, or they may have been used in smoothing the surface of ceramics. Without microscopic analyses, the actual function cannot be ascertained. Furthermore, there is the potential shaft-straightener made of slate which has been mentioned above, and a number of plump borers of triangular or leaf-shape, which were made of igneous rock. One of the few long, thin stone needles found so far is likewise made of slate, but most needles are made of bone and not stone. Among perforation tools, the following types can be distinguished (Figure 3.59):

Type A: awl, thickened top, pointed bottom (3);
- Type Aa: triangular shape (2);
- Type Ab: top-thickened leaf-shape (1);

Type B: double-point awl (3);

Type C: thin needle (13);
- Type Ca: bi-point shape (11);
- Type Cb: curved shape (1); and
- Type Cc: elongated D-shape (1).

Other tools that have served in the production of clothes are spindle-whorls. Spindle-whorls are flat, disk-shaped, middle-perforated objects usually made of fine-polished slate, sandstone, limestone, or some other kind of sedimentary rock. Most have a diameter of 5-7 cm, while a few measure as little as 3 cm or as much as 10 cm. The inner diameter varies accordingly between 0.5 and 2.3 cm, but all specimens are thin (0.3-0.6 cm) and flat with slightly convex sides. The following types can be distinguished (Figure 5.60):

Type A: flat disk-shape (5);
- Type Aa: d-shaped cross-section (4);
- Type Ab: bi-point cross-section (1);

Type B: thick disk-shape (10);
- Type Ba: concave sides (6); and
- Type Bb: straight sides (4).

Another type of production tool that has been found exclusively at Huili Washitian, are open stone molds for metal production, one for 14 arrowheads, one for a *ge* halberd, and one for a knife or dagger (Figure 3.61). All of these molds are made of fine-ground sandstone, trapezoidal in form, but came to light in surface finds, so that their actual date and context is not quite clear.

III.4.3.2 Other Stone Objects

Apart from lithics serving as tools, there are also a considerable number of decorative objects made of stone, which were found mainly in graves and more rarely in settlement context. As the same kinds of ornaments occur in a number of different materials, including stone, bone, and tooth, and they will be described together under “III.6 Decorative Objects” after elaborating on the particularities of the other types of raw material. Only metal ornaments assume very different forms and will be described separately under III.5.3.2.

Other stone objects found exclusively in grave context, are round to slightly oval stone balls of 6-7 cm diameter placed in the leg or foot area of the deceased, indicating a ritual significance. They were reported only from graves in Huili and Yanyuan, while the even more frequently occurring flat oval cobbles placed in the head or pelvis area of the deceases were mainly found at the cemetery of Huili Fenjiwan. These cobbles are fairly homogenous in measurements (7-14 x 5-10 x 2-4 cm) and were made of smoothly ground yellowish-grey sedimentary rock of local origin, probably river cobbles smoothed by water and not by humans.

III.4.4 Connecting Form, Material, and Technical Details: Inferences on Production and Function

Overall, the main kinds of activities in which stone tools from the present assemblage were employed are woodworking; possibly planting, harvesting, hunting and fishing; food processing; and production of clothes, tools, and other objects, including stone, bone, and bronze tools and decorative items. Stone was also made into decorative items, some of which might have had ritual or talismanic functions. Stone – mostly slate and shale in some areas and igneous rock in others – was also used as building material for graves but never for living quarters. The kind of stone material employed differs according to function – abrasive sandstone was used for grinding tools, fine slate for cutting tools, and aesthetically pleasing but hard to work agate, turquoise, and nephrite for personal ornaments – but might also be related to material availability (Tables 3.14-16). The question of raw material choice will therefore be discussed further in Chapter VI when evaluating the differences in assemblage between individual sites and site types.

By absolute number, woodworking tools (axes, adzes, chisel) outweigh all other types, followed by agricultural tools (knives, shovels, plows, ring stones), percussion tools (pestle, hammer, chopper), multi-purpose flake tools (scraper, flakes, microliths), grinding tools (grinding slabs, rods, handstones), and finally tools employed in the production of clothing items (spindle whorls, needles, borer) and other objects. Decorative items are very rare. Nevertheless, the numbers also differ significantly between different sites and site types. As is to be expected, nearly all decorative items have been found in graves, so have many grinding rods, while all other tool types were nearly exclusively found in settlement contexts.

Stone objects recovered from graves are all finely ground and polished, while the material from settlement sites is much more diverse. Although the majority of stone tools from a settlement context are worked by grinding (64%), about a fifth are only flaked (18.5 %), and for 17.5 % of all stone tools both kinds of techniques were employed. These proportions differ significantly by site. For a few sites, the number of primarily flaked tools is significantly higher, for some the percentages are about even, but at most sites the primarily ground tools are in the majority. While at some sites finely worked tools are most common, at others the lithic assemblage is very coarse. A number of sites also revealed an assemblage about evenly composed of fine, medium, and coarsely worked objects, but most settlement sites are characterized by a mixed assemblage, mostly finely-, or medium-polished lithics with only some coarser material. This phenomenon will likewise be discussed in greater detail when evaluating the settlement material in Chapter IV.

III.5 Metal Objects

The material under consideration here encompasses 1999 metal objects, most of them made of bronze (1858, 93%), some of iron (84, 4%), silver (12, 0.6%), or gold (7, 0.4%), as well as some composite objects combining iron and bronze (38, 2%). Most are small personal ornaments (868 made of bronze, 16 of iron, 7 of gold, 12 of silver), but weapons and tools are very common as well (660 bronze, 64 iron, 38 composite). Functional items including food and drink vessels, coins, armor, and horse harness apparatus occur (all together 182 in bronze, 3 in iron), but are more rare. Objects of potential ritual significance such as staff heads, stands, small and large bells, and drums (148 bronze and 1 iron object) are also rare. All of these metal objects were retrieved from three settlement sites, 110 graves from 51 cemeteries, 11 surface collections, and two collections of material confiscated by the police from looted contexts. The confiscated objects, mostly weapons and so-called ritual objects, make up the largest portion of the material (41%). A significant number of objects were from surface collections or were reported without assigning the exact grave they came from (11.5%). More than half of all metal objects therefore have no good contextual information, while the remaining objects (47.5%) come from a small number of well excavated and well documented sites: Over 11% of all bronze finds (222 objects) were equally distributed over four graves at Yanyuan Laolongtou, and most of the personal ornaments were recovered from seven so-called megalithic graves with multiple interments.[65] The sample is therefore highly biased, a fact that needs to be kept in mind in all further analyses.

III.5.1 Material Preconditions, Manufacture, and Use

Metal is very different from other kinds of materials in that it is derived. As Franklin (1983) has pointed out, most kinds of metal, especially bronze, have to go through a long production process requiring great expertise, a number of different materials and production facilities, and organized labor. From ethnographic examples, it is known that metal production can be accompanied by extensive ritual acts and taboos. While certain actions in the production process

[65] These graves include Xichang Xiaohuashan M1 (159 objects, i.e. 8% of all bronze finds), Xichang Qimugou M1 (51 objects), Puge Xiaoxingchang BM1 (37), AM1, AM2, and BM4 (12 each), and Mianning Bahe Baozi M1 (34).

are based on technical necessities, others are purely social or ritualistic, but nevertheless perceived as equally indispensable by the participants even though these actions might extend the process or compromise the results.[66] Attempts to calculate the time and man-power needed to produce a given number of metal objects might therefore not be very useful, at least not in pre-industrial production cycles. As the ritual, social, and cultural aspects of bronze production in prehistoric Southwest China are unknown, I can only list the main steps that were technically necessary for prehistoric metal production.[67] These include:

- *prospecting*: locating surface outcrops of ores identifiable by color orindicator plants;
- *mining*: surface collection, open cast mining, underground tunnel and shaft ore extraction;
- *beneficiation*: crushing, hand-sorting, separation by wind or water (gold), washing and firing (tin);
- *preparation of working environment and tools*: building furnaces, forming crucibles, procuring large amounts of fuel;
- *smelting*: 1. roasting: low-temperature roasting to remove sulfur (copper); heating with air supply (silver); 2. reduction: crucible smelting (copper), smelting in bloomery or puddling furnace (iron);[68]
- *alloying*: addition of other substances alter melting point, fluidity, hardness, or color (in bronze mainly tin, lead, antimony, arsenic, aluminum; for iron mainly carbon);
- *forming*: casting (simple open mold, bivalve mold, piece mold, link casting, lost wax casting), hammering/smithing (hammering, grinding polishing, either as main forming method or for refining), incising, gilding, tin plating, inlay;
- *use*: usage transformation (worn / broken), maintenance (sharpening, mending), modification, smelting down to make different object(s); and
- *deposition or discard*: placement in grave, hoard, rarely loss or abandonment.

Although both extraction and processing of raw materials can leave traces in the archaeological record, few such remains have been found in the Liangshan area. The earliest

[66] A striking example is the production of Japanese swords, that can extend over a year if all traditions are observed, while a modern-day smith can produce a sword of equal quality within a month (Kapp, Kapp, and Yoshihara 1987).

[67] A comprehensive overview on the chaîne opératoire of prehistoric bronze production has been provided by Ottaway (2001), while Murowchick (1989) has given an extensive description of the techniques of bronze production in Southwest China. In later historic periods, the range of techniques used in metalworking has been developed further, but here I will only describe the processes that are likely to have taken place in prehistoric and early historic Southwest China.

[68] A large variety of different kinds of furnaces has been reported from around the globe. The only characteristics that they have in common is that they have to be able to produce and withstand extremely high temperatures, have openings for adding fuel and ore, and a system of controlled ventilation, usually through air-channels and bellows. For a few examples, see e.g. Hirschberg and Janita 1980.

evidence for local bronze production apart from the bronze objects themselves, are the open stone molds from Huili Washitian, a site that has been dated to the time period between Warring States and Western Han (481 BC - AD 9). These remains include one mold for a *ge* dagger-axe, one for 14 arrowheads accompanied by an arrowhead of the same type as would have been produced by said mold, and one mold for a *mao* spearhead. Surface-finds include a bronze *yue* battle-axe and a bronze *guan* bead. The site did not reveal any furnaces or other evidence for local bronze production. As the excavation work conducted at this site is rather limited, there might still be some undiscovered furnace remains below ground, but as neither survey nor excavation work have revealed significant amounts of ash or slag, it is reasonable to assume that any bronze production at this site was not extensive.

Nevertheless, some amount of local bronze production must have taken place, not only in Huili but also in Xichang, as the lump of bronze slag from Wanao M2 testifies. All specialized smelting sites in the research area are fairly late, most of them dating to the Ming or Qing period. Only four smelting sites can be attributed to the time of the Wang Mang interregnum (AD 9-220). All of these sites show clear Han cultural affiliation through numerous molds for Han coins, weapons, tools, and the Han style ceramics testify.[69] Furnaces have been reported from all four sites: at Xichang Majialin and Yanyuan Meiyuzhen rather simple round pits of about 1.5 m diameter were found, while the single furnace at Nantan has not been described in greater detail.

Xichang Dongping, on the other hand, has been extensively excavated, revealing large amounts of charcoal and red-baked earth in connection with 16 furnaces, seven ash pits, four sand pits, five ditches, three workshops, and five houses. All of these features were embedded in

[69] Xichang Dongpping held several molds for *wuzhu* and *huaquan* coins, molds for arrowheads, knives, spades, *wuzhu* coins, and *guan* jars like they are known from Wang Meng period graves in Guizhou, Guangzhou, and Chengdu. Xichang Majialin also revealed five coin molds, 17 bronze nails, and 2 small hammers. Xichang Nantan held a bronze *xi* basin, 1 *fu* pot, 1 *gui* tureen of distinct Eastern Han style, and Yanyuan Meiyuzhan revealed 600 *daquan wushi* 大泉五十 coins from the Wang Mang reign period.

layers 3 to 13 of 13 cultural layers extending over an area of 4000 x 250 m. The furnaces fall into six types: Type I is the simplest in construction, being long-rectangular or oval in form (1.8 x 1.2 x 0.3 m) with a round indentation in the middle.[70] Some furnaces of type I were fully or partially lined with stones, and all of them contained large amounts of grey-black soil, red-baked earth, ash, charcoal, and some ceramic sherds. Type II furnaces consist of an irregular oval pit (2.6-3 m) lined by stones with two parallel ditches on the bottom, which are connected by a third ditch forming an H shape. All construction parts were covered by masonry and the ditches were lined with a layer of clay. The entrance way is located between those two ditches, measuring about 0.4-0.6 x 0.6 m. Inside, pottery air nozzles, sherds, and bricks were found.

Furnaces of type III are round with slanted sides and a sloped bottom of around 3 m diameter and a depth of 1.1 m. [71] On one end, three ditches emerge from the furnace wall, each of them 0.6 m wide, 5-8 cm deep, and partially lined with bricks. Between two of the ditches, a further shallow pit was dug, probably as an air vent, and a heap of ash and charcoal was found close to it. The inside walls are lined with 0.45 m of red-fired earth consisting of several layers and indicating long-time usage. Type IV furnaces consist of an oval pit of around 2 x 1 m inside, with curved sides and slanted bottom, one ditch at the bottom running along the full length of the pit and an opening on one end. [72] The ditch is lined with fine hard-fired clay and there is a pile of stones on the opposite end of the opening. In front of the opening, a sand pit of 1.4 x 0.4 m has been discovered, filled with big lumps of red-fired earth, much slag, ore, bronze fragments, two pottery air nozzles, and ceramic sherds of jars and bowls. Eight postholes around the pit indicate the existence of further construction parts outside.

[70] Sichuan, Liangshan, and Xichang 2006: Figure 6-7.

[71] Sichuan and Xichang 1994: Figure 11.

[72] Sichuan and Xichang 1994: Figure 13.

The only known furnace of type V is square in shape (2 x 2 m) and completely built of bricks layered with stone and sandy soil (Sichuan and Xichang 1994: Figure 15, Sichuan, Liangshan, and Xichang 2006: Figure 8). At the time of excavation, the furnace was filled with grey earth, slag, ash, charcoal, and brick fragments, It also held 33 *wuzhu* coins with rough edges, indicating that they are half-finished products. Type VI is a long-rectangular brick furnace (2.9 x 0.9 x 0.86) in an oval pit. Some had a U-shaped pit of 2.8 x 0.8 x 0.2 m in the middle. The walls of the furnace were coated with clay that had been burned a reddish color, and the construction was filled with ash, red-fired soil, charcoal, and crucible fragments.

Other associated features connected with bronze production are seven ash pits, three potential workshops, and further building remains. The ash pits are all of medium size (1.5-1.7 x 0.9-1.6 x 0.2-1 m), irregular in shape, and filled with large amounts of ceramic sherds belonging to Han-style coarse jars, bowls, basins, and bricks, as well as some ash, and much red-fired soil. The building remains differ significantly from each other in construction: One is a pit house (1.3 m diameter, 1.9 m depth) filled with loose black soil, sherds of jars and molds, as well as large urns next to it, one of them filled with 16 *wuzhu* coins with rough edges. The excavators have therefore suggested that it might have been a water-station, used for cooling down coins during production. Three other features are rectangular in size (4.2 x 2.6 m) with an oval fire pit in the middle (0.45 x 0.3 x 0.12 m), filled with soft grey-black soil containing small amounts of red-fired earth pellets, and heavily fragmented fine ware sherds. The other features – all of them brick constructions – were heavily disturbed, but the ditches were lined with red-fired clay and filled with ash, copper and mold fragments, indicating a connection with bronze production.

These detailed observations show clearly that Xichang Dongping was a specialized bronze smelting site producing mainly Han coins. Besides production facilities, the site also held living quarters. The small number of metal knives and spades without corresponding molds found at the site indicate limited amounts of agricultural activities. As the main product were Han coins and the bricks and ceramics were of Han manufacture, it is reasonable to assume that this production site was not run by or for local people, but established by the Han. The mode of production observed here probably does not reflect traditional ways of metal working in the area, but techniques transferred from Han-inhabited areas. The composition of the coins produced here does nevertheless differ from similar objects found in Shaanxi or Shanxi, indicating a local source of raw material.[73] The bronze nails retrieved from the bronze production site in Huili were similar in composition to the locally produced Han coins, but much coarser in execution, indicating production from local material but for local use and not for wider distribution.[74]

Composition analyses have also been conducted for a small number of special objects from Huili and many more from Yanyuan. The *bianzhong* bells from Huili consist largely of copper (92.49 %) with only 7% tin, indicating an only rudimentary or non-existent mastery of alloying techniques (Tao Mingkuan 1982:217). The bronzes from Yanyuan, on the other hand, vary widely in quality and composition. They vary from objects with 85 % copper to objects with large amounts of tin and lead, but only around 67 % copper. This might be an indicator of differences in origin and/or function that will need to be examined in relation to the respective object types. Adding tin lowers the melting point of copper significantly, making the casting process much easier.[75] Tin increases the hardness of the resulting bronze and changes the color from red to silvery-white, adding both functional and aesthetic or symbolic benefits. On the other hand, large amounts of tin make the material brittle, an effect that can be off-set by adding lead.

[73] The coins from Huili have the following composition: 81.3 % Cu, 1.9 % Sn, 15.8 % Pb. For sites around Xi'an, for example they are usually around 77.6 % Cu, 8.1 % Sn, 7.33 % Pb (Sichuan and Xichang 1994:39).

[74] The composition for bronze nails ranges around 76 % Cu, 8.1 % Sn, and 14.2 % Pb, with some impurities.

[75] The information here and in the following was taken from Rapp 2009.

Adding aluminum strengthens the material and protects it from corrosion, while giving it a golden color. Both arsenic and antimony improve the flux, harden the bronze, make it less prone to corrosion, and give it a silver color. In an excavated object, the original color let alone the kind and amount of alloy is impossible to ascertain without elemental composition analysis, but some other manufacturing details can be inferred from macroscopic observations. These include:

- *base material*: bronze / copper, iron, gold, silver;
- *production technique*: double-sided mold, single-sided mold, forging;
- *coarseness*: very coarse, coarse, medium, fine, very fine;
- *both sides worked*: yes / no, and
- *decoration technique*: incising in mold, incising in metal, gilding, tin plating, and inlay.

As most of the material was only accessible through published drawings photographs, such detailed information is not always available unless provided by the excavators themselves. I therefore assume that the observations by the excavators are correct unless published pictures or personal inspection of the objects indicate otherwise. Traces of use or repair have only rarely been reported. Most information on intended use has to come from the object itself. The most common functions of metal objects and the material characteristics determining their function are:

Function	**Examples of Tool Types**	**Material Characteristics**
hunting, harvesting, food, processing, fighting	projectile point, axe, adze, hammer, chisel, hoe, spade, sickle, knife, sword, halberd	weight, balance, position, angle, and sharpness of cutting edge, overall form, quality, material, deposition context
horse gear	bit, cheek-piece, strap crossing	form, deposition context
armor	arm-guard, body-armor	form, material, quality, deposition context
personal adornment	bead, ring, pendant, hair needle, comb, belt buckle and appliqué, clothing appliqué, button	overall form, quality, material, amount and kind of decoration, deposition context
container	fu and mou pot, bei cup, guan beaker	form, deposition context;
construction	nail	form, deposition context
representation, symbolic function	various tool and weapon types, seal, coin	weight, balance, position, angle, and sharpness of cutting edge, overall form, execution, amount and kind of decoration, material, quality, deposition context
ritual	drum, bell, staff-head, vessel stand, figurines, any kind of object depending on the context	size, form, amount and kind of decoration, material, quality, deposition context.

The distinction between weapon and tool, and the identification of ritual, symbolic, and representational objects are problematic, particularly with objects from grave contexts. Any object placed in a grave does in a sense have a "ritual" function, but its real significance can only be inferred from a combination of technical execution/quality, post-production treatment, and exact placement. Assigning function is therefore much more complex than in the case of ceramics or stone tools found within settlement context, where form and use-wear often provide unambiguous indicators.

III.5.3 Object Forms

Unlike ceramics, broken metal objects are hardly ever discarded. Instead, they are melted down to form new objects. The objects available for archaeological analysis have therefore come down to us in a highly selective process. Most metal objects have been intentionally deposited in graves, while only very few have been lost or discarded in a settlement context, biasing the available material toward personal ornaments, weapons, and ritual objects. Measurements recorded for all kinds of objects include overall length and width, as well as length, width (or diameter), and thickness of each part (e.g. handle, blade, top, and bottom). Descriptive categories always include overall object form, top, bottom, sides, cross-section, as well as presence/absence, placement, technique, and type of decoration and other forms of surface enhancement (e.g. gilding). For weapons and tools, further aspects recorded include:

- *general form*: overall form, blade form (concave, convex, straight, broken), blade type (single-sided, double-sided, broken), form of cross-section, back, sides, middle-ridge blade (yes/no); and
- *form aspects applicable only to part of the material*: base form, handle shape, stem shape, pommel shape, sword guard shape, handle hole, blade hole.

The aspects recorded for metal ornaments as well as staff-heads and other objects of unclear function are usually much more limited. They include:

- *general form*: overall form, cross-section, top, base, sides, form of various parts;
- *anchor*: form, location, number; and
- *number of elements.*

The aspects recorded for metal vessels and objects such as bells, drums, and stands are naturally fairly similar to those used for ceramic vessels and do therefore not need to be repeated here. Overall, there is so much variability in the material that it is not very useful to list all possible attributes each variable can take. Instead, the differences in form will be discussed separately for each object category.

III.5.3.1 Weapons and Tools

The majority of metal weapons and tools are made of bronze (655 objects, 86.5%), with small numbers of iron (64; 8.5%), and some composite objects (38; 5%). Weapons with long double-sided blades such as daggers and swords are most common (165), followed by arrowheads (125), knives (123), spearheads (108), dagger-axes (71), and a few other weapons or weapon-parts, while out-right tools are rare (9). Long double-sided blades are usually referred to as *jian* 劍, i.e. swords or short-swords, but some of the shorter varieties could also have been used as daggers. I will refer to all of these as *jian* swords, which shall be defined as double-edged weapons for thrusting or cutting that consist of a distinct blade and handle. The measurements for the handle are naturally all very similar (7-8 cm long, 3-4 cm wide), only some being a little longer to balance out longer blades (Table 3.16). The majority of swords measures 20-40 cm in length (66.7%), but some are also significantly longer (up to over 60 cm, 17.8%), and a small number measures below 20 cm (15.5%). By far the most common are relatively long swords with a three-pronged hilt, torqued hyperboloid handle, oval pommel, and protruding middle-ridge on a willow-leaf shaped or triangular blade (type A, 69). Short swords with a double-circle pommel and a very straight form are less common (type B, 14), while all other forms are relatively rare and have been reported only from a small number of sites. The material can thus be grouped into the following types and subtypes (Figures 3.63-3.65):

Type A: three-pronged hilt, torqued hyperboloid handle, oval pommel, protruding middle-ridge on blade (69);

- Type Aa: flat pommel, short blade;
- Type Ab: oval-protruding pommel, sides of the hilt slightly concave;
    - Type AbI: medium-long blade;
    - Type AbII: long blade;
- Type Ac: oval-protruding pommel, sides of the hilt concave, protruding horizontal lines in between three prongs, giving an insect-shell like impression, very long, some composite weapons with bronze handle and iron blade;
    - Type AcI: handle plain or decorated with simple spiraling lines or cross;
    - Type AcII: spiraling decoration made of lines and rows of points;
    - Type AcIII: rows of points;
    - Type AcIV: rows of points combined with large tilted cross;
    - Type AcV: prongs only indicated by lines, no real prongs, coarse;
    - Type AcVI: handle straight, body flat, sides of upper part of the blade concave, coarse;
        - Type AcVIa: transverse lines on hilt, two decorative horizontal chains of circles on upper part of the blade;
        - Type AcVIb: three prongs indicated by rows of circles;
- Type Ad: oval-protruding pommel, sides of the hilt concave, 4-5 protruding horizontal lines in between three prongs ending in spikes protruding on both sides (insect-shell like), very long, mostly composite weapons with bronze handle and iron blade;
    - Type AdI: handle undecorated;
    - Type AdII: lines of points on the handle;
    - Type AdIII: lines of points and large tilted cross;
    - Type AdIV: tilted cross as only decoration;

Type B: double-circle pommel, straight handle, protruding middle-ridge on blade (14);

- Type Ba: two circles clearly separate;
    - Type BaI: two circles decorated with concentric spirals, hilt decorated with inverse triangles;
    - Type BaII: circles and hilt undecorated;
- Type Bb: three-circle pommel, handle decorated with double-row of circles, hilt decorated with inverse triangles;
- Type Bc: two circles close together, braided handle, composite weapon with bronze handle and iron blade;
- Type Bd: two circles connected in trapezoidal handle, indicated three-pronged hilt;

Type C: cobra-head shaped handle with symmetrical geometric decoration (6);
Type D: trapezoidal handle, sides concave, flat-oval pommel, short blade (6);
    Type Da: intricate incised ornaments on the handle, triangles on hilt;
    Type Db: handle braided;
    Type Dc: transverse lines on hilt, no clear hilt;
    Type Dd: vertical lines in lower part of the handle, otherwise undecorated;
    Type De: undecorated;
Type E: curved handle, short blade (2);
    Type Ea: pommel in fish-tail shape, fish-scale incisions, cicada-decoration on lower part of the blade;
    Type Eb: straight pommel, no decoration;
Type F: bent pommel in shape of an animal head (horse?), horizontal bands on handle, unclear decoration on hilt, cicada-decoration on upper 2/3 of the blade, short blade (1);
Type G: straight narrow handle with concave sides and fish-tail shaped pommel, short blade, protruding middle-ridge on blade, flat body (3);
Type H: straight handle, protruding middle-ridge on blade, short blade (9);
    Type Ha: no pommel, undecorated;
    Type Hb: irregular protruding pommel, cross on handle;
    Type Hc: oval-protruding pommel;
        Type HcI: transverse lines on handle;
        Type HcII: undecorated, coarse;
Type I: partially organic handle, round stem with horizontal rings (2);
    Type Ia: long, straight blade (blades of all other types willow-leaf shaped), narrow stem, two rings, flat oval-triangular knob, and
    Type Ib: three rings, broad stem, no pronounced knob, flat end, iron blade.

Apart from the more fully preserved swords that could be assigned to specific types, two blade fragments and 51 swords without form description have been mentioned in publications.

In most cases, both blade and handle are made of bronze (135, 84.4%). Some swords are composite objects with an iron blade and a bronze handle. A single weapon of type C was made completely of iron. Most composite swords fall into type Ad, with a few examples of type Ac (2), C (2), Dd and Ib (1 each). The vast majority of composite swords have been reported from Yanyuan. Most bronze swords were also found there. Only one blade fragment was made by forging, while most swords were produced from double-sided molds with some reworking of the blade and edges. A considerable number (21, 19%) were made from single-sided molds with only one side having been embellished and reworked. These coarsely made show-weapons were probably specifically made to be placed in graves, serving as *mingqi* symbolizing real weapons, mainly of type A, G, and H. In spite of sometimes very complex decorative patterns, the quality of the material and workmanship for all kinds of swords tends to be rather coarse. Furthermore, only one single sword of type AbI shows clear signs of wear on the blade. It is therefore not clear if these weapons were actually used or if they were purely decorative or symbolic in function.

The handles of most swords were decorated, and the protruding points, lines, and spirals would have ensured a firm grip, quite apart from being decorative. The torqued form and point patterns might also mimic organic bands coiled around or applied to a handle that originally consisted only of a narrow stem. The round or rhombic indentation at the end of many pommels might also be a typological rudiment of partially organic/partially metallic handles held together by a nail or thorn at the end. For type H, which describes a group of very coarse *mingqi*, the design on some specimens resembles that on some bronze weapons of type Ab, Ac, and Ad: horizontal lines following the body-shape and wing-shaped horizontal ribs with application points and sometimes outward-protruding sides in the part of the blade closest to the handle. These might also imitate fastenings as they would have been used to secure a metal blade to an organic handle. Other handle-forms are clearly decorative in nature, for example the scale-like motifs on fish-tail shaped handles on type E swords, the double-circle pommel with concentric lines of type B swords, or the horse-head shaped pommel of type F swords. Purely decorative are also the various geometric patterns on the sword guards of many types, and even more so the blade decoration on a small number of type E and F swords consisting of geometric or animal designs. A single coarse forged bronze blade fragment from Miyi Wanqiu is described as having characters incised on the blade, but they could not be deciphered and are hardly visible on the published photographs or rubbings. Besides these alleged characters, which would have been incised after forging the blade, all other decoration motifs were cast and maybe refined a little by hand to remove unwanted edges left by the casting process.

Further indicators of the presence of swords either made of organic material or in symbolic representation are scabbard tips, which have been reported in 17 cases. These metal objects are usually 3 cm long and 2 cm thick and vary in length between 4-5 cm and 7-10 cm. The scabbard tips fall into two main forms of rectangular/trapezoidal shape (type A) and tongue shape (type B). The following subtypes can be distinguished (Figure 3.66):

Type A: rectangular to slightly trapezoidal shape, downward slightly narrowing, ending in triangle widening into small foot, elevated middle-ridge on the back, decorated;
Type B: tongue-shaped, elevated middle-ridge on the back;
- Type Ba: long tongue-shaped with u-shaped top;
  - Type BaI: rounded tip;
  - Type BaII: angular tip;
- Type Bb: short tongue-shaped, straight top;
  - Type BbI: round bottom, rounded elevated middle-ridge; and
  - Type BbII: slightly pointed bottom, triangular elevated middle-ridge.

All scabbard tips are all made of bronze, carefully worked, and mostly covered in incised ornaments of spirals and curved lines, sometimes enclosed by a rectangular frame.

Just as the sword, the *ge* 戈 dagger axe or halberd has a double-sided blade as well, but is hafted in a perpendicular fashion, being thus significantly shorter with a wide flat butt, a blade that is wide outward-flaring towards the hilt, and a clear break between butt and blade. The butt is always rectangular in form and usually has one large perforation in the middle for hafting. The hilt or blade can also be perforated to help secure the weapon on a wooden handle. Both sides of the blade are usually evenly curved and the tip is wide and rounded. Most dagger-axes have a length of 23-28 cm and a width of 7-10 cm, the butt usually being about three times as long as the blade, and with a length to width ratio of 3-4 to 1 for the overall weapon and 2-3 to 1 for the blade (Table 3.17). Only very few weapons are as long as 29-33 cm or as short as 16-20 cm. The smaller versions mostly have a very narrow blade, were produced in a single-sided mold, worked from only one side, and are very coarsely made, indicating that they might be symbolic in nature rather than objects of actual use. They can therefore be placed in a separate group of undecorated coarse *mingqi ge* dagger-axes with straight sides with the following subtypes (Figure 3.67):

Type A: swallow-shaped end of butt (2);
Type B: V-shaped end of butt (3);
Type C: knob-shaped pommel at end of butt (1); and
Type D: W-shaped end of butt (1).

All other *ge* dagger-axes can be grouped into the following types (Figures 3.68-3.69):

- Type A: long-triangular blade with concave sides, outward-flaring towards the hilt (54);
  - Type Aa: end of butt W-shape indented (20);
    - Type AaI: both butt and lower part of the blade covered in dense axially symmetric geometric decoration, rectangular perforation in butt, additional middle-perforation in lower part of the handle;
    - Type AaII: simple decoration on both butt and blade; rectangular perforation in butt, additional middle-perforation in lower part of the handle;
    - Type AaIII: intricate decoration on butt, rectangular, oval, or rhombic hole in butt, some with additional hole in lower part of blade;
    - Type AaIV: only blade decorated;
    - Type AaV: no decoration, crudely executed, some with additional perforations;
  - Type Ab: end of butt straight with pointed middle-protrusion and sometimes slight protrusions on the sides (*shan* 山-shaped) (10);
    - Type AbI: blade with tongue-shaped ornamentation-field filled with axially symmetric geometric motifs;
    - Type AbII: concentric circles and rectangles all over blade;
    - Type AbIII: undecorated;
  - Type Ac: end of butt straight with square middle-protrusion, broad butt (1);
  - Type Ad: end of butt V-shape indented, middle-ridge (12);
    - Type AdI: blade ornamented, hole in butt;
    - Type AdII: blade undecorated;
      - Type AdIIa: hole in butt;
      - Type AdIIb: no hole in butt;
  - Type Ae: end of butt straight (6);
    - Type AeI: no middle-ridge;
      - Type AeIa: hole in handle and lower part of blade;
      - Type AeIb: no holes;
    - Type AeII: middle-ridge, no holes;
  - Type Af: swallow-tail shaped butt, middle-ridge (2);
- Type B: pentagonal blade, middle-ridge, long-trapezoidal handle, slightly convex end (1); and

Type C: long-triangular blade with sickle-like extension on the lower side (hu), oval hole in blade close to the hilt (1).

Type A *mingqi ge* dagger-axes are most similar to full-fledged dagger-axes of type Af. Type B resembles type AdIIb, while type C might be an imitation of type AeII. Type D can be connected to type AaV. Except for two objects of unknown type, which have an iron blade, all other dagger-axes are made of bronze and formerly had a wooden handle. Except for the *mingqi*, all dagger-axes have been cast in double-sided molds, worked from both sides, and are of medium quality with no traces of use-wear.

The majority of dagger-axes (71.4%) are decorated, mostly on the blade with a sunk-relief pattern of concentric circles and squares in a triangular frame with curved sides following the shape of the weapon (48%), while others just have simple circles, lines, triangles or zigzag but without a frame around them. Half of all dagger-axes with some decoration on the blade also have a decorated butt, mainly an incised rectangular decoration-field with W-shaped end and spirals and curved-line patterns inside, while less than one third are decorated with similar patterns but without a frame around them. One specimen shows an ox-head within a decoration-field. Geometric ornaments can also be seen on the butt of five weapons whose blade is not ornamented. Except for complete dagger-axes consisting of butt and blade, four separate butts of dagger axes have been found that showed no traces of a blade (Figure 3.70). All of them showed elaborate symmetrical geometric patterns within a rectangular decoration-field with one W-shaped side. It is unclear if the blade of these weapons was destroyed in some fashion or if the butt was meant to stand alone, serving as *pars pro toto*. In any case, the elaborate decoration on the separate butts as well as on many full weapons shows their decorative function and also gives some indication that they were probably mounted with a narrow wooden handle fixed close to the blade, as anything else would have covered the decoration.

Another halberd or trident form is the *ji* 戟, which has an elongated blade resembling a narrow spearhead and a second smaller triangular blade on the side. The single specimen found in the Liangshan Area had an iron blade, a bronze tang, and was mounted on a wooden staff. It measured 20.6 cm in length, 12.6 cm of that length being reserved for the blade, which had a width of about 2 cm, while the lower part measured 2.8 cm in diameter. The end of the shaft was enhanced by two parallel protruding rings, but no further decoration was applied.

Mao 矛 spearheads are much more common in the overall assemblage than halberds or tridents. They either had a hollow socket with our without two small loops on the side, a flat-rectangular handle, or a massive round socket, while for the blade willow-leaf, narrow willow-leaf, long oval, small broad leaf, and rhomboid forms can be distinguished, resulting in the following types and subtypes (Figures 3.71-3.72):

Type A: socketed, with cast side-loops;
- Type Aa: willow-leaf shaped blade, pointed, long socket;
  - Type AaI: long blade;
  - Type AaII: short blade;
- Type Ab: narrow willow-leaf shaped blade, pointed, long socket;
  - Type AbI: decorated;
  - Type AbII: un-decorated;
- Type Ac: long-narrow leaf-shaped blade, rounded tip, medium-long socket;
  - Type AcI: blade decorated;
  - Type AcII: handle decorated;
  - Type AcIII: undecorated;
- Type Ad: long narrow oval blade, very long socket;
- Type Ae: short broad leaf-shaped blade;
  - Type AeI: long socket, narrow middle-ridge;
  - Type AeII: medium-length socket, wide triangular body extending into blade;

Type B: socketed, no side-loops;
- Type Ba: long blade with straight sides and pointed tip;
- Type Bb: long leaf-shaped blade, long to medium-sized socket;
  - Type BbI: middle-ridge;
  - Type BbII: triangular socket protruding into blade;
  - Type BbIII: no ridge;
- Type Bc: long-oval side-indented blade, long socket;
- Type Bd: small broad leaf-shaped blade;
  - Type BdI: long triangular socket;

Type BdIa: middle-ridge;
Type BdIb: no middle-ridge;
Type BdII: thin staff-shaped socket, middle-ridge;
Type Be: squat triangular socket extending into blade, small blade;
Type BeI: oval blade;
Type BeII: willow-leaf shaped blade;
Type Bf: rhomboid blade;
Type BfI: folded sides;
Type BfII: middle-ridge;
Type C: flat-rectangular socket, triangular blade;
Type D: massive round socket;
Type Da: long blade with straight sides and pointed tip, long staff-shaped handle; and
Type Db: long-rhomboid blade, short staff-shaped handle.

The vast majority of spearheads are made of bronze and mounted on wooden staffs (82.6%). The few specimens made of iron also differ in form from their bronze counter-parts. Most of them have a massive round or flat-rectangular socket and only rarely a hollow socket without side-loops, while the blade form can differ. The largest of all spearheads, a 37 cm long specimen of type Da with a very large and wide blade of 19 x 4.5 cm, was also made of iron and too badly corroded to allow for conclusions on the production technique. Most of the other spearheads were cast in double-sided molds, but three bronze specimens of type Bf and type C seem to have been completely or partially forged.

The spearheads vary widely in size with no apparent correlation to any of the types distinguished here (Table 3.18). The majority measure between 13 and 22 cm in length and the blade is usually about 3 cm wide, with a ratio of blade length to width of 3.5-4.5 to 1. A few spearheads are as short as 9-11 cm (most of them belonging to type Bd or other subtypes of type B) or as long as 23-27 cm (mostly type Ac or other subtypes of type A), with the singular iron spearhead of 37 cm length. Decoration is very rare, occurring on only eight bronze and two iron specimens. The blades of some spearheads of type Ab or Ac carry an oval decoration field filled with triangles, and a few staffs of type A or B spearheads have incised or protruding horizontal lines on the lower end. While less decorative, the spearheads are of higher quality than the other weapons introduced so far and might have been used for practical and not just symbolic purposes. A further indicator for the presence of either spears or other objects with a long wooden handle are two hollow conical objects of about 3 cm diameter found in graves – one of them made of bronze, the other of iron – that might have been mounted at the end of such long staffs.

The most common kind of projectile points found in graves and sometimes settlement layers are arrowheads, 125 of bronze, three of bone, and two of wood. The forms are essentially the same for all three kinds of material, and the measurements are similar as well, with an average length of 4-5 cm and a width of 1-2 cm, but the stone arrowheads are all rather thin with 0.2-0.3 cm, while those made of metal can be as thick as 1 cm. Both wooden arrowheads and all but four bronze arrowheads have a stem, but 2/3 of the stone arrowheads have no stem (Table 3.19). The majority of long-stemmed staff-shaped arrowheads (type IAb) were made of stone, while there is a greater variability in those made of bronze, with a certain preference for type IDbI (triangular double-winged arrowheads with a narrow tip and no hook). For stone arrowheads without a stem, narrow bi-point (type IIA) and lanceolate forms with a straight base (type IIBa) occur about equally often, while all other forms are rare. Two of the four bronze arrowheads without a stem also belong to type IIBa, but in the variety with straight sides and no downward-narrowing. The other two bronze arrowheads are of type IID (narrow-triangular with slightly curved sides), a relatively rare type that occurs both in stone and bronze.

The preference for very long stems and narrow shape for wooden arrowheads can be easily explained, as this form would give them more force and allow them to penetrate a target in spite of the softer raw material. Such arrowheads are likely to have been used on very small game such as birds. The preference for narrow staff-shaped forms with stemmed bone arrowheads might have a similar functional explanation. Bronze arrowheads usually have a slightly wider blade, but also have narrow tip angles of around 25°. Considering the usual form of molds in which arrowheads are made – large molds making about a dozen arrowheads at a time, all of them connected at the stem and forming a tree to allow for easy pouring and distribution of the molten metal – stemmed arrowheads are the natural choice. Stone arrowheads without a stem are easier to make and less prone to breaking then stemmed ones. The correlation between specific forms and certain kinds of raw material can therefore easily be explained by practical concerns, but cultural and temporal factors might have played a role as well. This question can best be examined through distribution maps and find context, a question that will be addressed in Chapter VI.

The main object categories that could be classified as either weapons or tools are axes and knives. For axes, the excavation reports distinguish between three groups: straight-sided *fu* 斧 axes, shouldered *yue* 鉞 axes, and circular *qi* 戚 axes. All of them are hollow and used to be mounted on a wooden shaft. The measurements for *fu* and *yue* are similar, but *yue* tend to be wider in the blade. *Fu* axes can be assigned to the following types and subtypes (Figure 3.73):

Type A: rectangular blade (3);
- Type Aa: rectangular cross-section, straight blade;
- Type Ab: oval cross-section, convex blade;

Type B: long-trapezoidal with slightly concave sides, convex blade (22);
- Type Ba: forged, flat (3);
  - Type BaI: bi-convex cross-section;
  - Type BaII: trapezoidal cross-section;
- Type Bb: cast, bi-convex cross-section (5);
- Type Bc: cast, oval cross-section (11);
- Type Bd: cast, rectangular cross-section (3);

Type C: short-trapezoidal, convex blade, oval cross-section; and
Type D: long-trapezoidal with slightly concave sides, oval blade, rounded edges, oval cross-section.

The majority of *fu* axes measures 8-12 cm in length, 5-7 cm in width at the blade and 4-5 cm at the handle with a cross section of around 2.5 cm. One single axe of type Bb is exceptionally large (21 cm length, 7.5 cm width) while the overall proportions and other characteristics do not differ from any other instantiations of the same type. A small number of other axes are particularly small, measuring only around 6 x 4.5 cm (type BaI and C). While the small specimen of type C is of high quality, the small type BaI axe is extremely coarse and forged. All other *fu* axes of type BaI, Bb, and C are cast from double-sided molds and are of fine to medium quality. Noteworthy in workmanship are also the two type Aa axes, which are made of iron instead of bronze. The two iron axes are rectangular with straight sides instead of the trapezoidal form with curved blade common to all other *fu* axes. Their size and dimensions do not differ from the other *fu* axes and the two protruding parallel lines at the opening are also common to some other *fu* and many *yue* axes. Among *fu* axes, these parallel lines are very rare, being restricted to one specimen each of type Aa (here combined with further coarse line application on the blade), Ab, Bc, and C. Other kinds of decoration – in one case a small protruding cross, in the other incised circles, both on the lower part of the blade – are restricted to the very carefully executed type D. The *yue* axes can be placed in the following types (Figures 3.74-3.75):

Type A: round blade, round shoulders, short neck (eye);
- Type Aa: bridge-shaped protruding line on blade;
- Type Ab: protruding horizontal lines;
- Type Ac: protruding horizontal lines and other decoration;
- Type Ad: no decoration;

Type B: round blade, round shoulders, high neck, oval or bi-convex cross-section;
- Type Ba: decorated;
- Type Bb: un-decorated;

Type C: long-oval blade, round shoulders, oval cross-section, short neck (eye), protruding horizontal lines and other decorations;

Type D: round to oval blade, flat angular shoulders, protruding horizontal lines;
- Type Da: short neck, rectangular cross-section;
- Type Db: medium-high neck, bi-convex cross-section;

Type E: D-shaped blade, angular shoulders, medium-high neck;
- Type Ea: oval cross-section;
  - Type EaI: protruding horizontal lines;
  - Type EaII: no decoration;
- Type Eb: bi-convex cross-section;

Type Ec: rectangular cross-section;
Type F: curved blade, angular shoulders, very high neck;
Type G: round blade, round shoulders, stout neck, rectangular cross-section;
Type H: spade-shaped flattened blade;
Type I: oval, round shoulders, middle-indented bi-convex cross-section;
Type Ia: slightly elongated;
Type Ib: stout;
Type J: nearly square with rounded blade, bi-convex cross-section, narrow hafting-hole; and
Type K: hammer-shaped head, long-narrow neck.

Y*ue* axes are between 7-12 cm long, 4-8 cm wide at the blade and 3-5 cm around the handle, with a proportion of length to width of 1.5-2.5 to 1. There are a few remarkable exceptions, e.g., a group of small axes (4.7-6.6 cm in length), which are nevertheless as finely executed as the larger specimens, and occur in many different form types. Particularly wide axes all belong to type I. Type F is generally much more narrow than other types without being particularly long (L:W = 2.5-3.2:1). The majority of *yue* axes are decorated (65.5%), mostly with the protruding horizontal double-lines also observed for some *fu* axes, or with bridge-shaped protruding lines or double-spirals, but only very rarely with incised horizontal lines or circles. These different kinds of decorations occur on all different types of *yue* axes except for type B, G, I and J, which are all fairly rare and more coarsely worked than most other axes.

The single *qi* axe that has been reported is a very finely worked object consisting of a completely circular blade with narrow-trapezoidal haft and an intricate incised design showing a snake, combined with two protruding parallel horizontal lines on the haft (Figure 3.76). This lavish design combined with the round blade, which would make it rather useless as a tool, testify to the symbolic function of this object. All other metal axes with their simple and fairly standardized form, limited decoration, but good technical execution, could have been objects of actual use, although macroscopic observations do not reveal any traces of use-wear.

Another object type that – just as the axes – could have served as either weapon or tool is the knife, which has been reported in a wide variety of different forms. A knife is generally a single-bladed short cutting tool and usually has a handle. In the excavation reports, the terms *xiao* 削 and *dao* 刀 have been used largely interchangeably for these kinds of objects, *xiao* being mostly but not exclusively reserved for ring-headed knives, and *dao* for most other forms. Given this lack of consistency, I will only use the term "knife." The knives from the Liangshan Area primarily differ in handle and pommel form as well as in the shape of their back. Overall, the following types and subtypes can be distinguished (Figures 3.77-3.79):

Type A: ring-headed knife;
- Type Aa: arched back, concave blade;
  - Type AaI: three-pronged sword-guard (*shanzi ge* 山字格);
  - Type AaII: curved line between handle and blade;
  - Type AaIII: no demarcation between handle and blade, incisions;
- Type Ab: arched back, straight or slightly concave blade;
  - Type AbI: three-pronged sword-guard (*shanzi ge*);
  - Type AbII: curved line between handle and blade;
  - Type AbIII: no demarcation between handle and blade, incisions;
  - Type AbIV: no demarcation between handle and blade, undecorated;
- Type Ac: slightly arched back, tip curving upward; straight or slightly indented blade;
  - Type AcI: decorated;
  - Type AcII: undecorated;
- Type Ad: slightly arched back, strongly upward-curving tip, straight blade;
- Type Ae: slightly arched back, straight to slightly concave blade;
  - Type AeI: indicated double-curved line between handle and blade;
  - Type AeII: no demarcation between handle and blade, no decoration;
- Type Af: straight back;
  - Type AfI: slightly convex blade;
  - Type AfII: straight blade;
  - Type AfIII: straight blade, long-narrow blade and handle, large ring-shaped pommel;
- Type Ag: straight back, rectangular blade;
- Type Ah: overly long, narrow straight blade, blade and handle bleeding into each other;
  - Type AhI: large round-oval pommel;
  - Type AbII: outward and downward-curving three-dimensional double-spiral;

Type B: end-perforated knife;
- Type Ba: medium-long handle, triangular-thickened middle-perforated pommel with rounded corners;
- Type Bb: long-narrow handle and blade, end-perforated;
  - Type BbI: convex end, round hole;
  - Type BbII; straight end, D-shaped hole;

Type C: double round pommel, long-rectangular holes along middle of the handle, line-decoration;

Type Ca: arched back, straight blade, flat double-circle pommel;
Type CaI: three-pronged sword-guard (*shanzi ge*);
Type CaII: curved line between handle and blade;
Type CaIII: no clear demarcation between handle and blade;
Type Cb: arched back, concave blade;
Type Cc: straight back, slightly curved blade, slightly upward-curving tip;
Type D: trapezoidally-widening head with rounded corners, long-rectangular holes along middle of the handle;
Type E: slightly trapezoidal handle with concave end, long-rectangular holes along middle of the handle, blade narrower and thinner than handle, clear demarcation;
Type F: rectangular plain handle;
Type Fa: broad handle, straight blade, back of blade arched, back of handle straight, curved decorative lines on upper part of the blade;
Type Fb: narrow handle, arched back, straight blade, some with lines on blade, coarse;
Type Fc: narrow handle, straight back, straight blade, triangular blade, lines on blade, coarse;
Type Fd: long-narrow body, slightly curved back, straight blade, coarse;
Type G: flat round pommel, triangular blade with rounded tip, undecorated, flat;
Type H: organic handle, long-narrow iron blade with long-pointed thorn/stem;
Type Ha: centered stem, clear demarcation between stem and blade (looks nearly like a sword but had only one cutting-edge);
Type Hb: stem at upper rim, no clear demarcation between stem and blade; and
Type I: D-shaped knife, straight blade, high-arched back, single perforation in middle of back.

The majority of knives measure 15-30 cm in overall length, and 2-3 cm in width, with a ratio of blade to handle between 1.8:1 and 3:1. Some are longer than 30 cm, with one single very coarse iron specimen even measuring 61.2 cm in length. Some very coarse iron or bronze knives can be as short as 7-10 cm, without any apparent correlation with any specific type (Table 3.21). Knives with a rectangular plain handle (type F) tend to be shorter than average, and some varieties of the ring-headed knives tend to be overly narrow and longer than average (type Ah), but most forms occur in various sizes. A little smaller than average (15.8 cm long, 4.6 cm wide) and remarkable in form is also the single knife of type I. It is D-shaped and single-perforated such as the stone-knives described above. This bronze knife might therefore be an imitation of the stone versions and more of symbolic than practical use.

The majority of knives consist of a bronze blade and handle worked from one piece (97 of 123, i.e. 79%) and they occur in all forms. Most ring-headed knives with a straight back are composite weapons consisting of an iron blade and a bronze handle (8, 6.5%). Knives with an iron blade and handle (13, 10.5%) are usually straight, very narrow and often overly long, belonging to type Ag, Ah, or H. For a number of iron knives, the handle has not been preserved, suggesting the use of organic material (5, 4%). Most knives (79% of the bronze, as well as all iron and composite knives) are of coarse quality, made from single-sided molds, and only embellished on one side. All knives with a double-round pommel (type C) and a few examples with a trapezoidal head (type D) are significantly more refined in craftsmanship, probably made from double-sided molds, and embellished on both sides. One of those nicely made knives of type D also shows clear signs of wear and re-sharpening, while for the other specimens no clear traces of use-wear have been reported. One single knife, the only example of type G, has probably been forged, and is of particularly coarse quality. It is furthermore undecorated.

All knives of higher quality made from double-sided molds, on the other hand, bear some form of decoration. Overall 42 of the bronze knives have been decorated on handle, blade, pommel, or all three zones, in a combination of incised lines, waves, or zigzag, protruding points, and cut-out geometric forms (Tables 3.22-3.23). Blade decoration is never protruding and usually limited to horizontal lines, lines following the shape of the blade, or triangles or transverse lines at the widest part of the blade close to the handle. The pommel decoration is likewise usually incised (probably produced by protrusions in the mold) and usually consist of lines or concentric circles following the pommel shape, or more rarely spirals or double-spirals.

For type A knives, a combination of incised lines following the object form on both handle and pommel; only rarely do the triangles on the blade stand alone (Table 3.24). The handle of most type C knives is decorated with lines of cut-out rectangles between horizontal lines, most often combined with horizontal lines or triangles on the blades and concentric circles on the pommel. All type D knives are decorated with cut-out triangles and lines or only zigzag on the handle and horizontal lines on the blade. Many type F knives carry the horizontal lines on the blade, sometimes combined with protruding horizontal lines on the handle. A few specimens of type A, C, and E are embellished solely with cut-out triangles and lines on the handle. The majority of knives (62%) remain undecorated. Given the relatively low quality, most knives might have had a symbolic rather than a practical function. Their placement in graves and mostly in between bones would suggest that they were part of the personal attire, be it as personal weapons or tools or both.

Objects more clearly identifiable as tools are the small number of bronze chisels, a burin, several hoes, a sickle, a bronze fishhook, and an iron spade. The *zao* 鑿 chisels fall into the following types and subtypes (Figure 3.80):

Type A: hollow chisel-head, originally mounted on wooden handle, convex blade (5);
- Type Aa: long-narrow, slightly inward-curving sides, hexagonal or round cross-section, thin walls (4);
- Type Ab: short, rectangular cross-section, thick walls (1); and

Type B: complete chisel made of bronze, organic string wound around lower part as handle, slightly downward-widening (1).

The chisels measure 6-9 cm in length, 1.2-1.4 cm in width, with a thickness of 1.2 cm, and are sometimes decorated with horizontal incision or application lines. They are fully worked from both sides, but the production technique remains unclear. They are much smaller and thinner than stone chisels and it remains questionable how efficient they would have been as tools. The usefulness as a tool is also questionable for the single small long-pointed burin, termed *kedao* 刻刀 by the excavators, which narrows towards the slightly convex tip, has a rectangular cross-section, and was probably hafted by winding organic material around the lower part of the object. Five hoes (*chu* 鋤) have been reported from the single find of Yanyuan Longtan but no further details are known about their form or quality. The single bronze sickle reported from the research area is poorly preserved, but it is still clear that the blade was thin and crescent-shaped, slightly convex, with a rectangular cross-section, and a wide eye-shaped hole to attach it to a wooden handle. The fish-hook was forged of a small piece of bronze, while the spade was made from iron formed in a double-sided mold. The spade is u-shaped, with a convex blade and a rectangular cross-section, and measurements of 11 x 9 cm. The blade used to be mounted on a wooden handle, as the organic remains in the u-bent show. All these tools have been found in graves and it is unclear if they showed any traces of use-wear. In any case, their connection with a burial makes clear that at the point of deposition they had attained a symbolic or ritual function independent of any practical function they might have had previously.

III.5.3.2 Personal Ornaments and Clothing Applications

Metal ornaments are even more numerous than metal weapons. The majority of metal ornaments is made of bronze (869 of 904, i.e. 96%). Only 16 consist of iron, 12 of silver, and 7 of gold. Most common are bracelets and other kinds of decorative rings, buttons and clothing applications, as well as hair ornaments. For bracelets, the two terms of *zhuo* 鐲 and *huan* 環 are used. Technically, a *zhuo* should have a round or oval cross-section while a *huan* should be a flat, middle-perforated disk, but in excavation reports and secondary literature alike, the two terms are used largely interchangeably. I will therefore use the term "bracelet" for all kinds of band- or ring-shaped ornaments of an appropriate size to have been used as arm-decoration. From the technical point of view, two major differences can be observed among the bracelets: some are open (type A) while others are closed (type B). For both types, we can distinguish between flat bands, high bands, ring-shaped, and broad wrist-guard type objects. The main types and subtypes are thus (Figures 3.81-.3.82):

- Type A: open (143);
  - Type Aa: flat band (33);
    - Type AaI: concave sides;
    - Type AaII: straight sides;
      - Type AaIIa: two parallel application lines;
      - Type AaIIb: two application-lines crossing each other;
      - Type AaIIc: complex decorative patterns;
      - Type AaIId: no decoration;
    - Type AaIII: thickened outward-protruding middle, several horizontal application bands;
  - Type Ab: high band (15);
    - Type AbI: several parallel application bands;
    - Type AbII: complex decoration of fish-bone pattern, application points, and lines;
    - Type AbIII: two incised zigzag-bands;
  - Type Ac: ring-shaped (95);
    - Type AcI: concave-convex cross-section, curving outwards;
    - Type AcII: concave-convex cross-section, curving inwards;
    - Type AcIII: straight sides;
      - Type AcIIIa: with curved-in ends;
      - Type AcIIIb: with application-points;
      - Type AcIIIc: saw-tooth pattern;
      - Type AcIIIc no decoration;
    - Type AcIV: torqued ring;
    - Type AcV: round or oval cross-section;
- Type B: closed (63);
  - Type Ba: flat band (22);
    - Type BaI: with bi-convex shape, trapezoidal / rectangular cross-section;
    - Type BaII: round shape and rectangular cross-section;
      - Type BaIIa: two rows of points at closure;
      - Type BaIIb: no decoration;
    - Type BaIII: concave sides;
    - Type BaIV: clamp-shaped cross-section;
    - Type BaV: thickened outward-protruding middle;
  - Type Bb: ring-shaped (37);
    - Type BbI: concave-convex cross-section, curving outwards;
      - Type BbIa: with application-point decoration;
      - Type BbIb: no decoration;
    - Type BbII: round to oval cross-section;
    - Type BbIII: layered, middle-ridged;
  - Type Bc: wrist-guard, decoration of line of protruding points on both ends, in between cut-out triangles and fishbone-decoration (4);
    - Type BcI: long, concave sides; and
    - Type BcII: short, straight sides.

Open forms are more common than closed forms, and ring-shaped bracelets outweigh all other types. Bracelets usually measure 5-10 cm in diameter. The ring-shaped ones are 0.2-2 cm wide and the band-shaped ones measure 2.2-4 cm wide, with the exception of the wrist-guard shaped specimens (type Bc) that can be over 6 cm wide. The material is usually very thin (0.2-0.5 cm on average) and very finely hammered or sometimes torqued (type AcIV). Only some of the ring-shaped specimens, especially type AcI, AcII, and BbI (i.e., bracelets with a concave-convex cross-section), might have been cast. They are nearly identical in form, and undecorated (type Ac). They were all retrieved from the same cemetery of Puge Xiaoxingchang, most of them from grave M1. As this grave held over 82 skeletons, the bracelets probably did not all belong to a single set worn by one person, but rather show a common custom of adornment for a certain group of people that were buried in the same place and fashion.

The vast majority of bracelets were made of bronze (220 of 236, i.e. 93.2%). One bracelet of type AaIIb was also gilded. Four bracelets of an unknown type were made of silver, and 12 bracelets of type Ac were made of iron. Less than a third of all bracelets were decorated (73, i.e. 31%), and all of these were made of bronze. Most common are simple application points as well as protruding horizontal bands, which occur on a number of different form types, sometimes in combination with incised line pattern, zigzag pattern, fish-bone pattern, and/or cut-out geometric forms. A pair of points or bands are often used as end- or closing-decoration and can be combined with other decorative elements. Saw-tooth pattern, cross-pattern, and zigzag-bands always occur alone. *Shan* 山-shaped incisions have only been observed in densely decorated bands together with spirals, concentric circles, zigzag, and cloud motifs. The broad cylindrical objects of thin bronze that have been classified as "wrist-guard like" (type Bc) are all densely covered in decoration, both protruding and incised. These bracelets are long enough to be part of an archer's wrist-guard and might thus have both a decorative/symbolic and a practical function.

Other kinds of decorative rings include finger rings.. They fall into the following types and subtypes (Figure 3.83):

Type A: open (11);
 Type Aa: flat band (6);
 Type Ab: ring with round crossection (5);
Type B: closed (14);
 Type Ba: flat band with chain attached to the side (7), and
 Type Bb: ring with round crossection (7).

The finger rings are mostly forged, made of bronze, undecorated, and measure 1.4-2.4 cm in diameter with a width of 0.25-0.4 for ring- and up to 2.4 cm for band-shaped rings. Three rings of type Bb were made of silver and one ring of type Ab was made of iron. The only decorated rings are those of type Ba, which consist of a flat band with application points or thin incised line decoration and a small multi-part ring-chain attached to the side that ends in a small flat oval-shaped pendant.

A number of small closed bronze rings with round cross sections have been found that are too small to be actual bracelets, but too wide for finger-rings. Two of them are connected with a little hook that was only loosely attached but would have made them into earrings or other kinds of pendants. This kind of object has therefore been classified as "decorative rings" of the following two types (Figure 3.84):

Type A: earring (2); and
Type B: ring of unclear function (11).

Another group of bronze rings of unclear function are flat and closed in form, with an outer diameter of 5.2-6.8 cm, an inner diameter of 2-4 cm, and a thickness of 0.3-0.5 cm. They have usually been called "*huan*" 環, a term derived from jade objects from the Central Planes, which are indeed very similar in form. Most *huan* rings have a collar protruding from the inner rim (type B), and more than half of these collared rings are decorated with incised nested zigzag lines (type Ba), resulting in the following types and subtypes (Figure 3.85):

Type A: broad flat ring, d-shaped cross-section, protruding rectangle in one corner (2);
Type B: collared ring (16);
    Type Ba: nested zigzag decoration (9);
    Type Bb: undecorated (7); and
Type C: thin flat ring (3).

The production technique for these objects is unclear, but both mold-casting and forging or a combination of both are conceivable. The decoration is very intricate and consists of thin lines and points that are most likely to have been incised rather than molded.

The thin application bands of unclear function that have mainly been reported from Yanyuan are also likely to have been forged and then decorated by cold-needle incision and cutting. These bands are all equally thin, measuring only 0.1-0.3 cm in thickness, but they differ widely in all other dimensions. Some are short gold strips of only 6.2 cm length and 1.9 cm width with incised curved lines. Others are long bronze bands of sometimes over 50 cm length and a width of 1-2 or 3-4 cm. Overall, the following types and subtypes can be distinguished (Figure 3.86):

Type A: short wave-incised gold-bands, 6.2 x 1.9 x 0.1 cm (1);
Type B: long broad strip-shaped bronze ornament, anchors on both ends, ~50 cm (3);
    Type Ba: very long, ~50 cm, undecorated (2);
    Type Bb: long, ~30 cm, cut-out decoration (1);
Type C: long thin strips, flat, triangular broadened and perforated at both ends, ~ 30 cm (2);
Type D: long thin strips, round cross-section, no visible anchor, ~ 25 cm (3); and
Type E: long, broad, thin, curved D-shape cross-section, trapezoidal anchors on both sides, ~25 cm (2).

How these bands were used is unclear: Some had hooks, narrow bands, a trapezoidal thickening, or triangular or oval holes at both ends that might have served for fastening the band to some kind of organic material or connect it with a strip of cloth or leather to form a hair-band or flat necklace, but they could also have served as clothing applications or additions to organic bags or containers.

Other kinds of objects can be securely identified as hair and head ornaments, both from their form and their location in the graves. These include decorative combs, hair needles, and round ornaments, all of them made of bronze and very few of them additionally gilded. The decorative combs – referred to as hair ornaments (*fashi* 髮式) or hair pins (*faji* 髮笄) in the excavation reports – consist of a usually lavishly decorated head plate and mostly 3-5 and rarely 11-14 long needles attached at the bottom. The following types and subtypes can be distinguished (Figure 3.87):

Type A: high-trapezoidal head-plate with 3-5 long needles (28);
Type B: long-rectangular head-plate (17);
  Type Ba: with 4-5 needles (11);
  Type Bb: long-rectangular with 10-15 needles (6);
Type C: inverted trapezoidal head with drawn-out tips and 4-5 needles (6);
Type D: long-oval head with 4-5 needles (1); and
Type E: strip-shaped with inward-curved long needles (1).

Most combs are decorated with different kinds of patterns that usually cover the whole head plate: Most common are protruding points in combination with incised triangle-, line-, and net-pattern, often enclosed in a frame following the shape of the object. Especially the high-trapezoidal head-plates of type A combs are densely covered in intricate decorative patterns that vary from object to object but usually combine protruding points with incised patterns. There is some difference in quality of execution and density of decoration between more coarse examples with less decoration and finely-made specimens with a pattern so dense that it resembles a weaving pattern. The long-rectangular head-plates of type B combs usually have a less intricate décor – mainly simple incised zigzag, circle, or net-pattern, and more rarely application points – and the shorter variety (type Ba) is not decorated at all. The wide outward-flaring trapezoidal head-plates of type C, on the other hand, are usually densely decorated, mainly with lines of protruding points following the forms of the object. These can sometimes be combined with incised net- or line-pattern. Type D combs are usually solely decorated with lines of application points, but of a lesser quality and with less complex patterns than it is the case for type A or C. Given their form and the nature of their decoration, the combs were probably produced in single-sided molds and later embellished with cold-needle impression and incision techniques, or sometimes by forging only.

Besides decorative hair combs with large head plates, there are also a number of hair needles. Some of them have only one tip and a small oval, trapezoidal, circle, or horizontally attached sun-ray shaped head. Others have a bent double-needle shape. The main types and subtypes are thus (Figure 3.88):

Type A: bi-convex head (3);
Type B: trapezoidal head (1);
Type C: horizontal sun-ray head (3);
Type D: small circle-shaped head (2);
Type E: double-needle shaped (2);
    Type Ea: short needles, long oval head (1); and
    Type Eb: U-bent needle (1).

Hair needles of type A and B are sometimes decorated with cut-out triangles or holes in the head-plate. Type C and type Eb can carry protruding points or spiral-incisions, but none of them are lavishly decorated. The pointed bronze needles of usually 6-7 cm length reported as placed in between the human bones in a small number of graves might have been hair- or clothing-needles as well. They might also have been part of a tool set held in little bags containing personal items. Both kinds of needles may have been produced by mold-casting or partial or complete forging.

The 12 circular bronze ornaments of 4-5 cm diameter from Xichang Xijiao Gongshe have been classified as part of the head-gear because they were found in the head area. One of them was decorated with incised spirals, another was gilded, but no pictures, drawings, or other details on their form have been published, so it is impossible to describe or classify them more precisely.

Much clearer in function are the hooks attached to oval or rectangular plates, which can be identified as belt-hooks. They are sometimes associated with hollow box-shaped objects open on two sides that were probably belt-ornaments. Both kinds of items can be classified as belt parts. The following types and subtypes can be distinguished (Figure 3.89):

Type A: oval-shaped head with long curved hook (belt-hook) (2);
- Type Aa: elevated oval head (1);
- Type Ab: knob at the bottom (1);

Type B: tiger-head shaped belt-hook (1);
Type C: square to rectangular hollow box with short hook (belt-hook) (3);
Type D: square to rectangular hollow box without hook, open on two sides (belt decoration) (18);
- Type Da: medium-sized (3); and
- Type Db: small, concave sides (15).

All belt parts are made of bronze, either by casting or forging or a combination of both techniques, and one belt-hook was additionally gilded. All ornaments were decorated, usually with incised lines following the form of the object (type Db), concentric circles, half-circles, and/or triangles and sometimes protruding points within a decoration field (type C and Da). As most of these elements came from only two different graves and one single find, it can be assumed that they belonged to three separate belts. Only the belt-hooks of type A and B differ significantly in form and decoration and were not associated with other clearly identifiable belt ornaments. The only example of type Aa is decorated with a simple incised concentric rhombus in the middle of the head, the single specimen of type Ab carries an intricate pattern of incised lines and oval ornaments covering the whole body, and the single belt-hook of type B has the shape of a tiger-head with incised lines marking the features of the tiger face.

Some of the large number of decorative applications of various forms might originally have been belt ornaments too, but they could just as well have served as clothing applications or decorative parts of horse gear. Most of these applications are round, with diameters of 3-5 cm and a thickness of 0.3-1 cm, but some varieties can be as large as 7.3 cm in diameter. These button-shaped ornaments are usually referred to as *koushi* 扣式, *paoshi* 泡飾, or *paoding* 泡釘 in the excavation reports, but without consistent differentiation between the three terms. According to the presence/absence and shape of their anchor and their size, these ornaments can be grouped into the following types and subtypes (Figures 3.90-3.91):

Type A: disk-shaped applications with small round-protruding middle and top decoration (62);
- Type Aa: flat bottom, decorated in star-pattern of lines and points, d. 4.3-4.9 cm (11);
- Type Ab: flat bottom, wheel-shaped pattern, d. 2.9-3.3 cm (43);
- Type Ac: strip-shaped bottom-anchor, wheel-shaped pattern, d. 2.9-3 cm (6);
- Type Ad: small, flat bottom, point-pattern all over the top, d. 1.7 cm (1);
- Type Ae: large, flat bottom, intricate wheel- and spiral pattern on top, d. 7.3 cm (1);

Type B: buckle-shaped application with strip-shaped anchor at the bottom (24);
- Type Ba: broad rim, undecorated, d. 4.8 cm (12);
- Type Bb: thin rim, undecorated, d. 2.1-2.3 (7);
- Type Bc: thin rim, small knob on top, d. 4.3 cm (5);

Type C: button-shaped ornament with strip-shaped anchor at the bottom (39);
- Type Ca: d-shaped cross-section, undecorated, d. 1.7-2.5 cm (14);
- Type Cb: triangular cross-section, decoration of radiating lines, d. 1.7-2.6 cm (6);
- Type Cc: bi-point cross-section, star-shaped decoration, d. 3.2-4.4 cm (19);

Type D: hollow button-shaped ornament with open bottom (14);
- Type Da: ring on top, gilded, d. 2.8-3.3 cm anchor (4);
- Type Db: complex decoration-pattern on top (4);
- Type Dc: short trapezoidal downward-pointing thorn in the middle, d. 6.5 cm (1);
- Type Dd: long triangular thorn, d. 4.2-5.1 cm (5); and

Type E: double-layer buttons with H-shaped cross-section, wheel-decorated (8).

The majority of button-shaped ornaments (100 out of 152, i.e. 65.8%) carry some form of decoration, but many instantiations of type B, C, and D are undecorated. All specimens of type A and type E are decorated in some way. A small number of basic decoration types dominate. Most common is the wheel-shaped decoration patterns with concentric spokes or radiating lines around a central empty circle of varying size (42 instances). For buttons of type Aa (3) and Ab (33), the spokes additionally have a protruding point in the middle, which does not appear on buttons type Cb (2), Cc (1), or E (3). A very common form of decoration is a ring of protruding (26) or more rarely impressed (3) points around the rim, which occur with buttons of type Ab (10), Ac (6), Cc (9), and E (4). Different kinds of star-pattern are also common, either as multi-layered star-pattern made of lines and points within a concentric circle and a bulbus in middle (with type Aa, 8 cases), or as a single star in the middle of a circle of protruding points (with type Cc, 9 cases). More rare are small protruding knobs covering the button (4 of type Bc, 1 of type Ad), or different kinds of dense and intricate patterns of points, lines, and circles around a small plain bulbus in the middle (4 cases of type Db, 1 of type Ae). Singular occurrences are a simple incised line pattern around the rim (type E) and incised or impressed net-pattern over the whole object (type Cb). How exactly these buttons and their decoration were produced is not clear, but given the sometimes complex form with protruding or deepened anchor and the sometimes intricate patterns with protruding and deepened decoration in the same field, a combination of molding, forging, and cold- or hot-needle incisions and embossing seems most likely.

Other bronze objects that might have served as buttons or decorative applications are different kinds of geometric applications, zoomorphic and anthropomorphic flat applications, and other kinds of ornaments. The geometric applications fall into the following types (Figure 3.92):

Type A: bi-convex ornament with open bottom, 1 round thorn on bottom, incision on top, 3.7 x 1.7 cm (13);
Type B: wave-shaped hollow application, 2 short square thorns as anchors, 3.7 x 2.1, 0.5 cm (51); and
Type C: S-shaped, no clear anchor, 3.4 x 1.7 x 0.4 cm (1).

The moderate size of these applications, their small thorn-shaped anchors, and their occurrence in groups of 13-51 objects at least for type A and B suggests that they were clothing applications or buttons, possibly on mantles or other larger garments. Applications of type A are incised with bug-like markings, and those of type B and C carry incised lines following the form of the object. As to production technique, again a combination of casting, forging, and incision might have been used. The zoo- and anthropomorphic decorative bronze elements include (Figure 3.93):

Type A: bird-ornament (20);

    Type Aa: middle-perforated swallow-shaped, 7-9 x 5.5-7.3 x 0.1 cm (18);

    Type Ab: small un-perforated bird-shape with spread wings, 4.5 x 3.5 x 0.1 cm (2);

Type B: tiger-shaped, no visible anchor, 4.7 x 4.3 x 0.3 cm (3); and

Type C: standing man, coarse, three-dimensional, 5.3 x 2.1 x 0.7 cm (1).

The swallow-shaped ornaments are all middle-perforated, indicating that they might have been attached to a piece of cloth or leather for decorative purposes, but also the other flat ornaments in bird- or tiger-shape might have been attached to cloth by winding string around certain parts of the object and then sowing it on. Only a single standing human figure on a small pedestal is three-dimensional and therefore less likely to have been used in this fashion. Most of these zoo- and anthropomorphic objects have incised concentric circles for eyes and for the standing human further lines to indicate facial features and clothes. The production technique for the three-dimensional figure is unclear and it might have been produced from a mold, but for all other ornaments different kinds of hot and cold hammering seem most likely. As at least the swallows occur in greater number and nearly identical form, it seems likely that they as well were used in decorating a mantle or similar large piece of clothing or also a sheet used to cover the dead.

Other ornaments that often occur in groups of 10-15 are other kinds of ornaments with or without a clear anchor. The following forms can be distinguished (Figures 3.94-3.95):

Type A: cow-horn shaped ornament, decorated, 2 cut-out rectangles on the sides as anchors, 16 x 2.3 x 1 cm (3);

Type B: rabbit-head shaped ornament, decorated, hollow, 2.5-6.2 x 1.2-1.5 x 1-1.6 cm (5);

Type C: pen-shaped ornament, three-dimensional, hollow, 15.5 x 0.9 cm (1);

Type D: conical-shaped thin bronze-sheet, hollow (92);

    Type Da: small, regular, h: 2.3-3.6 cm, 0.8-1 cm diameter (54);

    Type Db: medium-sized, irregular, perforated, h: 4.8 cm, 2 cm diameter (21);

    Type Dc: large, irregular, perforated, h: 7.8 cm, 1.6 cm diameter (17);

Type E: tube with round-thickened head, round to oval cross-section, perforations, hollow, 6.3 x 0.9-2 cm (2); and

Type F: other (71).

Most of these ornaments are made of bronze and were at least partially forged and sometimes cold- or hot-needle incised with decoration. However, the techniques used and the kinds of decoration differ from type to type. The cow-horn shaped elements have been incised with a wheel-spoke shaped decoration similar to those found on some buttons. Given the perforations and their hollowness, these cow-horn elements might either have been sewn onto cloth or leather, or mounted on a wooden staff or other object, maybe completing a figurine of some sort. Some of the hollow rabbit-ear like objects were incised with simple lines, V-pattern, or concentric circles, and their hollowness indicates that they might have been mounted on a kind of staff. The same applies to the pen-shaped ornament, which was decorated with incised lines and fish-scales. The large number of conical objects of different sized that were each made from a single bent sheet of bronze and often had cut-out irregular circles might have been tips or heads for organic staffs or even fingertips, but as 38 of them came from the same grave, their function remains puzzling. At least the two hollow tubular objects from grave M6 at Xide Lake Sihe are sure to have been mounted on some wooden core, as wooden fragments remained inside them. A similar function can be suggested for other objects of this shape, but 18 of them occurred within the same grave, making one wonder what they might have been mounted upon.

The rather vague category of "other' ornaments" includes bronze double-beads with spiral incision measuring 2.1 x 0.5 cm and plain fruit-stone shaped bronze ornaments of 1.5 x 1.3 x 0.8 cm, which occur in groups of 17 and 38 nearly identical objects, indicating that they were ornaments applied to the same object or garment. Singular small bronze objects include an intricately decorated box-shaped object, a flower- or butterfly-ornament with four perforations showing that it was probably sewn onto organic material, two wheel-shaped and one double-peaked ornaments incised with spoke-lines, a long-handled paddle-like undecorated object, fragments of one U-shaped and one curved ornament, as well as other unidentifiable fragments, some of them decorated with incised lines, circles, and triangles. Furthermore, fragments of two small gold objects – possibly earrings – and two small iron objects have been reported, but their original form is unclear.

A number of bronze pendants have been found, which may be either earrings, parts of a chain, fittings hanging from a headgear or cap, or even applications for an organic container or bag. These objects can be grouped into the following types (Figure 3.96):

Type A: pendants consisting of three circular and chain-like elements of each 3.6-4 cm diameter, (ear-decoration?) (4);
Type B: round or oval ornament with round lug, d. 3-5 cm (2);
 Type Ba: D-shaped cross-section (1);
 Type Bb: flat, oval (1);
Type C: flat round ornament of 3-4.9 cm diameter with ring or trapezoidal handle, mirror-shaped (2); and
Type D: flat standing-man shape, perforated head (10).

Some of these ornaments are incised with simple lines and circles, but many are undecorated. They are all made of bronze and at least partially forged, so are the few long tubular bronze-beads that have been found. The beads measure around 0.8-1.5 cm in length and 0.55 cm in diameter, with a material thickness of around 0.1 cm or less. The beads were clearly bent from small sheets of bronze, serving either as parts of a chain or hair applications wound around single strands of hair. Except for the great thinness of their material, these objects are not much different in form from beads made of stone or bone and have therefore all been assigned to type Bc of beads as to be introduced under point III.6.2 below.

III.5.3.3 Body Armor and Horse Gear

Other kinds of personal attire in the widest sense are elements of bronze armor, which are mainly arm-guards and body-armor. The arm-guards consist of 3-5 roughly trapezoidal parts with holes around the rim that would have allowed for attaching them to leather or cloth (Figure 3.97). Some are decorated with incised fish-bone or zigzag pattern (type A), while others remain undecorated (type B). All arm-guards are made of thin forged bronze plates (as is the body armor), which can bear incised line-decoration (type Aa) or geometric design (type Ab), but may also remain undecorated (type B) (Figure 3.98). Some body armor parts are perforated and were thus probably originally applied on leather or cloth. On some specimens no perforation was visible, but as they are poorly preserved especially around the rim, such perforations might once have been present.

Other kinds of armor sometimes interred in graves are shields: At least the large (15 cm diameter, type Bb) and very large (35 cm diameter, type C) round bronze plates were probably used as shield bosses, while the smaller varieties (8.2-8.3 cm diameter) with short (type A) or long-protruding thorns (type Ba) in the middle might have been horse-head ornaments (Figure 3.99). Unambiguously identifiable parts of horse gear include horse-bits (type A) and cheek-pieces (type B), which can take on the following forms (Figure 3.100):

Type A: horse-bit;
- Type Aa: two short round staffs with large rings on each end, two of the rings entwined, torqued (1);
- Type Ab: two short round staffs with large rings on each end, two of the rings entwined, plain (9);
- Type Ac: ring-shaped single element, ending in two large rings (1);

Type B: cheek-piece, curved thin round staff with ring on each end and several enlarged holes on the body (2);

Type C: strap-crossing, rectangular cross-section, hollow (16);
- Type Ca: T-shaped (5), and
- Type Cb: rectangular (11).

The horse-bits are always undecorated, but the cheek-pieces and strap-crossings usually carry incised decoration of concentric rhombi or spirals. All horse-gear elements were made of bronze. Type B and C were probably cast, but the horse-bits might have been forged or torqued.

III.5.3.4 Vessels, Drums, and Other Metal Objects

Besides bronze body and clothing ornaments, body armor, and horse-gear, a small number of bronze vessels and other metal objects have been reported. A single very thin disk-shaped mirror (8.7 cm diameter, 0.2 cm thick) with a ring with trapezoidal fastening at the edge has been reported. The mirror was decorated with a band of triangles and inverted triangles along the rim and application points on the handle. Bronze vessels are a little more common and fall into the following types and subtypes (Figure 3.101):

Type A: high handled *guan* jar, 12-14 cm high, 9 cm belly diameter, 7 cm rim diameter, 0.2 cm wall thickness (5);
- Type Aa: two thin double-handles running from lip to shoulder, ring-shaped base (4);
- Type Ab: 1 thin band-handle running from lip to belly, angular S-shaped profile (1);

Type B: *fu* pot with oval body, high outward-flaring rim, and two thin ring-handles at the neck, 20-21 cm high, 29-30 cm belly diameter, 22-25 cm rim diameter, 0.4 cm wall thickness (7);

Type C: *pen* basin, round bottom, outward-flaring lip, 9 cm high, 24-40 cm rim diameter;
- Type Ca: deep, angular profile, angular outward-flaring lip, ring-handles held by tiger-head (1);
- Type Cb: deep, curved profile, curved outward-flaring lip (4);
- Type Cc: shallow, 45° outward-flaring, broad, straight lip (1);

Type D: round-bottomed *mou* pot, globular body, high neck, outward-curving rim, 2 circular handles attached on shoulder, 15-17 cm high, 11-13 cm body diameter, 11 cm rim diameter (3); and

Type E: *bei* cup (2).

All of these vessels were cast from complex molds, the handles having mostly been cast on in a second step. The vessels are mostly undecorated, except for the handles of the *mou* pots, which are torqued or in the shape of concentric circles, and the handles of one basin of type Ca, which is held by a tiger-head executed in some detail. Many of the vessels are very similar to their ceramic counterparts. The bronze and ceramic *mou* pots are largely identical in form. except for the handle: On the bronze *mou*, the handle is positioned on the shoulder instead of between the lip and handle or from shoulder to belly as it is common for the ceramic versions. The bronze *mou* are also larger, measuring about 15-17.5 cm in height as opposed to 7-11 cm, but the relative proportions of height, belly, and rim diameter are similar. The double-handled bronze *guan* jars resemble type EcII of the ceramic *guan* jars. However, they are more elongated (somewhat resembling type EdII), but without the middle-rib in the handle and much smaller in size (12.4 cm in height instead of 20-26 cm). The basins vary in form. The bronze basin of type Cb with its round bottom and type Cc with its wide flat rim have no parallels among the ceramic material. The bronze basin of type Ca, on the other hand, is similar to ceramic basins of type C, except for the addition of the handles and the larger size (40 cm rim diameter instead of 27 cm).

The *fu* pots are completely different from anything in the ceramic material. Of very large size (20-21 cm height, 28-33 cm belly and 22-25 cm rim diameter) and characterized by a squat recumbent-ovoid body and a high collar, they resemble undecorated inverted drums more so than ceramic pots of any type. Nevertheless, the drums found in the Liangshan Area have a slightly different form and are always decorated, while the pots are plain. The drums are densely decorated with sun- or star-pattern on top and birds, rowers in boats, and geometric patterns on the sides. The drums are all mold-cast and of high quality. Their main types have been defined according to the bronze-drum typology established for the material from Yunnan, as they resemble them in every detail (Figures 3.102-3.103):[76]

Type A: *Wanjiaba* 万傢坝 type, circle-segment top with trumpet-shaped outward-flaring lower part, four thin flat band-handles, two each grouped together with some distance in between; high body, flower-like circle-segment decoration on top (4);
Type B: *Wanjiaba* type, flat oval top with trapezoidal or trumpet-shaped outward-flaring lower part, four thin flat band-handles, two each grouped together with some distance in between; squat body, simple star-decoration on top (3);
 Type Ba: large star (1);
 Type Bb: large star in circle (1);
 Type Bc: small star in circle, braided handles (1);
Type C: *Shizhaishan* 石寨山 type, flat oval top with trapezoidal outward-flaring lower part, slightly stepped bottom, four regularly distributed thin band-handles (5);
 Type Ca: four birds flying around sun with star in the middle and multi-layered ornamental band around; multiple bands of fish-bone and point-pattern on body (1); and
 Type Cb: multiple concentric layers around sun/star in middle, boat, bird, ox, and geometric patterns on body, braided double-handles (2).

[76] See Li and Huang 2008, Li Weiqing 1978, and Zhongguo Gudai Tonggu 1988 for further details.

The other type of musical instruments found in the Liangshan area are different kinds of bells, which can be grouped into *bianzhong* 編鐘 and *ling* 鈴 bells. The *bianzhong* bells have a long-oval downward-narrowing body, a thick ring-shaped handle, and have been produced in double-sided molds in relatively high quality. According to size and decoration, two types can be distinguished (Figure 3.104):

Type A: small, ~10 cm height, pair of incised concentric circles on each side (1); and
Type B: high, 43-50 cm height, incised double winding snake pattern with horizontal fish-bone lines below (6).

The *ling* bells, on the other hand, are very small (2.7-7 cm in height, 2.3-3.7 cm in width), coarsely made, and of an oval shape with a ring-handle on top and sometimes sound-holes and/or a tongue inside. According to the presence/absence of these additional elements and the overall shape, the following types and subtypes can be distinguished (Figures 3.105-3.106):

Type A: long-oval shape, straight sides, D-shaped ring-handle, tongue (17);
- Type Aa: no sound-holes, unclear bottom-form (5);
- Type Ab: straight bottom, with or without sound-holes (8);
- Type Ac: no sound-holes, concave bottom (4);

Type B: oval shape, outward-flaring sides, D-shaped ring-handle, sound-holes (5);
- Type Ba: tongue (3);
- Type Bb: no tongue (2);

Type C: oval shape, outward-flaring sides, rough form, undecorated (2);
- Type Ca: no handle, no tongue (1);
- Type Cb: bridge-like integrated handle, tongue (1);

Type D: broad-oval shape, D-shaped ring-handle at top (8);
- Type Da: straight bottom, no tongue (4);
- Type Db: concave bottom (4);
  - Type DbI: sound holes, no tongue (3);
  - Type DbII: no sound-holes, tongue, application pattern (1);

Type E: elongated oval, high oval ring-handle, with or without sound-holes (14);
- Type Ea: sound holes, decorated, straight bottom, with or without tongue (7);
- Type Eb: concave or straight bottom, undecorated, with or without tongue (7);

Type F: very small (9);
- Type Fa: straight sides, integrated handle, long-rectangular sound-holes, tongue (2); and
- Type Fb: lanceolate form, concave bottom, no tongue, handle, or sound-holes (7).

Most *ling* bells are undecorated; only a few have been incised with horizontal lines or concentric circles (type E only), and a single larger bell of type Da even carries an incised bird with spread wings and turned head on its body. Made of double-sided molds, these small bells are nevertheless very coarse and not very well preserved. As they were furthermore mostly found in the hip or pelvis area of the deceased, it is reasonable to assume that they were part of the personal attire rather than ritual objects used during the burial ceremonies. As small bells are a common part of the attire of shamans as known from the ethnographic record in Central Asia and other regions, these objects might nevertheless have had a ritual rather than a decorative function (Walter and Neumann Fridman 2004:Vol. 1, p. 60; Eliade and Trask 1964).

Other objects with potential ritual significance found in graves and single finds are staffs and staff-heads, as well as large bronze plates or tables with animal figures, all of them made of bronze and at least partially forged and incised. The staffs are hollow, 1.5-3 cm wide, and consist of several parts that can add up to a length of 54-135 cm, topped with a bronze staff-head. The following two types have been observed (Figure 3.107):

Type A: multi-element hollow round staff with pointed tip and decoration on top;
- Type Aa: flat chicken-shape standing on flat disk with four round disks hanging from the sides;
- Type Ab: unclear decoration, and

Type B: flat pointed staff with two cross-bars with tigers in contrapost standing on them and geometric patterns covering the whole staff.

Only four complete staffs have been found. Staff-heads originally mounted on wooden or other organic staffs are more common (61 specimens). They are mostly two-dimensional and commonly take the form of single or double-birds, as well as tree-shaped arrangements of horses and men. Overall, the following types and subtypes can be distinguished (3.108):

Type A: small staff-head, bi-convex cross-section, small perforations on the sides (5);
- Type Aa: two circles connected in a triangle (4);
- Type Ab: group of three birds with long necks looking upward (1);

Type B: three-dimensional group of three water-bearers facing each other, on stepped highly-decorated staff-top (1);
Type C: flat, tree-shaped (28);
- Type Ca: man in middle guiding pair of horses, two wheel-shaped ornaments below, geometric incisions (16);
  - Type CaI: riders on horses (12);
  - Type CaII: no riders on horses (4);
- Type Cb: two wheel-shaped ornaments on each side, connected by branches (7);
- Type Cc: four wheel-shaped ornaments on each side, connected by branches, possibly horse or bird-shape on top (1);
- Type Cd: juxtaposed horses on wheels (2);
- Type Ce: three horses, hooves pointing toward each other (1);
- Type Cf: two wheel-shaped ornaments on each side with bovine heads on them, connected by branches (1);

Type D: flat bird-shaped staff-head (27);
- Type Da: chicken-shaped (18);
- Type Db: cock-shaped (7); and
- Type Dc: juxtaposed birds (2).

These staff-heads can vary in height between 8 cm for the small varieties and over 20 cm for the large tree-shaped staff-heads, and the 2-dimensional versions are usually as thin as 0.3-0.4 cm. Some staff-heads are decorated with lines following the object form or additional horizontal, concentric, or wheel-shaped incisions. While the three-dimensional objects of type A and B have probably been cast in double-sided molds, the tree- and bird-shaped ornaments might come from single-sided molds, as the remainders of bronze material indicate that have flown beyond the object outline. That the borders have not been smoothed shows the fairly coarse execution of those objects, indicating that they were produced specifically for the occasion of the burial and not used over a long time. The complete staffs, on the other hand, were more carefully made. One of them was even silvered.

Bronze plates (probably table-tops) and tables are generally more finely executed. The following three types can be distinguished (Figure 3.109):

Type A: rectangular bronze stand with flat crisscross legs (2);
- Type Aa: incised fish-pattern on legs, two incised snakes with protruding three-dimensional heads and fish in their mouth surrounded by line of frogs on top (1);
- Type Ab: top only partially preserved, applications missing, no incised decoration (1);

Type B: rectangular bronze plate with two flat cocks on one end and two chickens on the other, facing outwards (1); and
Type C: round bronze plate with two three-dimensional tigers with forward-curving tails facing two frogs, plate incised with circles and lines (1).

Production technique and function are not entirely clear, but forging, cutting, incision and tool-impressions are the most likely means by which these still rather rough forms and decorations can have been attained.

Other metal objects occurring in graves in groups of 2-12, and in heaps of up to 600 in surface finds are coins, which have the following forms (Figure 3.110):

Type A: round, square middle-perforation, protruding characters (637);
- Type Aa: *wuzhu* 五銖 coin (27);[77]
- Type Ab: *daquan wushi* 大泉五十 coin (606);[78]
- Type Ac: *banliang* 半兩 coin (1);[79] and

Type B: rectangular spade money, *dabu huang (heng?) qian* 大佈黃（衡？）千 (12).[80]

These coins have been produced by mold-casting and can be clearly dated by their form and cast-on protruding inscription. The large number of coins discovered as surface finds as well as at smelting sites shows that at least some of the round coins are local products, and their quality is relatively coarse throughout.

A rare occurrence, on the other hand, are two small seals made of bronze with a ring-handle on top (Figure 3.110). They measure 1 x 1 x 0.7 cm, are square in form and have geometric and line incisions on top but no characters or signs on the bottom, marking them as imitations or *mingqi* for burial purposes.

The nails in a small number of graves at Yanyuan Laolongtou, on the other hand, are likely to have had a very practical function. Completely undecorated and coarse but of sturdy

[77] First issued 118 BC, but continued over 700 years.

[78] Dates to AD 9-14.

[79] Used from 221 to 118 BC.

[80] Used around AD 10-14.

quality, they were found lining the inside border of graves, indicating the former presence of a wooden coffin. These nails are oval, round, or triangular in diameter, usually made of bronze and in one case iron (unclear form). They can be grouped into the following types and subtypes (Figure 3.111):

Type A: long-pointed, straight or slightly bent at the end (9-14 cm length, 0.6 cm diameter) (15);
  Type Aa: perforated (1);
  Type Ab: unperforated (14);
Type B: medium-long, pointed, straight or slightly bent at the end (8-9 cm length, 0.6 cm diameter) (3); and
Type C: short, straight, pointed or convex end (4-5 cm length, 0.6 cm diameter) (2).

III.5.4 Why Metal? – Connecting Material Choice, Production, and Function

Metal analyses have only been conducted for a small number of objects from the Liangshan Area. Besides the Han coins, nails, and *bianzhong* bells from Huili mentioned above, the only other objects that have been analyzed are those from Yanyuan. The results of these analyses are all somewhat problematic: For Huili, only the relative amounts of copper, tin, and lead are given without listing other trace elements or mentioning how many samples were taken from which part of the object (i.e., from the surface or the core). In this respect, the samples from Yanyuan are more reliable as we know that they were taken from breakages so as to reach some of the core material and to avoid contamination through corrosion products or tin segregation on the surface. Three samples were taken from each Yanyuan object, testing for a larger range of elements than was done for the objects from Huili. However, the correlation of the samples analyzed with specific objects from the published assemblage remains unclear for 24 out of 49 analyzed objects, making it impossible to relate them to specific object types or subtypes. The usefulness of the results for the present study is therefore somewhat limited.

Observations on the correlation between production technique and metal composition are available for 45 objects from Yanyuan. Mold-casting is by far the most common technique and occurs in combination with all other kinds of techniques including hot forging, cold-working, re-heating after casting, and plating (Cui et al. 2010: Table2). The one example of an arsenic-tin bronze, the two antimony bronzes, and the four copper objects analyzed by Cui and his colleges were all cast in molds without further reworking, while one of the two arsenic bronzes was cast and the other forged. Only tin bronzes and lead-tin bronzes occur in appreciable numbers – 21 and 15 each – and nearly all different techniques were applied on them. Cold-hammering was used only once in the case of a lead-tin bronze, an alloy that would have been less brittle than pure copper or a mixture of tin and bronze only, making it easier to forge even in a cold state. It is remarkable that for these two alloys, as well as for the overall assemblage, forging is a rather common technique – be it after casting (7 cases) or as the only production technique (10). In the case of tin-bronzes, forging is even more prevalent than pure casting. This, however, might be a particularity of the Yanyuan assemblage, which is special in many respects.

The determination of the production techniques for all other objects from Yanyuan itself, as well as for most objects from other sites, is tentative. Musical instruments, vessels, strap crossings (sometimes referred to as "cruciform beads"), at least some of the button-shaped ornaments, decorative rings, and ornaments, and some of the weapons have clearly been cast, mostly in double-sided molds. However, it is often unclear whether the objects have been additionally hammered, be it in a hot or cold state. Those weapons that were clearly cast in a single-sided mold and not reworked much after casting can be clearly identified as *mingqi* (weapons produced solely for the grave and/or symbolic purposes). However, some of the very lavishly decorated weapons of finer quality might have had a symbolic function as well or may have served as markers of social or group-identity, either exclusively or in addition to their practical function. Many ornaments, such as bracelets and other rings, but also some of the zoo- and anthropomorphic applications, were forged, either as the only production technique applied or in order to refine their shape after casting. Some of the button-shaped ornaments might even have been hammered into a form in a heated state rather than as completely liquefied metal.

On a small number of ornaments (bracelets, head ornaments, belt applications, button-shaped fittings) gilding has been observed. Some staff-heads from Yanyuan were silvered. The composite weapons, most of which were found in Yanyuan and Yongsheng, furthermore show a mastery of casting-on techniques. Pure iron objects, on the other hand, are rare. Use-wear and re-sharpening has been observed only on one knife and one sword, both from Yanyuan. As concerns heating after casting, it is also not sure if this was part of the production-process or re-heating through a ritual application of fire during the burial ritual. Since nearly all weapons were found in graves, i.e., in a ritual context, either alternative are possible.

Since forging is necessary to produce a sharp blade, it is no surprise that most forged or partially forged objects found are weapons, especially *yue* axes and *ge* halberds. In the case of Yanyuan, these two kinds of weapons are all made of tin-bronze, usually containing around 10% tin and only 0.61-1.32% lead, which would have made them sturdy enough for actual use (Murowchick 2001:160). However, no actual use-wear was reported for these specimens (Table 3.22). While the halberd (type AaV) bears substantial decoration, the axes (type Ab, Db, and EaI) were only moderately decorated at the rim and of good quality, making them potential objects of actual use, while the more highly decorated types might have been decorative or symbolic in function. One of these axes is furthermore remarkable for the large amount of antimony (1.88%) and the higher-than-usual amounts of arsenic (0.39%) and nickel (216.3 ppn) it contains, a combination that would have made the object particularly hard. Similarly large amounts of antimony, showing deliberate alloying, have only been observed with two other objects: a knife (1.01%) and a three-dimensional staff-head of type B (0.83%). For the staff-head, hardness cannot have been a desired trait, but antimony also improves flux, a feature that would have been important for casting a complex three-dimensional object such as the one in question. Both the knife and the staff-head just mentioned are also relatively high in arsenic, possibly a deliberate addition to balance out the very high amount of tin in both objects (24.53%). Large amounts of arsenic can be observed with a spearhead of type AbII, which also has a high amount of both tin (19.85%) and arsenic (2994 ppn), and two of the four analyzed pieces of body armor (Cu of 29.08% and 24.78%, As 2405 ppn and 2776 ppn respectively). Relatively high proportions of arsenic occur also in two of the *yue* axes just mentioned (3883 ppn and 1257 ppn), possibly for further hardening of the material. Nevertheless, only one object has an arsenic percentage (6.03%) significant enough to call it an arsenical bronze, and it is not a weapon but a bracelet that otherwise consists purely of copper. The arsenic was therefore probably applied to attain the particular silvery color that arsenic can provide, rather than for the hardening effect.

One of the other four bracelets that have been analyzed consisted mainly of copper (91.43%), but with small amounts of tin (3.7%), lead (1.37%) and iron (3.51%) which were probably intentionally to improve the malleability or to enhance the color. The other two bracelets were made of tin-bronze with a composition similar to the *yue* axes (~86% copper, 14% tin), but without the addition of lead, as brittleness is less of a concern with ornaments than with tools or weapons. Nevertheless, most ornaments and objects of possible ritual function, such as staff-heads, staffs, stands with animal figures, different kinds of bells and drums, do contain considerable amounts of lead, either for color manipulation or for increasing the hardness or toughness of the metal. Most two-dimensional staff-heads and staffs are fairly similar in composition, with 83-87% copper, 8-12% tin, and 3-5% lead. However, the three-dimensional staff-head mentioned above differs significantly in composition, as does one of the chicken-shaped objects, having an unusually high percentage of tin (36%) but only small amounts of lead (0.71%). This object is therefore naturally very brittle and poorly preserved, but if it was indeed made for a single ritual function within the burial context –as the very coarse execution suggests – durability might not have been a concern. Many of the staff-heads and the bird-shaped fittings were of rather poor workmanship, showing only a coarse outline with a few incisions for the eyes. This may indicate a one-time use in burial. The fittings may have served as an embellishment for the clothes with which the deceased was buried, or of a cloth he was covered with, while the staff-heads are likely to have been employed in some kind of ritual act.

Very high amounts of tin were also identified in the *bianzhong* bell from Yanyuan Laolongtou M4 (30.46%), balanced out only partially by the presence of lead (2.16%) and arsenic (1186 ppn). The *bianzhong* bells from Huili, on the other hand, consist mainly of copper (92.49%), with some tin (7%), which would have helped significantly in casting the fine lines of their elaborate decoration, but would have made them ill-fit for actual usage.[81] The same holds true for one of the drums of type A from Yanyuan which consists almost exclusively of copper with small amounts of lead. By contrast, the other drum from Yanyuan Laolongtou M4 consists to 75.42% of copper, with 17.93% tin, and 0.8% lead, a combination that would have been relatively easy to cast into the complex form of a Shizhaishan-type drum (type Ca), but nevertheless not too brittle for actual use. In any case, the stark differences in composition between the different musical instruments may show a difference in origin and/or date, in spite of

[81] For a discussion on the influence of the metal composition on musical properties of bells see Falkenhausen 1988 (esp. 559) and 1993 (esp. 102-108).

the similarities in form. The small *ling* bells, which are likely to have been part of a person's attire or of horse gear, rather than being actual musical instruments for ceremonial use, would have been even more sturdy due to the addition of larger amounts of lead (2.0-3.6%) in combination with copper and tin. If they were indeed worn at the belt during the lifetime of the deceased, such properties would have been desirable so that the bells could resist the stress of constant movement and friction.

The weapon assemblage is not very homogenous in composition, but weapons of the same type are often similar. The three swords with double-circular pommel (type BaI) are all tin-bronzes with high percentages of tin (19-25.7%), around 73% copper, and 0.07-0.42% of lead, depending on the amount of tin that needs to be offset to avoid brittleness. These weapons are all of relatively high quality, moderately decorated, and could probably have been used, although no traces of use-wear have been reported. Of the two swords of type Aa with a three-pronged hilt, one was of relatively good quality with high amounts of lead (12.28%), some tin (5.1%), and surprisingly low amounts of copper (54.9), while the other one was not very well preserved, probably due to its relatively high tin-percentage (15.36%) with very small amounts of lead (0.16), and a relatively low percentage of copper (55.57%).

Low percentages of copper have also been observed in one arrowhead of type IDa, the spearhead of type AbII, and the knife of type Cc mentioned above. For both projectile points, the tin percentage is relatively high (15-20%), with larger amounts of iron, making the material less brittle. For the knife of type Cc, the percentage of iron is unusually high (16.62%) with only small amounts of tin (7.77%) but much arsenic, which should have resulted in a rather sturdy weapons, whose decoration was furthermore confined to the handle. Arrowhead and spearhead also remained undecorated but bore no traces of use-wear, indicating that they were probably produced specifically to be placed in the grave, making their usefulness as actual weapons less important. Two of the other knives are roughly the same in composition, with around 86% copper, 11-13% tin, and 3-4% lead, making for potentially useful weapons, while the third knife with its large percentage of tin (19.96%) and small amount of lead would have been more brittle. One more knife sticks out because it was made of pure copper without intentional alloying. A relatively coarse *fu* axe also has a very high copper content (90.1%), but alloyed with some tin (9.94%). The relative coarseness of this object might indicate that it was either a low-prestige tool for everyday use or on the contrary a symbolic object, produced for the grave without practical use-value. As it is unclear if the object came from a grave or a settlement context, the question of its actual function must thus remain open.

What all pieces of body armor have in common is their fairly high tin content (mostly 25-30%), combined with low amounts of lead and only in two cases higher amounts of arsenic and nickel, which would have hardened the material. Body armor would of course need to be more malleable to be fitted to the body, but brittleness would be an undesirable characteristic for protective armor in actual use. It therefore seems likely that the specimens analyzed here were intended for display or placement in the grave rather than for actual use.

The single container analyzed here (the actual type of the object remains unclear) likewise has a relatively high tin percentage (13.62%), making it a rather brittle object that furthermore would have been sensitive to corrosion by water. As a container for liquids or food in everyday usage, it would therefore not have been very useful. The bronze nails from Huili and Yanyuan, on the other hand, would have been very sturdy with their very high percentage of lead (>14%), combined with medium amounts of tin and copper. The composition of one of the horsebits is very similar, though with an even smaller amount of tin, while the second horse bit differs significantly, having much smaller amounts of both tin and lead and consisting mainly of copper. As both objects were retrieved by the police, archaeological context cannot be used to interpret these differences in composition and their relationship to function, but their composition indicates that they could have been used before being discarded.

Many of the tools and weapons analyzed above are of a quality that is not very desirable for actual use but appropriate for display. Many of the other bronze objects from the Liangshan area are of relatively poor quality as well. Utilitarian objects without much embellishment, such as fish-hooks, sickles, spades, hoes, chisels, and most of the *fu* axes and arrowheads, might indeed have been usable tools with certain advantages over stone objects: If produced in sufficient quality, they would have provided strong edges, and they could have been repaired or recast when broken, while stone tools would have to be discarded. Arrowheads made of metal would have had very different ballistic characteristics than those made of bone or stone, making them an addition to the inventory of projectiles available. With their thin blades, metal knives would have had clear advantages over stone blades, especially since the stone material in the Liangshan area is for the most part not ideal for producing sharp edges and would break upon use. How often metal knives or other tools were used in everyday life remains uncertain, but in representative grave contexts and possibly as part of the personal attire they clearly outweigh stone tools; such weapons as swords, furthermore, are unthinkable unless made of metal.

For decorative, representational, or ritual purposes, metal is very attractive. Furthermore, metal is comparatively easy to bend into bracelets and other rings and easy to work into decorative applications or buttons. Complex zoomorphic or anthropomorphic forms are likewise easier to attain through casting than through stone working. For beads and pendants, on the other hand, colorful stones such as agate and turquoise, and even plain bone, tooth, and shell, seem to have been more attractive choices. In the case of bone and tooth, furthermore, the raw material would have been more readily available and easier to work than stone. Nevertheless, from a technical point of view, beads are still relatively easy to whittle out of small pieces of stone, even though semiprecious stones such as agate or nephrite might not have been as readily available. On the other hand, their greater scarcity and special color would have made them just as attractive than metal, or maybe even more so, at least for personal ornaments.

III.6 Decorative Objects Made of Stone, Bone, Tooth, and Shell

Except for metal ornaments, there is a wide range of other decorative objects made of various types of material, most of them recovered from graves. They are mostly beads, but also pendents, bracelets, earrings, and other ring-forms of different sizes, have mostly been made of stone and bone, but also tooth, shell, and more rarely sintered ceramic material. The particularities of clay and stone as raw material have already been described above, but the processes of working bone, tooth, or shell have so far not been explored. Before classifying this group of decorative objects and commenting on the choice of raw material, in the following I will therefore first provide this necessary background.

III.6.1 Material Preconditions, Manufacture, and Use of Bone, Tooth, and Shell Objects[82]

Vertebrate hard tissues are rather different from stone or wood in their material characteristics: Bone and antler are elastic and have a much larger bending strength than any other type of material. Although bone is fairly tough and firm, it can be split easily and precisely

[82] Unless noted otherwise, I rely on MacGregor 1985 and Hahn 1991 for information on bone, antler, and tooth material, and on Claassen 1998 for shells.

and becomes very soft and easy to work when wet.[83] Bones are also readily available either as found objects on the landscape or as remains of meals. Easy to obtain and easy to work, bone has been called the "plastic of the past" (e.g. Hahn 1991:248f.), but using it in great efficiency still requires detailed anatomical knowledge and experience. Even within the same animal, different bones react differently to stress (Hahn 1991:249). Antler is generally a much tougher material than bone, being able to absorb shock and sudden impact much more easily, making it very useful for heavy-duty tools. Tooth enamel is the hardest material within a mammalian body and is thus particularly hard to work. For all three materials, transverse and longitudinal elasticity, toughness, and bending strength differ widely, influencing both methods of production and usage.

Mollusk shells are very thin and brittle, but can produce a sharp edge or corner, making useful tools. They can also be perforated and strung together for decoration, quite apart from their uses at currency in the past in the case of cowries. Most of the mollusks reported here are cowries shells (34) or snail shells (32). The closest source for all cowries found in China is the Indian Ocean (Peng and Zhu 1995, Yang 2004, Yao 2010), making procurement more than problematic. The snail shells were probably local, possibly substituting for the less easily attainable cowries or other seashells. After cleaning, shell material can be shaped by grooving and snapping or more rarely sawing for very large specimens. For the material at hand the only technique employed was perforation, be it by pecking or drilling with a hard stone or a soft drill of bone or organic material, possibly aided by an abrasive.[84]

For bones and to a lesser extend teeth and antler, the initial cleaning can be very work-intensive, requiring de-fleshing, either manually or by soaking and cooking. Soaking can also be employed to make the material softer and more easily workable, especially for fine sawing and

[83] For comparisons of bending strength, elasticity, and fracture, see MacGregor 1985: Tables 2.1-2.

[84] For a detailed description of these and other techniques of shell artifact production see Claassen 1998:196-203).

cutting techniques. Initial reduction of bone material to smaller sizes is easiest on a dry bone that can be split apart through percussion and splitting with the help of directed blows with a hard and pointed object and/or the help of a wedge.[85] Finer shaping, drilling, incising and polishing is best done on well-soaked bone material.[86]

Bones can be worked into small tools such as projectile points, fish hooks, needles, and musical instruments, as well as clothing applications and ornaments, while antler is the more fitting raw material for large percussion instruments. Medium-sized production or grooming tools such as pressure tools, wedges, or combs can be made of either material or even large teeth. In general, tooth material is more often used in a decorative or apotropaic/symbolic/ritual function.[87] Shell is also mostly used for decoration or in a symbolic or even monetary role, but shells can also serve as impression or even cutting tools, wedges, and in the case of large varieties even as hammers, adzes, or handles.[88]

From the research area, only very few bone and antler tools (mostly bone needles, arrowheads, and soft hammers made of antler) have ben reported. The five bone arrowheads have already been described and classified together with the much more numerous stone arrowheads, while none of the other kinds of tools have been published with enough detailed information to allow for further classification. [89] Here, I will therefore concentrate on the bone

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[85] This and other techniques are described in great detail by Hahn (1991:253-264), who also includes the results of experimental studies.

[86] Both bone and antler can even be softened to the point that they become mold-able. Coloring is also possible, but no instances of either technique have been reported from the research area. For detailed descriptions of these techniques and examples see MacGregor 1985:63-67.

[87] For a broad range of potential and actual functions in pre-historic periods see Hahn (1991:265-313). MacGregor (1985:73-205) provides material for later historic periods.

[88] For descriptions and drawings see Claassen 1998:199-203.

[89] Bone tools other than arrowheads have been reported from Renhe Huilongwa and Ninglan Jinyangcun, but no drawings or pictures have been published. For Jinyangcun, it has been reported that bone hammers and needles as well as other tools of ram's horns and deer antlers have been found.

decorative objects, for which drawings, photographs, and/or descriptions have been published. From 62 graves at 25 sites, 158 bone, 48 tooth, and 67 shell objects have been retrieved, but no antler material has been reported. Drawings are available for 49 of these objects, and 7 are represented by photographs, none of them detailed enough to allow for inferences on production techniques or use-wear. None of the original objects were available for first-hand inspection, and the variables recorded are therefore limited. They encompass the following factors:

- *basic measurements*: length, width, thickness, outer and inner diameter, number of elements, or edge angle (if applicable);
- *form description*: body shape, cross section, base form, top form, sides, blade form, hafting, hole number and form;
- *decoration*: incised circles, peach-shaped ornaments, or perforations; and
- *manufacturing details*: primary and secondary manufacture technique, texture, polishing degree, hole perforation technique.

The manufacturing techniques include grinding, polishing, sawing, drilling, pecking, and thermal alterations, while the hole perforation techniques comprise pecking and drilling from one or two sides. They are thus virtually identical with the manufacturing techniques used in the production of stone ornaments described in III.4.2.

III.6.2 Form and Function

The main decorative objects made of material other than metal are beads (334 + 510 in five chains; 217 stone, 76 bone + 510 in chains, 40 frit, 1 organic), pendants (121; 3 stone, 1 bone, 67 shell, 48 tusk, 2 ceramic), strung chains made of either beads only or both beads and pendants (5), earrings (33; 32 bone, 1 nephrite), bracelets (17; 13 bone, 1 nephrite, 3 wood), *huang* ring segments (13; 11 bone, 2 stone), rings of unclear function (6; 4 bone, 2 nephrite), hair ornaments (12 bone), one bone button, and five singular bone objects of unclear function.

For beads, the length ranges between 0.2 cm and 3.7 cm, and the diameter can be as small as 0.2 cm and as wide as 1.55 cm (mostly 0.7-1 cm). Proportions of height to width range from 0.35:1 to 4:1, and hole diameters range from 0.2-0.4 cm. Overall, the beads fall into three size categories: short (height: diameter < 1), medium (height: diameter = 1-2.2), and long (height: diameter > 2.2). For beads, the types and subtypes are (Figure 3.112):

Type A: tubular bead with convex sides (56 stone, 8 frit, + over 130 bone beads in chain);
- Type Aa short (3 turquoise, 1 nephrite, 44 agate);
- Type Ab medium length (3 agate, 7 frit + over 130 bone beads in chain);
- Type Ac long (9 agate, 1 frit);

Type B: tubular bead with straight sides (126 stone, 72 (+250) bone, 1 organic, 12 frit);
- Type Ba short (16 agate, 32 turquoise, 3 bone single + over 200 bone beads in one chain and over 50 in another);
- Type Bb medium length (4 agate, 2 nephrite, 2 turquoise, 4 blue stone, 2 other stone, 66 bone, 5 frit, 1 organic);
- Type Bc long (10 agate, 64 turquoise, 3 bone, 12 frit);

Type C: tubular bead with concave sides (hyperboloid), long (2 agate);

Type D rhombic bead (15 stone);
- Da short (8 turquoise, 1 agate);
- Db medium length (4 turquoise);
- Dc long (2 turquoise);

Type E: double-oval bead (1 bone + 9 bone beads in chain);

Type F: drop-shaped bead (1 turquoise, 1 nephrite), and

Type G: cowry-shaped bead (1 turquoise, 1 nephrite).

Type B, particularly in the short variety, is the most common, followed by type A, mainly in the medium-high variety of type Ab, but also the short variety type Aa is very common. Both stone and bone are very common materials for bead production, while frit and organic material are rare (Tables 3.23-25). The most common stone material used is turquoise, followed closely by agate, while nephrite and unidentified blue stone are less common. Agate was mainly worked into small, short tubular beads with convex or straight sides (type Aa), while tubular forms with straight sides occur less frequently. For turquoise, both high and squat varieties of tubular beads with straight sides are common, both of them of larger dimensions. For nephrite and blue stone, the numbers are too small to determine any regularities.

Bone beads are very common, but the majority of specimens was found strung on four chains, which skews the numbers significantly. When omitting these chains, medium-sized tubular beads with straight sides (type Bb) are the most common, followed by small short beads of the same form (type Ba). The beads found strung on chains, however, are mainly of the second type or of a different form with round sides and medium height (type Ab). Frit beads are mostly of medium size and tubular form with straight sides with fairly regular dimensions, measuring 1.5 cm in length and 0.8 cm in outer diameter. Since they come from the same grave of Xichang Xijiao Gongshe M1, it can be assumed that they all belonged to a single chain or other ornament. Also the majority of the bone beads have similar dimensions, and those coming from a single grave might thus have formed a set as well.

Five complete chains have been reported, consisting of bone beads, perforated animal teeth, cowrie shells, or a combination thereof. One chain consists of 200 flat bone beads with convex sides, each bead measuring 0.4-0.7 x 0.1 cm (type Aa chain); another chain contains over 130 perforated animal teeth of unclear kind (type Ab); one short chain consists of 9 double-oval beads (type B); and two other chains consist of a large number of tiny flat-cylindrical bone beads (over 50 and over 130 respectively, measuring 0.4 x 0.5 cm each) combined with a small number of cowry shells (type C). As all other beads and pendants were found in only 79 graves, with most of them concentrated in only five graves, it is reasonable to assume that most of them originally belonged to similar chains and only few occurred as single beads or pendants.[90]

[90] These graves are Huili Guojiabao M2 with its combination of 44 turquoise (type Bc), one nephrite (type Aa), and two agate beads (type Bb), Xichang Wanao M2 with 34 bone (type Ab) and two agate bead (type Bc), combined with a triangular stone pendant, Xichang Xiaohuashan M1, with the 25 nearly identical frit beads, one bone bead (type Ab), and one tusk ornament (type Cd), Yanyuan Laolongtou M4 with 10 agate (type Ac), three turquoise (type Da), and 20 bone beads (type Bb), as well as M11 from the same site with 39 agate (type Aa) and two turquoise beads (type Da).

Pendants of different material assume widely different shapes. Shell and tooth ornaments (all of them suid-tusks) are largely only perforated and therefore rather unified in form and execution, while the extensively worked stone and bone pendants differ greatly in shape and size. The types and subtypes are (Figure 3.113):

Type A stone and bone pendants (3 stone, 1 bone);
- Aa rhombic (1 nephrite);
- Ab needle-shaped (1 stone);
- Ac triangular (1 bone);
- Ad unclear form (1 nephrite);

Type B: perforated shell (67+);
- Ba cowry shell (34 + unclear number in two chains);
- Bb snail shell (32);
- Bc unidentified shell (1);

Type C: suid-tusk (48);
- Ca perforated on both ends (19);
- Cb middle-perforated (4);
- Cc perforated in middle and on one end (2);
- Cd perforated on one end (3);
- Ce unclear if perforated or not (20); and

Type D: drop-shaped decorative objects of ceramic material (2).

Rings, mainly of bone but sometimes of stone and more rarely wood, are much less common than beads or pendants. They fall into the categories of slit-rings (*jue* 玦, which are usually interpreted as earrings), *huan* 環 and *zhuo* 鐲 bracelets, finger-rings (*zhihuan* 指環), ring-segments (*huang* 璜), and broad flat rings of unclear function either interpreted as earrings, *bi* 璧 rings, or *huan* or *zhuo* bracelets. With the one exception of a stone ring described above, the *jue* rings (33) are all made of bone, have an outer diameter of 1.9-3.4 cm, an inner diameter of 0.65-1.2 cm, a narrow slit, and a can be further divided into the following types (Figure 3.114):

Type A: slit-ring, round (32 bone);
- Aa: hole in middle (16);
- Ab: hole in upper 1/3 (16), and

Type B: slit-ring, oval (1 nephrite).

Bracelets of bone (13), nephrite (1), and wood (3) have been reported from nine graves, while bracelets of bronze are rather common, but too different to unify all materials in one typology. For the non-metal bracelets, we can distinguish between the following forms:

Type A: thin, closed ring (6 bone, 1 nephrite);
    Type Aa: round cross-section (2 bone);
    Type Ab: D-shaped cross-section (4 bone, 1 nephrite);
Type B: thin band-shaped (4 bone);
    Type Ba: closed ring (2 bone);
    Type Bb: open ring (2 bone);
Type C: broad closed ring (3 bone, 3 wood);
    Type Ca: thick rectangular cross-section with rounded corners (3 wood, decorated), and
    Type Cb: medium-thick, rectangular cross-section (3 bone).

All bracelets have an outer diameter of 5.8-8 cm, depending on the thickness of the ring, and an inner diameter of 4.2-6.6 cm, with a width of around 0.5 cm for type A and around 1.5 for type B and C. The two finger-rings reported from Yongsheng Duizi, resemble type Ab in form but are significantly smaller. All bracelets and rings are carefully worked, and the wooden bracelets, which are naturally the thickest, have furthermore been decorated with cut-out surface-covering half- and full-circle ornaments, reminding of the decoration on a badly distorted but originally probably tubular-shaped stone object of unclear original form and function from Zhaojue.

For the *huang* ring segments, the function is likewise unclear. They are flat, perforated on one or both ends, have an outer diameter of 1.8-5.5 cm, an inner diameter of 2.6 cm, and are 0.1-0.3 cm thick. Most of them are made of bone (11) and two of stone. The types are (Figure 3.115):

Type A: perforated on one end (7 bone, 1 stone);
Type B: perforated on both ends (3 bone);
Type C: double-perforated on both ends (1 bone), and
Type D: unclear (1 stone).

Given the holes, these ring segments might have been part of a chain or clothing decorations, but for the closed rings of similar form and careful execution but without any perforation, this explanation cannot apply. Their types and subtypes are (Figure 3.116):

Type A: small flat ring (4 bone, 2.5-5.3 cm outer diameter);
    Type Aa: large inner diameter (3.1 cm), thin cross-section (3);
    Type Ab: small inner diameter (1 cm), wide cross-section (1);
Type B: big flat ring (2 nephrite, 9-10 cm outer diameter, 6-7 cm inner diameter);
    Type Ba: flat ring (*bi*) (1), and
    Type Bb: collared flat ring (1).

Other decorative or functional parts of the attire of the deceased are a saddle-shaped button made of nephrite and a piece of green nephrite of unclear shape and function. Furthermore, a number of long-pointed bone objects have been found, that are probably hair needles. They all have a flat trapezoidal head, a round or oval cross-section of about 0.8-1.1 x 0.6-0.3 cm, combined with varying lengths. Three main form-types can be distinguished (Figure 3.117):

Type A: straight and short (6-10 cm length), grooves in top and bottom 1/3 (5);
Type B: slightly curved with distinct trapezoidal head and incised decoration, extremely long (up to 28 cm), grooves or net pattern in upper 1/3 (6), and
Type C: long-irregular, short (7-9 cm length) (1).

Type A and B are rather similar in shape and all instantiations of both types have been found in the head area, suggesting the function of hair needles. The single object of type C known so far was found between the bones of a multi-person burial. Given the coarse execution so different from any of the other hair needles, it might also have been a tool of some sort, but otherwise the length and shape resemble hair pins of type A and B.

Overall, there is thus an overwhelming preference for decorative objects made of bone, closely followed by stone and tooth, with shell and frit being in second row and organic material only having been observed once. All decorative objects made of stone were finely ground and polished, which must have been significantly more cumbersome than producing a similar item out of bone/tooth, wood, or clay. Nevertheless, beads were often made of stone material, mostly turquoise (55% of all stone beads), followed closely by agate (40%). Beads made of nephrite or other kinds of stone were very rare, indicating a preference for the striking colors of turquoise and agate coupled with more ready access to turquoise. Three small pendants, one small slit-ring, one bracelet, two ring-segments, and two large flat rings collar were also made of highly-polished nephrite not dissimilar in visual appearance from the bone material that was otherwise used. Bone might thus have been used as a substitute for the much less easily attainable and much harder to work precious material. Hair needles, on the other hand, were always made of bone, which is the natural material for such objects. The choice of tusks and other kinds of animal teeth as well as shell might have a symbolic meaning as well as aesthetic reasons, while the ubiquity of wooden and other organic ornaments is hard to judge given the preservation bias.

III.7 Other Organic Objects

Organic objects have been reported only from two areas, Ninglang and Zhaojue, where preservation conditions seem to be more favorable than in other parts of the Liangshan region. The single organic bead and the wooden bracelets from Zhaojue have already been described above. Several other wooden objects were found in Ninglang Daxingzhen M5 including a small high-stemmed bowl with a straight rim, a pointed lid, the bottom of a quiver with remains of other organic material attached to it, a long stick with perforations on both ends and in the middle, and an oval object with extended sides (Figure 3.118). The stick might have been part of the quiver construction, or for stiffening some other kind of textile or leather bag, while the oval object might have been the bottom of an organic container whose other parts had disintegrated.

The organic objects from Zhaojue are coils of braided ropes, one in each of six graves and all of them blackened by fire and baked together with mud, so that their original measurements could not be ascertained. The excavators suggest that it might have been a rattan-like material, but so far no further analyses have been conducted to test this assumption.

Remains of woven material have been discovered in several graves, but none of them well-preserved enough to study the weaving techniques. The 17 corpses from Mianning Sankuaishi were wrapped in cloths and so was a bronze basin from Zhaojue Eba Buji M1. The cloth impressions on one spindle whorl from Xichang Xijiao Gongshe M1 also indicate the mastery of weaving techniques, as does the high frequency of spindle whorls themselves.

III.8 Conclusion

From the object assemblage described above it is clear that the material from the research area is highly heterogeneous both in form and execution, and differs widely by region, deposition context, and possibly also chronological position. While ceramic objects are pervasive throughout many but not all cemeteries and all settlement sites, stone tools were retrieved mainly from settlement layers, while decorative objects of stone, bone, and metal were mainly found in graves, and nearly all metal objects stem from graves, most of them in Yanyuan County. To understand these distribution patterns both in time and space, I will describe the objects in their deposition context, starting from the settlement material (Chapter IV), then turning to graves (Chapter V), and finally object pits and single finds (Chapter VI), before analyzing the spatial and chronological distribution of the different kinds of objects and features.

I was able to collect information on 313 sites which fall into the four major categories of settlement sites, smelting sites, grave sites, object pits, and single finds, and some sites hold more than one kind of remains. The smelting sites, although all of later date than the scope of this study, were included as evidence for bronze production in this area and have already been described in connection with the analysis of the bronze objects in Chapter III.5. Smelting sites as well as settlement and grave sites in most cases are relatively easy to identify by their main features, i.e. smelting furnaces, building remains, or burial constructions. Object pits and single finds are more problematic in their characterization. In this study, object pits shall be defined as man-made holes in the ground dug for the purpose of depositing complete or intentionally broken objects. This excludes trash pits but includes pits containing one or more ceramic vessels without any traces of human bones or ash. Pits with at leas one complete large ceramic vessel in them have generally been labeled as urn graves 甕棺葬, but as none of them contained traces of bone or charcoal, the term "object pits" is more appropriate.

Single finds shall be defined as objects that have been recovered under various circumstances and for which the original deposition context is unclear. Such finds can never be attributed to a specific feature but can be assigned to specific locations with varying degrees of reliability. In the most favorable case, they are survey or chance finds made on the surface or in the ground without systematic excavation or clearly identifiable associated features. In the worst case, they are objects recovered from the art market: In these cases, the original location is inevitably lost and it is even questionable if the objects originate from the research area at all. Objects found in private households with at least a vague assignation as to place of origin occupy a place in between those two extremes as far as reliability of original location is concerned.

Below, I will describe these four main site types of settlement, burials, object pits, and single finds separately, pointing out their main characteristics, features, and content, and using them to infer on sub-types if possible. Sites that contain more than one type of finds will feature in each section that concerns them. The number of the sites belonging to the different types when added up will thus be greater than the actual number of sites mentioned above. This discrepancy will have to be taken into account in all statistical analyses conducted in Chapters IV to VIII.

IV. The World of the Living — Settlement Sites and their Assemblages

As settlements have become a focus of archaeological research in the Liangshan area only during recent years, the number of excavated sites is still relatively small. Of the 108 settlement sites that have come to my notice, 33 (31 %) have been excavated to some extent, either in a few test pits in connection with survey work or — more rarely — in targeted excavations. Besides collecting the published settlement material, I have participated in excavations at four sites as well as surface surveys in Xichang and Mianning, and I have had access to original material from 34 additional settlement sites.[1]

IV.1 Nature and Distribution of the Sites

In order to explore the distribution of the settlement sites in relation to the surrounding environment, I have conducted spatial analyses both on the settlement sites and a set of 600 computer-generated random points that were used for comparison. Both sets of points were analyzed in ArcGIS, assessing elevation, slope, aspect (i.e., orientation of the slope), and distance to the nearest river. The results were then exported into SPSS to conduct statistical analyses. Aside from exploratory data analysis through descriptive statistics, histograms, and pie-charts, I also conducted the Kolmogorov-Smirnov test to compare the two populations. These analyses show, that the average elevation at settlement sites is 1693.36 m, compared to 2692.75 m from the random sample (Tables 4.2-4.2). The histograms make clear that the distribution of settlement sites is significantly skewed toward medium elevations; half of them are located around 1400-1900 m, and only very few can be found at higher elevations of up to 3100 m, while

[1] In the Fall of 2010 I took part in a one-week excavation at Dechang Dongjiapo as well as in test excavations at Mianning Gaopo, Zhaojiawan, and Hujiazui. Furthermore, I had access to original material from 34 previously excavated or surveyed sites. Altogether, I was thus able to collect first-hand information on 38 settlement sites, 7 of which remain unpublished, while 9 have only been listed in other publications with a limited amount of information.

most non-site random points are located between 2000 and 3000 m (Figures 4.1-4.2). The Kolmogorov-Smirnov test shows that the two samples cannot come from the same population, indicating that the settlements were indeed distributed preferentially at lower elevations (Table 4.3). Nevertheless, a number of sites were observed at relatively high elevations. Most of these high-elevation sites are located in areas with an especially high average elevation, such as the high-altitude depression of Yanyuan and the very mountainous areas in the Northeast, i.e., Zhaojue, Xide, Meigu, and Ninlang, where an elevation of around 2300 m can be considered average, rather than high-altitude, relative to the overall topography. The choice of site location therefore has to be judged locally and not by simple reference to absolute elevation figures.

When analyzing the slope values, it becomes clear that the average value for sites is 8.73%, while for non-sites it is 21.37%. The Kolmogorov-Smirnov test confirms clearly that they are from two different populations. The histograms confirm this picture, showing that the majority of settlement sites can be found at locations with a relatively minor slope, although most of the region does consist of mountains and hills (Figures 4.3-4.4). For aspect, the Kolmogorov-Smirnov test shows some difference between both populations as well (Table 4.4), but the descriptive statistics and histograms do not provide a very clear picture (Figure 4.5). This is probably mainly due to the nature of the variable, which is measured in degrees from 0° to 360°, which is neither a normal ratio nor an interval scale, and furthermore, 360° and 0° are identical. I have therefore reclassified the data into nine nominal values of N, NE, E, SE, S, SW, W, NW, which can conveniently be displayed in a pie-chart (Figure 4.6). Nevertheless, the outcome remains roughly the same, and there does not seem to be a preference for any specific direction of slopes, neither for those facing the sun, nor for those that are sheltered from wind. In such a mountainous region, level ground was probably a bigger concern than slope direction, and choices were thus rather limited.

As far as site placement in relation to river courses is concerned, a look at the map already makes clear that settlements are mostly located in close vicinity to rivers (Figures 4.4 and 4.9). The average distance from settlements to the nearest river is 1.97 km, but the range is relatively wide. For the random points, the average distance to the nearest river is 4.39 km and the Kolmogorov-Smirnov test indicates a clear difference between the two populations, but there is still a tendency for the non-sites to be close to river courses as well (Figure 4.7). This phenomenon can be easily explained by the fact that the research area is traversed by a large number of rivers and streams, meaning that most places will naturally be within a maximum of 10 km of a river. Nevertheless, given the high elevation and steep slopes that characterize much of the area, even a few kilometers might be rather arduous to traverse. Furthermore, we have to keep in mind that rivers are not only a resource but also a danger, as was shown in Chapter II. Most settlement sites are indeed located in close vicinity to a river, but at slightly elevated spots, usually on a terrace leaning against a mountain. Sites on hill-tops with no mountain slope in the background are rare, and only a small number of sites were found in the immediate alluvial fan of a river (Figure 4.8).[2] As modern-day settlements are largely located within the alluvial fan of the main rivers as well, they might have destroyed much of the archaeological record. Furthermore, at least the Anning River is known to be constantly shifting its course, and many smaller rivers are seasonal, changing course with nearly every rainy season, possibly destroying sites formerly located close by. On the other hand, the unpredictability of the exact location of

[2] These sites are Dechang Dashipai and Hezui, Huili Xiao'aozi, Mianning Huijiacui, all of them between 2 and 4 ha in size, as well as Mianning Wenjiatun and Zhaojiawan, Xichang Daniba, Shantou, Yangshanbo and Zhongjia Shanzui, all of them relatively small (0.015-0.88 ha).

the river courses would have been a good reason to choose an elevated spot providing some protection against flooding, and that is indeed where most settlements have been found.

What is harder to determine is the preference for specific soil types and surface cover. As explained in Chapter II, climatic development and anthropogenic modification have changed the landscape significantly, making it hard to estimate what conditions were like in the past. Furthermore, most published maps on soil quality and surface cover for Southwest China are rather imprecise, and even the more detailed ones cannot reflect the significant variations at different altitudes. All evaluations therefore have to remain rather general.

Overall, the majority of settlements tends to be located on the fertile yellow or grey-brown alluvial soil in the lacustrine basins, especially along the upper and middle reaches of the Anninghe between Dechang and Mianning, and particularly around Xichang. The settlements in the Yanyuan Basin are located on similar deposits of alluvial soil. A significant number of settlements were also reported as being located along the lower Anninghe and other rivers in the Southeast and Southwest, in areas characterized by drab red soil. Nowadays, these areas are mostly covered with agricultural fields that allow for three crops a year; in the Anning River Valley most of these are paddy fields. Only very few settlements can be found in the mountains of the hinterland on less fertile grey-brown purple soils, e.g., in Zhaojue, Meigu, and Huidong. Huili and Yongsheng are both characterized by red and para-red soils allowing for two crops a year, but these patches of good soil are surrounded by steep areas less well suited for agriculture. A few settlements can be found on the steep banks of the Jinshajiang and part of the lowest expanses of the Anninghe in areas that at present are covered with low shrubs and tend to be fairly dry. Yanyuan tends to be relatively hot and dry as well, while the middle and upper reaches of the Anninghe have a mild climate with seasonal but ample precipitation, and it is indeed the Anning River Valley where most settlements have been observed.

Overall, settlement sites tend to be located in areas that are favorable for agriculture, but some can also be found in the high mountains, on steep slopes, or in forested regions not suited for extensive planting of crops. A further factor that has to be kept in mind is the location of resources. The available maps on the distribution of metals and other natural resources are too imprecise to allow for safe correlations, but Huili and Panzhihua have especially rich deposits, and this is where a number of sites can be found even on less fertile soil and in a drier climate. The salt of Yanyuan is another important instance of a natural resource drawing people to a fairly inaccessible place surrounded by high mountains. So far, no early sites connected with salt production have been found, but a first survey has shown that the local salt has been exploited at least from the Tang Dynasty onward and possibly already since the Han (Zhou and Jiang 2011).

Nearly all of the known sites are open-air settlements, while only five are cave sites, all of them located in the southwestern mountains.[3] Three of the four cave sites measure 30-40 m^2, while Xiqu Yanwan consists of a cave site of 30 m^2 with an open-air settlement of 180 m^2 in front. Both open-air and cave sites usually have shallow cultural deposits and few layers, are small in extent, and oftentimes disturbed. The thickness of the cultural deposit ranges between 0.3 m and 4 m, with a mean of 1.1 m, while the thickness of single layers ranges between 5 cm and 1.5 m.[4] At most sites, only one cultural layer could be observed, but a small number of sites have thicker cultural deposits with several layers belonging to clearly different phases.[5] Site size

[3] These sites are Renhe Huilongwa, Renhe Xicaoping, Xiqu Yanwan, and Yongsheng Taoyingcun.

[4] As many sites are located on hill-slopes while the area is very prone to erosion, these numbers may not represent the original thickness of the cultural layers, but they cannot have been very thick from the outset.

[5] The most important sites with thick cultural deposits consisting of several layers are Xichang Dayangdui, Yingpanshan, Ma'anshan, and Mianning Sanfentun. Several cultural phases have also been observed at Xichang Henglanshan, Lizhou, Mimilang, Qimugou, and Yongsheng Duizi.

estimates have been provided for 84 sites, and they range widely from 13 m^2 (Jinyang Muangou) to 32 ha (Meigu Wagujue) for all known sites, and from 1400 m^2 to over 13 ha for sites that have been excavated.[6] Statistical evaluations provide a very disparate picture, [7] but a few general tendencies are discernible: 30-50% of the sites are 0.1-0.5 ha in size, 20% of all sites measure 1.1-5 ha, and only a few are considerably larger (Figures 4.10-4.13). The largest excavated sites are Puge Wadaluo (13.14 ha), Xichang Ma'anshan (10 ha), and Dechang Dongjiapo (7.1 ha); eight additional sites measure over 1 ha.[8]

What these size ranges mean in terms of population size or settlement pattern cannot be ascertained at the current stage of field work. Worldwide and even within China, the size of prehistoric settlements varies widely between different areas and time periods. It is obvious that the settlement sites in the Liangshan area cannot be compared to the large prehistoric walled settlements of the Chengdu Plain, which range around 11-60 ha in size (Wang Yi 2006). Considering the size spectrum, a better point of comparison might be small villages that Liu Li has places at the lowest rank within the settlement system of the Yiluo river valley; they measure 1-8 ha on average, but many are considerably smaller.[9] Given the shallow layering and the lack of large constructions, sites associated with prehistoric mobile and semi-mobile communities in

[6] I am leaving out Renhe Huilongwa from these estimates as it is a cave site, which cannot be compared in extent with open-air sites.

[7] For excavated sites the average size is 2.5 ha, with a median of 0.7, a mode of 0.7, and a standard elevation of 0.2, with sites of 0.14-13.14 ha in size. For all sites, including extreme values, the average size is 2.1 ha, with a median of 0.56, a mode of 0.2, a standard elevation of 4.48, and site sizes between 13 m^2 (Jinyang Munagou) and 32 ha (Meigu Wagujue). When the extreme values at the high and low end are eliminated, the average site size is 1.8 ha, with a median of 0.58, a mode of 0.2, a standard deviation of 3.05, and sites ranging from 150 m^2 at the low (Mianning Wenjiatun), and 15.75 ha at the high end (Huili Qiaoba). Looking at the overall distribution in a histogram, it becomes clear that over half of the sites are 0.1-1 ha in size, regardless if all sites are taken into account, 81 sites excluding extreme values, or the 25 excavated sites with site size estimates.

[8] These are Xichang Qimugou (1.3), Huili Dongzui (2.2), Mianning Hujiacui (4), Sanfentun (4.4), Xichang Mimilang (4.8), Puge Xiaoxingchang (5), Yanyuan Jiaodingshan (5).

[9] Her study is based on a full-coverge survey of the Yiluo river valley, where her team identified 13 major (20-35 ha) and 8 minor centers (10-19 ha), interspersed by a large number of small villages (Liu Li 2004).

Southwest Asia and other places might be another parallel worth considering. Such sites are mostly below 0.2 ha in size, with some larger settlements measuring between 0.2 and 0.5 ha, and the largest reaching 1-1.5 ha (Flecher 1986). This serves to show that the interpretation of site size is not only connected to questions of population size but also to subsistence and social structure, problems which require further investigations into settlement structure and object assemblage. These aspects will be discussed in the following pages.

IV.2 Settlement Structure and Features

As most excavations conducted so far are rather limited in extent and intensity, not much is known about settlement structure. Building remains are so far only known from eight sites,[10] while ash pits have been observed at 19 sites,[11] and pottery kilns were reported from two locations (Xichang Lizhou and Dechang Wangjiatian). House forms tend to be rectangular and relatively small (2-3 m by 1-2 m). So far, three different construction types could be identified: semi-subterranean houses with two posts in the middle or on the sides,[12] buildings whose walls were sunken into trenches (with or without supporting posts),[13] and features lined by rows of post holes (Figures 4.14-4.18),[14] while the spaces between the posts had probably originally been filled with wattle and daub construction or another kind of mixture of organic material and clay. At Dechang Wangjiaping and Xichang Ma'anshan, the posts were secured with stones and other

[10] Dechang Dongjiapo, Wangjiaping, Xichang Henglanshan, Ma'anshan, Mimilang, Qimugou, Huili Dongzui, and Yongsheng Duizi.

[11] Dechang Dongjiapo, Maojiakan, Wangjiaping, and Wangjiatian, Xichang Henglanshan, Lizhou, Ma'anshan, Maliucun, Mimilang, Qimugou, and Yingpanshan, Huili Dongzui, Fenjiwan, and Houzidong, Puge Wadaluo, Xide Wadegu, Yanyuan Jiaodingshan and Xifan, and Yongsheng Duizi.

[12] This type of houses was reported from Yongsheng Duizi and Dechang Dongjiapo.

[13] Such features were reported from Qimugou and Mimilang in Xichang, Dongjiapo in Dechang, and Huili Dongzui.

[14] Such features have been discovered at Huili Dongzui, Xichang Henglanshan, Ma’anshan, and Wangjiaping, while at Qimugou a number of post holes have been found, that did not align into any recognizable feature.

debris, probably to secure the post and/or prevent it from sagging deeper into the ground. The semi-subterranean houses at Yongsheng Duizi were sunken 10-30 cm deep into the ground, had a roughly square floor plan with rounded corners, and were sintered to a depth of 3 cm, which has been interpreted as a measurement against dampness (Figure 4.17).[15]

The only house for which some kind of internal division could be identified is the semi-subterranean house at Dechang Dongjiapo. There seems to have been an internal wall, separating off the eastern third of the building, but the feature could not be clearly observed (Figure 4.18). Inside the building, there was furthermore an area of 0.8 x 0.8 m of sintered earth with a round post hole of 0.3 m diameter in the middle. In the Northeast there was a firm grey-yellow occupation layer of 1.2-1.4 m, that the excavators have interpreted as entrance way. The rest of the ground was of softer consistency, and covered with charcoal fragments, red-burned earth pellets, and fragments of clay blocks with grass or straw imprint, probably plaster remains. Similar fragments have also been discovered during the second excavation campaign at Dongjiapo. Such detailed observations on the internal organization of the building features have not been reported from any other sites. In most cases, it was only mentioned that there were ash, charcoal, red-burned earth pellets, and small numbers of heavily-fragmented ceramic sherds within the house features, suggesting living quarters for facilities for cooking.[16] Feature F1 at Qimugou additionally contained a few stone tools, four plate-shaped choppers and a grinding roller, all fit for household-scale processing of food or maybe hides or other materials.

Most of the 61 ash pits that have been observed at settlement sites are round in form (34), a few oval (7) or rectangular (6), some irregular (5), and one roughly kidney-shaped (Figures

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[15] This as well as any other information on the site of Duizi was extracted from the PowerPoint file of a presentation given by the excavators at a conference in Chongqing in December 2010. As the material is still awaiting publication, this is currently the only source of information on the site.

[16] These are Dongzui F1, Henglanshan F1-2, Ma'anshan F1, Qimugou F1 of 2005 and F1 from the 2006 excavation.

4.19-4.25). The bottom is mostly flat, sometimes curved, the walls are usually straight or slightly curved, and the opening tends to be wider than the bottom. The pits usually have a diameter of 1.5-2.5 m with a few being much smaller (0.5 m diameter) or much larger (3-3.7 m diameter), and they are usually wider at the rim than at the bottom. Most pits (41) contained heavily fragmented ceramic sherds, mainly jars of various sizes, as well as bowl and more rarely spouted ewers. Eleven pits at five sites yielded stone tools, most of them polished, covering the entire range of most common stone tools found at sites, i.e. *fu* axes, *ben* adzes, *zu* arrowheads, *zao* chisel, *lishi* grinding stones, and *dao* knives, as well as flaked scrapers and semi-finished products.[17] Some pits additionally contained natural stones of unclear function.[18] Some yielded charcoal or other material indicating the firing of ceramics or other production processes.[19]

Most pits can thus be securely identified as trash pits, and only a few stand out because of their peculiar contents. The four pits at Fenjiwan are very regular in shape and contain large greenish sandstone pieces, as well as fragments of red-burned earth and charcoal, but no objects (Figure 4.24). These pits might therefore have had a special function involving fire, be it in production or ritual activities. All nine pits at Lizhou, likewise regular and round in form, have walls that are burned grey to a depth of 1-2 cm, indicating a short burning period at relatively low temperatures (Figure 4.27). In addition, they are filled with stones that are all blackened and partially cracked by fire, as well as ash and charcoal, but no artifacts. A kiln consisting of a fire pit and a fire corridor observed at the same site, contained similar material. It is therefore very likely that these pits were used for firing ceramics as well. The temperatures reached cannot have been very high, and indeed the ceramics found in the graves and settlement-layers at the same

[17] These sites are Dechang Maojiakan and Wangjiatian, Huili Dongzui, Xichang Ma'anshan, and Mimilang

[18] Reported from Huili Dongzui and Fenjiwan, Xichang Lizhou, Mimilang, and Wangjiatian.

[19] Observed at Huili Fenjiwan and Xichang Lizhou.

site are coarse, hand-thrown, sand-tempered and low-fired. Pottery kilns have not been reported from any other sites, and other production facilities are also rare. All features associated with metal working, for example, come from later contexts, as introduced in Chapter III.

The pits at Puge Wadaluo and Xichang Maliucun (Figure 4.28) differ from those observed at other sites. Although being of a fairly ordinary rectangular shape, the pit at Wadaluo was exceptionally large (3.68 x 2.06 x 0.6 m) and yielded over 150 neatly stacked ceramic vessels which were largely intact. The 20 vessels from Maliucun were complete as well and had been carefully deposited. In both cases the objects were of fine, high-fired fine ware, very different from the low-fired, sand-tempered, red ceramics otherwise common to settlement sites. These pits therefore do not belong to a domestic context but have a ritual significance and will therefore be discussed further in Chapter VI as "Object Pits."

IV.3 The Ceramic Assemblage

The ceramic assemblage consists of 5697 vessels and vessel fragments from 74 sites, but these number are highly skewed, as 4236 sherds alone were reported from Dechang Maojiakan; moreover, Dechang Wangjiatian and Xichang Qimugou are represented with several hundred sherds each, while for 58 sites only a few exemplary types and vague notions of the presence of 'few' or 'many' objects of certain forms have been published. To balance out this unevenness of information, I am comparing both absolute numbers and percentages as well as the general presence/absence of ceramic forms or technical details at the different sites. Collating the material collected in my field research and published material, I was able to collect detailed information on 1114 ceramic objects and fragments from 28 sites. This sample is large enough to allow for conducting object classification and statistical analyses (Tables 4.5-4.17; Figures 4.29-

4.39).[20] Below, I will describe the particularities of the assemblage including technical details, object forms, and decoration, focusing on the combination of these different factors and the spatial distribution of the various kinds of ceramics.

IV.4.1 Raw Material and Technical Details

Most of the ceramic assemblage consists of coarse sand-tempered pottery (Figure 4.29). Fine ware occurs at only 14 sites and usually make up a very small percentage of the ceramic material, typically below 2% and rarely over 15%. Only at the three sites of Puge Tianba, Yanyuan Xiaoguan Liangzi, and Yanyuan Xifan does fine ware stand a lone, and at Puge Wadaluo it makes up the majority of the assemblage. The two sites in Yanyuan are only known through surface finds and the original form of the objects is unclear, but it was reported that the ceramics were fired at a relatively high temperatures and in a reducing atmosphere. The ceramics from Yanyuan are generally made of relatively fine material, having been tempered with very fine sand or clay, which might be a regional particularity. Other sites in Puge aside from Tianba and Wadaluo have mainly yielded coarser reddish-brown sand-tempered ceramics, but the vessel forms are very similar to the flat-footed medium-sized jar forms without handles found at Tianba. The objects reported from the settlement layers of Wadaluo are similar to those from Tianba, but the objects were fired at higher temperatures and in a reducing atmosphere turning them grey. Furthermore, this site yielded an object pit containing large numbers of complete high-fired grey and black clay ceramics of fine quality instead of the usual coarse fragments found in trash pits

[20] These sites are Dechang Dongjiapo, Dashipai, Maojiaba, Maojiakan, Wangjiaping, Wangjiatian, Huili Dongzui, Houzidong, Mianning Gaopo, Sanfentun, Zhaojiawan, Puge Amucun, Kangli, Tianba, Tuantian, Xiaoxingchang, Zhongcun, Xichang Dayangdui, Henglanshan, Lizhou, Ma'anshan, Qimugou, Huangshuitang, Tuanbao, Yangjiashan, Yanjiashan, Yingpanshan, Xide Wadegou, Yanyuan Gesa.

in a settlement context. Puge Wadaluo might thus be a special-purpose site with a special assemblage rather than a settlement site.

The majority of actual settlement sites yielded only sand-tempered ceramics, most notably Dechang Dongjiapo, Maojiakan, Wangjiaping, and Wangjiatian, Huili Houzidong, Mianning Sanfentun, Xichang Lizhou, and Xide Wadegu. Furthermore, the ceramics at these sites are all low-fired, largely hand-thrown, and of relatively coarse quality; they are mostly within the reddish-brown mottled color spectrum, indicating a poorly controlled firing atmosphere. Vessel shapes consist mainly of undecorated flat-bottomed jars without handles. Fine ware has been reported from other sites as well, but mostly from later layers and ash pits, e.g., from Huili Dongzui, Xichang Henglanshan and Ma'anshan. These layers additionally contain handled vessels and higher percentages of high-fired grey and black vessels carrying a wider range and different kinds of decoration not occurring at sites dominated by coarse sand-tempered ceramics. Only at a few sites does fine ware occur throughout all layers and features in similar percentages, most remarkably at Xichang Mimilang, whose assemblage again differs from the ceramics found at the other sites just mentioned. Clay ceramics might thus be a chronological maker. This issue will receive appropriate attention in the chronological evaluations to be conducted in Chapter VII.4.

Many of the clay ceramics were wheel-thrown, but overall hand-forming predominates, and larger vessels were often coil-built (Figure 4.30). As far as surface finish is concerned, burnishing or polishing occurred in 85 cases at eight sites,[21] and black slip was reported for 31 vessels from four sites that also yielded polished vessels.[22] White slip occurred with one single

[21] These sites are Dechang Dongjiapo H4, Mianning Gaopo layer 3, Puge Wadaluo, all layers of Xichang Henglanshan, Lizhou, Mimilang, Ma'anshan, and Yingpanshan.

[22] These sites are Huili Houzidong, Mianning Gaopo layer 3, Ningnan Tangjiawan, Puge Wadaluo, Xichang Dayangdui, Henglanshan layer 1-2, Lizhou, and Qimugou layer 3.

vessel at Mianning Gaopo Layer 3, which additionally contained at least 19 burnished/polished and four black-slipped vessels. Both black slip and polishing were also observed a Xichang Henglanshan, but black slip occurred only in the later layers 1 and 2. The largest percentage of burnished vessels was found in all layers and features at Xichang Mimilang, and some polishing and smoothing on a slow wheel could also be ascertained for a small number of ceramics at Xichang Ma'anshan and Yingpanshan. Black slip is very rare overall, especially if combined with high polish as can be seen with ceramics from Xichang Dayangdui, Qimugou, and various sites in Puge. Both kinds of surface finish are mainly found with grey, grey-brown, brown, or black clay or sand-tempered pottery fired at medium or high temperatures.

Black slip seems to be mainly reserved for small forms such as fine *bo* or *wan* bowls, cups, goblets, and vases, but this kind of surface treatment can also occur with stout jar forms and even with large urns as seen at Dayangdui. In the case of the jars and urns, the slip might have been applied to prevent leakage when storing liquids or the intrusion of water when storing grains. The burnishing of vessel surfaces observed for a number of large urns at Ma'anshan and flat-bottomed jars at Mimilang and other sites might have served to condense and thus seal the surfaces for similar reasons. For bowls, goblets, vases, and basins, which might have served as fine table ware and/or for holding liquids, the purpose of such surface finish might be both decorative and practical.

While clay ceramics are mostly grey and black, and more rarely brown or red-brown, sand-tempered pottery can range widely in color, from red, over brown, to grey and black. Most common are colors of the red/yellow/brown spectrum, which make up over 50% of the overall assemblage including both clay and sand-tempered pottery (Figure 4.31). Uneven mottled colors with both reddish-brown and grey parts (here listed as grey-brown), account for another 14% of the ceramic assemblage. The remaining over 30% of all ceramics are grey or black, most of them being clay or fine sand-tempered pottery occurring with high-polished ceramics at sites such as Xichang Qimugou and Dayangdui. Most other sites are characterized by an assemblage consisting of reddish-brown colors showing an oxidizing firing atmosphere. Mottled colors are common at a considerable number of sites, indicating a not very well-controlled burning atmosphere as can be reached in simple pits such as those reported from Xichang Lizhou.[23] Such pits cannot produce a reducing atmosphere, however, and at least the few solidly black or grey ceramics known from other parts of the research area must have been fired in more complex kilns. The yellow-brown hue that characterizes ceramics from Dechang Maojiakan and most sites in Huili, on the other hand, might be connected with particular raw material sources exploited in those areas rather than with differences in firing processes.

IV.4.2 Object Form and Usage

As far as forms are concerned, open-mouthed vessels with moderately constricted neck, curved outward-flaring or angular everted rim (type A and B rims), and rounded or erected ellipsoid or ovaloid body and flat bottoms are most common (type IA bottoms) (Figure 4.32). Some of the flat bottoms are slightly thickened, or more rarely indented in the middle.[24] Ring-foot vessels appear only at a limited number of sites and there only in some layers, most prominently in Xichang Qimugou layer 3 with high and short ring-feet and higher pedestals occurring next to flat bottoms. Such pedestals as well as trumpet-shaped ring-feet are also

[23] Most notably among these sites are Dechang Maojiakan, Wangjiatian, Xichang Henglanshan, Lizhou, Yingpanshan, as well as the earlier layers of Mimilang

[24] Such bottoms have been found at Dechang Dongjiapo layer 3, Wangjiaping layer 3, Wangjiatian, Huili Dongzui layer 5, Mianning Zhaojiawan, Puge Wadaluo, Xichang Ma'anshang layer 7, Mimilang layer 3 and 4, Qimugou layer 3, and Yanyuan Jiaodingshan.

common in Mianning Gaopo and Zhaojiawan, as well as in Maojiakan layer 4 and 5. High stems were also reported from Xichang Yangjiashan, and shorter ring feet appeared at Dechang Wangjiatian, Mianning Sanfentun, and Xide Wadegu. Xichang Mimilang and Henglanshan, each one ring-foot was found, but only in the surface collection, so they might be of a later date than most of the material from the site. Overall, there is a tendency for ring-foot bottom to appear mainly in the immediate Anning River valley, and even there only at a limited number of sites and layers, indicating a possible regional as well as chronological bias.

As to overall vessel forms, different kinds of jars and urns without handles by far outweigh all other object types and they have been reported from all sites and settlement layers (Figures 4.33-4.34). All other vessel forms are too rare to allow for combination statistics, and no significant co-occurrence between any specific object types can be identified (Table 4.18), but a qualitative evaluation of the assemblage combined with simple histograms and pie-charts can provide some impression on the nature of the more fully excavated sites. The most common vessel forms are large coarse *guan* jars with rim diameters measuring mostly between 20 and 30 cm, but some are smaller, with rim diameters of 10-20 cm, and a few reach sizes of up to 38 cm diameter (jar type B, E, H, urn type A, B, D). Handled *guan* jars occur only at a limited number of sites, most prominently Dechang Wangjiatian, Huili Dongzui, Mianning Sanfentun, Xichang Dongjiapo, Mimilang and Qimugou, and a few other sites.[25] All of the handled vessels are small or of middle size, with one or two band-handles extending from the lip or rim to the shoulder. The handles observed at Wangjiatian, Sanfentun, Dongjiapo, Mimilang, and Qimugou are mainly wide and short, composed of 2-6 vertical clay strips, sometimes with a decorative horizontal clay strip placed across them, while other sites yielded long thin band handles made of

[25] These are Dechang Dongjiapo, Mianning Zhaojiawan, Puge Tianba and Zhongcun, and Yanyuan Jiaodingshan.

a single strip, e.g. Mianning Zhaojiawan and Yanyuan Jiaodingshan. While jars without handles occur in all places and layers, handles were only found in some layers, e.g. in Qimugou layer 3 but not 4, or in the later graves at Xichang Lizhou but not in the earlier settlement layers of the same site, indicating a chronological marker at least within the Anning River Valley. The presence of handles does surely mark a difference in object handling, indicating a lifting motion with one or two hands. The long horn-shaped handle observed on each one cup-shaped vessel at Puge Kangli and Puge Wadaluo, which is sticking out at an angle of over 45° and curved upwards, would have allowed for a similar lifting motion. Otherwise, such horn-handled vessels have only been found at Xichang Lizhou in a grave context.

While band-handles occur either single or at most in pairs attached to wide-mouthed small or medium-sized vessels likely used in drinking or serving, small horn-shaped knobs or lug handles occur on bigger vessels and usually in larger numbers. They are usually arranged in a horizontal row, probably providing support to a thread would around the vessel body for greater ease of handling. Such applications have been observed only on large coarse vessels which might have been used for storage but were very likely not lifted on a regular basis. These additions to the vessel body take two different forms: they can be horn-shaped with a broad base, as observed most prominently at Mianning Gaopo and Zhaojiawan, while similar vessels at Dechang Wangjiatian and Huili Dongzui are small and rather knob-like, and positioned in a way that would have made it hard to secure a rope below them. In some cases, these knobs might thus have been decorative rather than functional. Overall, it is remarkable that band-handles appear only at a small number of sites, mainly along the Anning River and in Huili, while lug handles and horn-shaped or knob applications are even more restricted in distribution, occurring only in

Dechang, Huili, and Mianning, but not in Xichang or further West, indicating regional differences in domestic vessel assemblages and, we may infer, in ways of living.

Other common vessel forms comprise bowls, mainly *bo* with a slightly inward-curving rim while open *wan* bowls are more rare but not altogether uncommon. Basins occur only infrequently, i.e., in Xichang Henglanshan layer 3, Mimilang layer 4, and Yingpanshan layer 5. Bowls, on the other hand, have been retrieved from most layers at Xichang Henglanshan and Yingpanshan, the early layers Mimilang and Ma'anshan, and sporadically at other sites in Dechang, Mianning, Puge, Huili, and Xichang, with no discernible distribution pattern. The same applies to the occurrence of small *bei* cups, goblets, beakers, and other potential drinking vessels. Bowls might have served as table ware as well, but it is remarkable how rare these small forms for personal usage are. It therefore seems likely that either the cups and plates used by people in daily life were made of organic material, or that it was customary to eat and drink from communal larger vessels. Spouts and ewers indicating the pouring of liquid (presumably into cups or bowls for single consumption) are even more rare, occurring in small numbers only at Mianning Gaopo, Xichang Henglanshan, Lizhou, Ma'anshan, and Qimugou. Vase-shaped ceramics and wide outward-flaring rims, which might have been used for pouring liquids as well, have likewise been observed at Xichang Henglanshan and Qimugou, but also at Mimilang, Yingpanshan, Dechang Dongjiapo, Wangjiatian, and several sites in Puge and Huili. While the spouts found in the Xichang area are all tubular-shaped, of medium length, and usually attached at a 45° angle, those in Mianning are extremely large, coarse, coil-built, and conical or horn-shaped in form. What kind of vessels they may have belonged to is still unclear, but it is obvious that they were rather different in function from the small to medium-sized fine spouted ewers and vases around Xichang.

Object stands occur very rarely; they have only been reported from Dechang Wangjiatian and Wangjiaping, and lids, as they occur at a few sites in Xichang and Dechang.[26] Only one ceramic net weight has been reported from Xichang Qimugou, and ceramic spindle whirls have been found at Xichang Mimilang, Mianning Gaopo, Sanfentun, and Yongsheng Duizi, while spindle whorls made of stone are much more common. Their distribution will be evaluated below together with other tools made of stone, bone, and other organic material.

IV.4.3 Decoration

The majority of ceramics (80-90%) is undecorated; from 28 sites no decorated sherds have been reported at all.[27] Exact percentages have been reported only for eight sites, while in all other cases it is only known that only 'a few' decorated sherds have been found. Among these eight sites for which exact percentages are known, the lowest percentages of decoration was recorded in Dechang Maojiakan with below 1 % for all layers, followed by Xichang Yingpanshan layer 5, Mimilang layers 3 and 5, Henglanshan layers 3 and 4, Mianning Sanfentun layers 5-7, and Dechang Dashipai, which all ranged below 10%, while Mimilang layer 4, Yingpanshan layers 4 and 6, Qimugou layers 3 and 4, and Huili Dongzui layer 4 between 10 and 20 % decorated sherds. Qimugou had the largest amount of decorated ceramics throughout all layers (17.9-19.5%), followed by Mimilang (5.1-10.1%), while all other sites contained significantly less decorated material, indicating local and/or chronological differences.

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[26] These sites are Dechang Dongjiapo, Maojiakan, Xichang Henglanshan, Ma'anshan, and Mimilang.

[27] These are Huili Fenjiwan, Jinmei, Raojiadi, and Shenjiafen, Huidong Dashanbao, Meigu Wagujue, Mianning Wenjiatun, Miyi Lianhua Gongshe, Puge Tianba and Tuantian, Xichang Bahe Baozi, Bentukan, Damaliu, Daniba, Dongyuemiao, Guanshan, Tanshan, Tuanshanbao, Xiaojia Gaokan, Zengjiabao, and Zhongjia Shanzui, Yanyuan Xifan, Zhaojue Hebo, Panzhehua Renhe Gonghe and Yangjiashan, and Xiqu Yanwan.

The main locations for decoration placement on the vessel are on the shoulder and the upper part of the vessel body, as well as on the bottom or right below the rim, while decoration on the lip or the neck is more rare (Figures 4.35-4.36). The decoration on the vessel-bottom consists nearly exclusively of impressed leaf-vein pattern, which — as mentioned in Chapter III — might be a technical detail rather than actual decoration. When recalculating the percentages omitting bottom decoration, the picture nevertheless stays roughly the same; there is a clear preponderance of shoulder and body decoration, but about 40% of the decoration are placed in the upper vessel part including lip, rim, and neck. Nevertheless, the body decoration is usually applied only to the upper part of the body just below the shoulders, mostly in continuation of decoration motives starting higher on the vessel body, indicating a view from a sitting position on the floor or looking from above when standing, but not from below. Decoration on various fields can be combined, with shoulder and body decoration frequently occurring together and impressions on the bottom often combined with most other decoration forms (including, sometimes, lack of any decoration). Only decoration right below the rim, mostly in the form of clay-strips, is usually not combined with other forms of decoration.

The most common decoration techniques are incision and impression with tools or finger-tips, as well as appliqué or a combination of appliqué and impression, and, very rarely, cutting (Figure 4.37). The most common decorative programs are impressed leaf-vein pattern on the vessel bottom (if to be counted as decoration motive), as well as incised horizontal and transversal lines, complex incised patterns (fish-bone pattern, net pattern, crosses, zigzag), and lines of tool-impressed points applied to shoulders and/or vessel body (Figures 4.38-4.39). Also rather frequent are horizontal appliqué bands with or without finger-tip impressions usually placed just below the rim, and corded pattern on the lip or the vessel body. Very rare are other applications such as short bands or spirals either applied to the vessel body or on handles, and cut-out triangles, ovals, or circles. Cut-out decoration on the pedestal base of goblet-shaped vessels has so far only been observed in layer 5 and features H2 and H5 in Huili Dongzui, and in Xichang Mimilang layer 4 a single rim fragment with cut-out holes has been found. The former kind of decoration is otherwise only known from Huili Leijiashan M1, while other forms of cutting are otherwise unknown. Other forms of application aside from horizontal clay strips include vertical finger-tip impressed clay strips placed over bundles of incised horizontal lines on vessel (Dechang Wangjiatian layer 2), bundles of water-ripple pattern with a lying S-shaped application on top (Huili Dongzui layer 4, Mianning Sanfentun surface finds), and short horizontal clay-strips on band-handles made up of several vertical clay strips (Mianning Sanfentun and Puge Xiaoxingchang surface finds). Both types of application are very common in the megalithic graves that will be discussed in Chapter V, showing a cultural and/or chronological connection.

Finger-tip impressed appliqué bands, although rather prominent by number of occurrences, have hardly ever been observed in a grave context and appear only at certain settlement sites, most prominently at Xichang Henglanshan, as well as at Ma'anshan, Yingpanshan, Qimugou layer 3, Dechang Maojiakan and Wangjiaping, and more rarely at Xichang Lizhou, Mimilang layers 3 and 4, Huili Dongzui, Dechang Dongjiapo layers 2 and 3. Such appliqué bands are completely absent from the sites of a Yongsheng Duizi, Mianning Sanfentun, Dechang Wangjiatian, Huili Houzidong, and most other sites in Huili, to name only the most important ones. This decoration motive might therefore be a chronological marker, while incised lines, corded ware, simple point designs and net patterns are widely distributed throughout most sites. Another type of surface alteration appearing only at specific sites are leaf-impressed bottoms, which are known from a considerable number of sites in Dechang, Mianning, Huili, Xichang, and even Yanyuan.[28] As no leaf-impressed bottoms appear at the sites of Henglanshan, Lizhou, Yingpanshan, Maojiakan, where application bands are very prominent, both types of promises to be good typological markers.

IV.4 The Tool Assemblage: Lithics and Bone Objects

The overall lithic assemblage from settlement sites recorded for this study consists of 1868 objects from 89 sites, 1049 of which were only listed in brief reports, while details on measurements and form could be obtained for 819 specimens from 37 sites (Tables 4.19-4.32). The actual number of objects at each of these sites was probably much higher, as for many sites only a few examples were published and the overall numbers are rarely provided, but the presence/absence of different kinds of objects at different sites and the relative frequency within a given site can serve as a basis for qualitative and a limited range of quantitative analyses, while complex statistics are not possible.

Most tools were made of stone, while three sites yielded a limited number of bone tools, mainly needles, and personal ornaments, and more rarely soft hammers made of antler.[29] The stone tools described and classified in Chapter III.3 were nearly exclusively found at settlement sites, and the description of their form and raw material therefore does not need to be repeated here. Overall, the main kinds of activities in which stone tools were employed are woodworking, possibly planting, harvesting, hunting and fishing, food processing, production of clothes, tools,

[28] These sites include Dechang Wangjiatian layer 3, Dongjiapo layer 3, Huili Dongzui layer 4, Huidong Liujiawan, Mianning Gaopo, Gaopo Wanwan, Sanfentun, Zhaojiawan, Xichang Ma'anshan layer 5, Mimilang, Qimugou, Yanyuan Jiaodingshan.

[29] Bone objects have been reported from the three sites of Renhe Huilongwa, Yongsheng Duizi, and Ninglan Jinyangcun, but no drawings or pictures have been published. For Jinyangcun, it has been reported that bone hammers and needles as well as other tools of ram's horns and deer antlers have been found, while at Yongsheng Duizi, bone was only used for personal ornaments.

and other objects. Furthermore, stone was made into decorative items as well, some of which might have had ritual or talismanic meaning. Stone was used as building material for graves as well, but for living quarter it was not employed. By absolute number, woodworking tools (axes, adzes, chisels) outweigh all other types, followed by possible agricultural tools (knives, shovels, plows, ring stones), percussion tools (pestles, hammers, choppers), multi-purpose flake tools (scrapers, flakes, microliths), and grinding tools (grinding slabs, rods, handstones), while tools employed in the production of clothing items (spindle whorls, needles, drills) and bronze objects (stone molds) are less frequent, and decorative items are rather rare, as can be expected from settlement sites (Tables 4.19-4.30, Figures 4.40-4.41). Additionally, a fair amount of semi-finished products and fragments have been reported, indicating on-site tool production. Nevertheless, as the amount of excavation conducted varies greatly from site to site, these absolute numbers are not a reliable basis for statistical analyses. When considering the percentages both of number of objects and number of sites of occurrence, it becomes clear that the overall number of flake tools reported is high, but the number of sites at which they occur is relatively small. The same holds true for hunting and fishing tools as well as grinding equipment. This phenomenon needs to be taken into consideration when evaluating the relative frequency of occurrence of different kinds of tools at different sites.

IV.5. Questions of Resource Availability, Site Function, and Location Choice

IV.5.1 Raw Material Choice and Availability

What kind of raw material was generally employed for which tool types has been described in Chapter III. As stone-material types were assigned on the basis of visual impression, it was not possible to distinguish between all different subtypes of the large categories of igneous, sedimentary, and metamorphic rock. Only some distinctive kinds of material, including slate, serpentinite, sandstone, limestone, quartzite, obsidian, and chert, could be identified.

Throughout all assemblages, different types of igneous rock are the most common type of lithic raw material used in the production of nearly all object types (Figures 4.44-4.45, Tables 4.31-4.32). Only knives were usually made of slate, and grinding tools and net weighs mostly consist of sandstone. Different types of sedimentary rock are widely distributed throughout the research area, both geologically and in the archaeological assemblage. Igneous rock is likewise very common, and has been preferably employed for axes, as well as adzes, and coarse percussion tools, for which they are well-suited. Serpentinite is often used for high-polished adzes, which have been found at a number of sites in Dechang, Huili, and Xichang. According to the geological maps, serpentinite does not occur in the Liangshan region, but only further north, on the northwestern rim of the Chengdu Plain, as well as on the border to Tibet. Of interest is also the distribution of shale, which only occurs in narrow bands along the Anning River and on the southern rim of the Yanyuan basin. It often appears in between layers of the fine dark-grey slate so widely used as raw material for knives in all parts of the Liangshan region. As this raw material does not occur anywhere else in the research area, it is very likely that it was traded within a regional exchange network.

All of these materials are best worked through grinding, but surprisingly they were also employed in making flake tools and coarsely chipped core tools. Materials such as obsidian and chert, which are ideally suited for flaked stone tools, are only rarely employed.[30] Other rarely used kinds of raw material are quartz, quartzite, and nephrite. There are large deposits of quartz diorite in Panzhihua, Yongsheng, and Xichang, but nephrite is most likely an imported raw

[30] Obsidian was reported only from Dechang Maojiakan, chert from Dechang Wangjiaping, Huili Fenjiwan, Liantang, and Xiao'aozi, and also Yongsheng Duizi.

material, as is chert. There are no known obsidian sources in Southwest China either, but considering the presence of active fault zones and volcanic deposits, there could be small occurrences of obsidian as yet unexplored by geologists or already exhausted in the past.[31]

Given the lack of detailed local geological observations and the macroscopic nature of object analysis employed in this study, any conclusions on raw material sources have to remain tentative. It is only certain that high-grade flakeable material is not widely available in the Liangshan area, explaining the usage of less ideal but more common material such as different types of less homogenous igneous or even sedimentary rocks. The large amount of high-quality knives found in settlement context are closely linked with the availability of fine slate in the northeastern mountains of the research area. Any further conclusions would require both more in-depth research into the local geology and microscopic analysis of the lithic assemblage.

IV.5.2 Stone Tool Production Techniques and their Spatial Correlates

The majority of stone tools were worked by grinding (64%), about a fifth is only flaked (18.5 %), and for 17.5 % of all stone tools both kinds of techniques could clearly be identified, but these proportions differ significantly by site. For a few sites, the number of primarily flaked tools is significantly higher,[32] for some the percentages are about even,[33] but at most sites the primarily ground tools are in the majority (Figure 4.44). Another factor which can be used to classify the stone tools in relation to production is the amount of work applied to them. At most sites finely worked tools predominate, while at others the lithic assemblage is very coarse, and a

[31] Very small fragments of obsidian have been found at a number of sites in Sichuan, but as they are only rarely shaped into tools while the material itself is unknown to many archaeologists working there, it is often not reported. (personal communication Jiang Zhanghua).

[32] These are Dechang Qangjiatian, Huili Liantang, Yangjia Wuji, Houzidong, and Puge Zhongcun.

[33] These are Dechang Dashipai, Tianbacun, and Xichang Qimugou.

number of sites had an assemblage about evenly composed of fine, medium, and coarsely worked objects (Figure 4.45).

The most highly polished assemblages were found in Puge, Yanyuan, and Yongsheng, while most coarse assemblages come from Dechang and Huili. The material from Xichang, on the other hand, has a high percentage of finely ground tools, intermingled with some coarser specimens. With the exception of Dechang Maojiakan and Wangjiatian, all flakes and microliths were found in Huili and Panzhihua, but their number is overall very small, with 151 such object coming from only seven sites. Neither the degree of refinement nor the relative number of flaked or ground stone tools correspond with their location characteristics, be it elevation or morphology, but there seems to be a regional bias. This impression will be re-evaluated below after considering the differences in object types occurring in the different sub-regions.

IV.5.3 Object Assemblages, Environmental Preconditions, and Economic Implications

All but ten sites in the research area contained stone tools, while bone tools have only rarely been reported, possibly due to unfavorable preservation conditions rather than lack of bone tool usage in the past.[34] From most sites varying amounts of ceramics have been reported, while only 11 sites yielded no pottery remains,[35] four of them cave sites in Panzhihua and Yunnan.[36] From the Liangshan area itself as well as from other areas in Sichuan, no cave sites have been reported, but they are fairly numerous in the neighboring areas of Yunnan, where they are characterized by coarse stone tool assemblages that are probably of late Paleolithic date

[34] No stone tools have been reported from Mianning Hujiazui, Wenjiatun, Miyi Lianhua Gongshe, Xichang Bahe Baozi, Dayangdui, Dongyuemiao, Xijiao Gongshe, Zengjiabao, Yanbian Yumen Wanxiao, and Xifan.

[35] The eleven sites without pottery remains are Dechang Majiabao, Huili Kangzipo, Yangjia Wuji, Ninglan Jinyangcun, Kaijicun, Renhe Huilongwa, Xicaoping, Yanbian Yumen Wanxiao, Yanyuan Ganhai Sandadui, Yongsheng Sankuaishi and Taoyingcun.

[36] These sites are Renhe Huilongwa, Renhe Xicaoping, Xiqu Yanwan, and Yongsheng Taoyingcun.

(Zhongguo Wenwuju 2009). The four cave sites falling within the research area are 30-40 m^2 in surface area and yield an assemblage consisting of chipped stone tools, microliths, and bone tools, as well as large numbers of animal bones. Only Xiqu Yanwan is different; it consists of a cave site of 30 m^2 with an open settlement of 180 m^2 in front, and its assemblage combines chipped stone tools with heavily fragmented ceramic sherds, indicating a more settled, but not necessarily agricultural way of living. The survey team — the site remains unexcavated — has therefore suggested an early Neolithic date, but at the current stage of research this is probably rather an assessment of the mode of subsistence than an actual date.

All cave sites are located in close vicinity to the Jinshajiang, mostly on drab red soil of medium to poor quality that is covered by low shrubs, while only Renhe Xicaoping is located in an area that is still forested today. Xicaoping is furthermore located at a relatively high elevation and steep slope compared to the surrounding area. Being cave sites, it is only natural that the slope would be considerable, but nowhere as steep as for Xicaoping, which might have the cave not easily accessible. It is furthermore relatively far from the river (7.33 km). The same is true of Yongsheng Taoyingcun, while the other two caves are situated less than half a kilometer from the Jinshajiang. Yongsheng Taoyingcun is furthermore remarkable for being located at the very high elevation of 2676 m asl, but the surrounding mountains are even higher, making the place less exceptional. It is noteworthy, however, that the site is separated from the river by a mountain ridge lying between them, while the other sites are overlooking the river. It would therefore have been very well sheltered, but potentially hard to access and removed from a water source. Xiqu Yanwan is at lower elevation and in the alluvial fan of the river where the soil is more fertile than higher up the mountains. As this site combines open-air and cave locations, and its assemblage combines chipped stone tools with ceramics, at least a limited amount of agricultural activity seems probable, while the other cave sites are more likely to have been inhabited by hunter-gatherers or used as hunting stations by groups living off a mixed economy.

Turning to open-air sites without ceramics in their assemblage, Huili Yangjia Wuji is characterized by a coarse, exclusively flaked stone assemblage consisting of a mainly microlithic industry with some larger flakes and scrapers, while the stone tools from the other sites without ceramics do not differ much from those usually associated which ceramic remains. All of these sites are located at relatively high elevations, which can nevertheless be considered average for the sub-regions they were found in, particularly Ninglang, Yanyuan, and Yongsheng. The sites in Ninglang are furthermore located on rather steep slopes and far away from the main rivers, but probably close to some of the small seasonal streams, and close to forested areas, indicating that the main mode of subsistence might not have been agriculture.[37] Other sites without ceramic remains, however, are located on fertile alluvial soil in Huili, Yanyuan, and Dechang, mostly very close to major river courses and on mellow slopes. As these sites are only known through surface surveys, the lack of pottery might thus reflect a lack of fieldwork, rather than an actual difference in original assemblage.

All microliths recorded in this study come from five sites in Huili, Panzhihua, and Dechang.[38] At Renhe Gonge, both microliths and a small number of coarse pottery sherds have been found. The site is located in the same region and kind of environment as the cave sites described above, and might thus likewise have been a hunter-gatherer dwelling, a seasonal camp, or special-purpose site. The two sites in Dechang are rather different in character. They are located on second-level terraces at moderate elevation, leaning against a mountain and

[37] The shapefile for rivers used in this analysis is too coarse to display these small seasonal streams, but the SRTM shows the network of fine veins cut into the surface by both larger and smaller rivers.

[38] These sites are Dechang Maojiakan, Wangjiatian, Huili Yangjia Wuji, Renhe Gonghe and Huilongwa.

overlooking a river, locations suitable for agricultural activities and a settled style of living. Both sites have a relatively thick bundle of cultural layers, but they are very similar in content; building-remains have not been found at either site. Dechang Maojiakan revealed a large amount of ceramic sherds as well as stone tools. The ceramics are mostly coarse sand-tempered flat-bottomed jars and cups and a few finer pieces; the lithic assemblage consists mainly of flakes and scrapers, as well as polished woodworking tools, knives (both with and without perforation), arrowheads, percussion tools, and also cores and semi-finished products, indicating local tool production. Although coarse stone tools predominate, more finely polished objects are present as well. At Dechang Wangjiatian, the flaked stone tool assemblage is similar in character, but the range of ground-stone tool types is much more limited, containing only un-perforated knives, grinding tools, and some semi-finished products, but no woodworking or agricultural tools or arrowheads. The ceramic assemblage is different as well, consisting mainly of finer ceramics in the form of small to medium-sized handled jars, spindle whorls, and ceramic decoration types usually associated with later-period megalithic graves. The differences in assemblage might thus be related to differences in date and/or cultural affiliation, as well as subsistence strategy.

A fair number of sites, mainly in Huili and Dechang, revealed substantial amounts of coarse flaked choppers and scrapers,[39] some of them only containing flaked tools,[40] others a mixed assemblage of fine, medium, and coarsely worked tools that can be flaked and/or ground. The lithic assemblage at most of these sites contained woodworking tools,[41] some form of

[39] These sites are Dechang Dashipai, Wangjiaping, Huili Guantianshan / Yingpanshan, Hewanwan, Houzidong, Liantang, Raojiadi, Tangjiaba, Tianbacun, Washitian, Yuanbaoshan, Mianning Miaoshan, Sanfentun, Xichang Lizhou, Xichang Qimugou, Yanbian Xilin, Yanyuan Xiaoguan Liangzi, Yongsheng Haiyancun

[40] These are Dechang Dashipai, Huili Guantianshan/ Yingpanshan, Houzidong, Liantang, Xichang Qimugou.

[41] Exceptions are Huili Tianbacun, Washitian, Mianning Miaoshan, early layers of Xichang Qimugou.

percussion and grinding tools,[42] and knives, but the perforated knives usually associated with rice agriculture were rare.[43] As sickle gloss has only been observed on one of these knives, it is not completely certain that their main purpose was harvesting, let alone harvesting rice. Nevertheless, as nearly identical tools have been found over all of East Asia with clear evidence of sickle gloss, while similar knives are in use in connection with rice agriculture in Southeast Asia until today, it is reasonable to assume that the knives from the Liangshan area were used for harvesting as well, be it of wild or domesticated plants.[44] If they were exclusively used for harvesting rice, sorghum, millet, or other grains, is still unclear.[45] Of the sites just mentioned, only two contained clear agricultural tools, Xichang Lizhou, which yielded a ring-stone and Dechang Wangjiaping, where a plow was found. Both sites furthermore revealed spindle whorls, woodworking, percussion, and grinding tools, but no fishing and hunting equipment, indicating a settled, possibly agricultural based mode of living, in spite of the coarse lithic assemblage and rather coarse low-fired pottery.

The sites in Huili tend to be somewhat different from those in other areas, with a relatively coarse assemblage of grinding and percussion tools accompanied by more refined projectile points, while perforated knives or other agricultural tools, spindle whorls, or finely made pottery are mostly lacking. Nevertheless, most sites in Huili yielded woodworking tools, indicating forest clearing usually associated with early agriculture or shifting cultivation.

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[42] Exceptions are Huili Yuanbaoshan and the early layers of of Xichang Qimugou.

[43] Perforated stone tools appear only at Huili Guantianshan / Yingpanshan, Liantang, Mianning Sanfentun, later layers of Xichang Qimugou.

[44] For further material on Southwest China see Luo Erhu 2000; for examples from Longshan sites see An Zhimin 1955 and 1980; for examples from Korea see Choe 1982 and Chon 1992; for a discussion of the Japanese material see Ishige 11968; for examples of the modern-day usage of similar knives see Ishige 1968, Luo Erhu 2000, Yin Shaoting 2001 and 2009.

[45] Okladnikov et al. (1965:121) and Leroi-Gourhan (1946:306) advocate that these knives were used for harvesting sorghum or millet, but most other scholars associate them with rice agriculture (An Zhimin 1955, Luo Erhu 2000).

Especially noteworthy is Huili Houzidong, which has produced large amounts of flaked tools, mainly coarsely worked axes and a few adzes, choppers, scrapers, and grinding equipment, but associated with relatively fine polished pottery, mainly flat-bottomed jars and pitchers. The site is located on a second-level terrace at relatively low elevation of below 1000 m asl., and close to a river. Most other sites in Huili — except for Tianba and Washitian, which are both relatively close to Houzidong — are at a much higher elevation, further away from the major river courses. Houzidong is particularly close to the Jinshajiang, a main contact route of the area. The very peculiar assemblage might therefore be related to outside influence, which will have to be examined in Chapter VIII.

The only sites in Huili with a more finely worked stone tool assemblage is Washitian.[46] This site furthermore revealed a number of bronze weapons and two stone molds indicating bronze smelting activities. Most stone tools found here (chopper, needles, drills) might have been used in production activities as well, pointing at a workshop setting rather than an actual settlement. Huili is particularly rich in copper and other metal sources, but early metal extraction or production sites have not been reported. The only other bronze find from a settlement site in the research area is a bracelet from Xichang Qimugou, but no evidence of local metal working could be identified at that site.

Qimugou is another one of the sites noted for the presence of flaked choppers and scrapers, both in early and in later layers, but associated with the perforated knives that probably indicate harvesting activities. Otherwise, the material from earlier and later layers differs greatly. While in the earlier layers coarse sand-tempered flat-bottomed ceramics predominate, in the later layers fine grey fine ware emerges and the stone tool assemblage becomes more versatile, now

[46] Huili Kangzipo and Tianbacun have high numbers of finely ground objects as well, but as these sites have only been surveyed with 6 and 2 reported stone tools respectively, the material basis is too small to draw any conclusions.

encompassing woodworking and grinding equipment as well as net weights. Both the ceramic and the lithic assemblage from early Qimugou is rather similar to that from Xichang Henglanshan, early Yingpanshan, and Ma'anshan. The ceramic assemblage from Xichang Lizhou bears some resemblance to the objects from these sites as well,[47] but the lithic assemblage contains a particularly large number of double-perforated knives and well-polished woodworking tools, as well as spindle whorls and drills, indicating forest-clearing activities as well as intensive agriculture and weaving.

Late Qimugou and Xichang Yingpanshan, on the other hand, yielded net-weights, an object type which is overall not widely distributed. Net-weights — most of them made of more robust stone rather than ceramic material — have been reported from 11 sites in various parts of the research area and mostly in large numbers, indicating a strong reliance on river resources in these places.[48] All of them are on terraces or slopes, i.e. on elevated locations in close vicinity to river courses, but that holds true for most settlement sites in the Liangshan area. At least from a geomorphological perspective there is thus no greater incentive for the exploitation of river resources at these sites than at other places. Nevertheless, at these 11 sites, fishing seem to have played a more important role, especially at Yingpanshan where net-weights were found through all layers and even in the object pits of possible ritual function dominating one of its phases. Net-weights were coupled with projectile points at only two sites, Dechang Dongjiapo and Yanyuan Jiaodingshan, but both places additionally yielded considerable numbers of woodworking tools and some perforated knives, indicating a mixed economy.

[47] From the early settlement layers of Lizhou, only one single spout has been reported in drawing and detailed description, but the report mentions finger-tip impressed application bands below the rim of medium-sized jars, which would make the material similar to that from Xichang Henglanshan, Yingpanshan, and Ma'anshan.

[48] The sites are early Dechang Dongjiapo, Huili Yuanbaoshan, Ninglan Jinyangcun, Kaijicun, Puge Kangli, Xichang Qimugou, Yingpanshan, Yanbian Xilin, Yanyuan Jiaodingshan, Xiaoguan Liangzi.

Projectile points have been found at altogether 22 sites other sites, showing at least a partial subsistence from hunting.[49] Interestingly, nearly all sites in Puge contained projectile points, all of them associated with woodworking tools and non-perforated knives, but no grinding equipment or agricultural tools, indicating a subsistence more heavily reliant on hunting than agriculture. The pottery at these sites in Puge is very homogenous as well, indicating a local group. Among these 22 sites, not clear preference for specific altitudes, slopes, aspects, or distances to rivers can be discerned, but they are mostly close to what until today is forested land and mostly in areas with overall steeper mountain slopes such as parts of Miyi, Yanbian, southern Huili, Xide, Puge, and Meigu, while they are relatively rare around Xichang, Mianning, and the flatter parts of Yongsheng where good agricultural soils can be found. A greater reliance on hunting or at least a mixed economy are thus a rather natural choice at those sites where projectile points have been found.

Clear indicators for agriculture among the stone tools are much harder to find than tools for hunting, and so far no paleobotanical material was collected to support such research. Plows were only reported from Dechang Dongjiapo and Wangjiaping, ring stones/ digging stick weights from Xichang Lizhou and Henglanshan, and shovels from Huili Fenjiwan, but the shovels could have been used in other activities as well. This applies also to the perforated knives often associated with rice agriculture, which have been reported from 22 sites, mainly in Xichang and Dechang, and less frequently in Huili, Xide, Yanyuan, Yongsheng, Miyi, and Puge. Only the crescent-shaped (type D) specimens, sometimes referred to as sickle, are very clearly identifiable as harvesting tools. These sickles only appear at a small number of sites: Dechang

[49] These sites are Dechang Dongjiapo layer 1-2, Maojiakan, Maojiaba, Huili Dachonggou, Hewanwan, Tangjiaba, Tianbacun, Washitian, Meigu Wagujue, Miyi Heijiaba, Puge Tianba, Tuantian, Wadaluo, Xiaoxingchang, Renhe Huilongwa, Yangjiashan, Xichang Henglanshan, Ma'anshan, Mimilang, Xide Wadegu, Yongsheng Duizi, and Yanyuan Jiaodingshan.

Dongjiapo, Mianning Sanfentun, Puge Xiaoxingchang, and Yongsheng Duizi, nearly all of which additionally yielded projectile points, showing at least a partial reliance on hunting, even though agriculture might have been more developed. The only exception is Mianning Sanfentun.

Spindle whorls — either made from stone or ceramic material — showing weaving activities have been reported from a number of sites,[50] in assemblages with or without perforated or un-perforated knives, other agricultural tools, net weight, and projectile points. The two factors of an agricultural style of subsistence and weaving are therefore not necessarily linked, although a more settled form of living is likely in both cases. Needles — made either of stone or bone — have been found only in connection with spindle whorls have been reported, but drill, which can have a much wider application, have been seen at a number of other sites as well.[51]

Woodworking tools in various numbers and form appear throughout nearly all sites. The sites without axes, adzes, or chisel naturally include some of the cave sites and some of the sites with primarily flaked and microlithic assemblages.[52] The only cave site with woodworking tools is Xiqu Yanwan, which has an open-air part and a mixed stone-tool assemblage. Most of the other sites without woodworking tools have only been superficially surveyed, revealing small numbers of stone tools that cannot be seen as representative. Nevertheless, there are a few well-researched sites without either axes, adzes, or chisel, that require a closer look. Among them is Huili Washitian, which might have been a place for metal production and therefore a special-purpose site naturally not showing the full range of tools a settlement site would have. The same applies to Huidong Dashanbao, which mainly yielded debris from stone tool production.

[50] Dechang Dongjiapo, Wangjiatian, Huili Dachonggou, Washitian, Guantianshan / Yingpanshan, Mianning Gaopo, Zhaojiawan, Miyi Hejiaba, Puge Xiaoxingchang, Yongsheng Duizi and Sankuaishi.

[51] Needles were found at Yongsheng Duizi and Huili Dachonggou, drill at Xichang Lizhou, Huili Washitian, Hewanwan, Yuanbashoan, and Yanyuan Jiaodingshan.

[52] These sites are Renhe Gonghe, Huilongwa, Xicaoping, Dechang Wangjiatian, Huili Yangjia Wuji, Tianbacun, Mianning Miaoshan.

The case of Mianning Gaopo and Zhaojiawan is more puzzling. These two sites are located very close to each other on flat fertile ground ideal for agriculture, and both contain large amounts of sand-tempered pottery sherds of peculiar vessels with large beak-shaped spouts and large jars with lug handles. The lithic assemblage, by contrast, was rather limited, mainly consisting of perforated knives, some hammerstones and grinding equipment; neither woodworking tools, nor spindle whorls, nor arrowheads were present. This might be due to the limited extend of research in the area (so far only one brief test-excavation has been conducted at both sites), or to the brief occupation span. Another possible explanation is that the area had already been cleared of trees, and heavy woodworking equipment was not necessary to conduct agriculture. The lack of forests would mean a lack of large game, which would explain the absence of arrowheads. At the current state of research, however, these are only possibilities and sure conclusions cannot be reached, yet.

Many sites furthermore yielded semi-finished products, cores, and other fragments indicating on-site stone tool production.[53] Most remarkable among them are the cave sites, as well as Dechang Dongjiapo, Maojiakan, Huili Xiao'aozi, and Fenjiwan, which all yielded a substantial amount of semi-finished products and cores, indicating more intensive stone tool production. Nevertheless, all of these sites revealed large amounts of finished forms of nearly all other tools categories, i.e. woodworking tools, knives, other agricultural implements, grinding and pounding tools, some also fishing and hunting equipment or spindle whorls. They were therefore not special-purpose sites but probably longer-term settlements at which a wide range of production processes took place.

[53] These sites are Dechang Dongjiapo, Maojiakan, Wangjiatian, Tianbacun Huili Guantianshan / Yingpanshan, Xiao'aozi, Mianning Gaopo, Sanfentun, Renhe Huilongwa, Xicaoping, Xiawan, Xichang Dongzui, Lizhou, Yongsheng Duizi.

A last object category that can be found only at a small number of sites are objects of a non-utilitarian character, be it decorative or ritual. These are bracelets, found mainly at Yongsheng Duizi, and less frequently at Huili Hewanwan and Tangjiaba, beads, seen at Yongsheng Duizi and Xichang Lizhou, decorated stone squares of unclear meaning from Huili Liantang, and stone balls from Xichang Lizhou, Huili Dongzui, Dechang Dongjiapo, and Yanyuan Xiaoguan Liangzi. The stone balls might have had an utilitarian function, e.g., as projectiles or small hammering/grinding implements, but as they carry no macroscopically visible signs of use-wear, the actual function is hard to assess. Decorative items — unless produced in great number at a given site — would have entered the archaeological record of a settlement only if broken and discarded; they are thus naturally rare in a settlement context. Only two pearls at Xichang Lizhou are semi-finished products, showing local production. Yongsheng Duizi is most rich in bracelets and other objects of personal adornment, both in the settlement layers and graves. The site is overall very remarkable for its many thick cultural layers, large number of finely polished stone tools of many different kinds, but excluding choppers, scrapers, and other coarsely flaked objects. Furthermore, the kind of raw material chosen is mostly rather fine, including nephrite, mainly for decorative objects, chert, slate, and fine igneous rock. Although many forms are similar to those found at other sites, the breadth of the assemblage is not matched by any other site in either Yongsheng or the adjacent regions of the Liangshan area.

IV.6. Conclusion

From the preceding analyses of raw material choice, sources, object types, functional categories, and their spatial correlates, it becomes clear that the material under investigation here is highly varied. Certain elements vary regionally, such as the coarser stone assemblage characterizing Huili and especially Houzidong, or the very finely polished tools of very similar forms in Puge, which differ greatly from the material in other regions. Other similarities and difference between the various sites seem to indicate chronological developments, as seen in the strong resemblance between the lithic and ceramic assemblage of Xichang Henglanshan, early Yingpanshan, early Qimugou, and Ma'anshan, while objects from Xichang Lizhou resemble them but are more refined, with a larger amount of polished stone tools, perforated knives, and a slightly different ceramic assemblage. The ceramics and stone tools in the later layers of Qimugou and other sites around Xichang are still similar to the aforementioned assemblages, but have even less coarse tools and finer ceramics of different types and with very varied decoration, resembling objects from megalithic graves. In other cases, the differences between different sites seem to lie in function alone. This is most prominently seen at Huili Washitian, which was probably a metal production site.

For many sites, however, the situation is much more involved, and their particularities are dictated by a number of factors, including location, site function, mode of subsistence, and chronological position. A striking example are the cave sites which only occur in rather mountainous parts of Panzhihua and Yongsheng and are mostly devoid of pottery, but instead have a stone tool and animal bone assemblage indicating an economy based on hunting and gathering and a not necessarily sedentary life-style. Although most other sites yielded some amount of pottery, their character varies by region as well as chronological position, the assemblage in the Xichang area and the overall Anning river valley being rather homogenous but differing from what is found in surrounding areas. Only some sites indicate a pronounced reliance on fishing, but they are distributed throughout most of the research area and are not associated with any particular kind of site morphology. Sites with evidence for hunting activities, on the other hand, tend to be located in areas which until today are forested and rather mountainous, making hunting a more natural choice of subsistence than agriculture. The varying amounts of woodworking tools at different sites might be indicators of differences in subsistence strategy as well. A large amount of woodworking tools would indicate the need for much forest-clearing, showing either an early stage of agriculture, the opening up of land for a growing group of experienced agriculturalists, or a form of shifting cultivation requiring the clearing of forests at regular intervals.

Because of the limited thickness and the small number of cultural layers at most of the sites, several authors have suggested that some form of shifting cultivation, possibly slash-and-burn agriculture, was commonly practiced there (Liu and Wang 2007, Zhou Zhiqing 2009). This would also explain the lack of significant amounts of tools for tilling the ground, as for this form of agriculture digging sticks and implements for harvesting would suffice. Some of the smaller axes and adzes found in such great number at many sites could have served as blades for digging sticks, but wooden implements would have been sufficient as well. Indeed, shifting cultivation was very common at least in the mountainous parts of the Liangshan area until the 1960s and is practiced in parts of Yunnan and adjacent areas of Southeast Area with similar geomorphological preconditions until today.[54] At present shifting cultivation is mainly seen on steep slopes with shallow soil cover as they characterize the humid regions of southern, eastern, and southeastern Asia. In some places, however, this form of agriculture can be found in flat lowlands as well. Furthermore, most of the groups practicing shifting cultivation are ethnic groups that have retreated into the mountainous areas with poorer soils under outside pressure.[55] Nevertheless, as

[54] See e.g. Spencer 1966 and Yin Shaoting 2001 for some ethnographic examples

[55] For the Liangshan area, this applies to the Yi minority, but many examples can also be found in other regions. For some examples see Spencer 1966, esp. 13 n. 3.

Spencer has pointed out, "[n]othing in the systems of shifting cultivation demands the selection of steep slopes, but flooding of lower-lying sites might drive people to make use of steeper slopes, at least seasonally" (Spencer 1966:26). Indeed, terraces or steep slopes marginal to the alluvial areas of the main rivers are the most common place for settlement sites in the research area, but they might have been cultivated constantly instead of in a shifting-field manner. The only reason for shifting fields would be incipient agriculture combined with seasonal migration, combined with easily depleted mountain soils that could not provide enough nutrients for good harvest during more than a few years.

Once the protecting tree cover is removed, soils in tropical and subtropical areas tend to be poor, but the complex geomorphological profile of the Liangshan areas and the multitude of rivers cutting through it and bringing fertile alluvial deposits, have led to a highly varied distribution of different soil types. Some of these soils are able to support long-term agricultural use, especially if flooded at regular intervals or irrigated. Building and sustaining paddy fields require much labor and organization and might not have been possible for the small groups that seem to have inhabited the area during prehistoric and early historic times.

As has been pointed out by Mazoyer and Roudart, polished stone axes are very effective at cutting shrubs and trees, but without further tools to work the soil or mow grass aside from digging sticks and hand-held knives, it would be difficult to clear grassy areas or maintain and re-fertilize an already cleared area over longer periods of time (Mazoyer and Roudart 2006:103). Early agriculturalists with an assemblage similar to the one found in the present research area, would therefore be more prone to shifting cultivation than to any other form of cultivation; as long as the population did not grow above a certain maximum, such a system would have been sustainable within the local environment (Pelzer 1978).

Nevertheless, the stone assemblage that Mazoyer and Roudart have in mind consists of highly polished woodworking tools, which have been shown to be highly effective for felling trees and working wood, while the tools at most sites in the research area are only partially ground or not at all, with only a few being highly polished. As practical experiments have shown, cutting hard or soft wood with ground stone tools can be fairly fast, while with chipped stone tools it is nearly impossible to cut hardwood and relatively time-consuming to cut softwood.[56] The bit of ground-stone tools is far more durable than that of flaked tools, chipping and breaking much less easy and quickly to re-sharpen by some grinding, while flaked stone tools are more prone to breakage and will be reduced away quickly by re-sharpening, never attaining the original sharp edge. Hafting would have been easier with a coarsely flaked tool providing more grip for any kind of bondage than a smooth tool if not perforated or indented specifically for hafting, but the sharp edges would have destroyed the bondage much faster. As Boydston (1989: esp. 74) has shown in a cost-benefit analysis, chipped-stone woodworking tools are low in cost and benefit, while both cost and benefit for ground stone tools would be high.

The factors that influence the decision for chipped or flaked stone tools are thus the amount of forest and the kind of wood to be cleared away (if the area had been used agriculturally for a longer time, there might be less to tree growth to clear, and softwood would be easier to cut with either kind of tool than hardwood), patterns of mobility (mobile groups are less likely to produce large amounts of large heavy tools high in production-cost that they might not be able to carry with them on their move), availability of suitable raw material for one or the other manufacturing technique, time constraints, relative importance of agriculture in the subsistence scheme, as well as various cultural factors hard to estimate.

[56] Summarized in Boydston 1989, esp. Tables 8.2-3.

In the research area, most of the available stone material is more adequate for ground than for flaked stone tools, but both kinds of techniques were used. Most settlements were small and the amounts of forest to be cleared would therefore have been limited. Furthermore, in many places the presence of arrowheads and net-weights indicates a mixed subsistence practice, making the clearing of land for agriculture less urgent and wide-ranging. It is not surprising that at many sites the path chosen is an intermediate one, with stone tools partially ground at least at the blade, but still remaining coarse in other parts, allowing for easier hafting without having to go through the arduous task of perforating the tool or grinding notches into it.

A further indicator for mixed subsistence practices are the local climate and high biodiversity. As explained in Chapter II, it is very likely that at least the mountainous parts of the research area would have been very unfavorable for growing *O. sativa Japonica*, while millet, barley, and white would have been suitable crops, although there was still a considerable danger of crop failure. The presence of a wide range of edible nuts and other plants, as well as of a rich fauna, make it even more likely that early inhabitants of the region relied on a mixed subsistence, which would have been less arduous to maintain while at the same time protecting them from famine. Nevertheless, as indicated by the differences between object assemblages at different sites, we are witnessing a complex interplay of different factors including geography, material availability, and cultural factors, which will require significantly more fieldwork, and particularly much more archaeobotanical and archaeozoological data collection, to understand in its entirety. The more ample data from graves can already provide some insight into cultural and chronological developments and will therefore be discussed in the next chapter before I turn to the larger questions of geographical distribution, chronological sequence, and cultural interaction.

V. Grave Sites

Most of the archaeological material known from southwest Sichuan comes from graves. They occur in a wide variety of forms, including earth-pit graves, megalithic graves, and graves with various forms of stone installations. Although a systematic classification is clearly needed, so far archaeologists do not agree on appropriate ways of structuring the material.[1]

The term "megalithic graves" (*dashimu* 大石墓) usually refers to constructions of a number of large, unmodified stone slabs general enclosing multiple, secondary burials. The category of graves with other kinds of stone installations, on the other hand, is less distinct, and includes a variety of different names including "stone-cist grave" (*shiguanzang* 石棺葬, literally "stone-coffin burials"), "stone-slate burials" (*shibanzang* 石板葬), and more rarely "stone-cover grave" (*shigaimu* 石蓋墓) or "stone -construction grave" (*shigoumu* 石构墓). Some examples of this type contain only a few stone slates; others have full-fledged stone coffins, complete with bottom, sides, and lid, or some combination of these elements. A few smaller graves consist of large boulders, blurring the distinction between megalithic and other stone graves. Furthermore, what excavators define as "earth-pit graves" (*tukengmu* 土坑墓) sometimes contain partial stone-installations, making the difference between stone-graves and earth-pit graves less distinct.

Archaeologists usually treat these three broad types — earth-pit graves, megalithic graves, and graves with stone installations — separately and even use stone-cist graves as the distinguishing characteristic of a "stone-cist grave culture."[2] In reality, however, there is too

[1] Different typologies were suggested by Luo Kaiyu 罗开玉 (Luo 1992), Chen Zujun 陈祖军 (Chen Zujun 1996), and Shen Zhongchang 沈仲常 and Li Fuhua 李複華 (Shen and Li 1996), but none has become generally accepted.

[2] The name "stone-cist grave" was coined in connection with discoveries at the Upper Minjiang 岷江上游, but has come to be applied to a wide range of different kinds of graves with stone installations throughout Western China. As grave construction, burial rites, and grave goods vary significantly, several scholars rightfully argue that the term

much variability in the material for such a simple typology. Grave construction, burial rites, and grave goods vary significantly within any given construction type, and there is much overlap in burial mode and object assemblage between the types. Given the complexity of the case, I propose a multi-faceted approach to burial behaviors that does not focus on one parameter only but takes into account many aspects of burial practice.

V.1 Theoretical and Methodological Considerations

The material record constituting a grave is actively and intentionally created but is by no means a direct reflection of past beliefs or social structures. Eggers (1959) argues that assemblages in graves are meaningfully constituted and a mixture of intentionally created features and results of actions. Furthermore, Ucko (1969:274) infers from ethnographic studies that "rather mundane matters may radically affect burial customs." Morris (1992) emphasizes this importance of context, cultural as well as geographical and ecological, arguing that no single part of burial evidence can be isolated and treated on its own; each must always be assessed in context. He also points out that the actors in past burial rituals largely determine what archaeologists are able to see in the archaeological record. Therefore Morris argues for a three-stage sequence in conducting a mortuary study: first understand the logic and processes by which the archaeological record was created. Secondly, define our assumptions about what we expect to find. Finally, compare these expectations with random distribution patterns as well as the archaeological record. I would argue that this behavioral approach needs to be applied on the object level as well. Many factors affect the condition of objects in burial assemblages. Burials

„stone cist grave culture" 石棺葬文化 is inadequate (e.g. Shen and Li 1996). Nevertheless, the term is still so widely used that a summary publication of all related excavation reports until 2008 carries it in its title (Aba 2009).

should therefore not be treated as static units but as the outcome of an array of processes and activities involving a large number of people and materials.

In the following, I introduce a model of the processes by which the burial record was created, identifying the elements that constitute a grave and suggesting attributes that can be used to define and describe them. One of the basic assumptions guiding my model is that grave assemblages consist of elements reflecting choice (intentional data), actions (functional data), and outer preconditions (non-intentional data).[3] Furthermore, objects in a grave rarely come into being at the moment of the actual burial; each has a past life of its own. I therefore propose an analytical scheme that treats burials as composite objects and considers their components separately and according to their respective life histories.[4]

I base my approach on the notion of life histories of objects, which has grown out of the more technical approach of *chaîne opératoire* analysis. While the concept of *chaîne opératoire* comes from a materialist perspective in which "artefacts are created, they have a finite use-life, they become worn and are discarded," the life histories approach "encompasses the idea that objects are used to construct and maintain social identities" (Jones 2002:84). Meanings associated with artifacts are not fixed but transform according to context and may express different modes of identity at various points in their life histories. The life histories approach is therefore a very useful concept for thinking about the ways in which people, artifacts, and places are related in time. The more materialistically oriented background of use-life analysis can aid in

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[3] For a treatment of the problem of non-intentional and intentional data see Härke (1993).

[4] The life history approach to objects can be traced back to Arjun Appadurai (1986), and was applied to archaeology, e.g., by Kopytoff (1986) and Hoskins (1998).

the process of evaluating the possible effects of “mundane matters,“ such as material availability and other practical issues.[5]

In a first step toward constructing the model, I concentrate on the logic by which people create the funerary record. My model outlines the life histories of the various pieces of the burial record, concentrating particularly on the grave as a built structure, plus its furnishings, objects, and the human body.[6] I outline the processes that form these various elements, from procurement of raw material to placement in the grave. Next, I consider transportation, preparation, production, use, and modification and reuse. Through this approach I treat all parts of the burial record in a similar way, and I can therefore apply the same kinds of analyses across all of the burial elements. This model structures the material systematically, but it has the potential to tear the elements apart and runs the danger of neglecting time and space. In order to avoid this pitfall, I also lay out how these processes and elements are connected in time and space.

After proposing this general model, I point out which of its elements are actually reflected in the material record and how researchers can use these elements to structure the burial record. Finally, I apply the model to the present data in order to infer underlying behavioral patterns.

V.2 The Life History of Graves: Developing a Model

My model treats all constituents of the burial separately in their respective “life histories." I concentrate on the grave structure, the body, and the object assemblage. All elements go through three main stages: preparation, mortuary ritual, and post-burial changes (Tables 5.1-5.4).

[5] Friedel, for example, lists a number of factors that can influence the choice of a certain kind of material for making particular objects. These are function, availability, economy, style, tradition, all of which are subject to change as circumstances (i.e., geography, technology, science, fashion, competition) change (Friedel 1993).

[6] I treat the body according to the “concept of the human body as a cultural artifact, shaped and perceived according to the social context” (Douglas 1970: 93), which would include all aspects of identity, including status, gender, or ethnic affiliation. This places the body into a category similar to the aspects of grave construction, installations, and burial objects, and thus allows for the same kind of analyses to be applied to all of them. See also Lemmonier 2012.

V.2.1. The Grave

The preparatory phase of the grave consists of the following steps:

(1) choice of location for the cemetery (if not an isolated burial)
(2) choice of the location of the grave within the cemetery
(3) preparation of the locale
(4) choice of grave form
(5) choice of grave orientation
(6) procurement and preparation of construction material and tools

Steps 2-6 may take place in any sequence and are likely to happen parallel to each other.

If the burying community modifies an existing grave or larger monument to make room for a new tomb or new interment, the procedure takes a different form. It requires less time and effort but it also limits the range of choices for location and grave form. People creating graves make these choices according to a range of factors including:

(1) material availability
(2) availability of suitable ground, direction of slopes
(3) accessibility of locale, problems of transport
(4) time constraints
(5) religious beliefs
(6) other social and cultural factors

Most of these factors, and particularly 5 and 6, also influence the actual mortuary ritual during which the mourners or religious specialists finish the last parts of the grave, close the tomb, and add above-ground elements and other structures. Finally, the model must account for the reopening, shifting, removing, adding, or destroying of elements due to post-burial changes, such as later rituals (such as ancestor worship and/or multiple burials), grave robbery, or natural post-depositional processes (decay, trampling, disturbance by animals, soil movement).

There is always the possibility of later reuse of the grave and thus modification of any of the elements. For objects and materials deposited in the grave, reuse (if it takes place) requires retrieval and is eventually followed by final discard. The grave as a whole therefore goes through a life history process consisting of:

(1) **preparation:** site/material preparation → construction →
(2) **burial ritual:** rituals → interment → closure →
(3) **potential reuse**: one/several instances of reopening → modification → reuse →
(4) **final closure**
(5) **post-depositional processes**
(6) **excavation**.

V.2.2. The Body

The life history of the body interred in the grave begins with the life history of the individual, including social standing, occupation, material wealth, health, age, sex, gender, ethnicity, and other aspects of identity. Individual preferences and habits in life influence the bone composition and bodily appearance, as do occupation and nutrition, which might in turn be connected to social status. Paleoanthropological analyses are key to discerning information about the deceased's lived social status and personal preferences, while the analyses of objects and their placement reveal more about decisions made by the mourners than preferences of the deceased him- or herself.

Modifications of the body after death can likewise reflect religious ideas held by the burying group, but possibly by the deceased as well. Members of the burying group may, for example, dismember, burn, or arrange the body into a special position. They may alter or remove parts of the body and/or close body apertures. Additionally, the mourners might clean, paint, adorn, wrap, and/or bed the body in preparation for the interment or for other pre-burial rituals. Depending on the procedures, preparers may perform several episodes of body treatment.

During the mortuary ritual, mourners or ritual specialists transport the corpse to the grave, possibly first moving through other locations and stages of the ritual process. They place the body in the grave and close the wrapping or coffin over it. After interment, they may exhume the corpse for reasons such as reburial, worship, various rituals, making space for new interments, or disturbance due to grave robbery. Furthermore, we have to account for decomposition.

Thus, the life history of the body starts from the lifetime of the individual itself from birth to death, including illness, instances of violence and stress inflicted on the body, possibly old age, and finally death, be it natural or violent. After death, the corpse is prepared for burial as described above.[7] Miscellaneous rituals may leave traces on the body before it is finally interred.[8] Post-burial changes include decay, as well as potential instances of exhumation for ritual or other reasons, and disturbance through grave robbery or other human-induced or natural disturbances. These various phases are reflected in the condition of the body, e.g., signs of pre-mortal violence or post-mortem modification, movement of the body after interment, health, sex, clothing, traces of body treatment, personal ornaments and burial objects, as well as grave structure and the position of the grave within the cemetery. The nature of the grave itself and the burial goods are particularly sensitive indicators of social standing and identity, and rise in significance for archaeological investigation if the bone material is insufficiently preserved.

V.2.3. The Objects

In the case of objects, we have to consider grave furniture, material used on the corpse including means of transportation such as a stretcher, bier, or coffin, and a range of objects usually called "grave goods." As Hachmann and Penner (1999) have pointed out, there is a broad

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[7] This includes the potential steps of intrusion into the body, dismemberment, cleaning, painting, clothing, adorning, and wrapping.

[8] Miscellaneous rituals include, e.g., display and burning. Interment consists of the placing of the body in the grave, and the closing of wrapping / coffin / grave.

range of reasons why various kinds of objects enter the grave; therefore, we must consider these objects separately. The main categories that Hachmann and Penner (1999:173-177) name are:

1. "**Beigaben**," i.e., grave goods in the narrow sense of objects specifically meant to be used in the afterlife by the deceased;
2. "**Mitgaben**," i.e., objects belonging to the dead, clothes, body ornaments, magical objects;
3. "**Traditionsgaben**" (traditional gifts) or "**Liebesgaben**" (love gifts), both given by mourners, the former prepared in advance and following a tradition, the second given spontaneously;
4. "**Zeremonialgerät**," i.e., ceremonial tools used during the burial ritual but without function in the afterworld; and
5. "**Nachgaben**," i.e., objects that entered the grave context after the actual mortuary ritual; this includes objects discarded after the burial ritual as ritually untouchable, objects placed in the grave during later ritual acts, and objects that grave robber left behind accidentally.

What happens to all of these objects during and after the burial ritual is fairly clear: mourners or ritual specialists transport them to the grave and may alter them during the burial. Later on, natural post-depositional processes or human activities such as ritual re-opening of the grave or grave robbery may lead to the deformation, destruction, or removal of these objects. If they are removed from the grave, the objects can re-enter into the cycle of transportation, modification, reuse, and discard.

The histories of objects can vary significantly depending on their nature and other circumstances. Actual grave goods (*Beigaben*) and traditional gifts (*Traditionsgaben*), as well as grave furniture and some of the material used in the burial ritual have a single life-cycle of procurement of raw material → preparation → production → use → discard. Between these stages, one or several instances of transportation, relocation, exchange, or modification may occur. For objects that existed in different context(s) before their deposition in the grave, we have to consider several instances of prior use. For objects retrieved from the burial after closure, there follows an additional life-cycle of one or several instances of reuse, modification, transport and final discard.

It is difficult to determine why objects were made and how many life-cycle stages they went through before they became refuse, lost objects, or permanently deposited objects eventually retrieved by archaeologists.[9] Nevertheless, if we analyze specific formal properties, traces of use-wear, reshaping, repair, and organic residues, we may find some indications regarding the previous use lives of objects. Additionally, by considering the exact location in the grave and condition of the object, we can distinguish between "Beigaben," "Mitgaben," and "Nachgaben."

V.2.4. Time and Space

Technically speaking, the only point when all components constituting an interment have to come together temporally and spatially is at the location of the grave during the interment itself. While the time windows are getting smaller and smaller, moving towards and centering around the moment of the burial, the possible locales are moving closer and closer towards the grave as well. We can envision the whole process as many trajectories starting out from different places at different times and moving towards the "destination" of the grave at various intervals. It is at the grave, during the burial ceremony that all these elements meet, staying together through the post-depositional processes. If they are removed from the grave, these objects can move away from this time-space entity again, starting a new life-cycle of their own.

In a general model, we can thus depict the overall process as a movement from a diverse array of locations and points in time towards the one time-space unit of the instance of burial, and then possibly moving away again (Table 5.4). The locations in which the different actions take place can be envisioned as concentric circles moving around and towards the grave, getting

[9] In the general archaeological sense of discarded material as established by Schiffer (1972:129): "Refuse labels the post-discard condition of an element-the condition of no longer participating in a behavioral system."

smaller and smaller as the actual time of the burial act approaches. As the time line moves away from the instance of interment, these circles may widen again, but most of the time all elements will stay with the grave until they are retrieved by tomb robbers or archaeologists. How wide the circles are and how they fluctuate over time and space is highly dependent on the overall cultural, geographical, and situational context. To move the nearly infinite number of possible combinations of temporal and spatial arrangements from the abstract to the concrete, in the following I illustrate the model with a few ethnographic examples.

V.3 Illustrating the Model: Ethnographic Examples and Textual Evidence

As Ucko points out, the main reason why archaeologists should study ethnographic examples is to widen their cultural and intellectual horizons (Ucko 1969:262). The goal of such readings is not to find a perfect analogy for the archaeological material at hand, but rather to encourage scholars to think beyond their own cultural milieu. I therefore do not endeavor to find a perfect ethnographic match for the material from the Liangshan region. Instead, I have chosen a few cases that provide some insight into the possible range of burial practices and highlight both the material traces they may leave and their spatial and temporal arrangement.

In late Imperial and Early Modern north China (this example is based on Chinese gazetteer accounts from 1870-1940), certain preparations for a funeral such as buying a coffin, sewing burial clothes, or locating a burial site could be made far in advance of the occurrence of death, while the rituals themselves would begin just before death (here and in the following after Naquin 1988). Because it was unlucky for death to occur on the *kang* (a heated living and sleeping platform made of brick), relatives or servants would transfer the dying person onto a stretcher that then transport them into a special ceremonial room in the house. After the person died, the family began mourning and preparing the corpse by washing and clothing him/her in a special gown that signified class and occupation (a *Mitgabe*). The family would cover the face of the dead with a piece of cloth or paper, tie the feet with a colored string, and place pearls or coins in the mouth and jewelry and/or mirrors on the body (all of these are *Mitgaben*, as well).

A diviner determined the best time and orientation of the grave, re-confirming or altering the burial site that the family had chosen prior to death. On the third day, close relatives placed the body into a coffin, surrounded it with further objects such as food and a stick to feed and beat the vicious dogs in the next world (i.e., providing *Beigaben*), and finally closed the coffin. A number of complex rituals followed, none of which would have left any traces on the coffin or the deceased. At the point of potential excavation, an archaeologist would thus be able to infer the status of the deceased in life using any preserved clothing, as well as some spiritual beliefs the mourners held, but they would have no indicators how much time elapsed between the placement of the deceased in the coffin and the actual burial.

In the case of north China, a family might wait months or years to bury the dead. The reasons for such a delay vary, but common examples include waiting for an auspicious date or for the passing away of a husband or wife to be buried in the same grave (Naquin 1988:42). Then they usually placed the coffin in an earth-pit grave. In rare cases, they may have burned the body if the death had been unnatural or unusual. The grave site was always at considerable distance from any human settlement, and burial participants transported the coffin there in an elaborate procession. After burial, the family only rarely exhumed and reburied the body. The only reasons for doing this included declining family fortunes resulting in the need for a more auspicious place or the repurposing of the burial grounds for a different usage (Gamble 1954:393). Most rituals involving the ancestors took place at home or in a temple. The family visited the grave only a few times out of the year, and they would burn paper money and firecrackers but not disturb the grave itself. The time preceding the actual interment of the dead could thus be very long, but the grave would remain largely undisturbed after final closure.

In orthodox Christian communities in present-day rural Greece, on the other hand, only very wealthy individuals receive a permanent burial, which families of more limited means always exhume the body after about five years (Danforth and Tsiaras 1982). Immediately after death, the family first washes and clothes the deceased into new clothes. They then place the corpse into a coffin, depositing a few coins or a cross on the body but no further objects. Shortly after, priests lower the coffin into an earth grave in the presence of the loudly lamenting women, other family members and friends. During the following years, part of the family (mostly the females) remains in a state of constant mourning, and priests perform several memorial services. Again the women of the family and a priest play the most important roles in the exhumation. The wife, mother, or daughter collects the bones in a box, and a priest places them in the village ossuary in another ceremony. This marks the final farewell of the family from the deceased as an individual. Later family members and priests only conduct general memorial services for all the dead in the ossuary, but the bones remain undisturbed, except for the slight rearranging when they add new bones. The primary grave is refilled, so an archaeologist would only see an empty rectangular hole with decomposed organic material, as well as maybe a coin, a cross, or a few un-retrieved human bones. The ossuary, if excavated, would not provide any concrete clues about the burial proceedings or social status of the various deceased, except for what an anthropologist can read from the state and composition of the bones themselves. Thus, burial customs in rural Greece mostly obliterate social differences and personal individuality of both the deceased and the mourners, but the identity of the community is preserved and reinforced through the final placement of the dead in a common ossuary.

The LoDagaa in west Africa only discriminate by age and circumstances of death in assigning grave forms for their members (Jack Goody 1959, 1962). The LoDagaa construct a separate chambered tomb for each group of brothers and their wives and place the dead on earthen benches with soil heaps as head rests. They orient women to face west and men to face east. The grave remains accessible until the last member of the group dies; only then do the mourners close the opening with an upturned pot never to open it again. These graves are arranged in cemeteries unless the man is very old at the time of death. If the man has seen his grandchildren, he and his wife are buried in the courtyard of their own house.

On the other hand, the LoDagaa do not see infants as full people and therefore do not place them into the earth. Instead, they bury infants at level ground under a pile of earth located at the crossroad nearest the mother's home. The mourners stick thorns into the pile to keep dogs and other scavengers away. Then, they place the cradle on top of the pile and drive a stake through it in order, likely to prevent the spirit of the child from haunting the mother (Goody 1962:150). In this case, both practical concerns and questions of belief thus influence the form the grave takes. This also applies to the third category of trench graves; the LoDagaa use these graves for disposing of the people who died of an epidemic and need to be buried quickly as well as for those that committed a sin (e.g., witchcraft, murder, suicide). In such cases, the community usually chooses a location far away from the village and close to a watercourse so that the rain can wash the impurities into the river and prevent them from contaminating the nourishing earth. In all cases, the burial occurs soon after death without burial goods or personal belongings; instead, family members and the community consume or distribute personal effects, based on a complex set of rules (Goody 1962:284-327). As the choice of location and grave form furthermore varies depending on the circumstances of death, archaeologists would have great difficulty relating the remains from trench burials to any one community with any reliability.

David-Néel (1952) described an even more dramatic case in the mountains of Sichuan from 1937. She reported that in Kham, both Chinese and Tibetans usually burned their dead and hardly ever buried the remains (David-Néel 1952:146). In Kangding, on the other hand people placed the coffins in a shallow grave (20-40 cm deep), arranged a few stones around it, and threw some earth on top (David-Néel 1952:144-145). The rain eventually washed the earth away and disturbed the stones until the bare bones lay open on the surface. Local women would then collect the bones and dispose of them in deep natural chutes or cliffs, leaving hardly any distinguishable traces for future archaeologists. David-Néel did not make any observations on rituals preceding or surrounding the temporary interment, bone collection, or final disposal, but we can surmise that the minimal time span for the overall procedure required the time needed for the elements to break open the grave and the body to decay, Depending on the local climate and weather, such a process may take only a few months or several years.

Other groups in Southwest China such as the Naxi buried their dead in a very different way (Goullart 1957). They largely adopted the burial customs observed by the Han population that dominated most of Yunnan at that time — customs largely similar to those described above for northern China. Their customs differed only in that women who died in childbirth and people who died violently were always hastily cremated and buried. The short procedure followed by a night-long ceremony in which *dtombas* (a traditional kind of Naxi spiritual specialists) and lamas chanted and danced together to expel the evil demons, resulting in the *dtombas* going into trance, sacrificing animals, and using their blood in the rituals (Goullart 1957:260). Thus, the burial practices from different traditions combined left weak but noticeable traces in the burial record that would help archaeologists to distinguish at least some of the Naxi burials from those of the Han living in the same area. Similarly, ethnographic studies from Africa suggest that a common set of burial customs may — but do not have to — characterize a particular society. The graves of the Sandawae in east Africa, for example, are clearly distinguishable from those of their neighbors because the Sandawae alone bury their dead deep below the cattle pen instead of exposing them to hyenas (Huntingford 1953:139).

Textual and archaeological evidence from Bronze Age China shows that some societies indeed bury their dead according to a complex rank system. In this case, grave makers indicate status through features such as placement of the tomb within the cemetery, tomb size, presence and number of burial chambers and coffins, horse-and-chariot pits, human or animal offerings, presence and number of ritual bronze vessels, metal weapons, ceramic kitchen vessels, and personal ornaments of nephrite, stone, or bone (Falkenhausen 2006:89-167). Furthermore, these rules varied by locale, between lineages, and over time, thus adding several dimensions of meaning (space, time, individual and group identity) to the burial record.

Thus the ethnographic record allows archaeologists to consider the complicated decisions that go into the creation of the burial record (Tables 5.1-5.4). As a result, we are more able to make appropriate interpretations concerning burial proceedings as well as social and even personal circumstances of the persons interred and the group who buried them. Nevertheless, the wide range of possible ways to dispose of the dead and the wide range of motivations behind the decision for a specific mode of burial that we see in ethnographic as well as historical accounts should caution us to keep an open mind and consider a range of possibilities instead of jumping to conclusions that seem logical from our own cultural experience.

V.4 Applying the Model: Particularities of the Data and Parameters of Analysis

The model I propose above is complex, multivariate, fluid, and necessarily somewhat idealized. The ethnographic examples indicate that the archaeological record very likely only mirrors a fraction of all the processes taking place in connection with the interment process. In preparation for the funeral, participants may conduct a wide range of rituals that are either not traceable in the archaeological record or difficult to connect with the actual burial. Furthermore, excavators and analysts cannot always reliably distinguish between certain elements such as *Beigaben* and *Mitgaben*. Nevertheless, a comprehensive model needs to include all of these elements to remind us of the range of possibilities. Both the ethnographic examples and the model proposed here make clear that in order to fully understand a burial and its assemblage, we always have to take the cultural, ecological, and situational context into account. Kingery (1996:185) argues that the physical and practical aspects of artifact production, use, and discard are enmeshed with the utilitarian, spiritual, emotional, creative, and aesthetic life of objects; this is applicable to the life histories of graves as composite units as well. As the relationships among people, objects, meanings, and places are fluid and change over time, a model trying to depict them all does necessarily have to be fluid and flexible. It can become only more concrete when applied to a specific body of material, which I will do in the next step.

As mentioned above, the graves from the Liangshan region vary widely in size, construction, and content. Furthermore, due to the difference in preservation conditions as well as amount of field work and publication, the kind of information available varies widely from case to case (Table 5.5).[10] There are several possible ways to meet this problem, especially when

[10] Of the reported 1059 graves, 443 (42%) were excavated, but only about half of these 443 graves have been published in greater detail. Of the excavated graves, 38 were well-preserved, 35 slightly disturbed, and 83 poorly preserved, while for 287 graves the state of preservation has not been reported. Among the 156 graves for which the state of preservation is known, over 45% are poorly preserved, around 36% are somewhat disturbed, while only

conducting quantitative analyses that require a coherent dataset with sufficient information on all the variables involved. One solution would be to take into consideration only all excavated, well-reported, and well-preserved graves, but doing so would reduce the amount of information immensely, i.e., from 1059 graves to 212 (20%) at best. Such a small sample would increase the problem of the locational bias favoring the area around Xichang and other cities in the Anning River Valley, where the main research centers are located. The opposite approach would be to include all known graves, but this would leave the entries for a large part of the categories empty, thus distorting the results of statistical analyses. A third solution would be to limit the range of attributes to those occurring throughout the whole assemblage, but this would mask the tremendous variety that makes this material so special, thus not only forgoing its great potential but at the same time running danger to come to erroneous conclusions.

I have therefore decided on a compromise: depending on the questions asked and the availability and nature of relevant attributes, I am using varying amounts of material for the different kinds of analyses. For spatial analyses, all graves known by location will be taken into consideration. Questions of burial ritual, on the other hand, will have to be answered relying on a much smaller corpus of material of excavated and reasonably well-preserved graves with adequately detailed information. This is where the reliability index developed in the catalog — a number reflecting the extensiveness of fieldwork, state of publication, preservation, and access to material — aids to decide which graves to include.[11] As long as these preconditions are made

about 19% are in good condition. Due to natural decay and other disturbances, only about one third of the graves (138) hold human bones, usually in an advanced stage of deterioration. Only 56 graves (5%) have been extensively published, for 425 (40%) there are preliminary reports, 459 (43%) have been mentioned with a few details, and 119 (12%) are known only by location and sometimes type. Full measurements are known for 499 graves, but the amount information provided on the internal organization of the graves is highly uneven. For the megalithic graves of Dechang Arong and a few other graves, the layers of fill material and the position of the different objects are described in minute detail, while for many sites only known from surveys even the number of graves is unclear.

[11] For an explanation of the reliability index and the scores for the various sites, see the catalog and Table 10.4.

clear and the results are understood as tentative, the unevenness of the material basis is not a hindrance to conducting a wide range of statistical and spatial analyses. Through comparative analysis of different subgroups of the material, it is furthermore possible to us the well-reported and well-preserved examples to make inferences on less well-understood cases. Such inferences, however, have to be made with great caution, and inferred attributes cannot be treated as equivalent to observed attributes during subsequent analyses.

Another problem in quantitative as well as qualitative analyses is the large number of aspects needed to outline the great variability of the overall body of material. I am meeting this challenge by using a reduced set of variables to address specific questions; however, to avoid information reduction at an early stage, at the point of data recording all observable aspects have been entered into a database specifically designed for this purpose. The main categories taken into consideration and the associated variables are the following:

- *location*: geographic coordinates, elevation, orientation[12], location in cemetery, spatial relationship to other graves;
- *construction details*: linear measurements[13], percentage above ground, percentage of stone installations, grave-chamber form[14], presence / absence and number of stone slates for bottom, walls, floor; measurements and nature of stones used;[15]
- *outside installations*: presence / absence and measurements of earthen tumulus, stone mound, "tail," ramp, other installations;[16]
- *inside installations*: floor material,[17] head compartment, foot compartment, second-level ledge, wooden coffin, other installations;[18]

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[12] Orientation can have 9 values: N (0-22.5° and 337.6-360°), NE (22.6-67.5°), E (67.6-112.5°), SE (112.6-157.5°), S (157.6-202.5°), SW (202.6-247.5°), W (247.6-292.5°), NW (292.6-337.5°) and Unclear.

[13] length, width, depth

[14] rectangular, long-rectangular, rectangular with rounded corners, square, trapezoidal, irregular, unclear

[15] material, linear measurements, weight, worked or not

[16] stones erected at one end, stone frame with objects inside, pile of stones outside grave, stone slabs framing entrance

[17] soil, sand-gravel mixture, pebble layer, stones + yellowish sandy soil, leveled virgin soil + layer of pebbles + layer of yellow sandy clay, stone slabs

[18] further inside partitioning, stairs, additional coffins, additional stone slates

- *body treatment and physical characteristics*: presence / absence of human bones, number skeletons, interment-type[19], orientation, position,[20] sex, body height;
- *evidence for rituals*: location bones, indications for body modification, presence / absence of cinnabar, charcoal, horse and other animal bones, other indications for food offerings, location objects, condition of objects;[21] and
- *objects*: category, type, number.

Below I start with a basic description of these variables. I also present my initial analysis of the main spheres of observation (grave construction, body treatment, burial ritual, and objects). This will allow me to decide on the range of variables necessary for addressing different kinds of questions, such as the identification of grave construction types, kinds of interment, and various kinds of associated rituals that can then be placed in relationship to each other as well as to geographical preconditions.

V.5 Constructing the Grave: The Main Parts and their Combination

The layout and construction of the graves in the research area varies widely from small earth-pit graves with no further internal subdivision or external markers to huge above-ground constructions made of large boulders, sometimes additionally covered with an earth-mound and further marked by an access ramp or entrance-way of large standing stones. The number of variables to be described here is therefore considerable. They fall in the main categories of linear measurements, basic construction, elements of outside installations, inside installations, as well as raw material used. Below, each of these categories and their respective variables and attributes will be described in turn.

[19] primary, secondary, cremation, unclear

[20] flexed, supine extended, disarticulate

[21] evidence for intentional breaking, burning, food content

V.5.1 Linear Measurements

V.5.1.1 Length, Width, and Depth

Full measurements of the grave chamber including length, width, and depth/height have been reported for 499 graves; the length is known for 642 graves, the width for 645 graves, and the depth/height for 525 graves. The depth/height measurement is problematic for a number of reasons; first of all, it combines two directions of extension, both above and below ground. For all graves only either height or depth have been reported, so that both measurements can be combined, assigning a negative value to those below ground and a positive value for those above.[22] Only when comparing the overall grave size I will use absolute values. What is problematic is the treatment of two graves that are partially above and partially below ground, Dechang Wangsuo M3 and Zhaojue Jinzi Niaobu M1. It is unclear if these graves were above-ground monuments originally covered by a tumulus that had been partially destroyed, or if they were meant to be below ground but the covering soil had eroded away, thus exposing part of the grave on the surface. These two graves therefore must be left out of the analysis for this measurement. A more formidable problem is posed by processes of erosion, human disturbance, and more rarely the accumulation of new soil layers above the original surface level that make it impossible to ascertain the original depth of graves below ground. Estimates of depth and volume can therefore only be made for graves above ground. For graves below ground, the vertical extension can only be used to identify graves that are very deep and thus exceptional.

To identify some general trends, in a first step I am providing descriptive statistics and histograms with cumulative frequencies (Table 5.6, Figures 5.1-5.12). The most striking trend

[22] As all graves built above ground consist of stone boulders slightly sunken into the floor, these graves technically have a depth as well as a height. Nevertheless, as the stones were at most slightly sunken in the ground, while the grave chamber was not deepened into the floor at all, the vertical extension of the grave chamber for these graves is completely above ground, making it possible to assign a positive value to these measurements.

for all measurement is the wide range of values, with the majority concentrated at the lower end. In the most extreme case of length, values ranging from 0.45 m to 41 m have been measured, but over 50% of the graves do not exceed 3 m, the strongest cluster being at 2-3 m, and 90% of all graves measure below 10 m in length. For width, the measurement range from 0.2 m to 7.3 m, while only 5% of all graves exceed 4 m in width, and about 60% of all graves measure 0.5-1.5 m. For length, there is a clear second peak around 7-9 m and smaller peaks at 15 m and 20 m, while for width, there might be a second peak around 3 m. The measurements for height/depth, on the other hand, show a clear bimodal distribution, most values ranging around 0.2-1 m below ground for the first peak, and around 1-2 m above ground for the second. Over 60% of all graves are located below ground, and the distribution here is more clearly skewed towards the left with most graves measuring below 1 m in depth and only eight graves being 3-4 m deep. The values for grave height are more evenly distributed, being only slightly skewed towards the left, i.e., toward lower values, while 11 graves measure around 3-4 m in height. Nevertheless, for all these values the distribution is uneven and does not lend itself to distinguishing clear size categories. This indicates that we might not be looking at a single group, but that a number of different types with their own subdivision in sizes might be present. The measurements therefore have to be re-evaluated once different subgroups have been identified with the help of other criteria.

V.5.1.2 Area and Volume

Turning to the combined measurements, five main groups are distinguishable: a few very small graves, a large number of small graves with an area of around 1-4 m^2 (~60%), some medium-sized graves of 5-12 m^2 (~14%), a considerable number of larger graves with a wide size spectrum (area of 13-45 m^2, making up ~25%), and a small number of very large graves of up to 106 m^2 in area; however, there are no clear breaks between those groups. The picture for volume is similar; over 60% of the values lie below 10 m^3, about 25% measure 10-50 m^3, and the remaining values are unevenly distributed between 60 m^3 and 299.25 m^3 on one and 0.04 m^3 and 1 m^3 on the other end. Given the unreliability of the depth measurements and the clear split between graves above and below ground, considering them separately promises to be useful. Overall, the graves located above ground are larger than those below ground and measure mostly between 3 and 55 m^3 while only very few are considerably larger.[23] For graves below ground, the picture is very different; over 53% measure 1 m^3 or less and only very few are as large as 41 m^3 or more, but none is as huge as even the medium-sized graves observed above ground.[24] When breaking these composite measurements down into their single component and re-calculating them separately for graves below and above ground, it becomes clear that we do indeed have two separate populations (Table 5.6, Figures 5.13-5.14): Graves above ground range very widely in length and are on average significantly longer, while the length measurements of graves below ground are relatively evenly distributed between 1.5 m and 6 m. Only a few graves located below ground are significantly longer but do not exceed 12 m. The trend for width is similar.

V.5.1.3 Grave Forms

Another useful aspect to explore is the relationships between the various measurements. For graves above ground, Pearson's correlation coefficient shows a weak correlation between

[23] For 80% of these graves, the measurements for volume are fairly evenly distributed between 3 and 55 m^3, while 16% are unevenly scattered between 56 and 160 m^3, and only 6 graves (3.7%) measure 220-299.5 m^3.

[24] Overall, 72% of all graves below ground measure up to 2 m^3, 24% of the remaining measurements range widely between 2 and 14 m^3, and 10 graves (3%) are spread between 15 and over 41 m^3.

width and height (0.136), a medium correlation between length and height (0.383), an equally strong correlation for length and width for graves above (0.451) and below ground (0.451). For graves below ground, there seems to be a correlation between width and depth (0.422), but given the limited reliability for depth measurements, this number cannot necessarily be trusted.

When creating scattergrams and overlaying them with regression, it becomes clear that the distribution of values is irregular, especially for graves below ground (Figures 5.15-5.23). For graves above ground, similar values for length can have a variety of different widths and heights, but within a rather limited window for height and a wide window for length. For graves below ground the values are overall restricted and generally low, especially for depth, probably due to erosion and other natural and human-induced processes. For graves above ground, the measurements for width and height are spread around a horizontal axis but with considerable variations in both directions. The only clear correlation that can be identified is that between length and width for small graves, while for large-size graves the grave forms vary significantly.

Nevertheless, most values for graves above ground are located within an elongated cloud along the regression line, indicating a gradual increase of width with increasing length. For graves below ground, the distribution takes the form of a cluster in the lower left-hand corner, with a few strands shooting upwards, showing that most graves are equal in size, but width can vary widely for similar length measurements, indicating a difference in form. At this point, we can furthermore identify a few outliers requiring special attention later on: Dechang Ganhai M1 with its unusual width (10 x 7.3 x 1. 4 m) and Xide Muhe M4 with its unusual length (41 x 2.6 x 2.1 m), both of them located above ground, as well Yanyuan Yingpanshan North M1 and M4 with their unusual depth combined with otherwise moderate measurements (2 x 1.5 x 4 m).

Overall, the uneven relationship between the different measurements indicates that the grave-pit forms vary widely from square over rectangular to overly long, while oval and trapezoidal forms have been reported as well. When considering grave forms, it is therefore useful to make histograms of the combined value of grave proportions (length/width) (Figures 5.24-5.25). For dimensions of 1.4-4, the frequency is roughly the same for graves below and above ground, but for graves above ground, there is a significant amount of examples with values of 4.5-8, which are rare for graves below ground. High values indicating long-narrow graves are generally rare and more common with above-ground constructions, while only very few graves both above and below ground have a square plan. Instead, rectangular forms with a ratio of around 2:1 up to 3:1 are most common (~40% of all graves). For graves above ground, there is a second peak at 5:1 to 7:1 (29% of graves above ground), showing that long-rectangular graves are common as well, while only a small number of graves both above and below ground are extremely narrow with ratios of up to 15:1 (~10%).

Overall, there is a clear division in measurements between graves below and above ground. For both categories, there is a clear distinction between a large number of small graves, a small number of medium and large graves, and a few exceptionally large graves, but the borders between those categories are blurred. The divide between the various floor-plans and proportions, on the other hand, is clear and allows for a grouping in four categories (square, rectangular, long-rectangular, long-narrow) that are more reliable than the arbitrary choice of terms such as "rectangular" or "long-rectangular" used in the excavation reports. The relative frequency of occurrence of these grave forms is the same for graves above and below ground, but extremely long graves tend to occur mainly below ground, but oval graves and rectangular graves with rounded corners have only been reported with below-ground constructions (Table 5.7, Figures

5.26-5.27). Rectangular graves are the most common for both categories (76%), followed with a wide gap by long-rectangular (15%) and square graves (3%); all other forms are rare.

V.5.2 Basic Construction

Varying amounts of stone installations have been reported from 689 (65%) of the graves. Of these, for 176 (25%) full information on the extend of the installations is available. Of the other 512 graves, 489 have not been excavated so that it is not possible to ascertain the presence/ absence of stone slabs for the floor, while 24 were excavated but too poorly preserved to be sure about the original extent of stone installations.[25] A special case are graves with a single or a small number of small slabs positioned in the head area (8 cases), rarely in the middle (2 cases), or next to a vessel (1). Although these are stone installations, they are not actually part of the grave chamber construction but inside additions, presumably with ritual significance. Therefore, they will be considered in connection with other inside installations and traces of ritual acts, while the graves with such fittings are classified as earth-pit graves, reducing the number of stone-construction graves to 678 reported and 165 excavated and well-preserved cases.

Among all graves with stone installations, a combination of both stone cover and walls occur most frequently, but among excavated graves, a combination of all three elements is nearly equally common, while the combination of stone walls and floor without stone-cover follows in third place (Tables 5.9-5.10). Stone-slabs are the most common floor cover (49%%), but in over 32% of all cases the ground was only leveled without applying additional layers or extraneous material, while a pebble- or soil-gravel layer was only reported for 30 out of 178 graves (~17%) (Tables 5.11-5.13). Only one grave was built directly on bedrock. Below or above floors covered

[25] For 23 of the unexcavated graves, it has only been reported that they are stone-cist graves. It can be assumed that they have some amount of stone installations, but as the term 'stone-cist grave' is used for a wide variety of graves with any or all of the three elements of stone walls, cover, and floor, it is unsure which of these parts were present.

with stone-slabs or a pebble layer, an additional soil layer can be applied; the addition of a soil layer is most common on top of stone-slab floors, but overall such additional layers are rare. From the behavioral point of view, three different actions can thus be distinguished:

1. the leveling of the ground if necessary;
2. the application of the main floor cover (stone slabs, pebble- or soil-gravel layer); and
3. the addition of another soil layer before or after.

Unless the grave was built on pure bedrock, the first step of leveling the ground is generally necessary while the other steps are optional. Overall, we can therefore distinguish three floor types — natural ground, stone slabs, and a pebble layer with or without soil — which can all be combined with additional soil layer(s) (Table 5.13). These details are important for distinguishing construction stages and grave types at a later point in the analysis.

Another noteworthy detail is the composition of the three elements of cover, walls, and floor. The cover most often consists of one or several large boulders (287 cases) or stone slabs of varying sizes and thickness (149). Only in two cases (Yanyuan Laolongtou M7 and M9) have a few large and many small stones been combined (Table 5.14). An exact count for the number of cover stones is only available for 94 sites, while for 167 it is only clear that there was more than one. Most common are graves with 3-5 cover stones (54%), followed by graves with only one large cover stone (20%). About 93% fall into the range of graves with 1-6 cover stones, while graves with 7-13 cover stones are rare (Table 5.15).

The cover stones of large graves can measure as much as 1.2-3.4 m in length, 0.5-2 m in width, and they usually have a thickness of 0.2-0.9 m, but measurements of around 1.5-2 x 1 x 0.5 are most common. Even for average-sized stones the weight would have been around 800 kg each with the largest ones weighing about 5 tons. Only the graves of Puge Xiaoxingchang are made of considerably smaller boulders measuring 0.3-0.5 x 0.1-0.25 x 0.05-0.15 m, and the graves as such are much smaller in size. Measurements for the thinner and more regular stone slabs used for small graves are available from four sites, ranging between 0.8-1.15 m in length, and 0.4-0.5 m in width. The thickness of the slabs varies widely from site to site, ranging between 4 cm and 44 cm, allowing for a differentiation between thin, average, and large slabs.[26]

The size, kind, and number of stones used as floor-cover is hardly ever described in the excavation reports, but one or several larger stone slabs and a number of smaller stones seem to be equally common. Where pictures or descriptions are available, these stones always appear relatively thin and smooth, instead of the large irregular boulders generally used for the cover. The information on doors and their structure is limited as well. Identifiable doors, which only occur in graves above ground, were reported from 109 graves, in 104 cases (95%) from one of the short sides and in five cases from the middle of one long-side.[27] In 50 cases the doors have been described in some details: Most often they consisted of a large number of irregular cobbles (26 cases, 52%), but some are made of a single large slab (14 cases, 28%), and in a few cases a small number of large slabs were used (10 cases, 20%).

The stones used in the construction of the walls range widely in measurements from cobble-sized stones over medium-sized slabs to large boulders, but in general the stones used for the walls tend to be smaller than those for the cover. The exact number of stones is only known in a very few cases, but it is nevertheless possible to distinguish between three different construction types: several erected stone slabs or boulders (i.e. 4-20 stones, depending on the size of the grave, 93%), a large number of cobbles or rectangular stones piled up in layers (4%), or a combination of a few large boulders and many small stones (3%) (Table 5.16).

[26] The stones used to build Huili Guojiabao M3 are 6 cm thick, those reported for Yanyuan Laolongtou M6 and Yanyuan Caojiawan M4 measured 20 cm in thickness, the stone plates used for Xichang Tianwangshan are 44 cm.

[27] These graves are Dechang Arong M3, Xichang Maliucun M2, and Xide Lake Sihe M1, M7, and M8.

Overall, the most common wall compositions are:

1. varying numbers of large boulders (40%);
2. stone slabs (53%), falling into the general categories of large and coarse, medium-sized, and thin stone slabs;
3. varying combinations of large boulders/slabs and smaller stones (3%);
    a. a combination of large boulders below and cobbles above; or
    b. a small number of boulders or slates with a larger number of cobbles and small stones filling the space in between;
4. several layers of irregular cobbles or smoothed rectangular stones forming a brick-wall like structure (4%); and
5. a wall-like construction made of irregular cobbles and Han tiles (Zhaojue Qianjinshe M6 only).

The percentages listed were calculated over all 641 reported graves, but the nature of the walls is completely clear only for the 168 excavated graves. When considering only excavated examples, the percentage of graves with walls made of simple large boulders drops dramatically (15%) as the majority of these large constructions has not been excavated (Figures 5.16-5.17). Nevertheless, the relative number of graves made of a combination of large and small stones or smaller stones exclusively remains relatively low (8%), showing their rarity. Among excavated graves, the percentage of stone-slab walls of varying sizes is significantly higher, mainly due to the fact that a greater percentage of these graves has been excavated. Large graves consisting of large boulders, whose excavation tends to be more time-consuming and less pressing because of their better state of preservation, are usually left unexcavated. Furthermore, all graves with large boulders are located above ground and their tumuli have mostly been destroyed, so that the basic construction of the walls is visible without excavation. The survey data thus provides a more realistic impression than the small sample of excavated graves, showing that graves made from large boulders are indeed more common that those made of smaller stone slabs.

When correlating the different wall-construction types with the location of the graves relative to the surface, it becomes immediately apparent that large boulders were exclusively used for above-ground constructions (Tables 5.18-5.20). Walls made of large boulders or slabs with small stones filling the gaps as well as large boulders or slabs erected at a distance with many cobbles in between have been observed only in above-ground constructions. Thin slabs, which were usually made of slate, have only been reported from graves below ground, possibly because of the brittleness of the material that could not carry large constructions. Regular-sized stone-slabs are commonly found below ground as well, while thick and coarse slabs appear equally frequently in graves above and below ground. The reason might lie with the somewhat arbitrary split between boulders, large, and regular-sized slabs, which needs to be re-examined.

A boulder is a rock with a coarse grain size (> 256 mm) that is too large to be lifted. While boulders are irregular in form, slabs have a flat, roughly rectangular form, are relatively smooth, and much less unwieldy. I am using the term "large slabs" for slabs of a thickness exceeding the average 10-15 cm that are unusually large in size but still have the same regular form as normal-sized slabs as opposed to the irregularity of boulders. As many reports do not detail the thickness of the slab, this split in sizes is somewhat problematic. Where the exact number, size, and coarseness of the stones used is unknown, I have therefore described cover and walls as made of "stone slab(s)" as opposed to "large slabs" or "thin slabs." When combining the categories to avoid any decisions on size, stone slabs are in 94% of the cases located below ground and constitute 53% of the overall stone material used. Large boulders (254 cases) as well as the combination of a few large and many small stones (22 cases) occur only above ground, together constituting over 40% of the material, while graves made of several layers of brick-sized stones are relatively rare and appear both above and below ground (Table 5:20).

After this detailed description of all the basic construction elements, it now becomes possible to infer on basic grave types and additional features. The main two groups are graves above and below ground, and the latter fall into the two subgroups of graves with and without stone construction. Below, I describe them in turn starting from the graves located below ground.

V. 5.2.1 Graves Below Ground

Most scholars treat graves with and without stone construction parts completely separately, but considering their similarity in form and measurements, such a division is problematic. Excavators mostly address all graves with stone installations as stone-cist graves, even if they are missing one of the three elements of stone cover, sides, and floor. As the term stone-cist graves was coined in connection with the graves at the upper Minjiang River, which are complete stone cists of usually trapezoidal form made of several thin slates for each element, I refrain from using that term; instead, I will address graves below ground with stone-construction parts as stone-construction graves, while graves without stone parts are called earth-pit graves. I will discuss graves above ground later in section 5.2.2

The grave measurements of earth-pit and stone-construction graves are overall very similar, although earth-pit graves tend to be a little longer and therefore overall larger in area and volume (Tables 5.6-5.7 and 5.28-5.34). Rectangular graves with rounded corners never feature stone construction and neither do most of the oval graves. Trapezoidal graves are usually made of stone slabs. The earth-pit graves provide the vast majority of long-rectangular and long-narrow graves, with some being extremely long and narrow. Indeed, about 70% of all graves have proportions of 4:1 to 7.5:1, while 70% of all stone-construction graves have proportions of 1.5:1 to 4:1. Nevertheless, as there is a significant overlap in proportions as well as absolute measurements, during further analyses earth-pit and stone-construction graves have to be constantly compared to test the validity of these types.

V. 5.2.1.1 Earth-Pit Graves

For earth-pit graves, it is possible to distinguish between different chamber forms and measurements. The overall measurements and proportions have just been described, but they refer to all graves, including the unexcavated graves, for which estimates of measurements and form are naturally tentative. When considering only excavated graves, the preponderance of long-rectangular graves is more pronounced, largely because all unexcavated graves were generally described as rectangular (Table 5.21). The proportions of length to width shows a clear division around 4:1. Therefore, I will classify graves with a length to width ratio under 4 as rectangular and those with a length to width ratio over 4 as long rectangular graves (Table 5.22).

Remarkably, all of the re-classified graves are at Huili Fenjiwan; all of the long-narrow graves and a large portion of the long-rectangular graves are likewise located there. With the exception of grave M4 from Huili Guojiabao, all of the particularly long graves were reported from Huili Fenjiwan and Xichang Lizhou. This is not surprising, as over 60% of all earth-pit graves in this study are from Huili Fenjiwan, followed by Xichang Lizhou (11%).[28] When analyzing the material from Huili Fenjiwan (146 graves), Xichang Lizhou (26 graves), and the remaining graves separately (56 without Fenjiwan, 82 without Fenjiwan or Lizhou), it becomes clear that the grave forms in Fenjiwan are different from those at other sites, while the graves in Lizhou are fairly similar to the rest of the material (Figures 5.35 and 5.36-5.41, Table 5.23).

For Fenjiwan, the values for grave proportions (i.e., length to width) are nearly normally distributed with a mean of 5.48. This means that the average grave at Fenjiwan is long-rectangular, while for the rest of the material the distribution is bimodal, with a main peak at 2.5

[28] The sites of Mianning Xiaogoudi (13 graves), Ninglang Daxingzhen (11), Huili Wuhuangqing (10), and Xichang Dayangdui (9) contribute 4-5% each, while all other sites hold only 1-5 graves. These are Yanyuan Yingpanshan North (5 graves), Huili Guojiabao, Xichang Qimugou, Yanyuan Wushidi II, Wushidi III (3 graves each), Huili Washitian, Yanyuan Xiaohebian, Xichang Yingpanshan (2 graves each), Yuexi Huayang, Yanyuan Jiejiafen, Yuexi Liaojiashan, and Xichang Ma'anshan (1 grave each).

and a lesser peak at 6. The values from Lizhou also peak twice but with opposite weights, i.e., the higher peak is at 6, the lesser at 2. When analyzing the rest of the material without Lizhou or Fenjiwan, the values are even more skewed towards the lower end, with a mean of 3.09 and nearly 80% of the values lying below 5. The graves at Lizhou show a clear break in distribution at 5, thus re-affirming the category-split between rectangular and long-rectangular originally set when analyzing the overall grave-material, but for Fenjiwan the break still lies below 4.

This clear split between the material from Fenjiwan and other sites is confirmed by the confidence intervals for all measurements (Table 5.24). For Lizhou the case is less clear; the only variable with an overlap in the confidence intervals between Lizhou and other sites excluding Fenjiwan is depth, which is not reliable due to uneven preservation conditions. The t-tests likewise show that there is a significant difference between all these groups for all variables except for depth and thus volume. The split between rectangular and long-rectangular graves at Lizhou and the other sites excluding Fenjiwan occurs at the same point, but there is a much greater preponderance of long-rectangular graves at Lizhou. Nevertheless, all the long-narrow graves are from Fenjiwan and most graves are long-rectangular in dimensions. By absolute measurements, the graves at Lizhou tend to be longer than those at Fenjiwan or the other sites and wider, while the graves at Fenjiwan are shorter but narrower. As a result, the surface area of the graves at Fenjiwan is on average smaller (mean: 1.36 m^2) than at other sites, but the surface area of the Lizhou graves is considerably larger (mean: 7.25 m^2). The material at Fenjiwan is overall fairly homogenous in measurements, with all graves measuring around 1-3.5 m^2. At all other sites, including Lizhou, the graves fall into three distinctive groups of small (< 1 m^2), medium (1-3 m^2), large (3.01-7 m^2), and very large (7.01-16.5 m^2) graves.[29]

For inferences on the amount of work invested in grave construction, volume would be the most useful measure, but as the original depth is uncertain, it cannot be employed for statistical purposes. Nevertheless, at least the exceptionally deep or voluminous graves deserve special notice and have to be reconsidered when testing for correlations with interment types, signs of special rituals, and object assemblages.[30] This also applies to exceptionally long graves of over 7 m (e.g., Xichang Lizhou AM1, AM3, AM7, AM8, BM4).

When disregarding Fenjiwan with its homogenous length measurements (mainly 2-3.5 m), there seems to be a split between a group of short graves (1.5-2.5 m), and long graves (4-6 m). This split is even more pronounced when removing the graves of Lizhou, which are on average relatively long (mainly 3.5-5.5 m) and comprise all graves longer than 5.5 m. The vast majority of graves at other sites (excluding Fenjiwan and Lizhou) are 0.5-1.5 m wide, with those at Fenjiwan tending to be a little narrower and those at Lizhou generally wider, while most of the particularly wide graves are from Lizhou.[31]

There are a number of possible explanations for these striking differences between the earth-pit graves from Fenjiwan, Lizhou, and other cemeteries. As Fenjiwan is located in Huili while most other graves are in Xichang, there might be a regional component. Lizhou, however, is located in Xichang as well, and the locational explanation can thus not hold in this case. For

[29] There is a large group of graves with areas of up to 3 m^2 (~60%), a second smaller cluster with an area of 5-7 m^2 (~20%), and a third very spread-out group of graves with area measurements of 8 to over 16 m^2 (~20%). Within the first and last group, there are subgroups of exceptionally small and exceptionally large graves.

[30] Particularly deep graves are Lizhou AM1, AM3, AM4, AM5, Ninglang Daxingzhen M3, M4, M5, M6, M9, M10, Huili Fenjiwan M14, M137, M143, Xichang Ma'anshan M1. Particularly voluminous graves are Xichang Lizhou AM1, AM2, AM4, AM5, AM7, AM8, BM4, Xichang Ma'anshan M1, Xichang Qimugou M3, Ninglang Daxingzhen M5, Huili Fenjiwan M137 and M 143.

[31] Graves of 1.8-3.7 m width were reported from Xichang Lizhou (AM1, AM2, AM3, AM4, AM5, BM2, BM8), Xichang Qimugou M3, Xichang Ma'anshan M1, Yuexi Huayang M1 and Liaojiashan M1.

Lizhou, a chronological interpretation seems most likely but has to be tested against the object assemblage. The stark differences between a large number of small graves, some medium-sized graves, and a small number of large graves lends itself more readily to a social explanation. When considering different cemeteries separately, it is remarkable that the graves at Fenjiwan are more homogenous in size and form than the graves from other cemeteries. Lizhou, on the other hand, has the widest spread of values for grave measurements, indicating some social differentiation reflected in grave dimensions. These questions have to be reconsidered below when drawing together construction details, objects, and rituals particularities.

V. 5.2.1.2 Stone-Construction Graves

V. 5.2.1.2.1 Construction Parts

Turning to the 371 graves below ground with some amount of stone construction, the feature observed the most often are stone walls (89%), followed by stone covers (44%), and stone floors (23%). These numbers are skewed by the fact that for unexcavated or severely disturbed graves the presence of any of these elements might be unknown. Nevertheless, when re-calculated these factors based on the 113 excavated and well-preserved graves, walls are still the most prominent construction feature (84%), followed by stone floors (67%), with covers coming in third place (57%) (Table 5.25). As many graves were reported as protruding on the surface, the lack of stone covers might be a function of poor preservation. The relative frequency of these elements might therefore not be completely correct and has to be treated with care.

In behavioral terms, we can envision a chaîne opératoire starting from the choice of a specific kind of floor, by way of the decision on stone walls, to the choice of a cover (Figure 5.42). When re-arranging this tree from the observation point of view, we have to start from the choice between stone or soil for walls, as this element can usually be observed with great reliability even for poorly preserved graves (Figure 5.43). The second element is the decision on a specific kind of cover, followed by the material chosen for the floor. When re-arranging the material and creating new clusters as well as a cross-tabulation, it becomes clear that there is a high co-occurrence of stone walls and cover stones; moreover, the combination of stone bottom, walls, and cover in complete stone-cists is not uncommon either (Table 5.25).

When considering the treatment of the ground apart from the presence or absence of stone slabs, 22 of the graves with stone floors have an additional soil layer on top (26%), so does the only grave erected directly on bedrock, Zhaojue Pusu Bohuang M10. Another grave from the same site, M4, has a pebble layer instead of stone slabs, so does Huili Xiaoyingpan M20, but they stand alone, as all other graves with pebble layers covering the floor were erected above ground. The most common material used in wall construction for graves below ground, are various kinds of stone slabs, in six cases thick slabs and in 72 cases thin slabs (Table 5.26). The thin slabs mainly consist of slate and more rarely sandstone; both materials are common with medium-sized slabs as well, but large slabs were usually made of igneous rock or more rarely sedimentary rock. Igneous rock was sometimes used for medium-sized stone slabs as well.

All stones are unworked, except for the rectangular stones arranged in layers like bricks, which can either be rough cobbles (4 cases) or carefully smoothed brick-sized stones (6 graves). These stone-brick graves have mostly been observed in Zhaojue (5 graves from Chike Boxixian and 1 from Eba Buji), while three have been reported from Yongsheng Duizi. At Chike Boxixian, the stones were additionally secured in place by filling the cracks with clay, thus building a solid wall. The stones used for the cover can be larger in size than those used for the walls, while the reverse never occurs.[32] The most common kind of cover stones are medium-sized stone-slabs, but thin or large slabs are not uncommon either (Table 5.27). Yanyuan Laolongtou M7 and M9 are remarkable as their cover is made of a combination of small and large stones, but as the graves are poorly preserved the cover might originally have consisted of a single large stone.

Very special are the 22 graves that consist of one stone for each wall, all of them thin or medium-sized stone slabs generally used in the construction of graves below ground. 18 of these graves have been reported from Zhaojue (Zhaojue Eba Buji, Erba Keku, Jike Jijie, Pusu Bohuang, and Wazhaishan), while only two examples are from Huili (Huili Guojiabaou and Xiaoyingpan), and two from the site of Yongsheng Duizi. The examples from Zhaojue are also particular in other respects; at four of the five sites, one or both of the short sides of the graves were clamped in between the long sides with the long sides standing over at each end, building a small and unused foot- and sometimes head compartment (Zhaojue Erba Keku [4], Wazhaishan [2], Pusu Bohuang [5], and Jike Jijie [3]). Two of the graves at Zhaojue Erba Keku were furthermore askew, building a parallelogram rather than a rectangle, which is an unusual way of constructing a grave (Zhaojue Erba Keku M3 and M10). The nearby site of Zhaojue Fuchengqu additionally held one grave (M3) that had double-layers of stone slabs for the walls, thus building an inner and outer coffin. The floor board was elevated, leaving a bottom compartment in which some animal teeth were found, a phenomenon that has never been reported from any other site.

Three graves at Zhaojue Eba Buji, have been cut directly into the hill-slope, which gives them a slanted floor. They are all relatively small, two being rectangular and made of four coarse stone-slabs for the walls and one for the floor. The third had an irregular-oval form and was made of several layers of irregular cobbles; it was furthermore covered with a large boulder, a

[32] The walls of Zhaojue Eba Buji M3 were made of several layers of cobbles and the cover was a large irregular boulder, while for all other graves with similar walls the cover consisted one or a small number of large slabs. In all other cases, the size of the wall-stones was usually the same size as that of the cover or one size smaller.

rather unique construction. The four graves at Yanbian Yumen Wanxiao are likewise located on a slope with the head part being higher than the foot. These graves are furthermore special for having a trapezoidal form, wider at the head than at the bottom, and made of nearly square very thin natural slates placed in a slightly overlapping manner, a construction not observed at any other site within the research area.

V. 5.2.1.2.2 Measurements

As far as measurements are concerned, there is a clear split between the majority of graves measuring 1-3 m, a second small peak for graves of 3.5-5 m length, and a few very short and a few very long graves (6-12 m) (Table 5.6, Figure 5.44). For width, the standard deviation is fairly small, but the histogram shows a split between the majority of graves measuring 0.4-1.2 m, a second smaller group measuring 1.4-1.8 m, and two small groups with extreme values of 1.9-3.4 m one the one end and below 0.4 m on the other (Figures 5.45-5.46). The majority of these graves are 0.2-1 m deep (78%), some are 1.1-2 m deep (12%), and five have a greater depth of 2.5-4 m (Figure 5.47). The proportions range very widely with measurements between 1.5 m and 5 m occurring about equally often and a very few graves being longer.

When re-examining the chamber-form categories defined earlier, the vast majority of graves are rectangular (Table 5.29). The values for area and volume range widely, but some groupings are recognizable (Figures 5.48-5.51). For area, the values have several clear breaks: the majority is small (0.4-1.49 m^2, ~58%) or medium-sized (1.5-3 m^2, ~25%), and some are large (3.01-5.5 m^2, ~8%), and very few very large (8.6-21.6 m^2) or very small (below 0.4 m^2). By volume, the majority of graves is very small (< 1m^3, 58%), mainly because of the low depth, but for 62% of the graves the values are widely spread, mainly between 1-12 m^3, with three graves measuring 17-31 m^3, all of them combining significant length with a considerable width and depth.[33] When considering the measurements separate by site, it becomes clear that the graves in Yanyuan, especially those at Laolongtou, tend to be very large and the highest overall values for most categories were measured here. Huili, on the other hand, is characterized by small and mid-sized graves, and some of the smallest measurements in all categories have been taken here. The smallest graves were reported from Zhaojue, but Zhaojue Pusu Bohuang held very small graves next to one exceptionally large grave. Overall, the material is thus very heterogeneous.

V. 5.2.1.2.3 Grave Typology

When combining the different variables of grave sizes, form, stone-construction parts, stone sizes, and additional installation details, we can distinguish between five main grave types each of which has several sub-types (Figures 5.52-5.56):[34]

0. Unclear (0 excavated + 102 unexcavated)
1. Graves with stone-slab cover and walls (46 excavated+99 unexcavated)
   - 1.1. coarse large slabs, medium-sized graves (8+14)
     - 1.1.1. stone-slab floor, rectangular (7)
     - 1.1.2. natural ground, square (1)
   - 1.2. medium-sized slabs, medium to very large graves (14+81)
     - 1.2.1. stone-slab floor, rectangular or long-rectangular (11)
       - 1.2.1.1.additional soil layer on floor (2)
       - 1.2.1.2.no additional soil layer on floor (9)
     - 1.2.2. natural ground, rectangular or trapezoidal (3)
   - 1.3. thin slabs (25+4)
     - 1.3.1. stone-slab floor (11)
       - 1.3.1.1.rectangular, medium-sized (4)
       - 1.3.1.2.long-rectangular, small (2)
       - 1.3.1.3.trapezoidal, head higher than feet, overlapping slates for walls, very small to medium-sized (4)
     - 1.3.2. natural ground (14)
       - 1.3.2.1.rectangular (12)

[33] These graves are Yanyuan Laolongtou M7 and M9, and Xide Wadegu M4.

[34] The numbers in brackets provide the number of graves for each type, the first number referring to the excavated graves, the second number after the plus-sign indicating unexcavated graves.

1.3.2.1.1. small (2)
1.3.2.1.2. medium (7)
1.3.2.1.3. large (3)
1.3.2.2.trapezoidal, medium-sized (1)
1.3.2.3.square, very small (1)
2. Stone wall graves (44+50)
2.1. several coarse stone-slabs, rectangular, stone slabs on ground, small to medium-sized, cut into mountain-slope (2)
2.1.1. additional soil layer on floor (1)
2.1.2. no additional soil layer on floor (1)
2.2. several mediums-sized slabs, stone-slab floor, rectangular (11 + 49)
2.2.1. additional soil layer on floor (9)
2.2.2. no additional soil layer on floor (2)
2.3. several thin slabs (8 + 1)
2.3.1. natural ground (4)
2.3.1.1.oval, small, head higher than feet (1)
2.3.1.2.rectangular (2)
2.3.1.3.trapezoidal (1)
2.3.2. stone-slab ground (4)
2.3.2.1.rectangular, small (3)
2.3.2.2.square, large (1)
2.4. one stone-slab for each side (23)
2.4.1. short-sides clammed between long-sides, thin slabs (16)
2.4.1.1.natural ground (7)
2.4.1.1.1. stone-slab cover (1)
2.4.1.1.2. no cover (6)
2.4.1.2.stone slab floor (8)
2.4.1.2.1. stone slab cover (1)
2.4.1.2.2. no cover (7)
2.4.1.3.pebble floor (1)
2.4.2. one short-side clammed between long-sides, stone slab floor (3)
2.4.2.1.additional soil layer on floor (2)
2.4.2.2.no additional soil layer (1)
2.4.3. two-tier double-wall construction, large, additional soil layer on stone-slab floor, no stone-cover (1)
2.4.4. medium-sized stone-slabs placed at irregular angles, no stone-cover (3)
2.4.4.1.additional soil layer on floor (1)
2.4.4.2.no additional soil layer on floor (2)
3. Stone-cover graves (7+2)
large, no additional soil layer
3.1. natural ground (6)
3.1.1. large cover stone (3)
3.1.2. medium-sized cover stone (2)
3.1.3. thin cover stone (1)
3.2. stone-slab floor (1)
4. Stone-slab floor graves, large (11)

4.1. rectangular (9)
    4.2. long-rectangular (1)
    4.3. long-narrow (1)
5. Layered-wall graves (10)
    5.1. rectangular, stone-slab floor (9)
        5.1.1. worked rectangular stones for walls, large slabs for cover (6)
            5.1.1.1. additional soil layer on floor (5)
            5.1.1.2. no additional soil layer (1)
        5.1.2. unworked cobbles for walls, no additional soil layer (3)
    5.2. oval, bedrock-floor, large boulder as cover, cut into mountain-slope (1)

Among the excavated graves, the most common types are Type 1 and 2, which occur equally often (~38% each); graves of the other types are more rare (6-9% each) (Table 5.30, Figure 5.57). When breaking down these numbers into sub-types, Type 1.3 and 2.4 are by far the most common (Table 5.31, Figure 5.58). Among unexcavated graves, Type 1 and 2 dominate, as the types defined by presence/absence of stone floors or wall structures cannot be recognized without excavation. Among the subgroups, categories with medium-sized stones dominate for unexcavated graves, very likely an outcome of vague descriptions rather than an actual trend.

When comparing stone-construction graves with earth-pit graves, it becomes clear that there are some similarities in measurements. In length, the stone-construction graves are very similar especially with the material from Huili Fenjiwan, but also with all other graves except for Xichang Lizhou with its particularly long graves. The measurements for width are similar as well, but the proportions are different. Long-rectangular graves are very rare among stone-construction graves, while graves with rounded corners never have stone-construction parts, but trapezoidal graves sometimes do. In area, stone-construction graves are similar to the earth-pit graves from Fenjiwan, and they are most different from Lizhou.

Overall, there therefore seems to be a close connection between some stone-construction graves and earth-pit graves without such installations, especially in the case of Huili Fenjiwan and other sites, but Lizhou stands clearly apart. The earth-pit graves at Fenjiwan are closest in measurements to stone-construction graves, even closer than to other earth-pit graves. This is not surprising as the cemetery of Fenjiwan itself held eight stone-construction graves next to 142 earth-pit graves. Two of them are stone-slab floor graves (Type 4.2 and 4.3), and the other six belong to the subgroup of the graves with stone-slab cover and walls that are rectangular in form and medium or large in size (type 1.3.2.1). Compared to the other graves from Fenjiwan, the stone-construction graves are relatively long, especially the stone-slab floor graves which are among the longest graves at the site. These graves are therefore marked as special through several attributes and deserve particular attention during further analyses.

V. 5.2.2 Graves Above Ground: Megalithic Graves

V. 5.2.2.1 Measurements

Graves located above ground all have stone-construction elements and are usually very large, much larger than any of the other grave categories discussed so far; even the very small ones measure around 1 x 2 m and the small ones reach length of up to 6-7 m. The average dimensions are 9 x 2.7 x 1.6 m, but many graves are much larger, reaching length of 20-40 m (Tables 5.32-5.34, Figures 5.59-5.61).[35] The measurements for area and volume are very large as well and similarly clustered (Figure 5.50).[36] The vast majority of graves is rectangular in form (81%), with a few being long-rectangular (12%) or square (4%), while only a small minority is long-narrow (1.3%) or trapezoidal (1.7%) (Table 5.35, Figures 5.62-5.64).

[35] There are only very few graves with a length of under 2 m (1.5%), while the majority measures 5.6-11.5 m (58%), with a second cluster at 2-5.5 m (22%), one smaller group around 11.6-17 m (15%), and a very small group of graves of 19-41 m length. Most graves are over 1 m wide, a majority of them measuring 2.1-3 m in width (38%), with a second peak at 1-2 m (26%) and a third cluster at 3.1-4 m (21%). Most graves are 1-2.2 m high (78%), a very few being rather low (9%), and some up to 3.4 m high (13 %).

[36] For area, the majority of values fall in the range of 2-28 m^2 (70%), but a considerable number of graves is much larger, measuring 30-72 m^2 (14%), while nine graves are even larger than this, reaching up to 237 m^2 (Figure 5.50). The picture for volume is similar. Most volume measurements fall between 3-54 m^3 (76%), a second group ranges around 60-112 m^3 in volume (15%), and a few graves measure significantly more or much less.

V. 5.2.2.2 Construction

The graves are mainly built of large boulders, justifying the name "megalithic graves" usually attached to them. The walls are always made of stone. The only graves located above ground, for which no stone cover has been reported, are severely disturbed with much of the stones and content missing, while all well-preserved or only slightly disturbed graves have a stone cover; it can therefore safely be assumed that they always had a stone cover.[37] The cover stones are always large boulders, while he floor usually consists of leveled virgin-soil, sometimes with a pebble layer or more rarely stone-slabs on top. Among the graves made of a combination of large and small stones, we can distinguish between the following wall types:

1. large boulders or slabs with small stones filling the gaps;
2. a combination of large boulders below and small stones above; and
3. several large boulders erected at some distance with many cobbles in between.

For Dechang Arong M1, M3, and M4 the excavation reports mention that the boulders were placed in a foundation ditch dug around the main grave chamber to secure the stones in place. Although the preliminary excavation reports for other graves do not mention such a ditch, the summary-publication for the megalithic graves of the Anning River Valley remarks that — with the exception of Xichang Wanao M1 and M2 — all of these large graves were made by first digging a trench that would fit the large boulders neatly (Sichuansheng, Liangshan, and Xichangshi 2006a). As the authors of this publication consulted all of the original excavation reports and/or took part in the excavations themselves, we can assume that constructions above ground using large boulders usually have a foundation trench. Only the large boulders of Xichang Wanao M1 and M2 were placed directly on the ground and then stabilized by piling up stones and earth on both sides, a technique that has so far not been observed at any other site.

[37] The graves from which the stone cover was missing are Dechang Ma'anzi, Wujia M1, Xiaoliusuo M1, M6, and M7, Xiaomiaoshan M3, M5, M6, and M7, Ximin Wujia M1, Puge Xiaoxingchang BM2, Xichang Chenyuancun M1, Dabaobao, Guihuacun M1, Maomaoshan M2 and M3.

Another detail pointed out in various summary publications is that the smoother side of the boulders and stone-slabs was always pointing inwards (Sichuansheng, Liangshan, and Xichangshi 2006a; Liu Hong 2009). The boulders were usually not artificially smoothed but do naturally have one flat side, on which they were probably lying when they were sourced. Only in seven (potentially 10) cases the large boulders used in such constructions have been artificially smoothed, usually only on the side pointing inward.[38] The rectangular stones used in lieu of bricks to build regular walls were naturally all substantially worked, but in some cases, unworked rough cobbles were used fulfilling the same function. Very special among the smoothed stones are those of Zhaojue Qianjinshe M7: Here one carefully smoothed whitish slab of igneous rock was placed in the center of each side, while smaller irregular grey cobbles built the rest of the walls of this relatively small rectangular construction.[39] These central slabs were thus carefully chosen, but the meaning remains elusive.

For 36% of the graves a door has been reported, usually made of a number of irregular cobbles or more rarely several stone-slabs. The door was usually located at one of the short ends, but sometimes in the center of one of the long-sides with stone-slabs erect in front, forming a doorway and giving the grave a T-shape with an elongated crossbar.

V. 5.2.2.3 Grave Typology

Overall, we can distinguish between four grave types with sub-types (Figures 5.65-5.76):

1. large boulders or large slabs for walls and cover, all sizes (18 + 243)
   1.1. door (9 + 62)

[38] The clear cases are Xide Lake Sihe M8, Puge Xiaoxingchang AM1 and BM4 (both igneous rock), Echang Fanjiacun M1-2 (igneous rock), Xichang Tuanbao M5 (granite), and Xide Lake Sihe M1 and M7 (igneous rock). The unclear cases are Dechang Arong M4 (igneous rock), Puge Xiaoxingchang BM1 and Xichang Tianwangshan M10, and Xichang Hexi Gaongshe M1 and M2.

[39] The measurements are 2 x 1.7 x 1.2 m.

1.1.1. pebble layer on floor (8)
1.1.2. natural ground (1)
1.2. unknown if door or not (9 + 175)
1.2.1. natural ground (8)
1.2.2. stone-slab floor (1)
1.3. no door (+6)
2. walls made of large boulders or slabs with smaller stones in between, large boulders for cover, small to medium-sized (18+4)
2.1. door on short-side (13+3)
2.1.1. large boulders or slabs with small filling the gaps for walls, pebble layer on floor (3)
2.1.1.1.additional soil layer on floor (2)
2.1.1.2.no soil layer (1)
2.1.2. large boulders below, small stones above, pebble layer on floor (4+3)
2.1.3. large boulders or slabs erected at a distance, cobbles in between (6)
2.1.3.1.pebble layer on floor (3)
2.1.3.2.stone-slab floor (3)
2.1.3.2.1. additional soil layer on floor (1)
2.1.3.2.2. no soil layer (1)
2.2. door in middle of one long-side, no additional soil layer on floor (4+1)
2.2.1. large slabs or boulders with small stones filling gaps (3+1)
2.2.1.1.pebble layer floor (1)
2.2.1.2.stone-slab floor (2)
2.2.2. large boulders below, small stones above, pebble layer on floor (1)
2.3. no door, rectangular, no additional soil layer on floor (1)
3. several layers of stones for walls, large boulders as cover, door on one short-side, all sizes (5+7)
3.1. smoothed rectangular brick-sized stones for walls, natural ground (2)
3.2. irregular cobbles for walls, pebble layer on floor (2 + 7))
3.3. irregular cobbles and Han bricks for walls, natural ground (1)
4. stone-slabs for walls, small (6+4)
4.1. large boulders as cover, pebble layer floor (4+2)
4.1.1. very small or small (2)
4.1.2. medium (2)
4.2. stone slabs as cover and floor, very small (2+2)

Type 1 with large boulders or slabs for both wall and cover is by far the most common (86%), followed at a wide distance by Type 2, whereas Types 3 and 4 are rare (Tables 5.36-5.37, Figures 5.77-5.78). Nearly all of the large and very large graves belong to construction type 1; due to their size, they have mostly not been excavated but they are usually well-preserved. Only one of the very large graves, Xichang Beishan M2, belongs to Type 3.2, while the other instantiations of this type tend to be small. Type 4 graves are usually very small in size, which increases its strong resemblance to stone-construction graves of type 1.1, except for the fact that one is located above ground and the other below. Square and trapezoidal chamber forms mostly go along with graves of Types 2, 3, and 4, while all other forms are common to all types.

V.5.3 Outside Installations

Apart from these basic construction parts, a number of megalithic graves have outside installations. Outside installations can take a variety of forms (Table 5.38). Given the frequency of later disturbances, it is usually impossible to say if a grave without above-ground markers did or did not originally possess any such additions. For presence/absence variables, I therefore differentiate between "Yes" and "Unknown" (instead of Yes/No) to mark that fact.

V. 5.3.1 Tumuli

Earthen tumuli were observed most often, covering over 30% of all graves located above ground. At the time they were first reported, 95 graves still had earthen tumuli, but they were mostly heavily disturbed. Measurements were published in only 26 cases; the values for length vary widely between 8 m and 40 m, with widths of 1-40 m, height measurements of 1-5.5 m, and volumes that can be as small as 24 m^3 and as large as 1648 m^3 (Tables 5.40-5.41). The tumuli are either round or oval in form with a slight preponderance for oval tumuli (probably because the graves are mostly long-rectangular in form), and they consist of several layers of slightly compressed or sometimes rammed earth that can contain small stones and ceramic sherds. For Xichang Tianwangshan M10, 22 layers of rammed earth have been reported, each of them 0.2-0.25 m thick and rammed with round pestles of 20 cm diameter leaving clear impressions in the soil. The earthen tumulus of Dechang Arong M4 consisted of 13 layers and the lower ones were mixed with large numbers of ceramic sherds. The tumulus rested furthermore on a foundation of tightly-packed small reddish stones creating an even surface; however, such a construction has never been reported from anywhere else.

Stone mounds appear in seven cases. Six of them were reported from the same site of Xichang Bahe Baozi and one from the site of Xichang Xijiao Gongshe, which is about 40 km away from Bahe Baozi and likewise in the Anning River Valley. It is thus unclear if this feature is a local particularity or a marker for a small number of special graves, or if the cobbles of stone mounds at other sites have just been removed over, the centuries to be used as building material. The stone mounds are very similar in construction; round or elongated in form and made of irregular cobbles, they were all covered with thick layers of earth building an earthen tumulus, while only very few earthen tumuli (14%) contain a stone packing inside. Measurements of seven graves are not enough for reliable statistical evaluations, but it is clear that the stone mounds range widely in dimensions. The diameters reported vary from 3.6 m to 13 m, and the mounds are between 1.7 m and 3 m high, with volumes of about 13 m^3 and over 155 m^3, thus having required significant amounts of labor (Table 5.39).

V. 5.3.2 “Tails”

A number of tumuli end in what have come to be known as "tails," i.e., human-made soil-beds sloping up the hill and connecting it with the grave in a way that would have facilitated sliding a heavy covering-stone in place.[40] This feature is therefore more likely connected to practical questions of grave construction and the location of the grave in relation to hill slopes and/or resources of building material, more so than to social or religious concerns. Another

[40] The tail-length was only reported for 6 of the 12 observed examples, measuring 4-10 m, the mean being 6.3 m. The graves reported as having tails are Dechang Arong M1, M3, and M4, Dechang Hongmiao M1, Xichang Bahe Baozi M1-M6 (length: 4.6 m, 4 m, 4.2 m, 10 m, 7 m, 8 m), and Xichang Wannao M1 and M3.

possibly practical feature is a short path paved with small smooth pebbles found near the graves of Dechang Arong during a survey in November 2004, which has been interpreted as a means for dragging the stones towards the grave (Sichuansheng, Liangshan, and Xichangshi 2006a:72). As no further detail such as the exact measurements of this path or its relative location to the graves are known, it is not possible to say if this interpretation is likely correct or if the path might have had a ritual function. A feature that is surely closely connected to questions of ritual are access ramps, which have been observed in 35 cases (~12% of all graves above ground and never with graves below ground). Length measurements are available for 11 of these ramp, and they are very uneven, ranging between 1.8 m and 15 m with a mean of 4.09. Given the small number of examples, it is not possible to gage if the variation is an outcome of uneven preservation conditions or if there is a greater significance to it.[41]

V. 5.3.3 Other Stone Constructions

There are also a few other types of outside installations that occur rarely and never in combination. One of them is a trapezoidal stone construction usually referred to as *ba*-shaped (*bazixing* 八字形), referring to the shape of the Chinese character for the number eight) or screen-shaped (*pingfengzhuang* 屏風狀). It consists of one or several stones erected on both sides close to the front of the grave or directly at the door, forming a perpendicular line to the main extension of the grave, and thus creating a cross or T-shape with very short arms. This kind

[41] The 11 graves and their measurements are Xichang Tuanbao M5 (15 m), Xide Lake Shihe M8 (4.7 m) and M1 (1.81 m), Xichang Bahe Baozi M1 (4.1m), M2 (3.02 m) and M3 (3.3 m), Xichang Xijiao Gongshe M1 (3.6 m), Xichang Wanao M1 (3.4 m), Xichang Beishan M1 (1.86 m), and Puge Xiaoxingchang (1.8 m). The other graves with ramps are Dechang Arong M3, Dechang Guoyuan M1-M7, Dechang Shuitangcun M1-M12, Puge Xiaoxingchang M1, Xichang Huangshuitang M1, Xide Guluqiao M1, Zhaojue Qianjinshe M7.

of installation has been observed in only eight graves at three sites.[42] Another kind of outside installation reported from six graves are groups of erected stones building a door-way at the side or the front of the grave.[43] A pile of stones outside the grave without a clear function has been reported from Xichang Hexi Gongshe M1, Xide Guluqiao M1, and Xichang Tianwangshan M10.

V. 5.3.4 Correlation between Different Construction Elements

All construction elements just described occur nearly exclusively with stone graves whose grave chamber is located above ground. The only exceptions are the stone-construction graves Yongsheng Duizi M1 and Yanyuan Laolongtou M9. Yongsheng Duizi M1 is the only grave below ground that consists of a main chamber and a smaller section that is located on one of the short sides but only has half the width of the grave chamber, thus giving the grave the shape of a rectangular kitchen knife with a short handle. This handle could be interpreted as an antechamber or as an access ramp. As Yongsheng Duizi has not been published, the unique form of grave M1 can only be noted in passing and has to be excluded from the analysis. Yanyuan Laolongtou M9 is likewise located below ground but has an earthen tumulus above, and is particular in content and burial ritual; it can therefore be treated as an exception. Graves below ground might have had above-ground markers as well, it is nevertheless clear that they were never large enough to remain as widely visible alterations in the landscape such as large tumuli would have done.

Of the graves above ground, 119 (39%) have some form of outside installations, most often a tumulus, sometimes with a stone package inside, a ramp, tail, or other elements.

[42] Dechang Arong M1 and M4, Miyi Wanqiu M1 and M2, Xichang Hexi Gongshe M3, M4, and M5, and Xichang Wanao M2.

[43] Observed at Dechang Arong M3, Dechang Dashipai M5, Dechang Shaba M8, Xichang Wanao M1 and M3, Xichang Xijiao Gongshe M1

Conducting statistical analyses on those different variables to search for correlation is somewhat problematic, considering the uncertainty of the presence/absence of the various features at the time of grave construction. Nevertheless, correlation matrixes, cross-tabulations and their histograms can help to identify patterns that might otherwise not be immediately obvious. When conducting analyses over all cases, the correlation matrix shows a moderate correlation between the presence of a door and an access ramp (0.538), as well as between door and tumulus (0.583), and a slightly stronger correlation between stone mound and tail (0.652) (Table 5.42). The cross-tabulations show clearly that all graves with an access ramp possess a clearly identifiable door, but by far not all graves with doors have an access ramp. Tumuli always seem to be associated with a door, but graves with clearly identifiable doors do not necessarily have a tumulus, which in some cases could be due to unfavorable preservation conditions. Stone mounds are always additionally covered with an earthen tumulus, but as mentioned above, only a small percentage of the earthen tumuli have a stone mound inside. Stone mounds are nearly always associated with a tail, but not all graves with tails do necessarily have a stone mound.

The correlation between stone mounds and tails provides some insight into the construction process. The tail might have been used to roll or slide stones onto the grave, which would have been especially important for constructions using especially large boulders or a particularly large number of stones as needed for a stone mound. All graves with tails are indeed constructed of very large stones with particularly large cover stones (measuring at least 1.9 x 1.2 x 0.6 m [Xichang Wanao M1] and at maximum 3.5 x 1.7 x 0.7 m [Xichang Bahe Baozi M1]). while nearly half of the graves additionally have a stone mound. Nevertheless, Xichang Xijiao Gongshe M1 does not have a tail, even though it has a stone mound; but it is constructed of a combination of larger and smaller stones, not exclusively large slates or boulders. More importantly, it is located on a very flat plain and not leaning against a mountain, which makes the addition of a tail impossible.

All other graves with exceptionally large stones are likewise either on level ground (e.g., Xichang Yunduanshan [max. stone size 2 x 2x 0.6] and Xichang Dayangdui M1 [max. stone size 2.7 x 1.18 x 0.54 m]) or poorly preserved, which makes it impossible to asses if they originally had a tail or not (Xichang Xinying M1 [max. stone size 2.9 x 1.2 x 0.5 m] and Xichang Lake Sihe M1 [max. stone size 3.2 x 1.74 x 0.6]). Of the 165 graves for which the actual size of the boulders used in construction is unclear, 123 (75%) are located on level ground with no reason or basis for a tail, and 32 (19.4%) were reported from a hill-slope, but they were either poorly preserved or not properly published, so that it is impossible to be sure about the presence or absence of such a construction detail. There still remain 11 graves from three sites that are located on a slope and are reasonably well-preserved but show no signs of a tail (Xichag Hexi Gongshe M1-M5, Xichang Lijiagou cun M1-M4, Xichang Shizuizi/ Reshuitang M1). As all of them had at least remainders of a tumulus, there seems to be no reason why a tail should not have been preserved if it originally existed. Judging from the pictures in the excavation reports, the graves of Hexi Gongshe are located on only slightly sloped ground, which is not steep enough to allow for a tail (Xichang Diqu 1978c: pl.1-2).

Only the five graves from Xichang Lijiagoucun and Xichang Reshuitang M1 do not fit the overall pattern. None of them has been excavated or published in greater detail, but they are only listed in the *Zhongguo Wenwu Dituji*, which does not mention the presence of a tail for any of the other graves either, even where it has been mentioned in the excavation report. It is therefore reasonable to infer that the tail is an outcome of the construction process and the local precondition, i.e., the location at a slope and the use of large numbers of heavy stones in the construction process, rather than a detail with ritual significance.

The correlation between ramp and door is natural and practical as well, showing that the access ramp is related to rituals requiring the accession of and possibly re-opening of the grave at a later time. That all graves with a tumulus but also many graves without a tumulus had a door is more difficult to explain. When taking a closer look at the material, it becomes clear that for 52 of the graves with a tumulus and 136 of those without, the presence of a door is by no means clear. Most of the graves with a tumulus were fairly well-preserved and the grave chamber was probably still completely covered with soil layers, making it impossible to judge the presence or absence of a door. Many of the graves without tumulus, on the other hand, were generally poorly preserved and might have had both a tumulus and a door, but at the current stage of preservation and excavation, the original constellation is unclear.

The trapezoidal stone-arrangements are always associated with both door and tumulus, indicating that these additions are likely meant to emphasize the importance of the grave. The stone-piles located outside the grave exclusively appear with graves that have a door as well, but only in two of three graves with a tumulus, while for the grave with a stone-pile outside but without a tumulus at Xide Guluqiao (M1), a ramp is present. A possible explanation would be that such stone-piles were related with later offerings during a re-opening of the grave, which could only be conducted if a door was present.

V. 5.3.5 Correlation between Outside Installations and Grave Types

When considering possible correlations between these outside installations and the grave types suggested previously, it becomes clear that tumuli occurred with all main types and most sub-types (the only exception are subtype 1.3, 2.3, 3.1 and 3.3). The only types they do not occur with are the subtypes of Types 1 and 2 without a door, and the subtypes of Type 3 that were built of smoothed rectangular stones or a combination of irregular cobbles and Han-bricks. Stone mounds never occur with Type 3, which seems rather natural as this type already has walls made of layers of smaller stones. Type 4, which likewise never has a stone mound, is constructed of smaller slabs as well, while all graves connected with stone mounds are made exclusively of large boulders (type 1.2.1) or a combination of large boulders and small cobbles (type 2.1.2 and 2.1.3.2.1). Ramps can occur with all grave types, suggesting that they were not a special marker of importance but might have been related to the continued use of the grave. Tails seem to be reserved for graves of Types 1 and 2 built of large boulders, which often additionally have an access ramp, a stone mound and other outside-installations requiring a large amount of stone material to be transported to the site.

All other outside installations are rare and their occurrence is therefore difficult to judge. Doorways occur both with Type 1 and 2 (1.1, 2.1 and 2.2), trapezoidal installations have been reported in connection with the same types but not the same graves, and stone-piles occur with Types 1.2, 2.1, and 4.2. There is no clear correlation between any of these structures and specific grave sizes. It is therefore neither possible nor necessary to modify the typology of megalithic graves proposed above after considering the outside installations and their distributions. It is relatively certain, however, that tumuli are a feature that was common to most or all of these graves. Access ramps are likely a sign of the planned re-opening and conducting of rituals around the grave, as is the presence of stone-piles. Doorways are rare, as are trapezoidal stone constructions and stone mounds, which require considerable work. All of these elements are connected with tumuli and doors, and other installations such as an access ramp or a tail. These kinds of graves all consist of large boulders and thus belong to Types 1 and 2. Nevertheless, they are not particularly large but of small or medium size. It therefore remains unclear why these graves warranted such special additions. Correlating them with interment types, traces of burial ritual, or special object-types at a later stage might throw further light on this question.

V.5.4 Internal Installations

V.5.4.1 Internal Installations in Megalithic Graves

Internal installations have been reported just as rarely as outside installations (Table 5.43). The most common types are head compartment, wooden coffin, foot compartment, and second-level ledge. Other installations include stone-slates placed beneath the head or in the pelvis-area, further partitioning of the grave-chamber, further stone-encasings or platforms, and stairs leading into the grave. Megalithic graves do only rarely feature internal installations. Remarkable are three megalithic graves that are partitioned into a smaller front- and a larger rear-chamber by additional stone-slabs: Puge Xiaoxingchang BM2 and BM4, and Zhaojue Qianjnshe M6. For the grave at Zhaojue Qianjinshe the publication does not provide details on object location, but in the two graves at Puge Xiaoxingchang, the objects inside the front and the rear-chamber are essentially the same (personal ornaments made of bone, stone, and bronze), and the function of the front-chamber remains unclear. A further type of partitioning is a brick-wall built across the whole length of Xichang Beishan M1, but this is a later addition from the time of the Kingdom of Dali (937-1253); during the same time period, ten urns were placed inside the grave and a few more on the top of the covering stone and around the grave. A similar brick-wall of Tang-dynasty date was reported from Xichang Tianwangshan M10, showing that large stone graves were sometimes reused many centuries after their original construction.

The three cases of partitioning mentioned before were observed in the only two graves of Type 4.1.2, i.e., medium-sized graves built of stone-slabs for the walls and large boulders for the cover with a pebble layer on the floor, and in the only grave of Type 3.3., i.e., a grave whose walls were built of several layers of irregular cobbles and Han-bricks. Therefore, the characteristic of inside-partitioning can be added to the definition of those types. The Han bricks indicate that Zhaojue Qianjinshe M6 is of a relatively late date, but the graves at Puge Xiaoxingchang are probably earlier, indicating that internal partition is probably not a chronological marker. While partitioning is rare, stone fragments arranged in no particular order have been reported from a number of megalithic graves. As most of these stones were found close to the entrance crushing bones and objects, they are probably not conscious installations but the outcome of instances of re-opening and re-closing of the grave.

The only other internal installation reported from a megalithic grave is a three-step staircase at the entrance of Xide Lake Sihe M1, a grave of Type 2.2.1.2, i.e., a grave whose walls were built of large slabs or boulders with small stones filling the gaps, with the door in the middle of one long-side, giving the grave a T-shape with very elongated cross-bars. This grave furthermore possessed a stone-slab floors, as well as a tumulus, a ramp, a tail and a doorway, but inspite of all these special markers it was only of medium size. Overall, the access way to the grave was thus clearly marked, built with considerable effort and combined with numerous special outside and inside markers. It was therefore clearly a construction to be entered and reused, possibly over an extended period of time. This might apply to many other megalithic graves as well, but the construction of stairs is unique to this grave.

V.5.4.2 Internal Installations in Stone-Construction Graves

In earth-pit and stone-construction graves, internal installations are significantly more common than in megalithic graves. For stone-construction graves, second-level ledges occur in three cases, always inside stone-cover graves with stone-slab floor (Yanyuan Laolongtou M4, Yongsheng Duizi M59, Huili Xiaoyingpan M4). One of them is combined with a head compartment and the other with a foot compartment. Due to their construction of overlapping stone-slabs, graves of Type 2.4.1 naturally tend to have at least a small partitioned-off section at the foot or head, but these spaces did not contain any objects and are therefore not referred to as compartments. Head or foot compartments were reported from eight stone-construction graves of Type 1, 2, and 3, but both never occur together in the same grave. Foot compartments were reported from Yanyuan Laolongtou M4 and M6 (both stone-construction grave type 3.1.1), and Huili Xiaoyingpan (type 1.3.1.2). Head compartments were observed at Yongsheng Duizi M59 (type 3.2) and Huili Xiaoyingpan M13 (type 1.3.1.2), M20 (type 2.3.2.1), and M21 (type 2.3).

In Yanyuan Laolongtou M4 the foot compartment was combined with a second-level ledge as well as a wooden coffin. So far, wooden coffins have only been reported from Laolongtou and Ninglang Daxingzhen, but it is unclear if they a regional particularity or the outcome of uneven preservation conditions. At Laolongtou itself, not all graves have wooden-coffins either, but they seem to be reserved for special graves marked by other particular installations as well. All graves at Laolongtou are stone-cover graves (Types 3.1.1 and 3.1.2), but only five have a wooden coffin, which was in at least three cases held together by bronze nails (wooden coffins were reported from M4, M6, M7, M9, and M11; of these, M4, M6, and M7 held 63, 10, and 8 nails respectively). The coffins were all fitted neatly into the grave, made from several layers of wooden planks, and the coffin in M6 was additionally divided into two compartments of 4.4 x 1.18 and 4.5 x 0.52 m. The divider was 20-30 cm wide, providing space for the placement of objects. The foot compartment in M6 furthermore had a wooden lid, but the one in M4 did not. The second-level ledge of M4 ran all around the grave and measured 34 cm in width. Such details are not known for other graves with a second-level ledge.

Laolongtou M7 had an oval niche in the western part providing room for objects, and M11 had two further layers of stones inside the grave, but their function or exact arrangement remain unclear. Judging by internal arrangement, M9 is the most complex grave. Inside the northern half of the wooden coffin, there was a complete stone-coffin that was half as wide and half as high as the wooden coffin and occupied its northern half. West of the stone-coffin further stone-slates had been arranged with a sword and bronze fragments lying on it, and south of this assemblage there was a stone-encasement containing pieces of human skull-bones, teeth, ceramic sherds, and other objects, all of them burned and covered by ash. The graves at Laolongtou can therefore be classified as special local forms of stone-cover graves with particular installations.

V.5.4.3 Internal Installations in Stone-Construction Graves

Inside installations were reported for a few graves without stone-construction parts as well. Eight earth-pit graves contained a wooden coffin, all of them from Ninglang Daxingzhen, about 60 km southwest of Yanyuan Laolongtou where all the other graves with coffins were found. Five of the graves with coffin had a head compartment, while the other graves at Daxingzhen featured neither coffins nor compartments. The graves fall clearly into two different size groups that correspond with the groups defined by the presence/absence of wooden coffins. Graves without coffins are small (1.5-1.75 m x 0.56-0.65 m x 1.1-1.12 m); graves with coffins measure 2-2.5 m by 0.7-0.9 m, and they were all over 1.6 m deep, the deepest measuring 3.25 m in vertical extension (M5). M5 is not only the deepest but also the longest of the graves a

Daxingzhen, and it was additionally equipped with a head compartment, indicating that grave size, depth, and the presence of complex internal installations were markers of importance.

Head compartments were observed in four graves at Huili Washitian, while the two remaining graves at the same site did not have internal installations. Complete measurements are only known from grave M1, which with its 2 m length and 0.3 m width can count as medium-sized but narrow.[44] Second-level ledges were reported from Xichang Ma'anshan M1 and Xichang Qimugou M3. Both of them are of considerable size (the measurements of Xichang Ma'anshan M1 are 3.67 x 2.9 x 2.02 m, those of Xichang Qimugou M3 are 4.98 x 3.1 x 0.6 m). All other graves with special stone-installations were large or at least medium-sized as well. They were all located at Huili Fenjiwan and mostly of long-rectangular or long-narrow form. In two of these graves, thin stone-slabs were placed near the pelvis (M12 and M40), and in nine graves slabs were found under the head.[45] In one grave, M113, a small stone-slab was placed upright next to a ceramic vessel, but the function or meaning of this particular installation remains unclear.

V.5.4.4 Correlation between Grave Types and Internal Installations

Overall, inside installations do appear very infrequently and are particularly rare in megalithic and stone-construction graves. For stone-construction graves, internal installations have been reported nearly exclusively from the two sites of Yanyuan Laolongtou and Huili Xiaoyingpan, with a single case from Yongsheng Duizi. The graves at Laolongtou are all

[44] For one of the graves with a head compartment, M1, measurements of 2 x 0.3 x 0.4 m are provided, and of one of the other graves, M4, 1.26 m in length were still extant, but it was severely disturbed and would have been longer, but it is unclear by how much.

[45] These graves were M13, M78, M87, M93, M95, M108, M110, M115, and M143.

particularly large and characterized by a number of unique installation features. As they all belong to stone-construction Type 3.1., they can thus be treated as special sub-types particular to this site. As Laolongtou is the only cemetery in Yanyuan that has been systematically excavated and published, it is currently not possible to tell if this type of graves is limited to Laolongtou or if it is a regional particularity. Yongsheng Duizi remains unpublished and is therefore hard to evaluate, but M59 from this site has both a second-level ledge and a head compartment and belongs likewise to Type 3, being thus similar to Yanyuan Laolongtou.

The graves from Huili Xiaoyingpan are less homogenous in their appearance. Some belong to Type 2.3, others to Type 1.3, i.e., they all have walls made of thin stone-slabs and are of rectangular form. The single grave with the second-level ledge (M4) is particularly small (1 x 0.45 x 0.45 m), while all others are medium-sized (1.8-2.65 x -.45-0.6 x 0.2-0.46 m). The single grave with the foot compartment is the longest of these graves and it is narrow, while the other three graves are rectangular in form and have a head compartment. Nevertheless, there is no clear correlation between grave size, stone-construction parts, and further installations. A further subdivision or re-framing of the typology proposed above is therefore not possible.

Internal installations are usually associated with large or medium-sized graves, mainly of rectangular or long-rectangular form, and they do not occur in small graves or graves of exceptional forms, i.e., trapezoidal, oval, or rectangular with rounded corners. As the breaks between square, rectangular, long-rectangular, and long-narrow are somewhat arbitrary, they can all be grouped together and described as rectangular graves. There are two possible ways of structuring earth-pit graves, the first going from size, over special features, to grave form, and the second from grave form, over size, to special features. The first typology would thus read:

1. very large (14)
    1.1. second-level ledge (5)

        1.1.1.   square (1)
        1.1.2.   rectangular (4)
        1.1.3.   long-rectangular (0)
    1.2. no second-level ledge (9)
        1.2.1.   square (2)
        1.2.2.   rectangular (3)
        1.2.3.   long-rectangular (4)
2.   large
    2.1. thin stone-slabs (12)
        2.1.1.   in pelvis-area, rectangular (2)
        2.1.2.   in head-area (9)
            2.1.2.1.rectangular (2)
            2.1.2.2.long-rectangular (5)
            2.1.2.3.long-narrow (2)
        2.1.3.   next to ceramic vessel, long-rectangular (1)
    2.2. no stone-slabs (49)
        2.2.1.   rectangular (3)
        2.2.2.   rectangular with rounded corners (2)
        2.2.3.   long-rectangular (39)
        2.2.4.   long-narrow (5)
3.   medium-sized (108)
    3.1. wooden coffin, rectangular (8)
        3.1.1.   head compartment (5)
        3.1.2.   no head compartment (3)
    3.2. no wooden coffin (100)
        3.2.1.   head compartment, long-rectangular (4)
        3.2.2.   no head compartment (96)
            3.2.2.1.trapezoidal (3)
            3.2.2.2.square (5)
            3.2.2.3.rectangular (4)
            3.2.2.4.rectangular with rounded corners (6)
            3.2.2.5.long-rectangular (41)
            3.2.2.6.long-narrow (1)
4.   small (50)
    4.1. square (1)
    4.2. rectangular (27)
    4.3. rectangular with rounded corners (4)
    4.4. long-rectangular (18)
5.   unclear size (148)
    5.1. oval (17)
    5.2. rectangular (131)

The second typology would be:

1.   rectangular grave form (194)
    1.1. very large (14)
        1.1.1.   second-level ledge (5)

1.1.1.1.square (1)
1.1.1.2.rectangular (4)
1.1.2. no second-level ledge (9)
1.1.2.1.square (2)
1.1.2.2.rectangular (3)
1.1.2.3.long-rectangular (4)
1.2. large (59)
1.2.1. thin stone slabs (12)
1.2.1.1.in pelvis-area, rectangular (2)
1.2.1.2.in head-area (9)
1.2.1.2.1. rectangular (2)
1.2.1.2.2. long-rectangular(5)
1.2.1.2.3. long-narrow (2)
1.2.1.3.next to ceramic-vessel (1)
1.2.2. no stone-slabs (47)
1.2.2.1.rectangular (3)
1.2.2.2.long-rectangular (39)
1.2.2.3.long-narrow (5)
1.3. medium-sized (63)
1.3.1. wooden coffin (8)
1.3.1.1.head compartment (5)
1.3.1.2.no head compartment (3)
1.3.2. no wooden coffin (55)
1.3.2.1.head compartment, long-rectangular (4)
1.3.2.2.no head compartment (51)
1.3.2.2.1. square (5)
1.3.2.2.2. rectangular (4)
1.3.2.2.3. long-rectangular (41)
1.3.2.2.4. long-narrow (1)
1.4. small (58)
1.4.1. square (1)
1.4.2. rectangular (27)
1.4.3. long-rectangular (18)
1.5. unclear size (131)
2. rectangular with rounded corners (12)
2.1. large (2)
2.2. medium-sized (6)
2.3. small (4)
3. trapezoidal, medium-sized (3)
4. oval, unclear size (17)

The interpretative value of both typologies is slightly different: The first one highlights labor investment, which can mainly be inferred from grave-size and special installations, while the second one highlights graves that are special in various ways, not only size, but also form, which might have cultural implications. As all the oval grave forms are from Yongsheng Duizi, the trapezoidal graves are all from Huili, and rectangular graves with rounded corners were reported only from Xichang, these might indeed be regional particularities.

When looking back at the stone-construction graves, no similar correlations between grave size, installations, overall form, and location can be identified. Instead, it seems to be the presence/absence and dimensions of the various stone-construction parts that characterize these graves, while grave-dimensions are secondary, and the same is true for internal installations. For stone-graves located above ground, the distinguishing criteria are the choice of the kind and number of stones used, as well as additions facilitating access, while absolute size seems to have been less important. Especially for graves using a considerable amount of particularly large boulders, there is the potential of a locational component, i.e., the availability of different kinds of raw material in specific areas. In a next step, I will therefore turn to the raw material employed in the construction of these various kinds of graves and their relative distribution in space.

V.5.5 Raw-Material Choice

As became apparent above, there are considerable differences in the form and size of the stone-construction elements chosen for stone-graves built above ground (i.e., megalithic graves) and those located below ground (i.e., stone-construction graves). Furthermore, there seem to be considerable differences in the kind of raw material employed in construction. Megalithic graves were mostly built of large pieces of granite or other kinds of igneous rock, while sandstone and other kinds of sedimentary rock are rather uncommon (Tables 5.44-5.46). The most common type of stone material used for smaller stone-construction graves is slate, while sandstone, limestone, and other types of sedimentary rock are less common. Igneous rock hardly ever seems to have been employed. This trend can be explained by a practical consideration: slate splits naturally into thin slabs that can be easily used as relatively light-weight parts for coffin-like constructions or partial installations. Igneous rock, on the other hand, mostly occurs in large formations and boulders that are not easily worked into thin slabs. They are, however, well-suited for large constructions meant to be seen from a distance and supposed to withstand time and weather.

Sandstone and other sedimentary rocks are considerably smoother easier to work than igneous rocks, but they are more prone to weathering and have different colors and other visual characteristics that might have made them less attractive. Information on potential color preferences is only available for a small number of graves in Zhaojue and Yanyuan. For Yanyuan Laolongtou M11, the excavators remarked on the attractive dark color of the sandstone slabs used as cover stones. For all graves at Zhaojue Jike Jijie moderately-sized sandstone slabs of purple-grey color were used for sides and bottom, while for other graves in Zhaojue coarse slate of homogenous dark grey color was used, which has a rather pleasing appearance as well, reminding of dark grey slate but without the latter's favorable construction qualities.

Another aspect of material choice might have been raw-material availability. When plotting raw-material choice against location, it becomes clear that different types of igneous rock were the main building material used throughout the Anning River Valley, whereas granite has been reported particularly frequently from the Xichang area (Tables 5.47-5.48). The same pattern can be observed in Yuexi and Xide, Meigu and Zhaojue in the east and Huili a little further southeast are dominated by graves made from slate, and the same is true Panzhihua and Luquan in the far south. Surprisingly, the graves in Yongsheng and Yanyuan, although not far from Panzhihua, mainly have grave installations made of igneous or sedimentary rock, but never of slate; however, as the raw material used in these areas is only known for three graves out of 16 and six graves out of 26, respectively, the impression might be misleading.

Nevertheless, it is remarkable that the fine dark-grey slate used for small stone-construction graves in Huili (66 graves), Panzhihua (26), Meigu (12), and Luquan (7), is fairly limited in natural occurrence. This material, which is also employed for the production of fine knives found in settlement sites in all parts of the research area, only occurs in narrow bands along the Anning River and on the southern rim of the Yanyuan basin. Unless the geological records and the archaeological observations are incorrect or incomplete, this means that in all cases the raw material used for these stone-slate graves was not far away but would still have to be transported over some distance and was clearly the result of a distinct selection process.

Different types of sedimentary rock, on the other hand, are widely distributed throughout the research area, both geologically and in the archaeological assemblage. The same is true of different types of sandstone, which can occur in association with limestone. Among igneous rocks, different types of granite are most common, occurring northwest of Mianning and between Huili and Panzhihua. The mountains in the Northwest and Northeast are particularly rich in sandstone; limestone occurs in some places as well. This material indeed employed much in grave construction in Zhaojue, but surprisingly in Yongsheng and Yanyuan as well. This is surprising because the inhabitants of these two places had ready access to fine slate, which would have required less effort to work, has a pleasing visual appearance, and is smooth to the touch. As remarked above, the stone material used in Zhaojue, Yongsheng, and Yanyuan seems to have visual characteristic similar to slate. Given the lack of stone analyses, it is therefore possible that the material described as limestone was indeed slate, albeit in thick slabs. If it was limestone, unknown ritual/cultural reasons for employing this material over slate can be assumed.

Geological and archaeological observations in Zhaojue have shown that the coarse stone slabs used in grave construction were local and might have come from the same mountain slope on which the respective graves were built (Liangshan, Sichuansheng, and Zhaojuexian 2009, 2010, and 2011). They were largely used in their natural coarse state, with the only exception of the rectangular stones used like bricks to build regular walls, which had to be substantially worked to attain their regular form (reported from Zhaojue Chike Boxixian for all graves).

Although no systematic studies on sourcing have been undertaken in any part of the research area, some excavation reports and summary publications provide some general remarks and observations on stone quality. The general tenor is that for graves using large boulders in there construction, there is no adequate material in the immediate vicinity. As stated in Chapter II, sandstone is widely distributed throughout the whole area, so is igneous rock. Granite is most common around Dechang and Xichang, and limestone is readily available in Mianning, Yanbian, and other parts of Panzhihua. The raw material used for megalithic graves is therefore generally available throughout the research area, but adequately large boulders with one flatter side are most often found in rivers and mountain creeks where they have been smoothed by running water. Irregular cobbles, on the other hand, might come from the nearby mountains, as Liu Hong suggests (2009:70). Some of the graves are indeed located in the river valley and close to a river, but about half of the sites can be found on the first- and second-level terraces, and about 28% are on mountain-slopes and a few are located directly on the mountain-top.

Nevertheless, the composition of the stones suggests that they were not retrieved on site but transported over some distance, at least a few kilometers (Liu Hong 2009:71). As many of the cover stones are very heavy, weighing up to 10 tons each, transporting them even a few meters would not have been an easy endeavor, let alone moving them down from the mountains or over long distances. Given the size and weight as well as the likely quarry locations, it is reasonable to assume that such boulders were mostly transported on waterways or over tree logs or other devices that can help in moving heavy loads. This only applies to large boulders, however, while smaller broken sedimentary rocks would have been easier to transport and are widely available in the vicinity of grave sites in the first place.

Overall, it thus becomes apparent that practicability and availability of adequate raw material were only a secondary concern in the building of the graves with stone-construction parts, be they megalithic or smaller stone-construction graves. Choosing stone as a building material thus implied a considerable endeavor and not just a mere practicality or possibility in an area were stone is generally available. Even for megalithic graves, stone was thus not just a visual marker, but had a deep and likely religious meaning. This likewise applies to stone-construction graves, for which special stones were chosen as well. Stone, particularly that from specific places and/or of specific quality must have been imbued with deep meaning throughout the research area. As the graves were not located near the places were these special stones came from, this raises the question whether the choice for specific grave locations was dictated by cultural reasons as well. This question can best be approached by conducting a number of spatial analyses, which I will do in the next step.

V.5.6 The Spatial Component: Grave Construction and Location Choice

V. 5.6.1 Geomorphological Preconditions and Regional Preferences

The main aspects of location choice that can be explored through spatial analysis are the distribution of different kinds of graves in relation to factors such as elevation, slope, aspect, and distance to the nearest watercourse. Furthermore, the spatial distribution of the different grave types needs to be considered. The methods used are the same as those applied to settlement sites in Chapter IV: I conducted spatial analyses in ArcGIS on grave sites as well as a set of 600 computer-generated random points, and then exported the results into SPSS to conduct statistical analyses. What complicates such analyses in the case of graves is the fact that for most grave sites only the coordinates of a single point are known, while the detailed geographical coordinates and orientation of individual graves have hardly ever been ascertained. Given the great variability of the terrain, it is questionable whether the measurements for slope at a given site are correct for all graves; some graves could have been located on areas slightly less steep or of a slightly different orientation. Additionally, the information concerning grave orientation provided in publications is often imprecise. For unexcavated graves and megalithic graves without a doorway, the exact orientation of the grave is naturally difficult to ascertain, and researchers have often settled on vague ascriptions such as "North-South orientation." In other cases exact degrees have been published, but where the graves are unexcavated or the bones not preserved, one cannot help but wonder about the correctness of this number.

This is where the accuracy index I have developed is particularly useful; this index assigns numbers from 0 (for location unknown) to 5 (coordinates taken by the author), depending on the reliability of location information, thus helping to evaluate the accuracy of the information and subsequent analyses. As many graves have been excavated or destroyed, I could not make observations myself; as a consequence, the orientation and exact aspect at the grave site are usually not very accurate, but elevation, overall placement within the landscape, distance to the nearest river, and location on a steep vs. gentle slope vs. flat ground can usually be ascertained fairly reliably. Nevertheless, given the unevenness of the information, in all cases it is necessary to consult both the outcome of statistical analyses and the actual maps and site descriptions.

Starting from statistical observations, it becomes clear that for all grave sites the slope is considerably less steep, the elevation lower, and the distance to river-courses considerably closer than for non-sites (Tables 5.49-5.50). Only for aspect are the values largely identical, indicating that there was probably no preference in the choice of a northward or southward slope. Nevertheless, there are considerable differences between different grave types. The elevation for megalithic graves is on average about 500 m lower than for the other graves, but this may largely be connected with the regional difference in distribution: megalithic graves are mostly located in the Anning River Valley with its lower elevation and stone-construction graves are mostly found in the mountains, while earth-pit graves occur mostly in the vicinity of stone-construction graves (Figures 5.79-5.80 and 5.84). It is therefore not surprising that the elevation at earth-pit and stone-construction grave sites is very similar to each other, while megalithic graves stand apart; however, the standard deviation for elevation at earth-pit grave sites is considerably higher than for other grave sites, indicating the presence of several different populations within this group.

It is furthermore noteworthy that both slope and distance to the nearest river are considerably greater for stone-construction graves than for other kinds of graves, but that the range in slope is the greatest for megalithic graves. Less than 1/3 of all megalithic graves are located on a noticeable slope, while the majority was built on level ground within the wide river valley of the Anninghe. The majority of megalithic graves in Puge and Xide are located on steep slopes, but some graves in Dechang, Xichang, and Mianning, i.e., in the immediate Anning River Valley, are located on steep slopes as well, and although most graves on steep slopes are on higher elevation, they are not necessarily far away from the river or high up in the mountains.

There is no apparent correlation between geomorphological factors and grave orientation or grave type either, with only one exception; all megalithic graves of Type 4 are located on steep slopes and in the mountains, instead of in the middle of a river valley. It is furthermore remarkable that nearly all of these graves are located on the eastern rim of the distribution of megalithic graves and closer to the area dominated by stone-construction graves, which tend to be located on steep slopes at high elevations. This connection is strengthened by the fact that these small megalithic graves — although consisting of large irregular boulders and located above ground — are not dissimilar from some of the stone-construction graves in Zhaojue, which are likewise built of large boulders, but located below ground and on mountain slopes.

A striking example of this phenomenon Zhaojue Qianjinshe, which is located far away from the Anning River Valley and its megalithic graves; nevertheless eleven megalithic graves and one stone-cist grave have been reported from here. Both kinds of graves are very small (the megalithic graves mostly measure 3-4 x 1-2 x 1-1.3 m, the stone-cist grave 1 x 0.4 m, and one of the megalithic graves in just as small as the stone-cist graves), and the main distinguishing characteristic between stone-construction and megalithic graves at this site is the size and form of the stones used: the stone-construction grave consists of a few stone-slabs forming a cist without bottom, and for the megalithic graves one or several irregular boulders were used to build cover and sides. The latter are thus an intermediate form between stone-construction and megalithic graves, and could be just as fittingly classified as stone-construction graves of Type 3.1 or as megalithic graves of Type 4. Furthermore, they are all sunken into the hill and their classification as megalithic graves is thus questionable. Given their small size and peculiar construction, it is therefore reasonable to reclassify them as stone-construction graves.

Another case that requires further scrutiny is Xide Wadegu, a site with five very large stone-construction graves of Type 1.1 and 1.2. As the site is insufficiently published and the graves are now destroyed, it is difficult to test the original report, which classified them as large stone-construction graves. It is interesting to note, however, that the graves were less than 500 m away from the megalithic grave of Wenjiaba, whose measurements and construction resemble those of Wadegu M1. The classification of the Wadegu graves as below-ground stone-construction graves is therefore likely faulty and should be changed to megalithic graves as well. Nevertheless, some of the megalithic graves of Xide are very special and fairly different from those seen in the immediate Anning River Valley. The graves seen at Xide Lake Sihe, Lanfenba, Liaoniuchang, Guoyuancun, Qingli, and Wuhe, are all small, roughly square in form, consist of one coarse boulder for each side and one for the cover, and are located on flat ground in the middle of a valley. For these reasons they have a very high visibility. The graves of Guluqiao, Wadegu, and Wenjiaba, however, are considerably larger, but located on very steep mountain slopes and oriented perpendicular to the direction of the mountain range. The graves in the valley are oriented to the cardinal directions, but as they are roughly square, it is impossible to tell in which direction exactly they are pointing. In any case, it becomes clear that there are two local groups that in turn will have to be compared to megalithic graves from other areas.

Other megalithic graves remarkable for their location away from the main cluster in the Anning River Valley, are the graves of Puge high up in the mountains in the east, as well as the four graves of Dechang Cizhuiping, the 13 graves at Dechang Guadi, and the group of graves in Miyi. The choice of location for the graves in Puge is very similar throughout: they can be found on the relatively steep mountain slope on the western side of the river valley at an elevation of around 1800 m, which can be considered average for Puge. The form and orientation of the graves differs considerably between and within sites. The two graves at Amucun are relatively small (2.9 x 1.5 m); they consist of large boulders, and they are oriented in southward direction, i.e., at a right angle to the direction of the mountain slope. The grave at Heping, on the other hand, albeit similar in size and construction, is sloping up the mountain. The graves at Xiaoxingchang are oriented perpendicular to the mountain, which is an interesting choice, as it would have made it impossible to slide the large cover stones smoothly onto them. Instead they would have to be lifted, which meant a considerable increase in labor. These larger graves were long and narrow, made of several layers of irregular cobbles for walls, large boulders as cover, and a door on one short side, as well as pebbles on the floor (Type 3.2).

The graves at Wadaluo were similar in dimensions but made of large boulders and not of small stones, and their orientation is unclear. They have not been excavated and are now destroyed, making it impossible to assess their construction. They were probably similar to the graves at Amucun. Xiaoxingchang AM1, AM2, and Heping M1, on the other hand, belonged to a different type. These graves were very small, made of one regular stone slab for each wall and a large boulder as cover, making them somewhat similar to the graves from Xide. Just as in Xide, Puge thus has two different kinds of megalithic graves that might differ in date or function.

The three megalithic grave sites in Miyi, on the other hand, although at a considerable distance from the main site clusters in the middle and upper Anning River Valley, are not very different from what is found there. Belonging to the very common Types 1.3 and 1.2 and being of medium size, they were all found at what in Miyi is an average elevation on level ground on the bottom of the river valley, and all roughly oriented along a North-South axis. The graves in Dechang Cizhuiping and Dechang Guadi are largely identical in construction, measurements, and orientation. Guadi is even located in a similar environment as the graves in Miyi, i.e., a little apart from the main concentration of megalithic graves, but on nearly level ground in a river valley and at moderate elevation. Dechang Cizhuiping M1, on the other hand, is located on a mountain-slope at an elevation of 2600 m and over 8 km distance to the next river. The grave is particularly long and not overly narrow, measuring 10 x 2.6 m, and it slopes up the mountain. Unfortunately, the grave has only been mentioned in passing, and details of construction and content are unknown. Nevertheless, it seems that the grave is only somewhat exceptional in its location but otherwise fairly similar to the majority of known megalithic graves.

For earth-pit graves the distribution is much less unified than it is for the other grave categories. Earth-pit graves occur both in places where stone-construction graves were observed and in areas usually reserved for megalithic graves. Furthermore, earth-pit grave sites are less numerous than sites holding other kinds of graves, probably a product of their limited visibility above ground rather than of their actual scarcity. Indeed, the majority of graves with stone-construction parts are only known through survey, while most known earth-pit graves have been excavated. This needs to be kept in mind when comparing the distribution of different grave types in relation to geographic preconditions.

V. 5.6.2 Situating the Grave within the Landscape: Visibility and Orientation

In spite of the uncertainties described above, it is fairly clear that megalithic graves are largely located on even ground where they are clearly visible from afar; only a small number of graves is located on the foot of the mountain with less clear visibility (Table 5.51 and Figure 5.84, left). Stone-construction graves of which at most a covering stone would have been visible, can mostly be found on mountain slopes; as they are mainly located in narrow river valleys, by mere distance they are just as close to the rivers as the megalithic graves or even closer, but they are high above the watercourses and not in their immediate vicinity. Earth-pit graves occur mostly on slightly elevated platforms, and more rarely on steep hills, in the latter case often right next to stone-construction graves. This co-occurrence of graves with and without stone-installations is particularly common in Huili, Yanyuan, and Yongsheng, where the vast majority of all earth-pit graves and many stone-construction graves were found. The Anning River Valley has some earth-pit graves as well, but they hardly ever occur in Zhaojue.

Zhaojue is characterized by a great variety of graves form; they comprise very particular small-sized graves built of coarse stone slabs, as well as a few graves cut into the mountain-slope and covered by a large boulder, and graves built of worked rectangular stones or rough cobbles building walls somewhat reminiscent of Han brick-graves. All of these types are rare in other regions. They are mostly located on very steep slopes overlooking the river. With very few exceptions, both earth-pit graves and stone-construction graves in Huili, are located at medium or steep slopes as well, giving them a wide view and distance from roads and waterways without making them inaccessible. Given their sometimes large covers, the graves in Zhaojue might still have been visible, while for smaller stone-construction graves located below ground, high visibility was not necessarily given or desired. The visibility of different grave types can relatively easily be judged through a combination of different factors including:

- grave height above surface
- grave size
- size of stones used in construction (if any)
- presence/absence of further outside constructions
- elevation relative to surrounding landscape

A preliminary degree of visibility can be developed based on grave construction:

0. graves completely below ground
1. graves with stone-installations protruding slightly on the surface, possibly due to disturbances
2. graves with large cover stone protruding on the surface, potentially intentional
3. megalithic graves without substantial outside stone-installations, relatively low, made of medium-sized stones
4. megalithic graves with some outside stone-installations, of medium height, made of medium-sized or large stones
5. megalithic graves with substantial outside stone-installations and/or of substantial size and height, made of large stones

When comparing these categories against slope and ease of access from the surrounding landscape (judged by slope, closeness to the mountain, possible obstruction through vegetation), it becomes very clear that the vast majority of earth-pit graves and small stone-construction graves would have had had a very low visibility, while the majority of very large megalithic graves with much additional outside installations were located on flat ground and thus widely visible (Table 5.52). As the landscape has changed considerably even during the last decades, let alone since prehistoric times, this assessment is naturally fairly impressionistic. It is remarkable, however, that even large graves located on mountain slopes at higher elevation are hard to find under present conditions, especially during the summer when the vegetation is particularly lush. Unless these graves were kept free from such overgrowth, they would not have been widely visible. This limited visibility is particular puzzling in the case of the very large graves of Xichang Bahe Baozi that were sloping up steep hills. If they were really as visible and accessible as their size and construction suggest therefore remains questionable.

No clear correlation becomes apparent between specific sub-types of the different grave categories and specific geographic factors such as slope or elevation, except for in the cases discussed above, and even those mirror a regional more than a geomorphological bias. Large megalithic graves of Type 1.1 are very widely distributed throughout the Anning River Valley, but also neighboring areas in Yuexi and Puge, while Type 1.2 and 1.3 occur even more widely, extending to Miyi and Xide. All these graves were very possibly accessed several times and the center of extensive ritual activities. The same is true for the graves of Type 2, which tend to be even larger and consist of a combination of small and large stones. Type 2 graves are rare but regionally not restricted, indicating a chronological difference.

For stone-construction graves there are regional differences as well, Zhaojue harbors a particularly large variety of small and medium-sized graves made of coarse elements never or rarely seen in other regions (e.g., Types 2.2., 2.4, 3.1, 3.2, 5.1, 5.2). Cist-like constructions made of thin or medium-sized slates or other slabs are more widely distributed, but those of finer execution are particularly common in Huili, Luquan, Yanbian, and Yongsheng, i.e., along the border to Yunnan and in northern Yunnan itself. Among earth-pit graves, there are a few regional particularities such as the trapezoidal graves in Huili, rectangular graves with rounded corners at a few sites in Xichang, and oval graves in Yongsheng Duizi, as well as a tendency toward longer graves in Lizhou. Most earth-pit graves are mostly located on even ground but at varying elevations. Only the graves in Puge, Ninglang, and Luquan were all observed on fairly steep slopes, but as flat ground is rare in these areas, this choice is not surprising.

A further factor connected with location choice is the orientation of the grave within the landscape. As mentioned above, the information on grave orientation is problematic in the majority of cases. Nevertheless, I have conducted preliminary statistics on both orientation and aspect at the location of the respective graves (Tables 5.53-5.56). There seems to be no preference for any specific orientation or slope-direction by grave type, but as the assignation of orientation is not very reliable, especially when the skeleton is missing, these results are not final. There is a greater tendency for graves to be oriented along the cardinal directions than at angles, but as the mountain-ridges and rivers are generally North-South aligned, this might reflect an orientation toward geographic markers rather than towards the stars and planets.

Both Pearson's and Spearman' Correlation Coefficient indicate a statistically significant positive correlation between grave orientation and aspect when tested over all graves (Table 5.57). A cross-tabulation of smoothed values for grave orientation and aspect connected with tests of significance show a very strong correlation of a southward grave orientation with southeastern slopes, as well as a general tendency for graves to be aligned in the same direction with or a slight angle of the orientation of the slope. The opposite alignment, i.e., perpendicular to the slope, is less common (Table 5.58). When conducting the same calculations separate by grave type, the picture is somewhat different. For megalithic graves the correlation is rather weak, either because the majority of graves is not located on a significant slope, or because it is usually impossible to ascertain the direction of the head if the grave has not been opened or the bones are missing. For earth-pit graves the correlation is slightly stronger but not as strong as for stone-construction graves, where a general preference for southwestern or southern orientation is coupled with westward slopes, while northern orientation is more commonly associated with northern or southern slopes. For earth-pit graves, a location on southeastern slopes is prevalent, but combined with all possible grave orientations with a certain preference for a southern orientation. To attain a visual impression of what this distribution of grave orientations may mean, I have displayed the graves with arrows indicating their orientation (Figures 5.81-5.83). Given the size of the research area and the considerable number of graves, the picture is unclear when displayed in a paper format, but becomes clearer when zooming in and out in a GIS.

From a comparison of wide-lens and close-up views it becomes clear that megalithic graves located in the river valleys are usually aligned with the river, while megalithic graves located on mountain slopes have a greater tendency to either follow the direction of the slope or be located perpendicular to it. Megalithic graves usually occur single or in small groups of 2-6 graves, while stone-construction and earth-pit graves tend to be grouped in cemeteries that can consist of 10-20 graves such as at Xichang Lizhou, or of several hundred graves as is often seen in Huili or Zhaojue. Especially in Huili, these cemeteries tend to hold both stone-construction and earth-pit graves that are oriented in regular rows following the direction of the mountain slope. For the few stone-construction and earth-pit graves were the original location of the head could be ascertained, it was mostly placed in the direction of the mountain, with the feet and face pointing toward the river. No clear correlation can be seen between specific grave sub-types and orientation, but the potential of a regional bias has to be further investigated (Tables 5.65-5.66). It is apparent that there are close similarities both in the choice of slope aspect and grave orientation between adjacent areas characterized by the same grave types (e.g., Dechang and Xichang, Huili and Zhaojue, Yanyuan and Yongsheng), but overall the picture is inconclusive, indicating that the choice of orientation may depend on the grave type rather than on the location.

V. 5.6.3 Situating the Grave within the Site: Cemeteries and their Structure

Another aspect that needs to be taken into consideration is the relationship of single graves to their neighbors. The 1674 reported graves were distributed over 210 sites, but over 40% of all sites held only one grave (89 sites) and many others consisted of small groups of 2-6 (75 sites), while a number had 10-20 graves (24 sites) and only very few cemeteries consisted of over 20 (8 cemeteries) or even over 100 graves (5 sites) (Table 5.67). Some sites might originally have held several graves that were not observed or destroyed, but as 47 of all reported single graves are large stone constructions, most of them located on even ground in the Anning River Valley, it is unlikely that similar graves in the vicinity would not have been noticed.

V. 5.6.3.1 Megalithic Graves

Although many of the megalithic graves stand alone, most were within 0.1-2 km of a similar grave, making it questionable if they should indeed be seen as single graves or not rather as grave groups, Dechang Hejiashan, Malilang Zhanbei, and Zhangjiaba, for example, are all within about 0.5 km radius of each other, so are many other sites, meaning that in most cases the megalithic grave actually occur in groups of two or three and not alone. Aside from the three graves just mentioned, this applies to Dechang Nahuagong and Shaba, Dechang Huangjiaba and Liangshanpo, Dechang Shaorenba and Ganhai, Dechang Dashipai and Wujia, Dechang Maliang and Zhangjiaba, Xichang Dabaozi and Luzuishan, Xichang Reshuitang West, Shangjiaxiang, Shizuizi, and Xixicun, Xichang Beishan and Zhengjiafen.

The only two megalithic graves located at a considerable distance to all other graves are Dechang Cizhuuiping and Mianning Xiangshi, both of them found at higher elevation and on mountain slopes. All other graves reported as single are earth-pit (13 sites) or stone-construction graves located below ground (29) and could thus have been part of a larger grave group or cemetery that was previously destroyed or has not been fully excavated yet: five of these sites are located in Huili, three in Mianning, one in Xichang , three in Yanbian, one in Yuexi, 14 in Yanyuan, and 15 in Zhaojue. A slight exception are the 15 graves in Zhaojue, as they are all stone-construction graves protruding at the surface; however, they are heavily disturbed and the covering stones of other graves might have been carried away, leaving only a single grave for archaeologists to discover.

Megalithic graves only rarely occur at the same site together with other grave forms, or — given the visual and spatial dominance any megalithic grave would have — other grave forms hardly ever occur at the same site with megalithic graves. The most common exception are sites where a megalithic grave was built later, e.g., Xichang Lizhou, where it is very likely that the builders of the megalithic grave were not aware of the earth-pit grave cemetery below, or the site of Dayangdui, where the successive use of the site for earth-pit graves, offering pits, and finally megalithic grave suggests that the ritual significance of the place remained. As the megalithic graves at Wadaluo have not been excavated and their content can thus not be compared with what was found in the earth-pit graves at the same site, their relationship remains unclear.

A rather different phenomenon is the reuse of megalithic graves at Xichang Beishan Ba for the placement of urn burials of Dali kingdom date (AD 937-1253). Such a deliberate reuse of earlier graves is unparalleled in the research area. It is not uncommon, however, for Han brick graves to occur on the same sites as earlier earth-pit or grave-construction graves, sometimes disturbing or unintentionally covering earlier constructions, sometimes honoring the earlier graves. The co-occurrence of local and Han brick graves is mainly known from Zhaojue where the coarse stone-cover graves would have protruded on the surface and might have been a point of reference for Han burials. Another possible explanation is that the graves were actually built around the same time, the difference in form reflecting either a difference in cultural identity and/or Han cultural influence on local groups. Zhaojue Qianjinshe provides particularly interesting evidence for Han influence on grave structure, witch several graves consisting of walls built of regular stones in a brick-wall like fashion and one grave even integrating Han bricks into the construction.

While evidence for Han influence is common throughout Zhaojue and to a lesser extent Xide, a similar conflation and co-occurrence of very different grave types at the same site is uncommon. The only and very important exception is Yongsheng Duizi at the very edge of the research area, which combines stone-construction graves, earth-pit graves, urn-graves, and possibly even megalithic graves within the same site but in different layers, promising valuable insight into chronological and cultural questions once the material is published. The only kinds of graves that routinely occur within the same sites — most frequently in Huili, sometimes in

Yanyuan and Zhaojue, but never in the Anning River Valley or other areas — are stone-constructions and earth-pit graves, usually occurring next to each other in large cemeteries. It is not uncommon in these regions for earth-pit grave sites to occur very closely to stone-construction grave sites: Huili Xiaotuanshan, Fenjiwan, and Yunshan are located with in a radius of less than 1 km; Huili Hedongtian, Washitian, and Yingpanshan are located at only 1 km distance to each other, albeit on different sides of the river, so are Huili Yingpanshan and Houzidong, and the majority of grave sites in Yanuan. Megalithic and earth-pit graves only rarely occur close to each other; some of the few examples are Xichang Qimugou and Lijiacun, Xichang Maliucun and Yingpanshan, and Puge Wadaluo and Xiaoxingchang, which are less than 1 km apart from each other.

Overall, many grave sites are located in close vicinity to each other; as spatial analysis shows; 85 sites occur within clusters of 2-4 located at less than 1 km distance to each other, 30 of them even less than 500 m apart from other sites. Most of these sites are located in Dechang, where megalithic graves cluster densely along the Anning River, as well as Zhaojue, where the mountain slopes are literally covered in remains of Han-brick and to a lesser extent stone-construction graves. Further clusters of earth-pit and stone-construction graves can be found at the widest point of the alluvial basin of the Chenghe and a more secluded mountain valley in Huili, along the Meiyuhe in Yanyuan, and the megalithic graves within the narrow river valley of the Daduhe in Xide. Although Xichang is very rich in sites, they are slightly more dispersed, but still mostly within 2-5 km of each other. That they appear somewhat more dispersed while the sites in Dechang and Xide are much more closely spaced, has probably geomorphological as well as culture-geographical reasons. The river valleys in Dechang and Xide are simply very narrow with high mountains encroaching very closely onto the flat land, and sites are thus naturally closer to each other than around Xichang, where the Anning River Valley reaches its widest point of about 12 km. Another reason is the greater and earlier urbanization and extensive agricultural usage of the area around Xichang, probably leading to the destruction of many sites. Furthermore, the river has shifted significantly, probably having covered many sites, while in Xide the valleys are so narrow that the rivers cannot shift much. Overall, the amount of level ground is very limited, leading to a natural clustering of sites.

Certain groupings further away from the main river valleys deserve special attention, such as Huili Miaozi Laobao and Guojiabao being located apart from all other sites, or the megalithic graves in the not easily accessible areas of Puge and Xide. Just as sites used over long periods for ritual activities such as Dayangdui, these places may have been of cultural importance to certain groups of people. In any case, we need to keep in mind that sites located particularly close to each other such as Zhaojue Fuchengqu and Muerguo or Yanyuan Jiaodingshan and Yanyuan Gesa might not be two cemeteries but one, albeit discovered at different times. Especially in the case of Zhaojue and Yanyuan, where the graves are so densely spaced and often protrude on the surface, it is very likely that graves were at various closely adjacent sites were built in reference to each other. The same applies to the megalithic graves, which in most cases could hardly have been overlooked and were probably used over longer periods of time. The sites can therefore often not be seen as separate entities but only separate points of observations to be drawn together in analysis.

Considering these relationships, it is remarkable that there seems to be no unified principle guiding the orientation of megalithic graves toward each other, neither between adjacent sites nor within the same site. Only the graves in Mianning are all facing in the same direction, so are all graves in the previously very large megalithic grave cemetery of Dechang

Wangsuo and most of the graves in the two adjacent grave groups of Dechang Xiaoliusuo and Xiaomiaoshan. The majority of adjacent graves in the Xichang area likewise have a similar orientation (Fig 5.86), but many do not, while in Xide opposite orientations between adjacent cemeteries or graves are common, even tough they are often only 7-20 m apart from each other. Nevertheless, the graves in Xide were roughly arranged in one row, setting them into spatial correspondence with each other, even if the orientation differed. The graves at Xide Lake Sihe are particularly remarkable as two of them were stretched out exactly perpendicular to five of the others, but had their door on the long-side, meaning that the direction of approach might have been the same for all of them (Figure 5.87). One other grave at the site does not fit this pattern and is furthermore much longer, indicating a different date or function.

Given that most megalithic graves were located close to one or several others, they are in a direct spatial relationship to each other, referencing each other by mere proximity. It is likely that several of them were incorporated in the same ritual and that rules of procession or individual points of reference determined the decision for a specific orientation of the graves to each other and the landscape. Given that both orientation and door placement for the majority of megalithic graves are unknown and the original monuments have often been destroyed, it is currently not possible to answer these questions conclusively, but it is important to keep in mind that the graves were built in reference to each other, creating a ritual landscape, but one very hard to read. It is furthermore remarkable that at most sites the graves tend to be similar in form and type, indicating that they were built by the same group, possibly even within a relatively short time frame. Especially remarkable in this context are five graves at Dechang Arong, one of them small, the others very large complex constructions of different types, but all of them oriented in the same direction and at 13-60 m distance of each other. Given their size, it is unlikely that they were built over a short period of time, and the content suggests that they were used over long periods, but it is impossible to suggest a time-frame. The uncertainty both of relative and absolute dates for the cultural developments in the research area make it very difficult to evaluate the relationship of these different monuments of each other, the overlap in time for their construction and usage, and thus their relationship to each other.

V. 5.6.3.2 Earth-Pit Graves and Stone-Construction Graves

For the small earth-pit and stone-construction graves, which had a significantly shorter use-life, were easier to build, and left a less significant impression on the landscape, the case is less complicated. The majority of stone-construction graves are arranged in large cemeteries consisting of dozens or sometimes hundreds of graves aligned in more or less neat lines following the orientation of the hill slope. The spacing of the graves can be very dense with hardly a meter between the graves as seen at Yanyuan Laolongtou, Huili Fenjiwan, and many sites in Zhaojue, or 3-4 m as at the majority of other sites. The actual arrangement of the graves differs somewhat from site to site, but there is a general tendency for the graves in Zhaojue to be aligned in a single-file row sloping up the mountain or in parallel rows on plateaus or hill-tops, showing deliberate orientation, planning, and the probable presence of grave markings above the ground preventing disturbance of earlier graves (Figure 5.88).

In some cases clearly separate grave groups can be identified, such as at Zhaojue Pusu Bohuang/Eba Buji (two closely adjacent sites), where tombs of different construction and probably different date are located on different parts of a single hill; nine round grave mounds of late Han or even later date are scattered on the hill-top (PM19-27), so are five cliff-tombs cut into the bedrock (PM13-17), while four small stone-construction graves of Type 2.3 and 2.4 are clustered at one end of the hill-top (PM1-4) and one large stone-construction grave (PM18, Type 1.1) is located on the other; a row of seven more stone-construction graves of Type 2.4 (PM5-12) slopes up the hill, and four more stone-construction graves — three likewise of Type 2 and one of the rare small-oval form with a large stone boulder as cover (Type 5.2) — scattered in no clear order on a neighboring hill (Figure 5.89). As most of the graves are destroyed and the others largely empty, it is difficult to ascertain the exact chronological and cultural relationship between them, but it seems likely that they were built for members of different cultural or social groups or of successive generations using the same sacred space for burial. Similar arrangements with Han brick tombs and stone-construction graves (some of the similar other of different types, but mainly Type 2.2. and 2.4) sharing the same hills and mostly facing the river, can be seen throughout all of Zhaojue, indicating a diverse pattern of different communities using the same sacred places together and throughout long periods, largely honoring previous grave markings.

The large grave sites in Huili and Luquan are somewhat different in nature. Even though the graves largely follow the slope of the hill as well and are densely spaced, largely without disturbing each other, their alignment appears less orderly. Furthermore, the graves at these sites tend to be considerably more homogenous. Although slightly separate groups can be identified, at least by grave size and structure there are no remarkable differences. Earth-pit and stone-construction graves as well as earth-pit graves with limited amount of stone installations appear side by side, they are otherwise very similar in form, size, and content, indicating a single burying group and temporal continuity (Figures 5.90-5.92). This preliminary impression will have to be tested through comparative analysis of the burial objects in a later part of this chapter (V.6). In Yanyuan, Ninglang, and Yongsheng, graves with various amounts or no stone installations occur side to side as well, mostly aligned in the same direction, but as the only cemetery plan published to date is a very fragmentary view of the site of Yanyuan Laolongtou (Figure 5.93), it is unclear how orderly the graves were usually arranged.

In the Anning River Valley, earth-pit graves are limited to a small number of sites, namely the single grave of Ma'anshan, two graves at Yingpanshan, and three graves each at Qimugou and Yangjiashan, as well as the nine graves at Dayangdui, and 21 at Lizhou (Figures 5.94-5.96). As explained above, these graves are all rather different in form and alignment. As the excavation area in Qimugou is relatively small, it is unclear how large the cemetery originally was, but the three graves cut by the excavation pits are oriented perpendicular to each other, though similar in form; they furthermore disturb earlier cultural layers, either not being aware of them or choosing to ignore their presence. At Dayangdui, on the other hand, the earth-pit graves are in the earliest cultural layer, with object pits and megalithic graves in layers above that nevertheless do not disturb the earlier features. The graves are all roughly oriented in the same direction, but they do not build regular rows. M1 even cuts M4, disturbing nearly half of the earlier grave, be it intentionally or unintentionally due to a lack of above-ground burial markers. All graves are similar in form and size (rectangular with rounded corners, of 1.5-2 m length) except for M3, which is particularly long. Interestingly, the later object and soil-pits are oriented either in the same direction as the graves or perpendicular to them, and even the later megalithic graves have the same orientation as the early graves, showing that there might be a common focus point. The site is located on a slope and the graves are described as facing East, which is the direction of the river. Given that the bones are missing, the graves might just as well be facing West, i.e., the opposite direction, but it is likely that a geographic point of reference (either river or mountain) was the reason for the orientation of all features at the site.

The site of Lizhou is not completely clear in its organization. All graves are similar in form (long-narrow with rounded corners) but they differ considerably in size. One of the earliest graves, M4, is particularly long and cut by two shorter ones (M3 and M5), one of which is again cut by another grave (M2) whose length could not be ascertained. While M2 is oriented along a NE-SW axis, the other graves just mentioned point toward the North, so do a number of other shorter or longer graves, but some are oriented toward the East, and later Han graves at the same site (all of them rectangular or nearly square) are arranged in regular North-South rows. Given the general similarity in orientation, form, and even content, the seeming lack of cemetery organization and the disturbance of earlier graves is puzzling, and might be a deliberate act rather than an accident. As the plans of Lizhou are incomplete and the site insufficiently excavated, the case remains uncertain, however, further insight can be gained by considering evidence for burial mode, ritual acts, and object assemblages, which I will discuss in the next section.

V.6 Using the Grave: Interment Practices and other Rituals

V.6.1 Inferences Based on Human Remains: Interment Types, Body Treatment, and Physical Condition

Preservation conditions are very poor in most parts of the research area, but for 138 graves bone remains have been recorded. Most of them are in an advance stage of deterioration. In many cases, the actual number of skeletons is unclear; in my analysis, I am therefore using the minimal number suggested by the excavators. Cases in which it is unclear whether there were one or several skeletons have to be omitted from the analysis, leaving a reduced sample of 134 graves. For graves were skeleton numbers are provided, it is possible to distinguish between single, double, and multiple burials. For multiple burials, the number of skeletons varies widely from 3 to over 125 skeletons, indicating a further subdivision. There are two natural breaks allowing to divide the material into small-group burials (3-6 skeletons), large group-burials (9-20 skeletons), and mass interments (48-125 skeletons) (Table 5.68, left). There is considerable variety in interment forms: in addition to the expected three categories of primary burial, secondary burial, and cremation, mixed forms of primary and secondary burial, as well as instances of inhumation and cremation within the same grave can be observed (Table 5.68, right).

The category of secondary burials is somewhat problematic, mainly for graves with a large number of interments. In the case of megalithic graves, it has generally been assumed that they contained "secondary disorderly interments" (*erci luanzang* 二次乱葬), an assumption that is not necessarily permissible, as cases to the contrary show. Grave M1 at Mianning Sankuaishi, for example, contained 17 relatively well-preserved skeletons, which were all reported as extended supine primary burials that had been wrapped in cloths and piled on top of each other. With less favorable preservation conditions, such an arrangement would have resulted in the bones of several individuals appearing scattered throughout the grave. In the case of Xichang Xijiao Gongshe M1, which held 123 skeletons, the excavators suggested a burial practice of many instances of primary interments, with the bones of previous interments being pushed to the side to make space for the new bodies, thus ending up in disjointed layers towards the rear-end of the grave. This would explain observations reported from Xichang Bahe Baozi M1, Miyi Wanqiu M1 and M2, and Puge Xiaoxingchang AM1, where most bones were piled up in the rear while some bones were scattered throughout the rest of the grave. Not always were the corpses of previous interments arranged in such a careful manner, as is suggested by the human bones and objects crushed under the stones of the door of some graves (i.e., Xide Lake Sihe M1, M5, M6, M7, and M8, and from Bahe Baozi M4, M5, and M6).

In other cases, the bones were carefully sorted and neatly stacked in different parts of the grave. For instance, in grave M3 at Zhaojue Chike Boxixian long-bones were piled along the sides of the grave; in Xichang Dayangdui DM1 the skulls were positioned in the West and the long-bones neatly aligned in the middle; at Zhaojue Wazhaishan M4 three skull fragments were arranged on a stone, and long-bones were placed parallel to each other in the middle and at the rear; and at Zhaojue Qianjinshe M9 long-bones were stacked in the rear. In these cases, as well as at Zhaojue Pusu Bohuang M9, where three skulls and several long-bones were arranged in one pile, it seems likely we are seeing the remains of secondary interments of selected bones. For many of the other multiple burials labeled as secondary interments, however, it seems more likely that they are actually multiple instances of primary burial, sometimes combined with ritual activities that led to a disarray of the bones. The case is particularly clear in graves in which much of the personal ornaments and weapons were found in between or right next to the bones, with earrings next to the head and bracelets on the arms, which would be highly unlikely in the case of secondary burials (reported from Mianning Sankuaishi M1, Xichang Xijiao Gongshe M1, Puge Xiaoxingchang AM 1AM2, BM1, BM2, and BM4, Miyi Wanqiu M1, Xide Lake Sihe M1, and Xide Guluqiao M1). I therefore re-classify these graves as "disarranged primary burials."

Other noteworthy interment practices are extended supine burials of complete skeletons whose heads have been placed in the stomach area. This is seen at Luquan Yingpanbao M4, and Huili Xiaoyingpan M13 and M16; in grave M14 at the latter site the skull was completely missing. As the bones are otherwise not disarticulated and small bones such as fingers and toes are largely present, these are instances of primary interment with a particular body treatment, i.e., the detachment of the head, resulting in a changed skeleton position.

Cremated bones are usually held in ceramic vessels; only in two cases was a cremated skeleton placed directly into a grave previously used for multiple primary inhumations,[46] while in Xichang Dayangdui DM2 a single uncalcinated bone was placed into a ceramic vessel. Another singular occurrence is the cinnabar applied to a set of teeth placed on the second-level ledge at Yanyuan Laolongtou M4. Something described as carmine-red soil (*yanzhitu* 胭脂土) by the excavators was observed either on the head and chest of two human skeletons in Laolongtou M6 and around animal bones in the same grave as well as in Laolongtou M11. The excavation report distinguishes between these occurrences without specifying whether cinnabar and carmine-red soil are actually substantially different. In both cases, the red color probably had a ritual function rather than a beautifying one.

There are therefore six different interment types, five different kinds of skeleton positions, and six types of additional body treatments (Figure 5.97, Table 5.69). When compiling a correlation table for interment types and skeleton positions, it becomes clear that single burials are usually primary interments or cremations, and more rarely secondary burials; double interments are usually primary or a combination of primary and secondary, and burials of larger numbers of people are generally primary disarranged or secondary, sometimes combined with cremation (Table 5.70). All primary interments are extended supine burials, and nearly all extended supine burials are primary with only one case of combined primary and secondary interment and one case of primary disarranged bodies, i.e., the grave where the bodies had originally had been wrapped in cloth (Table 5.71). Cremation ash was usually placed in urns except in those graves were inhumations and cremations were combined, and in one exceptional case an uncalcinated human long-bone was placed in an urn. The various forms of irregular

[46] Xichang Xijiao Gongshe M1 and Puge Xiaoxingchang AM1 (both primary disarranged and cremation) and Yanyuan Laolongtou M9 (primary or secondary and cremation).

placement, piling, or stacking of the bones were primary disarranged or secondary burials, in two cases combined with a single cremation. Extended supine burials are usually single or double burials, but they do also occur with interments of large groups of people, and are overall the dominant form of body position (Table 5.72). Irregular placement or piling of bones was mostly observed with the interment of larger groups. Various types of body treatment were very rare and generally connected with primary disarranged or secondary interments, except for the detachment of the skull, which took place in the case of five primary interments.

Considering these patterns from the behavioral point of view, the decision between single, double, multiple, group, and mass interment can occur before or after the decision on a specific interment type, while the skeleton position is either decided later or predetermined by the gender or status of the deceases. Special body treatment can occur at various stages of this process. These decisions can be displayed in tree-diagrams that reveal various patterns of behavior and their relative frequency (Figures 5.98-5.99). On these diagrams, a few special cases stand out. One is the only secondary burial in an urn that does not have any marks of burning. This phenomenon was reported from Xichang Dayangdui DM2, a small megalithic grave of Type 3.1. An urn containing the single long-bone was placed in the middle of the grave but very close to two other vessels of similar form without any human remains. The report does not specify whether there were burning marks. It might therefore be an exceptional deposit or just a case of poor preservation and/or insufficiently observation or reporting. The other single interment placed in an irregular fashion was observed at the unpublished site of Yongsheng Duizi (M10) and might be a secondary interment or a case of bad preservation or deficient reporting. Another special case is the only primary extended supine burial in the category of multiple burials, which contained four skeletons in Yanyuan Laolongtou M6, a fairly large grave marked as special by a complex set of installations, objects, and ritual practices. All other multiple interments follow similar patterns as the interments of large groups of people and mass-interments, which can be seen as one group, the primary burial of four skeletons in Laolongtou M4 can be re-grouped with the double-burials into small-group interments.

Other problematic cases are interments combined with cremation; twice a cremation was combined with primary disarranged interments of ten and 123 individuals respectively in graves most likely reopened; once a cremation occurred together with three inhumations, which might have been primary or secondary interments, but had been placed in a grave that had certainly not been reopened. This single grave, Yanyuan Laolongtou M9, therefore needs to be grouped together with small-group interments. A whole category that needs regrouping are the graves containing several skeletons. They reveal patterns similar to the large-group interments and can therefore be placed in that category. This results in three behavioral groups (Figure 5.100):

1. single interments without re-opening;
2. small-group interments probably without a reopening of the grave, burying all the corpses at the same time either as primary or primary and secondary interments; and
3. interments of large groups of people probably in several instances of burial requiring a re-opening of the grave or secondary burial.

Another type of inference that can be made on the basis of the bones retrieved from the graves is the life history of the buried individual. Due to the unfavorable preservation conditions and the lack of bone analyses, information on age, sex, and other physical characteristics is too rare and unsure to be useful in statistical analyses. The body height has been reported for 23 graves, nearly all of them single primary interments, except for Yanyuan Laolongtou M6 which held primary interments of four individuals reported as measuring 1.63-1.8 m in height. From 11 of the other graves, body heights of 1.3-1.5 m were reported; eight skeletons measured 1.55-1.6 m in height; one individual was as tall as 1.7 m and another even 1.9 m. These very tall individuals had occupied M4 and M11 at Laolongtou, a cemetery whose occupants seem to have been significantly taller than those from Huili Xiaoyingpan, where the average amounted to only 1.55 m. With data from only two cemeteries as comparanda, drawing general conclusions would be very dangerous. Adventurous suggestions would point to differences in nutrition either related to differences in local subsistence or individual wealth, or even differences in population origin. At this point, such ideas can neither be proven nor disproven, but they show how important a complete analysis of all human remains discovered in graves in the Liangshan region area is.

Age and sex have been mainly assigned to the human remains found in graves holding large-group interments as well as the cremation burials. All 18 cremation burials in urns are child burials, while for most of the 15 group-burials with information on age both male and female and mostly adult and senile skeletons were reported; only in two cases have juvenile skeletons been identified in these groups, while infants never occur (the two graves with juvenile skeletons are Xichang Bahe Baozi M1 and Xichang Hexi Gongshe M1). This suggests that not all parts of the population were interred in these large megalithic graves, but that they were reserved for older individuals. The assumption that infants were usually cremated and buried in urns is more problematic, as all the urn burials with calcinated remains of infants are from the single and unpublished site of Yongsheng Duizi in Yunnan at the very border of the research area. The probable age of the individual whose bones were found in the urns at Mianning Xiaogoudi is unknown, while oval pits with vessels usually referred to as burial urns had to be excluded from the number of graves as no bones or ash were reported from them. It is noteworthy that cremations were not limited to urn burials but that they could be deposited next to multiple inhumations without being contained in a vessel. As these calcinated human bones were found together with burned objects, ash, and in one case also with red-burned earth indicating they might have been burned inside the grave, this phenomenon requires further consideration in connection with burial rituals beyond the placement of the body.

V.6.2 Traces of Ritual Acts

A ritual is generally defined as a "religious or solemn ceremony consisting of a series of actions performed according to a prescribed order" as dictated by a tradition or community (Oxford Dictionaries 2010 [2012]). The term “burial ritual” is often used interchangeably with “burial custom,” “mortuary practices,” "funerary ritual,” and “burial rites” (Sprague 2005:2-4). These terms are very general and comprehensive, including all actions related to the “disposal of the dead,” as Sprague has called it. I am therefore using the term ritual acts/actions to refer to activities in connection with the burial and/or the grave aside from the grave construction or the treatment/placement of the dead. Such acts can take place before, during, or after the actual interment, and they are only partially traceable in the archaeological record. Visible traces are remains of food and animal offerings, fire treatment of bones and/or objects within the grave, offerings in the vicinity deposited either as *Nachgaben* in connection with the funeral or during later rituals, and finally traces of a re-opening of the grave and/or re-arrangement of the bones, either for later instances of interment within the same grave or for rituals connected with previous interments, e.g., on holy days or anniversaries, or memorial services.

There is a certain overlap between the interment of animal bones and food offerings, as animals might have served as food offerings. The part of the animal interred provide indicators as to the nature of the deposit. Horse remains have been reported from four graves in Yanyuan. They usually consist of the head, sometimes accompanied by long-bones indicating a special ritual meaning rather than a food offering (horse bones have been reported from Yanyuan

Laolongtou M4, M6, and M9, and Yanyuan Maojiaba M2). Other animal bones are equally rare and have mostly been observed in Yanyuan as well. Yanyuan Laolongtou M7 contained unidentified animal bones, oyster shells, and ten sheep shoulder blades, one of them clacinated, indicating ritual modification. All animal bones at Laolongtou M9 showed burn marks; they included a pig skeleton, selected chicken bones, antlers (i.e., an inedible and therefore symbolic part of the deer) and other bones. Bones of an unknown species were found in M6 at the same site, and animal teeth have been reported from Zhaojue Fuchengqu M3. In the latter grave the teeth were placed in the lower tier of a two-tier stone-coffin, which the excavators interpreted as symbolizing a house, the lower story housing the animals, the upper story providing space for the humans (Liangshan Yizu 1977a), a not unlikely but hardly provable supposition.

Given the poor preservation of bones in general, the absence of animal bone remains from other graves is not necessarily conclusive; only for graves where human bones were preserved can we assume that at least the bones of medium- to large-size animals would have been reported. Of the 137 excavated graves with human bone remains only four held animal bones, indicating that the practice of animal or meat offerings including bones was not very common. Non-meat food has been observed in only two graves: a pile of calcinated rice husks in Xichang Bahe Baozi M1, and two eggs in Yongsheng Duizi M49. Food offerings could also have been contained in vessels, but as no residue analyses have been conducted on any of the ceramic objects from graves, this question must remain unanswered.

Traces from ritual acts inside the graves include various traces of fire (burned earth, ash, charcoal, burn and scorch-marks on objects, bones, and/or stone installations), and the arrangement of small stone slabs on or around bones or objects. Ash remains have been reported from 54 graves, in 27 cases as part of a cremation, which had taken place outside the graves, while the others are instances of burning of objects, wood, or other substances. In the 14 cases where red-burned earth is present, we can be certain that a fire was lit inside the grave (Miyi Wanqiu M2, Puge Xiaoxingchang M1, Luquan Yingpanbao M1, M2, M3, M4, M7, and M8, Xichang Bahe Baozi M1, Xichang Yingpanshan M1 and M2, Xichang Wanao M1, and Dechang Arong M1 and M4). The stone frame in the southwest corner of Yanyuan Laolongtou M9 speaks clearly of rituals conducted inside the grave. The frame enclosed fragments of a human skull, stones, animal bones, ceramics and bronze objects, all of them carrying burn marks. Ash concentrations without bones were observed in Yanyuan Laolongtou M7 and Miyi Wanqiu M1 and M2. The graves from Miyi Wanqiu additionally contained wood fragments that might have belonged to wooden boards lining the bottom of the grave or stretchers used for transporting the dead. In Xichang Bahe Baozi M1, small irregular stones were placed between the bones and on top of three skulls; next to one of the skeletons, there was furthermore a mixture of burned black soil and calcinated rice husks, which might be the remains of a ritual offering inside the grave.

Ash and scorch-marks on objects were in most cases connected with calcinated bones, wood, red-burned soil, and in the case of Xichang Wanao M2 even bronze slag, indicating burning inside the grave. From Xichang Xijiao Gongshe M1 carbonized bones, objects, and traces of ash were reported; the ash was distributed throughout the whole grave and some parts of the stone-construction were positively scorched. The excavators have therefore suggested that these traces were scorch marks left by torches and other light sources that people brought with them when entering the tomb (Liangshan Yizu 1983b: 148). A number of graves show various indicators of re-entering; these include the presence of several distinct layers of grave filling and interments, the crushing of bones beneath objects, and the crushing of bones and/or objects by the closing stones of the door.[47] Nevertheless, it remains questionable whether the re-opening of a grave always indicates complete re-entering, especially as the height of some graves was below 1.40 m, making re-entering cumbersome. Especially in the case of long-narrow graves, accessing the rear-part would have been particularly hard, considering that the grave would have been filled with objects and at least bones if not bodies in different stages of decay. For graves with clear traces of re-opening, we can therefore imagine different scenarios of grave usage:

1. a) building the grave → first primary interment and rituals → placing cove stone →
   OR
   b) building of the grave → placing of cover stone but entrance remains open → first primary interments and rituals → closing door →
   OR
   c) building the grave → first secondary interment and rituals → placing covering-stone
   OR
   d) building of the grave → placing of cover stone but entrance free → first secondary interments and rituals → closing door →
2. a) |: later re-opening of door on the side or front → complete entering → re-arranging of previously interred bodies, making space for new interments → new primary or secondary interments and/or rituals → re-closing of door :|[48]
   OR
   b) |: later re-opening of door on the side or front → partial entering → pushing previously interred bodies to the rear → new primary or secondary interments and/or rituals → re-closing of door:|
   OR
   c) |: later re-opening of door on the side or front → no entering → pushing previously interred bodies to the rear → new primary or secondary interments and/or offerings → pushing related bones and objects inside →re-closing of door:|
3. → final closing

Which scenario might be applicable to a given case can best be ascertained by considering:

1. *accessibility* (grave height, length, and width; presence/absence of a clearly identifiable doorway, size of door closing stones at door, percentage of grave above ground, presence/ absence of stairs);

[47] Clear signs of a re-opening of the grave were observed for 26 graves, and in five more cases it seems likely, for 36 of the excavated and 250 of the unexcavated graves it is not unlikely but unsure if they were re-opened, and for the remaining excavated 376 and unexcavated 367 graves, it is highly unlikely that they have been re-opened.

[48] Borrowed from music notation conventions, |: :| indicates the repetition of the section in between for an unknown number of times.

2. *content and internal organization* (bones or objects crushed under door, presence / absence of layers and their nature, objects and / or bones overlaying or crushing each other); and
3. *bone findings* (interment type, skeleton position, number of skeletons, traces of rearrangement of the bones).

While the third set of factors can only be applied to the small number of graves where human bones were preserved and recorded in greater detail, the second set is available for the larger number of excavated graves, and the first set can be applied to all graves reported in sufficient details. This allows for calculating various degrees of likelihood for the reopening of the grave.

When assigning value points to each factor and ranking all burials by number of points, the results are inconclusive for many graves. This is due to two main issues: the unevenness of degree of excavation, preservation conditions, and reliability and extensiveness of the information published on the one hand, and the arbitrary assigning of values to different factors on the other. Part of the problem can be met by analyzing excavated and unexcavated graves separately and distinguishing between graves with and without human bones; additionally, I am weighing the variables according to their indicative power.[49] The theoretical maximum number of points is 21 for excavated graves, while 17 is the maximum achieved by any of the graves reported so far; for excavated graves without human bones the numbers are 15 and 10, and for unexcavated graves they are 9 and 7. The results are rated according to the following scale:

Probability	**With bones**	**Without bones**	**Unexcavated**
High	12-17	7-10	5-7
Medium	6-11	6-4	3-4
Low	1-5	1-3	1-2
None	0	0	0

After this purely mechanical exercise of assigning scores to graves, I have tested the result against the parameter of preservation condition, which can distort the picture considerably.

[49] Important factors receiving the value 2 are number of skeletons, signs of rearrangement of bones, bones or objects crushed under the door, several clearly identifiable layers containing bones and objects, and existence of a door.

Furthermore, I have re-read all reports carefully, checking for indicators for a re-opening that might be decisive, such as a rearrangement of the bones or the crushing of bones or objects under the door. A grave's location relative to the surface is crucial as well: graves located completely below ground could not have been re-opened without disturbing and altering the grave form substantially, which would have been noted in the excavation report.[50]

With these different adjustments and controls, the estimate for most graves can be confirmed, but some graves have to be re-classified.[51] For about 1/3 of the graves, there is a high or medium likelihood of reopening, while for the remaining 2/3 of the graves the likelihood is low or none (Table 5.73). For the 31 graves that have likely been reopened or where the case is unclear, the object assemblage has to be treated with particular care, as it cannot be assumed that all objects entered the grave at the same time. In those cases, the grave cannot be treated as a "sealed deposit" or "closed find" in the sense of Montelius.[52] Where possible, I therefore split these assemblages by layers and/or location within the grave and investigate them separately.[53]

A further indicator for rituals conducted after the first interment or at least outside of the actual grave, are object pits or other kinds of deposits located in the vicinity of a grave. For example, on the eastern side of Tianwangshan M10 nine ceramic vessels were deposited. Further southeast but within the tumulus, a stone-frame consisting of 11 thin slabs for walls and bottom was observed; inside were placed four ceramic vessels, while the grave itself did not contain any

[50] Size could be an indicator, as burials of many bodies need more space, however, there are many examples to the contrary, e.g., the large graves at Yanyuan Laolongtou containing a maximum of only four skeletons, or the small grave BM1 at Puge Xiaoxingchang (1.05 x 1 x 0.9 m) with its 82 skeletons. Therefore, size was not considered.

[51] Xichang Tianwangshan M10, and Zhaojue Qianjinshe M6 and M7 have to be placed into a new category labeled "unclear," mainly because of poor preservation conditions; a considerable number can be moved into a higher category, and Zhaojue Watuo M1 has to be moved into a lower category.

[52] „Ein [geschlossener] Fund … kann als Summe von denjenigen Gegenständen bezeichnet werden, welche unter solchen Verhältnissen gefunden worden sind, dass sie als ganz gleichzeitig niedergelegt betrachtet werden müssen." (Montelius 1903:3).

[53] Layers and their content have been distinguished for Dechang Arong M1, M3, M4, Xichang Dayangdui DM1, Xichang Hexi Gongshe M2, M3, Xichang Wanao M1, M2, Xichang Xijiao Gongshe M1, Xide Guluqiao M1.

objects. The vessels are many stout jar-types with outward-flaring rims, four of them placed in the stone frame, three erect and the fourth lying on a small stone-slate; the other six vessels were deposited on the east of the grave, three of them jars and three vases. All of the objects were complete and not intentionally destroyed or damage. The overall placement suggests that the objects in the stone frame might have been or contained offerings to the dead conducted after the closing of the grave but before building the tumulus, while the other objects were deposited at an unknown point after the finishing of the tumulus, but without placing them in a separate pit.

Object pits were discovered in the vicinity of other megalithic graves, one at Xichang Maliucun, two at Xichang Dayangdui. The former was located in the vicinity of four megalithic graves and has been interpreted as offering-pit related to the graves, especially as the pit was very close to the graves and contained complete vessels resembling objects otherwise only known from megalithic graves. Also at Xichang Dayangdui two such pits have been found in close vicinity to two megalithic graves DM1 and DM2 (exact distance has not been reported). The ceramics in the pits were very similar to those in the graves and also they were complete vessels neatly arranged. It is therefore reasonable to suggest that these pits were offering-pits connected with the megalithic graves. Liu Hong has suggested that they may have been created in connection with the re-opening of the grave (Liu Hong 2009:91f.), but in that case it would be more likely for the objects to have been placed into the grave itself. I would therefore suggest that these objects had either been used in the funerary ritual or during later rituals connected with the grave, and therefore had to be deposed of but were not meant to enter the grave, i.e., they were *Nachgaben*, not *Beigaben*. As the vessels were largely intact and had not been ritually destroyed, it is also possible that they were meant as gifts for the deceased to be used in the afterlife. They may have contained food provisions, but as no residue-analysis has been conducted, it is not possible to test this hypothesis.

The question remains why such object-pits have only been reported from two sites, and traces of additional offerings have only been at Tianwangshan. Liu Hong (2009:92) suggests that the reason is simply that the ground around the other graves has never been systematically surveyed. The pits at Dayangdui were only discovered because it had first been classified as a settlement site that was therefore extensively excavated, and at Maliucun the pit was found by accident by local peasants while the megalithic graves remain untouched. With such large graves built in a community effort and usually holding a considerable number of skeletons interred over a long time-span, it is reasonable to assume that further rituals were conducted around them, rituals which might have left traces to be explored in future systematic surveys and excavations.

V.6.3 Making Connections: Grave Form, Ritual Acts, and Location Choice

Throughout the description of interment types, body treatment, and various rituals reflected in the grave, it has already become clear that the megalithic graves in the Anning River valley were mostly used for the interment of many people with several instances of re-opening, possibly over a longer period of time. A noteworthy exception are Xichang Dayangdui DM1 and DM2, which both are of the small Type 3.1, were probably not re-opened, and very likely contained only a small group of interments, in the case of DM1 six irregular placed potentially secondary interments, in the case of DM2 a single bone in an urn, either a secondary interment or a cremation burial. All other megalithic graves containing only a small number of skeletons had clearly been re-accessed but contained primary interments that had been disarticulated during subsequent re-usage of the grave. There is thus a clear difference in interment practice between

Dayangdui and megalithic graves at other sites, which could denote a difference in date. Graves of similar construction and small size have furthermore been observed at Puge Xiaoxingchang AM1 and AM2, and Xichang Tianwangshang M10. For Tianwangshan it is unclear if the grave had been re-opened, but there were object deposits in the vicinity, indicating ritual activities around the grave. The graves at Puge held only a small number of skeletons, but the graves had clearly been re-opened. It is furthermore interesting to note that this type of graves is somewhat similar in construction to the small graves at Zhaojue Qianjinshe, which could be either addressed as megalithic or stone-construction graves. The interment practice and number of skeletons at Qianjinshe is unclear and the lack of object makes it impossible to date them properly, but the use of Han tiles in the walls of M6 indicate a late date while Tianwangshan is associated with relatively early ceramic forms. This serves to show that an outward similarity in grave construction does not automatically show closeness in date or associated rituals.

Overall, the evidence suggests that Xichang Dayangdui DM1 and DM2 belong to a different kind and possibly earlier phase of megalithic graves that were used for secondary burials without re-accessing of the tomb. Tianwangshang M10 might belong to the same tradition, but there was clear evidence of rituals outside the grave. Puge Xiaoxingchang AM1 and AM2 likely mirror a different and possibly slightly later custom that involved re-accessing and reuse of the same grave, but involving the interment of a small number of people, while the other graves at the same site were the center of successive burials and rituals, involving the primary interment of mostly over 100 people probably over a long period of time. Their small size suggests that they had originally not necessarily been meant to house such a large number of bodies but became the center of burial rites for several successive generations. A similar development can be seen at Xichang Bahe Baozi, were all the graves are of small size, some containing only a few skeletons, others 50-100. At most other sites in Xichang and all sites in Dechang, large graves prevail, indicating that they were planned to be used for a large number of interments and/or extensive rituals requiring such a large size. If this indeed a chronological development, megalithic graves might at that point have developed into central places of congregation and markers of communal identity and possibly even territory, as it is generally suggested for megalithic graves in Europe (Beinhauer 1999, Midgley 2008, Furholt 2011). The very small graves at Xide Wuhe with their particular form and arrangement would then belong to the earlier phase, while at Xide Lake Sihe with its small to medium-sized graves with about 10-15 interments each we would see a intermediate phase, and Xide Guluqiao and Wadegu with their large graves might be the outcome of a later development. Another possible explanation in the difference of grave sizes at the same size as well as the occurrence of several megalithic graves next to each other would be that several subgroups of the same population were buried separately. This hypothesis will be tested below by comparing the object assemblages.

All of the simultaneous multiple burials occur in stone-construction graves or graves with at least some amount of stone-installation in Yanyuan, Yongsheng, and Zhaojue, however, there is some difference between the graves in these different regions. The graves in Zhaojue are all characterized by secondary interments with a stacking of the bones in the rear part of the grave, in the case of Wazhaishan M4 even with a separation by bone type showing clearly secondary burials of bodies that had previously decomposed elsewhere. The same phenomenon was observed at Xichang Dayangdui, while in all other megalithic graves the bones of previous interments were piled in the back in an unorderly fashion or simply pushed to the side to make room for further interments. Some form of piling only took place in graves of a considerable size with large numbers of interments that show also other signs of re-entering such as scorch marks on the stones. Such clear signs of an actual re-entering and not just re-opening have only been observed with large megalithic graves in the Xichang area and Xide, with the sole exception of Puge Xiaoxingchang AM1, where the bones of over 10 people were neatly arranged throughout the grave with a few bones being scattered throughout the grave. In this respect, Puge Xiaoxingchang AM1 and Xichang Dayangdui are again very similar, except for the difference between primary and secondary burial. It is possible that both phenomena sprang from the same tradition of secondary burial, but in one case the secondary burial was conducted at a place different from the primary interment, while in the second case they took place in the same grave. This is very different from the majority of other megalithic graves, where the rearranging of previous interments seems to have been a function of making space for later interments.

Overall, the main form of interment for all grave types is thus primary extended-supine interment, in the case of megalithic graves often followed by later re- or disarrangement, while secondary interments in the form of the re-burial of selected bones are limited to stone-construction graves in Zhaojue and very few small megalithic graves in Xichang. Secondary interments in the form of cremation are extremely rare, occurring only at Yongsheng Duizi and Mianning Xiaogoudi as outright urn-burials in earth pits, as well as in the megalithic graves of Puge Xiaoxingchang AM1 and Xichang Xijiao Gongshe M1 together with inhumations, and at Yanyuan Laolongtou M9 with three primary inhumations. Given the state of publication, not much can be said about Yongsheng Duizi, but Mianning is otherwise characterized by megalithic graves, and only Mianning Xiaogoudi holds both earth-pit graves with single primary inhumations and urn-burials. It is therefore not unlikely that different parts of the same population were buried in different kinds of graves, e.g., children in cremation urns, and other subgroups in earth-pit and megalithic graves; however, as most of the graves in Mianning were severely disturbed and yielded hardly any object, it is currently not possible to test this suggestion. Unless we are simply witnessing a gap in research, cremation with subsequent burial of the remains was scarce within the research area. Yongsheng Duizi is located at the very edge of the research area and might thus reflect a tradition not common anywhere else.

Traces of calcinated human bones in Yanyuan Laolongtou M9, Xichang Xiaoxingchang M1, and Puge Xiaoxingchang M1 are very different in nature, as they are probably the remains of rituals conducted within the grave,. It is unclear if these acts were meant as a human sacrifice or a treatment for a deceased with a special status. Laolongtou M9 contained remains of at least four individuals, but the state of preservation makes it impossible to ascertain if they were all secondary interments or if some of them were primary. At least one of the bodies was subject to fire treatment together with a number of object and all of them were placed in a separate part of the grave, showing a clear case of secondary burial, while the long-bones found in other parts of the grave could belong to deteriorated primary or a secondary burials. The grave could thus either be the re-unification of a family or other kind of small social group after the death of its last member, in which case there would be one primary and three secondary interments, or the burial of one main person who was accompanied by relatives or dependents who had to follow him or her, or even unrelated sacrificial victims. As each interment was accompanied by a separate group of objects, the last explanation is unlikely. In case of the human mandible covered in cinnabar and placed in the main chamber in Laolongtou M4 together with a large number of burial object, it is probable that this was the main interment, while the extended-supine burial on the second-level ledge was an accompanying attendant, although probably not a common sacrificial victim, given the weapons and body armor with which the body was equipped.

Such complex burial sequences have never been observed elsewhere in the research area, but that may also be due to less favorable soil climate for bone preservation at most other sites. Most earth-pit graves did not contain any remains of human bones with the exception of the graves at Yongsheng Duizi, which remain unpublished, Mianning Xiaogoudi, Yanyuan Laolongtou, Huili Washitian, and very few graves at Huili Fenjiwan and Laolongtou, as well as stone-construction graves at Huili Xiaoyingpan, Luquan Yingpanbao, a very few graves in Zhaojue and Mianning. Most earth-pit and stone-construction graves are single interments and many of them primary. Special burials have only been observed at Huili Xiaoyingpan and Luquan Yingpanbao, which are located fairly close to each other. In all cases, the skull was detached and placed either in the stomach area of primary extended-supine interments, completely removed from the grave, or buried separately in graves made of thin stone slates that were oriented toward the North or Northeast on steep slopes of southern orientation, i.e., not any different from the other graves at the same cemeteries. In any case, it seems likely that this form of special burial was a local custom reserved for a certain number of people.

Evidence for burning of unknown substances are known from a very few graves of all types in Xichang, Dechang, Miyi, and Luquan, and ash-piles that might be the outcome of fire inside the grave or elsewhere, are known from earth-pit graves in Xichang and stone-construction graves in Zhaojue, while charcoal remains have been found in Laolongtou M4 and M7 as well as various megalithic graves. Rituals involving fire are therefore not restricted to Yanyuan or to megalithic graves, but what exactly was burned is largely unknown. Fire-treatment of sheep shoulder-blades as so far only been seen in one of the large graves with stone installations at Yanyuan Laolongtou, and most other interments of animal bones are likewise restricted to Yanyuan, indicating the greater ritual importance of animals here, especially of horses as animals with a special meaning and function, as the horse gear indicates, and sheep possibly as a source of meat, which is not unlikely given the strong prevalence of sheep and goat in the mountains around Yanyuan until the present day. The teeth interred in Zhaojue Fuchengqu M3, on the other hand, are very likely pig teeth, showing the greater importance of this kind of domestic animals, while graves in other areas are devoid of animal bones, even those where human remains have been found, showing that animals did not play a large part in burial rituals as reflected in the grave. Instead, Xichang Bahe Baozi M1 contained a pile of calcinated rice husks, showing the importance of this staple, be it for ritual reasons, be it as a food provision for the afterlife. This regional difference in food and animal offerings may not only reflect differences in rituals but also in the economic basis of the people conducting the burial, with a certain reliance on animal husbandry possibly involving horse-riding in Yanyuan, a rice-based subsistence in the Anning River Valley, and a mixed but settled economy in Zhaojue.

The lack of evidence for special rituals in most earth-pit graves and many stone-construction graves apart from those in Yanyuan does not mean that the burial process was less complex, but only that it did not affect the grave itself. Nevertheless, even in earth-pit graves there is a certain amount of differentiation reflected in burial construction, with head- or foot compartments in a very few graves at Huili Washitian and Xiaoyingpan as well as Ninglang Daxingzhen and Yongsheng Duizi, a second-level ledge in one grave at Xiaoyingpan and Yongsheng Duizi as well as Xichang Qimugou and Ma'anshan, and stone-slabs in the head or pelvis area in a number of graves at Huili Fenjiwan. All these construction elements do likewise appear in the larger and more remarkable graves at Yanyuan Laolongtou, and seem to be a phenomenon restricted to Huili and Yanyuan/ northeast Yunnan. The only exception are the two graves at Xichang Qimugou and Ma'anshan, which contain Han style ceramics and thus belong to a different tradition. The second-level ledge is therefore another case in point that the similar-looking phenomena can have different origins. Greater clarity on their exact relationship can be attained by an analysis of the object assemblages, which will be conducted below.

V.7 Furnishing the Grave: The Object Assemblage

Artifacts have been reported from 399 of 443 graves, but 70 of these graves were severely disturbed and only part of the assemblage could be retrieved, while 61 remain unpublished or insufficiently described, making it impossible to estimate the original combination of objects. According to the index developed above, 45 of the remaining 268 graves have a medium or high likelihood of having been reopened, and they do not qualify as discrete assemblages. Furthermore, 61 graves contain more than one skeleton and might therefore hold several separate assemblages. Fortunately, for 10 out of these 61 graves with multiple interments, the excavators have reported detailed observations on the exact location of the objects, and it is therefore possible to distinguish between 30 assemblages from 10 graves. Apart from objects clearly connected to a specific grave, archaeologists have reported surface finds from 15 sites, which at least prove the presence of specific object types at those sites.

Over 70% (279) of all graves contained some amount of ceramics, ranging from only one object in the majority of graves (40%, 160), over 2-7 in others (30%, 120), to over 70 in five cases, not surprisingly most them megalithic graves (Dechang Arong M1, Huili Leijiashan M1, Miyi Wanqiu M1 and M2, Xichang Wanao M1). Containers made of other kinds of material such as metal or wood are extremely rare and occur only in a very small number of graves. About 33% of all graves held some metal artifacts, mostly bronze weapons or ornaments (76%, 159), some iron (18%, 72) or composite weapons (2%, 8), and a few gold or silver ornaments

(2%, 8 each). The majority of metal objects are personal ornaments and clothing applications, followed by weapons/tools (Tables 5.88-5.91). Most common among metal weapons are arrowheads, all of them made of bronze, but arrowheads made of stone are nearly equally common. The majority of tools are made of stone, followed by clay, if one wants to count spindle whorls as tools.

Apart from ceramics, which are much more numerous than any other kind of objects, personal ornaments seem to be most common by artifact count. These numbers, however, are somewhat misleading; beads often occur in sets of 20-40 objects that probably used to be strung a chain, but in the statistics they feature as 20-40 separate ornaments instead of one. Perforated teeth, shells, and cowries can likewise occur in sets that might have been strung on the same chain, and clothing applications tend to occur in sets as well. Nevertheless, even when accounting for these distortions, personal ornaments, hair decoration, and clothing applications are remarkably common. Beads tend to be made of precious stone such as agate and turquoise, or sometimes bone, which might be imitating the less widely available nephrite. Rings are often made of bronze, and snail/shell, cowrie, and animal teeth are mostly used as pendants.

About 31% (123) of all graves contained some stone objects, be it ornaments or weapons/tools. Among stone ornaments, agate, turquoise, and nephrite occur in roughly equally few numbers of graves (15, 19, and 13 graves), but agate and turquoise objects (most of them beads) are considerably more numerous than nephrite pieces, which were also made into pendants and rings. Tooth ornaments occurred in only eight graves, mostly megalithic graves in Xichang, Xide, and Puge,[54] while bone is more common, occurring in 26 graves, and cowries and other kinds of shell are rare, having been reported only from various graves at Yongsheng

[54] Huili Xiaotuanshan M21, Puge Xiaoxingchang BM1, BM2, and BM4, Xide Lake Sihe M8, Xichang Wanao M2, Xichang Xijiao Gongshe M1, Puge Wadaluo M1.

Duizi (M11, M15, M18, M77, M88, M91, M94) as well as Huili Xiaotuanshan M21 and Zhaojue Erba Keku M11. A single wooden bracelet has been reported from Zhaojue Erba Keku, the same site that held organic beads, and frit beads are known only for Xichang Xijiao Gongshe M1.

Because of significant differences in burial practice, preservation, and extensiveness of publication, different questions have to be answered drawing on a varying range of assemblages:

Question	**Range of Material**
kinds of artifacts present in graves	all grave assemblages and collections from surface surveys, inclusive of single finds from graves (442 assemblages from 412+ graves at 79 sites)
range of artifact types present at different kinds of sites	all grave assemblages and collections from surface surveys, inclusive of single finds from graves (442 assemblages from 412+ graves at 79 sites)
artifact sets	assemblages from well-preserved and well-published graves with single interments (220 graves); separate analysis of assemblages from graves with multiple interments were layers/assemblages could be distinguished (30 assemblages from 10 graves)
co-occurrence of different artifact types	all graves with discrete but not necessarily complete assemblages (397 graves)
artifact placement	1550 artifacts from 152 graves from 19 sites

The most common objects found at grave sites are ceramic vessels (~43%) and ornaments of metal, stone, or bone (~34%), followed with a wide distance by metal weapons (~9%) and tools/weapons of stone and bone (~6%), while spindle whirls are rare (~2%). Metal ritual objects, coins, armor, horse gear, and organic containers are rare, while bronze seals and calcinated ropes have been reported only two and five times each (Figure 5.101). The placement within the grave is known for objects from 19 sites.[55] The main location categories are:

1. **between the bones (26)**;
2. **throughout the whole grave (31)** [i.e. throughout the whole grave (26), or ceramic vessels at both ends and more objects along the walls (1), or ceramics at both ends and personal ornaments and weapons in middle (1), or ceramics at head, weapons in middle, and

[55] This includes all excavated graves from Huili Fenjiwan, Guojiabao, Xiaoyingpan, Luquan Yingpanbao, Miyi Wanqiu, Ninlang Daxingzhen, Puge Xiaoxingchang, Xichang Bahe Baozi, Hexi Longshe, Tianwangshan, Tuanbao, Wanao, Xijiao Gonshi, Xide Guluqiao, Lake Sihe, Yanyuan Laolongtou, as well as some of the graves at Yongsheng Duizi and Zhaojue Chike Boxixian

personal ornaments at foot (1), or ceramics at rear end and sides, some smaller vessels and ornaments in larger ones, personal ornaments and weapons between bones (2)];

3. **in the middle (39)** [i.e., in middle (36), hip area (1), at the knees (1), or in the coffin (3)];
4. **at the head and in the middle (19)** [i.e., at the head and in middle (8), or ceramics in the head compartment and weapons in the coffin (3), or ceramics and stone tools at head and personal ornaments and weapons between bones (1), or ceramics at head und personal ornaments and weapons in middle (6), ceramics in head compartment, personal ornaments in middle (1)];
5. **at the feet and in the middle (2)** [i.e., ceramics at door and personal ornaments and weapons throughout (1), in the middle and at the feet (1)];
6. **at the head (97)** [i.e., at the head (89), or in the head compartment (7), ceramics in head compartment (1);
7. **at the feet (10)** [i.e., at the foot (9), or in the foot compartment (1)];
8. **on one end (2)**;
9. **on both ends (25)** [i.e. on both ends (24), or ceramics at head and weapons at head and foot (1)];
10. **outside the grave (1)**; and
11. **unknown (85)**.

For the majority of objects the exact placement has not been reported, but judging from the information attainable, personal ornaments and clothing application appear mainly on and around the bones (~78%), more rarely at one end of the grave pit (~9%), or even outside the grave chamber (~13%) (Table 5.74). Weapons and tools — some of them possible part of the personal attire or belongings of the deceased — are mostly placed on or alongside the body (~56%), and less frequently on either end of the grave (~20%) or outside the main grave chamber (~24%), both mainly in the richly furnished graves at Yanyuan Laolongtou. Body armor and horse gear are too rare for a meaningful statistical evaluation of their placement, but armor has mainly been reported on or close to the body, and more rarely at the end of the grave or on the second-level ledge, while horse gear was mainly found next to horse skulls that were often placed in the leg area. As horse skulls and horse gear as well as body armor are mainly known from Yanyuan, with one single example of the former from Huili Guojiabao as a surface find, and of the latter at Xichang Xiaohuashan M1, they cannot be the basis for general conclusions.

Ceramics most often appear at either end of the grave pit or in the head- or foot compartment (~82%), They were sometimes placed on both sides of the corpse or even intermingled with the bones (~17%), and in two cases even outside the grave. Metal vessels are rare and have been reported from the foot compartment and from within the grave chamber. Other burial goods are too rare and/or too unclear in placement to allow for any conclusions. Remarkable is the occurrence of smooth flat oval cobbles in 49 graves at Huili Fenjiwan and grave M1 at Huili Leijiashan. They were usually found under the head or more rarely in the hip- or stomach-area, indicating a ritual function. In three cases, similar oval stones were placed on ceramic vessels, but might have a different meaning there, simply functioning as covers or lids. Stone balls were reported from three graves, three each from Yanyuan Laolongtou M4 and M9, always placed in at the leg or feet, and one from Huili Leijiashan with unclear placement.

Another unusual kind of burial goods are carbonized ropes appearing in the burial chamber of six graves in Zhaojue, always in the main grave chamber, sometimes close to the head, sometimes more in the middle or towards the foot area (Zhaojue Erba Keku M2, M4, Zhaojue Pusu Bohuang M3, M4, Zhaojue Wazhaishan M1, M2). Their function is unclear, but their limited distribution makes them an interesting indicator for possible local customs in burial ritual. To gain a general understanding of the distribution of these and other objects, whose placement in the grave is not always known, below, I am describing the different objects separate by categories, discussing both their absolute frequency at grave sites in general and their comparative frequency at different grave sites, before turning to the combination of objects of different categories within the same grave and/or at the same site.

V.7.1 Ceramic Vessels and Other Containers

Among ceramic vessels, jars with and without handles are equally common and make up the majority of the assemblage (Table 5.75). Common are also vessel forms associated with eating and drinking, particularly goblets, vases, and bowls, as well as cups and ewers. A number of graves additionally hold spindle whorls of all types, mainly Types Aa, Ab, Ba, and Bb, i.e., low and high disk-shaped, middle-perforated varieties as they were also found at settlement sites. Pill-shaped spindle whorls have never been reported from settlement sites and they are rare in graves as well, occurring only in Huili Leijiashan M1 and Xichang Hexi Gongshe M4.

Large vessel forms such as urns, particularly very large varieties such as Type A, and large jars without handles so common to settlement sites, are rarely found in graves. Nearly all known specimens of high-collared jars of type B were found at settlement sites. The vast majority of vessel-forms employed in a grave context have curved outward-flaring or more rarely angular-everted rims. Among bowls and basins, small open forms that could be used as shallow drinking-vessels or single-serving food containers (i.e., *wan* bowls, *bo* bowls with straight sides and/or outward-turning lips, small basins of type Bb and C) are most common, while large and/or closed forms with inward-curving rims are very rare.

The vast majority of small or medium-sized jars (10-17 cm height) with one, two, or rarely four band-handles or horn-shaped handles, have been reported from graves throughout the research area, as well as from single-finds and the antiquities market in Yanyuan and Huili, which — as the intact condition suggests — have come from grave sites as well. The only kind of handles that has never been reported from grave sites are lug-handles, while horn-shaped handles have never been found at settlement sites. Many vessel forms are exclusive or nearly exclusive to grave sites and hardly ever occur in settlements. This applies in particular to drinking-vessels, including most types of stemmed goblets, beaker, cups, and *dou* bowls, as well as pouring-vessels such as ewers and vases. Lids, on the other hand, mostly come from settlement sites. Overall, the vessel forms observed in a grave context thus indicate consumption of food and drink in single portions, be it by the deceased or the mourners, and potential (re-)filling from medium-sized vessels, and/or the offering of small to medium amounts of food and drink, but not the gifting of large quantities of either to be used by the deceased in the after-life.

One might expect the quality of the vessels found in grave context to be either significantly higher or significantly lower than what is usually seen at settlement sites, but this is not unequivocally the case (Tables 5.76-5.78 vs. 4.5-4.6, 4.9, and 4.15-4.16). Black slip is indeed significantly more common with grave ceramics, but burnishing occurs fairly often at settlements sites as well. Decoration, on the other hand, is very common, with over one third of all grave ceramics having been enhanced in this fashion, while at most settlement sites undecorated objects account for around 90% of all material. The percentage of ceramics with a grey or black surface color is likewise higher for grave finds than for settlement ceramic, but not as high as the percentage of red and red-brown ceramic, which still accounts for over 50% of all grave ceramics. The percentage of high-fired ceramics is significantly higher in graves than at settlement sites (42.46% vs. 15.38%); furthermore, ceramics of fine ware are more common (19% vs. 3.29%), and so are wheel-thrown vessels (25% vs. 2.73%), but hand-thrown (59%) sand-tempered (80%) ceramics fired at low temperatures (57%) are still in the majority even at grave sites. As it became clear during the settlement analyses that the percentages for all these factors vary significantly from site to site, possibly due to chronological differences, the percentages at different grave sites have to be compared to each other as well.

In Huili, low-fired hand-thrown vessels without decoration are in the majority, but some grave-sites also hold decorated vessels and objects fired at high temperatures, such as Huili

Guojiabao, where about 2/3 of all vessels are decorated, all of them are high-fired, yellow-brown in color, and of fine paste ware with no or only fine-grained sand inclusions. All 92 vessels from Huili Leijiashan M1 are high-fired and grey-brown as well, and mostly highly decorated (71 vessels) and of fine-past ware (85). Huili Washitian, Xiaoyingpan, and Fenjiwan, on the other hand, are characterized by low-fired, hand-thrown, yellow or yellow-brown undecorated vessels of sand-tempered ware. Only a few graves at Fenjiwan contained decorated vessels, e.g., M148 and M26, where most ceramics are decorated, and which furthermore contain goblets, ewers, and single-handled vessels that are otherwise rare at Fenjiwan. Handled vessels are a marker of Guojiabao as well and goblets are most common in the assemblage at Leijiashan, while they are largely absent from other grave sites in Huili. What seems to be a local particularity is the yellowish color of the clay in Huili, while the ceramics of other regions have a reddish base color.

In the Xichang region, ceramic quality and execution differ considerably by site. At Xiaohuashan, Xijiao Gongshe, Xixingcun, and Yanjiashan, both decorated and un-decorated, high- and low-fired, red and black, sand-tempered and fine-paste ware occur side by side and in a variety of forms. Other sites, such as Huangshuitang, Hexi Gongshe, and Lizhou, hold only low-fired, red, red-brown, or mottled ceramics whose paste was tempered with coarse sand, and which remained largely undecorated. At Lizhou, only very few vessels of specific types (i.e., vases and ewers) were covered in incised geometric decoration, but they, too, were of similar ceramic quality and only somewhat less coarse in execution. Later Han graves at the same site are then characterized by decorated grey fine-past ware, but about 40% of the ceramics are still sand-tempered and undecorated; however, all of them are high-fired and thrown on a fast wheel.

The ceramics from the graves at Xichang Ma'anshan and Qimugou are mostly high-fired, thrown on a fast wheel, of grey and black color, sometimes with black slip, but mostly undecorated. The assemblage at Qimugou is characterized by goblets, ewers, and vases, while the grave at Ma'anshan contained *fu* cauldrons and a stout urn with a wide flat bottom, both of them typical for Han objects, while the Qimugou assemblage is rather different, indicating a difference in date and possibly cultural tradition. The assemblage from the graves at Dayangdui is very special as well. The ceramics are of a black high-fired fine-paste ware of vey high quality, most of them burnished and all hand-thrown. The handled jars (double-handled jars of Types Ac and Aa, single-handled jars of Type A) from Dayangdui in particular are rather different in from other objects found in the research area, and their high quality and firing temperature additionally sets them apart, indicating either a foreign origin or a discontinued local tradition. High-fired ceramics of high quality have been reported from Miyi Wanqiu as well, but they were mostly formed on a fast wheel, are largely red, only rarely burnished or slipped, and mostly decorated (130 out of 171 vessels). Most of them are single-or double-handled jars, beakers, cups, ewers, or vases, while bowls are rare and jars without handles never occur.

High-fired vessels have been reported from Luquan Yingpanbao, but they are mostly of coarse quality, sand-tempered, hand-thrown, undecorated, and devoid of handles. From many sites, there is hardly any information on the ceramic quality. For Mianning it is only known that objects tend to be undecorated and devoid of handles; some vessels at Puge Xiaoxingchang are decorated, grey-black, high-fired vessels thrown on a fast-wheel; Yongsheng, Yanbian, and Zhaojue seem to be characterized by low-fired undecorated ceramics, except for Pusu Bohuang, which has some high-fired bu hand-thrown sand-tempered ceramics, with or without decoration.

At Yanyuan Laolongtou, most ceramics are hand-thrown and can be uneven in form, but they are mostly of fine paste, high-fired, burnished, sometimes, slipped, and can have elaborate but large-patterned decoration, mostly on shoulders and body, mostly of double-handled jars.

Double-handled vessels dominate many sites in Yanyuan and likewise occur in Yongsheng, Miyi, and Ninglang, all of them located in the southwestern part of the research area. The ceramics in graves at Ninglang Daxingzhen are mostly decorated, have a fine paste, are grey in color, can have a black slip, and are mostly handled, making them rather similar to the objects from Miyi Wanqiu but rather different to the red sand-tempered objects of Xichang, Mianning, and Dechang, where handled object occur only at some sites. These regional and local differences both between and within regions and sites indicate both spatial and chronological variation in the ceramic assemblage, possibly in connection with specific grave types or interment practices.

When turning to the presence/absence and combination of the various vessel types at different sites and in different graves, it becomes clear that there is considerable variety. Of all 393 graves, for which some content was reported, 86 did not contain any ceramics; however, as 21 of those were not properly published and 13 others severely disturbed, we can only be certain that 52 never contained ceramics, i.e., about 13% of all observed or 14.5% of all sufficiently preserved and reported graves. Most graves did thus contain some amount of ceramics, on average 5-6 per grave, although the majority of graves held only 1-2 vessel (198) and three held over 100 each (Dechang Arong M1, Xichang Wanao M1, Huili Leijiashan M1). The most common vessel-forms appearing in all kinds of graves are jars without handles followed by vessels with two handles or a single handle, but there are significant differences between different graves (Figure 5.102; Table 5.78). Graves that had been re-opened and/or were used for multiple burial had a much higher number of ceramic vessels (15 on average, with a range of 0-130 per grave), mostly decorated medium-sized jars and double-handled vessels, while large urns hardly ever occur, and different bowl types tend to be rare as well.

V.7.1.1 Ceramic Assemblages in Graves for Multiple Instances of Interment (Megalithic Graves)

When considering re-opened burials separately, it becomes clear that there is much variety in their assemblages. Four of them (Dechang Arong M1, Xichang Wanao M1, Miyi Wanqiu M1 and M2) have particularly large assemblages, but they all consist of a different range of artifact types. Miyi Wanqiu M1 and M2 contained a combination of double-handled and single-handled jars, together with small drinking vessels (cups/beakers) and pouring vessels (ewer/vases); Wanao M1 is characterized by jars without handles as well as beakers combined with only a few bowls; and Arong M1 held a large number of medium-sized decorated jars with or without handles. Comparing these assemblages with those in other graves, it becomes clear that nearly all of the double-handled vessels occur in connection with multiple burials above ground are mostly restricted to these few very rich graves. Single-handled vessels are somewhat more common, and simple small or medium-sized jars or cups occur fairly frequently as well.

Remarkable is also the distribution of ewers/vases, beakers, and bowls. Bowls are rare in megalithic graves that were re-opened multiple burials, occurring nearly exclusively at Xichang Wanao, while they are very common in earth-pit or stone-construction graves. Small single-serving drinking vessels such as cups and beakers have been found in many graves. Multiple burials hold none of these vessels; only megalithic graves with high number of ceramic vessels held many beakers/cups, mostly together with ewers and vases fit for pouring liquids. The larger elaborate goblets, on the other hand, do hardly ever occur in these large assemblages, and rarely in connection with multiple interments, while they are common with other kinds of graves.

When conducting combination statistics and correspondence analyses to identify the most common combinations, it becomes clear that Xichang Dayangdui DM2 and Xide Lake Sihe M1 stand apart from all other graves: DM2 for containing five urns and M1 for holding three *fu* goblets, object types that have never been reported from any other grave with multiple interments (Figure5.103). DM2 is furthermore exceptional for its extremely small size for a "megalithic" grave, the interment of one single uncalcinated human long-bone in one of the urns, and the lack of any other objects. Xide Lake Sihe M1 is of a more common construction (megalithic grave type 2.2.1.2), has a medium size, and contained at least ten skeletons that have been rearranged during later reentries of the grave. Other objects found in this grave (e.g., 2 bronze combs, 1 stone arrowhead, 1 jar) are relatively common in megalithic graves as well, but the single goblet of high-fired grey pottery (type EbI) is rather unique; both its high firing-temperature and the co-occurrence with *fu* vessels and Han coins indicate a relatively late date and Han cultural influence. Dayangdui DM2, seems to stand at the opposite end of the spectrum, certainly culturally and possibly chronologically as well. The small grave size and single instance of interment without traces of re-opening show a connection with local ritual practices other than megalithic graves, and the urns of low-fired coarse pottery indicate an early date.

Considering the megalithic graves and the combination of objects visible therein, it becomes clear that there is a strong correlation between vases/ewers and cups/beakers (Figures 5.104-5.105; Tables 5.79-5.80). The co-occurrence is not strong enough to treat these objects as sets, but it is reasonable to assume that vases/ewers were used to pour liquids into cups for consumption. The co-occurrence of a large number of cups/beakers and a few vases/ewers furthermore suggests that communal drinking practices were part of mortuary rituals that involved the reopening of communal graves. Traces of similar ritual acts can be seen in objects pits associated with megalithic graves, such as Xichang Maliucun H1, which contained a number of goblets, beakers, stemmed *dou* bowls, and ewers; the stone frame outside of Xichang

Tianwangshan M10 held a vase and three jars with outward-flaring rims useful in pouring liquids; and the two pits at Xichang Dayangdui contained similar jars, stemmed bowls, and cups.

The correlation tables show a strong association between beakers and double-handled vessels as well as double-handled vessels and ewers; the only megalithic grave in which beaker occur without double-handled vessels is Xichang Wanao M1. Only Xichang Bahe Baozi and Puge Xiaoxingchang contained ewers but no handled vessels. Beakers and cups occur in other grave forms as well but in relatively small number; vases and ewers are hardly ever combined with handled ceramics, indicating a chronological component.

V.7.1.2 Ceramic Assemblages in Graves used for Single Interments

Graves that were not re-opened generally contain much fewer artifacts than those with multiple instances of interment, with an average of four ceramic vessels each, while about 2/3 of the graves contained only one or two vessels, a few held 10-50 ceramic objects, and only Huili Leijiashan M1 revealed 102 ceramic vessels. Most common by far in such graves are various kinds of jars, followed by goblets, vases, and bowls, but the differences between the graves are considerable (Figure 5.106, Table 5.81). Huili Leijiashan M1 is very remarkable for its large number of vessels (102), mainly highly decorated goblets and single-handled vessels, but also a few vases and the only double-bulge jar found so far in the research area. Large assemblages of 15-50 ceramic vessels in a single grave have otherwise only been reported from Xichang Qimugou M1 and M2 as well as from 9 of 21 graves in Xichang Lizhou. The graves at Qimugou are furthermore remarkable for the very fine quality of the ceramics they contain, all of them black or grey fine-ware fired at very high temperatures and embellished with a black slip. The assemblage is furthermore characterized by tulip-shaped high-stemmed goblets rarely seen in other contexts. The large assemblages from Lizhou are very different, consisting mainly of coarse sand-tempered red-brown ceramics fired at low temperatures and formed mostly into simple jars or bowls. Even though the assemblages from Lizhou are relatively similar to each other judging by functional form, there are considerable differences in details such as execution, decoration, and additions such as handles and spouts. While some graves (AM2, AM6, AM10, BM4) are characterized by highly decorated vases and ewers, others (AM9, BM3, BM8) have instead double-handled vessels, combined with large numbers of bowls but no spouted or decorated vessels. These differences seem to cross-cut the contrast between graves with 20-50 vessels and those less richly equipped, indicating temporal as well as social differentiation.

Among the graves from Huili Fenjiwan, which make up a large part of all graves below ground, there is no such clear grouping. Most graves hold 1-4 small to medium-sized jars or urns, sometimes in combination with probable drinking vessels such as bowls, stemmed bowls, or goblets. Single- and double-handled vessels occur in only four (M26, M144, M148) and two graves respectively (M6, M33), but on vessels that otherwise look identical to jars without such applications. It is remarkable, however, that the only two spouted vessels and two of the three ewers reported from Fenjiwan were associated with single- or double-handled vessels. Furthermore, all of the graves just mentioned were located in the lower part of the hill slope, where all graves are oriented at 270-280° compared to the 160-180° common for graves located further up the slope, probably in both cases simply following the direction of the slope at that point. As M26 furthermore contained a bronze sword fragments, it is not unlikely that the graves with handled vessels are of a slightly later date. The only other grave site in Huili, from which handled vessels are known, is Huili Guojiabao, a site otherwise known for the large number of metal weapons and ornaments found here. Furthermore, there is a considerable regional bias in the distribution of single- and especially double-handled vessels, most of them coming from Ninglang Daxingzhen or various sites in Yanyuan, where nearly all graves held one or two of these vessels. Several but not all of these graves furthermore had stone installations, but there are no clear differences in assemblage between those graves with and those without stone construction parts. The same holds true for the graves at Huili Fenjiwan.

The graves in Zhaojue were mostly devoid of ceramics or held only coarse small jars without handles or decoration. Remarkable is only Zhaojue Chike Boxixian M1, which held a ceramic *fu* vessel combined with an iron knife and Han coins indicating the late date and outside influence. The only other grave below ground with such vessels is Xichang Ma'anshan, where two *fu* were combined with a flat-bottomed urn reminding of Han-forms as well. Correspondence analysis identifies this grave as a clear outlier, and the graves at Xichang Dayangdui stand apart as well, mainly because of their high-quality high-fired black fine-ware and the unusually thin and overly long handles on some jars. Similar vessels have only been found in the later ceramic pits at the same site, setting Dayangdui apart from everything else know in the research area.

Overall, the ceramic assemblages associated with graves used for multiple instances of burial (all of them megalithic graves) and those used for a single instance of interment, are very different. Megalithic graves mostly contain vessels used in drinking rituals associated with the grave, and were not always deposited in the grave but sometimes discarded outside in special pits. A number of megalithic graves did not contain any ceramics at all, reaffirming that such vessels were probably not intended for the use of the deceased in afterlife but for the burying group in this life. The kinds of object found in graves used for single instances of interment probably had a different function, holding offerings and gifts serving the deceased more so than the mourners. The kind of ceramics used for such a purpose, however, differs very much from region to region, site to site, and even grave to grave, indicating cultural as well as temporal and social differences. Nevertheless, this interpretation is not unproblematic as graves devoid of ceramics might have contained vessels made of wood or tree-bark that were not preserved.

V.7.1.3 Containers made of Metal or Organic Material

Indeed, vessels and containers made from material other than clay are very rare throughout all of the research area. Bronze vessels include seven *fu* and two *mou* cauldrons, one single- and three double-handled jars, six *pen* basin and fragments of a vessel of unclear form. All of them were found either in the two adjacent counties of Yuexi and Zhaojue in the Northeast, or in Yongsheng and Yanyuan, which is located at the opposite end of the research area. Similar vessels have otherwise been reported from Han graves, both at Lizhou and elsewhere. Many of the graves additionally hold bronze and iron weapons and in one case even a seal reminding of Han assemblages as well, confirming both a relatively late date and Han influence.[56]

Wooden vessels have only been reported from the single grave of Ninglang Daxingzhen M5, which contained a wooden bowl, a lid, a spoon, a quiver made of a wooden bottom and hide or other organic material and containing two wooden arrowheads, as well as the bottom of another container and a wooden stick with wholes that was probably the backbone of another kind of bag. These objects were accompanied by a bronze knife, a turquoise bead, 15 ceramic jars (9 with one, 5 with two, and 1 without handles) and one vase. Aside from the singular

[56] The graves are Yuexi Liaojiashan M1 (1 double-handled and 1 single handled bronze vessels, 1 *mou*, 1 *pen*, associated with bronze and iron weapons, no ceramics), Yuexi Huayang M1 (5 bronze *fu*, 3 bronze *pen*, 2 double-handled bronze jars, 1 bronze seal, 1 bronze plate, no ceramics), Zhaojue Erba Keku M4 (1 bronze *pen* basin, 1 calcinated rope, 8 stone arrowheads, 1 stone axe), Zhaojue Eba Buji M1 (1 bronze *pen* basin, 1 bronze arm guard, 1 agate bead, 2 nephrite *huan*, 1 stone arrowhead), Zhaojue Wazhaishan M5 (bronze vessel fragments), Yongsheng Yanjiaqing surface find (2 bronze cups, 2 drums, 2 bronze ornaments), Yongsheng Laolongtou M4 (2 bronze *fu*, 1 metal drum, 1 bell, large number of personal ornaments, 2 single-handled and 5 double-handled ceramic vessels, a number of bronze and iron weapons).

wooden objects, the assemblage is not dissimilar from what was found in other graves both at the same site and in other regions. Preservation conditions for organic material are generally poor, as the lack of bones in the majority of graves indicates, and it is thus impossible to say if organic containers were a common occurrence. The absence of wooden objects from other graves at Ninglang Daxingzhen indicates that they were at least not commonly interred in all graves.

Several graves at Zhaojue Pusu Bohuan contained wooden bracelets and beads of organic material, and graves throughout Zhaojue contained calcinated ropes, showing that organic material was employed and did preserve in some cases. At Yanyuan Laolongtou, i.e., fairly close to Ninglang, graves M6 and M11 both revealed tree-bark containers. The one in M6 was placed on the divider and held an assortment of small tools and particular stones; the tree-bark object in M11 was placed on the right side of the deceased and held severely fragmented bronze and iron objects. Both might therefore have been bags holding tools and in the case of M6 possibly talismans or other objects with special significance. In a number of graves such as Xide Lake Sihe M1 and M5, Zhaojue Shike Boxixian M3, arrowheads, various stone and metal tools, and coins were found in between the bones and sometimes in the pelvis area of skeletons, indicating that they were probably kept in a bag worn as part of the attire. Organic containers might thus not have been rare at all, but are difficult to trace in the archaeological record. Weapons and tools of metal and stone, on the other hand, naturally preserve well and have been reported from quite a number of sites. They will be described in the next passage.

V.7.2 Weapons and Tools made of Metal, Stone, and Bone

Metal weapons have been reported in considerable number from graves, while metal tools are relatively rare; the same is true for most stone tools, but stone and bone arrowheads and knives are more common. Nevertheless, all of these objects are uneven in their distribution at different sites and graves; they have been retrieved from 68 graves and 10 surface finds at 44 sites, as well as collections of objects confiscated by the authorities. Indeed, the majority of metal weapons and tools were retrieved from the antiquities market at Yanyuan (315 artifacts) and from surface collections at grave sites in Yongsheng (Longtan: 52 artifacts; Laoying: 20 artifacts). The finds from the antiquities market will be discussed in Chapter VI, while the surface finds can be evaluated together with the grave finds as showing the presence of certain object types at the location in question.

V.7.2.1 Metal Weapons and Tools

The majority of metal weapons and tools retrieved from grave sites were found at ten sites in Yanyuan and Yongsheng and one in Huili, the overwhelming majority in surface finds at Huili Guojiabao (64) and Yongsheng Longtan (52), and graves at Yanyuan Laolongtou (54). Apart from Huili Guojiabao, most other grave sites in Huili held only a single bronze *yue* axe or no metal objects at all, but Guojiabao revealed 39 bronze spear heads of types not seen anywhere else in the research area together with 10 bronze swords, 8 bronze knives, and each one *yue* axe and one arrowhead, as well as a considerable number of bronze ornaments. Overall, the graves at all other sites in Huili are remarkably poor in metal objects, especially for an area so rich in adequate resources. Both in Yanyuan and in Yongsheng, metal objects are widely distributed over a number of sites, but some graves are considerably richer than others (Table 5.82).

Most of the metal weapons/tools from Laolongtou came from grave M9 and M11, while most other sites and graves in Yanyuan and Yongsheng contained only 1-6 such objects each. Yanyuan Xiaohebian held as much as 11 bronze weapons (5 bronze *yue* axes and 6 bronze swords), while all other 29 graves at the same site were devoid of such objects. Admittedly, the majority of bronze weapons at Laolongtou M9 and M11 were bronze arrowheads, which generally tend to occur in greater number within the same grave; however, M9 and M11 furthermore contained bronze and composite swords, axes, knives, and spear-heads. In fact, a considerable number of object types are unique to Yanyuan (i.e., composite dagger-axes, iron tips, butts of bronze dagger axes, bronze *qi* axe, bronze chisel), or Yongsheng (composite knife, bronze fish-hook, bronze hoe), while all bronze dagger-axes and iron spear-heads, as well as most bronze *fu* axes were found in Yongsheng or Yanyuan, and scabbard tips are known from Huili and Yanyuan exclusively, both in graves with and without stone-installation parts.

Bronze swords, spear-heads, and *yue* axes are very common in all three areas, but have also been found elsewhere, although in smaller number and often different types.[57] Most swords are not well enough preserved or documented to assign a sub-type, but Ninglang, Yanyuan, and Huili all held swords of Type A, while Type H swords were restricted to Huili. Composite swords are known from Yanyuan Gesa (Type Ac) and Laolongtou (Type I), Ninglang Daxingzhen (Type Ac), and Yuexi Liaojiashan (Type C), but are overall very rare. So are other composite weapons, such as composite knives (2 in Yongsheng Duizi) and dagger-axes (one from Yanyuan Maojiaba). Iron weapons and tools were found mostly in Yongsheng, Yanyuan, and Yuexi, and once each at Zhaojue Chike Boxixian and Xichang Xijiao Gongshe. Overall very poor in metal weapons and tools are graves from Dechang, Mianning, and Miyi, where mostly small objects such as bronze arrowheads have been discovered in a small number of graves. Graves in Ninglang and Puge held a few more bronze weapons/tools, but all of them came from

[57] Spear-heads in Huili are usually of Type A or B, in Yanyuan and Yongsheng Type Aa, Ab, and D dominate, while in Ninglang it is Type Ae, while Dechang and Xichang exclusively held bronze and iron spears of Type C. Type F *yue* axes were found both in Ninglang and Yanyuan, while Type I seems to be exclusive to Huili, and Zhaojue Eba Buji revealed a single specimen of Type J.

one site each (Ninglang Daxingzhen and Puge Xiaoxingchang). Altogether only 15 bronze weapons were discovered throughout Xide, Yuexi, and Zhaojue, mostly bronze knives from Xide Lake Sihe, and a few bronze and iron knives from other sites.

Unequivocal metal tools are extremely rare and among them *fu* bronze axes are in the overwhelming majority (17), most of them from Yongsheng Longtan (8) and Ninlang Cunyi (5), with single occurrences in Yanyuan Gesa, Laolongtou, Zhushiba, and Xichang Xiaohuashan. Single bronze chisel are known from two graves in Laolongtou, one bronze sickle was found in Xiaohuashan M1, one iron spade in Xichang Xijiao Gongshe, one fish hook at Yongsheng Duizi, one bronze burin in Laolongtou M6, and 4 bronze hoes at Yongsheng Longtan. The majority of graves contained neither tools nor weapons made of metal, but a considerable number contained metal ornaments, showing that the difference to the graves containing metal weapons/tools probably lay in burial custom. These graves include Puge Amucun M2, Xiaoxingchang M2 and M4, most graves at Xichang Bahe Baozi, Xide Lake M1, some graves in Yongsheng Duizi, and Zhaojue Chike Boxixian and Erba Keku, as well as a very small number of graves from Huili Fenjiwan and Guojiabao, and Mianning Tianba.

V.7.2.2 Weapons and Tools made of Stone, Bone, and Clay

Compared to what was found at settlement sites, stone weapons and tools are very rare in graves (Table 5.83). Most common are arrowheads (64), just as it is the case among bronze weapons; additionally, in Ninglang Daxingzhen M5 two wooden arrowheads were found, and 3 bone specimens occurred in Puge Wadaluo M3. Overall, arrowheads of different kinds have been reported from more graves than settlement sites and in greater number, but nearly all types and subtypes occur in both kinds of sites with no noticeable difference in execution or choice of material, showing that they were weapons used in both everyday life and burial. That they are less often found in settlement sites is easily explained, as using small projectile points often leads to their loss or breakage. Interestingly, net weights, which occur in some settlement sites, have never been found in graves, showing that there was a considerable perceived difference between hunting and fishing. While arrowheads seem to have had a symbolic significance defining to a certain extent the identity of an individual and/or providing him/her with a means of subsistence (s)he could exploit on his own, net-fishing might have been conducted in groups and/or not have any specific symbolic value attached to it that would connect it to an individual's identity.

Not surprisingly, woodworking tools (axes, adzes, chisels) occur much less frequently in graves than in settlement sites and in much smaller numbers. Although most form types are represented, material and execution tend to be particularly fine, and special material (nephrite, quartzite, very fine igneous rock) and color (grey-green, white, yellow) are preferred, indicating a special symbolic function and production of these objects especially for the grave, instead of an interment of objects of actual use. Some of these objects are furthermore particularly large or particularly small, while the arrowheads are normal-sized. The knives (nearly all of them double- or single-perforated) found in a small number of graves, are not very different in form or execution from those retrieved from settlement sites and do even have signs of usage (striation, damage of the blade and/or sides). They are never sickle-shaped or rectangular, but they occur in all other forms and are of medium size, indicating that they might have been personal tools rather than harvesting sickles. Unequivocal agricultural tools such as shovels, plows, or ring stones, have never been reported from graves, showing that activities connected with such tools did not have a symbolic meaning extending into the grave and/or afterlife of the individual.

Clothes production, on the other hand, seems to have been of great importance, especially were spindle whorls were involved. Ceramic spindle whorls are over ten times more numerous in graves than settlement sites (83 vs. 8), while stone spindle whorls are more common to settlements, but still very rare. Nevertheless, aside from the few peculiar pill-shaped or octagonal spindle whorls, all other types occur at both kinds of sites, both in fine ware and coarse sand-tempered ware and in all colors. It is remarkable that 22 ceramic spindle whorls came from the single grave of Huili Leijiashan M1, while most other graves contained only 1-3 spindle whorls. In general, spindle whorls are more numerous in Huili than in any other region. They are not uncommon in the Anning River Valley either, while they occur very rarely in other areas, showing a clear regional bias (46 spindle whorls were found in Huili, 30 in Xichang, 6 in Mianning, 4 in Yongsheng, 3 in Dechang, 2 in Zhaojue, 2 in Puge, and 1 in Ninglang). Needles, awls, and drills are equally rare at grave and settlement sites, while coarser tools are considerably more common in settlements, but they are not completely missing from graves either.

A single scraper and one single microlithic cutter were reported from Huili Leijiashan M1, but it is unclear if they are really part of the assemblage or just happened to be in the grave fill. The 13 handstones, six grinding rollers, four pestles, and single grinding slab retrieved from the same grave, however, are considerably to large and numerous to be explained in the same manner. Grinding rods are overall more numerous in graves than at settlements, both in the perorated and the un-perforated version, and their placement in the hip area of the dead makes the interpretation as personal sharpening tool rather likely. All types occur both in graves and at settlement sites, and they are all of similar material, quality, and size, showing that they were tools used in everyday life and at the same time personal belongings or even part of the attire that had to accompany the deceased into the grave. Pestles found in graves, which are mostly of the small variety of type A and finely smoothed, might find a similar explanation. The same applies to the varieties of grinding slabs and handstones found in this and other graves. These tools are usually only around 10 cm long, smooth, and of fine grey granite. Even the five choppers retrieved from graves are below 10 cm in length, but of coarse quality as their function demands. All of these objects might therefore be personal tools, some of which might have been carried around in a pouch as part of the personal equipment, and which were either seen as too closely linked to the individual or too necessary even in the afterlife to be taken away in death.

When considering which of these weapons and tools were found together in the same grave, the picture is not very clear (Figures 5.107-5.109). Many of object types such as scabbard tips, iron points, or spades are too rare to be used for any statistical calculations and I therefore mainly consider artifact types that occur reasonably often. Furthermore, I am mainly differentiating by functional types and not by raw material used. It is not surprising that the only observed scabbard tip would be found in a grave containing two swords (Yanyuan Gesa M1). The very few bronze *ge* discovered so far are all from Yanyuan and all associated with a sword as well as a considerable number of other metal weapons, mostly bronze arrowheads, but also spears and more rarely knives or *yue*, and a lesser number of stone weapons or tools. All these graves, most of them located at Laolongtou are rather exceptional in the number and quality of metal weapons they hold. The same applies to most but not all of the graves containing spear-heads mostly made of bronze and more rarely wood. The spears were mostly observed in Yanyuan, Yongsheng and Ninglang, mostly in combination with metal swords, knives, arrowheads, and sometimes *yue* or *fu* axes, but only rarely with stone weapons or tools. A major exception are two megalithic graves with multiple interments, Xichang Xixingcun M1 and Xijiao Gongshe M1, which held spindle whorls, stone knives, and agricultural tools, but this might be due to the fact that a wide range of different people with different belongings and/or attributes were interred here.

Another exception is Huili Fenjiwan M3, where a spear of relatively high quality and elaborate decoration was found associated with two bracelets (one of bronze, the other of nephrite), and a single-handled ceramic vessel. The graves in Fenjiwan are generally very poor not only in metal objects but also in stone tools or weapons, probably due to specific burial rituals not necessarily requiring the interment of weapons or tools. As spindle whorls are often seen as a female attribute or at least as an object category associated with the domestic sphere as opposed to hunting or combat, it is necessary to consider the association between spindle whorls and these other categories. The majority of spindle whorls do indeed occur in graves that do not hold any weapons, and only two of these grave contained grinding rods but no other tools. Most graves in which spindle whorls are associated with stone arrowheads and or other weapons made of metal or stone, are multiple burials that might have held both male and female interments (these graves are Xichang Bahe Baozi M1, Side Lake Sihe M6 and M8, Xichang Xixingcun M1, Xijiao Gongshe M1, and Yuanjiashan M1). The only single graves combining spindle whorls and weapons are Yongsheng Duizi M106, which has not been published, and Huili Leijiashan M1, which was only partially excavated, making it difficult to judge the nature of these finds (Yongsheng Duizi M106 is a stone-construction grave containing 1 composite knife, 2 bronze arrowheads, 1 bronze spear-head, 1 spindle whorl. Huili Leijiashan M1 is an earth-pit grave containing 114 ceramic vessels, 13 stone arrowheads, 5 grinding rods, 1 stone axe, 12 handstones, 4 pestles, 2 flake tools, and 22 spindle whorls).

What remains remarkable for most single graves is the separation of spheres between clothes production and hunting/armed combat. Bronze arrowheads and spearheads often occur in the same grave, while arrowheads of metal and other material only rarely occur together, possibly due to chronological differences. On the other hand, no clear correlation can be seen between arrowheads and other weapons/tools. Metal knives can occur with all kinds of weapons, but hardly ever with woodworking tools, grinders, or production tools, and rarely with spindle whorls, indicating that they were a personal weapon/tool rather than part of a tool set used in object production or food procurement. Half-moon shaped stone knives are very rare in graves and are often combined with food processing or procurement tools, which are equally rare in graves but common in settlements. In graves, woodworking tools are usually associated with grinding equipment and sometimes arrowheads, but hardly ever with spindle whorls or metal weapons, indicating separate spheres of occupation. Somewhat puzzling are grinding rods; they have mostly been found in multiple burials, making it difficult to judge their association with other object types, but they were often placed in the hip area of the deceased, suggesting a function as personal tools. In most graves they are associated with metal knives, sometimes with swords or arrowheads, indicating that they served as sharpening tools for weapons; however, in three graves they were not accompanied by any weapons or tools but only by spindle whorls in and ceramics or personal ornaments (Dechang Arong M4, Huili Miaozi Laobao M1, Xichang Hexi Gongshe M4, and Wanao M2). These rods might thus have served as a personal tool fulfilling a variety of functions not limited to sharpening weapons.

V.7.3 Personal Ornaments and Clothing Application

Just as weapons and tools, personal ornaments and clothing applications can be made of metal, stone, bone, or more rarely wood or other material. Most common are ornaments made of metal, followed at a considerable distance by stone ornaments (mostly semi-precious stone, e.g., agate, turquoise, rarely nephrite), objects of bone, tooth, or shell, and finally frit and wood (Table5.84). The various object types and subtypes have been described in detail in Chapter III and the information does not need to be repeated here. Instead, they shall be described by functional category and relative frequency of occurrence at different sites.

The four major object categories that can be distinguished are various types of ornaments worn around the neck, hair ornaments, clothing applications (including buttons, belt ornaments, belt buckles, ornaments sown onto clothes), and ornaments of unclear function (Tables 5.85-5.87). Various kinds of rings are overall most common, both in number of objects and number of sites of occurrence. Ornaments worn around the neck (mostly beads made of semi-precious stone, bone, or more rarely metal or frit) occur at just as many sites but in considerably larger number. The same holds true for clothing ornaments. Hair decoration, on the other hand, usually only occur single or in sets of 2-4 unless they are associated with multiple interments.

The number of graves with ornaments as well as the amount of ornaments found in individual graves in Huili are fairly limited, with the sole exception of Guojiabao, where a large number of turquoise beads and bronze clothing applications were found. Many sites in Zhaojue are devoid of ornaments as well, and those graves that do contain decorative elements mostly hold only single fingerings, earrings, and more rarely beads or pendants. At Yongsheng Duizi, at least half of all graves yielded at least some ornaments, and a few graves are particularly rich in beads and shells, while most other sites in Yongsheng are completely devoid of decorative object. The same holds true for Yanyuan, where Laolongtou M4, M6, M9, and M11 remain unrivaled in their richness of clothing applications and personal ornaments. Throughout the Anning River Valley, numerous graves did not yield any personal ornaments at all (e.g., Xichang Lizhou), while other graves contained considerable numbers of bracelets, hair ornaments, and beads;

however, all of these seemingly richer graves are multiple burials, and each individual was therefore presumably only equipped with a small number of decorative objects.

Belt hooks and belt ornaments occur only in a small number of graves, always in combination with buttons and/or other clothing applications (Yanyuan Laolongtou M6, M9, Xichang Xijiao Gongshe M1; see Figures 5.110-5.111). Clothes with non-organic belts were therefore probably not very common. Clothing applications and/or buttons were more widely distributed, mostly in Yanyuan, Ninglang, and a few multiple burials in Xichang and Mianning. Clothing applications were mostly found in rich graves and are often associated with hair ornaments (e.g., in multiple burials in Xichang, Puge, and Dechang, and single burials in Yanyuan and Yongsheng). Beads, pendants, and perforated tusks or shells often occur together and sometimes in large numbers, which suggests that they were originally assembled in one or several chains. As many ornaments were found in multiple burials in between the bones, it is impossible to tell how many ornaments belonged to each individual. It is remarkable, however, that the majority of single burials was devoid of personal ornaments (284 vs. 57), while more than half of all multiple burials contained considerable amounts of decoration elements.

The discrepancy in the occurrence or non-occurrence of personal ornaments at different sites and in different regions is not necessarily a direct reflection of a difference in dress, but might only show differences in burial customs. While it seems fairly certain that the people buried in the megalithic graves were mostly placed in there fully clothed and ornamented — be it in their daily attire, in festive clothes, or in an outfit only meant to be worn in death — for other grave types it might have been customary to place the deceased in the grave only wrapped in cloth or at least without any jewelry. The latter kind of rule might have been observed at the earth-pit grave cemeteries of Xichang Lizhou, Yingpanshan, and Mianning Xiaogoudi, as well as with earth-pit and various stone-construction grave sites in Yanyuan, Huili, and Luquan.[58] Megalithic graves and stone-construction graves with multiple interments are hardly ever devoid of personal ornaments. The only exceptions are Yuexi Que'ershan, Xichang Yanjiashan and Yuanjiashan, and Xide Wadegu, however, as these graves all hold only very few objects, it might simply be a difference in wealth rather than burial custom. Remarkable is Huili Leijiashan M1, which held a large number of ceramic vessels and spindle whorls as well as stone tools but was completely devoid of personal ornaments. As no human bones were found while the grave was only partially excavated, it is unclear if the lack of personal ornaments indicates the absence of a body or just shows that the body did not bear ornaments. Remarkable is also Huili Fenjiwan, where only five graves held any ornaments, mostly single bracelets or rings of metal or stone either combined with a single ceramic vessel or metal weapon or without further ornaments. None of these graves had any special features, installations, or other artifacts that would explain the presence of these ornaments. They might therefore be a personal note either requested by the deceased before death or given by the mourners as *Liebesgabe*.

V.7.4 Potential Ritual Objects and Other Items

Apart from objects clearly identifiable as weapons, tools, or personal ornaments, some graves held rather particular objects whose function is less easy to ascertain. Calcinated ropes have been reported from four graves in Zhaojue (Erba Keku M2 and M4, Pusu Bohuang M4, Wazhaishan M1), a particular local custom not observed elsewhere. Flat oval cobbles placed in the head or pelvis area of the deceases are significantly more common and have mostly been found at Huili Fenjiwan (39 graves with 1-4 stones each), indicating a local tradition. One flat

[58] These sites are Yanyuan Maojiaba, Xiaohebian, Wushidi, Yingpanshan, Luquan Yingpanbao, Huili Leijiashan, Miaozi Laobao, Washitian, and Xiaoyingpan.

oval cobble was found in Yanyuan Haimatang, while one stone ball was reported from Huili Leijiashan M1, and two and three such balls each came from Yanyuan Laolongtou M4 and M9. This connection between graves that are otherwise so different, both in form and content and location, is rather puzzling, especially considering the high mountains and deep river valleys that lie between them. The stones at these different sites might therefore be the outcome of separate traditions leaving similar traces in the archaeological record.

The only other objects aside from the stone ball that connects Laolongtou M4 with Huili, are the Shizhaishan drums and the *bianzhong* bells in the object pits at Guoyuan, Luoluochong, and Zhuanchangba. *Bianzhong* bells have not been found anywhere else in the Liangshan area, and drums are otherwise only known from Yanyuan Maojiaba M1, Yanyuan Yanjiaqing, and the antiquities market. Interestingly, the drum in Laolongtou M4 is paired with two *fu* metal vessels of drum-like shape, and Yanjiaqing yielded five similar objects as well, speaking of a very similar if not identical burial tradition probably connected to Guizhou and/or Yunnan, were the Shizhaishan type drums originate. As the drums in Huili were not found in graves but metal deposits, they had a rather different function which will be discussed in Chapter VI.

Yanyuan Laolongtou M4, M6, and M9 each contained one or two small coarse *ling* bells found in the pelvis area of the deceased and likely worn on their belt. Similar bells have been reported from only ten other graves, both in earth-pit and stone graves the Yanyuan/Yongsheng area, and associated with multiple burials in megalithic graves in far-away Xichang and Xide.[59] World-wide and both in past and present contexts, such bells are commonly associated with shamans and their costume (Walter and Neumann Fridman 2004:Vol. 1, p. 60; Eliade and Trask 1964), and it is therefore likely that the individuals wearing such objects had a special function.

[59] Xichang Bahe Baozi M1 (2 small bells), Xichang Beishan M1 (1 bell), Xichang Hexi Gongshe M2 (5 bells), Xichang Xijiao Gongshe M1 (3), Xide Guluqiao M1 (1), Xide Lake Gongshe M8 (3), Yongsheng Duizi M15 (2), and Yanyuan Yingpanshan M1, M5, and M7 (1 each).

The graves with such bells at Laolongtou are remarkable rich and bear every sign of having housed special individuals, while the graves in Xide and Xichang all were multiple burials making no visible distinction between the people interred therein (the material from Yongsheng Duizi and Yanyuan Yingpanshan is not sufficiently published to make such observations). The social status of people wearing such bells in these two areas must therefore have been very different – at least as reflected in the grave. Overall, such bells are rare in both regions, indicating that they were probably not simple ornaments but imbued with special meaning.

Laolongtou M4 is the only scientifically excavated grave from the research area containing horse gear and ornaments, while all other known examples of such objects have been retrieved from the antiquities market in Yanyuan and Huili. In this grave, the horse gear was associated with two hose skulls and horse long bones as well as body armor and a large number of weapons, an assemblage indicating the involvement of the tomb occupant in combative activities involving horse-riding. Armor has also been reported from two other graves in Yanyuan, as well as one in Xichang and one in Zhaojue (Yanyuan Laolongtou M5, Yanyuan Maojiaba M2, Xichang Xixingcun M1, Zhaojue Eba Buji M1). Most of these graves likewise contained armor, but except for Laolongtou M4 and Yanyuan Maojiaba M2, none of the other graves was especially richly equipped, and Xichang Xixingcun M1 is not even a single burial but contained over 100 skeletons. Although body armor is rare, it is therefore clear that it cannot be used as the sole indicator of status or function in society of the individual interred with it.

Han-style bronze seals are even rarer, occurring only in Yuexi Huayang M1 and Xide Lake Sihe M8. Huayang M1 was a small earth-pit grave and Lake Sihe M8 a megalithic grave with multiple interments, but both contained metal vessels and other objects clearly showing Han cultural influence. The seals do not show any writing on them, indicating that they had no practical function but a purely symbolic meaning and/or may have imitated Han customs without grasping the full meaning. Xide Lake Sihe M8 furthermore contained a single Han coin, so did M1 at the same site and nine other graves in Xichang, Zhaojue, Miyi, and Yanyuan.[60] In all cases, the coins were associated with other Han-style objects as well as items and/or burial customs of local origin. Aside from Zhaojue Chike Boxixian M1 where three coins were placed at the left side of the grave, the coins were found in between the bones in no recognizable order. They might have been contained in pouches attached to the clothing of the individuals interred in those graves, or they might have been placed or thrown into the grave during the burial ritual. Their small number (mostly 1-4, rarely 8-9) does in any case indicate that the coins probably had a symbolic or even decorative function and were not interred for their monetary value.

A singular find that deserves mentioning is a heap of bronze slag in Xichang Wanao M2, a megalithic grave with no identifiable human bones but a number of ceramic vessels, a single perforated grinding roller, and some agate beads. It is very likely that this grave was used for multiple interments over a longer period of time, but the number of objects retrieved from it is small and there are no metal objects among them, making the occurrence of bronze slag rather puzzling. It is conceivable that this phenomenon was not correctly observed and that the so-called slag was actually a bronze object exposed to a fire during ritual acts. As the remains were not collected and no photographs have been published, the case remains unclear.

V.7.5 Raw-Material Choice

One more factor that needs to be considered apart from object types is raw material. When connecting the different grave types with the kind of material they contained, no specific

[60] These graves are Miyi Tianba M1 and M2, Xichang Hexi Gongshe M3, Xide Guluqiao M1, Yanyuan Caojiawan M4, Zhaojue Chike Boxixian M1, M3, M4, and M6.

pattern for bone/tooth, stone, or other material can be discerned, but for metal and ceramics there are some clear differences. The majority of earth-pit graves contain ceramics, but most do not hold metal, while the majority of megalithic graves contain metal objects but ceramics occur less frequently (Tables 5.92-5.96). About one third of the stone-construction graves held metal objects and about 2/3 contained ceramics. A considerable number of earth-pit graves and many stone-construction graves held only ceramics, while most megalithic graves held at least some ornaments and/or weapons/tools made of stone, metal, or bone. As to be expected, the overall number of objects for megalithic graves with multiple interments is much higher than for other kinds of graves, but the majority of these artifacts in megalithic graves are various kinds of ornaments and weapons, while ceramics are considerably more numerous in earth-pit graves.

From the regional point of view, it is remarkable that metal occurs by far the most often in Yanyuan and mostly in the form of weapons and to a lesser extend clothing applications, while in Xichang metal is nearly equally frequent, but occurs mostly in the form of hair and body ornaments. The graves in Huili are poor in metal objects, with only a small number of bronze weapons and arm-rings, but no iron, composite objects, silver, or gold. This is especially remarkable as Huili is rich in metal resources, and remains of metal production show that bronze was worked locally. Iron and composite objects are rare throughout the research area, occurring mainly at Yanyuan, Yongsheng, and Xichang, and nearly exclusively in stone-construction and megalithic graves. Objects made of agate, turquoise, nephrite, bone, tooth, or shell are distributed in a similar fashion. The only exception is the earth-pit grave of Huili Guojiabao M2, which contained 41 turquoise, 2 agate, and 1 nephrite bead, together with a ceramic spindle whorl and two bronze bracelets.

Double-handled jars are often associated with metal objects made of bronze, iron, or both. Composite weapons have been found only at a small number of graves located at opposite ends of the research area, i.e., in Yuexi in one case, and in Ninglang, Yongsheng, and Yanyuan in all other cases, mostly in stone-construction graves and associated with double-handled jars, belts and bronze applications, as well as with considerable numbers of metal and stone weapons and personal ornaments (Ninglang Daxingzhen M4, Yanyuan Laolongtou M6 and M9, Yanyuan Maojiaba M2, Yuexi Liaojiashan M1, Yongsheng Duizi M91 and M106). Given the occurrence of iron combined with the technique of joining of different metals, these graves are probably of a relatively late date and might have received outside cultural influence, although most likely from different directions, in Yuexi from the Han in the Chengdu Basin, and Yongsheng, Yanyuan, and Ninglang either from northwest Yunnan or from Northern Sichuan or the steppes.

Given how inaccessible Huili is both from the Sichuan Basin and from the Anning River Valley, it is not surprising that the grave assemblages there are be rather particular. Especially Huili Fenjiwan but also other sites in Huili mainly held a few ceramic vessels each, sometimes combined with stone tools but only rarely bronze weapons or stone ornaments. Nephrite ornaments, which are overall rare in the research area, occur at two sites in Huili; the same applies to shell, turquoise, and agate, indicating far-flung exchange networks. Nephrite is overall extremely rare, occurring only in the form of single beads, pendants, or rings/ring-segments in 13 graves in Huili, Zhaojue, Yanyuan, and Yongsheng. In some cases, bone might have been used to imitate this very rare material. Similarly, snail shells were perforated and strung in similar ways to cowrie shells, possibly substituting these rare items. Cowries have mainly been found at Yongsheng Duizi, and in the stone-construction gave M21 at Huili Xiaotuanshan, while a single shell has been found in Zhaojue Erba Keku M11. Furthermore, Yanyuan Laolongtou M11 contained a few oyster shells, probably a food offering. All of these places are very far from oceans where such animals may live. Yongsheng and Yanyuan are at least close to Yunnan, were cowrie shells are frequently found in connection with Dian culture burials, and Huili has clear connections to Yunnan as well, but for Zhaojue the source of the cowrie shells is unclear.

Where frit objects or the knowledge of how to produce them might have come from is unclear, but they were not very widely available (Xichang Xijiao Gongshe contained 25 frit beads, and Zhaojue Erba Keku M3 revealed four blue beads that might have been made of frit or some kind of other blue stone). They might thus be the outcome of a local experiment or single instances of probably indirect trade or exchange with Southeast Asia or other regions were such beads were produced. The distribution of organic objects is even less telling, as it says more about preservation conditions than about burial customs. Wooden containers and arrowheads were only preserved in Ninglang, while Zhaojue Pusu Bohuang M3 held two wooden bracelets and M4 contained one organic bead. Several sites in Zhaojue furthermore revealed calcinated ropes that had probably been interred for ritual purposes. Further materials used for objects of clear ritual function are bronze (seen in the few drums, bells, and staffs), stone in form of flat stones placed under pelvis or head of the deceased in Huili and Yanyuan, and the head of what might be a ceramic figurine of a ram in the earth-pit grave Xichang Yangjiashan M2, making the instances too far and few between to draw any further conclusions. At least in the case of Huili, it is clear that the very smooth stones interred in a number of graves came from the nearby rivers, indicating their ritual/cultural significance.

Both agate and turquoise were used nearly exclusively in the production of beads found in sometimes large numbers in megalithic graves in the Anning River Valley, but also stone-construction graves in Yongsheng, and Yanyuan, while the earth-pit grave M2 at Huili

Guojiabao was the only grave in this area containing large numbers of turquoise as well as a small number of agate beads. Both kinds of material are used about equally frequently and in the same areas. As agate mostly occurs in small nodules in volcanic rock, which is widely found throughout the research area, it is likely that the raw material was found and worked locally, but it might just as easily have come from somewhere else. Yunnan has known rich sources of turquoise, so do Sichuan, eastern Tibet, and other areas in China; the material can be easily retrieved as it builds very close to the earth's surface through weathering and oxidation of pre-existing minerals, mostly in cavities in volcanic rocks as they appear throughout all of the area. Although physically attractive, both types of raw material were likely not very rare and could have been widely used for decorative items, mainly depending on cultural preferences.

Bone beads have a very similar distribution and shape; only in Puge do they outnumber agate or turquoise beads. Remarkably, Puge is the only place were perforated tusk ornaments occur in great number, showing a clear local preference for bone and tooth. Puge is until today densely wooded and arrowheads of bone, metal, and stone are common at sites in the area, indicating an economy at least partially relying on hunting, hence the importance of what are probably boar tusks. Bones and animal teeth are available everywhere and were widely used for ornament production. Only Huili is remarkably devoid of bone ornaments; here nephrite was used instead to make beads and flat rings. Similar small and larger flat rings as well as pendants have been found in small numbers in graves in Xide, Xichang, Yanyuan, Yongsheng, and Zhaojue, always single but usually accompanied by a number of beads of bone, turquoise, or agate, together building a complex chain. Perforated cowrie and snail shells were combined in chains as well. In Puge Wadaluo M1 and Huili Xiaoyingpan M21 they were combined with bone beads, while all other cowrie and snail arrangements come from Yongsheng Duizi. Zhaojue Erba Keku M11 held only a single perforated shell highlighting its special value.

Adzes, axes, and arrowheads found in graves are sometimes made of semi-precious material such as nephrite (Yongsheng), or particularly fine green igneous rock (Zhaojue), while at settlement sites igneous rock, fine serpentinite, or ideally obsidian, quartzite, or chert are more commonly employed for these kinds of objects (Tables 5.97-5.5.101). Interestingly, most arrowheads found in graves consist of fine dark-grey slate or shale; they are hardly ever found in settlement sites and are then mostly made of igneous or sedimentary rock.

Half-moon shaped harvesting knives usually made of fine slate commonly found in settlement sites hardly ever occur in graves; instead, graves hold bronze and sometimes iron or composite knives with a long handle that were clearly weapons and tools for personal usage with a decorative and probably symbolic component. Only a single D-shaped double-perforated bronze knife clearly imitating stone specimens found in Xichang Xiaohuashan M1, but this is a singular occurrence in a megalithic grave containing multiple burials with two half-moon shaped knives of fine igneous rock, two bronze arrowheads, as well as a bronze *fu* axe, a bronze sickle, one ceramic cup, and a number of bronze ornaments not clearly attributable to any specific skeleton. Although it is unclear if these objects all belonged to one or to several people, the assemblage emphasizes the importance of agriculture and other mans of food procurement, which also explains the presence of a harvesting knife in bronze that would have been not very useful in actual harvesting but of great symbolic significance.

Grinding rollers from graves are mostly made of slate/shale and sometimes from sedimentary or igneous rock, while this type of objects is rare at settlement sites and then mainly consists of igneous rock. It is therefore likely that grinding rollers were indeed part of the personal equipment of the interred. Grinding tools, coarse tools, agricultural tools, various production tools, and stone tool production debris as well as net-weights were rarely interred in graves in any kind of material but occurred often in settlement sites. This shows clearly that most production activities did not have a symbolic value or were deemed necessary to be conducted in the afterlife. The only exception was presumably the production of clothes, as ceramic spindle whorls were commonly interred in graves while they are rare in settlements.

When considering the employment of various stone material types separate by region, it becomes clear that over half of the coarse and nearly all of the fine-paste spindle-whorls are from Huili, with Huili Fenjiwan being particularly rich in stone tools of sedimentary rock and stone of unclear quality, while graves in Xichang held more objects of igneous rock than other sites (Tables 5.98-5.5.99). Nearly all artifacts made of fine slate or shale found in graves are from Yongsheng Duizi, while most bronze arrowheads are from Yanyuan and Yongsheng, followed by specimens in Huili and Xichang. Yanyuan is generally very rich in arrowheads of various materials, followed by Huili and Zhaojue, while grinding rods are most common in Xichang and Yanyuan, which might also explain the majority of igneous rock and various other kinds of stone material at both sites. Overall, the picture is not very unified and becomes a little clearer only in comparison with the settlement material. Settlement sites in Dechang are particularly rich in serpentinite, as well as various types of igneous rock and slate, while even chert and obsidian occur here as well as in Huili, albeit rarely. Huili and Xichang are likewise very rich in various kinds of stone tool mostly made of igneous rock and to a lesser extend slate, which can be ground in sites throughout the research area but in lesser numbers.

At least for burial objects, there is no strong regional bias for the employment of specific kinds of stone material, except for the greater usage of slate/shale especially for arrowheads in

Yongsheng, where the raw material widely occurs, as well as general preponderance of stone tools of any material in Xichang over all other areas, and the more common occurrence of river pebbles in graves in Huili. The interment of spindle whorls is likewise much more common in Huili than in any other area, which shows local particularities in burial ritual more than limitations in raw material availability.

V.7.6 Object Assemblages and their Distribution

The analysis of the co-occurrence of different kinds of object and their relationship with different grave and interment types is riddled with a number of problems. One of them is the great diversity of artifacts, many of which were found too infrequently to allow for statistic analyses. Furthermore, several kinds of objects such as beads or arrowheads occur in a variety of different materials while ceramic vessels such as jars and cups appear in a wide range of different types and sub-types, which could have been used interchangeably or in various combinations with different meanings attached to them. Another major problem is the difference in reliability of observations made for different graves: some have been re-opened and/or contain multiple burials and thus mixed assemblages, others were severely disturbed or insufficiently reported. I therefore analyze different subsets of graves separately, starting from graves with multiple successive interments were separate layers/assemblages could be distinguished, then comparing the results with multiple interments where these distinctions are unclear. In a next step, I conduct an analysis of small-group interments in graves that have not been re-opened, before turning to the single interments. In all cases, I start from the well-preserved and well-published material, analyzing it separately before considering less well-documented examples.

My main aim is to identify regularities in the co-occurrence between different artifact types and their connection with different interment types, grave constructions, and natural surroundings.

V. 7.6.1 Object Assemblages in Graves with Multiple Successive Interments

Only for a very few of the megalithic graves used for multiple instances of burial has the content been reported separate by layer. These graves are Dechang Arong M1, M3, and M4, Xide Guluqiao M1, Xichang Hexi Gongshe M2 and M3, and Wanao M1 and M2. All graves contain ceramics, personal ornaments/clothing applications, weapons/tools and sometimes other kinds of artifacts such as coins or *ling* bells, but they are unevenly distributed between the different layers (Table 5.102). At Xichang Wanao, Hexi Gongshe, and Xide Guluqiao the ceramics are highly fragmented and located in separate layers above the other object and human bones and some even outside the main grave chamber. This shows that the ceramics were not belongings of the deceased but objects used in rituals associated with the grave. They are thus *Nachgaben* and not actual *Beigaben* or *Mitgaben*. At Wanao, the ceramic assemblage consists of sets of many medium-sized jars and drinking vessels such as cups, beakers, or bowls, and at Hexi Gongshe and Guluqiao only single jars and goblets were placed into the grave.

At Dechang Arong, on the other hand, the vast majority of vessels were located in the lower layers of the grave, both in the front and the back, while only a few were found in the top layers, and other objects occurred in different layers in relatively small number. In these graves, the ceramic assemblages were richer and more diverse, always combining a number of jars, some handled vessels, beakers, and sometimes even ewers and vessels within the same layer. Especially remarkable is the large number of highly fragmented ceramics close to the door of M1 and the about equally large number of slightly better preserved vessels, The ceramics from the other graves at Arong are mostly broken as well, but not as severely damaged as those in the front part of M1. As there is evidence of burning within these fairly large graves, it is therefore likely that the ceramics were deposited in rituals conducted both deep within and in the front part of the grave, both during and after the actual burial(s). These rituals likely involved the consumption or at least libation of liquids, as the vessel forms indicate. Similar rituals took place at the other graves as well, but likely after the actual interment and/or outside the grave. Nevertheless, all graves at Wanao and Arong M1 and M4 show scorch-marks and other instances of burning inside the grave, and the bones at Guluqiao were re-arranged and piled in the back, indicating that all the graves were actually re-entered and not just re-opened. Furthermore, all of these graves are rather large and have a height of 1.7-2 m, allowing for a person to stand comfortably in them, indicating that they were meant to be accessed.

As the bones are too heavily deteriorated, it is not possible to ascertain how many individuals each of the graves with known layering held and which objects may actually have belonged to the which person. Nearly all layers contained more than one ornament (mostly different rings, beads, and hair ornaments with no particular preference the combination of elements); weapons and tools (metal knives, arrowheads, grinding rods) can occur with or without ornaments. The largest number of ornaments was found within the re-arranged stack of bones of Xichang Guluqiao M1 (38), combining various types of rings and beads with several bronze knives, probably belonging to several individuals. The large number of ornaments in the lowest layer of Wanao M2 (36) is likewise problematic as nearly all of them are very small bone beads of similar shape and size, which either belonged to the same necklace or to several ornaments worn by a number of individuals. As most of the ornaments from this and other graves are small, they and can easily have become dislocated and their position in specific layers might not reflect their original placement.

More useful than a description of the vertical distribution is therefore information on the horizontal arrangement of objects in megalithic graves (such observations are available for Xichang Hexi Gongshe M2 and M3, Xijiao Gongshe M1 and M6, all excavated graves at Xichang Guoyuancun, Tuanbao, and Tianwangshan, as well as Xide Lake Sihe, Puge Xiaoxingchang, and Miyi Wanqiu). Both Tianwangshan and Tuanbao provide evidence for ceramic vessels occurring outside the grave instead of within, identifying them as *Nachgaben*, while in all graves at Lake Sihe and Xiaoxingchang the ceramics were found inside the grave in between the bones, but mostly in a fragmented state indicating that they might have been used in ritual drinking or libation ceremonies inside the grave, being *Nachgaben* as well. The only megalithic graves from which large numbers of mainly intact vessels are known are Miyi Wanqiu M1 and M2, where both objects and human skeletons were neatly arranged in the back of the grave. Several larger vessels furthermore contained smaller vessels and personal ornaments such as beads, showing that they were intended for the use of the deceased. The assemblage at Wanqiu is furthermore rather different from what is seen at most other sites, with a large number of decorated double-handled and single-handled vessels, accompanied by a number of cups, beakers, ewers, and vases, but a very small number of personal ornaments or weapons. A similar assemblage with handled jars of the same types (types C and D), albeit in much smaller number, is otherwise only known from Dechang Arong M3, where the vessels were likewise clustered along one wall and in better preservation condition than in M1, where ceramic sherds were scattered throughout the grave and in the entrance area. Miyi Wanqiu M1 and M2 and Dechang Arong M3 thus seem to share similar burial rituals and ceramic assemblages somewhat different from what is seen in most other graves, while the personal ornaments found in most megalithic graves are fairly similar to each other.

The majority of personal ornaments in these as well as in all other megalithic graves were found in between the human bones and scattered throughout the grave, indicating that they were still on the bodies when the bodies were interred (reported from all excavated graves at Xide Guluqiao, Xichang Bahe Baozi, Lake Sihe, and Xijiao Gongshe). From Xichang Xijiao Gongshe it was even reported that most of the head ornaments were located around the skulls, the earrings next to the necks, and the bracelets and fingerings on arms and hands, showing clearly a primary burial with personal ornaments. Other objects found between the bones are bone needles, indicating that they might be tools or dress pins (reported from Xijiao Gongshe), metal weapons, especially knives (this placement was observed in all graves at Xide Lake Sihe and Guluqiao, Miyi Wanqiu, Xichang Xiaoxingchang, and Miyi Wanqiu), stone weapons and ceramic spindle whorls (in various graves at Xide Lake Sihe), while *ling* bells were always found between the bones and — were observed in such detail — always in the pelvis area, hence their assignation as parts of the personal attire rather than separate ritual objects (observed at Xide Lake Xihe M8, Guluqiao M1, Xichang Bahe Baozi M1, and Hexi Gongshe M2). Han coins occurred only very rarely but then always between the bones, be it as objects kept in a bag attached to the clothes, on a chain as a talisman, or placed with the deceased in some kind of ritual function. Only at few graves were any of these objects deposited separate from the human bones. At Xiaoxingchang BM1 a bronze sword together with three perforated boar's fangs had been deposited next to the door, identifying the assemblage as a ritual offering rather than a *Mitgabe*. The other perforated tusks found in this and other graves at the same site were observed as lying in between the bones as a personal ornament of possible talismanic function, showing that the same kind of object can be used differently, even within the same grave. In Xichang Hexi Gongshe M2, several different groups of objects could be identified, consisting of ceramic fragments in the front part, and six separate piles of several object in the rear part, which probably each belonged to a different individual buried in the grave. This grave therefore provides the clearest evidence currently available for object sets within megalithic graves. The following assemblages can be discerned:

a) 2 bronze bracelets, 2 bronze knives, 1 bronze bracelet, 1 bone bead (in one pile at the rear wall);
b) 2 bronze knives, 2 bells, 1 grinding rod (separate pile toward the back);
c) 1 bell, 1 bracelet (on the side);
d) 2 knives;
e) 1 bell; and
f) 1 grinding rod (each on the opposite wall in separate piles).

If these observations are correct and these objects indeed belonged to one individual each, then it becomes clear that a single person usually was equipped only with a limited number of ornaments and personal weapons/tools, while many individuals might not have had any objects of imperishable material on their person at all. This impression is confirmed by the uneven but usually rather small number of non-ceramic objects found in graves with large number of skeletons, which were accompanied by a comparatively small number of objects (examples are 35 ornaments and no weapons/tools for over 125 people in Puge Xiaoxingchang BM4, and 2 ornaments and 1 weapon for 10+ people in Xide Lake Sihe M1 and M7; see Table 5.103). Some, on the other hand held more ornaments than people, showing that one person could indeed have more than one ornament (e.g. Puge Xiaoxingchang M1, Xide Guluqiao M1). Weapons and tools, on the other hand are more rare. It is therefore unlikely that one person had more than the 1-3 observed at Hexi Gongshe, while many corpses were buried without any objects.

There is a considerable difference in assemblage between graves even within the same site, some holding only ceramics, some only personal ornaments and/or weapons/tools, others a combination of both. No clear correlation can be discerned between the presence/absence of these different object groups, the number of people interred, the grave form, and the location. It is remarkable that the graves at Xichang Wanao and Dechang Arong as well as Miyi Wanqiu are considerably richer in ceramic vessels than those at other sites; at the same time they hold a number of personal ornaments and weapons. It is noteworthy, that all graves with particularly large numbers of ornaments were found next to graves with very few or no ornaments at all, even though all of them housed a considerable number of corpses (Xichang Xijiao Gongshe M1, Puge Xiaoxingchang BM1, BM2, and BM4, Xichang Bahe Baozi M1, and Xide Guluqiao M1). This discrepancy suggests that either different subgroups of the same population — probably different social groups as men and women seem to have been interred in the same graves — were buried in separate graves within the same site, or that there is a chronological difference.

As there is hardly any overlap in object types between these graves, their relationship is difficult to ascertain, but it is noteworthy that at Puge Xiaoxingchang the graves with large number of ornaments but few weapons were located slightly apart from those containing mainly weapons and tools. Those graves containing ornaments also held swords, arrowheads, and grinding rods, but not knives, while the graves without ornaments mainly contained knives and arrowheads as wells spindle whorls and various stone tools; this shows that the stereotypical split between "warrior" and "craftsperson" or "male" and "female" spheres of life expressed in a combination of jewelry and spindle whorls on the one hand and weapons and tools on the other is not applicable here. Granted that the sword and the \ bracelets in Xiaoxingchang BM1 might have belonged to different people, the separate assemblages at Hexi Gongshe nevertheless show that ornaments and weapons/tools could be worn by the same person.

When creating cross-tabulations and conducting correspondence analysis, it becomes clear that nearly all kinds artifacts in megalithic grave can occur together in the same grave, but some regular co-occurrences are discernible (Tables 5.104-5.106; Figures 5.112-5.115). Vases and cups/beakers often occur together, indicating a functional set for drinking. The regular co-occurrence of *fu* vessels and coins — both of them clearly Han-type objects — are hardly happenstance, but a chronological marker that indicates contact with the Han cultural sphere. (observed at Miyi Tianba M1 and M2, Xichang Hexi Gongshe M3, Xide Lake Sihe M1 and M8) The same applies to the bronze seal found in Xide Lake Sihe M8 together with a bronze coin.

Grinding rods always appear next to metal weapon/tool, but with no special preference for knife, sword, or axe, reaffirming the function of personal sharpening tool inferred above. That the only grave containing pieces of body armor (Xichang Xixingcun M1) additionally held a considerable number of weapons is not surprising, but these objects were associated with metal bracelets as well, showing that ornaments and weapons did not exclude each other. Indeed, bronze knives usually occur next to various rings as well as *ling* bells, while swords are more commonly associated with clothing application, hair ornaments, bracelets, and beads. It is therefore not unlikely that swords and knives had different functions and meanings, one being a weapon worn by a small number of people with richer clothes and more elaborate hair-do, the other a personal tool used by a larger number of people who only wore a few rings for decoration.

Arrowheads occur in various different combinations and have no strong link to any other object group. Coarse stone tools and wood-working tools are often associated with arrowheads, but they are overall too rare for these co-occurrences to have statistical significance. The same applies to spindle whorls, which have been found in small numbers in about 20% of the megalithic graves and co-occur with all common object types. More significant is the fact that buttons and other clothing applications are always associated with a considerable number of personal ornaments of all types, especially hair combs and needles, but also different kinds of beads and rings, indicating that clothing ornaments were reserved for overall more richly equipped individuals. Many of these graves furthermore contained various kinds of flat or collard discs and disc-segments usually made of bone, or more rarely bronze; these objects are very rare, having been found only in a few graves; as they remind of objects known from the Sichuan Basin and the Central Plains, it is likely that they are rare and possibly foreign objects (the graves are Xide Guluqiao M1, Xichang Bahe Baozi M1, Xiaohuashan M1, Puge Xiaoxingcheang BM1).

In contrast, bracelets, mostly made of bronze, are the most common type of personal ornament, occurring in 22 graves, some holding only one, others as many as 10-30. Beads are a very common type of ornament as well, but there are differences in the preference for different kinds of raw material, with turquoise and agate hardly ever appearing in the same grave but nevertheless often at the same site. As beads usually occur in groups of 3-30 specimens of nearly identical form within the same grave, it is reasonable to assume that they were usually strung in chains with a preference for a homogenous appearance of the resulting ornament. It is therefore very likely that in most graves only one or two people were equipped with such an ornament.

Overall, this great variability in material remains associated with graves used for several instances of interment and associated rituals allows for a number of conclusions. In spite of all diversity, there is a certain regularity in the ceramic assemblage and placement of objects cutting across grave forms, with certain behavioral differences that might be regional and/or chronological. In general, megalithic burials were used for multiple successive interments of larger or smaller numbers of people that involved a great amount of ritual, both during and after the actual burial, consisting of communal drinking practices and ritual acts involving fire and sometimes a re-entering of the grave and/or a re-arrangement of the bones of previous interments. Only in very few instances were ceramic vessels used as containers for *Beigaben* for the deceased. Instead, ceramics were mostly employed in related rituals, entering the grave as *Nachgaben*. While the burial ritual might have been involved and possibly even strict, there seem to have been no definite rules as to the *Mitgaben* accompanying the dead in multiple interments.

As no clear object sets are identifiable, and as personal ornaments as well as clothing applications and small amounts of weapons and tools were found in between or still on the bones, it is very likely that the deceased were simply buried in their usual attire. Different social or other groups might have been buried in different graves — hence the difference in assemblages between neighboring graves — but men and women were buried together. All objects addressed here as ornaments might of course just as well have a talismanic function protecting the deceased in this life and the next, but judging from the sets of one or two knives and bracelets at Hexi Gongshe, it is very likely that they went to their dead equipped in similar fashion as in life. Certain amounts of use-wear have been observed on some weapons and tools, while some of the beads are unevenly flattened on one side, indicating wear through friction on clothes over extended periods of time, thus supporting the assumption that these were objects that had belonged to the deceased in life, i.e. true *Mitgaben*. Less clear is the case of the sword deposited close to the door of Puge Xiaoxingchang BM1 together with three boar tusks, clearly not objects worn by a person in the grave, but possibly belonging to them all the same. Nevertheless, this assemblage might just as well be a magical bundle or other kind of offering or even a spontaneous gift (*Liebesgabe*) given in a single case without following specific rules or customs.

Overall, the assemblages in the megalithic graves thus reflect communal rituals that re-affirmed bonds within a certain group by burying its members together, while leaving a certain freedom for expression of individuality in personal attire and possibly spontaneous gifts. Only the megalithic graves at Xichang Dayangdui deviate from this pattern; they were probably used for a single instance of interment and only contained very few skeletons and no objects except for ceramic urns. The burial ritual in this case was therefore rather different in nature to what we see in other megalithic graves, but possibly more similar to the small-group interments in graves that were not re-opened. These will be discussed in the next two sections.

V. 7.6.2 Object Assemblages associated with Small-Group Interments

V. 7.6.2.1 The Graves of Zhaojue

Only very few graves used for a single instance of burial contained more than one skeleton, all of them a stone-construction graves in Zhaojue, Yanyuan, and Yongsheng. The graves in Zhaojue are nearly empty and made in a simple fashion out of coarse stone slabs, with at least one of the graves containing a secondary interment, while the graves in Yanyuan all have a very complex structure and a rich assemblage consisting of large numbers of weapons and ornaments accompanied by a few ceramic vessels, associated with primary interments.

Even in Zhaojue itself, there is a considerable difference between the graves from Chike Boxixian and Pusu Bohuang. Chike Boxixian M3 belongs to Type 5.1.1 of stone-construction graves, consisting of brick-like layered rectangular stones for the walls, large slabs for the cover, and several slates lining the floor. At least nine skeletons were interred here as secondary burials, the long-bones arranged in several piles throughout the grave. The grave is of considerable size for a stone-construction grave located below ground (3.3 x 1.45 x 1.8 m), and the dead were buried with some ritual as the pile of ash on the northern long-side shows; the assemblage, however, is limited to nine Han bronze coins, one silver ring and some iron fragments of unclear nature found in between the bones. The other graves in Zhaojue have a very similar assemblage consisting mainly of a few coins, a chain of beads, single iron or bronze knives, and sometimes metal vessels or calcinated organic ropes. As most graves did not contain any bones, it is uncertain if they were primary or secondary, single or multiple interments, but as they are all very small in size, it is likely that they usually housed only one or two bodies.

The assemblages in Pusu Bohuang are a little different from those at Chike Boxixian, so are the grave forms. Most graves are of Type 2.4.1; the human bones were highly fragmented, but M2 and M3 contained three human skulls and several long-bones stacked in one pile as a secondary burial; M9 held enough long-bones to allow for inferring the presence of three separate bodies, but it is unclear if they were primary or secondary interments. Just as all other graves at the site, they contained 1-3 vessels, vases with high narrow necks or small jars with outward-flaring rim placed on one of the long-sides close to the head-part, probably serving as *Beigaben*. M3 additionally contained four wooden bracelet in a pile in the head area of the grave, probably belongings of the deceased that had been deposited separately from the bones during the process of secondary burial. While the other graves at the site were devoid of non-ceramic artifacts, M3 and M4 contained calcinated ropes placed next to the bones, reflecting unknown ritual acts. When comparing these graves to other stone-construction graves in Zhaojue, it becomes clear that graves with multiple interments do not stand out from those holding only a single corpse, but are largely identical in construction, content, and associated rituals.

The graves in Zhaojue are generally too severely disturbed and contain too few objects to allow for a statistical evaluation, but the same kinds of objects — ceramic vases and jars, stone arrowheads and woodworking tools, spindle whorls, and various kinds of small personal ornaments as well as bronze vessel and coins of Han origin and calcinated ropes — seem to occur throughout all sites in various combinations. It is remarkable how objects of clear outside origin such as Han bronze vessel types and coins and probably also the concept of building brick-grave like graves albeit mostly of stone are combined with local customs such as the calcinated ropes and the custom of secondary burial, which is even observed for single burials. The burial customs as far as they concern the treatment of the body and other acts are therefore a local trait, while the addition of foreign elements in the form of objects and at least certain aspects of the grave form seems to have been permissible. It is remarkable that the multiple interments seem not to be much different from those containing only a single body.

V. 7.6.2.2 The Special Case of Yanyuan

The multiple graves in Yanyuan are rather different, both from those in Zhaojue and from most single interments in Yanyuan. Only three of the eight graves excavated at Yanyuan Laolongtou contained more than one skeleton, M6 and M9 housing each four and M4 containing remains of two individuals (Table 5.107). They are the largest graves in the cemetery and have the most complex structures and the richest assemblages. M6 and M9 are similar to each other in assemblage, and they both have a partitioning. The skeletons in M6 were all interred in extended supine position, all of them with their head in the West, even the one on the second-level ledge (S5), which was not accompanied by any objects but only by a horse-skull and horse long-bones, and it has therefore been interpreted as human sacrifice next to the sacrifice of a special animal (Liangshan and Chengdu 2009:19). For each of the other skeletons, separate artifact assemblages and signs of body treatment can be identified. One skeleton (S1) showed carmine-red soil in the head and chest area, probably a kind of beautification or ritual treatment, and it was decorated with bronze earrings and a bronze bracelet, while a long-oval grinding stone in the hip-area (probably originally in a pouch) completed the set of *Mitgaben*, the double-handled jar at the feet being a *Beigabe* probably containing grain or other food. Another skeleton S2 had a similar vessel at its feet and a *ling* bell in the pelvis area, while the ceramic vessel associated with S3 was placed at the left shoulder. It was more richly equipped than the other two, having bronze tubes around the head (probably hair ornaments), agate beads at the neck, a belt ornament in the pelvis area, a composite knife and a bronze dagger-axe on the upper part of the left femur. Additionally traces of carmine-red soil were observed around the head, and on the body. S4 had a slightly different assemblage consisting of a belt with belt hook and belt applications applied on cloth, a bronze box on its right side, and some animal bones with carmine-red soil in the foot area, probably food offerings. The western part of the northern coffin chamber was severely disturbed, and round and butterfly-shaped bronze clothing-applications, bracelets, arrowheads, and agate beads were concentrated here that probably once had been part of the *Mitgaben* for S4.

Apart from the object directly associated with one of the skeletons, a tree-bark container with several worked stones (one large and one small round reddish stone of unreported size, over ten quartz stones of different size, and a black shiny stone - probably obsidian), one perforated stone cutter, a small bronze axe, a bronze knife, a bronze chisel, and two bronze cones had been placed on the divider. The foot compartment held a hairpin, 10 stone arrowheads, and three horse long-bones. Who of the four interred people was supposed to make use of which of the objects placed in these two places is not entirely clear, but the arrowheads match those associated with S4, which — judging from the assemblages associated with each skeleton and the overall arrangement — is probably the main interment, equipped with much decoration on the clothes and the person as well as other decorative items, weapons, and food. The relationship to the interments is unclear, but as they were all in the same compartment, they are probably more closely related, either in a personal or blood relationship or in their common serving function to the person in the other part of the grave. Overall, the combination of a variety of personal ornaments, hunting and processing tools, and food offerings, as well as traces of ritual acts such as the application of red substance, the offering of horse head and long-bones, and possibly even human sacrifice is fairly unique, the closest parallel being Laolongtou M9.

Both M6 and M9 had a wooden coffin and a stone cover and contained four skeletons each, but for M9 it is much more difficult to distinguish separate assemblages as the grave was disturbed and the objects were scattered throughout the grave. A single human rib bone was found in the western part of the stone coffin together with a bronze arrowhead, small bronze ornaments below, three stone balls on the southern side, and a complete pig skeleton in the East. West of the stone cist there are scattered bronze belt ornaments and a bronze *ge* halberd, which might originally have been placed inside the coffin or in the area south of the coffin. Outside of the wooden coffin in the Southwest there are a few human long-bones but without any objects. In the southern part of the wooden coffin there are some ash remains, scattered pieces of a human palate and teeth, horse long-bones, small bronze ornaments, ceramic sherds, fragments of bronze weapons, and two sets of round belt ornaments. The assemblage is thus not unlike that of M6, but there are traces of unique ritual acts; outside of the stone-cist on the southwestern end an ash-layer of 1.4 x 1.35 x 0.1 m was observed, which was surrounded by small stone slabs on four sides, and contained ash remains, fragments of a human skull, ceramic sherds, *ling* bells, small clothing-applications, bronze arrowheads, chicken bones, pieces of antler, and other animal bones, all of them with burning marks. This assemblage is therefore likely a separate set of *Beigaben* and *Mitgaben* for another person, whose remains received fire-treatment inside the grave. The composite sword and the belt ornaments placed between this assemblage and the stone coffin could have belonged to either of these interments. The combination of clothing applications and a sword or other weapon, sometimes combined with personal ornaments and handled vessels, is very common throughout Yanyuan and has been observed in Yongsheng as well. At Laolongtou itself, similar assemblages can be seen in M4 and M11, but associated with a slightly different set of burial rituals.

M4 is a double-burial, but it is unclear if both are primary interments, as only one of the skeletons was found complete in extended-supine position on the second-level ledge, while the main grave chamber contained only a single human mandible with cinnabar on the teeth. It is conceivable that the more richly equipped interment in the main chamber had been reburied together with the person on the second-level ledge, or that the corpse went through a rather special ritual leaving only the mandible to be interred. The secondary interment is in this case thus probably the main person in this grave and not the primary interment as is usually the case. It is unlikely to be a case of human sacrifice or suttee, though, as both bodies were accompanied by a considerable number of objects as well as one stone ball in the foot area each, reflecting a similar ritual conducted for both. The primary interment on the second-level ledge was accompanied by a triangular bronze dagger-axe on the right side of the head, a set of armor plates on the right arm, a small double-handled *guan* beaker, and a horse head with horse-harness made of gilded bronze at the lower legs, an assemblage identifying the person as a warrior. The standing and function of the interment in the main chamber is less easy to ascertain, given the combination of a necklace made of turquoise and agate beads below the mandible, small bronze ornaments in the middle (probably clothing applications) with a bronze chicken-shaped staff-head above (probably a ritual offering or tool, rather than a personal ornament), an iron spear, a bronze halberd, and some body armour in the foot area, next to another horse skull and the lower palate of a third horse, likewise accompanied by bronze horse harness. Both interments therefore share a similar basic equipment, identifying them both as people who knew how to handle weapons but probably were of different standing, the one on the second-level ledge possibly being in a serving or assisting function to the person for whom the burial was mainly intended.

The objects in the foot compartment (1 bronze drum, 2 bronze *fu* cauldrons of inverted drum shape, 1 *bianzhong* bell, 2 single- and two double-handled ceramic jars, 1 bronze knife, 3 pieces of horse harness, and a number of bone beads) and those on the southern part of the second-level ledge (1 horse-head, 2 horse long-bones, 1 bronze sword, and 1 bronze staff) might be more than additional *Beigaben*. The combination of horse bones and a bronze staff indicate a ritual offering, although the sword combined with the horse head might as well represent a warrior's equipment; the drum and bells probably had a ritual function as well and the vessels likely contained further food offerings; knife and beads would be additional personal attire and horse harness further equipment. Interestingly, the horse skull placed with the first skeleton faces east, while the other two are oriented towards the West, i.e., the horse heads were facing in the same direction as the human skeletons they were placed next to. As the ceramic vessels are complete, they likely contained food *Beigaben*, a smaller amount for the person placed on the second-level ledge, and considerably more for the person in the main chamber.

A fairly similar assemblage combining bronze arrowheads, a knife, sword or other weapon, a grinding rod and other tools, as well as some clothing applications and personal ornaments have been observed at Laolongtou M11 as well, albeit in a single interment in a simple wooden coffin with stone cover on the grave. The skeleton was placed with the head in the South as extended-supine interment with bronze spirals around the head (probably originally wound around strands of hair, similar to S3 in M6), turquoise and jade ornaments for the ears, a chain of agate pearls around the neck, a set of 20 thin bracelets on the right arm, a set of eight bronze weapons (sword, halberd, 2 axes, 2 knives, 2 spears) left of the body together with a ceramic vessel and three sharpening/polishing stone, another polishing stone on the right together with metal fragment in a tree-bark container, and a half-moon shaped stone knife or sharpener on the right side of the neck, next to it a heap of animal-bones resting on a lump of carmine-red soil. We can therefore distinguish between a ritual meat offering and a *Beigabe* of other kind of food in a ceramic container framing the head on both sides, personal ornaments for hair and body (*Mitgaben*), a considerable range of weapons, and the tools to keep maintain them, some of them in a separate container (either *Mitgaben* or *Beigaben*, depending on if they had already been used in this life or had been especially produced for the burial).

Combining metal weapons, stone tools for maintaining the weapons and other tasks, meat and other food offerings, usage of carmine-red soil, with a necklace of agate beads and bronze ornaments wound around strands of hair, the assemblage of M11 is indeed very similar to the objects accompanying S3 in M6. What is probably the main interment in M6 (S4) combined with the artifacts in the foot compartment and on the second level-ledge, on the other hand, bear greater resemblance in associated assemblage to the interment in the main grave-pit in M4 and to the assemblage of Yanyuan Maojiaba M2, and the ten earth-pit graves with wooden coffins in Ninglang Daxingzhen. The graves at Daxingzhen are all of medium size, oriented toward the north, have a wooden coffin but no human bones, and are each equipped with one or several single- and double-handled vessels and a combination of one or several weapons, and sometimes turquoise beads or metal ornaments. They are therefore a modest version of what can be seen in Yanyuan M4 or M6, but with artifacts that are fairly similar in form and execution.

The assemblage of Yanyuan Maojiaba M2 is considerably richer. The grave contained a single primary interment wearing a bronze wrist- and arm-guard, and accompanied by a set of five metal weapons and a bronze drum, combined with a horse skull and horse long-bones. M1 at the same site held two bronze drums, one sword, and one bronze arrowhead, but interred in a grave without stone installations, while M2 is marked by a complete stone-cist; however, the site has not been published in sufficient detail for a proper evaluation. The same applies to all other sites in Yanyuan and Yongsheng, some of which seem to have similar assemblages. Especially the material from Yongsheng Duizi is unparalleled in its richness and diversity, with 140 graves with varying amounts of stone-installations, interment practices, and artifact assemblages, which have not been properly published. What can be seen from a power-point presentation on the site currently available is some information on a few objects that occurred together in specific graves, but no reliable information on complete assemblages or special rituals.

What can be ascertained at the current state of research is that many stone-construction graves and some earth-pit graves with limited amounts of stone installations in Yanyuan contain assemblages consisting of a small number of double-handled vessels combined with a few metal weapons such as swords, arrowheads, metal spears, halberds, or *yue* or *fu* axes, very rarely accompanied by a drum, a *fu* or other bronze vessel, a few clothing ornaments or bracelets similar to those observed at Laolongtou. Not much is known of the local earth-pit graves without stone installations, but they seem to usually have contained at least some single- or double-handled jars, sometimes combined with metal weapons or ornaments, quite similar to what was found in graves of a more elaborate structure, although in lesser number.

Throughout Yanyuan and neighboring areas in Yunnan, we can thus see a similar burial custom of interring the deceased with a small number of handled vessels — probably containing food offerings — and a set of personal ornaments and weapons on their person. Common sets are:

a) armor, 1 sword, and one or all of a range of weapons (sword, dagger-axe, spear-head, axe), in richer graves combined with hair ornaments and/or a chain of agate or turquoise beads;
b) 1 sword and one or several other weapons (spear, axe, knife, arrowhead);
c) arrowhead(s), grinding/polishing equipment and/or other tools, and ornaments (agate beads, bracelets, *ling* bells);
d) 1 knife, one other weapon, and/or tools to maintain them, and ornaments; and
e) ornaments and/or *ling* bell(s), sometimes with a grinding rod.

Horse skulls and bones occur only in graves holding a sword and at least one other weapon; horse skulls are mostly found in very rich graves with a complex construction holding several skeletons dressed in richly decorated clothes, a belt, hair decoration, chains of beads and other ornaments. Some of these graves furthermore held bones of other kinds of animals and traces of red colorant, but these last two elements can also occur with equally rich graves not holding horse skulls. All other elements such as the burning of human bones or the interment of drums, bells, or other objects with a clear ritual function are too rare to draw further conclusions.

It is remarkable that nearly all of these sets and assemblages at Yanyuan contain weapons, and often a large number of them. Knives, which might have been personal tools rather than weapons, never occur without other weapons. Unless women could be warriors in this area, these rich burials from Laolongtou and Maojiaba therefore probably held men of high standing engaged in combat, horse riding, and/or hunting. Only one of the multiple burials, Laolongtou M4, might have contained two men and two women, but the main interment was likely a man. If this assessment is correct, then it is noteworthy that elaborate hair decoration as well as chains of semi-precious beads and bracelets were worn by men and cannot be seen as signifying female burials. Given the lack of bio-anthropological work or even the presence of human bones in the research area is thus a severe hindrance for an interpretation of the burial record. Overall, it has thus become clear that the small-group interments in Yanyuan seem to be marker of elite burials associated with many special rituals, while the range of artifacts they contained is not considerably different from those found in local single interments characterized by less elaborate assemblages and burial proceedings.

V. 7.6.2.3 The Graves of Yongsheng

The situation in Yongsheng, although reasonably close-by, seems to be rather different from that in Yanyuan. At least six graves at the site of Duizi contained several skeletons, all of them secondary interments in irregular placement, deposited in stone-construction graves below ground. Aside from the one large grave of kitchen-knife shaped form (M1) which was mentioned above, all other graves were very similar to those observed in Zhaojue holding similar multiple secondary interments, i.e., the had layered walls consisting of coarse roughly brick sized stones for the walls with large stone slabs for the cover (type 5.1.2). The complete assemblages are unknown, but all of them contained one or several bronze arrows, combined with bronze knives or other weapons, as well as a range of different ornaments (metal bracelets, finger rings, turquoise or bone beads, perforated cowrie and snail shells, bone hair-pins), in some cases double-handled jars, and in one case a spindle whorl (Table 5.104). At least one part of the assemblage therefore reminds of what is observed in Yanyuan, but the other part (spindle whorls, hair pins, shells, types of double-handled vessels) is very different, while grave form and burial mode remind more of the multiple interments in Zhaojue or even the megalithic graves of the Anning River valley than of the singular elite burials in Yanyuan Laolongtou, or even the less elaborate single interments in neighboring Ninglang. The graves in Zhaojue are clearly joined interments with no single person being elevated in rank over the others in death.

Given the sad state of preservation of the graves from Zhaojue and the lack of publication for the site of Yongsheng Duizi, the relationship between the graves from these two regions currently remains unclear. Nevertheless, it is noteworthy that the association of round-headed knives, bronze bracelets, and *ling* bells in several of the multiple interments at Duizi reminds strongly of the sets identified for megalithic graves in the Anning River Valley, while shells, grave construction, and mode of interment show a strong link to Zhaojue, and much of the assemblage reflects connections with Yanyuan and Ninglang; this combination indicates at least the possibility of a vivid network of different kinds of linkages, some of them simple exchange, others possibly the movement of people (reflected, e.g., in sets of personal tools and ornaments otherwise known from the Anning River Valley), and either strong connections or simply parallel developments in belief systems and their expression in burial ritual and grave construction. In any case, given the occurrence of so many kinds of burials and object types in successive layers, Yongsheng Duizi promises to be a major key to the understanding of the cultural and chronological development of the research area.

V. 7.6.3 Object Assemblages in Single-Interment Graves

Even a first glance at the assemblages single-interment graves with and without stone installations already reveals a great diversity that seems to have a strong regional and as well as a possible chronological component. Especially the material from Huili Fenjiwan and Xichang Lizhou stand apart, both by the large number of graves and the particularity of the assemblage, while some of the particular characteristics of Zhaojue on the one hand and the southwest (i.e., Yanyuan, Yongsheng, and Ninglang have been described above. It is therefore most useful to first analyze these main groups of data separately, starting with the assemblages from undisturbed and sufficiently published graves, before comparing these groups with each other as well as with more unique assemblages to form a coherent picture. In a last step, these results can be supplemented with information from disturbed or insufficiently published graves.

V. 7.6.3.1 Graves in Xichang

When creating two-way tables and seriation matrixes, and conducting correspondence analyses on the material from Lizhou, it becomes clear that nearly all graves contain a standard set of a number of jars/vats, vases/ewers, and bowls, thus constituting a set for holding and distributing food (Tables 5.109-5.111; Figures 5.116-5.117). Ewers, which in the case of Lizhou are identical to vases in form and decoration apart from the addition of a small spout at the rim, occur exclusively in graves that contain the more ubiquitous vases as well, but they are likely to have the same function as containers for pouring liquid. *Bo* bowls and basins occur only in graves that also held jars, serving probably the same function of holding food, while vats — having a nearly identical form to jars, occur mostly together with them but can also substitute them. Some types of *dou* are essentially *bo* with a hollow foot, while others are wide outward-flaring just as *wan* bowls, probably having served for consumption rather than holding or serving food or liquids. Double-jars and lids are special forms, occurring in only one of the richest graves each, so do double-handled jars. The double-handled jars are remarkable as falling into two main categories, one with a vat- or jar-like body and handles usually located above the not very far outward-flaring rim, and one with a vase-shaped body, wide outward-flaring opening ideal for pouring liquids, and small handles at the shoulders. All these vessels come from the same grave BM3 (one of the richest as well) and were probably a variation of the usual jars and vases.

Interestingly, all of the richest graves containing 31-51 ceramics (AM11, BM3, BM7, BM4) held such special objects together with large numbers of jars, vases and usually cups and outward-flaring bowls for consumption. Middle-sized graves with 12-28 vessels always hold several specimens of each functional category but no special vessels, while less well-equipped graves ewers contain ewers or cups, and graves with only 5-6 vessels always miss entire categories such as vessels for consumption (AM3), holding and serving of liquids (AM8), or even both vessels for holding liquids and food (AM12). Another pattern that cross-cuts this ranking by size is the probably chronological difference between assemblages highly decorated vases and ewers on the one side (e.g., AM2, AM6, AM10, BM4), and graves holding double-handled vessels, combined with large numbers of bowls but no spouted or decorated vessels on the other (e.g., AM9, BM3, BM8). If there is indeed a chronological difference between these two kinds of assemblages, the basic functional sets as well as the differentiation between more and less richly equipped graves remained over time while decoration and execution changed.

Turning to other graves in the Xichang area, the vessel form and assemblages of Yangjiashan M1 and M3 resemble closely the poorer graves at Lizhou, suggesting that they were culturally and chronologically close. They are furthermore located in similar environments on even ground at some distance from a river, and at not too far a distance of 22 km from each other; however, it is unclear if the particular grave form and mode of deposit — ceramics arranged at two opposite ends of very long-narrow graves — was observed at Yangjiashan as well.

The assemblages in the other graves in the Xichang area are rather different both from Lizhou and from each other. The particular ceramic assemblage of Dayangdui with its high-fired fine grey and black ware building such a stark contrast to the coarse sand-tempered ceramics otherwise typical for the Xichang region has already been mentioned above. The graves are all of similar size, orientation, and form, but there is some variation in the assemblages; three graves contained vessels with long band-handles, in one case combined with small jars, a bowl, a stone axe and a grinding rod (M2), in the other together with a footed *dou* bowl, another grinding rod, a stone arrow, and a bronze sword (M3); in the third case the assemblage consisted of two single- and two double-handled vessels (M9); the other two graves contained stemmed goblets, in one case combined with a small jar similar to the one in M2, and with a bowl similar to the one in M3 (M8). The presence/absence of handled jars and goblets might therefore signify difference in social group, age, or gender, but given the lack of bone remains and other information, the case remains obscure. Even though both Lizhou and Dayangdui hold jars, bowls, and handled vessels, the types and quality are so exceedingly different that a cultural connection seems unlikely, even though the two sites are less than 7 km apart from each other and in similar environments.

The three earth-pit graves at Qimugou, on the other hand, contain a ceramic assemblage that at least from the point of view of functional groups is similar to those known from Lizhou, a combination of jars, goblets and ewers or vases; however, again stylistic type and execution are very different. The jars are rather small and stout, the ewers have long spouts, the goblets are high-stemmed and mostly tulip-shaped, and all the ceramics are of high-fired black or grey fine-ware pottery. In M1 and M2, large numbers of such goblets and jars are associated with one or two vases/ewers each, possibly as equipment for liquid consumption by a group of people combined with jars containing food for the deceased. The object types and combinations at Qimugou thus resemble closely what can be seen in megalithic graves, suggesting a closer connection to them than to other earth-pit graves. It is therefore conceivable that not all members of the communities using such vessels were interred in the same graves, but that some found their last resting place in megaliths and others in earth-pit graves.

The single grave at Ma'anshan is square, very large, oriented toward the south, and contained one small Han-style urn and two ceramic *fu*, all traits that clearly identify it as a Han grave; the grave will therefore not be treated in detail here, but it serves as a *terminus ante quem* for the settlement layers below. Less easy to interpret are the two earth-pit graves at Yingpanshan, one of them devoid of objects, the other containing fragments of a stemmed bowl or goblet, two jars with outward-flaring rim, one of them with a fingertip-impressed application band around the rim, as well as each one axe and adze made of stone, both finely polished. The jars and stone-tools are similar to material known from local Neolithic settlement sites, but the bowl is different, but too poorly preserved to make any inferences on original form or function. The majority of earth-pit graves in the Xichang area are thus characterized by ceramic assemblages sometimes associated with a few stone or metal tools. This is very similar to what can be observed in Huili.

V. 7.6.3.2 Graves in Huili and Luquan

The majority of the material in Huili comes from Fenjiwan (Table 5.113). Of the 150 graves at this site, 108 contained objects, and 90% of them held one or several ceramic vessels, mostly plain medium-sized jars or urns, in about 60% of all cases accompanied by no further objects except for 1-4 flat river cobbles placed in the head- or stomach area. There is no clear correlation between the number of stones and grave size, location, orientation, or kind or number of artifacts interred; conceivable reasons for the presence/absence would thus be age, gender, or social status of the deceased, as well as season or special circumstances of death.

Only a few graves held other types of ceramic vessels additional to or instead of the jars or urns. These include middle-sized jars with one or two small ring-handles, ewers and/or vases, a number of globular goblets with a small foot, a number of bowls, two of them with small stems, and a single cup. The ceramic forms suggest the provision of medium quantities of food or drink for the deceased, only rarely accompanied by small vessels for individual consumption. Nine graves furthermore contained one or two spindle whorls, occurring in combination with all kinds of vessels, but never with weapons/tools or ornaments, possibly indicating a differentiation by gender or occupation. Aside from one grave which contained a bronze *yue* axe as well as a stone arrowhead, metal and stone tools do not occur in the same grave, however, the overall number is too low to infer on a rule. Personal ornaments were rater rare as well, comprising seven bracelets and one finger ring, all made of bronze concentrated in only three graves. Overall, only 15 graves at Fenjiwan contained objects other than ceramic vessels and/or flat stones, marking them as special; however, as they comprise graves with few, many, and no ceramics and/or flat stones, wealth was likely not the main criterion. The two main possible explanations are chronological differences and/or a personal note, rather than specific sumptuary rules.

The five earth-pit graves at Huili Washitian all contained extended-supine primary burials (at Fenjiwan no human bones were preserved), all oriented following the direction of the mountain slope just as at Fenjiwan, but had a head compartment and not flat river cobbles. The two sites of Washitian and Fenjiwan are furthermore located in two different river valleys but still only 15 km apart form each other and in a very similar environment. The ceramics found at Washitian are nearly identical in form with those from Fenjiwan, but the number of spindle whorls is considerably higher (mostly 3-4 in each grave). Most graves contained only ceramics, except for M1 which held but stone tool fragments and a considerable number of jars and bowls, reaffirming the mutual exclusion of spindle whorls and other tools/weapons. The surface finds at Washitian are more problematic as they might have come from graves or settlement layers, but as stone and bronze arrowheads, and especially bronze axes and bronze beads are usually not found in settlement layers, they are more likely to have come from local earth-pit graves similar in assemblage to those at Huili Guojiabao (Table 5.114).

The graves at Huili Guojiabao were severely disturbed and the objects remaining in each of the excavated earth-pit graves (each one single- and double-handled jar in M1, a spindle whorls, 2 bronze bracelets, 2 agate beads, 41 turquoise beads, and 1 nephrite bead in M2, and one bronze axe in M29) are completely different from each other. The surface finds additionally include a large number of bronze axes, swords, knives, arrowheads, belt and clothing application, hair ornaments, as well as some perforated grinding rods, fragments of highly decorated goblets, and even horse gear. Ornaments and armor are highly decorated and very different from the simple coarse objects found at Fenjiwan, but instead bear some resemblance to objects known from megalithic graves and/or graves in Yanyuan. The grinding rods and goblets, on the other hand, are virtually identical with artifacts found in the single disturbed grave of Huili Leijiashan, which held large amounts of such goblets and other lavishly decorated ceramics, metal arrowheads, grinding rods and other stone tools as well as a large number of spindle whorls, and a single one of the flat river pebbles found in so many graves at Fenjiwan.

Given that grave M1 at Huili Leijiashan was disturbed and only a part could be excavated, it is difficult to interpret the picture. A possible explanation would be a chronological development, with Fenjiwan standing at the beginning, with local traditions of food in ceramic vessels for the deceased and river pebbles as ritual objects. At a later phase of Fenjiwan spindle whorls and metal objects might have occurred in some graves, increasing in number at slightly later sites such as Washitian, with metal weapons and ornaments increasing in importance at Leijiashan and Guojiabao, which furthermore witnessed a shift in ceramic vessels from medium-sized containers to highly-decorated vessels used in the consumption of liquids, even though medium-sized containers continued to be employed. The arrangement of the objects in the graves at Leijiashan and Guojiabao is not clear, but the jars might have held food for the dead, while the goblets might have been used in burial rituals, similar to what was customary in connection with megalithic graves. The weapons and ornaments at these later sites show the possibility of medium-distance exchange and influence, but the nature of this contact is of yet unclear.

Apart from these two kinds of grave assemblages — those at Fenjiwan/Washitian and those at the other sites just mentioned — a number of small to medium-sized graves lined with thin slates and containing a very different assemblage have been reported from Huili Xiaoyingpan, Xiaotuanshan, as well as Luquan Yingpanbao, located on the other side of the Jinshajiang at a distance of about 40 km. All graves are oriented on a mountainside, following the direction of the slope with the feet of the deceased pointing toward the river. The majority of graves at all these sites were devoid of objects, but some contained one or two plain jars and vases not dissimilar from those known from Fenjiwan, but also some very peculiar specimens with a wide belly and extremely narrow opening, resembling ceramic vessels from similar small stone-cist graves in Zhaojue. M21 at Xiaoyingpan which contained one of these vases, additionally held a chain made of a large number of cowries and other seashells, not unlike what was found in similar context in Zhaojue. The burial ritual associated with these graves, however, has some unique features. The majority of graves held one extended supine primary burial, but the skeletons in Luquan Yingpanbao M5 and Huili Xiaoyingpan M14 and M18 where missing, while in M13 and M16 the skull was present but had been placed in the stomach area. A similar placement has never been reported from elsewhere in the research area, but as the bones are mostly not preserved, this lack of similar observations is not necessarily conclusive. The skeletons buried in this way did not have a richer or significantly different assemblage from that seen in other graves in the area, and the reason for their special treatment remains unclear.

V. 7.6.3.3 Graves in Zhaojue and Neighboring Counties

Many of the stone-construction graves in Zhaojue did not contain any objects. Those that did, held only very few objects, their combination and distribution following no recognizable pattern (Table 5.115). Most common are simple stout jars or vases resembling those seen in Huili, more rarely a bowl or a ceramic *fu* vessel, as well as a variety wide variety of small ornaments, various kinds of weapons and tools, and special objects such as fine metal vessels, some of them carefully wrapped in cloth and bronze coins. At least the metal vessels are likely imported goods of Han origin, while the Han coins and ceramic *fu* might have been locally produced. An special feature of local origin are calcinated ropes that occur together with all kinds of different object and even in otherwise empty graves. While the interment of Han metal vessels are very likely signs of a greater wealth and/or higher social status of the individuals buried with them, they were neither found in particularly large nor otherwise particularly lavishly equipped graves.

Overall, in Zhaojue there is thus no clear correlation between grave size, construction, number and kind of objects, and number of interments. There is a clear preference for the use of coarse stone in grave construction, secondary burial, and other peculiar local burial customs such as the burning of ropes, but no signs for large-scale consumption of food or drink as seen with megalithic graves. The artifact assemblage in the graves combine a limited amount of food provisions for the dead with a few personal ornaments, tools, and more rarely special objects, indicating very little regulation but much flexibility, possibly leaving room for individual choices at least for objects. It is unclear if this practice extended to the neighboring area of Meigu, but as the grave forms observed there are very similar to those in Zhaojue, it is likely that modes of interment and object assemblages were similar as well.

The earth-pit and stone-construction graves from Xide, Puge, Mianning, and Yuexi — all of them poorly preserved and insufficiently published — are not easy to fit into the overall picture. The bone arrowheads and chains of bone beads and shells discovered in the three earth-pit graves at Puge Wadaluo remind of finds from Zhaojue, but the grave lacks stone construction parts; the same site furthermore comprised two megalithic graves, a type of burial that can contain bone beads and arrowheads as well, but usually no shells. The earth-pit graves at Wadaluo were found in the upper layer of the site and their relationship with the megalithic graves is not entirely clear; they could be contemporaneous — possibly holding two socially or ethnically different parts of the local population — or belong to two separate phases. Puge is generally characterized megalithic graves, some of which contain arrowheads as well, but beads are rare and usually consist of agate or turquoise, while the dominant material for other ornaments are bone and tooth. It is therefore not unlikely that the earth-pit graves at Wadaluo held a separate, non-local part of the population that had re-located from Zhaojue to Puge, possibly through marriage, but was buried in a fashion similar to (but not identical with) what was customary at their place of origin.

Xide is characterized by megalithic graves as well, but the settlement sites of Wuhe and Wadegu additionally hold some stone-construction graves. Both sites are only known through surface survey, but from two of the five large graves at Wadegu considerable numbers of coarse ceramic fragments protruded, mainly jar and bowl forms too heavily fragmented to assess the similarity or dissimilarity with material from other sites. The interment of large numbers of ceramics is uncommon for stone-construction graves but not unknown from megalithic graves, confirming the suggestion made above that the graves at Wadegu were not stone-construction graves but actually megalithic graves covered by a tumulus.

For Yuexi Que'ershan, another site that held both megalithic and stone-construction graves, it is unclear which objects belonged to which grave. The surface finds from the disturbed graves include plain medium-sized coarse ceramic jars and bowls, stone and bronze axes, a perforated grinding rod, and three bronze bracelets, i.e., an object combination more commonly found in megalithic graves than in stone-construction or earth-pit graves (Table 5.116). The earth-pit graves known from Yuexi Huayang and Liaojiashan hold very different assemblages dominated by metal weapons, vessels, and ornaments very different from local traditions but showing strong Han connections in the vessel assemblage, while the weapons show strong similarities with finds from Yanyuan and Yunnan, and only some of the ornaments resemble artifacts found in megalithic graves. Metal vessels are known from stone-construction graves in Zhaojue as well, where they occur single as special items and are associated with stone beads and other ornaments or more rarely stone weapons and tools. The association between a considerable number of metal vessels and several metal weapons as well as a small number of metal ornaments has otherwise only been observed in stone-construction graves in Yanyuan, which is located at the opposite end of the research area. The occurrence of similar assemblages at Yuexi is therefore difficult to explain.

What distinguishes the earth-pit graves in Yuexi from the stone-construction graves in the southwest is the lack of ceramics. As described above, the majority of graves with or without stone installation in Yanyuan and neighboring parts of Yunnan contain assemblages consisting of a small number of double-handled vessels combined with a few metal weapons, clothing and body ornaments, but only rarely bronze vessels or special objects such as drums or horse-gear. The function as container for provisions for the dead that ceramic vessels probably had in the Southwest, could have been taken over by metal vessels in the graves at Yuexi, which would make them fairly richly equipped examples of burials following similar principles for the outfitting of graves in the Southwest likely to have held a single or at most two individuals.

V. 7.6.3.4 Graves in Yongsheng and Ninglang

The assemblages in multiple interments in Yanyuan and Yongsheng are very similar to what was observed in the graves at Yuexi, combining a few mostly double-handled vessels (presumably containing food provisions for the dead) with a set of weapons and tools and sometimes personal ornaments (Tables 5.117-5.118). The vessels were mostly found in the head area, and at least in Ninglang outside of the wooden coffin the body was placed in, showing clearly a separation in function and meaning from the other artifacts in the grave. Weapons and tools were either placed on the right side or in the hip area of the deceased, that is, where they would have been worn in life, and the ornaments were on the body as well. As far as object combinations are concerned, they are largely identical with what has been described above for graves with multiple interments, allowing for the co-occurrence of nearly all different object types with no specific sets. Only spindle whorls never appear together with weapons, but as spindle whorls are extremely rare, the sample does not suffice to infer on a general rule.

For most of these graves, the interment type is unknown; only for Yongsheng Duizi is it clear that graves with and without stone installations usually contained one or two primary burials in extended supine position, while secondary interments and the combination of one primary and one secondary interment were rare. Additionally, a number of cremation burials in urns interred in oval earth-pit graves matching the size of the urn have been reported. The artifact assemblages in these graves, which contained child burials, are significantly different from the interments of adults, consisting only of 1-4 ceramic vessels, rarely combined with a few personal ornaments or a small stone tool or spindle whorl. The assemblages of primary and secondary interments, on the other hand, are very similar, but seem to lack weapons except for sometimes arrowheads and occasionally a small knife. Metal swords, spearheads, and axes only occurred in graves with multiple secondary interments and even there not in very great number, while not such objects have been reported from other gravesites in Yongsheng. This is striking, considering how prominent weapons are at other gravesites in the Southwest, indicating that life at Duizi might have been very different from what was customary further north.

When considering the geographic preconditions, it becomes immediately apparent that most of the other grave sites just described are not only located at a considerable distance from those in Yongsheng, but also at very high altitude in extremely mountainous terrain, while Duizi, Qiaodiping, and Yanjiaqing are located on flat ground on fertile alluvial planes of rivers or lakes. The settlement material likewise indicates a settled agricultural living, while in the mountains and on the high-altitude plateaus of Yanyuan and Ninglang a pastoral or mixed economy and generally harsher life with scarcer resources can be assumed. This difference in natural surroundings might have lead to the emergence of a more combative society in the mountains, which would have found its expression in the presence of larger number of weapons in the burials, and a more peaceful mode of living in the low-altitude valleys, where bearing arms — at least in the grave — was a privilege limited to a very few people buried with special ceremonies. The Yanyuan basin itself, located on a high altitude and with a less favorable climate than the area around Duizi but still with ample level ground, is again a special case, as becomes clear from the strong emphasize on horses and horse riding at Laolongtou. At least for the people buried there, horses were a central part at least of elite life, while in other parts of the Southwest, horse gear or horse bones do hardly ever occur. At the current point of research it is unclear if the importance of horse riding was confined to Laolongtou or if it applied to all of the Yanyuan basin, but the large number of horse harness recovered from the antiquities market in Yanyuan makes it seem likely that it was a more widely spread phenomenon.

V.8 The Big Picture: Form and Content, Action and Location

From the above analyses of the grave material, several spheres of behavior have emerged, some of them overlapping, others intersecting or excluding each other in time and/or space. These spheres of behavior include the construction of various kinds of graves of different sizes and with varying amounts of stone installations, the interment of one, several, or many bodies in the same grave, be it as primary or secondary burials in one or several instances of interment, as well as a range of different kinds of body treatment and other ritual acts, including communal drinking, burning, and offering, and the interment of items for the use of the deceased, be it on their body or next to them. The correlation between these different actions varies greatly from region to region and possibly also between different chronological periods. It has furthermore become clear that the geographic preconditions are an important factor shaping the appearance of the graves and their content as well as their spatial distribution. Most importantly, the limited availability of level ground has resulted in the dense clustering of grave sites in specific areas. The high north-south running mountain ridges channeling both the rivers and the connections between different areas, have furthermore lead to a clear spatial separation between different burial customs with some overlap only in adjacent areas or regions connected to each other through the river network. Additionally, the particular landscape clearly was a point of reference for grave placement and orientation, indicating its likely religious importance.

The megalithic graves clustered in the Anning River Valley are mostly located on flat ground. Their alignment follows the direction of both river and mountain ridges, and a few of them slope up the hillside at an angle that is exactly perpendicular to the direction of these landmarks. By their sheer size, the megalithic graves themselves become landmarks, entering in connection with the landscape and with each other. Forming more or less widely spaced clusters, they constituted a ritual landscape; each grave was used and reused many times for successive primary interments as well as, very rarely, for cremation burials. Moreover, the megalithic graves served as a focus for complex rituals that may have served commemorative purposes or marked special occasions. Most importantly and most frequently, the inhabitants of the surrounding region engaged in the communal consumption of liquids in or around these graves, and the vessels used at such occasions were later disposed of nearby, be it in the grave, in the tumulus, or in pits especially dug for the purpose. Less frequently, organic materials such as rice were burned inside or outside a grave, as attested by piles of ashes in some graves.

Human bones were only rarely burned, be it inside or outside the grave. The bodies of the deceases were usually interred as primary extended supine burials probably wearing what they had been wearing in life (or at least on special occasions), including a limited amount of personal ornaments and tools probably kept in a small pouch or under the belt. During later instances of interment, the bones already present in the grave were either pushed aside or more rarely neatly stacked, activities that were probably likewise accompanied by specific rituals. The differences in object assemblages that are observable between different graves indicate that different social groups might have been buried separately in neighboring graves, or that neighboring graves contained the members of successive generations. The fact that these graves probably held only adult and senile men and women, combined with the presence of earth-pit graves in the vicinity of megalithic graves, furthermore suggests that part of the population might have been buried differently. Nevertheless, Xichang Qimugou is currently the only known earth-pit grave containing objects virtually identical with what is otherwise known from nearby megalithic graves; the other earth-pit graves in the area are very different in nature.

There are only very few earth-pit graves in the Anning River Valley. The majority of these graves are located further away from the river and closer to the mountains than the megalithic graves, whose location was probably mostly chosen according to visibility criteria and the presence of previously built megalithic graves and other landmarks. Furthermore, the earth-pit graves are often located right next to settlement sites, while most megalithic graves were built at some distance from them. The majority of earth-pit graves in the Anning River Valley follow burial customs that are very different from those observed in connection with the megalithic graves. In most graves, single interments are accompanied by jars and other vessels probably holding food provisions but no further artifacts, showing that the dead were likely not buried in their usual attire, but either in a plain garments or only wrapped in a piece of cloth.

The only exception are the graves of Dayangdui, which not only contained sets of weapons and tools but also ceramics that were of very different form and quality from those found in the other graves in the Anning River Valley. While the majority of earth-pit graves in the region are dominated by coarse sand-tempered low-fired ceramic vessels without handles or spouts, Dayangdui yielded high-fired black double-handled vessels. The graves at Qimugou, on the other hand, are characterized by an assemblage consisting of goblets and ewers very different in overall from what can be seen at Dayangdui, but instead resembling assemblages known from megalithic graves. Albeit all being earth-pit graves with single primary interments, the graves in the Anning River Valley therefore belong to three different traditions, one of which is clearly linked to the megalithic graves.

The megalithic graves, as well, exhibit some differentiation, spatially as well as, probably, temporarily. Their chronological development seems to have undergone three stages: from relatively small graves only containing very few bodies that might even have been interred at the same time, to small or medium-sized constructions containing an increasingly large number of interments, and finally to extremely large graves that were not always used for particularly large numbers of interments but for elaborate rituals requiring the entering of the grave. From the spatial point of view, the most common grave types, Types 1 and 2, appear without much variation throughout the Anning River Valley from Mianning in the far North to Miyi in the far south. By contrast graves located on less easily accessible tributaries or along other river courses further east, such as those in Xide and Puge can differ considerably from the graves in the Anning River Valley, both in grave form and in the style of the objects they contain, even though the range of functional types is the same.

The rugged mountains East and West of the Anning River Valley lack flat open plains in which widely visible megalithic constructions could easily find space, and the area is furthermore not easily accessible from the Anning River Valley. Considering these geomorphological preconditions, it is not surprising that the main type of graves found in the eastern and western part of the research area are small earth-pit graves with varying amounts of stone construction that are located at high altitudes at some distance to the rivers and aligned with the slope of the mountain, with the dead facing the river as point of reference and geographical feature of cultural importance. In Huili, it was even customary to place flat river pebbles under the pelvis or head of the deceased, reaffirming the ritual and thus religious importance of the river. While these graves in Huili were all located completely below ground, in Zhaojue stones slabs of sometimes considerable size were used as grave covers; although they are much smaller than what was usually employed in the construction of megalithic graves, it is obvious that the grave builders desired a certain degree of visibility. Indeed, the outward similarity with the smaller varieties of stone-construction graves in nearby Puge is remarkable, even though the burial mode and object assemblages are rather different.

From the fact that many of the graves in Zhaojue occur next to Han brick-graves, sometimes even imitating them and/or containing a few objects of Han origin, we may infer that the stone-construction graves in that part of the region are essentially distinct from and later in date than the megalithic graves of the Anning River Valley. Although a number of multiple interments and ash remains have been observed in Zhaojue as well, the related behavioral patterns are very different. The graves with multiple interments in Zhaojue were only used once and always for secondary interments involving the careful arrangement of the bones, instead of pushing them to the side as seen in most megalithic graves. The ash remains were furthermore never connected with traces of red-burned soil, indicating that the fire had burned elsewhere and it was only the ash that entered the grave, while in megalithic graves both can occur. A particular local custom not observed anywhere else but in Zhaojue is the interment of calcinated ropes occurring with no particular regularity with all different kinds of stone-constructions and artifacts. The number of grave goods is very limited, but they are clearly all objects that either belonged to the attire of the dead or were meant for his use in afterlife, such as a small storage vessels, tools, personal ornaments, and, rarely, weapons or special objects such as precious Han bronze vessels.

The funerary-good assemblages in all earth-pit and stone-construction graves in the research area are dominated by medium-sized ceramic vessels that likely contained food offerings and which were placed in the head or foot area of the grave. These can be combined with a few personal ornaments (most often bracelets or other rings or beads), weapons or tools worn on the body, sometimes clothing applications or hair decoration, and very rarely special objects such as metal vessels or drums (Figure 5.118). Nevertheless, the relative and absolute number of the different kinds of objects, as well as their execution and style, differ considerably from region to region, and sometimes even within the same region, as exemplified by the case of the earth-pit graves in the Anning River Valley. Interestingly, there is usually no apparent correlation between the amount of stone installations in a grave and the amount and kind of objects it contains, showing that the stone constructions had a considerably deeper meaning than just serving as a marker of high status for the deceased. Instead, the form and contents of these tombs are clearly differentiated regionally. While earth-pit graves with and without stone installations and stone-construction graves can appear side by side in Huili, Yanyuan, and Yongsheng, Zhaojue is exclusively dominated by small and medium-sized types of stone-construction graves made of particularly coarse stones never or rarely seen in other regions. Huili and Luquan in the Southeast, on the other hand, are dominated by cist-like constructions made of thin slates next to earth-pit graves, while Yanyuan and northern Yunnan feature similar graves but with the addition of wooden coffins in many earth-pit graves and some large special grave constructions involving both wooden coffins and stone-construction parts.

Furthermore, there is some inner-regional diversification as well: the graves at Huili Fenjiwan, for example, all contain similar sets of plain small storage vessels and river pebbles only rarely accompanied by tools or ornaments; the grave of Huili Leijiashan M1, on the other hand, is dominated by drinking vessels combined with considerable numbers of stone weapons and tools; and Huili Guojiabao combines few double-handled vessels with large number of metal weapons and ornaments, exhibiting a repertoire that is otherwise customary in Yanyuan and northwest Yunnan but not in other parts of the research area. These differences between the graves at different sites in Huili just described thus reflect changes over time as well as regional developments vs. outside influences or other forms of contact. Less clear is the relationship of Huili Fenjiwan, Leijiashan, and Guojiabao with Huili Xiaoyingpan, Xiaotuanshan, and Luquan Yingpanbao. The latter sites all held stone-cist graves containing only very few objects including vases with a particularly wide belly and a narrow opening and chains of cowrie shells, that is, objects that are very similar to what is known from graves in Zhaojue, which are very different in construction and interment practices.

The graves in Zhaojue, on the other hand, additionally hold ceramics reminiscent of those from Fenjiwan, as well as Han objects and the calcinated ropes not found anywhere else. If Fenjiwan is indeed of a relatively early date, then the assemblages at Zhaojue show a conflation of objects from different traditions and places combined with local burial customs. The great diversity of grave forms in Zhaojue, allowing for Han brick graves and various types of stone-construction graves to occur side-by-side on the same mountain slopes — albeit in separate groups — shows the co-existence of different cultural traditions, with various groups conducting different kinds of burial rituals next to each other, while respecting the other's monuments and even adopting some of their customs and objects. If all of them are indeed contemporaneous, however, remains to be examined in Chapter VII.

The few earth-pit graves in Puge, an area which is otherwise characterized by megalithic graves, contain assemblages very similar to those in Zhaojue but lack stone-construction parts.

They were likely the last resting place of a few people who had migrated from Zhaojue to Puge, possibly through marriage or similar bonds, but were buried according to their own custom without exerting much influence on the local burial tradition as a whole. The same may have happened in Yuexi, whose graves display a very peculiar assemblages of metal weapons, vessels, and ornaments very different from the local traditions but more closely related to finds in Yanyuan and Yunnan over 150 km further southwest. Another set of connections over nearly equally long distances is that between Huili and Yanyuan/northwest Yunnan, which are connected by the Jinshajiang. These similarities, however, are only restricted to a few sites and objects, while the burial customs and interment practices are very different both between these two regions and between them and the Anning River Valley. Huili, in spite of being particularly rich in metal resources, is characterized by graves with object assemblages that are dominated by ceramics and contain only very few metal ornaments, weapons, and tools.

The dead interred in the megalithic graves were equipped with only insignificantly larger sets of weapons and ornaments, mostly sets of one or two bracelets or other rings and/or sometimes a chain of beads or other pendants, sometimes combined with a knife, grinding rod, or other personal tool, but swords or other weapons as well as hair ornaments and clothing application was rare. The assemblages in graves in Yanyuan and northwest Yunnan, on the other hand, are mostly dominated by considerable numbers of metal weapons. Clothing applications and hair decoration are very frequent as well and occurs usually together with swords and other weapons, showing that people engaged in combat had elaborate hair-dos and other types of clothing decoration. This applies equally to the few occurrences of swords in megalithic graves, where they are commonly associated with a small number of clothing and hair ornaments. Ordinarily in megalithic graves only bronze knives are seen together with a few rings. This probably represents the attire of the majority of the population, and there were but very few sword-bearers. Nevertheless, weapons feature prominently in Yanyuan and Ninglang, not only in the rich multiple burials at Laolongtou, which are clearly elite burials, but also in smaller graves with a more limited amount of burial goods. This shows very clearly that in these areas armed combat — which for a small number of people was combined with horseback-riding – constituted a central part of life; such warfare was the basis for and expression of identity that was translated into the graves. In Yongsheng as well as in the Anning River Valley and the eastern part of the research area, by contrast, weapons were apparently of lesser importance and reserved for a very few, possibly as a status symbol.

These differences in livelihood are reflected furthermore in the kind of food and animal offerings observed in the different sub-regions. While the Anning River Valley and Huili seem to have been dominated by non-meat food items including rice, which indicates an agriculturally based settled economy, the graves in Puge yielded large numbers of arrowheads and boar tusks that reflect the importance of hunting, while in Zhaojue, pig teeth in some graves indicate a mixed economy. The graves in Yanyuan, on the other hand, contained only very few ceramic vessels (the probable containers of grain and other staples), but featured instead sheep bones, which might have been the remains of meat offering. The interment, in these graves, of horse skulls together with horse gear shows the importance of these animals, which one may surmise were raised mainly as riding animals rather than as suppliers of meat. This fits exceedingly well with the geographic preconditions in the different areas, which would have required different modes of adaptation and additionally led to different social responses and cultural developments, as the difference in grave material clearly shows.

In spite of these differences in subsistence, ways of life, and object assemblages, there are nevertheless a few communalities in interment practices and related rituals between these different areas so far apart from each other. The multiple secondary interments in coarse stone-construction graves in Zhaojue have striking parallels in Yongsheng Duizi, both in grave construction and interment form, but at the current stage of publication it is impossible to suggest what these similarities signify. The symbolic interment of smooth stones with the dead was observed both in Huili and Yanyuan, but different kinds of stones were used (smooth river pebbles in one case, round stone balls in the other). These seemingly similar customs might therefore have a different origin and meaning. Another kind of objects that connect Huili and Yanyuan is the presence of Shizhaishan-type bronze drums and bells, however, in Yanyuan they were found in graves, just as in Yunnan, were this kind of drums originates, while in Huili they were deposited in pits. The apparent sharing of object types is therefore probably just the outcome of a shared connection with a third place, that is, Shizhaishan in Yunnan, rather than actual similarities in burial rituals or other religious practices. To understand the differences more clearly, it is necessary to analyze these special bronze deposits in Huili, which I will do in the next chapter (VI). In that context, I will furthermore discuss archaeological evidence for other kinds of ritual acts such as different kinds of ceramic deposits and surface finds of unclear nature, which will help to elucidate various religiously motivated patterns of behavior in the research area beyond the placement of the dead.

VI. Object Pits and Single Finds: Dealing with Heterogeneous Categories

Not all features and finds reported from the research area fit neatly into the main categories of settlements and grave sites described above. Apart from single finds, there are a sizable number of pits containing complete objects deposited in an organized manner. This mode of object placement makes it clear that they are not simple trash pits dug to dispose of waste, but intentional deposits with specific meaning. Single finds are usually chance discoveries made by non-archaeologists and subsequently reported to local authorities or artifacts retrieved from the ground through grave robbery or other means that were later confiscated by the authorities. Below, I introduce each of the two find categories in turn. Then I compare them with material from graves and settlement sites in order to gain insight into their origin, function, and meaning.

VI.1 Object Pits

Object pits fall into two main categories: those containing bronzes and those containing ceramics. As they are very different in nature, they will be discussed separately.

VI.1.1 Bronze Deposits

The three known bronze deposits in the Liangshan region were discovered in Huili. They all contained large musical instruments. At Huili Luoluochong and Guoyuan, peasants found single bronze drums buried upside-down in the ground. At Zhuanchangba, locals encountered six bronze bells when digging a well. The bells were subsequently retrieved by archaeologists, who noticed that they had been carefully stacked in three layers with their handles pointing westward. The drum at Luoluochong was filled with grey-black earth, indicating that it had either contained organic material that had deteriorated and turned into grey-black sediment, or been filled with a special kind of soil denoting ritual significance.

The drums from the two sites of Luoluochong and Guoyuan are very similar; they are both Shizhaishan type drums (type Cb), consisting of a flattened oval top and a trapezoidal outward-flaring lower part with a slightly stepped foot part (Figures 6.1-6.2). Four pairs of small braided double-handles are distributed around the vessels, connecting the lower part of the top portion of the vessel to its middle. Both drums are of medium size, measuring 24.1 cm (Guoyuan) and 30.4 cm (Luoluochong) in height respectively, with top diameters of 28.5 and 41 cm and bottom diameters of 34.5 and 50 cm. These drums are decorated in a similar fashion, carrying a star or sun motif inside several concentric circles on the top and several bands and panels of geometric and figural ornamentation around their body. The star/sun on the Guoyuan drum has 10 rays; the one on the Luoluochong drum has only 8, in spite of the latter drum's larger overall size. The sides of the Luoluochong drum show the outlines of six boats with two or three rowers each, as well as four oxen with birds sitting on their back and at their feet and additional birds shown in separate panels. The published picture of the Guoyuan drum is too small and unclear to see such details, but the excavation report describes the drum as carrying similar decorations of boats with two rowers each and standing oxen. Tang Xiang (1999), who had access to the original drums, furthermore remarks that the Guoyuan drum was most similar to Shizhaishan-type drums of the middle phase found both at Shizhaishan (e.g., M3:3, M15:7, M16:1) and Lijiashan 李家山 (e.g., M24:36, M24:42) (Zhongguo Gudai Tonggu 1988:37-42) (Figure 6.3).[1] The Luoluochong drum strongly resembles a number of other drums from Shizhaishan

[1] For the complete excavation reports and some analyses of the two sites see Yunnansheng 1959, Pirazzoli-t'Serstevens 1974, Zhang and Yunnansheng 1998, and Yunnansheng, Kunmingshi, and Jinningxian 2009 for Shizhaishan, and Yunnansheng 1975 and 1981 for Lijiashan.

(e.g.M1:58, M6:2) (Figure 6.4), as well as drums from Yunnan, Guizhou, and Guangxi generally attributed to late phase Shizhaishan drums (Zhongguo Gudai Tonggu 1988:43-47).

Shizhaishan-type drums, which are also referred to as Heger Style I drums, are very common throughout Southwest China, and are either of similar size or larger than those from Huili. The alloys used in their production vary considerably, but it is unclear whether these differences were meant to influence the resulting sound or whether they had metallurgical or material-saving reasons.[2] The drums from southwest China and Southeast Asia are conventionally taken to have been cast in the lost-wax technique (Jiang Yu 2008), although the occurrence of casting seams suggests that the piece-mold technique might have been used. Nevertheless, the quality of these drums is very high. This is also true of the drums from Huili, contrasting with the lower quality of most other bronze objects from Huili. Tang Xiang (1999) therefore suggests that the drums were not locally produced but imported; however, as no metal analyses on the Huili drums have been published, this remains a mere hypothesis. An alternative explanation would be that ritual objects were produced with greater care than weapons or tools. Nevertheless, the stylistic similarity with objects from Yunnan makes it probable that at least the bronze drums were imported.

What is most remarkable about the Huili drums is their mode of deposition. While in other parts of southwest China and Southeast Asia bronze drums have been mostly retrieved from graves, bronze deposits are rare. Only at Cổ Loa Citadel near Hanoi has a bronze drum been found in a separate pit (Highham 2000:122-123). This drum was exceptionally large, with a width of 73.6 cm and a height of 57 cm, and it was filled with about 200 bronzes, including 20 kg of scrap pieces of various kinds of tools. It is unclear whether this was a storage hoard or a

[2] Nearly half of the Shizhaishan bronze drums analyzed are tin bronzes and most of the others are leaded tin bronzes, but both the tin (10-15%) and the lead content (0.1-16.5%) can vary significantly (Murowchick 1989:160).

ritual offering involving large amounts of metal. At the Phu Chanh site, about 40 km north of Ho-Chi-Minh City, a Shizhaishan/Heger I type bronze drum was found positioned over a larger lugged wooden jar of 50 cm diameter and 43.5 cm height (Bui Chi Hoang 2008). Although the drum was interred in a large pit and contained no bones, the site has been interpreted as a burial. At Prohear, Cambodia, some of the dead were buried with a bronze drum over their head (Reinecke, Laychour, and Sonetra 2009), a phenomenon that resembles the common burial practices at Kele culture 可樂文化 sites in Guizhou, where bronze kettles were employed for the same purpose (Guizhousheng 2008).

Combined with textual sources and ethnographic records, the archaeological material thus suggests a wide range of uses for bronze drums.[3] Aside from the obvious function as musical instruments and signaling devices in rituals, celebrations, and war, they were employed in a burial context, most often as burial goods, presumably for the dead to use in the afterlife, or as objects that had been made ritually unusable as a consequence of their use in the burial ritual. Furthermore, drums could be used to cover the head of the dead, and they could serve as containers for various kinds of offerings, e.g., cowrie shells at Shizhaishan and other sites. Additionally, the drums probably served a wide range of purposes outside the grave, as suggested by some of the scenes depicted on cowrie containers (Wang Ningsheng 1979, Tong Enzheng 1983). The decoration motifs were possibly connected to the function of the drums in some fashion, but any interpretation is necessarily riddled with uncertainties.[4]

[3] For an ethnographic study on the use of bronze drums see Cooler 1995. Both textual and pictorial evidence on the use of bronze drums have been discussed in a number of books and articles (e.g. Tong Enzheng 1983, Zhongguo Gudai Tonggu 1988:138-148, Jiang Tingyu 1999:216-229,. Li and Huang 2008:145-180).

[4] Much has been written on the topic of bronze drum decoration both by Chinese and Vietnamese authors, leading to considerable controversies that have been summarized by Han Xiaorong (1998).

What kind of inferences can be drawn from this material that might help us to understand the nature of the bronze drum deposits in Huili? It is fairly clear that at least the object form and possibly even the drums themselves had been derived from the Dian cultural context. The use to which the drums were put in Huili, however, might have been very different from what was customary in Yunnan. That the drums were placed upside down indicates that they may have served as containers rather than as musical instruments. Although their use as burial urns cannot be excluded — after all, bone does not preserve well in most of the research area — their upside-down placement into a pit without any accompanying objects suggests a ritual deposition possibly containing food or other organic objects.

The case of the six bells from Zhuanchangba is somewhat different. Although they were deposited in a pit just as the drums, they hardly lend themselves to any other usage than as musical instruments, signaling devices, and/or objects with a symbolic function. These bells are clearly a set, given their nearly identical shape, with high rounded shoulders, sides that taper inward toward the mouth, and a band-shaped loop with round cross-section at the top (Figures 6.5-6.6). They differ slightly in size with heights of 43 cm to 49.5 cm and a maximum width of 22 cm to 30 cm, showing that they had been made from separate but very similar molds and would produce different tones. All six bells are decorated with nearly identical finely executed line incisions of winding bands that remind of snakes, with spirals, broken lines, saw-tooth, and dot patterns covering their bodies and four similar decorative bands below. These decorative bands closely resemble those on the drum from Luoluochong.

Bells of a similar form have been found in Yanyuan Laolongtou M4 and several sites west of Chuxiong 楚雄 in Yunnan (Figures 6.7-6.8).[5] Aside from the bells from Fushilong, which were found 3 m below the surface without clear features surrounding them, and the bells at Zhuanchangba which came from a pit, all other specimens have been retrieved from graves. The bells usually come in sets of six; the only exceptions are the single bell from Laolongtou and the three specimens from Xiangyun Jiancun in Yunnan. In all cases, the sizes are similar to those from Zhuanchangba, and the surface is either decorated with large animals with curved bodies (Jiancun, Jinning Shizhaishan, Zhuanchangba) or geometric motifs which can either be surface-covering (Xiangyun Dabona) or limited to the upper part of the object (Laolongtou, probably Mouding Fushilong). A large number of bells of somewhat similar form but with a sheep's-horn shaped protrusion on top and straight or slightly outward-flaring sides have been found in great numbers all over Yunnan, Guangxi, Guangdong, and northern Vietnam. They were deposited in graves and are either undecorated or carry geometric motifs similar to those usually found on drums (Falkenhausen 1988:561-563). Both types of bells — those with sheep's-horn shaped protrusions and those with a simple loop handle — are therefore restricted in distribution to southwest China, and the second type is even more limited in its range of occurrence.

To date, the number of bells from Southwest China analyzed for their material composition is very small, but it is remarkable that most bells and drums from Yunnan have a similar composition, consisting of 70-80% copper, 13-16% tin, and up to 13.7% lead (Falkenhausen 1993:105; Murowchick 1989:225-226). The bell from Laolongtou has an even higher tin percentage (30.46%) but a fairly low lead content (2.19%) (Liu and Tang 2006:219),

[5] These include Jinning Shizhaishan (Yunnansheng 1959:80-81), Xiangyun Dabona 大波那 (Yunnansheng 1964), Xiangyun Jiancun 祥雲檢村 (Li Chaozhen 1983), and Fushilong Village in Mouding County 牟定縣福士龍村 (Renmin Ribao 1979).

and the bells from Huili consist of nearly pure copper (92.49% copper, 7% tin) (Falkenhausen 1993:105). Von Falkenhausen suggests that the Dian bell manufacturers might have been aware of the Chinese bronze casting rules calling for one part tin and six parts copper for musical instruments (Falkenhausen 1988:559), a recipe that as he has shown does indeed provide the resulting object with favorable qualities for their usage (Falkenhausen 1993:102-108). In later periods, the southwestern bell casters seem to have moved away from these casting principles, as reflected in the very different composition of the Zhuanchangba bells (Falkenhausen 1988:559).

This model of development, however, does not explain the composition of the similarly late bell from Laolongtou with its unusually high tin content.[6] Such a high percentage of tin would have influenced the playing behavior unfavorably, making it brittle and thus prone to breakage when playing it. The tin might have been added to aid in the casting process and/or to enhance the color of the object, suggesting that the object's qualities as a musical instrument were but a secondary concern. Another explanation for the differences in metal composition between the various bells and drums might be different casting traditions or different degrees of mastery of bronze production. While the Dian had a specific casting tradition that might indeed have been informed by casting rules from the Central Plains, the casting techniques employed in the Liangshan area might represent a local practice that was much less refined.

Another factor to keep in mind is the availability of raw materials. As Murowchick has pointed out, lead levels in bronzes in northern China as well as northern Vietnam and Cambodia tend to be considerably higher than lead levels in artifacts from southwest China, which could be due to the ready availability of tin in southwest China, making it unnecessary to substitute lead (Murowchick 1989:226). Nevertheless, as high lead levels improve the flow of the material in

[6] A tin content of 12-16% has been shown to make the bells sufficiently hard for striking, but a higher tin content would make them rather brittle (Ye Yuxian et al. 1981).

casting and also make the final tuning of the instruments easier (Falkenhausen 1988:225), technical considerations would have played a role as well. The casting techniques used for the bells in Huili and Shizhaishan have been compared to those common for small *ling* bells found as part of the personal attire in a number of graves throughout the Liangshan area and in Yunnan (Tao Mingkuan 1982). The *ling* bells, however, are usually much coarser in execution and only rarely carry any decoration. Those specimens recovered from Chuxiong Wanjiaba 楚雄万傢坝 (Yunnansheng 1983) are of nearly pure copper with trace elements of other metals (Murowchick 1989:103), indicating no deliberate alloying, but two specimens retrieved from the art market in Yanyuan have a relatively high tin content (7-12%), combined with a low amount of lead (2-4%).

Given the trace elements of titanium, bismuth, and silver in the bells from Zhuanchangba, it is fairly certain that the mining source at least for these specimens was local (Tao Mingkuan 1982). The low tin content and the lack of deliberate alloying with lead, combined with the casting technique used, all indicate local production. Considering the coarse quality of many of the local bronzes, it seems that metal-working techniques were not very developed in Huili in spite of the rich resources of both copper and tin available in the vicinity. Although both bells and drums are fairly well executed and decorated, the techniques used in the production of the drums were clearly more refined than that used for making the bells. It is therefore conceivable that the drums were imported, while the bells might have been local products imitating objects and decorations known from elsewhere, presumably from the Dian culture realm. While the forms were the same, the usage might have been different from what was customary in the Dian realm, making their sound and striking properties and thus the actual alloy immaterial to the metal workers in Huili. The probable difference in usage and meaning would also explain the difference in interment; as special objects of purely symbolic value, these objects were naturally placed into a special cache instead of a grave. The usage, meaning, and production techniques of the bell from Yanyuan, on the other hand, might have been different, but perhaps still not identical with what was common in the Dian cultural realm. Although the specimen from Laolongtou was placed in a grave, it was not part of a set and furthermore had a metal composition which would have made it physically very attractive but not ideal for playing music. This bell might therefore have had a symbolic function, rather than a practical one.

It is difficult to say what the actual distribution of drums and bells was, as not all of them might have been deposited in graves or object pits. Metal objects can be and were melted down to make new objects, resulting in the destruction of evidence. In the research area, neither drums nor large musical bells seem to have played a significant role in a burial context, and their use is likely to have been limited outside the grave as well. In deposits, both kinds of instruments are even more limited in distribution than in graves, making the examples from Huili a rather unique phenomenon. Object deposits in general are not very common in the Liangshan area; this likewise applies to the pits containing carefully deposited ceramics that will be introduced below.

VI.1.2 Ceramic Deposits

Object pits containing carefully arranged complete ceramic objects have been reported from Xichang Dayangdui, Maliucun, Qimugou, and Yingpanshan, as well as from Puge Wadaluo. Among them, we can distinguish between two different types of features:

I. small round-oval or irregular pits containing one horizontally placed large jar or urn, sometimes combined with a few smaller ceramic vessels (Dayangdui Ka1-24, Qimugou W1, Yingpanshan W1-13), and
II. large, usually rectangular pits with a larger number of different kinds of medium-sized and small vessels (Dayangdui H1-2, Maliucun H1, Puge Wadaluo H1).

Below, each type will be discussed in turn. To convey a sufficiently clear picture of the ceramic assemblages and their placement, they are described verbally, listed in a table (Table 6.1), and illustrated in plans, drawings, and photographs (Figures 6.9-6.24)

VI.1.2.1 Type I Ceramic Deposits

The 24 pits at Dayangdui were found in layer 5, which was devoid of other traces of cultural activity. The pits were arranged in two groups; those in the northern part of the site were East-West aligned, and those in the south were North-South aligned (Figure 6.9). Most pits contained one urn or large jar, which often had a row of upward-pointing lug-handles running around the shoulder. The bottom of this vessel was usually intentionally broken and placed into a smaller jar. Only in a few cases was the placement different: Ka3 contained two such vessel groups accompanied by three basins and one bowl; in Ka11 the vessels were placed mouth to mouth; in Ka2 they were positioned next to each other; Ka4-7 and Ka9 each held only one large jar with an intact bottom; Ka 13 had an assemblage composed of one jar, one double-handled jar, one cup, and one *dou* bowl; and in Ka14 two large jars of equal size and form were stacked on top of each other (Figures 6.10-6.11). In all cases, the vessels were horizontally placed in somewhat irregular pits just large enough to hold them comfortably. Furthermore, every object pit was paired with a larger long-rectangular pit with rounded corners containing fine yellow silt (Kb1-19). Such silt pits do not occur at Qimugou or Yingpanshan, but the vessel forms observed there are similar to those seen at Dayangdui.

The single object pit W1 at Qimugou was small and contained one urn and one jar accompanied by some charcoal (Figure 6.12). In this instance, the smaller vessel was placed inside the larger one, and the larger vessel seems to have been standing upright instead of lying on its side. The pits at Yingpanshan were mostly small and round (0.5-0.9 cm rim diameter, 0.1-0.3 m depth), with the exception of W2, which was considerably larger (1.3-1.62 rim diameter, 0.1-0.24 cm deep). In spite of its larger size, W2 contained only two large urns (Figures 6.13-6.16). The vessels from the pits at Yingpanshan are generally larger than those at Dayangdui (mostly 40-50 cm height compared to 23-35 cm). Furthermore, they are slightly different in form (mostly type Aa and Ab urns vs. mostly D urns and Bb jars), and none had lug-handles, but some did feature incised decoration, which is very rare at Dayangdui. The vessel forms from Qimugou W1 are similar to those from the pits in Yingpanshan (AaIII and Ab jars), and the sizes correspond closely as well. The vessels at Yingpanshan were horizontally placed but the bottoms had not been intentionally broken, and some contained red-burned earth pellets and ash (W2, W5, W8, W11), which does not occur at Dayangdui. Some pits at Yingpanshan held only one large urn (W1, W3, W4, W9, W10, W12), others contained two vessels (W2, W5-8), most of them urns as well, while W6 held one urn and one double-handled jar. W11 and W13 are exceptional as their assemblages consist of five objects each; W11 held three urns or jars (they were mostly too fragmented to allow reconstructing the exact form) and one vessel with a high ring-foot, possibly a beaker, all of them placed horizontally next to each other, and W13 contained two urns layered on top of each other, with one *wan* bowl and one lid placed next to them. W12 is noteworthy as well, having yielded a large urn with a stone net-weight placed inside it.

The vessels from all three sites are of red to brown coarse sand-tempered material, and were hand-thrown or more rarely coil-built and fired at very low temperatures. The regularity of their placement and treatment makes it clear that the deposits had a ritual function and was not meant for storage. Because of the urn form and the charcoal contained in some of them, these features have often been referred to as "urn graves" (*wenguanzang* 瓮棺葬). As none of them contained any bone remains or personal ornaments and many were even devoid of ash, this interpretation seems untenable. The pits could have been cenotaphs or ritual offerings, or they might contain objects used in ritual activities that precluded them from being employed in everyday consumption afterward. As no residue analyses were conducted at the time of excavation, it is difficult to tell whether they contained food or drink, but as the objects were placed horizontally, it is unlikely that they contained anything at the time of their deposition.

The ceramics in Dayangdui on the one hand (we may call them ceramic deposits type Ia) and Qimugou and Yingpanshan (ceramic deposits type Ib) on the other seem to have been used differently. Most of the large urns and jars at Dayangdui had a broken bottom and were placed in a smaller vessel. This suggest that these objects might have been used for a libation or some other kind of symbolic transition from one state or place to another. The fine yellow silt in the adjacent pits might have come from a special or sacred location, perhaps a place of origin of the group of people who dug them.[7] At the other two sites, fire was involved in some way, but the vessels were intact, reflecting a different kind of ritual.

Both kinds of deposits are unique within the research area and do not seem to have any parallels in adjoining regions either. They have been compared to the urn graves in Yuanmou Dadunzi 元謀大墩子 in Yunnan, but these contained actual charred bones of children placed in large urns that had been covered either by another urn or jar, or by a stone (Yunnansheng 1977.1). The urns had been horizontally placed as well, but were of different form, roughly pill-shaped with a very small bottoms and narrow opening with medium-high neck. Many urns contained additional objects, either ceramics (ewers or jars), or animal bones probably belonging to food offerings, or in one case 12 bone beads that might have belonged to a necklace. A similar

[7] The silt material has not been analyzed, and it is therefore unclear where it came from.

kind of urn graves containing the calcinated bones of infants sometimes accompanied by a few ornaments or small tools have furthermore been observed at the unpublished site of Yongsheng Duizi. The site of Mianning Xiaogoudi is likewise reported to have held 21 urn burials of a similar kind, but as the material remains unpublished it is unclear if they were burials of infants or adults, what the urns looked like, and how they were positioned.

While the pits at Dayangdui clearly did not contain cremation burials, it is conceivable that the large vessels in the pits at Qimugou and Yingpanshan originally contained children's bones, which had deteriorated in the unfavorable soil climate. As both sites as well as Mianning Xiaogoudi are very close to megalithic graves, which only contained bones of older men and women, it is indeed possible that these three sites are cremation burials for children of the same group who buried their elderly in megalithic graves. If this was the case, then the object pits at Dayangdui are either a completely unrelated phenomenon or a symbolic burial for infants whose bodies might have been deposed of elsewhere. As the pits at Dayangdui clearly precede the megalithic graves at the same site, the latter explanation seems more plausible, while for Qimugou and Yingpanshan the case remains unclear.

VI.1.2.2 Type II Ceramic Deposits

Type II pits are large (1.2-3.7 m in length), roughly rectangular in form, and contain a larger number of smaller vessels neatly stacked in the center of the pit (Figures 6.17 and 6.20). The excavators interpret the feature at Wadaluo as a storage pit (*yaoxue* 窯穴), and the ones at Maliucun and Dayangdui as ash pits (*huikeng* 灰坑), i.e., places for trash disposal. At least the second assignation does not seem appropriate, as the objects found in these pits were complete and carefully stacked, not fragments consistent with waste objects that had been disposed of.

The three pits differ significantly in size and assemblage. Even though the Maliucun pit is much larger than the others (3.68 x 2.06 x 0.6 m as compared to 1-1.2 x 0.5 x 0.8 m), it held only 20 identifiable objects, while over 150 vessels have been reported from Wadaluo; Dayangdui H1 contained 14 and H2 a mere 8 vessels. The assemblage of Xichang Dayangdui H1 consists of 12 jars of type Ba and two type C cups, while H2 held six jars of type Ba and Bb as well as one goblet and one *dou* bowl (Figures 6.17-6.18). The ceramics from Dayangdui were all hand-thrown and made of red or brown sand-tempered clay enhanced in some cases with incised water-ripple pattern, impressed leaf-vein pattern, or a black slip. Nearly all forms have wide outward-flaring rims, making them useful for drinking or pouring liquids.

The assemblages from Puge Wadaluo H1 and Xichang Maliucun H1 consist of fine grey-brown or black-brown high-fired clay-ceramics, many of them highly polished or with black slip. In both pits, vessel forms associated with drinking, such as *bei* cups, *guan* beakers, *hu* ewers, and *ping* vases are most common, but there are stylistic differences between them. The objects from Wadaluo are simple in form, undecorated, and with flat bottoms (CcI cups, BaI jars, Ha, Hb, and Hc vases, Cb ewer, BcIII *wan* and Fb *bo* bowls); at Maliucun complex vase and goblet forms with handles, spouts, ring-footed or pedestal-based bottoms, and line-decorated bodies are most common (CaII cup, CaI, DaII, and EbII goblet, BbII ewer, jar fragments) (Figures 6.19-6.20).

Megalithic graves have been observed at all three sites where deposits of this type were discovered, but so far only two of the graves at Dayangdui have been excavated. One of them (DM1) was devoid of objects. The other one, however, Dayangdui DM2, contained five ceramic vessels (three type AaII urns, one type A beaker, and one jar of unknown form) of similar form and quality as those from the two object pits (Figure 6.18). The assemblage from Maliucun H1 closely resembles the ceramics from the megalithic graves of Xichang Bahe Baozi, which were located at about 15 km from Maliucun. Both sites are situated on the western bank of the Anning River (Figure 6.21). Liu Hong's interpretation of Maliucun as an offering pit used in connection with the multiple secondary burials of the megalithic graves is highly plausible and can be applied to Xichang Dayangdui H1 and H2 as well (Liu Hong 2009:91-92).

For the object pit at Wadaluo, the situation is a little more difficult to assess. The megalithic graves excavated so far in Puge (six graves at the Xiaoxingchang cemetery, which originally comprised more than 40 graves) are very different in assemblage from what was found at Wadaluo. The graves contained mainly bronze, stone, bone, and tooth ornaments, bronze weapons and tools, and a very small number of pottery objects, the only overlap being a single centrally perforated spindle whorl in one of the graves resembling one object from the Wadaluo pit (type Bc).[8] The relationship between these two kinds of features therefore remains unclear. The ceramics at Wadaluo are reminiscent of objects from the stone grave M10 at Xichang Tianwangshan (Figure 6.22), as well as of vessels from earth pit graves with or without stone installations in Puge, Zhaojue, and Huili (Figures 6.23-6.24). Given this resemblance to artifacts from grave contexts, the object pit at Wadaluo might have been an offering connected with burial practices as well, be it in earth-pit, megalithic, or stone construction graves.

VI.1.3 Location Choice

As has become clear in the description above, the different kinds of object pits seem to have been preferentially located in specific parts of the research area (Figure 6.25). All object pits containing bronzes have been found in Huili. Luoluochong and Guoyuan, the two places with drum finds, are located less than 3 km apart from each other. They are both less than 1 km

[8] No pictures are available for either of these objects, but they have been described in the publications.

south of the Chenghe river, and were built on level ground at an elevation of around 1800 m, which is low in comparison with the overall terrain of Huili. The pit containing the bronze bells at Zhuanchangba, as well, was located at an elevation of around 1800 m on the moderate eastern slope of a depression between the mountains. The place is close to a modern public road, just as the other two sites, but it is nearly 6 km from the nearest major river, in this case the Anninghe. All three sites are located within clusters of other kinds of sites, including mostly graves but also some settlements, all located at similar elevations and on similar slopes as the object pits.

Given the similarity of the bronzes retrieved from these pits to objects from Yunnan Chuxiong and their dissimilarity vis-à-vis archaeological assemblages from the Anning River Valley, it is noteworthy that all three sites are located in a region with easy access to Yunnan, particularly to Chuxiong, while the way into the Anning River Valley is more tortuous. Zhuanchangba in particular is only about 20 km away from Chuxiong; for the other two sites the distance from Chuxiong is over 60 km, but the road runs across easily traversable downward-sloping terrain. The distance to the Anning River Valley is shorter, but blocked by high mountains that are difficult to traverse. As these deposits contained high-quality bronze objects, the location of metal resources has to be taken into account as well. Presently known tin sources are located around Luoluochong and Guoyuan, while copper sources are closer to Zhuanchangba, and lead can be found in Huidong County just east of Huili. As the whole area is particularly rich in metal resources and functions as the Liangshan region's gateway to Dian, the occurrence of special metal objects resembling Dian material in Huili is not surprising.

The pits with ceramic objects described above are located in a very different area. All of them except for Wadaluo were discovered around Xichang in the alluvial fan of the Anning River (at 0.05-1.7 km distance to the river), and thus at relatively low elevations (~1500 m asl.).

While Qimugou, Maliucun, and Yingpanshan are within a few kilometers of each other, Dayangdui is over 17 km south of the closest of the other sites and on the eastern bank of the river instead of on the west. Puge Wadaluo is even further away, over 44 km southeast of Dayangdui and separated from the others by a high mountain chain and several rivers. Wadaluo is likewise located very close to a river, the Xiluohe 西儸河, and at a moderate elevation of 1773 m, but on very steep ground with a slope of over 30° and thus 30 m above the present-day valley bottom. However, the location is extremely close to the megalithic graves of Puge Xiaoxingchang, which are likewise located on the mountain slope. The exact location is unknown, but according to the rough maps published in the excavation reports, both sites seem to be on the same slope less than 0.5 km from each other, indicating a direct relationship. The similarity in the object assemblage between the sites from Xichang Tianwangshan, Huili, Zhaojue, and Puge might therefore have chronological reasons, and is unlikely to define a small regional group. Xichang Dayangdui and Maliucun are undoubtedly extremely close to megalithic graves, which are all located on level ground on a wide alluvial plane and not on a mountain slope as observed in Puge. Furthermore, the ceramic assemblages from these two areas are very different from each other, indicating a difference both in ceramic tradition and in megalithic grave construction; however, the offering practices are similar.

It is difficult to tell whether special locations were chosen to conduct the rituals associated with the Xichang Dayangdui layer 5, Qimugou, and Yingpanshan. Dayangdui is located on a manmade platform towering about 10 m above the surrounding landscape. The spot was used as an earth-pit grave cemetery before serving as a place of ritual activity, as reflected in ceramic deposits. It was subsequently occupied by megalithic graves with associated ceramic pits of the second type. Qimugou first served as a settlement with associated graves, followed by a phase that saw the construction of a single grave accompanied by a ceramic pit. The site is very close to the river, on level ground a slightly elevated natural terrace with the mountains at its back and the river in front, making it similar to Dayangdui as well as Yingpanshan. Nevertheless, most settlement sites and many graves are located in a similar environment, and the natural surroundings of these three sites therefore do not seem to be very special. Yingpanshan held several layers of settlement remains, object pits, and earth-pit graves, with object pits and graves occurring within the same layers. Given the close similarity between Qimugou and Yingpanshan and their spatial association with megalithic graves, it seems likely that the pits at these two sites were directly associated with burial rituals or might even have served as graves themselves. They are furthermore located within less than 9 km from each other, while Dayangdui is over 20 km further south, although still within the main area of distribution of megalithic graves and even overlain by one such burial monument. Judging by their unique form and content, the pits at Dayangdui might thus belong to a separate tradition, commemorating the earlier burials at the same site or they could have been the outcome of quite different kinds of ritual acts.

VI.1.4 The Nature of the Object Deposits

The analyses conducted above clearly show that the occurrence of an assemblage of intact objects in a pit — be it of ceramics, bronzes, or items of other material — could be the result of a wide variety of different behaviors. In the research area alone, three different kinds of practices were identified. These phenomena are deposits of precious metal objects (connected with the two separate traditions of interring either bells in their own right or single drums serving as a containers for offerings), deposits of one large and one or several small ceramic vessels (connected with the two different ritual acts of fire treatment and libation/transition), and the interment of a larger number of ceramic vessels, probably in connection with burial rituals. The last category therefore has to be seen in connection with the grave material introduced above, while the other two kinds of phenomena reflect independent ritual acts.

VI.2 Single Finds

Only very few of the single finds reported from the research area can be related to specific kinds of past behavior, mainly because these finds were not made by archaeologists and their place of origin is often unclear. We can distinguish between two main categories of single finds with several sub-categories:

(1) objects recovered from the art market, for which the original deposition context is irretrievably lost;
   a. discoveries followed up by excavation or surface-survey;
   b. finds for which the original location has been reported but not further explored;
   c. objects kept in private households as heirlooms with at least a vague assignation as to place of origin.

(2) objects found and reported by local residents.

Examples of 2.a) are, for instance, the bronze object pits from Huili, which have been described above, as well as many graves, which have been included in the analysis of burial material in Chapter V. Below I only discuss finds that have not been followed up by further archaeological research and can therefore not be assigned to specific kinds of features.

VI.2.1 Provenienced Single Finds

Collections of material retrieved from the art market include assemblages from Huili and Yanyuan, while real single finds with known location have been reported from Huili Hekoucun and Yimen Xiacunxiang, Ninglan Cunyi, Yongsheng Laoying, Longtan, and Yanjiaqing, and Zhaojue Sikaixiang. In most cases, no drawings or photographs have been published, making it difficult to assess the object types and potential significance of their occurrence. The bronze sword from Hekoucun was found at a slightly elevated spot on the eastern bank of the Jinshajiang on level ground at 1771 m, close to the foot of the mountain. The weapon has been in the household of local peasants since 1971 and was recorded by archaeologists in March 1933 (Tang Xiang 1933). It has been described as a sword with a three-pronged hilt, measuring more than 32 cm in length (it was broken at the tip). The object was found at 1.5 km distance from the grave site of Huili Yunshuancun and not far from Fenjiwan, Xiaotuanshan, and other sites that have both graves and settlement remains, none of which contain similar weapons. As many of the graves were severely disturbed and robbed, causing similar swords to appear on the art market in Huili, the specimen from Hekoucun could have come from a grave, but it is unclear what kind of grave it was and what kind of objects it might have been associated with.

Yimen Xiacunxiang, where a single bronze *yue* axe was discovered on a second-level river terrace at 1789 m asl, is considerably further away from Fenjiwan than from most other sites with bronze weapon finds. Overall, many graves in Huili contained bronze *yue* axes, the closest of them being Guojiabao at 16 km distance from Yimen Xiacunxiang. It is thus likely that the axe at Yimen Xiacunxiang came from a grave as well, probably an earth-pit grave with or without stone installations.

The assemblages of surface finds in Yongsheng are very rich and all very close to each other within the same valley on level ground at around 1600 m asl.; each collection site is close to a river. At Longtan, over 300 bronze objects have been discovered, among them swords, *ge* halberds, *mao* spear-heads, *yue* and *fu* axes, *chu* hoes, composite swords and *mao* spear-heads, iron *mao* spear-heads, and ceramic *guan* jars. As no detailed descriptions or pictures of the objects have been published, it is difficult to compare them with provenience objects; however, composite swords are otherwise mainly known from Yanyuan Laolongtou and Han-period stone-cist graves from Yunnan and Sichuan, indicating that these finds might come from similar graves. Yongsheng Longtan and Yanjiaqing are very close as well and have yielded similar objects, indicating that the whole area was or probably still is covered with large cemeteries of several hundreds of such graves. Ninglan Cunyi is located in a mountain valley as well, but in a very narrow one at high altitude (2195 m) with no other known sites around. Nevertheless, as various kinds of bronze weapons have continuously come to light around the area since the 1960s, excavations in this area would probably reveal a similar cemetery of Bronze Age or later date.

The situation in Zhaojue Sikaixiang is different. Here, a pile of 17 Han coins was discovered 10 m below the surface on the alluvial fan of a river at the considerable elevation of 2444 m asl., but surrounded by even higher mountains. The location is close to a Han settlement site and a number of earlier and later graves and settlements (e.g., Ada Bobu, Geze Yangpeng, Juntun). Because of their relatively late date and Han-cultural connection, these coins technically do not belong within the scope of this study, but they are nevertheless of interest as an instance either of a hidden treasure or offering. The hoards or cashes of ritual vessels from the Central Plains are rather different as they were deposited in times of unrest. The little pile of coins in Sikaixiang, on the other hand, was deposited in the mountains but not to far from where ancient roads and river courses might have been. It is therefore highly likely that they were either offerings for the safety on the road or as money hidden for safe-keeping in case of a bandit attack.

VI.2.1 Objects from the Antiquities Market

Much richer but archaeologically much less useful "assemblages" are the collections of material confiscated by the authorities from the art and antiquities market, one of them in Huili, the other one in Yanyuan. As they are such a rich body of material that is largely virtually identical with objects retrieved from graves in Yanyuan and Ninglang, I have nevertheless decided to include it in my study.

The collection in Huili comprises nine metal objects, most of them weapons very different from what is usually found in that region (Table 6.2). The bronze objects excavated so far from earth-pit graves with or without stone installations in Huili mainly comprise coarse *yue* axes, arrowheads, and more rarely elongated leaf-shaped *mao* spear-heads (Figure 6.28), all of them local forms. The small assemblage from the antiquities market, on the other hand, is composed mostly of very finely made highly decorated weapons quite similar to objects excavated from the graves of Yanyuan Laolongtou or retrieved from the art market in Yanyuan. Particularly the ring-handled knives and the double-pommel knives are nearly identical with objects from Yanyuan (Figures 6.29.1, 2, and 5) but somewhat different from specimens of the same type from graves in the Anning River Valley (Figures 6.29.16). The sword and the dagger-axe have nearly identical counterparts in Yanyuan (Figures 6.30-6.31), and tree-shaped staff heads are typical for Yanyuan as well.

The particular motifs on the staff-head in the Huili collection, however, — wheel-shaped disks with bull-heads on the end of tree-branches protruding from a central rod — are not known to be from Yanyuan either. The staff heads from Yanyuan have a similar construction, but the wheel-shaped disks on the branches either stand alone or build a platform for a pair of horses, often with riders on their backs and led by a single human figure emerging from the staff. Depictions of bulls are more commonly associated with the Dian cultural realm, but the overall form still shows a strong connection with Yanyuan. The *mao* spearhead, on the other hand, seems most closely related to a specimen from Dechang Arong M1 in the Anning River Valley

(Figure 6.32), but the forms are very simple and the objects not well-preserved, making it impossible to draw a clear connection. The same applies to the bronze arm ring, which can be seen in similar form both in Yanyuan and in the Anning River Valley as well as many other places worldwide as a natural way of arm decoration (Figure 6.33).

The only object that has no clear connection to any other part of the research area is the short-sword with animal-head shaped pommel of type F (Figure 6.27). Weapons with animal-head shaped pommels are most common in the Ordos Region and throughout most of Northern China, as well as southern Siberia and the Seima-Turbino Complex found across northern Eurasia (Loehr 1956:101-105, Wu En 1985:147-148; Linduff 2003: esp. Figure 1.10; Kohl 2007:168-171). They usually take on the form of ram's heads placed on the handle of a curved-bladed knife, while horses, falcons, and other animals are more often associated with straight short-swords or daggers. Both kinds of objects have been found all over northern China, as well as the Shang capital at Anyang in Henan, and even in stone-cist graves in Southwest China, most prominently Maoxian Moutuo 茂縣牟托 M1 in Northwest Sichuan (Figure 6.35). A different kind of object that is often cited as a parallel is the short-sword/dagger with outward-bent pommel such as the specimen with a fish-tail handle from Yanyuan, or similar weapons found in stone-cist graves in Yunnan and Sichuan (Figure 6.35). The handle of these objects was curved, indicating some differences in handling. Indeed, weapons with a similarly bent handle and broad flattened area in their upper part have most likely been hafted side-ways like dagger-axes, making them very different from both the objects from the northern steppes and those from Moutuo and the Huili assemblage (Sichuansheng and Ganzi 1991: esp. Figure 19.17).

Judging by the shape, the closest parallel to the specimen from Huili is the one from Moutuo, but the head is more similar to objects from northern China, and the plantain-leaf decoration (*jiaoyewen* 蕉葉紋) covering the upper 2/3 of the blade, the animal-head incisions between handle and blade, and the rows of points covering the handle are difficult to relate to any of these weapons. The rest of the assemblage points unequivocally to Yanyuan with no ties to Huili itself. As objects retrieved from the art market are often found somewhere other than where they are finally sold, I therefore agree with Tang Xiang's assessment that the objects just described probably come from Yanyuan and not from Huili. Not all of the comparanda from Yanyuan have actually been obtained through excavation — many were retrieved from the art market. Nevertheless, since there are parallels from the cemetery of Yanyuan Laolongtou for over half of the object assemblage from Huili, the ascription is still fairly secure.

Most metal objects (732 out of 1073) and nearly half of all ceramics (82 out of 188) known from Yanyuan have been retrieved from the antiquities market by the authorities. Of the 341 metal objects that have been excavated or collected in surface surveys by archaeologists, 236 came from six graves in Laolongtou, as did 15 of the 106 excavated ceramics. 95 of the 96 excavated stone objects (most of them beads, as well as a few arrowheads, axes and other tools) were retrieved from the Laolongtou graves as well, as were all of the 21 excavated bone ornaments. On the antiquities market, on the other hand, 35 stone arrowheads, 9 stone grinding-rollers and two cowrie shells appeared. Overall, the range of material known from Yanyuan is thus highly biased toward objects clearly identifiable as precious or special, such as metal weapons, staff-heads, drums, ornaments, and ceramics of particular form or decoration. It is nevertheless remarkable that stone arrowheads and grinding-rollers were sold as well, indicating that at least for some richer graves that had been robbed, every retrievable object was sold. Naturally not all objects originally taken from graves in Yanyuan have been confiscated by the authorities, and the number of lost objects must be considerable, quite apart from the tragic loss of their archaeological context.

As it is now clear that the objects retrieved from the art market in Huili were not actually retrieved from Huili, it is worth taking a closer look at the objects from the Yanyuan collection (from here onward referred to as Yanyuan Gong'anju 公安局) as well. Similar grinding rollers as found here have otherwise been excavated from Laolongtou M11, Yanyuan Jiaodingshan, Yongsheng Duizi, Puge Xiaoxingchang, and Huili Miaozi Laobao, while grinding rollers from sites in the Anning River Valley look somewhat different. The grinding rollers from Yanyuan Gong'anju can thus be securely connected to Yanyuan, but their form is not unique to the area. Long-narrow shafted arrowheads such as those from Yanyuan Gong'anju have hardly ever been found elsewhere, apart from a few specimens at Ninglang Daxingzhen and Yanyuan Jiaodingshan, indicating a local origin as well. Cowrie shells are very rare throughout the research area and have otherwise only been reported from several graves in Yongsheng Duizi as well as Huili Xiaoyingpan M21, most of them perforated, while those from the assemblage under discussion did not have perforations. Cowrie shells are fairly common in the Dian cultural context as well, and it is therefore hard to tell whether the specimens under discussion here had come from neighboring regions or from Yanyuan itself.

Many of the ceramic forms, most of them being type D and E double-handled jars, have close parallels in the Laolongtou finds, but at the same time they do resemble finds from stone-cist graves throughout all of southwest China, e.g., Deqin Nagu, which is not far from Yanyuan (Yunnansheng 1983). The earth-pit graves at Ninglang Daxingzhen held similar vessels as well, while similarities with objects from the Anning River Valley are noticeable but less pronounced. Only a portion of the single-handled jars and the single vase are closely related to objects otherwise known from Megalithic graves. Most remarkable, however, is the jar with cross-bars in the wide outward-curving double-handles. Such objects have so far only been found at Yanyuan, both at Laolongtou and in the Gong'anju collection, marking them a local particularity. Some vessels retrieved from the antiquities market in Yanyuan are fairly unique as well, such as the double-handled jar with a double-spiral decorating the body (ram's head design), which in this case is not only slightly protruding but made of thick clay coils (type EaIII). Many of the bronze objects from the Gong'anju assemblage are similarly unique, making it difficult to assign the place of origin.

Such unique objects comprise both personal ornaments and objects with a probable ritual function, including four bronze plates with animal figures on them, four staffs, 58 staff heads of various forms, 20 swallow-shaped and two flat tiger-shaped ornaments, a single three-dimensional object resembling a standing-man, as well as various types of bronze pendants and other ornaments. The single chicken-shaped staff-head of coarse quality from Laolongtou M4 nevertheless suggests a local origin of this kind of object, and the animal forms on the bronze plates are also very similar in execution to the object from M4. The only exceptions are the bronze stand with cross-bar legs and snake-fish-and-frog decoration and the three-dimensional staff-heads showing water-bearers, which are all very finely executed and strongly resemble motifs known from Shizhaishan (Yunnansheng 1959, Pirazzoli-t'Serstevens 1974). The drums are very similar to specimens from Chuxiong Wanjiaba in Yunnan too, but comparable objects have likewise been found at Yanyuan Majojiaba M1 and M2, showing that the drums in the Yanyuan Gong'anju assemblage might still have come out of the ground in Yanyuan, even if they were produced in Yunnan.

Large musical bells have been found at Laolongtou, but the Gong'anju assemblage contains only small *ling* bells similar to those from Laolongtou M9, but are commonly found in megalithic graves in the Anning River Valley. Certain types of these bells do not occur in other parts of the research area but only in Yanyuan and neighboring areas in Yunnan, e.g., broad-oval shaped bells with a concave bottom (type Db), and bells of elongated oval form with a high oval ring-handle and elaborate decoration (type E). While type Db bells have been found at Laolongtou, type E is so far only known from the Gong'anju assemblage, as are the very coarse and very small bells of type F, that do not seem to have parallels in neighboring areas either.

The arm and finger rings in the assemblage are mostly plain and are thus very similar to simple rings from many other places in Southwest China, naturally most of them naturally grave sites. Other kinds of personal ornaments are more unique, e.g., cow-horn and rabbit-ear shaped ornaments, a pen-shaped ornament, flat ornamental bands, and double-beads, which might have been clothing applications such as buttons or other clothing decoration. While most of the types just mentioned have no parallels elsewhere, double-beads were found in Laolongtou M4, M6, and M11, and a flat band was found in M4, connecting the Gong'anju specimens fairly securely with Yanyuan. A single wave-like ornament, on the other hand, most closely resembles ornaments found at the cemetery of Huili Guojiabao, albeit as surface finds. It is therefore unclear whether they were clothing applications or ornaments decorating a coffin or a wooden container, however, given that objects from Yanyuan appeared on the antiquities market in Huili, that this case were the reverse is curious to note.

Various kinds of button-shaped applications as found in the Gong'anju assemblage have been retrieved from Laolongtou M6 and M9 and from various megalithic graves in the Xichang area as well, linking these objects to Yanyuan but without making them unique to the region.

Belt hooks and belt ornaments of type A, C, and D, on the other hand, have so far only occurred at Laolongtou M9, M6, and Gong'anju, as well as in the collection from Huili. Only a single belt hook in the shape of a tiger head (type B) has been retrieved from Xichang Xijiao Gongshe M1, which is in turn related to objects from the Ba-Shu cultural realm. As the presence of belt hooks provides some indicators as to differences in clothing habits between different areas as well as cultural contacts, this object category will be discussed further in Chapter VIII.

Different kinds of horse harnesses, body armor, and shield bosses have mostly been reported from various graves in Yanyuan as well (i.e., Laolongtou M4 and M5, and Maojiaba M2), but they are common to the neighboring areas of Yunnan. These parallels thus anchor similar objects in the Gong'anju assemblage firmly in the general vicinity of Yanyuan, but not necessarily in Yanyuan itself. Han coins and bronze *mou* vessels have a wide distribution, although they are somewhat rare in the research area. On the other hand, a small mirror-shaped object of only 8.7 cm diameter is entirely unique, although its function is still unclear.

Apart from these rare specimens, the Gong'anju assemblage contains a large number of bronze weapons, which show very clear connections to both Laolongtou and other graves sites in Yanyuan, and stone-cist graves both in Yunnan and at the upper Minjiang River. Swords, especially of the three-pronged variety with torqued handle (type A), but also those with double-circle pommel (type B), and various straight and trapezoidal handle-forms (types C, D, G, H) are particularly numerous. Within the research area, type A swords are known from several graves in Laolongtou, Yanyuan Gesa and Ninglang Daxingzhen, but they are also common to stone-cist graves throughout southwest China. The same holds true for type B and type D swords. Furthermore, all three types occur as composite swords, both in Yanyuan and elsewhere. Type C swords have interestingly been found in Yuexi Liaojiahsan M1 as well, which is fairly far away from Yanyuan. There, they were accompanied by bronze *mou* vessels, various ornaments, and double-handled jars not unlike the other objects known from Yanyuan and from various stone-cist graves along the upper Minjiang. This a connection will be further examined in Chapter VIII.

Other metal weapons from the Gong'anju assemblage that have parallels in grave finds from Yanyuan and Ninglang are scabbard tips, knives, dagger-axes, *fu* and *yue* axes, spear-heads, and shafted arrowheads; however, many sub-types have no exact local parallels but are close enough in form to objects found in Yunnan to have come from there. Some of the dagger-axes even have parallels in the Ba-Shu cultural realm, pushing the range of connections even further.

Overall, it is therefore difficult to ascertain where exactly the objects in the Yanyuan Gong'anju assemblage originally came from. Given that they are mainly bronze objects and ceramics similar to those known from graves in various parts of Southwest China, it is likely that most of them also came from graves. The staff-heads, staffs, bronze tablets, and other objects with a potential ritual function, however, might just as well have come from special deposits as has been observed in Huili. What makes the original place of deposition so difficult to ascertain for most of these objects is the nature of the grave assemblages from Yanyuan itself. They too consist of objects that show close similarities to a wide range of different places, cultures, and even chronological periods. Given their uncertain provenience, the objects from the Gong'anju assemblages both in Yanyuan and Huili can therefore not simply be treated as objects from Yanyuan, as is usually done, but they must be treated separately, carefully comparing every single object, considering form, decoration, as well as technical details such as execution and metal composition. So far, the metal composition of 52 objects from Yanyuan has been analyzed, but since analyses have only rarely been conducted on similar objects in other parts of the research area or in adjoining areas, the results are difficult to evaluate.

Most staff-heads are of similar composition (~85% copper, 10% tin, 5% lead), but one specimen of type B and one of type Da have particularly high tin percentage of over 30%, combined with only a little over 50% copper.[9] Interestingly, type B is the finely-made three-dimensional staff-head showing water-bearers that strongly resemble human representations from the Dian culture realm. Unfortunately no comparable objects from Yunnan have been analyzed, making it difficult to evaluate this connection. It is remarkable, however, that one of the tables from the Gong'anju assemblage also contained a very high percentage of tin (22.82%), and low percentages of copper (68.49%), although this might be a function of the complex form and desired visual appeal, rather than an indicator of origin.

One of the *Wanjiaba* drums consists of nearly pure copper, while the *Shizhaishan* drum from Laolongtou M4 consists of 75.45% copper and 17.83% tin. *Shizhaishan* type bronzes from Yunnan vary considerably in composition, but all of the analyzed specimens have been alloyed with sometimes substantial amounts of tin as well as lead, while all drums from Wanjiaba either consist of pure copper or contain very small amounts of tin and lead (< 3.5%). The drums from Yanyuan Laolongtou and Gong'anju might therefore be imports or at least made according to the same principles as those in Yunnan. Two wide bracelets from the Gong'anju assemblage were made of nearly pure copper, while three thin bracelets consist of about 80% of copper, having been alloyed with tin, a composition that can be observed in similar bracelets from Shizhaishan and Wanjiaba. The tongues of one type Ab *ling* bell consists of 76.57% copper, alloyed with 12.71% tin and 2.01% lead, while a small bell of unknown type has 88.76% copper, likewise alloyed with 7.29% tin and 3.62% lead. To my knowledge, so far only one type Ab *ling* bell from Wanjiaba has been analyzed, showing a nearly pure copper composition. Many of the very small

[9] The information on the composition of objects from Yanyuan and other parts of the Liangshan region were taken from Liangshan and Chengdu 2009:219 and Cui Jianfeng et al. 2010, while the analyses of material from Yunnan are cited after Murowchick 1989, Li, Chao, and Jiang 2004, and Yunnansheng, Kunmingshi, and Jinningxian 2009.

bells both from Yunnan and Yanyuan, are indeed very coarse and might not have been alloyed either, but more analyses are needed to reach any further conclusions.

Most of the weapons both from Yanyuan Gong'anju and Yunnan are more homogenous in their composition, consisting mostly of 73-85% copper, 10-20% tin, and small amounts of lead. Notable exceptions are two three-pronged swords (type Aa), one type Cc knife, and one type IDa arrowhead, all from the Gong'anju assemblage, as well as one type AbII spear-head from Laolongtou M11, which all have low percentages of copper (45-65%), alloyed with much copper and in the case of one type Aa sword and the knife lead. Such low levels of copper are uncommon in the bronze weapons from Yunnan that have been analyzed; instead, the weapons from Yunnan tend to have tin levels of only 10-15% with hardly any lead. Two other weapons from Yanyuan Gong'anju (a knife and a *fu* axe), are remarkable for their high copper content of 90-98%. The axe was alloyed with some tin, but the knife consisted of pure copper. In Yunnan, pure or only slightly alloyed copper is very common for tools, especially at earlier sites such as Wanjiaba or Dabona, but less so at Dian sites such as Shizhaishan. Some of the differences in material composition could therefore be due to date rather than place of origin. Horse harnesses and body armor tend to be relatively high in tin content (13-29%) both for the specimens known from Yanyuan and those from Shizhaishan, but one of the horse bits from Yanyuan Gong'anju consisted of 94.22% copper, alloyed with only 4.22% tin and 1.56% lead. More research needs to be done to make suggestions regarding metal sources, but judging from both object forms and alloys used, the connections are close between the bronze objects in the Yanyuan Gong'anju assemblage, those from Yanyuan Laolongtou, and from neighboring regions in Yunnan.

VI.3 Conclusion

Through detailed analysis and comparison of objects and features in the heterogeneous categories of object pits and single finds, it has been possible to assess their relationship with the material known from graves and settlement finds. The main categories and sub-categories of object pits identified above are bronze deposits (drum caches and bell caches), and ceramic deposits (offering pits used in connection with megalithic graves, potential urn burials, and remains of other ritual acts). The drums are likely imports from the Dian culture sphere, deposited as ritual offerings of special objects, possibly in reference to the near-by river or other landmarks. The singular deposition of bronze bells was observed over 40 km further southwest in a different valley and separated by a high mountain ridge both from the other sites with bronze deposits and from the nearest river. The meaning of both groups of deposits might nevertheless be similar as they both contained ritual musical instruments used in graves in the Dian culture area but otherwise unknown from Huili. It is remarkable, however, that the bells were clearly local products imitating foreign objects but not meant for actual use as musical instruments. All three deposits therefore show the high esteem in which Dian objects were held.

Bronze drums in particular have a wide distribution far beyond the Dian realm, extending throughout most of Yunnan and much of Southeast Asia. Apart from their usage in various rituals and as grave goods, historical sources show that the drums were symbols of authority as well as instruments for summoning the gods (Cooler 1995:9, Pirazzoli-t'Serstevens 1974:29-31), while pictographic evidence from Dian cowrie containers indicates that they might have had a similar function during earlier times as well. Alice Yao (2010) suggests that the drums might have symbolized formalized alliance networks, and it is conceivable that the specimens from the research area did indeed reach Huili as tokens of mutual political agreements between the groups living there and the Dian. This might apply to the drums found in Yanyuan as well, but here these objects were placed inside graves and not object pits, reflecting the high status, far-reaching connections, and political importance of the tomb owner. Yanyuan is furthermore characterized by the contrast between large and very richly furnished elite burials and small graves with only minimal equipment, while the cemeteries in Huili speak of a society that — at least in death — seems to have been considerably more egalitarian. The bronze drums therefore likely took on a slightly different meaning in these two places — in Huili as tokens of a bond between the Dian and the local community as a whole, in Yanyuan a symbol of elite exchange and high status of a few — which would explain the differences in deposition practice. The close connections with Yunnan visible in the assemblages from both regions and the lack of bronze drums and bells in other parts of the research area can be easily explained by geomorphological factors. Both areas are separated from the Anning River Valley by high mountain ranges not easy to traverse, while in Huili the terrain gently slopes down toward Yunnan, making Huili the gateway to Dian. Yanyuan is considerably further away from the region that the Dian inhabited in the past, but has relatively easy access to northwest Yunnan and thus indirectly to Dian.

The ceramic deposits, on the other hand, are all located within the area dominated by megalithic graves and mostly stand in direct relationship to them. The pits at Xichang Dayangdui and Maliucun were clearly used in connection with the multiple secondary burials of the megalithic graves, either for offerings to the dead or for depositing objects used in ritual meals or other activity that precluded them from being employed in everyday consumption afterward; the same interpretation likely applies to Puge Wadaluo as well. The remaining ceramic deposits are very different in content, even though they are located in the vicinity of megalithic graves as well. Xichang Qimugou and Yingpanshan might be either symbolic or actual urn burials from which the ash remains have not been reported, originally holding the bones of infants and juveniles that for religious or social reasons could not be buried in the megalithic graves that were reserved for older people. Both sites are relatively close to each other, while the ceramic pit of Xichang Dayangdui is located significantly further south and reflects a very different practice. The pits at Dayangdui hold ceramics clearly used in libation rituals and are paired with pits containing fine yellow silt, which might have come from a special or sacred location, a custom that is unique within the research area and does not seem to have any parallels in adjoining regions either.

The practice of depositing bronze objects in pits is likewise unique within both the research area and southwest China as a whole, but the objects show clear signs of outside influence, so do many of the single finds. From a comparison of both the provenienced single finds and the objects retrieved from the antiquities market it has become clear that they very likely all come from earth-pit graves with or without stone-construction parts in the southwest of the research area, i.e., Yanyuan, Yongsheng, and Ninglang. Among the unprovenienced artifacts there are many unique bronze weapons, ritual objects, and personal ornament strongly resembling finds from places as diverse as northwest Sichuan, northern China, the Ordos region, and particular various parts of Yunnan. In spite of their unknown precise origin, these objects can therefore not be completely ignored but have to be taken into consideration when discussion various instances of cultural contact in Chapter VIII. Before discussing such complex questions involving other regions both close-by and farther away, the first step is to assess the relationship between the different kinds of features and objects within the research area itself. In the following chapter, I will therefore first compare the different site types and object assemblages as well as their geographic distribution, to identify potential local groups. Secondly, I will revisit the problem of the chronology of the research area. Only after clarifying local developments in this fashion can the question of contact with other regions be addressed in a meaningful way.

VII. Synthesis: Connecting Settlements, Grave Material, and Object Pits

Having analyzed the different kinds of sites, their content, and their location in the landscape independently, I shall now attempt to weave these separate threads into one big picture. This requires a number of separate steps: 1. a evaluation of the geographic distribution of the different kinds of sites both in relation to each other and to geographic features; 2. a comparison of the archaeological material from the various sub-regions; and 3. an investigation into matters of chronology. Below, each of these points will be addressed in turn before discussing the culture-historical implications of these observations. The aim of this chapter is twofold: to assess the relationship between the various behavioral patterns identified in the preceding chapters, and to define different types of identity groups based on the behavioral patterns reflected in the archaeological record; furthermore, I want to sketch out the development of these groups over time and their relationship to each other and as well as to the local environment.

VII.1 The Geographic Distribution of Different Types of Sites

VII.1.1 Settlement Site

As may be expected, compared to a sample of random points, all types of sites are preferentially located at low elevations, on moderate slopes, and in close vicinity of a river (Tables 7.1-7.2). Given the unevenness of the terrain, there is much regional variation, but settlement sites are preferentially found at medium elevation and on level ground with no preference for a specific slope orientation. Northern slopes (including NE and NW) were chosen more rarely than slopes facing into other directions, but the numbers do not reach statistical significance (Table 7.3). The reason for this indifference lies probably with the fact that the whole area receives a high amount of sunshine with considerable sun intensity year around regardless of slope direction. The only region where settlement sites never appear on northern slopes is Zhaojue, which is generally colder climate and less fertile ground than, e.g., the Anning River Valley. In Zhaojue, it would thus be more important to shelter the settlements from the cold and expose them to as much sunlight as possible, hence the preference for slopes other than the northern ones. Most settlements in all sub-regions are located in close vicinity to a river, but on elevated spots, i.e., on a terrace leaning against the mountain; such a position would have provided the sites with access to water, while at the same time protecting them from the dangers of the shifting river courses with their seasonally swelling waters. Furthermore, the mountains would have afforded protection from both wind and approaching unfriendly groups, while the complex system of river courses nearby meant access to various contact networks.

As far as can be ascertained from the regrettably imprecise soil maps, settlements are preferentially located on land that is favorable for agriculture, such as the alluvial soil in the lacustrine basins along the Anninghe, as well as in Huili, and the Yanyuan Basin. Nevertheless, settlement sites can be found in high mountains, on steep slopes, and on forested land as well, but nearly exclusively in areas lacking flat land such as Puge and Zhaojue. Not surprisingly, the settlements of Puge located on steep and forested slopes yield many arrowheads, indicating an economy based on hunting, while the object assemblages in Zhaojue point to a mixed economy.

As far as natural resources are concerned, the local salt sources probably drew people into the Yanyuan Basin in spite of the high mountains surrounding it on all sides. The precise location of salt sources used in the past is unknown and it is therefore unsure if settlement sites were built close to them or at a distance. The same yields true for the metal resources of Huili, whose exact location is unknown as well. The wide variety of different kinds of metal in considerable quantities would in any case have made the fertile valleys of the Southeast additionally attractive, in spite of the high mountains surrounding it on three sides.

VII.1.2 Grave Site

Natural resources and soil quality were probably not of much concern in the choice of location for graves or other ritually motivated constructions. Nevertheless, the environment in which both graves and object pits are located is similar to that of settlement sites. Sometimes these different kinds of sites are even located in the exact same location or immediately adjacent. The available soil maps are too imprecise to assess if ritually motivated structures were deliberately built on less fertile ground, but it is noteworthy that megalithic graves were erected closer to river courses than most settlements or other types of graves, indicating that their builders were more concerned with their visibility within the flat alluvial plain than with safety from flooding or with preserving valuable agricultural land.

Stone-construction graves below ground, on the other hand, are mostly found at greater distance from the rivers than the settlement sites in the same areas; moreover, they are usually at considerably higher elevation and on steep slopes; in orientation, they follow the direction of the slope, with the interred facing the river (Tables 5.53-5.56). While the orientation of the graves likely has a cultural motivation (e.g., the religious/cultural importance of the river courses), the location choice on steep slopes that are unsuitable for agriculture probably has practical reasons as well (e.g., reserving flat areas for agricultural activities). This assumption is strengthened by the fact that the contrast in geomorphological characteristics between the places chosen for settlements and graves is particularly strong in Zhaojue with its narrow river valleys and steep slopes. In Huili, on the other hand, where the river valleys are wide and fertile, graves often occur right next to settlement sites, albeit usually a little further up the slope.

For the sites in the southwestern part of the research area, the case is a little different. In the Yanyuan Basin and around the lakes and rivers of Yongsheng, earth-pit graves with different amounts of stone construction are found in similar locations, on even or only slightly sloped ground within alluvial plains, close to a river but usually on slightly elevated platforms overlooking the area and protecting the site from flooding. In Ninglang and the mountainous parts of Yanyuan, on the other hand, where the river valleys are extremely narrow and even ground is scarce, both graves and settlement sites are found on steep slopes, and at wide distance from the major rivers, although usually in the vicinity of small seasonal creeks.

The eastern mountains of Miyi, Puge, and Xide are likewise characterized by narrow river valleys, steep slopes, and less fertile soils than along the middle reaches of the Anninghe; nevertheless, these sub-regions are dominated by megalithic graves, which in most of the Anning River Valley are preferentially located in highly visible places on even ground. In the eastern mountains both settlement sites and megalithic graves are unevenly distributed, but the graves are mostly found on the few patches of even ground the region has to offer and always close to a river. The settlements, on the other hand, are located at some distance from the river and both on steep and flat slopes with no preference for a specific slope orientation. As the number of known sites from these counties is small and their locations are mostly recorded on small-scale maps, the level of accuracy of these observations is low.[1] Nevertheless, at the current state of research it seems probable that the preference for high visibility for megalithic graves was more important than the use of the scarce high-quality soil for agricultural purposes. As the local tool assemblage

[1] Exact coordinates are only known for two out of 25 sites, Xide Guluqiao and Xide Wuhe.

indicates that hunting was a dominant means of food procurement, the seemingly low importance attributed to agricultural soil is not surprising.

The distribution of earth-pit graves in relation to settlement sites varies greatly by region as well. The earth-pit graves in Huili, Ninglang, and Yanyuan are all associated with stone-construction graves and thus identical in distribution with what was described above. The known earth-pit graves in Yongsheng have all been found right next to settlement sites on even ground at low elevation at close distance to a river. The situation in Xichang and Puge is similar, but the earth-pit graves are often adjacent to megalithic graves, although one usually predates the other.

A special case are the potential urn burials at Xichang Qimugou, Yingpanshan, and Mianning Xiaogoudi, which are all located in the vicinity of both megalithic graves and settlement sites and might be related to either or both. These urn pits are all located on moderate southeastern slopes at low elevation in less than 2 km distance of the nearest river, just as most of the graves and settlement sites (Table 7.4). The bronze deposits in Huili are located in places that are geomorphologically similar to those where settlement and grave sites can be found. The same applies to ceramic deposits. The ceramic pits of Puge Wadaluo and Xichang Maliucun are immediately adjacent to megalithic graves, reaffirming the close connection suggested by a similarity in ceramic material. Only the ceramic deposit of Xichang Dayangdui are superimposed by megalithic graves and of different form and content than the other known ceramic pits, showing that they belonged to a different tradition.

The earth-pit graves in Yuexi are located in a river valley east of the Anninghe and have rich bronze assemblages different from what was otherwise found in the northwestern mountains. So far, Yuexi has only been explored through surface surveys without excavations, but the presence of both megalithic and earth-pit graves suggests that there should be some settlement sites nearby, as graves are mostly found close to settlements.

Overall, about 64% of all grave sites throughout the research area are located within less than 5 km of a known settlement site and the majority of the remaining sites are within less than 10 km distance of a settlement site (Figure 7.1). The sites that yielded both settlement remains and graves,[2] as well as the grave sites located at less than 1 km distance to a settlement (Table 7.5), require special attention when comparing the material from different sites with each other.

VII.2 Comparing Assemblages: Functional Differences, Chronological Developments, or Cultural Differentiation?

As can be expected, the assemblages at settlement sites mostly consist of ceramic vessels and stone tools. Over 40% of all objects known from graves are ceramic vessels as well, followed closely by personal ornaments (~34%); weapons and tools of metal, stone or bone are considerably more rare (together ~17%), not to mention ritual paraphernalia and other special objects (Figure 5.76). Bronze deposits, on the other hand, only contain special objects such as drums and bells, and ceramic deposits naturally mostly contain ceramic vessels accompanied by a small number of tools. The main focus of comparison between the different types of sites are therefore ceramic vessels and to a lesser extent stone tools and spindle whorls; metal objects are of importance for the comparison between bronze deposits and grave finds, as well as between different types of graves.

[2] These sites are Dechang Dashipai, Huili Fenjiwan, Guantianshan, Guojiabao, Houzidong, Tangjiaba, Washitian, Xiaotuanshan, Puge Wadaluo, Xiaotingchang, Xichang Bahe Baozi, Dayangdui, Guanshan, Lizhou, Ma'anshan, Mimilang, Qimugou, Tianwangshan, Xiaohuashan, Yangjiashan, Xide Wadegu, Yanbian Yumen Wanxiao, Yanyuan Jiaodingshan, Xiaoguan Liangxi, Yingpanshan North and South, and Yongsheng Duizi.

VII.2.1 Weapons and Tools of Metal, Stone, Bone, and Clay

The majority of metal weapons and personal ornaments made from various materials naturally come from graves; the assemblages found at settlement sites, by contrast, mostly consist of ceramics and stone tools. However, there are a few exceptions to this rule. Huili Washitian, which yielded both settlement remains and over 30 earth-pit graves, was also a smelting site, as attested by the discovery of a *ge* dagger-axe mold and an arrowhead mold. The surface finds comprise both tools probably used in bronze production (stone molds, choppers, stone perforators, bronze tubes) and local metal products (one bonze arrowhead and one bronze *yue* axe). Arrowheads made of stone, bone, and wood occur about equally often in graves and settlement layers throughout most of the research area, most frequently in Puge, Yanyuan, and Huili, but also Dechang, Miyi, Xichang, Xide, and Yongsheng,[3] without any general differences in style or execution between arrowheads from graves and settlement layers. The stone arrowheads are all of good quality, highly polished, and made of fine dark-grey slate, shale, or sometimes fine igneous rock. Remarkable exceptions are single arrowheads from graves at Xichang Dayangdui, Xide Lake, and Yongsheng Duizi, which consist of smooth purple chert in the case of Dayangdui and white/yellow nephrite at the other sites. All of these arrowheads are leaf-shaped, thinner, and even more carefully worked than arrowheads of slate or shale from the same sites. It is highly likely that the material was chosen for its attractive physical qualities and/or cultural or spiritual implications; these objects thus had a symbolic value going beyond that of other arrowheads in graves, which were not different from those used in everyday life.

[3] The settlement sites containing arrowheads of stone and in one case metal are Dechang Dongjiapo, Maojiakan, Huili Tianbacun, Washitian, Puge Xiaxingchang, Tianba, Xichang Henglanshan, Ma'anshan, Mimilang, Xide Wadaluo, Yanyuan Jiaodingshan, and Yongsheng Duizi. Graves containing arrowheads made of stone, bronze, bone, or wood were observed at Huili Fenjiwan, Leijiashan, Miyi Wanqiu, Ninglang Daxingzhen, Puge Wadaluo, Xiaoxingchang, Xichang Bahe Baozi, Dayangdui, Xiaohuashan, Xijiao Gongshe, Yanjiashan, Yuanjiashan, Xide Lake, Yanyuan Jiaodingshan, Laolongtou, antiquities market, Yongsheng Duizi, Zhaojue Eba Buji, Wazhaishan.

Another kind of artifact found in both settlement sites and graves are knives, but they belong to different functional types. All knives retrieved from settlement layers are made of slate or fine igneous rock, often perforated, either D-shaped, oval, or more rarely rectangular or crescent-shaped. As discussed in Chapters III and IV, these knives were probably harvesting tools. The perforated varieties are usually associated with rice agriculture and occur only at a small number of sites.[4] Un-perforated knives of similar form, on the other hand, are common throughout most of the research area except for the mountains of Meigu, Xide, Yuexi, and Zhaojue, i.e., they are restricted to areas appropriate for agricultural activities. Perforated knives furthermore never occur in assemblages characterized by coarse stone-tools, and they are also missing from cave sites. In graves, this kind of knives is extremely rare, so are other agricultural tools. This may show that in most of the research area this subsistence practice was not seen as important for the afterlife and/or for the definition of the social persona as reflected in the grave.[5]

As the deceased in the megalithic graves and the earth-pit graves associated with them were usually buried with individual sets of personal ornaments, small weapons, and tools worn on the body, the lack of stone knives and other agricultural tools is not surprising. It is remarkable that the few stone knives found in graves were always highly polished but at the same time showed striations and other signs of actual use. They might therefore have been used in ritual cutting of plant stalks or other activities of ritual significance rather than in everyday subsistence practices, and were then finally deposited in the ritual context of a grave.

[4] Perforated stone tools appear only at Huili Guantianshan/Yingpanshan, Liantang, Mianning Sanfentun, and in the later layers of Xichang Qimugou.

[5] Stone knives occur only in the earth-pit graves Xichang Qimugou M1 and M2, Yanyuan Laolongtou M11, and Yongsheng Duizi M34 and M93and in the megalithic graves Xichang Xiaohuashan M1, and Xijiao Gongshe M1. Xichang Xiaohuashan M1 furthermore yielded a bronze version of such a D-shaped single-perforated stone knife as well as a sickle, and Xichang Xijiao Gongshe M1 contained stone knives and an iron spade.

The burials in Yanyuan, Yongsheng, and Ninglang usually emphasize metal weapons and personal ornaments rather than tools. Nevertheless, both Laolongtou M11 and Yongsheng Duizi M34 and M93 contained stone knives as well as further stone tools such as axes and chisels; the stone knives were thus probably part of tool sets rather than special items. Given the lack of publication, the full assemblage of the graves at Yongsheng Duizi is unknown, but in Laolongtou M11, the tools were accompanied by small grinding stones, a considerable number of bronze arrowheads and other weapons as well as personal ornaments and a few ceramics. As the grave lacked bronze ritual objects, horse gear, animal bones, or signs of special burial rituals as have been observed with the largest graves at Laolongtou, it seems that the tomb occupant had special knowledge concerning food procurement and/or tool production that was valued but did not afford the highest rank. Given the tiny sample of one grave, these suggestions are naturally tentative, but as both agricultural and woodworking tools in this sub-region are limited, it is likely that agriculture did not play a vey important role here.

Woodworking tools can occur both in settlement and grave context and are made mostly of stone and more rarely of metal. Chisels made of metal and stone do not differ much in form, but for axes and adzes, there is a considerable split between stone and metal specimens. *Yue* axes are always made of bronze, and they exclusively occur in graves, mostly in Yanyuan and Ninglang, and more rarely in Huili and Zhaojue. They are of high quality and often decorated, indicating that they were weapons with a potential symbolic function and not tools such as the *fu* axes known from many settlements and a few graves. *Fu* axes were mostly made of stone or bronze. The two iron specimens from Yanyuan are completely rectangular, a form that never occurs with other axes; bronze axes are always long-trapezoidal with a curved blade and slightly concave sides, as only rarely seen with stone specimens. As discussed in Chapter III, this difference in form is likely due to differences in the production process rather than differences in function or meaning of the resulting objects.

The quality of the stone tools interred in graves is generally high and the raw material is special, e.g., chert, nephrite, quartzite, or fine dark-grey igneous rock or slate instead of the coarse igneous rock more commonly observed with stone tools found in settlement sites. They were thus probably made specifically for the occasion of the burial, choosing a material of symbolic significance and/or particular visual appeal. Only the few stone tools found in megalithic graves are coarse and similar to objects found in settlement sites; they were thus probably the personal tools of the people they were interred with, rather than items specifically made for the afterlife. The vast majority of stone tools found in earth-pit and stone-construction graves, however, were special in material and execution, but nevertheless largely identical in form to what was found in settlement sites.[6]

Coarse stone tools are rarely found in graves; a single scraper and one single microlithic cutter were reported from Huili Leijiashan M1, but it is unclear if they are really part of the assemblage or were part of the grave fill. A tree-bark container placed on the divider in Yanyuan Laolongtou M6 contained a number of worked stones of small size and irregular shape, some of quartz, some of obsidian, together with a polished stone cutter, a small bronze axe, a bronze knife, and a bronze chisel, which likely belonged to a tool set, but none of the settlement sites in Yanyuan showed any similar small stone tools. The stones in Laolongtou M6, which are of a particular color, might therefore have symbolic rather than a practical function.

[6] The axes from Huili Fenjiwan M129 belong to the same type as those found throughout the settlement layers of the same site; the axe from Huili Xiaoyingpan M6 resembles finds from Huili Tianba, which is located at less than 4 km distance, and both axes and adzes from graves at Yongsheng Duizi are of the same types as specimens found in the settlement layers at the same site.

Flakes and microliths are rare at settlement sites as well; they occur mostly in caves and in a few open-air sites in Panzhihua and Huili, as well as Dechang Maojiakan and Wangjiatian. Several of the settlement sites characterized by coarse stone tools and/or microliths do not contain ceramics, and those who do have only coarse, sand-tempered, largely undecorated jars and sometimes cups with flat bottoms, indicating an early stage of ceramic production. Overall, the most natural assumption for all of these sites with coarse stone-tool or microlithic assemblages would be that they predate other local settlement and grave sites; the lack of related burials could be explained as a sign that the inhabitants disposed of their dead in an archaeologically not recognizable way. The material from Dechang Wangjiatian, however, does not fit with such an explanation; here, microlithic cores and scrapers are associated with polished stone tools, ceramic spindle whorls, and pottery vessels with broad band-handles made of several clay strips as they are otherwise known from megalithic graves. This as well as the microliths from Yanyuan Laolongtou and Huili Leijiashan, indicate that flake tools — mostly scrapers and cutters — continued to be used even in post-Neolithic periods, although at a much smaller scale.

Choppers and grinding equipment occur both in settlements and graves but are typologically too insensitive to allow for a useful local or regional comparison aiming at establishing the relationship between different sites. The same applies to grinding rods, which are more numerous in graves than at settlement sites.[7] Their placement in the hip area of the deceased shows that these objects were probably personal sharpening tools used in everyday life and at the same time personal belongings that could not be taken away after death but had to accompany the deceased into the grave.

[7] Grinding rods occur mostly in Puge, Huili, Yanyuan, Yongsheng, and more rarely in Dechang and Xichang.

Another set of tools that occurs more often in graves than in settlement sites are ceramic spindle whorls. The settlement sites where spindle whorls appear are limited in number, comprising only Dechang Wangjiatian, Mianning Sanfentun and Zhaojiawan, Puge Amucun, and Xichang Mimilang. The majority of graves with spindle whorls are located in the Anning River Valley, most of them megalithic graves. A second concentration of spindle whorls can be found in earth-pit graves in Huili, but with no corresponding finds in local settlement sites. Spindle whorls are rare in Zhaojue, Puge, and Ninglang, and they never occur in Yanyuan. This may indicate a difference in how clothes were produced, and/or the lack of importance of spinning and weaving in defining the identity of the deceased in the burial context.

VII.2.2 Ceramic Vessels

The vast majority of ceramics retrieved from settlement sites are of coarse sand-tempered quality, hand-thrown or coil-built, low or unevenly fired, and therefore usually red or reddish-brown in color (Tables 5.76-5.78 vs. Tables 4.5-4.6, 4.9, and 4.15-4.16). Fine ware does occur, but only at some sites and usually in later layers that contain handled vessels of high-fired grey and black ceramic material; these objects furthermore carry a different range of decoration motives than the ceramics at sites characterized by coarse sand-tempered pottery. In settlement contexts, fine ware is thus a chronological marker, but it can also characterize special-purpose sites such as Puge Wadaluo, which was likely a site for ritual use and not an actual settlement. The vessels found in ceramic pits of Type II are mostly made of high-fired fine ware as well. Ceramic pits of Type I yield only low-fired sand-tempered large vessels of reddish-brown color. It is therefore likely that the Type II ceramic pits date later than those of Type I.

The settlement material from most sites is characterized by large urns and jars with flat bottoms, high shoulders, and slightly outward-turning rims likely used for storage; different kinds of bowls likely used for serving or personal consumption are frequent as well (Table 7.6). The handled vessels so commonly occurring in graves, on the other hand, are rare at settlement sites. They also uncommon in ceramic deposits of Type I; their assemblages are instead characterized by large jars and urns with small flat bottoms, high shoulders, and lug-handles and/or a fingertip-impressed appliqué strip below the rim as they are otherwise common at settlement sites. The ceramic deposits of Type II, on the other hand, yield a high percentage of medium-sized handled vessels accompanied by small jars and a wide variety of liquid serving and consumption (e.g., cups, beakers, bowls, ewers, and vases), i.e., an assemblage nearly identical to what is usually found in megalithic graves.

As can be expected, the quality of the ceramics found in graves is considerably higher than what is usually seen at settlement sites; over 40% of the grave ceramics are high-fired, at least 24% are fine ware, and about 1/3 are decorated with a wide range of decorative patterns or black slip. Coil-built vessels hardly ever occur in graves as this technique was mostly reserved for particularly large vessels, probably storage vessel that were nearly exclusively used in a settlement context. Burnishing or polishing is most common with large or medium-sized vessels from settlement sites as well, indicating that these techniques were used for sealing the vessel surface rather than for visual enhancement. Black slip, on the other hand, is significantly more common with grave ceramics than with settlement ware, so are other kinds of decoration. Nevertheless, even in graves sand-tempered ceramics fired at low temperatures are still in the majority, and there are considerable differences in ceramic quality and decoration between different kinds of graves in different sub-regions as well as between different sites within the same region, which indicates chronological as well as regional differences.

VII.2.2.1 Megalithic Graves and Related Ceramic Deposits

As far as the ceramic assemblage is concerned, megalithic graves fall into two main categories: those mainly containing sand-tempered ware and those characterized by fine ware. The sand-tempered ware is mostly low-fired, of red-brown color, and decorated with water-ripple pattern on the belly or leaf-vein impressions on the bottom.[8] The fine ware from megalithic graves is either red or black-brown in color and only sparingly decorated with bundles of lines or fish-bone pattern.[9] There seems to be a geographical component to this dichotomy: megalithic graves containing sand-tempered ceramics have been observed throughout the Anning River Valley, while fine ware assemblages are most common in Puge and Xide. Nevertheless, fine ware does occur in megalithic graves in Xichang as well, albeit rarely, indicating that there might be an additional chronological component to this difference. This impression is supported by the fact that Xichang Wanao (a prominent representative of graves with sand-tempered ceramics) is less than 2 km away from Huangshuitang, whose graves contain fine ware vessels.

Among these two main types of assemblages further subtypes are discernible. Among the megalithic graves with sand-tempered ceramics only Xichang Dayangdui DM2 yielded large urns with fingertip-impressed appliqué bands below the rim. Most megalithic grave assemblages are instead characterized by jars with or without handles (the latter often carrying a bundle

[8] These are the graves at Dechang Arong, Mianning Wanqiu, Xichang Dayangdui, Hexi Gongshe, Huangshuitang, Wanao, and Xiaohuashan.

[9] Graves with this kind of assemblages were found at Puge Xiaoxingchang, Xichang Bahe Baozi, Guanshan, Tianwangshan, Xijiao Gongshe, Yanjiashan, Yuanjiashan, Xide Guluqiao, and Lake Sihe.

water-ripple pattern around the belly) as well as cups and more rarely bowls, vases, or jars. Fine ware occurs mainly in the form of goblets, ewers, and vases, while jars and cups are rare.

Additionally, there are significant differences in form and execution between the ceramics from different sites. The ceramics from Xichang Tianwangshan M10, for example, are of red low-fired fine ware formed into squat closed vessels with high outward-flaring collars, similar to ceramics known from the object pits at Xichang Dayangdui (jars of Type Ba). The ceramics from Xide Guluqiao and some objects from Xichang Xijiao Gongshe and Xide Lake Sihe are of red fine ware as well, but they are high-fired and mostly take the form of undecorated single-handled jars (Types CaI and K) different from the vessels at Tianwangshan. As the finds from Dayangdui are relatively early, while several of the other graves just mentioned contained Han coins, a difference in date is the most logical explanation for the difference between the ceramics. The graves at Xichang Xijiao Gongshe and Xide Lake Sihe additionally contain goblets of black/grey fine ware strongly resembling ceramics from the megalithic graves of Xichang Bahe Baozi and from the ceramic pit at Xichang Maliucun, reaffirming their identification as ceramic deposits connected to ritual activities in and around megalithic graves.

The objects from the ceramic pit at Puge Wadaluo are less easy to place. Judging by form alone, the vases and bowls found there resemble objects from the local settlement sites; however, the settlement ceramics are mostly made of sand-tempered pottery, and the ceramics at Wadaluo are of high-fired grey-brown fine ware, similar to those retrieved from the megalithic graves of Puge Xiaoxingchang This indicates that in Puge fine ware might have been preferably used in a ritual context, and Puge Wadaluo might have been a ritual site as well.

VII.2.2.2 Connecting Megalithic Graves, Settlement Sites, and Earth-Pit Graves in the Anning River Valley

The megalithic graves in the Anning River Valley are not easy to connect with any of the known settlement sites or the earth-pit graves in the same region. The large jars and urns with fingertip-impressed appliqué bands below the rim from Xichang Dayangdui are one of the few vessel types seen in megalithic graves that occur widely throughout many settlement sites. Vessels of the same type, quality, and decoration are also known from ceramic pits of Type I at Xichang Dayangdui and Yingpanshan. Such vessels are furthermore common with settlement sites throughout the Anning River Valley, in layers that do not contain handled vessels as they are usually found in megalithic graves, indicating a difference in date.

Handled vessels are common in the earth-pit graves at Dayangdui as well, but they are different from the handled vessels commonly associated with megalithic graves. The specimens at Dayangdui are high-fired black-brown fine ware, have a black slip without further decoration, and thin long handles reaching from the high collar to the low belly of the round-bottom ovoid vessels; in contrast, the objects from megalithic graves have short band handles confined to the upper part of largely globular body, and they are made of coarse sand-tempered red low-fired ceramic material mostly decorated with water-ripple pattern. The presence of handles is thus by far not enough to draw a direct connection between different kinds of sites even within the confines of the Anning River Valley. The handles we see at Lizhou are thick ring-handles attached to the upper part of jars made of coarse sand-tempered material sometimes decorated with net pattern, making them different from both Dayangdui and megalithic grave finds.

The handled vessels found in the earth-pit graves at Lizhou are often decorated with a band of net pattern, but the vases and jars are mostly completely covered in decoration, something never seen elsewhere in the Anning River Valley. It is therefore likely that the ceramics from Lizhou represent a local and possibly short-lived custom of lavishly decorating vessels used in burials. Short outward-flaring spouts such as those seen on ewers at Lizhou, however, occur in settlement sites as well (i.e., Xichang Henglanshan, Lizhou itself, Ma'anshan, Mimilang), albeit rarely. Spouted vessels are common in megalithic graves, but they have long tubular spouts attached to the shoulder at a 45° angle instead of the short outward-flaring spouts seen at Lizhou. In a settlement context, long-tubular spouts have only been found in the late layers of Qimugou, whose handled vessels are similar in form to those usually associated with megalithic graves, although the decorations differ. Qimugou also yielded fragments of ring-footed beakers not common to other settlement sites, indicating a local particularity.

The megalithic graves observed close to Qimugou have not been excavated, but the similarity of the Qimugou assemblage with that of the ceramic deposition of Xichang Maliucun (~9 km distance) and in the megalithic graves at Bahe Baozi (~15 km distance) are apparent. It is therefore likely that the inhabitants of the site of Qimugou belonged to the same cultural group as (i.e., they shared material culture, customs, and beliefs with) those people who built the graves at Bahe Baozi and who dug the pit at Maliucun. Given the relatively short distance between all of those sites, they might even have been used by the same local community. The same applies to the settlement site of Dechang Wangjiatian, whose faux ring-feet and double-handled jars are largely identical with what was found in the megalithic graves at Miyi Wanqiu, a site located only about 7 km further down on the Anninghe. The band handles made of several clay-strips seen at the settlement site of Sanfentun are similar to material from megalithic graves as well, but as none of the excavated megalithic graves in Mianning contained ceramic vessels, local comparison is not possible. Nevertheless, both vessel forms and decoration motives on objects from Sanfentun are similar to what we see at Xichang Xijiao Gongshe, the closest excavated megalithic grave site (~40 km distance), indicating a cultural connection.

Although located less than 5 km south of Sanfentun, the assemblage from the settlement site of Mianning Gaopo is completely different from what was found at any of the other sites described so far. Although the ceramic quality is similar (i.e., red-brown send-tempered ware) the vessels at Gaopo are predominantly wheel-thrown, rarely coil-built, and never hand-thrown as it is common with other sites. Furthermore, the assemblage consists predominantly of large urns with horn-shaped applications on the shoulder, duck-beak shaped spouts that do not resemble any known finds from other sites in the research area, and carinated bowls with ring-feet and leaf-vein pattern on the bottom that are only matched by a single specimen in the late phase of Xichang Qimugou. Urns with horn-shaped applications have been reported from Dayangdui, but both horns and vessel body differ in shape between those sites, and the overall assemblages have nothing else in common. The same applies to Xichang Qimugou, whose single carinated bowl is indeed similar to the objects from Mianning Gaopo, but of much coarser quality and associated with an assemblage that is different to what is common at Gaopo.

Only the settlement site of Mianning Zhaojiawan about 20 km further south along the Anning River Valley has an assemblage that is virtually identical to what we see at Gaopo. Otherwise, the closest parallel is Ludian Yeshishan 魯甸縣野石山 in northeastern Yunnan on the border to Guizhou (Liu and Sun 2009, Yunnansheng, Zhaotongshi, and Ludianxian 2009). How and why such far-flung contacts came about and how the assemblage from Gaopo and Zhaojiawan fit into the local developments at Mianning is of yet unclear.

A few of the ceramics found at Xichang Yangjiashan bear some resemblance to those from Lizhou, both in form and decoration (e.g., surface-covering decoration on some jars, large bowl with side-handle), but the majority of forms and especially the ceramic quality is much closer to what is known from sites in Puge. Yangjiashan lies halfway between Puge and Lizhou and is located close to Lake Qionghai, on fertile red soil, at an elevated spot overlooking the river. The stone tool assemblage of Yangjiashan furthermore contains evidence both for agricultural activities and forest-clearing. It is therefore not unlikely that people from the rugged mountains of Puge resettled at the Qionghai, bringing with them their ceramic technology and assemblage while at the same time adopting vessel forms common in the Anning River Valley.

A remarkable phenomenon prevalent not only throughout different kinds of sites in the Anning River Valley and adjacent sub-regions are leaf-vein impressed vessel bottoms. As discussed in Chapter III, these impressions might not be actual decoration motives but the outcome of placing the vessels on a leaf for drying. Be it decoration or a technical detail, the wide distribution of leaf-vein impressions throughout most of the research area as well as northern Yunnan and northwest Sichuan[10] is remarkable as it shows commonalities in production practices. Within the research area, such impressions are commonly seen on bowls and small to medium-sized jars/beakers (most of them two-handled), and more rarely vases, cups, or goblets. These impressions do not occur on all sites, but it is difficult to discern a pattern, be it geographically, chronologically, or by site or grave type (Figures 7.3-7.4, Table 7.7). This seeming randomness is puzzling and currently eludes explanation.

VII.2.2.3 Ceramic Assemblages East of the Anning River Valley

Ceramics from both graves and settlement sites in Huili and Luquan share a number of features with sites in the Anning River Valley, but overall the material from the Southeast is

[10] Leaf-vein impressed vessels have been found, e.g., in Sichuan Shimian (Sichuansheng Wenguanhui 1996, Sichuansheng Wenwu 2006) and Yunnan Midu (Yunnansheng Bowuguan 1986).

distinct. Additionally, there is some differentiation between sites within the sub-region: the ceramic material from both settlement layers and graves at Huili Fenjiwan, Houzidong, Washitian, and Xiaoyingpan mainly consists of low-fired, hand-thrown, yellow or yellow-brown undecorated vessels of sand-tempered ware, while the graves of Huili Guojiabao, Leijiashan, and Miaozi Laobao are characterized by often lavishly decorated fine ware fired at high temperatures. The settlement site of Huili Dongzui, on the other hand, combines large amounts of often decorated sand-tempered ceramics with a small number of fine-ware pieces of black or grey color. This site furthermore shows both finger-tip impressed appliqué bands below the rim as seen at various settlement sites in the Anning River Valley, and small ring-handles as they are occur in Huili Fenjiwan and Leijiashan as well as at various sites in northern Yunnan.[11] While the earliest layers at Dongzui yield a large number of vessels with finger-tip impressed appliqué bands as they are common to early settlement sites in the Anning River Valley, the incised decoration motives on neck and shoulders found in layer 3 and 4 are particularly close to what we see at Dechang Wangjiaping. This combination of objects related to places north and south is not surprising, considering the location of Dongzui half-way between Yunnan and Dechang next to a river system that provides pathways in both directions.

Within a radius of less than 5 km around Dongzui, eight other sites have been reported. Two of the few excavated sites are the bronze drum deposits of Guoyuan and Luoluochong, but none of the other sites revealed any metal objects. As metal objects are generally rare at settlement or grave sites in Huili, the drum deposits might nevertheless be connected to one of the sites in their vicinity. A connection with Yangjia Wuji, however, which is the settlement site

[11] These sites include, e.g., Yuanmou Dadunzi 元謀縣大墩子 (Yunnansheng Bowuguan 1977), Yongren Caiyuanzi 永仁縣菜園子 (Yunnansheng Bowuguan 1985) and Mopandi 磨盤地 (Yunnansheng Wenwu et al. 2003), and Jianchuan Haimenkou 劍川縣還門口 (Yunnansheng, Dalizhou, and Jianchuanxian 2009a and 2009b).

closest to Luoluochong, is highly unlikely, as the site is characterized by a microlithic stone industry indicating an early date. Dongzui, on the other hand, was occupied over a long time and some layers might be contemporaneous with and even connected with the close by drum deposits.

The ceramics from Dongzui show clear similarities to those at Leijiashan, mainly in the types of single-handled jars and some of the decoration motives. Nevertheless, there are considerable differences as well: the ceramics at Leijiashan are made of high-fired grey-brown fine ware with geometric decoration bands covering the whole vessel body of most objects; Dongzui, on the other hand, is characterized by sand-tempered, low-fired, moderately decorated ware. Furthermore, the vessel forms at Leijiashan are different from what is found at Dongzui (goblets and other drinking vessels instead of storage jars). In vessel forms, the Leijiashan ceramics are similar to those from Fenjiwan. It is likely that all three sites belong to the same ceramic tradition, with Dongzui spanning a relatively long period both pre- and post-dating the other sites, and Fenjiwan dating earlier than Leijiashan. Where the inhabitants of Dongzui buried their dead and where the burying community of Leijiashan lived, however, remains unclear.

Some of the goblet forms, single-handled jars, and spindle whorls at Leijiashan resemble material from Dechang Arong and Miyi Wanqiu, i.e., the megalithic graves closest to Huili. The vases with flat middle-perforated knobs in Leijiashan (Types Ja and Jb), on the other hand, closely resemble objects from Yuanmou Dadunzi 元謀縣大墩子 and other sites in northern Yunnan (Yunnansheng Bowuguan 1977). Seen from the ceramic material, Huili thus has a cultural tradition of its own that shows close connections with groups in Yunnan and less frequent and later contacts with the Anning River Valley, but local particularities remain prevail.

Furthermore, there is considerable intra-regional differentiation in Huili. The ceramic finds from the sites located at the lower reaches of the Chenghe and close to the Jinshajiang (e.g., Fenjiwan, Tianbacun, and Washitian) are similar to each other but differ notably from the assemblages of Leijiashan or Dongzui. The majority of settlement sites in Huili remains unexcavated, but from surface surveys it becomes clear that they are mostly characterized by open bowls and plain flat-bottomed jars made of low-fired, hand-thrown, yellow or yellow-brown sand-tempered ware; they are thus similar to what we see in the graves at Fenjiwan, but usually without handles and little decoration.

The graves at Xiaoyingpan, on the other hand, although only 1 km south of Washitian and single interments in earth-pit graves with or without stone installations just like Fenjiwan, yield a different assemblage. The ceramics are all of coarse, undecorated, low-fired, sand-tempered ware, mostly in the form of small or medium-sized plain jars with wide openings, as well as vases with a particularly wide belly and narrow opening. These ceramics are sometimes accompanied by chains of cowrie shells, but other graves are completely empty. Nearly identical graves and objects were found at Huili Xiaotuanshan, which is located right next to Fenjiwan, and Luquan Yingpanbao on the other side of the Jinshajiang in Yunnan.

Given the coarse material and the location close to sites with different material, it is likely that the graves of Xiaotuanshan, Xiaoyingpan, and Yingpanbao are of earlier date than those at Fenjiwan and might even belong to a different cultural tradition. The ceramics from Huili Guantianshan/Yingpanshan are of similarly coarse quality as those at the former graves and the vessels are likewise mainly undecorated, flat-bottomed, and devoid of handles, making them different from what is found at the neighboring site of Fenjiwan. Instead, the open, medium-sized jar forms of Guantianshan/Yingpanshan are similar to the ceramics found in the graves of Xiaoyingpan 20 km further south. These two sites might therefore be similar in date and probably belong to the same cultural tradition.

The material from another group of settlement sites in Huili (i.e., Hewanwan, Houzidong, Liantang, Tangjiaba, Tianbacun), is even more coarse than what we see at Guantianshan/Yingpanshan. The former assemblages furthermore contain coarse chipped stone-tools instead of the polished stone tools seen at other sites in Huili. The ceramics collected at this group of sites are severely fragmented, but both quality (polished black-slipped grey sand-tempered pottery fired at low temperatures) and form (wide outward-flaring openings and folded rims) are different from those discussed before.[12] They therefore likely represent an early local group, which currently cannot be securely connected with any known graves.

At the other end of the chronological spectrum stands Huili Guojiabao, a site containing both earth-pit and stone-construction graves built of thin slates just as Fenjiwan, but containing different assemblages. The graves at Guojiabao are characterized by bronze weapons, ornaments, and horse gear closely resembling objects from Yanyuan Laolongtou and accompanied double-handled jars that point in the same direction. The ceramics, on the other hand, strongly resemble moderately decorated jars found at Huili Leijiashan M1, and the objects from the graves of Miaozi Laobao, a site immediately adjacent to Guojiabao, revealed highly decorated goblet fragments and grinding rods virtually identical with objects from Leijiashan. The connection between these three sites is therefore close, but the graves at Guojiabao are probably of later date.

Huili is thus overall most closely related to the regions adjacent in the South and West, and the connections into the Anning River Valley are less pronounced and of later date. The relationship with Zhaojue is at best remote and seems one-sided: none of the particular traits of the Zhaojue assemblages (calcinated ropes, wooden bracelets, Han bronze vessels) occur in Huili,

[12] It has been suggested that the ceramic material might be connected to finds from Maoxian Baishuizhai 茂縣白水寨 in the Upper Minjiang River Valley (Sichuansheng, Liangshan, and Huilixian 2009:21), but the similarities are not very pronounced and the distance between the sites is considerable. At the current juncture, this hypothesis therefore seems unlikely.

but the graves at Zhaojue Pusu Bohuang yield vases and jars closely resembling objects from the graves in Fenjiwan and Xiaoyingpan. The footed *dou* bowls from the graves of Zhaojue Erba Keku and Fuchengqu are similar to objects from Fenjiwan as well, but the jars are much more similar to objects from settlements and earth-pit graves at Puge, both in form and ceramic quality. The ceramic vessels from Zhaojue Chike Boxixian M1 are again different from those of any other assemblage discussed so far: Han-style wide-bottomed jars (Type Db) and *fu* vessels (Type A) of fine sand-tempered quality as they are otherwise known from Han graves both in Zhaojue and the Anning River Valley (e.g., Xichang Lizhou).

The exact relationship between the finds from Zhaojue, Puge, and Huili is not entirely clear. As Zhaojue and Puge are close to each other and the river valleys allow for a relatively easy passage between the two, contact between these sub-regions must have been relatively close. Nevertheless, the mode of burial (primary multiple vs. secondary single or group interment) and the grave construction (megalithic above-ground construction vs. a variety of smaller stone-constructions below ground) are different, indicating different beliefs. Only the three earth-pit graves at Puge Wadaluo containing bone and shell ornaments largely identical with those known from Zhaojue, deviate from the interment practices otherwise common in Puge and might thus have belonged to people who had relocated from Zhaojue. It is therefore not unlikely that marriage bonds existed between the groups in these two sub-regions, which would explain the similarities in ceramic assemblages combined with differences in burial tradition.

VII.2.2.4 Ceramic Assemblages and Metal Objects West of the Anning River Valley and Beyond

The only settlement site in the western part of the research area that has been excavated so far is Yongsheng Duizi, which is as of yet unpublished. During a public presentation

(Yunnansheng, Lijiangshi, and Lijiangshi 2010), the excavators distinguished four phases at the site, the first represented by the settlement remains of layer 4, the second by early earth-pit graves and house remains, the third by settlement remains from layer 3, and the fourth by different kinds of stone-construction graves, cremation burials in urns, and late earth-pit graves. The ceramic material from layer 4 consists of grey sand-tempered ceramics mostly decorated with fine corded ware, more rarely net pattern, or finger-tip impressed appliqué bands. Typical are vessels with wide openings and flat bottoms, accompanied by finely polished stone woodworking tools and bone needles. Similar assemblages have been reported from Yongping Xinguang 永平新光 in Dali (Yunnansheng, Dalizhou, and Yongpingxian 2002), which shares some ceramic and stone tool types with Yuanmou Dadunzi (Yunnansheng Bowuguan 1977).

The slightly later earth-pit graves yield grey polished and black-slipped fine ware decorated with a few lines of fish-bone pattern or rows of slanted lines. The major forms are small stout jars, large carinated bowls, and wide-bellied vases, accompanied by highly polished nephrite adzes and arrowheads, as well as personal ornaments of bone, stone, or shell. The bowls resemble finds from Binchuan Baiyangcun 賓川縣白羊村, likewise in Dali (Wang Dadao 1998:50-52), but for other parts of the assemblage it is difficult to name a parallel. For the ceramics from layer 3, no photographs are at hand, but the excavators describe them as undecorated sand-tempered pottery jars, basins, and stemmed *dou* bowls, accompanied by a stone tool assemblage similar to that of layer 4.

Stemmed *dou* bowls, which strongly resemble finds from Kunming Yangfutou 昆明羊傅頭 (Yunnansheng, Kunmingshi, and Kunmingshi 2005) and other cemeteries around lake Dian, appear in the later earth-pit graves at Duizi as well. The cremation burials each contain one single large urn, sometimes accompanied by one or two smaller jar, and the stone-construction graves mostly yield double-handled jars. All these ceramics are undecorated and of red-brown or grey high-fired material. The double-handled jars are particular in form, with a long body of round-bottom ovoid form with pronounced foot and long broad band-handles reaching from rim to belly. These handles sometimes have an additional middle-rib for support, just as seen in Yanyuan, but the vessel form is considerably more elongated. Double-handled vessels are common in grave sites throughout Yanyuan, Yongsheng, Ninglang, and Miyi, all of them located in the southwestern part of the research area and adjacent parts of northern Yunnan. As far as can be judged from the surface surveys conducted so far, handled vessels are rare at settlement sites in the southwestern part of the research area, and the typical double-handled beakers known from graves with varying amounts of stone installations seem to never occur in settlements, making it difficult to connect the spheres of the living and the dead.

The late-phase stone-construction graves at Duizi comprise primary single or double interments in small cists built of stone-slabs and large multiple secondary interments in graves made of coarse stone blocks similar to those in Zhaojue. Both kinds of graves yield one or two double-handled jars each, combined with bronze projectile points and/or a knife, as well as a range of different ornaments (metal bracelets, finger rings, turquoise or bone beads, perforated cowry and snail shells, bone hair-pins, *ling* bells), and rarely spindle whorls. Similar assemblages are common in stone-construction graves throughout the southwestern part of the research area as well as adjacent parts of northern Yunnan; most of these graves, however, are primary single interments and generally yield metal swords and daggers. The combination of round-headed knives, bronze bracelets, and *ling* bells seen in the stone graves at Duizi instead more closely resembles assemblages from megalithic graves in the Anning River Valley. The interment of shells, the secondary mode of burial for multiple skeletons, and the construction of the stone graves at Duizi, on the other hand, show a strong likeness with the graves in Zhaojue, indicating the possible existence of a far-flung contact network or instances of independent development.

The settlement material known from Yongsheng consists mainly of large and medium-sized storage jars accompanied by double-perforated half-moon or sickle-shaped stone knives, small stone adzes and axes, ceramic spindle whorls, and bone awls, reflecting a settled, agricultural mode of living, potentially supplemented by hunting, as the projectile points in some of the graves indicate. The sites in Yongsheng are all located on flat ground with fertile soil ideal for agriculture; Ninglang and Yanyuan, on the other hand, are largely covered by mountains and high-altitude plateaus, and the stone-construction graves in other parts of northern Yunnan are found in mountainous terrain as well, locations largely asking for a mixed economy.

Indeed, the settlement material from Ninglang consists of a combination of tools made of deer antler, net weights, and stone woodworking tools; the graves combine several weapons including stone arrowheads, bronze knives, axes, and more rarely swords, with personal ornaments and double-handled vessels. The Yanyuan Basin has ample flat and relatively fertile land, but a dry and cold climate allowing only for a limited range of agricultural activities; not surprisingly, the local settlement sites yield stone arrowheads, net weights, and woodworking tools combined with perforated knives or spindle whorls either. There is hardly any overlap in object forms between settlement sites and graves; the ceramics from settlement sites are usually devoid of handles and never combined with metal objects, and the graves usually contain an assemblage consisting of small number of double-handled vessels, metal weapons, clothing applications, body armor, and/or personal ornaments, rarely a drum, *bianzhong* bell, bronze vessel, or horse gear and horse bones. The grave material thus reflects a society emphasizing combative activities and, in the case of Yanyuan Laolongtou and Maojiaba, horseback riding.

In southwest China, the interment of horse bones is rare; it has so far only been observed with a few stone-construction graves in northwest Sichuan,[13] and a few pieces of horse equipment have been found in similar graves in northwest Yunnan.[14] Evidence for horse riding is known from Dian culture context as well, although never associated with horse bones.[15] Considerably earlier evidence for the presence of horses has been reported throughout the Ordos region and northern China (Gansu, Shanxi, Shaanxi) from the Yangshao period (5000-3000 BC), but mostly from settlement contexts whereas the interment of horse bones in graves is rare.[16] Horse gear closely resembling the two-part bits and cross-strap guards found in Yanyuan Laolongtou and Huili Guojiabao are most similar to object types found in the northern steppe, e.g., on sites attributed to the Upper Xiajiadian Culture 夏傢店上層文化 (1000-600 BC) (Neimenggu and Ningchengxian 2009), as well as throughout the Ordos region.

Throughout southwest China, signs of horse-riding are usually associated with weapons and tend to occur in particularly rich graves indicating high rank and possibly a warrior status of the tomb occupants. Whereas Dian graves as well as stone-construction graves located on the fertile plains around rivers and lakes in Dali additionally contain bronze hoes and other indicators of agricultural activities (Yunnansheng Wenwu 1964, Yunnansheng Bowuguan 1975, Wang Ningsheng 1979, Dalizhou and Xiangyunxian 1983), such evidence is missing from the stone-construction graves with horse bones and gear located in the mountains. Taken together with the presence of arrowheads in the stone graves, this indicates a difference in subsistence or

[13] The interment of horse bones together with dog and cow skulls has been observed at Ganzi Jililong 甘孜縣吉裏龍, and Guri Munianggang, Xinlong County, 新龍縣谷日木娘崗 in stone-construction graves containing single- and double-handled jars, bronze knives, and personal ornaments (Sichuansheng and Ganzi 1986, Gu Le 1987).

[14] Such assemblages containing round metal plaques that very likely served as frontlets for a bridle as seen in the northern steppe are common in Yunnan Deqin (Li Kunsheng 1998:22).

[15] These are mainly cross-pieces from horse headgear and pictorial evidence for horse-riding, as well as very rarely horse bits (Yunnansheng Bowuguan 1959 and 1975, Chiou-Peng 2004 and 2008).

[16] For a list of early finds of horse bone finds see Liu and Chen 2012:401-402.

at least in the importance of agriculture for social status as reflected in graves. Yanyuan and Ninglang were probably characterized by a mixed or pastoral economy, practiced by societies that emphasized armed combat and horse-riding, whereas for the people living around Lake Dian agriculture seems to have had a considerable importance, both in daily life and in burial practice.

For Huili Guojiabao, the case is not as clear. The settlement material from Huili indicates an economy based on agriculture, in a few cases supplemented by hunting and/or fishing. Other graves in Huili apart from those at Guojiabao yield only small numbers of ceramic vessels, some spindle whorls, stone arrowheads, grinding rods, and rarely metal ornaments and weapons. The yellow sherd color of the ceramic vessels at Guojiabao shows local production and the forms are very similar to objects found at Huili Leijiashan, but the metal assemblage is very different from anything seen at other sites in Huili. The metal assemblage of Huili Fenjiwan, the only grave site in Huili apart from Guojiabao that has so far yielded any metal objects, is largely restricted to projectile points and coarse axes, which might have functioned as tools rather than weapons. By contrast, weapons found at Guojiabao comprise arrowheads, dagger-axes, spearheads, knives, and swords largely identical with objects known from Yanyuan. The specific types of belt hooks, scabbard tips, turquoise beads, bronze bracelets, clothing applications, and peculiar rabbit-ear shaped ornaments found at Huili Guojiabao are matched by finds from graves in Yanyuan as well. Huili Guojiabao itself is located close to the Jinshajiang, which provides a connection to Yanyuan, and it is therefore overall not unlikely that Guojiabao is the cemetery of a foreign population that settled down in Huili. Where they settled is unclear, but further survey work and excavations around Guojiabao might help to answer this question.

Another group of graves that contrasts strongly with neighboring sites are those at Yuexi Huayang and Liaojiashan. Both sites are characterized by earth-pit graves containing mainly metal objects, i.e. bronze *mou*, basins, beakers with and without handles, bronze and composite swords, knives, and bronze ornaments, as well as some double-handled ceramic vessels, assemblages virtually identical with what is commonly found in Han period stone-cist graves in the upper Minjiang River Valley (Sichuansheng and Maowenxian 1983). Other sites in Yuexi yield stone-construction graves, and more rarely megalithic graves, that all remain unexcavated; settlement remains have not been reported. As the river system opens a direct connection between Yuexi and the upper Minjiang, the meeting of different populations with different burial traditions in Yuexi seems natural. So far, archaeological work in this sub-region has been limited to surface collections, but further excavations promise to clarify the situation.

The bronze deposits in Huili are likewise difficult to connect to other sites in the vicinity. As was established in Chapter VI, the bells from Huili Zhuanchangba are probably local imitations of objects known from Dian culture context, whereas the drums found at Guoyuan and Luoluochong are very likely imports. The deposit of Huili Zhuanchangba is located close to a number of settlement sites, but they are all characterized by particularly coarse stone tools indicating an early date. It is therefore unlikely that these sites are in any way connected. The same applies to Huili Luoluochong, a pit containing a Wanjiaba style drum; the site is close to the settlement of Yangjia Wuji, which is characterized by microlithic stone tools. Huili Guoyuan which yielded a Shizhaishan-style drum, is located at less than 1 km distance to the settlement of Huili Dongzui. Although largely devoid of metal objects, layer 4 at Dongzui revealed a coarse kidney-shaped bronze fragment (probably a by-product of heating metal) in association with grinding equipment and sand-tempered ceramics. It is therefore likely that this site was connected with metal production and/or extraction, which might have brought about long-distance contacts, possibly to the Dian culture realm from where the drums came.

The overall picture that emerges from the comparison between different kinds of sites and assemblages thus shows regional particularities and chronological developments as well as signs inter- and intra-regional interaction. To fully understand the relationship between these different trends, in the next step I will turn to evidence that throws light on the relative as well as absolute chronological position of the assemblages described above.

VII.3 Chronology: Revisiting an Old Problem

VII.3.1 Previous Suggestions and Current State of Research

As detailed in the introduction, the chronology and cultural sequence for many parts of southwest China are still largely unclear, but the intensification of archaeological work in the research area during the last decade have provided much new evidence that can help to solve this problem. The most important piece of evidence are multi-phase sites with thick cultural deposits, augmented by local radiocarbon dates, and typological comparison with well-dated sites in other places. The radiocarbon dates are problematic as they mostly rely on only one or two samples per layer, which is questionable from the statistical and methodological point of view. Object comparison between different region do not necessarily provide reliable dates either as the continuation of specific types might differ significantly between different locations. These points must be kept in mind during the subsequent evaluation of the material. Another important piece of evidence that should be used in concert with stratigraphic information are the object typologies developed in Chapter III. They can help close gaps left by other sources.

Within the research area, nearly all known stratified sites are located in Xichang, and they have helped to establish a basic chronological sequence for the Anning River Valley.[17] Based on stratigraphic and typological considerations, Jiang Zhanghua 江章華 (2009) proposed a three-phase chronology: the Henglanshan phase, a transition phase represented by Xichang Lizhou, Dayangdui, and Mimilang, and a third phase dominated by megalithic graves. This chronology has been widely accepted, but the fine-chronological division is still a topic of much debate. For the megalithic graves, for instance, a number of different chronological schemes have been suggested, some based solely on grave form, some on ceramic types, others on both.[18] Given that some megalithic graves were probably used for a long time, and not all of them contain ceramics, none of the schemes suggested so far can be completely confirmed or dismissed.

As far as absolute dates are concerned, it is generally agreed that the earliest megalithic graves were probably built during the 5th century BC whereas the Han coins found in the latest excavated examples securely date them to the early 1st century AD.[19] In a recent publication on the "Stone-Cist Graves in the Ethnic Corridor between Sichuan, Yunnan, and the Qinghai-Tibet Plateau" (川滇青藏民族走廊石棺葬), Luo Erhu 儸二虎 (2012) boldly proposes a chronological

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[17] The most important sites with thick cultural deposits consisting of several layers are Xichang Dayangdui, Yingpanshan, Ma'anshan, and Mianning Sanfentun. Several cultural phases have also been observed at Xichang Henglanshan, Lizhou, Mimilang, Qimugou, and Yongsheng Duizi.

[18] Song Zhimin (1991) suggests a scheme of four construction types (1. rectangular, covered with large stone; 2. rectangular, large irregular stones, access ramp; 3. made of large stones, door on one long-side, access ramp; 4. similar to 1. but with trapezoidal stone construction in front), which he assigns to different chronological periods from Warring States to Han. Tong Enzheng (1978) proposes a similar scheme but with three grave types belonging to different phases as well. The summary publication of the megalithic graves in the Anning River Valley (Sichuansheng, Liangshan, and Xichangshi 2006) suggests three phases based on similarities between objects in the graves and sites with well-established dates from northern Sichuan, Yunnan, and even the Central Plains. Jiang Zhanghua (2009) distinguishes two types of ceramic objects that might be characteristic of two different periods, but he is not entirely positive about this assessment.

[19] The terminology used in the Chinese literature on this topic is based on the chronology of the Central Plains, speaking of Late Spring and Autumn (771-476 BC) to Early Warring States (475-222 BC) as the earliest dates and early Eastern Han (AD 24-220) for the end point of this burial tradition (e.g., Sichuansheng, Liangshan, and Xichangshi 2006a, Jiang Zhanghua 2009). In my chronological table (Table 7.14) I therefore list both absolute and conventional historical dates for easy reference.

framework encompassing all graves with stone installations in southwest China, excluding only the megalithic graves. Given the considerable variability in grave form and content between stone-constructions graves in different regions and sites, suggesting a uniform cultural development seems highly problematic. Indeed, Luo's characterization of his five phases remains vague, and the graves from the current research area do not fit his scheme.

Previous research suggests that the developments of graves in the upper Minjiang River Valley followed a common sequence.[20] For northern Yunnan, however, the case is more problematic as there is much regional variability in grave construction and content (Guo Jiyan 2002). The considerable strides that have been made in recent years toward a relative and absolute chronology of prehistoric sites in Yunnan,[21] provide a point of comparison for material from the research area. Excavations at multi-phased sites with particularly thick deposits and rich assemblages at Jianchuan Haimenkou 劍川縣還門口 (Yunnansheng Bowuguan 1958, Yunnansheng, Dalizhou, and Jianchuanxian 2009a and 2009b) and Dali Haidong Yinsuodao 大理市海東銀梭島 (Yunnansheng Wenwu et al. 2009), provide important stratigraphic evidence that helps in developing a chronological framework for the research area. Even more important is Yongsheng Duizi, a multi-phase site within the research area containing settlement remains as well as earth-pit and stone-construction graves and even cremation burials; however, as the material is unpublished and the available information limited, at the current juncture the material from Duizi can only serve as supporting evidence but not as main basis for chronological claims.

[20] Adam Smith (2001) has suggested a three-phase scheme of development for the graves from the upper Minjiang ranging from Western Zhou to early Western Han. Various other scholars have suggested chronological schemes for these graves mostly based on ceramic typology (e.g., Xu Xueshu 1998, Xie and Jiang 2002, He Kunyu 2009).

[21] See for example Xu Xueshu 1999, Yang Fan 2002, Fan Yong 2007, Zhou Zhiqing 2009. In her article on "Recent Developments in the Archaeology of Southwestern China", Alice Yao (2010) provides a very useful overview on the state of research for Yunnan, but Sichuan does hardly feature and the Liangshan region is not mentioned at all.

VII.3.2 Developing a New Chronological Framework

The review of previous work on the chronology of southwest Sichuan and northern Yunnan shows that a common chronological framework for the research area is still lacking, a deficiency that I endeavor to help solve. As has become clear when comparing the material from different kinds of sites, there are considerable regional differences. I will therefore start from the most securely dated sites in the Anning River Valley, first describing the local development in that area and thereafter turning to other sub-regions and their internal developments as well as their connections with other parts of the research area.

VII.3.2.1 Chronological Developments in the Anning River Valley and Adjacent Regions

VII.3.2.1.1 Early Settlement Finds and Earth-Pit Graves

Early developments in the central Anning River Valley around Xichang are fairly well understood. One of the earliest Neolithic sites there is Xichang Henglanshan, which gave its name to the Henglanshan culture 横欄山文化. The assemblage consists of coarse sand-tempered low fired red-brown ceramics (mainly large urns with finger-tip impressed appliqué strip below the rim, *bo* and *wan* bowls, vases, and a few lids and rarely spouts), accompanied by a few polished stone woodworking tools, arrowheads, and among the surface finds also perforated stone-knives (Figure 7.5). The material from the two cultural layers 3 (dated to 3710 ±40 cal. BP, i.e. 2150-2030 BC) and 4 (4020 ±40 cal. BP, i.e. 2575-2480 BC) is largely identical. It strongly resembles finds from Xichang Ma'anshan, lower Qimugou, and lower Yingpanshan. The finds from these three sites, however, bear a stronger resemblance to each other than to Henglanshan: the ceramic forms and decoration motives are largely identical, and double-perforated knives and leaf-impressed vessel bottoms occur throughout all settlement layers instead of only in the surface finds as at Henglanshan (Figures 7.6-7.8). Jiang Zhanghua's suggestion to refer to the finds from the type site as Early Henglanshan and those from the other three sites as Late Henglanshan has therefore been widely accepted. Judging mainly from the stone tool assemblage, the less well documented assemblage of the early settlement layers of Xichang Lizhou probably belongs to the late Henglanshan phase as well (Figure 7.9).

The finds from Dechang Wangjiaping are similar to those from Henglanshan both in quality and form types; but the incised net- and cross pattern seen at Wangjiaping is not common in assemblages from Xichang, and the stone tools from Wangjiaping are much coarser in execution than those from Henglanshan: they are only marginally polished instead of finely worked, and their typological range comprises only woodworking and coarse processing tools, lacking the perforated knives common to the other sites (Figure 7.11). This combination of features does indicate some difference in subsistence between Dechang Wangjiaping and the sites around Xichang, as well as differences in expression of cultural identity. This impression is confirmed by the material from other sites in Dechang such as Maojiakan and Dongjiapo: Maojiakan is characterized by coarse stone tools similar to those from Wangjiaping, but the site additionally contains many microliths and coarse sand-tempered ceramics, mainly flat-bottomed jars of simple form and a few lids similar to the ones seen at Wangjiaping, but all of them undecorated and plain (Figures 7.11-7.12). The radiocarbon dates confirm that Wangjiaping is probably largely contemporary with the early Henglanshan sites (layer 3 at Wangjiaping dates to 3865 ± 35 cal. BP, i.e. 2470-2270 BC). Maojiakan is likely earlier than both and shows local particularities different from the early Xichang sites, indicating an independent local origin.

The ceramic and stone tool forms from the early phase of Dechang Dongjiapo are similar to objects from Wangjiaping; however, they are accompanied by a large number of net-weights of the same form and type as those at Xichang Yingpanshan and by ceramics with complex decoration reminding of Xichang Mimilang, a site postdating Henglanshan. Incised net pattern, zigzag decoration, single-handled vessels, and fine-polished stone tools resembling objects found both at Mimilang and in megalithic graves, are particularly numerous in the late layers of Dongjiapo. It is therefore likely that the early phases of Dongjiapo dates later than Wangjiaping, whereas the later phases might be contemporaneous with Mimilang. As Mimilang dates considerably later than Henglanshan, there might be a gap in the occupation of Dongjiapo and/or a mixing of material in the uppermost layers, as the Han coins found in layer 3 indicates.

The late Henglanshan-style material in the early settlement layers of Xichang Lizhou, is superimposed by earth-pit graves with rich ceramic assemblages. Some of them contain vases and ewers whose whole surface is covered with geometric decoration patterns different from what is seen at other sites in the Anning River Valley (e.g., in graves AM2, AM6, AM10, BM4), whereas others contain double-handled jars and large numbers of bowl but no spouted or decorated vessels (AM9, BM3, BM8) (Figures 7.15-7.16). As the site has not been sufficiently published, it is not clear if handled and highly decorate vessels did indeed never occur within the same grave, but as BM3 cuts BM4, it seems likely that the second type of ceramics (i.e., the handled, undecorated, spout-less vessels) can be assigned to a later date than the first (i.e., the highly decorated vases and ewers). This assessment is confirmed by the fact that the second kind of ceramics encompasses a stout jar with horn-shaped handle nearly identical with a vessel from a Han grave observed in a later layer at the same site (Lizhou Yizhi 1980: Figure 6.5).

The ceramics from the pre-Han graves at Xichang Lizhou are all sand-tempered, low-fired, of red-brown color, and of low quality. They are thus different from the ceramics in the early earth-pit graves at Xichang Dayangdui. The latter are of high-fired black-brown fine ware and have a black slip without further decoration. Even though they have handles as well, these are different fin form from those at Lizhou: they are thin and long, reaching from the high collar to the low belly of the round-bottom ovoid vessels, instead of thick ring-handles attached to the upper part of squat jars sometimes decorated with net pattern. Both in ceramic quality and execution, the early Dayangdui ceramics thus strongly resemble ceramics from sites in Gansu 甘肅 and Qinghai 青海 attributed to the Qijia culture 齊傢文化 (Figure 7.17). It is therefore not unlikely that the earth-pit graves at Dayangdui were built by a group of Qijia origin. This would suggest a date between 2200 and 1800 BC, i.e., probably after Lower Yingpanshan and Early Lizhou, and either contemporaneous with or shortly after the middle Lizhou phase.

Double-handled vessels occur at Mimilang as well, but their handles are small, ring-shaped, and attached to the straight neck of wide-bodied vessels different from those seen either at Lizhou or Dayangdui (Figure 7.18). Furthermore, the ceramic material of Mimilang comprises both fine ware and sand-tempered ceramics; the vessels often have plate- or trumpet-shaped wide outward-flaring rims and decoration motives similar to those of early Dongjiapo. The exact date of both Dongjiapo and Mimilang is unclear, but the stratigraphic evidence from Dongjiapo combined with the stylistic particularities of their object indicate that they are roughly contemporaneous with middle Lizhou and Early Dayangdui.[22]

Double-handled jars similar to those found in the early earth-pit graves occur in the ceramic pits of the middle phase of Dayangdui as well, but they are relatively rare and made of red or brown sand-tempered ceramic material rather than high-fired black fine ware (Figure 7.19, left). Furthermore, the overall form and handle style of the double-handled vessels at Middle

[22] At Mimilang, two radiocarbon dates were taken, one from layer 5 (50-140 AD) and one from layer 4 (1050-920 BC), but as the date from layer 4 is earlier than the one from layer 5 instead of the other way around, and the dates rely on only one charcoal sample each (Jiang Zhanghua 2007:10), this late date is likely faulty.

Dayangdui is more similar to ceramics from stone-cist graves at Wenchuan Zhaodiancun 汶川縣昭店村 rather than objects from early Dayangdui or Gansu, as is the ceramic quality (Figure 7.20). By comparison with other finds from the upper Minjiang, Zhaodiancun has been dated to the 7th or 8th century BC, a date that might apply to middle Dayangdui as well.

Similar to earlier ceramics from the same site, the vessels from middle Dayangdui have a black slip, but the finger-tip impressed appliqué bands and line incision motives that some of them carry do not occur in the earlier layers; lug handles are a new element as well, but not one commonly found at early Neolithic sites in Xichang. A single lug handle has been observed in the late phase assemblage at Dechang Dongjiapo, but otherwise large urns with lug handles are a characteristic trait of Mianning Gaopo and Zhaojiawan. The ceramics from these two settlement sites are largely identical to each other but different from the assemblages at other site in the research area (Figures 7.21-7.22). The Mianning Gaopo and Zhaojiawan assemblages consist of red-brown and grey sand-tempered wheel-thrown pottery; the main forms are carinated *wan* bowls, large urns and jars, mostly with a row of lug handles around the shoulder, leaf-vein impressed flat or shallow ring-footed bottoms, a few high stems, and conical spindle whorls. Zhaojiawan furthermore shows a few narrow band-handles. Gaopo, on the other hand, yields many coil-built duck-beak shaped objects of unclear function, probably spouts.

The ceramics from Mianning Gaopo and Yeshishan closely resemble objects from Ludian Yeshishan in northeastern Yunnan, which in turn shares some traits with Weining Jigongshan 威寧縣雞公山 across the border in Guizhou (Figures 7.23-7.24). These sites date to 1300-900 BC and 1900-1500 BC respectively (Guizhousheng Wenwu et al. 2006, Liu and Sun 2009, Yunnansheng, Zhaotongshi, and Ludianxian 2009). The radiocarbon dates of 1410-1050

BC for Gaopo[23] and 1390-840 BC for Zhaojiawan[24] fit well with this assessment, but the relationship with the other sites in the Anning River Valley remains problematic. The lug handles of middle Dayangdui and late Dongjiapo and the band handles at Zhaojiawan suggest that Gaopo predates middle Dayangdui and late Dongjiapo; Zhaojiawan might be slightly later.

Very large urns with or without application bands and double-handled vessels similar to those at Dayangdui occur in the ceramic deposits of upper Yingpanshan as well; however, they are accompanied by net-weights as seen in the lower layers of Yingpanshan, vessels with net-pattern similar to ceramics at Xichang Mimilang, Dechang Dongjiapo, and Wangjiaping. The high stems of upper Yingpanshan are reminiscent of objects from Dayangdui (Figures 7.19 and 7.25) and of ceramics from Xichang Qimugou, which are in turn related to material from megalithic graves (Figures 7.30-7.37). It is therefore likely that upper Yingpanshan is later than the middle phase of Dayangdui and might even postdate the late phase of Dayangdui.

VII.3.2.1.2 Megalithic Graves and Related Sites

DM1 and DM2 at Dayangdui clearly represent an early form of megalithic graves, both in form, mode of interment, and in ceramic assemblage (Figure 7.19, right). These graves were used for a single instance of a probably secondary interment of one or several people accompanied by a small number of large jars. Ceramic pits observed close by yielded an assemblage of drinking and pouring vessels indicative of communal rituals in connection with these graves. Just as the ceramics from middle Dayangdui, the late-phase vessels are hand-thrown and made of red-brown sand-tempered ceramic material that is often black-slipped and

[23] The radiocarbon dates are 3010±35 cal. BP for layer 1, 3050±30 BP for layer 2, and 2950±25 BP and 3110±25 BP for two samples from layer 3.

[24] The radiocarbon dates are 3030±25 for layer 2 and 2810±45 for layer 3.

undecorated. Except for the urns, however, the ceramic forms from the late phase are different from those of the middle phase: they comprise footed beakers and plain jars with high outward-flaring collars. A close parallel to the latter kind of vessels can be found in the ceramic assemblage of Xichang Tianwangshan M10, a small megalithic grave that is probably of an early date as well (Figure 7.26). The ceramics from the settlement site of Xichang Yangjiashan likewise show some similarity in ceramic forms (stout jars and cups) and quality (Figure 7.27). The decorated vases and the single stout vessel with side handle found at Yangjiashan, on the other hand, resemble ceramics from the earth-pit graves at Lizhou, but are executed in high-fired fine ware instead of coarse sand-tempered material common at Lizhou.

High-fired fine ware in the form of plain jars of types similar to those seen at Yangjiashan and Tianwangshan also occur at Puge Wadaluo (Figure 7.28). The cups and stout jars from Wadaluo are of the same type as some of the ceramics seen in the megalithic graves of Miyi Wanqiu, but the ceramic material from Wadaluo is less coarse. Furthermore, Wadaluo yields none of the handled or spouted vessels or decoration motifs typical for megalithic graves. The stone tool types, ceramic quality, and vessel forms (especially ewers and bowls) furthermore connect Puge Wadaluo to local Neolithic settlement sites (Figure 7.29). It is therefore likely that Puge had an independent ceramic and stone tool tradition that later incorporated elements from the Anning River Valley, while Xichang Yangjiashan combines elements of both traditions.

The ceramics from the early megalithic graves of Dayangdui and Tianwangshan show that the contact with Puge was not a one-way street, but that the ceramic traditions of this less accessible neighboring area exercised some (although limited) influence on the ceramic development in the Anning River Valley. At a later point, the custom of megalithic grave burials reached Puge, first in the form of relatively small graves with a small number of interments similar to Tianwangshan and Dayangdui (Puge Xiaoxingchang AM1 and AM2), followed by a phase with medium-sized graves holding up to 125 skeletons (BM1-3). Remarkably, the assemblages from all graves at Xiaoxingchang differ significantly in assemblage from those at Tianwangshan and Dayangdui. Even the small graves AM1 and AM2 mostly contain bronze bracelets, arrowheads, and knives, but no ceramics similar to those from the megalithic graves at Tianwangshan and Dayangdui. In spite of the similarity in grave form, the range of burial goods thus followed a different set of rules than what was common in the Anning River Valley.

The assemblages from megalithic graves are notoriously difficult to compare, let alone date. Many megalithic graves are poor in burial goods and vary widely in contents, with not a single object category common to all. Most graves yield personal ornaments, weapons, and tools, but others contain only ceramics, and only a few have both. Furthermore, many megalithic graves have been accessed multiple times, leading to a mixing of material from different periods, which makes it difficult to establish a relative chronology based on the co-occurrence of different object types. Nevertheless, some insight can be gained from stratified sites (i.e., Puge Xiaoxingchang, and Xichang Dayangdui, Lizhou, Maliucun, Mimilang, and Qimugou), graves that have not been re-opened, and material known from sites with an established date.

Stratigraphic evidence shows that the earliest megalithic graves postdate the ceramic deposits of Yingpanshan and Dayangdui, which date roughly to the 8th century BC. The only radiocarbon dates available for megalithic graves come from human bones found in Puge Xiaoxingchang AM1 and BM2, both dating to 2470±75 cal. BP (520-450 BC). As these graves do not belong to the earliest phase of megalithic graves, it is reasonable to consider an early or middle Spring and Autumn date as the earliest time for the occurrence of megalithic graves.[25] The latest graves and their date are much easier to ascertain, as some of them contained Han-style ring-pommel iron knives and iron swords[26] and others *daquan wushi* (~AD 9-14) (e.g., Xide Guluqiao) or *wuzhu* (~AD25)[27] coins, suggesting a date contemporary to mid or late Han.

More problematic than the absolute dates is the relative chronology of the different megalithic graves. In this context, Xichang Qimugou provides crucial evidence: the Neolithic settlement remains of lower Qimugou mentioned above are superimposed by two earth-pit graves (M1 and M2) that yielded vessel types similar to those known from the ceramic pit of Xichang Maliucun and megalithic graves in Xichang and Xide (Figures 7.30-7.36). The earth-pit graves at Qimugou are in turn superimposed by settlement layer 3 (generally referred to as upper Qimugou), which is characterized by coarse sand-tempered handled vessels strongly resembling objects from the megalithic graves of Miyi Wanqiu and Dechang Arong (Figures 7.37-7.38, and 7.43-7.44). Qimugou layer 3 was superimposed by one earth-pit grave (M3) with three coarse choppers and one round pit (W1) containing one large urn with a smaller jar inside (Figure 7.45). The urn resembles vessels from the ceramic deposits at Yingpanshan, which is superimposed by a layer containing Han tiles, and the small jar with its squat form resembles Han-style ceramics. Furthermore, the form of Qimugou M3 is largely identical to that of Xichang Ma'anshan M1, whose ceramics show clear Han influence as well (Figure 7.46). We can therefore infer that the

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[25] Based on the lack of metal objects in the early graves and comparison with ceramics from Chengdu Shi'erqiao 成都十二橋, Luo Kaiyu 儸開玉 (1989) suggests a Shang date, but as the resemblances are vague and early Dayangdui, which predates the megalithic graves, contains a bronze sword, this date is probably too early. Based on the radiocarbon dates of Puge Xiaoxingchang, Liu Hong (2009) has suggested a late Spring and Autumn date which considering the stratigraphic and typological evidence from Dayangdui seems a little late.

[26] Iron knives were found at Dechang Arong M3, Xichang Guoyuancun M1, Xichang Hexi Gongshe M2, M4, and M5, Huangshuitang M1, Wanao M1, and Xiaohuashan M1, and an iron sword was found at Xijiao Gongshe M1. Dechang Arong M4 furthermore contained a few iron nails.

[27] These graves are Xide Guluqiao M1, Lake Sihe M1, and Xichang Hexi Gongshe M3. Mianning Tianba M1 and M2 furthermore contained Han coins of an unclear type.

urn pits at Yingpanshan date a little later than Xichang Mimilang but likely pre-date Qimugou M1 and M2 or at least Qimugou W1, which dates to Western Han or later. It remains unclear how much time has elapsed between the different phases of Qimugou, especially as M1 and M2 start directly below layer 3. It is therefore still a possibility that both are nearly contemporaneous, although typological evidence suggests that the first kind of material is indeed earlier.

The assemblage of Qimugou M1 and M2 is characterized by geometric decoration bands, ewers, stout jars, and high stems with cut-out geometric motives that are different from the lower Qimugou material but instead remind of middle Lizhou ceramics. This indicates a possible time gap between the later graves and the early settlement remains at Qimugou, which predate middle Lizhou. The goblet forms from Qimugou M1 and M2 and Maliucun are of a similar ceramic quality as those from the megalithic graves of Dayangdui (high-fired black-brown clay ceramics), and may have developed from the same ceramic tradition. The assemblages of the other megalithic graves from Xichang and Xide listed above comprise both sand-tempered and fine ware, but they are of dark color as well. It therefore seems likely that the ceramic tradition to which the finds from Qimugou M1 and M2 belong has local roots and is furthermore culturally and chronologically connected with a second phase of megalithic graves postdating Dayangdui and Tianwangshan. The goblets and the few thin handles from Qimugou M1 and M2 furthermore resemble pottery from Zhangjiazui 張傢咀 in Gansu, which is conventionally attributed to the late phase of the Xindian culture 辛店文化 (1500-1000 BC) (Shui Tao 2001:205-220).

Qimugou layer 3 shares spouted vessels, round-bodied jars, and stemmed goblets with the earlier graves at the same site, and the large urns with finger-tip impressed appliqué bands below the rim and leaf-vein pattern on the bottom show a connection with even earlier local ceramic traditions. Most ceramic forms, however, are different from what is seen in earlier layers, and they are of red sand-tempered material instead of dark-colored fine ware of Qimugou M1 and M2. Both ceramic quality and forms of layer 3 instead closely resemble finds from the settlement sites of Xichang Wangjiatian and Mianning Sanfentun as well as the megalithic graves of Miyi Wanqiu and Dechang Arong (Figures 7.39-44). Similar stout jars with short band handles are common to stone-cist graves from the upper Minjiang River Valley, which are conventionally dated to the 3rd century BC (He Kunyu 2009). Iron object have been reported from megalithic graves holding similar ceramics as Qimugou layer 3, but they never occur in megalithic graves with ceramics resembling those from Qimugou M1 and M2. Yanyuan Laolongtou M6, i.e., a grave that was not reopened, furthermore yielded both a composite knife and a stout vessel with short band similar to objects from Qimugou layer 3 as well as the graves at Miyi Wanqiu, suggesting a date around the 3rd c. BC for this kind of ceramics.

For a further subdivision of the megalithic graves beyond the two phases indicated by the finds from Qimugou, ceramic typology is a useful tool. Especially the double-handled and spouted vessels, as well as the goblets show considerable variation (Figures 7.47-7.49). For the megalithic graves containing ceramics and settlement sites with similar material, it is possible to distinguish between four main phases with several sub-phases:

Phase	**Ceramics**	**Other Objects**	**Graves**	**Examples**
I	*forms*: few ceramics, urns, jars, goblets, cups *quality:* high-fired, slipped, fine ware	no other objects	small graves, single instance of interment	Xichang Dayangdui DM1 and DM2, Xichang Tianwangshan M10
IIa	*forms*: spouted jars, high-stemmed goblets, round-bodied goblets *quality:* high-fired, slipped, fine ware	perforated knives, spindle whorls, stone arrowheads, metal bracelets, grinding tools	small and medium-sized graves, group interments, reopening	Xichang Qimugou M1 and M2, Maliucun H1, Bahe Baozi M4 and M6 Yanjiashan M3
IIb	*forms*: spouted jars with foot and knob-handles, round-bodied goblets, small vessels with thin double-handles *quality:* high-fired, fine and sand-tempered ware	spindle whirls, arrowheads, bronze knives, bracelets, bone rings	medium-sized graves, group interments, reopening	Xide Lake Sihe M6, Xichang Lianghuan

IIIa	*forms*: single- and double-handled round-bodied vessels, often with water-ripple application, spouted vessels with high trumpet-shaped neck and handle *quality*: coarse sand-tempered, low-fired, red-brown ceramics	stone and metal arrowheads, grinding rods, adzes, chisels, spindle whorls, metal bracelets, beads, earrings, hair combs	medium-sized or large graves (only Puge grave small), group interments, reopening, entering	Upper Qimugou, Dechang Wangjiatian, Mianning Sanfentun, Miyi Wanqiu M1-2, Puge Xiaoxingchang BM1
IIIb	*forms*: single- and double-handled vessels with elongated body, often elaborate handle decoration, spouted vessels with high straight neck *quality*: coarse sand-tempered, low-fired, red-brown ceramics	beads, metal knives, arrowheads, metal bracelets, perforated animal teeth (Puge only)	medium-sized or large graves (only Puge grave small), group interments, reopening, entering	Puge Xiaoxingchang AM1, Dechang Arong M1, M3, and M4
IV	*forms*: single and double-handled undecorated small vessels with long-narrow handles, spouted jars with high neck, small footed beakers *quality*: high-polished, high-fired, red fine ware	bronze knives, iron swords, large metal hair combs, clothing applications, *ling* bells, metal bracelets, rings, earrings, beads, grinding rods	large or very large, multiple interments, re-entering of grave	Xichang Xijiao M1, Xichang Hexi M3, Xide Lake Sihe M8, Xichang Huangshuitang M1, Xide Guluqiao M1, Xichang Wanao M1

In the case of graves without ceramics, parallel finds from other regions and a comparison with graves containing both ceramics and metal objects provide valuable indicators. The assemblage from Puge Xiaoxingchang AM2, for example, comprises metal knives, arrowheads, and bracelets similar to those from AM1 at the same site, whose ceramics place it in phase IIIa (Figures 7.50-7.51). The hair combs from Bahe Baozi M1 with their narrow trapezoidal head plate are of the same type as specimens from Puge Xiaoxingchang BM4 and Xichang Xiaohuashan M1 (Figure 7.53). The large triangular head plates of the hair combs from Xichang Beishan M1 strongly resemble objects from Xichang Xijiao M1. The *ling* bells do not show much diversity in form, but they only occur in a few megalithic graves of relatively late date such as Xide Lake Sihe M8 and Guluqiao M1, and Xichang Beishan M1 (Figure 7.54). The presence of iron knives with ring-handle both at Xichang Wanao M1 and Dechang Arong M3, on the one hand, and Guluqiao M1, Huangshuitang M1, and Xiaohuashan M1 on the other, helps to assign the second group of graves a relatively late date as well (Figure 7.55).

The problem remains that most megalithic graves have been reopened one or several times and might have been used over a long time. Any date suggested by means of typology and comparison therefore can only help to date one point during the use life of the grave in question. Xide Lake Sihe M1, for example, contains both a goblet similar to objects from phase IIb graves and Han objects (coins and a Han-style *fu* vessel), showing that the grave may have been used from the 4th to the 3rd or 2nd century (Figure 7.36). Another indicator for a long use life is the number of objects and skeletons interred (e.g., Puge Xiaoxingchang BM1 and BM4, or Xide Guluqiao M1). A large number of ceramic vessels alone is not necessarily a reliable indicator of a long use-life of the grave unless paired with a large number of skeletons and/or personal ornaments but does contain a large number of largely identical ceramics. A particularly spacious construction containing large number of vessels, especially if heavily fragmented as in the case of Dechang Arong, does primarily reflect the intensive use of the grave, but possibly within a relatively short time frame. At Miyi Wanqiu, however, the same basic vessel forms occur in a variety of different types and subtypes, indicating a somewhat longer time of usage.

With the help of the analyses and comparisons conducted above, it is possible to assign all but four of the excavated graves to one of the phases described above and display them in tables listing the object forms and types associated with them (Tables 7.8-7.13). All graves that were likely used over an extended period are marked a such (Table 7.8 under "remarks"), and they are listed at the earliest point at which they probably were used. The resulting lists are naturally tentative and will have to be revisited once more material becomes available. Nevertheless, at the current juncture it has already become clear that Phase I, which is characterized by small graves used for one single instance of interment, likely post-dates middle

Dayangdui and Puge Wadaluo. The main objects placed in these graves are large jars and urns, probably containing food provisions for the dead, while other kinds of objects are rare.

The graves of Phase II are of a very different character: they are of medium size, used for multiple instances of primary inhumations. The deceased were sometimes adorned with ornaments and/or carried personal tools or weapons. Ceramics are common in graves of this phase, and they consist mainly of fine, high-fired goblets, vases, and ewers, which were probably used in rituals connected with the burial. During the second part of this phase, metal knives start to occur, as does bronze hair decoration, and personal ornaments become more common. This does not necessarily mean that people wore more jewelry, but it may be due to the increasing number of interments placed in a single grave. The grave size nevertheless remains moderate.

The graves of Phase III are characterized by jars with one or two short band handles made of several clay strips, while drinking vessels are more rare. Interestingly, the ceramic material becomes coarser, reminding of the early settlement and grave finds at Lizhou instead of the objects at Dayangdui or Qimugou. As Dayangdui may have been occupied by a foreign population and Qimugou shows outside influence as well, the megalithic graves of Phase III may reflect a return to local traditions. During Phase III, grinding rods become common, increasing in number especially during the second part of this phase. Additionally, personal ornaments both of metal and stone become more frequent, especially in the second part of Phase III. This is furthermore the first time that iron knives and bronze swords occur in megalithic graves.

In Phase IV, considerable changes occur both in grave form and in ceramic assemblage. All very large graves date to this phase, and some of them contain considerable amounts of ceramic sherds indicating extensive rituals inside the graves. The assemblages now mainly consist of single-handled and mostly undecorated vessels of high-fired red fine ware, frequently accompanied by iron or bronze knives, grinding rods, elaborate hair combs, and many other ornaments, as well as clothing applications and various objects of clear Han origin.

The late phase therefore probably dates between the 2nd century BC and the early 1st century AD, whereas Phase III dates to the 4th to 3rd century BC, Phase II to the early 5th century, and Phase I to the 7th or 6th century. Given the many problems in the assignation of absolute dates discussed above, it would also be perceivable that Phase II and III are nearly contemporaneous, and there might be some overlap between Phase III and IV as well, mainly because of the relatively long use life of many late graves. What is certain, however, is the general development: at first, the graves were small and used for single interments with a small number of objects, and in the final phase they had developed into large constructions used in elaborate rituals. The intermediate period sees medium-sized graves containing increasingly larger numbers of people interred successively with their personal ornaments and tools under ceremonies involving communal drinking and possibly offerings for the dead.

As discussed in Chapter V, the urn pits of upper Yingpanshan and Qimugou likely fall into the same time period as the megalithic graves (Phases IIa and IV respectively); they might be connected to the burial of children or other members of the population not interred in the megalithic graves. The earth-pit graves at Qimugou, which are contemporary with the megalithic graves of Phase IIb, may have served a similar purpose, and Maliucun yielded ceramic remains connected with ritual acts centering around megalithic graves from Phase IIb as well.

Overall, it is remarkable to note that developments in Xichang and neighboring sub-regions before the advent of the megalithic graves were far from unified. The megalithic graves and their assemblages, on the other hand, are similar throughout the Anning River Valley and even in remote mountain areas such as Puge and Xide. The megalithic graves of Puge differ somewhat in form, but their assemblages are similar to that of megalithic graves throughout the Anning River Valley. Other parts of the research area, such as Huili, Zhaojue, or Yanyuan, however, were not touched by this trend but underwent separate developments.

VII.3.2.2 The Southeast: Huili and its Neighbors

Huili goes through a development of its own that shows some connections with neighboring parts of Yunnan rather than the Anning River Valley. The coarsely flaked shouldered axes and adzes from Huili Houzidong, for example, are different from any other stone tools found in the research area, but resemble the assemblages at middle to late Neolithic settlement sites throughout southern Yunnan (Figure 7.57). The ceramics from Houzidong might have a local origin: similar black-slipped, low-fired, sand-tempered pottery in form of small- and medium-sized jars with wide outward-flaring openings and folded rims have been observed at a number of settlement sites in Huili that are likewise associated with coarse choppers and scrapers but lack shouldered axes; instead, they contain double-perforated knives, indicating a slightly later date (Figure 7.57).The ceramic forms at these later sites show a vague resemblance to Dechang Maojiakan on the one hand and to the settlement material from Puge on the other. The ceramics from Puge, however, are of high-fired fine ware and accompanied by finely polished stone tools: Maojiakan yielded perforated stone knives and arrowheads as well as microliths and flake tools. Both sites are thus different from Houzidong in subsistence practices.

In Huili, only the settlement site of Yangjia Wuji furnished microliths associated with scrapers, choppers, and other coarse stone tools; the site is furthermore devoid of ceramic objects. Microlithic assemblages were reported from Renhe Gonghe, Huilongwa, and Xicaoping in Panzhihua, i.e., a sub-region close to Huili but more mountainous. Renhe Huilongwa and

Xicaoping are cave sites devoid of ceramic material; instead, they yield large amounts of faunal remains. Xiqu Yanwan, another cave site in Panzhihua, contains flaked stone tools and ceramics, but no microliths. No cave sites have been reported from other parts of Sichuan, but they are numerous in adjacent parts of Yunnan; these sites are characterized by coarse stone tool assemblages that are probably of late Paleolithic date (Zhongguo Wenwuju 2009). Xiqu Yanwan, a cave site with open-air parts holding both ceramic material and flaked stone tools, is conventionally dated to the early Neolithic, but as the site has only been surveyed, at the current juncture this is probably more an assessment of the mode of subsistence than an actual date.

Nevertheless, at least in Huili the differences between the ceramics of sites characterized by coarse stone tools and sites containing polished stone tools clearly indicate a difference in date. The settlement site of Dongzui yields large amounts of sand-tempered ceramics of red-yellow color accompanied by a small number of dark fine ware and a ground tool assemblage consisting of woodworking tools, perforated knives, and some grinding equipment, as well as spindle whorls (Figures 7.58-7.59). The settlement remains at Dongzui fall into two main phases: the first phase is characterized by jars with moderately curved outward-flaring rims, some of them with finger-tip impressed appliqué bands, others with incised decoration reminding of Dechang Wangjiaping. These early ceramics are associated with ground-stone tools such as axes, adzes, and perforated knives. The later layers contain a considerable number of rims decorated with corded-ware design similar to finds from Yongren Caiyuanzi and Mopandi in Yunnan (Yunnansheng Wenwu et al. 2003, Yunnansheng Bowuguan 1985), and handles with a middle-ridge reminding of objects from Jianchuan Haimenkou (Yunnansheng Bowuguan 1995, Yunnansheng, Dalizhou, and Jianchuanxian 2009a and 2009b) (Figures 7.61-7.62). The overall date of the site is therefore likely similar to that of the sites in Yunnan just mentioned, i.e., late Neolithic to early Bronze Age with absolute dates of 1500-1100 BC at the latest.

The settlement layers and earth-pit graves at Huili Washitian contain low-fired, hand-thrown, yellow or yellow-brown sand-tempered ceramics as well, but the forms are different from those seen at Dongzui: instead of handled jars with corded-ware design, the assemblage of Washitian consists of open bowls, plain flat-bottomed jars, and stemmed goblets with net pattern similar to objects from Fenjiwan. The weapons and tools at Washitian comprise needles, arrowheads, and *yue* axes made of stone, bone, or bronze, as well as stone molds for metal tools (Figure7.63), all of them clear signs both of local metal production and of a later date. The spearhead that would have been produced with the mold found at Washitian strongly resembles objects found at Yongsheng Longze 永勝龍澤 in Yunnan, a site dating to around the 5th century BC (Yang, Wan, and Hu 2009:207-2011); the *ge* dagger-axe mold is described in the excavation report as being of typical Shu style that was prevalent around the 6th-5th century (Tao and Zhaodian 1981).[28] It is therefore most likely that Washitian dates around the 5th century at well, and is furthermore contemporaneous at least with some of the 150 graves at Huili Fenjiwan.

The number of non-ceramic objects observed at Fenjiwan is limited, but the bronze *yue* axes are largely identical in form with the axe found at Washitian as well as with objects from various graves in Southern Yunnan [e.g., Yongsheng Longze and Xiangyun Dabona (Xi Xuezhong 1991: Figures 3 and 6; Li Chaozhen 1983: Figure 5)]. All of these graves in Yunnan furthermore had stone installations just as some of the graves at Fenjiwan. Another connecting point are the decorated spear heads present both at Fenjiwan and at various grave sites in Yunnan [e.g., Xiangyun Dabona and Chuxiong Wanjiaba (Yunnansheng Wenwu Gongzuodui 1983)].

[28] The photograph is of too low a quality to see any details, and the actual object is lost, so that the assessment in the excavation report cannot be tested.

The ceramic assemblage of Fenjiwan consists of large urns and jars not unlike those seen at Xichang Qimugou or Yingpanshan but without application bands or lug handles (Figure 7.66).

A geographically much closer point of comparison are the stone-construction graves at Yongren Yongdingzhen 永仁永定鎮, which (similar to the megalithic graves at Xichang Tianwangshan and Dayangdui) yielded only a few urns and more rarely vases (Figure 67) (Chuxiong and Yunnansheng 1986). Based on the lack of bronze objects, the excavators have assigned a late Neolithic date to the graves at Yongdingzhen, but as urns of this form are common at Bronze Age settlement sites as well, a later date is equally likely. The goblets at Fenjiwan bear resemblance to objects from Dayangdui and Tianwangshan, but their net-pattern reminds of objects from Xichang Lizhou, as do the double-handled vessels and spouted ewers.

The large number of graves indicates a long time-span of usage for the cemetery, requiring an internal chronology. As most of the excavated graves contained only a small number of urns/jars belonging to a few similar types while some graves yielded no objects at all, chronological assessments are difficult to make. Nevertheless, among all graves with objects, several kinds of assemblages can be distinguished that allow to assign the grave to three groups:

Group	**Urn/Jar**	**Other Ceramics**	**Tools**	**Metal**
Ia	1-3 urns and/or jars	no other ceramics	no tools	no metal
Ib	0-1 jar	no other ceramics	1 stone axe	no metal
Ic	1-2 jars	no other ceramics	1-2 spindle whorls	no metal
II	1-5 urns and/or jars	bowls, goblets, ewers, vases, type C single- or type D or E double-handled jar, cups; up to 12 vessels	0-2 stone ornaments and/or spindle whorls	no metal
IIIa	0-1 jar	no other ceramics	no tools	1-2 bronze bracelets, finger rings, or other metal ornaments
IIIb	0-3 urns or jars	1-2 goblets, ewers, type I single-handled jars, *dou*, or bowls	0-1 stone arrows	1-5 bronze objects (bracelets, ornaments, swords, spears, *yue* axes)
IIIc	1-2 urns or jars	1 *dou* or single-handled jar of type I	0-1 spindle whorls	no metal

Early settlement finds in Huili as well as neighboring regions are usually devoid of handled or spouted forms or stemmed *dou* bowls, while at Fenjiwan all three kinds of object often occur together and/or in association with metal weapons; it is therefore reasonable to assume that they are of a later date than graves without any of these objects. Both these special ceramic vessels and metal object are furthermore only rarely associated with large urn forms (e.g., Type B). It is furthermore remarkable that metal weapons and ornaments never occur in graves containing a particularly large number of ceramic vessels. It is therefore not unlikely that the main groups do indeed represent different chronological phases, while the subgroups may be socially defined. Judging from the comparison with objects from other sites conducted above, Phase I and II (equaling Group I and II) might partially overlap. Phase I thus probably dates to the 5th century BC, and Phase II and III can be assigned to the late 5th or early 4th century. Huili Washitian is likely contemporaneous with Phase III as defined by this chronological scheme.

The small graves lined with slates reported from Huili Xiaoyingpan, Xiaotuanshan, and Luquan Yingpanbao contain a different assemblage. Many of them are devoid of objects; others yielded ceramics similar to those from Yunnan Chuxiong Yongdingzhen, whose large urns and jars resemble vessels from Fenjiwan Phase I (Figures 7.67-7.68). The narrow-necked vases occurring both at Yongdingzhen and in the slate-graves in Huili are not shared by Fenjiwan; the other object forms from Xiaoyingpan, Xiaotuanshan, and Yingpanbao are likewise different both from Fenjiwan and from the stone-construction graves in northern Yunnan. They are therefore probably a local phenomenon of relatively early date possibly even predating Dongzui.

The objects from Huili Leijiashan M1 and from the graves at Huili Guojiabao — all of them earth-pit graves — are different from what was found either at Fenjiwan or in the stone-construction graves further south. While the ceramics at these sites are all low-fired, hand-thrown, made of sand-tempered material, and only sparingly decorated, nearly all vessels from Leijiashan and Guojiabao are decorated (in the case of Leijiashan mostly even surface-covering) and of high-fired fine paste ware. The assemblage of Leijiashan shares a few forms with the graves at Fenjiwan (e.g., moderately decorated single-handled jars with wide-bottomed bodies, certain types of vases and goblets), and the custom of placing flat river cobbles into the grave. The jars with the peculiar ear-shaped handles seen at Leijiashan reminds of objects from Yuanmou Dadunzi and other late Neolithic to early Bronze Age sites in southern Yunnan (Yunnansheng Bowuguan 1977: Figure 17.6), but similar objects have been reported from Fenjiwan as well (Figure 7.79). Other ceramic forms observed at Leijiashan are similar to those from megalithic graves of Phases IIa and IIb.[29] Overall, for Leijiashan M1 a date around the 3rd century BC seems tenable. This applies to the graves at Huili Miaozi Laobao as well, which contain objects virtually identical to those at Leijiashan.

The assemblage from Huili Guojiabao is again different, consisting mainly of bronze weapons and ornaments similar to objects known from Yanyuan, as well as turquoise beads, single- and double-handled vessels, and buttons similar to artifacts known from Dechang Arong (Figures 7.44 and 7.70). As most of the objects from Yanyuan were retrieved from the antiquities market, they are not useful comparanda for dating Guojiabao, but bracelets and some of the weapon types seen at both Guojiabao and Yanyuan are common in stone-construction graves throughout southwest China, whereas belt hooks and scabbard tips are more rare. Similar objects were found in stone-cist graves in northwest Sichuan such as Lixian Jiashan 理縣佳山 and Baoxing Hantanshan 寶興漢塔山 (Figure 7.72) (Aba and Lixian 1987, Sichuansheng, Ya'an, and

[29] The round-bodied as well as some of the long-bodied goblets resemble objects from megalithic graves of Phase IIa, and the stout single-handled jars with leaf-vein impression on the bottom are not unlike objects from Phase IIb; the spindle whorl forms and grinding rods remind of objects from megalithic graves as well.

Baoxingxian 1999), and rabbit-head ornaments appear not only at Guojiabao and in Yanyuan, but also in earth-pit graves with or without stone installations in Yunnan such as Changning Fenlinggang 昌寧墳嶺崗 (Figure 7.71) (Yunnansheng 2005). All these comparanda date between the 4th and the 1st centuries BC, which tallies with the assessment for the date of Dechang Arong (Phase IIIb); the graves at Huili Guojiabao thus probably fall into the same time period. The same date likely also applies to most of the objects retrieved from the antiquities market in Yanyuan and Huili that were discussed in Chapter VI.

VII.3.2.3 The Southwest: Yanyuan and its Neighbors

The only scientifically excavated graves in Yanyuan and the adjacent county of Ninglang are those at Yanyuan Laolongtou M4-M11 and Maojiaba M1-M2, and Ninglang Daxingzhen M1-M11. The ceramics from Daxingzhen, particularly the elongated double-handled jars and small single-handled cups, are similar to objects from Dechang Arong and other sites belonging to Phase IIIb of the megalithic graves; the combinations of metal objects (swords with three-pronged and torqued hilt, *fu* axes, knives with ring-shaped pommel, spear heads with side-loops, mirror-shaped decorative plaques), however, are virtually identical with what was found in stone-construction and earth-pit graves at Deqin Yongzhi 德欽永芝 (Yunnansheng Bowuguan 1975). The kinds of swords seen at Daxingzhen are common in stone-cist graves on the upper Minjiang River, but occur even more often in graves with or without stone-installation parts in northern Yunnan, particularly Deqin and Chuxiong; mirror-shaped objects occur in both areas as well (Aba and Chengdu 2009). All these graves date between the 5th and the 1st centuries BC, but considering the similarities in ceramics between Daxingzhen and Dechang Arong and the lack of composite weapons or *fu* vessels commonly occurring at the late graves along the upper Minjiang, a date around the late 4th or 3rd century BC seems a tenable estimate for Daxingzhen.

The double-handled vessels at Deqin Yongzhi, whose metal assemblage closely resembles that of Daxingzhen, are similar to those from Laolongtou M4, both bearing a prominent double-spiral motive on the body (Figure 7.75). Such vessels are common in stone-cist graves in the upper Minjiang River Valley; the types most similar to the vessels at Laolongtou M4 date to the 2nd/1st century BC (Figure 7.76). The middle support in the handles of some vessels at Laolongtou, on the other hand, seem to be a local trait. The drum and the bell in Laolongtou M4 are similar to objects from Shizhaishan dating to the 3rd and 2nd century BC, but the iron spearheads in Laolongtou M4 remind of objects from Phase IV of Kunming Yangfutou, suggesting a slightly later date (Yunnansheng, Kunmingshi, and Kunmingshi 2005).

These comparisons thus help to date the bronze deposits in Huili: the bronze drums from Guoyuan and Luoluochong probably date to the 3rd or 2nd century BC, as do the bells from Zhuanchangba. The grave assemblages of Yanyuan Maojiaba M1 and M2 contained Shizhaishan-style bronze drums, but M1 yielded no iron objects, while M2 contained several composite objects and an iron spear similar to the one at Laolongtou M4. It is therefore likely that Maojiaba M2 is contemporaneous with Laolongtou M4, while M1 dates earlier.

The surface finds from the grave site of Yanyuan Caojiawan comprise composite and iron spearheads, double-handled jars, swords with three-pronged guards, ring-pommeled knives, bronze ornaments, and horse gear similar to objects from Laolongtou M4, suggesting a similar date. Laolongtou M11 likewise contained an iron spearhead, but of a different type and accompanied by the dagger with fish-tail handle discussed in Chapter VI as having parallels in Laolongtou M7 and Deqin Nagu on the one hand, and in various sites in Baoxing County on the other (Figures 6.35 and 7.79-7.80) (Baoxingxian Wenhuaguan 1982, Yunnansheng 1983). Overall, the evidence thus suggests a date of mid to late Western Han for Laolongtou M7 and M11, but the few bronze fragments in M5 do not provide enough evidence to suggest a date.

The assemblages of Laolongtou M6 and M9, on the other hand, are rich, containing a number of ceramics, personal ornaments, clothing applications, and bronze and composite weapons but no pure iron objects (Figures 7.77-7.78). The assemblages from these two graves are similar to each other, suggesting a closeness in date; the stout double-handled vessels that both contain are remarkably different from the vessels of M4; instead, they are similar to objects known from megalithic graves of phase III, but a little stouter, indicating a slight later date. It is therefore likely that both M6 and M9 date a little earlier than the other graves at Laolongtou; being probably contemporaneous with Maojiaba M1 and the late megalithic graves.

Judging from the similarities with finds from graves in Yanyuan (e.g., composite weapons, ring-pommel knives, mirror-shaped ornaments, *ling* bells, and cowrie shells, turquoise beads, and spear- and arrowheads), and the shared particularity of the middle support in the double handles with Laolongtou M4, the stone-construction graves of Phase IV at Yongsheng Duizi probably date to the 1st century BC (Figure 7.81). The stemmed *dou* bowls of Duizi Phase IV strongly resembling finds from Yangfutou (Yunnansheng, Kunmingshi, and Kunmingshi 2005) and other cemeteries around lake Dian confirm this date. The settlement material of Duizi Phase I is characterized by grey, sand-tempered, flat-bottomed ceramics with wide openings, which are mostly decorated with fine corded ware and more rarely net pattern; these objects are associated with ground-stone woodworking tools and some needles, an assemblage similar to what can be seen in the settlement layers of Yongping Xinguang 永平新光 that date to the local mid Neolithic around 2000-1700 BC (Yunnansheng, Dalizhou, and Yongpingxian 2002).

The ceramics from the earth-pit graves of Duizi Phase II comprise small stout jars and wide-bellied vases made of highly polished and sometimes black-slipped ceramic material different both from Duizi Phase I and from objects otherwise known from Southwest China (Figure 7.83). Only the carinated bowls resemble finds from Dali Binchuan Baiyangcun, which are usually accompanied by polished woodworking tools with crescent-shaped double-perforated knives as they are typical for Duizi Phase III (Wang Dadao 1998:50-52).

Crescent- or sickle-shaped knives with two perforations are common in early Bronze Age settlements in Dali Prefecture such as the early Bronze Age layers of Jianchuan Haimenkou and Yinsuodao (Yunnansheng Bowuguan 1958, Yunnansheng, Dalizhou, and Jianchuanxian 2009a and 2009b; Yunnansheng, Dalishi, and Dalizhou 2009). At Yinsuodao, the mid Neolithic layers (3000-2400 BC) mainly contain jars with moderately outward-flaring rims either decorated with net-pattern, corded-ware impressions, or surface-covering point patterns, and more rarely fingertip-impressed appliqué bands below the rim. The late Neolithic (1500-1100 BC) sees incised lines as well as point pattern, whereas the early Bronze Age (1200-900 BC) is characterized by water-ripple pattern, net pattern, and fish-bone pattern, the latter resembling decoration seen in Yongsheng Duizi Phase II. At both sites, such decoration is applied to bowls, jars with wide outward-flaring rims, and small vessels with one or more short broad band-handles. In the mid to late Bronze Age layers of Yinsuodao (900-400 BC), decorated vessels are rare and jars have only moderately outward-curving rims, but handled vessels remain common; additionally, closed bowl forms with carinated or curved sides become prevalent.

The ceramic assemblage at Haimenkou shows a similar development, but the handled vessels occur already in late Neolithic layers, and the Bronze Age layers additionally display a considerable number of metal weapons and tools as well as *dou* bowls and goblets similar to objects seen in the Anning River Valley. Double-perforated half-moon shaped stone knives are common throughout all of these layers, although crescent-shaped varieties seem to be more common in the early Bronze Age than during other periods. It is therefore not unlikely that Duizi Phase II and III both date to the early Bronze Age, even though the ceramic forms are different from what we see at other sites in northwestern Yunnan.

At the current stage of publication, the internal chronology of Yongsheng Duizi remains somewhat unclear, but the site was likely occupied over a long period, spanning the time from the mid or late Neolithic to the 2nd century BC or later. Apart from Yongsheng Duizi, the settlements in the southern and western part of the research area are only know through surface finds summarily reported without any illustrations, making it difficult to assign a date. Judging by those descriptions, it seems likely that the small band-handled jars and the bowls and other vessels with corded ware and fish-bone pattern reported from Yongsheng Haiyancun, Jiaodingshan, Ninlang Pijiangcun, and Miyi Lianhua Gongshe date to the early Bronze Age. Yongsheng Lujiajie is missing handled vessels but the objects carry similar decoration and crescent-shaped knives were reported as well, indicating a somewhat earlier date; the same applies to the assemblages of Yanbian Xinlin, Miyi Hejiaba, Yuanjiaba, Yanyuan Wuqiu, and Yongsheng Sankuaishi, but without further information, these estimates must remain tentative. The settlement finds of Ninglang Jinyangcun and Kaijicun consist of polished woodworking tools associated with hammers and needles made of antler or bone, but given their location in particularly mountainous and thickly forested areas, this does not necessarily indicate an early date. The date of these sites is therefore currently unclear.

Apart from settlement sites and the well-documented graves discussed above, a number of cemeteries have been reported from Yanyuan, Yongsheng, and Panzhihua that have only been surveyed. The graves in Yanyuan are mostly earth-construction graves with limited amounts of stone installations, and they often contain double-handled vessels, but Yongsheng and Panzhihua are characterized by stone-construction graves. All graves reported from the northeastern part of Panzhihua (i.e., Miyi in the southernmost part of the Anning River Valley) are megalithic graves. Renhe and Yanbian, on the other hand, are characterized by large cemeteries of single-interment stone-construction graves, most of them slightly trapezoidal cists aligned in neat rows, similar to the cemeteries along the upper Minjiang River. Of these cemeteries, only four graves at Yanbian Yumen Wanxiao have been excavated, and the corresponding report is lacking in detail; it contains only one imprecise drawing of a stout jar with a high-narrow neck, wide shoulders, and ring-handles that strongly remind of objects from Xichang Mimilang or – even more remotely – Qijia culture sites in Gansu (Figures 7.17, 7.18, 7.85). Some graves at Yumen Wanxiao allegedly contained small jars without handles, forms which are common at Puge Wadaluo or Zhaojue Fuchengqu, but without further information it is difficult to make inferences. The graves at Yumen Wanxiao can therefore only tentatively be assigned to the 7th to 3rd century BC.

VII.3.2.4 The Northeast: Zhaojue and its Neighbors

As most graves in Zhaojue are completely devoid of objects, and the others yield only a small number of often unique objects, it is difficult to assess their date. The graves at Zhaojue Chike Boxixian, whose brick-wall like construction clearly imitate Han graves, contain unique ornaments of semi-precious stone and metal as well as typical Han ceramics and Han coins; they can thus be safely be dated to the 1st or 2nd century AD (Figure 7.86). Eba Buji M1 furnished a bronze basin virtually identical to object from Han Graves in late Western to early Eastern Han graves at Guizhou Weining and Mancheng 满城 and (Figure 7.87) (Zhongguo Shehui 1980: 58, Guizhousheng and Weiningxian 1981: Figure 11). Eba Buji M3 yielded a finely-worked bronze axe of a form common in both Western and Eastern Han sites as well, indicating a similar date. The single nephrite pendant in M2 is not sufficient for assigning a date, but as the grave structure of all three graves is essentially the same, it is likely that they are about contemporaneous.

Erba Keku M4 contained fragments of a metal basin as well, but the quality is low and the form does not resemble any known Han objects; the grave might thus be of an earlier date (Figure 7.88). The basin was accompanied by finely polished arrowheads similar to those from grave M5 at the same site, and a large stone axe similar to the one from M9. These stone tools all closely resemble objects from the settlement layers of Puge Xiaoxingchang.

The objects from the stone-construction graves at Zhaojue Fuchengqu, which is located close to Erba Keku, show a strong resemblance with finds from Puge as well: the flat-bottomed jars are nearly identical with objects from the settlement layers of Wadaluo and Xiaoxingchang, but the footed bowls are of the same form type as those in the early earth-pit graves at Xichang Dayangdui (Figure 7.88). It is therefore not unlikely, that the graves at Zhaojue Fuchengqu are considerably earlier than those at Erba Keku, dating roughly to the same time as the settlement remains of Wadaluo. The assemblages of the graves at Pusu Bohuang mostly consist of plain ceramic vessels as well, but these objects differ noticeably in form from those retrieved from Fuchengqu; instead, they closely resemble ceramics from the stone-construction graves at Huili Xiaotuanshan and Xiaoyingpan, and Luquan Yingpanbao, which date to the late Neolithic (Figure 7.87, right). It is therefore likely that the graves at Pusu Bohuang are considerably earlier than those at Eba Buji, even though they are located on the same hill. Calcinated ropes occur at most sites in Zhaojue and in graves of many different shapes and sizes; it is therefore currently impossible to date the graves from Zhaojue Wazhaishan, which contained nothing but such ropes (Figure 7.89), let alone stone-construction graves which were completely devoid of objects.

Considering the geographic location of Zhaojue, close connections with Puge on the one hand and more distant relations with Huili on the other are not surprising, but one would expect even closer contacts with Xide and Yuexi, which are immediately adjacent to Zhaojue. Xide, however, seems to be closely connected to the Anning River Valley, while Yuexi is poorly researched. The earth-pit graves from Yuexi Huayang and Liaojiashan, are noteworthy for the large number of bronze vessels, bronze and composite swords, knives, double-handled ceramics, and bronze ornaments they contained. Their assemblages are largely identical to those from stone-cist graves at the upper Minjiang, which yield Han style bronze vessels and are therefore usually seen as contemporaneous with the Western Han period (Figures 7.90-7.91).

The main connecting factor between Yuexi and Zhaojue is thus the intense and relatively early contact with the Han resulting from the geographical closeness of the sub-region to the Sichuan Basin; in other parts of the research area it is not until the middle to late Eastern Han that a strong Han presence is reflected in the material record. The considerable cultural and social change that the encroachment of the Han means, is clearly visible in the archaeological record and thus sets a fitting endpoint for this study.

On the basis on the analyses and comparisons conducted above, it now becomes possible to compile for the first time a chronological table for the research area (Table 7.14). Given the unevenness of the material currently available, this table is necessarily tentative but it can serve as a useful basis for discussions concerning cultural developments and contact networks not only in the research area itself but also throughout Southwest China as a whole.

VII.4 The "Big Picture": Regional Groups, Geographic Preconditions, and Chronological Developments

After sketching out the relationship between the different types of sites and assemblages and assessing their relative and absolute chronological position, the question arises how these developments are related to actual people inhabiting the research area in the past. Throughout all analyses conducted in this study it has become clear that the research area falls into four sub-regions showing fairly distinct archaeological assemblages, burial patterns, and subsistence systems, indicating that they were probably inhabited by different cultural groups. Interestingly, the sub-regions as defined by the archaeological material largely correspond with four of the five climato-geographic zones defined in Chapter II,[30] making them real cultural-geographic zones.

While geographic entities naturally stay constant in their extent, cultural regions are not static in their expansion and character, nor are they isolated from each other, but they are all part of various contact networks. These networks expand, contract, and change over time, so do the boundaries and particularities of the different cultural regions and the groups that characterize them. Each of the culture-geographic sub-regions furthermore shows some internal variation, both spatial and chronological. Additionally, there is some overlap between some of them at certain times that will be discussed in greater detail below.

VII.4.1 The Anning River Valley and its Inhabitants

The major developments in the Anning River Valley seem to originate from its central area during the mid 3rd millennium BC; at that time communities inhabiting settlements such as those of Xichang Henglanshan, Ma'anshan, Qimugou, Yingpanshan, and Lizhou shared the same

[30] These sub-regions are the Anning River Valley, the Northeast, Southeast, and Southwest of the research area. Only the Northwest is missing, simply because it did so far not furnish any archaeological data, probably mostly due to the lack of fieldwork there..

ceramic forms, decoration, and production techniques, indicating that they probably shared similar cultural tradition and thus identified themselves as part of the same larger group. The slight variation in ceramic style between Henglanshan, Early Lizhou, and the "triad" of Ma'anshan, Qimugou Phase I, and Lower Yingpanshan, is likely chronological in nature; the difference in stone tool assemblage, however, is not merely chronological but also shows differences in subsistence practice.

The inhabitants of Henglanshan, which is located on a piece of land not ideal for agricultural activities, seems to have relied on a mixed economy of hunting and small-scale agricultural activities; Lizhou, by contrast, is located on fertile ground and the stone tool assemblage indicates forest clearing, extensive agricultural activities, and weaving, but no hunting or fishing. All layers of Yingpanshan, on the other hand, contain considerable numbers of net weights, mostly accompanied by grinding equipment, while forest-clearing and agricultural tools are largely missing; this shows a strong reliance on fishing and probably gathering of wild plants and grains rather than systematic agricultural activities. Interestingly, the geomorphological preconditions at the site of Yingpanshan — at least as they can be observed today — are not different from those at Ma'anshan or Qimugou, whose inhabitants seem to have relied on a mixed economy with a strong emphasize on agriculture but not fishing, indicating that it might have been a culturally motivated choice rather than the only possible alternative to choose one form of economy over the other. The ceramic assemblage of all three sites is nevertheless nearly identical.

As all of these settlements have shallow layers and were likely occupied only over a relatively short period of time, it is possible that the same settlement community occupied all three sites, moving from one to the other either in seasonal cycles or after a number of years without returning. Another possible explanation would be that the sites were inhabited by different communities or subgroups of the same community who shared a common cultural identity and were in constant contact, exchanging food supplies won through different modes of economic practice. All of these explanations are equally convincing as they explain both similarities and differences in object assemblages between the different sites and the geomorphological particularities of the different site locations.

In spite of the distance of nearly 60 km between Dechang Wangjiaping and the other sites just discussed, the ceramic assemblage shows strong similarities, especially in object forms, while there are some noticeable differences in the choice of decoration patterns. Furthermore, the stone tool assemblage of Wangjiaping is much coarser and does not comprise any perforated knives, but it yields spindle whorls, woodworking, percussion, and grinding tools, indicating a settled, possibly agricultural-based mode of living. It seems therefore likely that the people inhabiting Xichang and Dechang during the middle and late Neolithic identified themselves either with different cultural groups or saw themselves as different subgroups of the same larger entity. Considering that the material from the earlier sites of Dechang Maojiakan and early Dongjiapo show only little similarity with objects known from the sites in Xichang, but are on the whole distinct, it is likely that they belonged to a different cultural group, who came to be in increasingly close contact with people from Xichang.

While Wangjiaping is largely contemporaneous with Henglanshan, Maojiakan is considerably earlier than, and different from, Henglanshan: the ceramics are coarse and undecorated, and the stone tool assemblage consists mainly of microliths and flake tools accompanied by a number of arrowheads and a few knives and grinding tools. The subsistence practice at Maojiakan, whose surroundings are not conducive to agriculture, was therefore probably based on hunting and gathering, supplemented by the harvesting of — not necessarily consciously cultivated — starchy plants. The assemblage from the early Dongjiapo layers, on the other hand, combines spindle whorls, double-perforated harvesting knives, grinding equipment, and small woodworking tools with net-weights. This combination of different tools indicates a mixed economy, which is appropriate for the mountainous regions of Dechang covered by soil less fertile than what characterizes Xichang. The ceramic assemblage of Dongjiapo resembles finds from Wangjiaping and Mimilang, a site postdating Henglanshan. The late phase of Dongjiapo furthermore yields ceramic remains similar to what is known from megalithic graves. The same applies to later sites such as the settlement of Dechang Wangjiatian and the megalithic graves of Dechang Arong.

The most likely explanation for this patter is that Dechang was at first inhabited by a pre-agricultural local group that was likely culturally different from the people who lived in the Xichang area. During the following centuries, an increasingly close contact between the two areas ensued; the communities in Dechang came to adopt most of the ceramic assemblages that they knew from their neighbors, but they maintained the mixed form of economy most suitable to their natural surroundings. It is likely that people from Xichang even relocated to Dechang — be it through marriage arrangements or for other reasons — brining with them a particular tradition of pottery making, and finally even a peculiar burial practice.

A similar development seems to have taken place in Mianning in the northern part of the Anning River Valley. The sites of Gaopo and Zhaojiawan show a particular ceramic tradition different from what characterizes the other parts of the Anning River Valley. The raw material and firing temperature are similar to what we see in Xichang, but the ceramic technology and forms differ; a potter's wheel was used to throw large urns with horn-shaped applications and carinated bowls with small feet, and duck-beak shaped spouts were made in coil-building method. A few ceramic objects found at Xichang Qimugou and Dayangdui resemble finds from Mianning, showing a rather distant relationship. Megalithic graves appear in Mianning only during Phase III. At the same time, the ceramic material at local settlement sites such as Mianning Sanfentun changes drastically: the forms and decoration motives are now basically identical to what is known from megalithic grave context in Xichang, while local particularities seem to be lost.

Nevertheless, the early developments and the transition of Mianning from a place inhabited by people identifying themselves with a local culture to a place belonging to the region occupied by megalithic-grave builders seems to be different from what likely happened in Dechang. Considering that the assemblages of Mianning Gaopo and Zhaojiawan are so different from anything else found in the research area and different from later sites in Mianning as well, it seems that a complete replacement took place rather than a process of acculturation.

It is remarkable that Mianning Gaopo dates late, i.e., 1410-1050 BC, with a considerable gap from Mianning Sanfentun (~Megalithic Grave Phase IIIa), and no earlier local sites have been reported. This may reflect a lacuna in our current knowledge, or it might indicate that Mianning was settled only relatively late. Nevertheless, the Henglanshan ceramics show some similarity with finds from Hanyuan 漢源 directly north of Mianning,[31] indicating the existence of an early contact route through the area. Furthermore, Mianning itself has some flat and fertile land to offer with a fairly agreeable climate, and it therefore seems unlikely that there should be no early settlements. Future excavation work in this area promises to help solving this puzzle.

[31] This suggestion has been made in the excavation report of Xichang Henglanshan (Chengdu, Liangshan, and Xichangshi 2004). For excavation reports from Hanyuan see Daduhe Zhongyou 2001, Zhongguo, Sichuansheng, and Chengdushi 2006, Liu Huashi 2007, Sichuansheng, Ya'anshi, and Hanyuanxian 2008

The unique ceramic assemblage of Mianning Gaopo and Zhaojiawan indicates that the people who lived there likely were not related to other group living in the research area at the time. The assemblage of Ludian Yeshishan in northeastern Yunnan, which combines objects similar to what we see at Gaopo/Zhaojiawan and ceramics from Weining Jigongshan in Guizhou with some local particularities, indicates a mixed population. It is therefore not unlikely that at least part of the cultural group from Mianning to which the inhabitants of Gaopo and Zhaojiawan belonged, relocated to Yunnan. Why they left Mianning and what happened to the people who may have stayed is difficult to tell at the current stage of research. The mode of subsistence that people at Mianning Gaopo/Zhaojiawan practiced and the way that these communities disposed of their dead before megalithic graves became customary are likewise unclear.

What happened to the dead in pre-megalithic Dechang is not know either, but in Xichang single primary interments in earth-pit graves with food offerings in ceramic vessels were probably the norm. Of particularly great interest are the earth-pit graves from the early phase of Xichang Dayangdui. The ceramic quality (high-fired black brown fine ware with black slip and no further decoration) as well as the forms (vessels with high collars and long band handles, stemmed bowls) are strikingly different from the typical coarse low-fired sand-tempered reddish material and the flat-bottomed bowl, jar, vase, and ewer forms otherwise common in the early sites of the Anning River Valley. Instead, the assemblage of the early Dayangdui graves so strongly resembles objects known from Qijia culture context in Gansu that it seems highly likely that these graves yielded a foreign population that had immigrated from the North. The double-handled vessels at Lizhou and Mimilang show some resemblance to material from Gansu as well, but overall local particularities prevail, showing that these sites were inhabited by local groups that might have been in contact with areas in the North.

The lack of clarity on the exact number and form of objects found in the graves at Dayangdui and Lizhou makes it difficult to infer on social differences between the occupants of the different tombs. Some of the graves at Lizhou seem to yield significantly larger ceramic assemblages than others, indicating possible social differentiation, but grave form and size are similar throughout. The graves at Dayangdui all had a similar form and orientation and contained 1-6 ceramic vessels each as well as some stone tools and beads, indicating that the people buried in them were of roughly equal status, at least as expressed in the grave. Only two tombs were slightly different from the others as they contained one bronze sword each, indicating a different and possibly higher status of the person interred therein. As there is no evidence for early metallurgy in the Anning River Valley before Dayangdui, and metal objects only become common in megalithic graves, it is likely that this new technology was introduced through contact with or relocation of Qijia-related groups from Gansu.

The middle and late Dayangdui assemblages do not contain any metal objects, however, and they show a mixture of both early Dayangdui and local Neolithic trades that indicate some form of acculturation of the group of immigrants. As no similar sites of clear foreign origin have been identified in the Anning River Valley, it is likely that migration of whole groups from the North occurred rarely. The early graves at Dayangdui are superimposed by ceramic deposits in the middle phase, which were in turn superimposed by early megalithic graves. Ritual deposits of ceramics are not known from Qijia culture context and they are rare in the Anning River Valley as well. The origin and meaning of this tradition are therefore unclear.[32] The ceramics of middle

[32] The ceramic deposits of middle Dayangdui are different from those at upper Yingpanshan and Qimugou, both in nature and in date. The ceramic pits at Dayangdui did not contain any human bones or ash and were paired with silt pits, indicating a ritual nature different from actual burials. The pits at the other two sites, on the other hand, might have been cremation burials related to megalithic graves. Although somewhat similar in object assemblage and mode of deposit, the two kinds of pits therefore likely reflect two unrelated traditions.

Dayangdui indicate a mixed population of acculturated foreign and local people to whom the place had some deep cultural or religious meaning.

Graves with stone-construction parts are common throughout Southwest China, but megalithic graves seem to be unique to the Anning River Valley. The ceramics associated with these graves indicate a local origin of this burial tradition in the Xichang area. This impression is supported by the fact that all early megalithic graves (Dayangdui DM1 and DM2, Tianwangshan M10, and Guanshan M1) are located in Xichang, while the megalithic graves in other regions such as Dechang, Mianning, Puge, and Xide all date to Phase IIa at the earliest. Why this kind of burial mode arose is uncertain, but its overall development and spread is relatively clear: it started with small constructions used for a single instance of interment of several people, possibly in a secondary mode of burial. During or after the burial, communal drinking rituals took place which seem to have become more extensive over time, as the large number of drinking vessels both in later graves and related ceramic pits shows.

The mode of interment changed over time as well, most substantially from Phase I to Phase II. At first the graves are still of medium size, but increasingly large numbers of people are interred in multiple instances of primary inhumations and under increasingly elaborate rituals involving fire, and especially in Phase III also the re-entering of the grave and/or the re-arrangement of the bones of previous interments. Some of the later graves of Phase III and IV are of considerable size and high enough for someone to stand in them upright, but the number of skeletons in them are comparatively small, indicating that the rituals conducted inside the grave became increasingly extensive. The considerable number of highly visible large stone constructions dotting the Anning River Valley and especially Xichang, combined with the fact that these graves usually occur in more or less widely spaced groups, show the emergence of a ritual landscape that was probably traversed in various kinds of processions involving more than one grave. The orientation of the graves parallel or at a right angle to geographic markers such as rivers and mountains furthermore indicates that nature was involved in these rituals as well.

Such extensive and probably visually impressive rituals naturally have a strong binding power for the communities that conduct them, and might have helped to incorporate groups that before stood in loose contact with those in the Xichang area. This applies not only to Dechang and Mianning, which are located in the Anning River Valley, but also to the remote mountains of Xide and Puge, whose inhabitants belonged to culturally clearly distinct groups. Not much is known about the archaeological material of Xide predating the megalithic graves, but the few known early settlement remains are different from assemblages in Xichang, showing some vague resemblance only to material from Mianning Gaopo (e.g., lug handles, small-footed open bowls).

The early settlement material from Puge is more ample and shows distinct local particularities in ceramic quality and form, and in stone tool assemblage. The strong reliance on hunting and to a lesser extent fishing more so than agriculture reflected in the local tool assemblages, is natural for the forested mountains characterizing Puge to this day. The ceramics furthermore show that the difference between the people living in Puge and those inhabiting the Anning River Valley at the time was not only one of subsistence and environment but also of cultural identity. The only early settlement site in Xichang whose ceramics show clear resemblance with material from Puge combined with a tool assemblage indicating an agricultural mode of living, is Yangjiashan. As argued above, Yangjiashan is therefore probably the settlement of a community from Puge that moved to the Qionghai, taking advantage of the fertile soil and the mild climate. The quality and execution of the ceramic assemblage at Yangjiashan indicates that the producers were from Puge, but adopted local forms as well.

Even when the custom of erecting megalithic graves reached Puge, the mode of subsistence did not change, and the grave forms remained small and too low to be completely re-entered to conduct complex rituals as seen in the Anning River Valley. The ceramics and personal ornaments retrieved from the megalithic graves at Puge Xiaoxingchang nevertheless do not differ much from what we see in the graves in Dechang, Miyi, or Xichang; only the ornaments made of perforated bovine teeth and the regular occurrence of arrowheads in all graves in Puge are a local idiosyncrasy.

This particular combination of similarities and differences thus indicates that both Xide and Puge were inhabited by local groups that were culturally different from and at first hardly in contact with people in the Anning River Valley. Only later did the groups inhabiting the mountains become part of the powerful tradition of megalithic grave burials, adopting even ceramics and personal ornaments from groups in Xichang but preserving particularities of their own. Perforated bovine teeth (probably talismans rather than ornaments) and arrowheads, for example, show not only the continued importance of hunting as a subsistence practice, but also its significance for the self-definition and possibly the spiritual beliefs of the people in Puge.

The differences in burial ritual between Puge and Xichang in spite of all similarities in grave form are another sign that no change in population and probably not even a mixing of populations took place. Instead, it is more likely that local people adopted some aspects of a foreign ritual practices and even foreign objects of daily use without necessarily abandoning their own beliefs or their sense of a separate group identity. Nevertheless, sharing at least part of the burial customs and associated rituals — powerful rituals requiring much physical labor and organization (i.e., for building the graves) and thus doubly re-affirming local social bonds — must have created a supra-local sense of community throughout the Anning River Valley and neighboring regions, leading to the emergence of a new kind of identity that transcended the previous cultural and local group boundaries without necessarily destroying them.

What about social, gender, and personal identities in such communal graves? The earliest megalithic graves contain only a few ceramic vessels, but in all later phases the deceased seem to have been buried with personal ornaments, tools, and more rarely weapons on their body, indicating that the interred probably wore their usual attire. They were thus equipped with *Mitgaben*, but *Beigaben* meant to be used by the deceased in afterlife seem to have been uncommon. Most ceramics had been employed in communal drinking, entering the grave as *Nachgaben*. It therefore seems that the burying community was the focus of the burial rituals more so than the deceased. Nevertheless, as no re-occurring ornament or tool sets could be identified, it seems that there was a certain freedom for expression of individuality in personal attire and spontaneous gifts.

It is furthermore noteworthy that men and women were buried together and that even individuals who possibly had a special function or special powers (e.g., people wearing typical "shaman" bells on their belt or people wearing swords) were buried with everybody else. Only a small number of individuals seem to have been cremated — be it because of their special status, be it because of a disease or other special circumstance that required such treatment. It is possible that different social groups or clans/families might have been buried in separate graves, which would explain the divergence in assemblages between neighboring graves; however, the limited amount of objects in all graves speaks against a discrepancy in wealth between the different groups buried separately. The graves may thus differ somewhat in date or they may hold groups that were socially or culturally different without these subtle differences being reflected clearly in the archaeological record.

Observations made in the few graves that yielded sufficiently preserved bone material indicate that all people interred therein were of an advanced age while infants and young people are missing. At least in the Anning River Valley, where these observations were made, it is therefore likely that only men and women who had reached a certain age and possibly a certain status were buried in megalithic graves. As ethnographic and archaeological examples worldwide show, cremation burials or other form of separate treatment for children is common, largely because infants below a certain age were not seen as full members of society, yet (e.g., Goody 1962); the urn pits at Yingpanshan and Qimugou might thus have been child burials conducted by the same people who built the megalithic graves. The assemblages of Xichang Qimugou M1 and M2, which are so exceedingly like those in megalithic graves of Phase IIa and the ceramic pit of Maliucun, show that part of the population was apparently buried in earth-pit graves; however, who was buried in which fashion and for which reasons is currently unclear.

As far as daily life and mode of subsistence are concerned, the tool assemblages from megalithic graves and related settlement sites in the Anning River Valley show an agricultural and probably settled mode of living involving the planting of rice and probably other cereals, often supplemented by hunting, and in some places fishing. Only the sites in Puge show a continued primary reliance on hunting. Metal seems to have mainly been used for personal ornaments and only secondarily weapons or tools. While personal knives (probably tools rather than weapons) and stone grinding rollers seem to have been of some importance, swords are rare and mostly made of iron, i.e., they are of late date. It therefore seems that swords were signs of a special status of a few, but armed combat was probably not a central part of life, or at least in the expression of communal and individual identities as expressed in the grave.

So far, no traces of local metal working have been found, but the coarse quality and considerable number of metal ornaments indicate that they were locally produced. Many people seem to have worn metal bracelets, rings, and stone beads. In later graves, metal hair ornaments and clothing applications seem to have become popular both in the Anning River Valley and even more so in the mountains of Puge and Xide. Some ornaments and tools show signs of wear, showing that they were probably worn in life as well. As all of these ornaments were spread throughout communal graves and could not be assigned to separate individuals, it unclear if they were an expression of a specific form of personal identity. It is noteworthy, however, that clothing ornaments such as the buttons and belt hooks are not unique to megalithic graves or the Anning River Valley, but commonly occur in many different kinds of graves throughout southwest China, and in association with different kinds of ceramics.[33] At least within megalithic graves, these object were therefore probably not an expression of cultural identity but either followed a supra-regional trend or were precious imported objects. The same applies to the inclusion of coins and other Han objects in megalithic graves of Phase IV.

Elaborate hair combs, on the other hand, seem to be a unique feature of megalithic graves of Phase III and IV and might therefore be a promising indicator of cultural and — given the considerable difference in execution of different types — even social identity. Hairdos can be important markers of identity as both ethnographic examples and historical texts and depictions show. The small bronze figurines on bronze cowrie containers from Dian sites in Yunnan all show different hairdos, which Feng Hanji (1961b) has interpreted as expressions of different tribal identities. Hair ornaments thus deserve particular attention in future studies.

[33] Apart from a number of examples in the research area (Huili Guojiabao M1 and various graves in Yanyuan), similar objects have been reported from stone-construction and earth-pit graves in northern Yunnan, in the upper Minjiang River Valley, and in Ya'an Shimian 雅安石棉 (Sichuansheng, Ya'anshi, and Shimianxian 2006).

VII.4.2 The Remote Mountains of the Northeast: A Place in Between

Although technically located in the northeastern mountains, the developments in Puge and Xide with their more moderate climate and less forbidding elevation have a stronger connection to the Anning River Valley than to the remote and cold mountains of Zhaojue, Meigu, or Yuexi. Even today, the Northeast remains hardly accessible and is characterized by infertile soil, cold winters, and not much natural resources. In the past, the mountains were densely forested, making the Northeast a more agreeable but nevertheless harsh place to live. The few known settlement remains and the small number of tools found in graves show that hunting was probably an important subsistence practice, but woodworking tools and teeth of domesticated pigs found in graves show that mixed forms of economy were probably most common.

What is most striking about the graves in Zhaojue and Meigu is the great diversity of grave forms that occur in close vicinity to each other, with assemblages combining objects from different traditions. The small stone-construction graves of Pusu Bohuang contain only a few stout jars and narrow-necked vases strongly resembling objects from stone-construction graves at Huili Xiaotuanshan and Xiaoyingpan, and Luquan Yingpanbao; the graves of Eba Buji on the other side of the hill are irregular constructions of large stone slabs yielding imported Han bronze vessels and local personal ornaments, and both kinds of grave contain calcinated ropes, a particular local custom. Other unexcavated graves on the same hill comprise Han cliff tombs and various other kinds of small stone constructions.

A similar situation can be seen in Zhaojue Fuchengqu/Erba Keku: small stone-cists made of thin slates and containing ceramics and stone tools remarkably similar to finds from Puge Wadaluo, were observed in the immediate vicinity of graves made of four thick slates containing similar ceramics and stone tools but combined with metal vessels. In close proximity to all of these graves, Han brick graves and other kinds of stone-construction graves have been observed that so far have not been excavated. Particularly remarkable is the site of Chike Boxixian, whose brick-wall like construction clearly imitate Han graves, and which contain unique ornaments of semi-precious stone and metal as well as typical Han ceramics and Han coins.

The usual burial mode seems to be secondary burial of one or several people during a single instance of interment; this mode of interment occurs through all types of grave construction except for the Han brick graves, just as the custom of interring calcinated ropes and beads and pendants made of nephrite, turquoise, bone, or shell. In spite of these noticeable continuities visible in some graves, the slight spatial separation between graves of different construction indicates that they were built for and by people belonging to different groups that were probably culturally defined.

It is interesting to note that these groups of different origins conducted different kinds of burial rituals next to each other, apparently respecting each other's monuments and even adopting part of each others burial customs and objects. In this meeting place of different groups, cultural and other forms of identity (or at lest their expression in the choice of grave from, burial mode, and object assemblage) thus seem to have been extremely fluid. At the current state of research it would be unwise to jump to any conclusions on the precise identity of the buried or the burying group for any of these graves, but the material from Zhaojue indicates that the idea of border regions as places of heightened differentiation between groups — as suggested by Frederik Barth (1969) — might require some rethinking if not revision.[34] Conversely, at least before the large-scale encroachment of the Han during late Eastern Han, the Northeast is not

[34] Geoff Emberling (1997) has made some remarks to that extent as well, but studies on concrete archaeological examples are still missing.

actually a border region, in the sense of a border area of a state, but simply a meeting place of different groups none of which was more powerful than the other.

The nature of the groups who may have lived in Zhaojue before the onset of considerable outside contact is unknown. Why people may have moved into or through Zhaojue is not entirely clear either. At least in the case of Puge, contact with Zhaojue was clearly not a one-way street: the assemblages of the three earth-pit graves at Puge Wadaluo consist of bone and shell ornaments largely identical with those known from Zhaojue. These objects were furthermore found in a grave that deviated from the interment practices otherwise common in Puge, indicating that the people buried there might have relocated from Zhaojue. Considering how close Puge and Zhaojue are to each other, marriage or other kinds of social bonds between the people inhabiting these two areas would not be surprising.

The multiple secondary interments in coarse stone-construction graves in Zhaojue have striking parallels in Yongsheng Duizi, both in grave construction and interment form, but considering the equally strong differences in object form and the considerable distance between these two places, it is likely that what we see are structural similarities rather than actual connections. The relationship between Zhaojue and Huili is probably much closer, as shown by the strong resemblance between the ceramics from some graves in Zhaojue with objects from Huili Fenjiwan and Xiaoyingpan. The associated burial modes, however, differ greatly between the two regions, so do most of the other associated objects. If Zhaojue did indeed act mainly as a thoroughfare, the inclusion of objects from Huili in graves in Zhaojue is not necessarily a sign that these graves contained foreigners, but may just show contact with foreign groups. The reasons for and circumstances of this contact, however, are as of yet unclear.

The sizable number of Han objects in later graves in Zhaojue and the appearance of Han brick graves and stone-construction graves imitating them are considerably easier to explain. The Han were trying to find a way into and through the Liangshan region toward Yunnan, and they seem to have settled the area in increasingly large groups. Considering the function of Han bronze vessels as precious prestige goods within local non-Han graves (the wrapping of such vessels in fine cloth says as much) and the imitation of brick constructions in some graves that otherwise follow local interment practices, indicate that the Han enjoyed a relatively high status, making their customs and objects worthy of imitation and special treatment. The assessment of the exact relations between the Han and other groups living in the Northeast during the Western and Eastern Han, however, would require a separate study considering later Han material not included in this dissertation.

With the current state of research it is only clear that Zhaojue served as a gateway into the Liangshan area and as a transit region for people moving from the Liangshan to the North and East. Some people in transit may have stayed, leading to a highly diverse population that seems to have been comfortable mixing different burial practices and object forms or at least letting them exist side by side. Nevertheless, idiosyncrasies such as the interment of calcinated ropes, multiple secondary interments, and the placement of graves on steep slopes, orienting them toward the river as a point of reference and cultural/ritual importance, are probably of local origin. They may be holdovers from an older local cultural group that absorbed both foreign people and customs, but preserved certain beliefs and traditions that were essential to their identity as a group and their relationship with the environment.

The situation in Yuexi is less clear, as hardly any archaeological work has been conducted there so far. Surveys have shown that different kinds of stone-construction graves, megalithic graves, and earth-pit graves with assemblages nearly identical to those in stone-cist graves on the upper Minjiang and objects showing Han connections occur next to each other. Similar to Zhaojue, Yuexi thus seems to be an intermediate area where people, objects, and traditions from different places meet in not yet well understood ways. Being located in between the Anning River Valley, the Sichuan Plain, and Huili, the Northeast is a natural transit region; at the same time, the marginal environment may have lead to particular local developments different from what is seen in neighboring areas. To understand this network of different connections and local particularities, extensive fieldwork is needed.

VII.4.3 The Fertile Valleys on the Other Side of the Mountains: The Southeast

Being separated from the Anning River Valley by high mountains, the Southeast underwent a developmental sequence of its own that is different from what we see either of the two sub-regions described so far. The earliest sites in Huili and Panzhihua likely predate even Dechang Maojiakan, let alone all sites in the Northeast. The cave sites of Renhe Huilongwa and Xicaoping as well as the open-air site of Huili Yangjia Wuji are probably the earliest sites observed to date in the research area. They are characterized by assemblages consisting of microliths associated with scrapers, choppers, and large numbers of faunal remains, while ceramics have not been observed. Microlithic assemblages associated with coarse ceramic sherds have been reported from the open-air sites of Renhe Gonghe and Huili Yangjia Wuji. The cave sites of Xiqu Yanwan and Yongsheng Taoyingcun and the open-air site of Huili Houzidong, on the other hand, revealed both flaked stone tools and ceramics but no microliths.

None of these sites has been sufficiently excavated or published to make any cultural assignations. It is only clear that the inhabitants practiced a hunter-gatherer lifestyle, using caves and open-air sites either as seasonal or hunting camps rather than living in permanent settlements. Non-agricultural forms of subsistence may have continued among groups who already produced ceramics. It is noteworthy that all of the early sites in Panzhihua are located at medium elevations and close to a river but in mountainous terrain, places that are not ideal for agricultural activities in spite of the favorable climate. The abundance of a variety of plants and animals in this biodiversity hotspot is instead more conducive to a hunter-gatherer life style — be it mobile or settled — than for the emergence of agricultural communities.

The situation in Huili is different: Huili Yangjia Wuji and Houzidong are not only located in wide and fertile river valleys in a climatically favorable area but they are also surrounded by later settlement sites, cemeteries, and ritual sites with object pits. The relatively well-documented site of Houzidong is particularly remarkable for the large number of coarsely flaked choppers, grinding tools, scrapers, and especially shouldered axes and adzes different from the usual tool assemblages in Huili or other parts of the research area. Such assemblages indicating forest clearing are usually associated with early agriculture or shifting cultivation. Both arrowheads, coarse double-perforated stone knives, and woodworking tools similar to those from Houzidong (apart from the shouldered axes) have been reported from other settlement sites in Huili as well (i.e., Hewanwan, Liantang, Tangjiaba, Tianbacun). The ceramics known from all five sites are similar to each other both in quality (polished black-slipped grey sand-tempered pottery fired at low temperatures) and form (wide outward-flaring openings and folded rims), but different from what can be seen at later settlement sites in the Southwest.

It is therefore likely that these sites were inhabited by communities that identified themselves with the same cultural group, a group practicing incipient agriculture in a particularly congenial environment, living either in permanent or semi-permanent settlements, and using a particular stone tool set later augmented with incipient pottery production. The coarser stone tool assemblage at Houzidong probably reflects an earlier developmental stage. Considering the particularly short distance (< 5 km) and the relatively easily traversable terrain between Houzidong and northern Yunnan and its direct access to the Jinshajiang, it is likely that the people living at Houzidong were indeed in contact with groups in Yunnan or with people from even more far-away places such as Karuo, as suggested by the form of the shouldered axes. The strong local particularities of the ceramics at Houzidong and at the other early sites in Huili, however, indicates a local development rather than a group that moved to Huili from a different place bringing with them a fully formed tradition of ceramic and stone-tool production.

The ceramic material and stone tools from the settlement and stone-construction grave site of Huili Guantianshan/Yingpanshan probably belong to the same local tradition, but the tool assemblage combines flaked with polished tools and comprises many double-perforated knives, indicating a slightly later date. In construction, the graves furthermore resemble the stone-construction graves of Huili Xiaotuanshan, Xiaoyingpan, and Luquan Yingpanbao. The ceramics found at the latter three sites are similar to objects from Chuxiong Yongdingzhen in northeast Yunnan, while at the same time bearing some resemblance to objects from the earth-pit graves at Huili Fenjiwan. The burying communities of Xiaotuanshan, Xiaoyingpan, and Yingpanbao therefore likely belonged to an early local cultural group that spanned both Huili and northeast Yunnan, and which had emerged from the group to which the communities of Huili Houzidong, Hewanwan, Liantang, Guantianshan/Yingpanshan, Tangjiaba, and Tianbacun belonged.

Nevertheless, the graves at Huili Xiaoyingpan and Luquan Yingpanbao show some idiosyncrasies in burial practice that were seemingly not shared by the inhabitants of other sites in the research area or neighboring regions: all graves contained a single skeleton in extended-supine placement, but in a few cases the head had been placed in the stomach area and in one case the skull was missing completely. As these graves are otherwise identical in form and content to the other graves surrounding them, it is likely that the special body treatment was connected to the circumstances of the death of the buried individuals and/or their behavior [e.g., committing a sin such as suicide, murder, or witchcraft as seen with the LaDooga (Goody 1962)] rather than with their social standing or cultural affiliation.

It is furthermore noteworthy that one grave at Huili Xiaoyingpan contained a chain made of perforated animal teeth and a cowrie shell, resembling chains from graves in Zhaojue, Puge Wadaluo, and Yongsheng Duizi. Some ceramics observed in Zhaojue are similar to those seen at Huili Xiaoyingpan and Luquan Yingpanbao, but grave construction and mode of interment are different: most graves in Zhaojue and a few graves at Yongsheng Duizi were made of unrefined boulders and contained multiple secondary interments, but the graves in Huili were clearly primary interments, even though in some cases the head of the deceased had been removed.

These similarities and differences in burial mode, object assemblage, and grave construction between these three areas (i.e., Zhaojue, southern Huili/Luquan, and Yongsheng) are difficult to explain, especially considering the considerable geographical distance between them. As Zhaojue was a transit region whose inhabitants came into contact with many different people and traditions, the builders of some of the graves there might have incorporated Han objects while otherwise following local burial customs. The apparent similarities in grave construction, mode of interment, and object assemblage between Zhaojue and Yongsheng Duizi, are unclear. It is possible that a movement of people in either direction took place, or that we are witnessing two unrelated phenomena leading to similar patterns in the archaeological record. Both possibilities need to be examined once the material from Yongsheng Duizi is published.

The later material from Huili is far less problematic to interpret. The settlement site of Dongzui has remarkably thick cultural layers reflecting an extended period of continued use. The stone tool assemblage indicates an agricultural mode of living and the ceramic forms and decoration patterns remind somewhat of Dechang Wangjiaping but even more so of various sites in Yunnan. The ceramic quality (sand-tempered, low-fired, yellowish material) is largely identical with what is known from most other sites in Huili, but the forms and decoration motives are remarkably different from what is common at either earlier or later sites in Huili proper. This indicates that Dongzui might have been home to a non-local population coming from Yunnan. This suggestion is supported by the fact that the ceramics from later sites in Huili (i.e., Fenjiwan, Washitian, and Leijiashan) are largely different from the Dongzui assemblage.

The vessel forms without handles from Fenjiwan strongly resemble ceramics from earlier sites in Huili, but some elements are of distinct Xichang Lizhou origin, such as the footed bowls, goblets, and the fish-bone and net-pattern bands decorating some vessel bodies. The ceramics found in the single grave at Huili Leijiashan are similar to what was found at Fenjiwan, even though the Fenjiwan vessels are only sparingly decorated and of low-fired sand-tempered material, while the Leijiashan ceramics are of high-fired fine ware decorated with similar decoration band that often cover the whole vessel body. The main difference between these two sites therefore probably lies in date, while the cultural affiliation is likely the same. The assemblage from the grave site of Huili Miaozi Laobao are nearly identical with those from Leijiashan in spite of the distance of nearly 40 km between them, but both differ greatly from what we see at Huili Guojiabao, a grave site located adjacent to Miaozi Laobao.

The earth-pit and stone-construction graves of Huili Guojiabao are characterized by an assemblage consisting of a few ceramic vessels resembling objects from Leijiashan combined with a considerable number bronze weapons, ornaments, and horse gear, and double-handled jars largely identical with objects from Yanyuan. As discussed above, various personal ornaments and weapons show close resemblance to objects commonly found in stone-cist graves on the upper Minjiang but also earth-pit graves Yunnan. Buttons and belt hooks similar to those at Guojiabao have been recovered from megalithic graves in the Anning River Valley as well.

Apart from Guojiabao, both grave and settlement assemblages observed in Huili are usually poor in metal objects; a few of the later graves at Fenjiwan contain a few simple bracelets, *yue* axes, and one possibly imported spearhead, while otherwise ceramic spindle whorls and stone arrowheads are the most common tools found both in graves and settlement sites. Huili is remarkably rich in metal resources, and at least simple weapons and tools such as metal axes, spearheads, and arrowheads were clearly produced in Huili itself, as shown by the moulds from Washitian. Complex weapons and ornaments such as those seen at Guojiabao, on the other hand, were probably not local products, and it seems generally not to have been customary to deposit large amounts of metal objects in graves.

It therefore seems likely that the large cemetery and settlement site of Fenjiwan as well as the settlement and smelting site of Washitian, which yielded ceramics and metal and stone tools similar to those found in late Fenjiwan graves, were inhabited by communities of local origin that saw themselves as belonging to the same culture group, a group probably relating back to those people living at Huili Hewanwan, Guantianshan, and the other early sites described above. Although during this earlier phase contacts with northern Yunnan seem to have been most common, during the time of Fenjiwan contacts with the Anning River Valley seem to have been close, albeit not so close that the custom of erecting megalithic burials would have reached Huili. It is curious that megalithic graves were erected at the southernmost tip of the Anning River

Valley in Miyi but not Huili. After all, Huili is located only about 15-20 km further south, and earlier ceramic traditions from the Anning River Valley clearly found their reflection in Huili, showing that there was a connection between the two sub-regions.

The answer probably lies both in geographic preconditions and differences in the mode of transmission of ritual customs and ceramic forms. Even today, the road between Huili and the Anning River Valley or *vice versa* is cumbersome to take (particularly from Huili into the Anning River Valley as it means a steep ascent). Furthermore, the Anning River Valley does not have much to offer in terms of natural resources to people from lush and fertile Huili with its rich metal deposits. The road more often might have been traveled in the opposite direction. The transmission of customs requiring a considerable communal effort such as the building of megalithic graves for use in special rituals is not likely to travel by word-of-mouth; instead, it requires either the migration of a whole group from the place of origin of this custom to the new "destination," or the personal and preferably frequent encounter with those rituals by considerable parts of the population at said "destination" (in this case people from Huili). Otherwise they would hardly choose to implement such complex and cumbersome practices.

In other words, the custom of building megalithic graves and conducting complex rituals in and around them likely was taken up by various groups in the Anning River Valley and neighboring regions who were in frequent contact with those people who first built megalithic graves. The personal experience of seeing these impressive monuments and witnessing and probably participating in the rituals surrounding them led to the adoption of this practice throughout all of the Anning River Valley and even Puge and Xide. Groups living further east, west, and south, who would rarely venture into the Anning River Valley, may have heard of this practice, but hearsay alone would not induce them to adopt this custom. For most groups in Huili, it seems, the contact with the areas that are now part of Yunnan was much more important, and communities belonging to the same cultural group lived on both sides of the Jinshajiang.

Being a fertile place with ample flat land and natural resources as well as a mild climate, Huili was naturally inhabited early on, and groups who moved there seem to have stayed, as the lack of typical Huili objects in most other parts of Southwest China indicate. Local particularities are thus strong, and intrusive groups are easily identifiable. It is furthermore interesting to note that the tool and weapon assemblages even at late sites in Huili combine considerable numbers of projectile points with spindle whorls, woodworking and grinding tools, and sometimes net weight, but hardly any perforated knives or other clear signs of agricultural activities. It is therefore likely that the groups living in Huili made use of the particularly congenial environment by exploiting it in mixed economic practices instead of completely relying on the labor-intensive and risky subsistence practice of agriculture.

It is equally noteworthy that — in spite of the rich metal resources that were obviously exploited — local metal production techniques remain rudimentary and the few high-quality objects such as the single decorated spear-head at Fenjiwan, all metal objects at Guojiabao, and the bronze drums at Guoyuan and Luoluochong are clearly imports. The nature of the few metal objects found in graves at Fenjiwan — mostly plain axes, arrowheads, and bracelets — and the lack of metal objects in the later (!) grave of Leijiashan M1 indicate that for the definition of cultural or personal identity (at least as reflected in the grave), metal objects and especially weapons cannot have been very important. If is of course conceivable that high-quality metal objects were in wide use in daily life and that it was not customary to inter them in graves; however, the deposition, in special pits, of imported bronze drums and clumsy local imitations of bronze bells speaks against such an interpretation.

It is puzzling that high-quality bronze drums would have been prized, but no attempt seems to have been made to master the skills necessary to recreate the process. This seeming contradiction indicates that it was probably not the metal working technology that was admired, but a special meaning or power associated with the drums and bells themselves; hence their interment in special pits. Considering that the bells produced locally were not actually usable and the drums likely functioned as containers, it is very likely that the local people were probably not even sure of the actual use of these objects. This lack of interest in metal working in spite of the rich local resources and the considerable interest that outside groups probably had in them, can be seen as one of the special characteristics of the people of Huili.

At most sites in Huili only a small number of graves have been excavated; the 150 graves at the large cemetery of Fenjiwan therefore remain the main source of information on social structure. As shown above, the form and decoration of the ceramic assemblage combined with the presence/absence of stone and metal objects allows for distinguishing between three grave groups with subgroups, the main groups probably representing chronological phases, and the subgroups identity groups, be they defined by social status, gender, or other factors. Considering the small number of burial goods, the limited differentiation in form and content between different graves, and the lack of human bones that would otherwise have given clues as to age and sex of the deceased, this interpretation is necessarily tentative.

The large number of graves does suggest that a significant part at least of the adult population of the settlement of Fenjiwan was probably buried here. Overall it thus seems that at least in the grave and therefore potentially in the afterlife differences in social status, occupation, and possibly even gender seem to have plaid no significant role. The large number of objects found in the single grave of Leijiashan M1, however, indicates that this may not have applied to later phases of cultural development in Huili or at least not to all places. What connects all grave sites in Huili except for Guojiabao, however, is the great importance of ceramic vessels accompanied by a limited number of tools (spindle whorls, arrowheads) and/or plain personal ornaments worn on arms and neck (bracelets, chains); weapons, clothing applications, and lavishly decorated ornaments as seen at Guojiabao, on the other hand, are otherwise uncommon. Such objects were important to groups living in the Southwest, who will be discussed below.

VII.4.4 A Different World: The High-Altitude Mountains, Plateaus, and Valleys of the Southwest

Just as the finds from Huili Guojiabao, the assemblages of earth-pit graves with or without stone installation parts in the Yanyuan Basin and in the high mountains of Yanyuan and Ninglang show a clear emphasize on metal weapons and ornaments combined with one or two double-handled vessels and sometimes special ritual objects (i.e., drums, bells, staff heads), and/or horse gear, while tools are rare. By contrast, graves in all other parts of the research area are characterized by a preponderance of ceramic vessels sometimes accompanied by a few tools, arrowheads, or limited amounts of simple personal ornaments such as bracelets, beads, or pendants. Even in the wide valley around Lake Chenghai in Yongsheng, the assemblages in early earth-pit graves are analogous. The stone-construction graves from Duizi Phase IV with their multiple interments contain sets of objects somewhat reminiscent of those for less well-equipped individuals in graves in Yanyuan/Ninglang, i.e., a combination of arrowheads, bronze knives, bracelets, beads, *ling* bells, cowrie shells, and double-handled vessels, but at Duizi, such sets can furthermore contain spindle whorls which never occur in graves in Yanyuan/Ninglang. Swords and other weapons, on the other hand, are common in Yanyuan/Ninglang, but are missing in

Yongsheng, let alone horse gear, armor, clothing decoration, or special ritual objects such as drums, bells, or staff heads characterizing particularly rich graves in Yanyuan.

The grave material in Yanyuan/Ninglang thus emphasizes armed combat, in case of the graves in the Yanyuan Basin combined with horse riding, in a clearly stratified society where in death some people were adorned with a large number of personal and clothing ornaments buried in complex grave constructions under rituals involving fire and cinnabar, and equipped with substantial sets of objects. These could include weapons, ritual objects, armor, horses, and horse gear, and the deceased could even be accompanied by one or two people, be they servants, fighting men, or relatives. Either the main interment or the subsequent interments in such graves entered the grave as secondary burials, indicating that they had died at different points in time and were then reburied together. The accompanying people were thus not slaves or sacrificial victims, but probably related by blood or other forms of dependence that required their interment with the main tomb occupant.

It is remarkable that all of these especially rich graves were observed in the Yanyuan Basin, while the graves in the mountains all show more humble yet comparable assemblages. Tools occur rarely in either of those locations and never in the most elaborate graves. Spindle whorls are completely missing both from settlements and graves in Yanyuan and Ninglang, but net weights, arrowheads, and woodworking tools are common. Settlements and graves in Yongsheng, by contrast, frequently contain spindle whorls, double-perforated stone knives, finely polished woodworking tools, and grinding equipment, and the dead are buried either in group interments or single graves with modest equipments consisting of a few simple personal ornaments and tools indicating food-procurement and processing activities.

Apart from the middle-support in the handles of some vessels from Yanyuan, the sets of objects accompanying the dead into the stone-construction graves in Yongsheng Duizi and the mode of multiple interments show a close resemblance to the megalithic graves in the Anning River Valley. The custom of cremating the children and burying the ashes in separate urn graves were reported from both places as well, although the reliability of this information remains dubious. The grave construction of the stone graves themselves and some of the objects, however, are reminiscent of graves in Zhaojue, but similar graves have also been observed in Xiangyun in Dali (Dalizhou and Xiangyunxian 1993). Interestingly, the ceramics in the graves from Xiangyun are virtually identical with some of those observed in Yongsheng, but they are associated with rabbit-head shaped ornaments and bells similar to objects found at Yanyuan Laolongtou and Huili Guojiabao.

The tools observed in the various layers of Duizi and at other settlement and grave sites of Yongsheng generally show at least partially an agricultural way of subsistence with no special emphasis on combative activities. The different types of ceramics as well as their quality and execution strongly resemble objects known from adjacent parts of Yunnan such as Dali. The people who inhabited the sites in Yongsheng therefore probably identified themselves with one or several other groups in Yunnan, even though connections both to Yanyuan and the Anning River Valley may have existed. All of these graves contained vessels probably holding food and drink offerings (*Beigaben*) as well as some personal ornaments and tools (*Mitgaben*), that may be interpreted as markers of personal or social identity.

The people living in Yanyuan and Ninglang, on the other hand, belonged to a clearly separate cultural group for whom armed combat — sometimes combined with horseback-riding — was a central part of their life and identity. People engaged in object production and food procurement — probably through mixed forms of subsistence — seem to have played a lesser role in society. Considering that Yanyuan is rich in salt, a resource that was exploited at least since Han times and probably earlier (Zhou and Jiang 2011), it is likely that it was the salt that brought wealth to the elite of the Yanyuan Basin, allowing the inhabitants to acquire considerable amounts of different kinds of high-quality metal objects from other places.

Their own metal products was feeble, most of them idiosyncratic bird-shaped applications and staff heads of particular ritual meaning that were produced locally, as well as a small number of personal tools and simple ornaments. The salt lords of Yanyuan — if one may call them that — thus needed raw copper and tin, which they could have received from Huili. The Yanyuan-type grave at Huili Guojiabao might thus be associated with people from Yanyuan involved in such exchange. The richness of the graves at Guojiabao, which furthermore contained horse gear and other objects associated with the elite of Yanyuan, indicates that exchange of salt and metal — if it really took place — was not the business of merchants but an elite transaction.

The emphasis on horse-riding, the interment of horse heads and sheep shoulder blades in graves and the overall metal assemblage (in particular the staff heads) seen at Yanyuan are essentially foreign to the research area. Pictorial evidence for horse-riding is known from the Dian culture context, but horse skulls or long bones have never been. The interment of horse bones is instead common in the Northern Steppe and the Ordos region, and elements of horse gear similar to those seen in Yanyuan have been reported from there as well. The ceramics and many of the personal ornaments, weapons, and the specific type of double-handled vessels from Yanyuan show a close connection with the stone-cist graves on the upper Minjiang River, as well as graves in northern Yunnan. None of the graves in Yunnan, however, contained horse bones, let alone other animal bones. This phenomenon has so far only been reported from Yanyuan, various graves in northwest Sichuan,[35] and the steppe zone.

It is therefore likely that the burying group of the "warrior graves" in Yanyuan is of a northern origin, be it the upper Minjiang or even the steppe. It is unclear whether this group replaced or merged with an existing population, or whether it moved into previously unoccupied territory. Considering that the adjacent areas to the East and South had been occupied as early as the Paleolithic, and that the Yanyuan Basin is a flat terrain crisscrossed by watercourses and receiving much sunlight, it seems unlikely that it should have been unoccupied for so long. The local idiosyncrasies in burial ritual might be a reflection of traditions of a local group that was absorbed by the dominant immigrant group. At the current stage of limited fieldwork, these suggestions are necessarily only tentative and need to be tested through future excavations.

VII.5 Mechanisms of Human-Environment Interaction and Intra- and Inter-Group Demarcation

As the comparative analysis of the material from different kinds of sites has shown, there are remarkable discrepancies in archaeological assemblages between the four cultural-geographical sub-regions identified above. The people who inhabited these sub-regions in the past, their subsistence systems, burial traditions, social structures, and various other customs were clearly influenced, but not completely predetermined, by the special environments in which they lived. The choice of a largely agricultural-based mode of subsistence in the fertile Anning River Valley with its mild climate or in the lush and warm valleys of central Yongsheng is natural; the same applies to the economy based on hunting in the forested mountains in Puge,

[35] The interment of horse bones together with dog and cow skulls has been observed at Ganzi Jililong 甘孜縣吉裏龍, and Guri Munianggang, Xinlong County, 新龍縣谷日木娘崗 in stone-construction graves containing single- and double-handled jars, bronze knives, and personal ornaments (Sichuansheng and Ganzi 1986, Gu Le 1987).

and to the mixed economy practiced both in the cold and forbidding mountains in and around Zhaojue and in the species-rich and fertile Southeast, in the former case to mitigate risk, in the latter to take advantage of the local abundance of resources. The emergence of a society defining itself through armed combat and horse-riding as seen in Yanyuan, however, as opposed to groups seemingly focused on domestic affairs as seen in the rest of the research area, cannot simply be explained by environmental preconditions.

The availability of considerable salt resources in Yanyuan may account for the wealth of metal objects observable in the graves in the Yanyuan basin, and may also have been the reason for a greater competition between the people living there. It seems that access to a main source of wealth — be it salt or something else — was restricted to a few people who established and justified their privilege through their skills in armed combat. Social differentiation on the basis of wealth or special skills and an emphasis on weapons and lavish personal decoration for a few, are clearly not the only possible reaction to the presence of valuable and tradable resources or to marginal environments that may increase competition. Evidence to the contrary is available in the research area itself: in the marginal environment of Zhaojue all graves are about equally small, equally poorly equipped, and located close to each other without much differentiation. The graves in Huili are likewise all similar in form and equipment, with no single grave showing a particular wealth, in spite of the rich local metal resources that were clearly exploited.

It is remarkable how limited the local interest in metal objects and technology seems to have been in Huili, even though high-quality metal objects from other places such as the Shizhaishan-type bronze drums were known and prized. As discussed above, the value attached to them was probably not connected to the metal working technology, but a special meaning associated with the objects themselves. The case of Huili thus clearly shows that metal is not necessarily attractive to all groups, and that the presence of quarries yielding valuable raw material does not automatically lead to the emergence of highly-stratified societies.

Location choice for graves and settlements is another aspect that can be, but does not have to be, determined by geographical preconditions. Settlements of communities practicing agriculture tend to be located on flat, fertile land. Additionally, settlements are usually located in close vicinity to a river, which would have provided the inhabitants with water and connected them to various contact routes; nevertheless, settlements were hardly ever located right by the water but usually at an elevated spot and leaning against the mountain, which would have afforded some protection both from rising waters and hostile groups. In Puge, however, settlements were apparently not preferentially built on flat ground in the narrow river valleys, but on relatively steep slopes. As the material from Puge indicates a subsistence mainly based on hunting, the lack of interest in flat ground for settlements is not surprising. Nevertheless, there is suitable soil for agriculture in Puge, but this form of subsistence seems not to have been the preferred choice for the local groups. Some indicators as to the reasons for this phenomenon can be found in the burial goods known from local megalithic graves: The perforated boar and other animal teeth apparently worn by people from Puge both in life and death were likely talismanic pendants, showing that wild animals probably had a spiritual and not just a practical importance.

In Ninglang, Yanyuan, and parts of Panzhihua, settlements whose inhabitants practiced a mixed economy were not exclusively located in the wide Yanyuan Basin or around Lake Lugu, but some were found on steep slopes deep in the mountains. Considering that the graves associated with the settlements in the mountains are considerably poorer but otherwise similar to those in the Yanyuan Basin, it is possible that inter- or intra-group conflicts may have driven some people into the mountains, far away from the most coveted areas.

As far as the choice of grave locations is concerned, cultural considerations naturally played an even more important role, but practical concerns were also of importance. Although graves in the Northeast generally slope up the hills, in Zhaojue, where flat ground is rare, locations high up the slopes were chosen. In Huili with its wide and fertile river valleys, by contrast, graves often occur right next to settlement sites and only a little further up the slope. The location of megalithic graves in the middle of river valleys on the most fertile land where they would be visible from afar, is clearly a cultural choice, and may at the same time be an expression of community identity and/or a territorial marker.[36] The rivers and possibly also the mountains seem to have been of ritual/religious importance for many if not most groups throughout the research area. The megalithic graves were either oriented parallel with or pointing towards the rivers and/or mountains; the earth-pit and stone-construction graves in the Northeast and Southeast were all oriented toward the river, and in Huili one or two flat river pebbles were interred into most graves. A similar custom has been observed in Yanyuan, even though the graves there seem to follow no specific rule in their orientation.

The use of stone elements in the construction of burials throughout the region may have been connected with a special meaning attached to stone or the mountains they came from, although speaking of a custom of revering stones might be going too far.[37] Nevertheless, the fact that at least some of the stones used in the construction of megalithic graves and the special yellow earth found in pits next to ceramic deposits at Xichang Dayangdui did come from farther away, may show that certain places and the earth and stone retrieved from them carried a special

[36] Similar suggestions have frequently been made in connection with megalithic graves in Europe (Beinhauer 1999, Migdley 2008, Furholt 2011). For present-day examples of megalithic traditions in Indonesia see Adams 2007.

[37] Such ideas have been discussed by various authors, mostly based on the importance of stones in ritual practice by the Yi who are the largest minority currently living in the Liangshan area (e.g., Shen Zhongchang 1982, Jing Ai 1986, Yang Fuwang 1996). Various stone monuments are known throughout East Asia, some of which have been erected in fairly recent times (Yu Weichao 1985), however, comprehensive research on this topic is still lacking.

meaning for the respective groups. The natural environment is therefore more than a stage, and more than a limiting or enabling factor, but it can have a deep spiritual meaning as well. Furthermore, practical concerns can be ignored and natural boundaries overcome if cultural or other reasons demand it. There is thus a clear demarcation between the various sub-regions and their subsistence practices, burial customs, and other cultural characteristics, but the high mountains and other natural obstacles between them do not mean that they were isolated from each other. At the same time, intra-regional diversification can be observed as well.

The Anning River Valley is a case in point that the same community or culture group can be characterized by a variety of different burial practices, with megalithic graves for older people, cremation burials for infants, and earth-pit graves for another not clearly defined part of the population. The graves at Huili Xiaoyingpan and Luquan Yingpanbao containing individuals whose heads were removed, were completely identical in form and content to those containing bodies not treated in such a manner. This phenomenon can most readily be interpreted as differential treatment due to special circumstances of death and/or fear of the deceased. In both cases, ethnographic examples such as those presented in Chapter V open the mind to the wide variety of possible explanations, although none of them should be applied directly to the archaeological material. In any case, both the ethnographic examples and the archaeological material clearly show the aptness of Ucko's (1969) warning that one group may practice a range of different burial practice, and that the same burial practice may be common to different groups.

The similarity between grave construction and burial practice between Zhaojue and Yongsheng Duizi, for example, may well be the sign of independent developments imbued with different meanings, and the use of megalithic graves for burials and related rituals seems to have been taken up by various groups that previously did not share a common cultural identity.

Adopting another culture's burial practice — be it only in some aspects or be it part and parcel — seems like a big step, but it is not unheard of, as shown by some of the ethnographic cases presented in Chapter V. The archaeological materials from Zhaojue as well as from Puge, Mianning, and Dechang, point in the same direction.

In Zhaojue, aspects of the grave construction and burial objects could have been adopted from groups that were clearly culturally different, but they were combined with local ritual practices apparently too essential to be dispensed of. The material from Zhaojue indicates that dogmatism in burial customs or even personal attire seems to have been foreign to this place in-between, where people and groups of different origin met and intermingled, some being in transit, others remaining. At the current stage of research it is not possible to distinguish clearly between different groups and practices, let alone identify traditions and people of actual local origin. With more fieldwork, however, the Northeast promises to provide a unique case study for questions of the negotiation of different identities in a transit-, contact-, and border region, as well as an interesting basis for an in-depth study on human-environment interaction in a marginal environment. At the current stage of research, it can already be said that various forms of identity and their expression in material remains may be even more fluid and negotiable than previously though, possibly even changing within a person's lifetime through the move into another region, or with the advent of a new group in the neighborhood. Such changes may not necessarily be conscious, but they can be seen as a form of adaptation to and negotiation of identities and connections between people in a harsh environment with constantly changing inhabitants.

The spread of the custom of building megalithic graves is a very different case. The extent of the spread and the differences in the degree of adaptation in different regions[38] seems to be determined by spatial vicinity and intensity of contact with the "heartland" of the megalithic graves. That such a labor-intensive custom as erecting megalithic graves was taken up by groups that were originally culturally distinct, is likely the outcome of the personal encounter with the powerful rituals surrounding them and the bonds they created between those who participated in them, forming a supra-local sense of community throughout the Anning River Valley and neighboring regions, leading to the emergence of a new kind of identity that transcended the previous cultural and local group boundaries without necessarily destroying them, as the continuation of local particularities in each of the various location shows.

The material from the research area thus shows that each person and even each community can have various identities at the same time, which are related to different aspects of life (and death) and come to be of importance in different situations. Speaking of a "megalithic grave culture" (which links cultural identity to burial mode) or of "Anning River culture" or "Henglanshan culture" (which links cultural identity to a specific place) thus simply falls short of the actual complexity of human behavior and implies a false sense of simplicity. Imagining the existence of strict boundaries in such cases inhibits a proper interpretation and understanding of the material record. Instead of identifying archaeological cultures and assigning them names and specific territories, it therefore promises to be much more useful to identify various *traditions*, e.g., of grave construction, burial mode, or related rituals, as well as settlement and burying *communities*, and the spatial distribution of various *behavioral patterns* connected to different forms of *identity*. As far the as the archaeological finds from the Liangshan region are concerned,

[38] These include complete replacement of previous customs by various groups throughout the Anning River Valley, adaptation of grave form and objects but not of all related ritual practices in Puge, and no adaptation at all in places whose inhabitants only rarely if at all made the way into the Anning River Valley.

the life-histories/ *chaîne opératoire* approach to objects and features chosen in Chapter III, and the treatment of graves as composite objects conducted in Chapter V, have proven to be not merely useful but imperative means for the understanding of this complex body of material.

On the micro-level of objects, common raw material characteristics (such as the yellow clay from Huili) can show co-habitation within the same region; common technologies indicate subgroups of different communities related through common technological traditions that may be referred to as *schools* or *traditions* of production, or communities of practice (Lave and Wenger 1991, Wendrich 2012); common object forms (particularly in vessels and tools) show commonalities in subsistence practices, food consumption, and object production, and other necessities of daily life that can either be circumstantial (i.e., due to similar responses to a similar environment or situation) or point to a common *cultural identity*; single objects occurring in many different places associated with a variety of different objects, on the other hand, reflect different forms of contact rather than a shared identity. On the intermediate level of features and site units such as settlements, graves, or special deposits, the combination of object forms and types, their execution, and the traces left by their use as well as by other behavioral patterns, allow inferences on *communities of practice* and therefore various kinds of group identity (e.g., *settlement community*, *burying community*, *family/lineage/clan*, *religious group*, *cultural group*).

Graves furthermore allow a glimpse at inter-group differentiation related to *occupation*, *gender*, *social position*, or other forms of *small-group* or *personal identity* uniting certain people while drawing a boundary between others. Nevertheless, ethnographic cases (including present-day customs of burying all people indiscriminately in the same position in earth graves without burial objects) as well as the archaeological case of the megalithic graves warn us that social or other differentiations that are important in life do not necessarily translate into differential treatment after death. People serving as shamans in life may be buried next to people wearing a sword as sign of an elevated status, who in turn may be placed right next to people wearing only a standard set of one or two ornaments and/or personal tools or carrying no personal attributes at all. At the same time, members of different families or lineages may have been buried in separate megalithic graves, and not all age groups seem to have been buried in megalithic graves either.

In connection with the megalithic graves, the focus was thus on the burying community more so than on the individual, as the large amount of *Nachgaben*, the lack of *Beigaben*, and the apparent freedom in the choice of *Mitgaben* and spontaneous gifts (*Liebesgaben*) indicates. The case of the megalithic graves thus serves to show that it is not only possible but useful to distinguish between *Beigaben*, *Mitgaben*, *Nachgaben*, and *Traditions-/Liebesgaben*: this approach can help us to ascertain the reasons behind some of the pattern we see in the material record and the believes and different forms of identity they may reflect.

Megalithic graves do not provide much information on social and personal forms of identity; the material from Yanyuan, on the other hand, shows that and how differences in material wealth, access to raw material, special skills, occupation, and social status can be reflected in the burial record. Important indicators are differences in grave construction, body treatment, skeleton position and orientation, number of interred, personal attire. i.e., *Beigaben*, as well as *Mitgaben*. The lack of clearly identifiable *Nachgaben* shows that the deceased and his position in society were in the center of interest more so than rituals reaffirming group bonds. It is likely that the decorum with which a certain person was buried was an important expression of and affirmation (or way of establishing) the status of his or her kin group, but concrete material evidence for this plausible assumption is necessarily lacking. The only indicator lies in the strong differentiation in wealth, kind of objects, and other attributes associated with the various graves indicating the presence of a strict set of rules as to who should be buried in which way that left not much space for personal notes such as spontaneous *Liebesgaben*. The focus point for this form of burial was therefore not the buried individual in the sense of a person with his or her own taste and preferences but the social or kind group to which he or she belonged.

It is interesting to note that both in the southwestern part of the research area and in the megalithic graves of the Anning River Valley the choice for certain types of hairstyle were likely a reflection of a specific status or other kind of group identity rather than a personal choice or a question of fashion. Cases such as the graves of Zhaojue, however, show that the kind, form, and number of grave goods and even the grave form do not necessarily have to be regularized in such a strict way, but that fashion, access to foreign objects seen as attractive, and imitation of behavioral pattern seen with other people might shape the burial record. The choice of attire and other elements visible in the burial record might not necessarily be an expression of cultural or other forms of group identity, but may be up to individual decisions. In the case of Zhaojue, it seems that culturally the truly crucial elements of the burial process were grave orientation and associated rituals such as the use of stone in grave construction, the custom of multiple secondary interments, the burning of ropes, and possibly a number of other behavioral patterns that left no traces in the material record; the object assemblage, however, seems to not have been of great cultural significance. The graves of Zhaojue are therefore a very good case in point that the same elements of a burial can have different cultural or social in different places.

Another case in point is the interment of swords and other weapons, which in Yanyuan is an expression of the importance of armed combat for the burying group as a whole, while in the Anning River Valley, Huili, and Yongsheng, such objects were reserved for a few individuals, possibly as a status symbol. Another interesting phenomenon is the introduction of objects of foreign origin into local contexts, where they are often given a new meaning and function. One example of this are the Han bronze vessels interred in some of the graves in Zhaojue, where they functioned as priced possessions wrapped in fine cloth, rather than as actual containers.

Another example are the bells and drums occurring in object pits in Huili and in graves in Yanyuan. The bells produced in both places are local imitations of objects known from Yunnan; these imitations were not functional and probably never intended to be played. The drums were imported, and at Huili they were interred in a fashion showing that they were high prized but misunderstood, since they were used as vessels and ritual offerings rather than musical instruments. In Yanyuan, bells and drums were interred in graves just as in Yunnan, but it is unclear if they had the same function. Overall, the occurrence of drums and bells in Huili and Yanyuan are clearly not the outcome of similarities in burial rituals or other religious practices between the two places, but the outcome of a shared connection with a third place.

Other phenomena occurring in different places at the same time, such as the various forms of ceramic deposits in different sites in the Anning River Valley and Huili may be similar in form but nevertheless can differ significantly in function and meaning. The same applies to the similarity in grave forms between Zhaojue and Yongsheng, or to the similarity in the cultural importance of horses seen in places as far apart from each other as Yanyuan and the northern steppe or Central Asia. Such similarities may imply an actual connection, or they may be based on similarities in social structure and/or geo-ecological preconditions, or even entirely accidental.

In other cases the material evidence clearly shows the relocation of people from one place to another. Examples include the earth-pit graves in Puge that stand in sharp contrast to the usual local burial practice and assemblages but are nearly identical to what is known from Zhaojue, or the graves in Huili Guojiabao with their assemblages virtually identical to those characterizing graves in Yanyuan; and the graves in Puge with their typical upper-Minjiang assemblages. Such immigrants may be received in a variety of different ways by the local population: by completely "absorbing" them to the point that no clear traces of them remain in the material record, by burying them separately following their own burial traditions more or less closely, or in a variety of intermediate ways. Changes in material culture or the occurrence of single objects of foreign origin may be the outcome of the integration of people of foreign origin into a local community, or they may come about through different other forms of contact.

In other cases, a whole group of people of foreign origin may relocate to a new place, such as seen in the assemblages from Mianning Gaopo/Zhaojiawan, whose population may have come from or relocated to Yunnan, the graves and object pits of Xichang Dayangdui, whose builders were clearly of foreign origin, or the settlement of Xichang Yangjiashan, whose inhabitants had likely moved from Puge to the Qionghai is search for land and climate more suited to agriculture than the mountains they came from. Additionally, small-scale seasonal movement of single communities or subgroups of a community may take place as has been suggested for the Anning River Valley and the mountains in its immediate vicinity, but which may equally apply to Huili, parts of Panzhihua, or any other sub-region of the research area.

It has therefore become clear that the various sub-regions — although largely separated from each other by high mountains and characterized by their own particularities in archaeological assemblage and local environment — are by no means isolated but in constant contact both with each other and with places lying outside of the research area. The modes of and motivators for these different kinds of exchange are discussed in Chapter VIII, providing yet another opportunity to reconsider the nature of different kinds of identity groups, their reflection in the archaeological record, and the influence of geographic preconditions on human behavior.

VIII. Questions of Culture Contact and Mobility

As has become clear throughout the preceding chapters, the archaeological material from the different cultural-geographic sub-regions identified above shows indications for a varying range of connections at different times, both with each other and with regions outside the research area. However, it is not enough to point out single objects or features and then jump to inferences such as "migration," "influence," or "contact," which are so readily used as blanket explanations for similarities between the material remains in different places. In a first step, we have to define what we mean by "contact," what different types of contact there may be, and how we can identify them in the archaeological record. The challenging terrain of the research area furthermore makes it imperative to consider possible routes and reasons for contact. In the following, I will first discuss the underlying theoretical and methodological questions, before turning to the case at hand and trying to identify signs of different types of contact, their local preconditions, motivations, and the routes on which people may have moved in the past.

VIII.1 Theoretical and Methodological Considerations

VIII.1.1 Migration, Diffusion, and the Case of Southwest China

The term "contact" generally refers to one or several, singular, repeated, or regular instances of encounter or communication between different people or groups of people. The types of encounter include direct an indirect exchange and trade, as well as personal interactions such as talking, communal eating, drinking, or even marriage or adoption; furthermore, adversary exchanges such as combat and war are instances of contact that affects the communities involved profoundly. In the context of archaeological research, the term contact is usually not explicitly defined, but it is generally used to refer to various types of exchange between different culture groups living at longer or shorter distances from each other. The word contact is largely used synonymously with "interaction" which Irving Rouse (1986:11) has prominently defined as "contact among individuals and social groups while carrying out cultural activities." This applies to all levels of inter-human encounter, both within and between groups.

The problem of the identification of instances of contact in the archaeological record is closely connected to questions of the nature and material expression of various kinds of identity groups discussed in Chapters I and VII. Both issues are in turn linked with discussions on reasons for cultural change, that in the late 19th and in the first half of the 20th century have generally been explained through "migration or "diffusion." Such models have been proposed by various people such as Friedrich Ratzel (1882), Franz Boas (1915), Clark Wissler (1923), or — in connection with the study of archaeological material from China and East Asia — Robert Heine-Geldern (1928, 1954, 1959, 1964, 1966). These migrationist-diffusionist ideas arose in opposition to the cultural evolutionism of the late 19th century, which emphasized the uniformity of human development that left no room for the particularity of single cases or instances of inter-cultural contact. While migration refers to the large-scale displacement of people as a reason for cultural change and/or similarities between archaeological phenomena in different regions, diffusionism propagates the possibility that objects and ideas can be transferred between different regions, culture, and people without population movement.

The tendency of many proponents of diffusionist-migrationist ideas to suggest far-flung contacts between places as far apart as, for example, China and Mexico (Heine-Geldern 1959) without considering routes, reasons, or mechanisms of such movements and exchanges, was naturally met with much criticism. Furthermore, the cultural-materialist and processual schools of thought arising in the 1960s with their interest in system theory and process as seen from single case studies left no room for intercultural contact.[1] A major problem imminent to systemic models is their static nature, which makes them unsuitable to explain culture change; the concept of migration and diffusion as possible explanations for change soon came to the forefront again. Although the term "diffusion" has largely fallen out of favor, ill-defined notions of population movement and long- and short-distance "contacts" are still the standard explanation suggested for the material from Southwest China, especially for the occurrence of stone-construction graves throughout the whole western part of the area and beyond, and for the similarities in the form of certain bronze objects between Southwest China and the steppe.

Both in the immediate research area and beyond, the standard debate is over local development (e.g., Lang 2006: esp. 55-58) vs. "influence" or "contacts" with places as far away as the Near East and as close by as Yunnan (e.g., Liu and Tang 2006, Liangshan and Chengdu 2009). Especially in connection with the different kinds of stone construction graves occurring throughout Southwest China, the assumption of far-flung movements of a single cultural group is still a common model of explanation. The builders of these tombs are often equated with the Di 氐/Qiang 羌 mentioned in historical texts (e.g., Wang Ningsheng 1989, Zhang Zengqi 1994), who are seen as having grown out of the Andronovo culture and moved into Northwest Sichuan and then further south to Yunnan (e.g., Chiou-Peng 1998 and 2004). These groups supposedly brought with them certain types of bronzes and the custom of building stone tombs; at the same time they adopted farming and other foreign elements from people they encountered on their way. At the time, contact with the original homelands may have been maintained, an exchange that explains later influences in both directions with (Chiou-Peng 2004). Although allowing for a bigger number of groups, local developments and multi-directional movements, this big-picture

[1] For an overview on the research of that time see Trigger 2009: 314-385

narrative of a single cultural group bridging huge spans of time and space strongly reminds of the migratory-diffusionist theories described above, and it is obviously problematic.

In a paper of 1987, Tong Enzheng 童恩正 warns against such a simplistic explanatory model. In this much cited but also much misinterpreted paper, he develops the model of a crescent-shaped exchange belt 邊地半月形文化傳播帶 stretching from Northeast China over the Qinghai area all the way to Yunnan. Contrary to the way his model is often applied, Tong emphasizes that the similarities in material remains throughout this region should not be confused with the presence of a single culture or ethnic group migrating back and forth over long distances [2] Instead he suggests the existence of a contact network between regions with similar ecological preconditions but different economies, which prompted various forms of exchange along the pathways laid out by the rivers and mountain ridges connecting them.

Tong Enzheng furthermore remarks that cultural unity or contact are not sufficient explanations in themselves, but that there are many possible reasons for similarities between different archaeological phenomena in different regions. Apart from migration and economic exchange, he mentions independent development, and the transmission of pure "ideas;" however, he does not define clearly what he means by "ideas," through which mechanisms they were transmitted, or how we can distinguish between the different forms of transmission. In spite of these important words of warning, in his own case studies of various types of bronze objects and their origin and spread, Tong Enzheng (1990) relies on pure stylistic comparison of single

[2] Chiou-Peng, for example, interprets the model of the half moon-shaped cultural zone not merely as a zone of exchange but as a distinct cultural continuum. Although she avoids the term "stone cist culture" in later publications, first using the term "stone-cist grave cultures" in the plural to pay tribute to the various regional forms, then speaking of the “various cultures in the pastoral Di/Qiang complex” (Chiou-Peng 2004: 307), she still treats them as one more or less unified cultural group.

objects or decorative elements that disregards the different contexts in which they were used and the different meanings they might have yielded in areas so far apart as Central Asia and Yunnan.

VIII.1.2 Types and Mechanisms of Contact

It is generally agreed that similarities in material culture between two assemblages can, but do not have to, indicate some kind of connection between those groups. In the American anthropological and archaeological tradition of contact studies, the main focus has been on colonial situations (e.g., Lightfoot and Martinez 1995) or empires and their boundaries (e.g., Wells 1999). Scholars have suggested core-periphery models (e.g., Hirth 1978) and theories of frontier areas as spaces of interaction (e.g., Rice 1998). All of these models assume the presence of one or several dominant state-level societies in contact with each other and/or surrounded by lower-level groups; the situation is completely different from the patchwork of various independent groups in the Liangshan area, none of which apparently dominated the others.

Of greater help for the case at hand are the types of contact suggested in migration studies by demographers, geographers, and archaeologists. The main types of migration they define are the permanent replacements of whole groups or single people settling down in a new area, and temporal replacements or movements back and forth for trade, temporal work, political negotiations, or war (e.g., Burmeister 2000). Anthony (1990, 2007) furthermore points out that migrations are never unidirectional and that long-distance movements are hardly ever made into unknown or unsettled territory. According to his model, it is not whole cultures that migrate but “often only a narrowly defined, goal-oriented subgroup” that moves into an area known through previous contacts (Anthony 1990:908). Furthermore, as he remarks, migratory groups do not move through or into empty space but encounter people on their way and at their final destination, with whom they will intermingle in different kinds of ways. Although Anthony himself does not provide a theory of cultural encounter and influence, his observations suggest that a multi-dimensional approach is necessary.

Furthermore, as Olaussen (1988) has pointed out, objects, technologies, or even abstract concepts, can reach a group indirectly through an intermediary by way of trade, gifts, or other kinds of exchange (Olaussen 1988). These different types of contact can be expected to leave different kind of traces in the material record. Willey and his colleagues (Willey et al. 1956) therefore developed a model that distinguishes between site-unit intrusions and trait-unit intrusions with four sub-types each differentiating between different levels of mutual influence from complete replacement over different levels of amalgamation to completely new developments.[3] Additionally, Willey and his colleagues mention the possibility of contacts leaving no trace in the material record and contact without meeting of individuals, e.g., through time by antiquarian collecting or deliberate imitation of older styles.

Although such a scheme is helpful for structuring one's thoughts, it remains vague and does not answer the question what kind of traces these different kinds of contact may leave in the material record, and how we can infer from one on the other. Various scholars have suggested to measure interaction by quantifying the degree of similarity of stylistic attributes in ceramic designs (e.g., Longacre 1964 and 1970, Hill 1970). It is difficult, however, to quantify something whose classification is as contested as style; ethnographic studies furthermore show that only some stylistic attributes reflect the intensity of intra-group interaction while others do not (e.g.,

[3] They distinguish between: A. Site-unit intrusion: Al. Retention of cultural identity with little trait change, A2. Fusion with dominance of the resident culture, A3. Fusion with dominance of the intruding culture, A4. Fusion followed by revival of the resident culture, B. Trait-unit intrusion. Bl. Adoption of the trait-unit without modification and without fusion of the introduced trait-unit with corresponding elements in the receiving culture, B2. Fusion with dominance of the corresponding part of the receiving culture. B3. Fusion with dominance of the intruded trait-unit in the aspect of culture involved. B4. Fusion with emergence of new traits which have no obvious antecedents in the trait-units or the receiving culture (Willey et al. 1956).

Stanislawski 1969). A similar problem persists in the application of gravity models and various forms of spatial analyses aiming at measuring interaction and identifying group boundaries. On the methodological level, Hodder and Orton (1976) warn that archaeological data are often too unreliable and patchy to produce results that are statistically sound. Furthermore, different processes may produce the same spatial pattern, and association between different objects and phenomena is not the same as a causal link. Hodder and Orton therefore argue that spatial models may be used to predict the location of undiscovered sites or their relative importance, while the explanatory power is usually small.

Similarly, gravity models proposed in geography may show a certain level of accuracy in prediction without being able to furnish proper explanations for the observed patterns (Olsson 1970). Gravity models have originally been created based on the assumption that there is a direct and measurable positive relationship between amount of interaction and population size and an inverse relationship with distance; however, as Plog (1976) has pointed out, there are many other factors apart from distance and population numbers that influence the level of exchange, such as the nature of the goods exchanged (everyday commodities vs. prestige goods) the groups involved, and the mechanisms of exchange (elite exchange vs. trade vs. group movement).

Renfrew (1977) has therefore proposed a significantly more complex model that considers abundance of the commodity in question, effective (instead of absolute) distance, energy expenditure, and distance-decay effect; additionally, he considers difference between various kinds of objects, their transportability, value, and exclusiveness of access, as well as differences in kinds of exchange mechanisms involved. For obsidian, his model works fairly well: there is a clear fall-off in the frequency of occurrence starting from a certain distance from the source, and his model helps to explain the asymmetrical spread of various pottery products and obsidian in the Near East as the outcome of various competing resources (Renfrew 1977:86). At the same time, Renfrew has to admit that different modes of exchange are not always distinguishable in the material record, and that hierarchy of places and people involved in different forms of exchange may skew the picture considerably.

Furthermore, not all kinds of exchange are as straightforward as trade in a scarce raw material with known quarries such as obsidian. The distribution patterns created by the exchange of special objects such as bronze drums in southwest China and Southeast Asia, or of perishable commodities such as salt or grain that were possibly contained in recoverable vessels, would naturally be different. The traces left in the material record by marriage bonds or other personal encounters are yet again different: such forms of contact may lead to the integration of foreign traditions, production techniques, or object forms into the behavioral patterns and assemblages characterizing a specific group; however, the integration of a small number of foreigners into a community may just as well leave no recoverable traces at all. Zhang Zengqi (1994:667) furthermore points out that "different media of exchange can bring about cultural exchange with different ranges of degree." According to his line of reasoning, mechanisms such as trade and tribute merely exchange goods, but not customs, religions, habits, technologies, or "ideas" (whatever they may be); all these are best transmitted through the movement of people. Nevertheless, as Olausson (1988) argues convincingly, even trade has a social component. Olausson therefore holds that there is no simple equation between final resting place of a foreign object and specific processes of exchange, nor are there mechanisms to distinguish reliably between different kinds of contact. As Jones (1997:115) put it, we cannot assume that "degrees of similarity and difference in material culture provide a straightforward index of interaction."

The case is nevertheless not completely hopeless, for human actions are not arbitrary or without regularity, and many of them do leave recoverable traces in the archaeological record. Although mathematical models and pure statistical manipulation may be of little value, carefully-weighted contextual forms of analysis can enable us to identify instances of contact and to make suggestions as to their nature and underlying motivations. In an environment as complex as the one we encounter in Southwest China, ecological and geographic preconditions, raw material availability and local economies have to be explored first of all, as they might have given incentives for either searching or avoiding contact with other regions.[4]

In migration studies, demographers and geographers identify push and pull factors in the place of origin and the destination respectively, as well as obstacles that need to be overcome on the way between both. They then use different kinds of models to calculate the probability of the decision to migrate (e.g., Lee 1966; Kearkney 1986). However, the reasons for movements of people, be they single or in groups, are highly complex and include social and individual factors or even spiritual reasons that are usually not covered in these models. Furthermore, much of the information used by geographers to analyze present-day societies, is not available for archaeologists. It is therefore advisable to refrain from applying such models in archaeology; nevertheless, it can be helpful to identify possible push and pull factors and the possible routes by looking at geographic preconditions, natural resources, settlement and population data, if available, and pay attention to practical aspect of any proposed exchange. Likewise, the cultural layout and development as well as the chronology of both the research area and any regions with which contact is suggested must be considered. Otherwise reliable correlations are not feasible.

[4] Tong Enzheng has already noted that the different economies of the half-moon shaped exchange belt have propelled exchange (Tong Enzheng 1987). Fukusawa Hitoshi has suggested that ecological changes drove people from the North into Southwest China (Fukusawa 2002: 325-326).

As Rouse (1986:13) has pointed out, there are a various possible explanations for changes in the local material record, be it in the form of single new elements or a completely new assemblage. He lists local development, acculturation (i.e., adoption of foreign elements without the local population loosing their sense of a separate identity), and population replacement through migration. Only by starting from the local level and understanding local preconditions, social structures, and developments does it become possible to identify any object, element, or phenomenon as intrusive. If there is a compelling reason to define an element as foreign, in a next step the nature of this intrusion has to be determined. As Hans Peter Hahn (2008:197-200) has remarked, foreign elements are not just transplanted unchanged into a new context, but they are adapted, if not in their form then at least in their function and meaning. It is therefore crucial to consider the context and function of any element identified as foreign both in the original and in the new location to determine what kind of mechanisms may have led to its transfer from one place to another and how it was received. "Influence", after all, does not happen automatically, but it brings about and requires change, and this change is enacted by people. Even if no evidence of migration of groups is detectable, objects as well as "ideas" (be they new technologies or ritual practices) never travel on their own. As Zhang Zengqi (1994:683) puts it, “the propagation of any culture […] needs the intermediation of man-made activities.” We therefore need to consider both small-scale patterns of interaction and middle- and long-range contact from the perspective of its local impact and the actions of individual agents or groups.

As far as long-distance interactions are concerned, the most common models of explanation proposed by geographers are world-system theories and globalization. However, they cannot easily be transferred from modern cases to prehistoric communities.[5] Philip L. Kohl

[5] Several attempt in this direction have been made, moste famously by Chase-Dunn and Hull (1997).

(2007), among others, has therefore questioned the applicability of world-system and globalization theories to Bronze Age or even earlier times. After all, he argues, most people in these societies were “cultivators and herders, not merchants” and therefore most of the time “firmly rooted in their own soil, not setting off to far distant lands to exchange precious goods” (Kohl 2007:245). Furthermore, as scholars working in the fields of sociology, anthropology, or politics have noticed, even in modern-day cases "globalization" easily becomes a blanket-explanation replacing the earlier saving straw of "diffusion" as explanation for similarities between phenomena observed in places located far away from each other (Hahn 2008:191-193). Gideon Shelach (2009:117) has given a similar warning for the term interaction: “If we are not careful, ‘interaction’, the new fashionable term, may easily become just a new replacement for the ‘diffusion’ term of 50 years ago.”

The solution that Hahn (2008) suggest for the "globalization dilemma" in anthropology might be applicable to archaeology as well: he proposes to focus on the local perspective, studying different mechanisms of cultural appropriation, rejection, or reinvention of certain cultural elements on the local level, simultaneously taking into account the view of the local protagonist. Nevertheless, we have to be careful that we do not lose ourselves in speculations on particular actions of single individuals far back in time, a level of detail that is nearly impossible to asses from archaeological material. We therefore have to balance between close-up views and the "big picture" of long-distance interactions.

Although ancient networks of exchange are unlikely to have formed a unified whole in the sense of a full-fledged world-system, we can nevertheless imagine a loose network of interconnections, some of them more important than others at different times, for different purposes, and to different groups of people. Although Kohl (2007:249) is certainly right in stating that “in the absence of written sources, it is doubtful that such movements are ever completely or accurately understood,” this does not mean that we should or even can ignore them, as they have after all impacted local developments. Thus, as Kohl (2007) admits, contacts “must be accounted for or modeled, even though our interpretations are likely to remain partial and approximate, always subject to necessary revision.” This, however, cannot be done by trying to frame everything into a core-periphery or world-system model, but has to emanate from a detailed, multiscalar, and multidimensional analysis of the complex archaeological record and the diversity of inter-personal and intra- and inter-group relationships it reflects.

VIII.1.3 The Present Study and Approach

The considerable ecological diversity and the rich patchwork of local cultural developments characterizing the study area force us to start from the micro-level of local analysis before moving onto middle-range and long-range levels of exchange. Given the abundant traces of outside contact, the case at hand requires considering the many routes of exchange provided by the multitude of rivers branching out in all directions from in between the Hengduan Mountains. The present study can therefore serve as an exercise for avoiding sweeping diffusionist assumptions while still keeping an open mind as to any possibilities — and patterns — of outside contact. Approached in this fashion, the material at hand can provide new insight into the development of the subregion in question, but also provide new insight into some of the general problems and questions of inter-cultural and inter-regional contact outlined above.

Throughout this study, I have laid a foundation for discussions of various forms of interaction by clearly defining basic terms such as "cultural group," "community," and "identity," and suggesting how each of them may be of importance in different situations and how they can be identified in the archaeological record. Furthermore, I have analyzed various aspects of the archaeological record such as objects, features, and sites separately, tracing the different patterns of human behavior that created them. Moving from the level of single objects to intermediate levels of feature, site, and sub-region, I have placed the different elements and subregions in relationship both to each other and to their environment. This has helped me to identify elements of likely foreign origin, whether it comes from other parts of the research area or from places further away. Furthermore, I have developed a sorely needed local chronological framework, which is a crucial precondition for comparisons with archaeological material from other regions. In the following, I will approach the question of different kinds of inter-group interaction throughout and beyond the research area by first highlighting the local preconditions of such exchange; in particular, I will point out possible motivators for but also deterrents from movement, and I will suggest possible routes of contact. In a next step, I discuss the indicators for outside contact observable in the archaeological record separate by sub-region, inferring on the different exchange networks that each of them may have been part of at different points in time. This will allow me to assess the positions of the different sub-regions to each other and within the framework of early cultural developments in Southwest China, while at the same time providing an opportunity to revisit theoretical and methodological questions of research on contact situations in general.

VIII.2 Geographic Preconditions: Incentives, Impediments, and Routes of Interaction

As described in detail in Chapter II, the high mountains of the Hengduanshan divide the whole region into many small micro-areas with vert different environmental characteristics. The peculiar vertical ecological zonation characterizing the region furthermore places very different environments in immediate proximity to each other, requiring different forms of human adaptation and inducing different lifeways to emerge within a small area. Not surprisingly, the high biodiversity of the Hengduan Mountains is matched by a nearly equally high cultural diversity that has persisted from Neolithic times until today. In spite of all the local idiosyncrasies and high mountains separating the different sub-regions both from each other and from the outside world, the intricate network of rivers opens up multiple routes in all directions, allowing for multiple ways of exchange in all directions, and nearly demanding such exchange due to the uneven distribution of different resources and economies (Figure 9.29).

One may expect that frequent movements took place between the mountains and the river valleys involving one or several groups of people. A single group of people may have traversed the land on a regular basis or may have moved seasonally between different places. It is equally possible that parts of the same group inhabited different areas of the same macro-region, or that the place was inhabited by completely separate groups relying on different kinds of subsistence practice and exchanging goods with their neighbors. It is for example possible that some communities practiced agriculture in the valley while others hunted in the forests further up the mountain, and others again exploited the resources of the rivers, exchanging what they had in abundance for what they were lacking. Conversely, the same people may have spent some of their days fishing, others hunting, and others again on agricultural work. Another option would be for different parts of a single settlement community to be involved in different kinds of subsistence practice, moving around the landscape following different patterns of necessity, but living in the same place most of the time and sharing the same cultural and communal identity.

It is difficult to decide which of these different scenarios is correct in any one case, but the archaeological material shows some indicators. Most sites throughout the Anning River

Valley yield a variety of different tools, reflecting a mixed economy, but with some local variation: the widest point of the valley around Xichang shows a preponderance of agricultural tools; only Xichang Yingpanshan, which is located right next to two river courses, contains remarkably high numbers of net weights throughout all layers. The archaeological assemblages from settlements located in more mountainous parts of the Anning River Valley, such as Mianning and Dechang, show a stronger emphasis on hunting, and the settlement assemblages in the adjacent mountains of Puge and Xide indicate an economy nearly completely based on hunting, supplemented by some fishing and gathering of various fruits and even starchy plants that may or may not have been deliberately cultivated. The chosen form of economy in any of these regions seems to have matched the particular geographic preconditions.

The slight differences in ceramic forms and decoration between the sites in these different parts of the Anning River Valley indicate that they were inhabited by separate communities that relied on slightly different subsistence practices, rather than specializing on one economic practice and exchanging other commodities from neighbouring groups. Considering the similarity in ceramic assemblages, these communities were likely culturally related and may have been engaged in various forms of social and other exchange, but they were likely not economically dependent on each other. The case of Puge may have been a little different: the early ceramics at sites in Puge are considerably different from those in the Anning River Valley, reflecting the presence of a separate local culture or a separate ceramic-supply system, and the tool assemblages reflect a local economy that mostly specialized in hunting. Considering the local environmental preconditions, this was probably a sensible choice, but it may have induced the local communities to search out contact with groups in the Anning River Valley for purposes of trading in staples they themselves may have lacked. Such forms of contact, which probably had social and cultural components as well, may be what finally brought about the inclusion of Puge into the distribution area of megalithic graves, even though certain local particularities such as the continued emphasis on hunting and the cultural/ritual importance of animal teeth prevailed.

Nevertheless, the thin settlement layers and the many single-layer small-scale settlements characterizing most of the research area indicate the presence of a highly mobile population that changed settlement locations frequently, either seasonally or after a few years after exhausting the land. The only exceptions are Huili Dongzui and Yongsheng Duizi with their particularly thick layer packages and other indicators for long-term use. Both sites are located in particularly hospitable environments with ample fertile flat soil, access to water and other resources, and a warm climate allowing for long-term settlement; however, as the thin layers of settlements close to Huili Dongzui show, not all communities choose to stay for long in the same place. Environmental factors and cultural choice both played a role.

Fertile regions with a warm and moist climate such as the wide valleys of Huili, the area around the lakes of Chenghai in Yongsheng and Qionghai in Xichang, and the lush Anning River Valley, especially at its widest and warmest point around Xichang, must have been attractive places to settle in (Figure 9.1). To people coming from the particularly ridged and cold mountains in the Northwest of the research area and beyond, even the Yanyuan Plateau would have been an attractive place, which — although a little dry and cool — receives many hours of intense sunshine and can offer ample flat and fairly fertile ground supplied with water through various river courses. In spite of the high surrounding mountains, such favorable settlement spots would surely have been a clear pull factor for the movement of whole groups of people.

Whereas the river system opens up multiple routes in North-South direction, East-West traffic is significantly impeded by the high mountain ridges. Especially the mountains in the North are high and rugged, but in the Southeast the terrain slopes gently downward towards Yunnan and Guizhou. Moving south is therefore relatively easy in spite of the wild waters of the Jinshajiang that block the way at some points. Simultaneously, the Jinshajiang is the only river in the area that — coming from the Tibetan Plateau — turns east and connects the southeastern part of the research area not only with places further east such as the Chengdu Basin, and in the end even the Central Plains and the coast, but — moving in the opposite direction — also with the Southwest and eventually the North.

The Anninghe is naturally the central North-South artery of the research area; it furthermore flows into the Jinshajiang, opening up wide-ranging network of pathways in all directions. Areas north of the research area can only be reached by land over the mountains and valleys between Anninghe and the Daduhe river network, which are not too hard to traverse. In fact, the modern road from Chengdu to Xichang runs through Hanyuan and Mianning, following first the Daduhe and then one of its tributaries, the Nanyahe 南亞河. Interestingly, the train route from the Sichuan Basin instead runs through Yuexi and Xide, following another side arm of the Daduhe, the Zhumahe 竹馬河. Another potential route between the Anning River Valley and the Sichuan Basin or other places further east runs through Zhaojue, either by way of Leibo or Meigu, but the roads are either long, following the meanderings of various rivers to avoid the narrowest valleys or the high mountains, or hazardous. The most direct routes either cross the steep mountains directly to traverse from one river system to the other, or they run through valleys so narrow that it is impossible to travel right by the river but the roads are clinging against the steep mountains, with travelers facing the hazards of falling rocks, landslides, or a missed step into the abyss. The whole Northeast is overall poorly connected to any other place. Tributaries of the Jinshajiang reach fairly far into Meigu and Zhaojue, but they run through mountainous terrain, and the roads between Zhaojue and Xichang are not easy to traverse either. The Heishuihe 黑水河 connects Zhaojue with Puge, Ningnan, and eventually the Jinshajiang, but the roads are not easy traversable even under modern-day conditions.

An only recently completed highway now connects Huili with the Anning River Valley, with tunnels cutting through the high mountains between Anninghe and Chenghe. Only two years ago the roads were still running over steep mountain path that were dangerous to traverse in rainy conditions. The Southeast is difficult to reach from the Anning River Valley or from the Northeast, but well connected to Yunnan: the moderately mountainous terrain gently sloping down southward and a considerable number of the rivers of Huili and Huidong run directly southward into the Jinshajiang, which provides a connection to Yanyuan.

Yanyuan itself is overall most easily accessible from the North and South, but separated by a high mountain ridge from the Anning River Valley. Even nowadays, it is not advisable to travel the road from Xichang to Yanyuan during rain or frost as is leads over steep and narrow path crossing the mountains and the wide Yalongjiang instead of traveling along one of the major rivers or their tributaries. Surrounded on three sides by high mountains, the Yanyuan depression opens southwestward, were the terrain is much less forbidding. The main artery connecting Yanyuan to the north is the Yalongjiang, which likewise flows into the Jinshajiang. It reaches Yanyuan through the Meiyuhe, which enters the Yanyuan Basin from the Southwest.

Most of the rivers mentioned above as possible transit routes are not actual waterways. They are partially navigable at best, being too wild, too shallow, or too narrow to be useful for transporting goods in bulk on big boats. During the dry season, however, most of them are reduced so much in width, the small tributaries even completely drying out, that travelling along them is a viable option. Nevertheless, for considerable parts of the Jinshajiang, which always carries significant amounts of water, the banks are so steep and the valleys so narrow that only winding footpaths on higher elevation can be used. Only most parts of the Anninghe and many rivers in Huili run through fairly wide valleys, but most mid- or long-distance connections would have run over paths so narrow that the use of carts and therefore bulk transportation would have been impossible. Trade on the famous Tea-Horse Route (*chamadao* 茶馬道) connecting Yunnan, Sichuan, Tibet and India, mostly had to be travelled on horses and mules in single file, costing many an animal and traveler his or her life, especially when crossing a river on so-called one-rope bridges, while many mountain paths could only be traversed on foot along dangerous roads where deathly accidents were a common occurrence (Figures 9.2-9.6).[6] Even today, many roads in the southwestern mountains are dangerous to traverse and had to be cut deep into the mountain slopes to allow for busses to pass (Figures 9.7-9.8); furthermore, many villages inhabited by mountain populations such as the Nuosuo (*Yizu* 彝族) can still only be reached on foot after arduous climbs. This naturally restricts the amount and kind of objects and the size of the groups that can have traversed these areas in the past. Considering the dangerous routes, it can be assumed that there must have been extremely compelling reasons for anyone to travel such routes in either direction.

[6] The Tea-Horse Route was a network of paths through the mountains connecting Yunnan, Sichuan and Tibet. From about the time of the Tang dynasty (618-907 AD) onwards, tea, typically in brick form, but also also salt and other goods were transported on two main routes, one beginning in Ya'an in Sichuan, then going to Chamdo via Luding, Kangding, Litang and Batang before meeting the other route in Lhasa. The latter begins in Xishuangbanna and runs through Dali, Lijiang, Zhongdian, and Deqin in Yunnan to Zogong, Pemba, Lhasa, Khangma, Gyantye, and Tingri in Tibet, before continuing into Myanmar, Nepal and India (Yang 2004). Yang (2004:290-291) refers to it as the Yunnan-Tibet connection of the Southern Silk Road that connected to the Yunnan-Burma-India route and was in use as early as before the 3rd c. BC. Richard von Glahn's (1987) study on trade in Sichuan during the Song dynasty reports the use of this route during later times. The very interesting trvaelogue by Shyuler Camman (1974)reports on the situation on this road during the early 20th century.

Here, the local geography provides some indicators for possible explanations: as mentioned above, the uneven distribution of agricultural land and the close proximity of different environments to each other already emerge as a compelling reason for contact at least of intra-regional dimensions. Given the limited traversability of the roads described above, bulk objects such as grain or other staples might not have been negotiated far, but the richness in more valuable resources negotiated in smaller amounts would have been an incentive for outside groups to seek out the area for trade purposes. This applies in particular to the rich copper, tin, and other metal quarries in the Southeast and to the salt that gave Yanyuan its name. As discussed in Chapter VII, it may have been the rich salt quarries that allowed the inhabitants of the Yanyuan Basin to attain high-quality metal objects from many different places without bothering to perfect their own metal production skills. The people buried in Huili Guojiabao with weapons, personal ornaments, and horse gear clearly identifying them as people of high standing from Yanyuan, may have been involved in exchange of salt and metal. The material of the Southeast, on the other hand, shows no signs of clear social stratification, even though the local metal resources were clearly exploited and used in low-quality metal production. The use that rich local resources are put to clearly differs much between various groups and regions, but the reasons remain opaque.

Another kind of resources that could have attracted people from outside is the large amount of timber and the richness in a wide variety of plants and animals; at least during later historic periods timber was indeed a valid commodity exploited by and/or traded with the Han, but during pre-historic times Western China was likely still thickly forested, and the need for timber was probably considerably lower than the general availability. It is more likely that the mild climate prevalent especially throughout the southern part of the region, as well as the fertility of the soils of the Anning River Valley were attractive to groups from less suitable environments. An examples of this is the assemblage of Xichang Dayangdui that shows no similarity with the objects from other sites in the Xichang area but closely resembles finds from Qijia culture context in Qinghai and Gansu, likely reflecting an instance of immigration.

Another prominent example are the finds from Yanyuan that consist of considerable number of weapon and ornament forms reminding of assemblages from the steppe, combined with instances of the interment of horse skulls and bones of other animals in graves as it is common with steppe cultures; the finds from Yanyuan are indicators of the presence of a group that may have moved into the Yanyuan Basin coming from the North. A less impressive but nevertheless relatively clear example is the settlement site of Xichang Yangjiashan, whose ceramic assemblage identifies the inhabitants as people who had moved here from Puge in search of good agricultural land. All other signs of different forms of interaction are more subtle and will be discussed separate by sub-region below.

VIII.3 Indicators of Contact in the Archaeological Record

VIII.3.1 The Anning River Valley and Its Neighbors

VIII.3.1.1 Self-Contained Yet Not Isolated: Neolithic and Early Bronze Age Sites

During the Neolithic and Early Bronze Age, the Anning River Valley was probably fairly self-contained; most communities seem to have only engaged in different forms of contact with other communities in their immediate vicinity or throughout the river valley at most. The ceramic assemblages between sites around Xichang closely resemble each other, as do those of the sites further north in Mianning, and those of different sites in Dechang; at the same time, there are noticeable differences as well as a few similarities in ceramic form and decoration between the assemblages from the three micro-areas. Combined, this evidence indicates that all communities throughout the Anning River Valley were in frequent contact with each other, but short-distance movements within the separate micro-areas were more frequent than encounters requiring medium-range movement. The lack of clearly identifiable objects of exchange (e.g., the occurrence of ceramics clearly made in Dechang at a site in Mianning, or the use of raw material from Xichang in Dechang) indicates that the nature of the interaction between the different communities in the three micro-regions of the sub-region of the Anning River Valley were social rather than purely economic in nature, possibly involving marriage or adoption and therefore the permanent relocation of single members of one community into the other; other bonds such as communal rituals, negotiations over land usage, or even friendships are perceivable as well.

It has been suggested that Xichang Henglanshan may be culturally closely related to Yuanmou Dadunzi in Yunnan or Hanyuan Maiping in northwest Sichuan (Xichang Wenwu 1998, Chengdu, Liangshan, and Xichangshi 2006).[7] The argument is based on the similarity in tool assemblages, the presence of considerable numbers of coarse jars at all three sites, and the fingertip-impressed appliqué bands on ceramics in Hanyuan and most early sites in the Anning River Valley (Figures 7.5-7.10 and 9.9-9.9). The differences in all other ceramic forms and decoration motives, however, are considerable; the corded-ware design, stamp impressions, and high jar forms characterizing the assemblage at Hanyuan Maiping never occur in the Anning River Valley, but they are extremely common throughout northern Yunnan (e.g. Yongping Xinguang, Figure 7.82), and bear a much closer resemblance to the finds from Hanyuan Maiping than either of them does to objects from Henglanshan.

[7] Hanyuan Maiping has in turn been seen as closely connected with remains from the upper Daduhe and Minjiang (Chen Jian 2003).

The frequent occurrence of similar finger-tip impressed appliqué bands and double-perforated halfmoon-shaped knives in Hanyuan, the Anning River, and many sites in northern Yunnan is remarkable; however, this kind of decoration seems to be a much more far-ranging phenomenon than a mere migration or even constant contact between groups in Hanyuan and Xichang, for instance. Instead, these patterns in the archaeological record indicate that the Anning River Valley functioned as a much-travelled contact route from South to North and to a lesser extent the other way around. The reason for these movements is as yet unclear, but it seems likely that the inhabitants of Hanyuan Maiping had either migrated there from Yunnan or were in such frequent and intense exchange with people from Yunnan that they adopted much of their ceramic and stone tool assemblage. On their way from South to North and possibly vice versa, these people probably came into contact with inhabitants of the Anning River Valley, who thus came to know foreign pottery decoration motives, some of which they subsequently integrated into their own repertoire. In essence, however, the inhabitants of Xichang Henglanshan and related sites were probably a local group related to people who had lived in the Anning River Valley for a while, possibly centuries. Considering the lack of local Paleolithic material, the question arises were these earlier groups may have originally come from, but at the current stage of research this is not possible to assess.

Signs of somewhat intensified and more wide-ranging contacts can be seen in the middle-Lizhou earth-pit graves. Although many vessel forms are clearly of local origin and the decoration motives seem to be specific to Lizhou itself, handled objects are likely not a local development. In form and handle style, the double-handled vessels found at Lizhou remind of Qijia ceramics, resembling most strongly finds from the site of Qinghai Ledu Liuwan (Figures 7.17-7.19). The footed bowls at Lizhou strongly resemble objects both from Dayangdui and various Qijia sites, and the wide-bodied jars with two small handles found at Xichang Mimilang remind of Qijia ceramics as well. Considering the vast amount of data from Gansu and Qinghai connected with the Qijia and other related cultural phenomena, it is not possible to evaluate them in a truly all-encompassing comparative manner here.[8] It is important to note, however, that the Qijia seem to have lead a settled life, cultivating millet, wheat, and barley and domesticating pigs and other animals, supplemented by animal husbandry and hunting, and produced a considerable amount of metal objects, mainly ornaments, knives, axes, mirrors, plaques, and spearheads.

Both tool assemblage and subsistence patterns at Qijia sites are different from what we see in the Anning River Valley, and the ceramic technology differs as well: high-fired fine ware, often with black slip, as opposed to low-fired sand-tempered coarsely made pottery. Furthermore, many vessel forms such as tripodal vessels or certain jar forms common to Qijia assemblages never occur in the Anning River Valley, and the painted geometric decorations known from some of the Qijia vessels — holdovers from earlier local ceramic traditions – never occur at Lizhou. The overall assemblage of the early graves at Xichang Dayangdui, on the other hand, is nearly identical with Qijia objects, both in ceramic quality and form, and in stone tool and metal sword forms. As discussed in Chapter VII, the pottery from middle and late Dayangdui shows some resemblance with those from the earlier layers, but double-handled vessels become increasingly rare; instead ceramic forms occur that remind of finds from Mianning Gaopo and Zhaojiawan (e.g., large jars with lug handles), and others resemble finds from Wenchuan Zhaodiancun in northwest Sichuan (Figures 7.19-7.22). The ceramics found in the megalithic graves of Dayangdui (i.e., late Dayangdui), all of them completely devoid of handles, strongly resemble ceramics found in features such as the ceramic pits at Xichang Yingpanshan, or the

[8] See Debaine-Francfort 1995 and Shui Tao 2001 for an overview. Some very recently discovered material has been presented in Gansusheng and Xibei 2009 while a brief summary of the current state of research was presented in Liu and Chen 2012.

early megalithic graves at Xichang Tianwangshan, although the ceramic material at these latter sites is somewhat coarser (Figure 7.19, right, Figures 7.25-7.26).

Considering the combination of similarities and differences and assuming that the chronology suggested in Chapter VII is correct, the following scenario seems the most likely: the early earth-pit graves at Dayangdui likely belong to an early Bronze Age group from Gansu who had migrated into the Anning River Valley for unknown reasons, possibly attracted by the mild climate, fertile soil, and rich fauna and flora. It is unsure whether the immigrants adapted their subsistence practices to the new environment, but they brought both their ceramic technology and forms and their metallurgy with them. This group did not move into the void, however, but was likely preceded by pioneers who brought news of the Anning River Valley back to Gansu that induced at least one group of people to actually make the move. It was probably the contact between such pathfinders and the local population that led to the incorporation of handled jars, footed bowls, and vessels with surface-covering geometric decoration into the local ceramic repertoire. Considering that the ceramic technology at Lizhou did not change and that the ceramic forms and especially the decoration motives deviate considerably from those common in Qijia culture context, the people who made the Lizhou vessels were likely of local origin, but imitated objects or elements of objects they had seen with other groups, i.e., the pioneers who had come from the North. Similarly, the inhabitants of Xichang Mimilang may have emulated the ceramics that their new foreign neighbors used, i.e., the people who had relocated from Gansu or Qinghai to Dayangdui.

In the course of time, the people of Dayangdui seem to have come in increasingly close contact with the local population, adopting some of their ceramic forms; additionally, they seem to have assumed elements of the cultural repertoire of groups they encountered on their way through Mianning and northwest Sichuan. They may simply have imitated what they saw, or they may have integrated people from these foreign groups into their midst, whose involvement in ceramic production subsequently led to changes in form and decoration repertoire. Inferring from the combination of foreign elements and their various origins, it appears that the route of contact probably followed the Daduhe through Aba, Danba, and Shimian, finally reaching Mianning in the utmost north of the Anning River Valley. Furthermore, the continued influx of northern elements indicates that the people of Dayangdui kept in contact with their place of origin, with some amount of traffic going back and forth along the known route. At the same time, form and quality of the ceramics produced at Dayangdui became more and more similar to local pottery traditions, indicating a gradual process of acculturation. The strong resemblance between late Dayangdui and other early megalithic graves around Xichang, not only in ceramic assemblage but also in grave form, size, and burial ritual, clearly shows that at this point the people of Dayangdui had been thoroughly integrated into the local culture; they even came to be part of the early development of a form of burial ritual that came to characterize the Anning River Valley for an several centuries.

The case of the origin and movements of the population of Xichang Gaopo and Zhaojiawan is far less clear. Apparently, some of their ceramic forms were seen and taken up by the people from Dayangdui and a few other sites throughout the Anning River Valley, possibly even as far south as Dechang Dongjiapo (Figures 7.14, 7.21-7.22). The closest sites with an overall similar ceramic assemblage, however, is Ludian Yeshishan in northeast Yunnan, which is not only over 400 km away but also separated from Mianning by high mountains and many river streams not easy to cross. The assemblage of Ludian Yeshishan appears to be a combination of ceramic types nearly identical to those seen at Gaopo/Zhaojiawan, while another part is nearly indistinguishable from finds made in northwest Guizhou, and others again are unique to Ludian Yeshishan itself (Figures 7.23-7.24).

Such a combination of elements should indicate the presence of a mixed population, in this case consisting of people from Mianning, northwest Guizhou, and a local group. While the movement of people from northwest Guizhou to northeast Yunnan is unproblematic and not surprising, the potential relocation of people form Mianning to Yunnan is all the more astonishing as both the origins and the later fate of the group in Mianning are entirely unclear, and no sites with similar material in between those two areas are known. If the people of Gaopo/ Zhaojiawan are indeed a local population, their ceramic repertoire would be a completely idiosyncratic local development unrelated to anything seen there before or after. The reasons for such a development and the motivation for such a group to leave Mianning for Yunnan are currently unclear. This puzzle can only be resolved with further archaeological evidence from the Anning River Valley, Yunnan, and/or other places in between.

VIII.3.1.2 Wide-Ranging Contacts and Local Idiosyncrasies: Megalithic Graves and Related Sites

Whereas the range of contacts with places outside the Anning River Valley (inasmuch as reflected in the archaeological assemblage) seems to have been limited during the Neolithic and early Bronze Age, the assemblage from the megalithic graves show indicators for various forms of exchange with many places as far away and various as Yunnan, Gansu, Northwest Sichuan, the Chengdu Plains, and even the Han culture sphere. On the local level, the interactions between communities living throughout the whole Anning River Valley from Mianning to Miyi as well as in the neighboring river valleys in Xide and Puge, intensified so much as to make object assemblages and burial forms nearly indistinguishable throughout the whole sub-region.

Only the ceramics, tool assemblages, and form of the megalithic graves in Puge remain somewhat different. Mountainous and thickly forested, Puge is separated from the Anning River Valley and other places by high mountain ridges. Puge underwent a cultural development of its own. As discussed above, this does not mean complete isolation, as the hunters of Puge might have left their mountains from time to time to exchange goods with the agriculturalists in the Anning River Valley. Some people from Puge even relocated into the Anning River Valley, adopting a mostly agriculture-based mode of subsistence and integrating some new vessel forms and decoration motives into their ceramic repertoire, but without apparent changes in the ceramic technology. Judging from the retention of Puge-specific idiosyncrasies both in technology and object forms, it seems that social and other forms of contact with the local population were relatively limited, not necessarily amounting to the level of intermarriage or similar strong bonds. The nature of interaction between the different communities both throughout the Anning River Valley and the mountains of Xide and Puge changes drastically at the beginning of Phase III of the megalithic graves; from this point onward the people inhabiting all three places seem to have been involved in similar burial and other ritual practices surrounding megalithic graves. The bonding effect of these rituals and the beliefs underlying them probably lead to the development of a new form of group identity that superseded the previously existing division into groups with somewhat different object assemblages, behavioral patterns, and probably cultural identities.

How and why the tradition of building megalithic graves and conducting increasingly complex rituals in and around them arose is unclear, but it seems to be unique to the Anning River Valley. Megalithic constructions are of course known from other parts of the world and graves with construction elements made of stone are common throughout what Tong Enzheng called the crescent-shaped exchange belt and even beyond in Korea, Japan, and Central Asia, but this does not mean that they are all related. After all, fortifying or specially marking a grave with stone construction parts is a common and natural behavioral pattern occurring in many times and places throughout the world. Choosing stone or other material from a special place in a burial or other ritual context, as it was probably done in the Anning River Valley for megalithic graves and in Huili with the interment of river pebbles, may be connected to the special meaning attached to the place they came from and/or to stone in general; however, these beliefs are not necessarily all related. Considering the many special traits of the megalithic graves, I therefore suggest that they are a tradition of local origin not connected to any outside influence.

Many of the objects retrieved from the megalithic graves and related sites, however, bear clear signs of outside contact. Most prominently, these are the double-handled vessels, some of which resemble late Qijia ceramics, whereas the majority is most closely related to objects known from later sites in Gansu attributed to the Xindian culture 辛店文化, Siwa culture 寺窪文化, and Kayue culture 卡約文化 (Figures 7.43-7.44, 7.49, and 9.11-9.12), as well as ceramics from stone-cist graves in Wenchuan in northwest Sichuan (Figure 7.20). Double-handled vessels of various forms are commonly found in stone-construction graves throughout Southwest China (Aba and Chengdu 2009), but they differ in decoration and execution from place to place. In case of the material from the megalithic graves, the ceramic quality and production techniques are clearly local, as are the decoration patterns and many of the ceramic forms. Especially vases, jars, and bowl forms are clearly based on local ceramic traditions, and the tool forms and hair combs are of local origin as well (Figures 7.47 and 7.53).

Other kinds of personal ornaments such as plain bronze bracelets, agate and turquoise beads, and earrings of metal or bone occur in many different kinds of graves throughout southwest China, but they are generic and cannot be interpreted as signs of contact. Of greater interest are the bronze buttons and *ling* bells that occur in various shapes and sizes not only in megalithic graves but also in stone-cist graves and other types of stone-construction and earth-pit graves along the upper Minjiang, in northern Yunnan, Yanyuan, and Huili Guojiabao (Figures 7.54, 7.70-7.72, and 7.76-78). The forms that are common in megalithic graves most strongly resemble objects from stone-cist graves in northwest Sichuan on the one hand, and Huili Guojiabao and various sites in Yanyuan on the other.[9] All these sites yield plain bronze bracelets, agate and turquoise beads, and earrings as well. Furthermore, some of the bronze knives, especially the specimen with fish-tail shaped pommel found in Xichang Hexi M1, and the arch-back shaped daggers seen in various megalithic graves, as well as the round-headed bronze ornaments of unclear function found at Xichang Xijiao Gongshe and Xide Lake Sihe show similarities with objects from Baoxing 寶興, Yingjing 滎經, and Shimian 石棉 (Figures 6.27, 6.29, 6.35, and 7.51).[10]

Daggers with fish-tail shaped pommel are not unique to Northwest Sichuan, but they occur in graves with and without stone-installations in Yanyuan and Northwest Yunnan as well. In the stone-construction graves of Yunnan Deqin Nagu (Yunnansheng Bowuguan 1983), such daggers are associated with specimens with double-circle pommel as they have been found in Xichang Hexi M2, the graves of Ninglang Daxingzhen, and various other sites in Yunnan (Tong Enzheng 1977, Sichuansheng Wenwu 1990), and they are also common in Yanyuan. Grinding

[9] Objects from Baoxing, Hanyuan, Ganzi, and Xingjing are particularly similar (Feng and Tong 1973, Maowen Qiangzu 1981, Li Shaoming 1984, Sichuansheng and Ganzi 1991, Sichuansheng, Ya'an, and Baoxingxian 1999).

[10] See Baoxing Wenhuaguan 1982, Li Shaoming 1984, and Sichuansheng, Ya'anshi, and Hanyuanxian 2008.

rods, which frequently occur in megalithic grave, have a similarly wide distribution throughout Yunnan, but they are less common in Yanyuan. The arrowhead forms known from megalithic graves are largely identical with those known from Yanyuan, but they find parallels in northern Yunnan as well.

A different set of connections is reflected in the Han coins, ring-pommel iron swords, Han-style *gui* and *fu* ceramic vessels, the *gu* goblets reminding of bronze vessels from the Central Plains, and the single belt hook in shape of a tiger head resembling tiger imagery from Ba/Shu context; all of these objects are signs of the rare instances of northeastern contacts that took place at different times and with different groups (Figures 7.31-7.37 and 9.13). The *gu* goblets occur in megalithic graves of Phase II, but their similarity with Neolithic ceramic objects and Shang Dynasty bronze vessels from the Central Plains is not very close and might be a case of independent development. The fact that at that time no other signs of a connection with places and people further East can be ascertained (not even with the much closer Sichuan Basin) supports this hypothesis. The belt hook would likewise be a single incidence of an occurrence of Ba/Shu-type objects in the Anning River Valley and the similarities with Ba/Shu objects are not remarkable enough to be quite certain of its origin.[11] Judging from the quality it is an imported object and so far unique in the research area; although belt hooks have been found at Huili Guojiabao and in many graves in Yanyuan and Yunnan, they never take the form of a tiger head. The signs of Han connections are much clearer; they all occur together in a small number of megalithic graves (Xichang Huangshuitang, Wannao, Xide Lake Sihe, Guluqiao) and it is not difficult to find comparanda for these objects in Han sites in the Sichuan Basin and beyond (Mengoni 2003: Figures 4.2 and 4.37).

[11] See Pu Xiaorong 1978:9 and Mengoni 2003: Figure 4.108 for comparanda.

What does this staggering amount of indicators for outside connections in many different directions tell us about the nature of these contacts and what about the identity of the people burying and buried in the megalithic graves? First of all it is noteworthy that the ceramic assemblages both in the megalithic graves themselves and in related settlement sites and earth-pit graves show strong local idiosyncrasies. The double-handled vessel forms speak of continued and possibly even intensified contact with Gansu and other regions in the North, but most other ceramic forms and decorations are clearly connected with earlier local traditions with some new local developments. The quality of the few metal ornaments and tools of probable local origin is low, and the few higher-quality objects such as the belt hook, some of the daggers with double-circle pommel, and a few of the more complex buttons, are likely to be imports (Figure 9.14, esp. 14 and 17-19). Apart from their occurrence in megalithic graves, identical buttons have been found both at Baoxing Hantanshan in northwest Sichuan (Figure 7.72) and Yanyuan Laolongtou in the Southwest of the research area (Figures 7.77-7.78), i.e., at exactly opposite ends of the contact network. The double-circle pommel knives and daggers with fish-tail shaped handle have a similar disparate distribution. As it is not possible to assign the objects found in megalithic graves to separate individuals, it is not clear what combination of objects could be worn by the same person, and it is even unclear whether they all belong to the same period.

Several different scenarios can be suggested that would explain this highly varied assemblage. The foreign objects may have belonged to individuals of foreign origin who relocated to the Anning River Valley, were accepted into local communities, and buried in the local fashion. As the custom of building megalithic graves seems to have been observed by communities of different cultural origins, such an accepting attitude does not seem to be out of the question. Another scenario would be one of increasing outside contacts in which the local population did not only adopt bronze production but also followed general trends — or one may even say fashions — in personal decorations prevalent throughout Southwest China, while at the same developing their own set of ornaments. Considering the special local characteristics of the ceramic assemblage and especially of the burial customs and related rituals, the latter explanation is more likely correct.

Single individuals from northern regions — especially from the upper Minjiang and the Daduhe, whose ornaments and weapons most closely resemble those observed in some megalithic graves — might still have found a new home in the Anning River Valley, but many might simply have been trespassing on their way to Yunnan and beyond, possibly in search for metal resources and in particular tin, in which Yunnan and Southeast Asia are very rich. It is not quite clear what the mechanisms of such an exchange — if it occurred at all — might have been, but it is fairly clear that the groups in the Anning River Valley were in fairly close contact with groups in Northwest Sichuan, most likely without sharing a common identity. It may have been people from Northwest Sichuan or earlier groups of Qijia origin who introduced metallurgy to the Anning River Valley, but local mastery of the technique remained low and objects of higher quality, which show all foreign forms, were probably imports.

The relationship between the groups who at the time inhabited the upper Minjiang and Daduhe River Valleys on the one hand and northern Yunnan on the other, is a point of heated discussion that cannot be resolved here. It is likely, though, that the contact routes between the two areas ran through the Anning River Valley, whatever the nature of the connection may have been. At a later point in time, the Anning River Valley became the entry point to the Southwest for the Han as well, which explains the presence of coins and other objects of clear Han origin in the megalithic graves just before this local burial tradition was discontinued. The Han graves at

Xichang Lizhou, Ma'anshan, and other later sites in the Anning River Valley are basically indistinguishable in form and assemblage from Han sites in the Sichuan Basin. The ceramic vessels with horn-shaped handle found in Han tombs, which closely resemble objects from the middle Lizhou earth-pit graves, indicate that a few traces of local traditions may have continued (Figure 9.15). To assess whether this was the outcome of a fairly rapid acculturation of the local population by the Han, or if large-scale population replacement occurred, or if — as I would suspect — a combination of large-scale Han immigration and acculturation of the local population took place, could only be assessed in a separate detailed study.

VIII.3.1.3 Summary

Overall, it has therefore become clear that after a period of relatively self-contained local development, a steadily increasing number of people moved through and into the Anning River Valley, mostly from the North and to a lesser extent from the East. Especially in the beginning, single people and even whole groups seem to have relocated here, probably attracted by the congenial environment. They came in various types of contact with the local population that mostly led to their acculturation to local traditions, but at the same time brought new ceramic forms, styles, and metal technology to the local groups. The local ceramic technology, however, seems to have largely persisted in spite of the lower quality of the vessels produced in this way compared to the early inhabitants of Xichang Dayangdui were accustomed to. The reasons for this phenomenon are unclear, but the opportunity to learn metal smelting from the immigrant groups may have been so much more attractive that acquiring new techniques of ceramic production may have seemed uninteresting.

During the time when the megalithic graves were built, the graves and the rituals surrounding them seem to have been of just as much — if not stronger — attraction to the people in Puge as the lush environment of the Anning River Valley or the agricultural products its inhabitants had to offer. At that point, people living further north seem to have come to regard the Anning River Valley less as a place to move to but more as a place to traverse through, be it to obtain resources from places further south, be it for other reasons. Such exchange may have taken place through several intermediaries without any one person necessarily moving all the way from the upper Minjiang to Yunnan; however, judging from the strong similarities between archaeological phenomena on the upper Minjiang and in Yunnan and from the many local idiosyncrasies of the Anning River Valley and its megalithic graves, it is likely that people in the Anning River Valley were not actively involved in this exchange. It is of course possible that the Anning River Valley may have been circumvented on routes in the East or West, but considering the steep mountains on both sides, going through these areas seems an unlikely choice. Nevertheless, stone-construction graves with assemblages resembling those of the upper Minjiang stone-cist graves were found even on the Tibetan Plateau and in northwest Yunnan, indicating that some pathways toward the West must have existed, but the considerable number of similar objects in the Anning River Valley shows that the direct route was probably more commonly used.

For the Han, the Anning River Valley then became both an agreeable place to settle — one may even say colonize in the sense of appropriating a territory previously inhabited by a different population and subduing said population with violence and other means — and an entrance to Yunnan and beyond. The Anning River Valley has been an attractive place for many outside groups for a fairly long time, but there are no clear signs of the local population venturing any further than the southern- or northernmost point of the Anning River Valley. The same seems to hold true for the people living in the Southeast, particularly Huili with its pleasant if somewhat isolated environment.

VIII.3.2 The Southeast: Huili and Its Neighbors

The Southeast seems to have been inhabited significantly earlier than any other part of the research area, as the Paleolithic and early Neolithic sites in the mountains of Panzhihua show. The mountains there were and in part still are rich in wildlife and plants and furthermore provide many caves for a hunting-and-gathering population to use, but for people with an agricultural lifestyle the wide river valleys of Huili and Huidong are the more natural choice. These valleys may have been attractive to early agriculturalists from Panzhihua, and they definitely attracted people from Luquan, Chuxiong, and other parts of Yunnan. In fact, the early inhabitants of Huili probably belonged to the same culture group as those in Luquan and were in frequent and close contact with communities in other parts of Yunnan as well; connections with places further north and west such as the Anning River Valley, Puge, or Zhaojue, on the other hand, seem to have been rare if not non-existent at this point.

This seems to have changed only during a later phase: the ceramic forms and decoration patterns that characterize the settlement site of Huili Dongzui are noticeably different from the assemblages of local origin in the early sites of Huili Houzidong, Hewanwan, Liantang, Tangjiaba, and Tianbacun (Figures 7.56-7.57), and the somewhat later sites of Huili Guantianshan/Yingpanshan, Xiaotuanshan, Xiaoyingpan, and Luquan Yingpanbao (Figure 7.68). The assemblage from Huili Dongzui instead is characterized by ceramics so closely resembling material from sites in northern Yunnan, particularly Yongren, that an extraneous origin of the inhabitants of Dongzui, probably from Yongren, is exceedingly likely (Figures 7.58-7.62). Interestingly, there are no apparent similarities between the assemblages from Dongzui and that of earlier or later sites in Huili, but a few of the decoration patterns and ceramic forms observed at Dongzui show some resemblance to ceramics from Dechang Wangjiaping. As these similarities are slight, the contact may have only amounted to a few instances of movement of people from Dechang to Huili; however, as the assemblages from contemporary sites in the Anning River Valley do not show any similarities with objects from Huili, the opposite direction of movement seems unlikely. Nevertheless, the time of Dongzui appears to be the beginning of a more frequent exchange between the two sub-regions, as the ceramics from Huili Fenjiwan show.

The ceramics from Fenjiwan combine local jar forms with decoration patterns and handled and footed vessels so similar to those from the late phase Lizhou graves that the movement of a considerable number of people from Xichang to Huili seems likely; however, there is no evidence for movements in the other direction (Figures 7.15, 7.47, and 7.66). The ceramic quality and color show that the vessels found at Fenjiwan were locally produced, probably by groups that consisted of both people of local origin and immigrants. The forms and decoration motives of the ceramics of Huili Leijiashan, Miaozi Laobao, and Washitian combine a considerable number of types known from Fenjiwan with a considerable number of types originating from the ceramic tradition associated with the megalithic graves in the Anning River Valley, and a few forms more commonly known from Yunnan (Figures 7.63 and 7.69). The few bronze objects found at Fenjiwan and Washitian (spearheads, *yue* axes) likewise resemble forms known from various sites in Yunnan,[12] and the dagger-axe mold retrieved from Washitian is even described as being of typical Shu style (Tao and Zhaodian 1981).

In connection with the lack of characteristic Huili objects elsewhere, the presence of these foreign forms at Huili indicates that an increasing number of people moved from the Anning River Valley and to a lesser extent Yanyuan and Yunnan to Huili and were integrated into local communities. The initial incentive for exchange between Huili and the Anning River Valley and Huili and Yanyuan may have been the metal quarries of Huili, and the reason for people to stay may have been the purpose of facilitating exchange, but the pleasant local environment may have been a point of attraction as well. For people from the Anning River Valley, the latter point may have been of lesser importance, but coming from Yanyuan, Huili would be an attractive place to live.

The reasons for the movement of people from Yanyuan to Huili reflected in the graves at Huili Guojiabao with their Yanyuan-style assemblage were probably analogous (Figures 7.70 and 7.76-7.80). This members of this community in particular, however, seem to have kept themselves apart from the local populations, adopting only some of the ceramic forms but continuing to use their vast range of metal ornaments, weapons, and horse gear so completely foreign to the people from Huili, who seem not to have been interested in metal objects of this kind. The few coarse metal objects found at Huili Fenjiwan and Washitian are largely utilitarian in nature (axes, arrowheads, and spears), amended by only a few bracelets (Figures 7.63-65). As argued in Chapter VII, the high-quality bronze drums found in bronze deposits in Huili, are imports from the Dian culture realm that were probably revered for their special meaning rather than for the high-quality craftsmanship. The mode of deposition and the low-quality local

[12] The spearheads found at Washitian and Fenjiwan resemble finds from Xiangyun Dabona, Chuxiong Wanjiaba, and Yongsheng Longze (Yang, Wan, and Hu 2009:207-211; Yunnansheng Wenwu 1983). The *yue* axes resemble specimens from Yongsheng Longze and Xiangyun Dabona as well.

imitation of Dian bronze bells shows that both kinds of musical instruments were probably poorly understood in their original function but imbued with a new meaning and purpose.

The nature of the connection between Huili and the Dian culture realm reflected only in these few special bronze objects, is unclear. Bronze drums have a wide distribution throughout most of Yunnan and Southeast Asia, and it has been suggested that they may have symbolized formalized alliance networks (Alice Yao 2010). This may apply to the specimens found in Huili as well as to those in Yanyuan, where they were interred in elite graves; however, considering the apparent lack of signs of an elite in Huili (of one identifiable by richly equipped or otherwise special burials), the exchange patterns in this case may have been different. The origins of the practice of depositing bronze drums and bells in special pits does furthermore seem to be unique to Huili and a rare occurrence even there. It is possible that the drums were gifts from Dian people to groups in Huili, who commemorated the special occasion of — maybe not well-understood — presents by depositing them in the ground in a ritual fashion. Given the small number of drums, bells, and bronze deposits, and the scarceness of signs for any forms of contact between Huili and the Dian culture realm, the case currently remains unclear.

In spite of this apparent lack of interest in metal technology and high-quality metal objects in general, the stone moulds from Washitian show that some metalworking was conducted in Huili. Later sites furthermore show that metal extraction took place in Huili at least since the 2nd century AD, but mostly under Han control and using Han techniques, and not under the command of local groups. The hypothesis that metal may have been extracted during earlier periods as well, and that raw material may indeed have been traded into the Anning River Valley, Yanyuan, and other places, has to be tested through geological as well as archaeological survey work and comparative metal analysis.

VIII.3.3 Yanyuan and Ninglang

By far the most staggering amount of elements originating in many different places reported from the research area so far comes from Yanyuan (Figures 7.74-7.80). Most abundant are signs of contact with northwest Yunnan and northwest Sichuan; the connection with the Dian cultural realm on the one hand and the Anning River Valley on the other seems to be less close, and Shu-type objects are positively rare; yet again other elements point to possible connections with the northern steppe or even Central Asia. Below, the evidence for each of these different possible directions of contact and their nature have to be examined in turn.

VIII.3.3.1 Looking East: Connections with the Anning River Valley, Shu, and Dian

Elements pointing to a connection between Yanyuan/Ninglang and the Anning River valley are double-handled vessels with a stout body and water-ripple pattern and the grinding rods that so commonly occur in megalithic graves and have been reported from Yanyuan in small numbers as well (Figure 7.49). Elongated double-handled vessels and small single-handled cups similar to objects from Dechang Arong have been found in the graves of Ninglang Daxingzhen as well, but associated with a metal assemblage virtually identical with that of the graves at Deqin Yongzhi (Figures 7.73-7.74). The ceramic assemblage of Deqin Yongzhi, on the other hand is similar to that in other graves in northwest Yunnan but differs from what we see both at Dechang Arong and Ninglang Daxingzhen. Some megalithic graves contain a few types of metal weapons common to graves in Yanyuan, Ninglang, and northwest Yunnan, which might have reached the Anning River Valley coming from either of these places. The relationship between the Anning River Valley on the one hand and Yanyuan/Ninglang on the other is therefore not quite clear. The inclusion of domestic ware of foreign types in the graves at Yanyuan/Ninglang indicates that people from the Anning River Valley were probably integrated into the local community. Whether permanent relocation of people in the opposite direction took place as well, is unclear.

The *ge* dagger-axes, *yue* axes, and belt buckles reported from Yanyuan have typical Shu forms and decoration motives, but the dagger axes are not of the stout type known from Shu sites; instead, they are of an elongated type commonly found in Dian culture context (Figure 6.31).[13] The belt buckles found in Yanyuan are largely identical with objects of Shu origin, but such items have been found in various graves in Yunnan and northwest Sichuan as well; these objects are therefore not necessarily a sign of direct contact between Yanyuan and Shu but might have reached Yanyuan through intermediaries in the North or South.

Objects showing connections to the Dian culture realm fall into the two groups of likely imports and local imitations. Judging by form, execution, and metal composition, the drums found at Yanyuan Laolongtou and Maojiaba, the three-dimensional staff head from Laolongtou, and some of the dagger-axes from both sites are probably Dian imports. The *bianzhong* bell from Laolongtou M4, on the other hand, has a metal composition that would make it unfit to play, indicating that it was probably a local imitation made without real understanding of the purpose of the object. Many dagger axes, spearheads, and other weapons show some form or decorations elements that resemble typical Dian objects, but the overall appearance and execution identify them as local products imitating or elaborating on Dian traditions (Figure 9.16). The nature of these objects — ritual objects or highly-decorated weapons — indicate that they reached

[13] See Jing Zhongwei 2011 for an in-depth discussion of the different dagger-axe types and their origin.

Yanyuan through some form of elite exchange, be it through gift giving or in exchange for salt or another commodity. It is less likely that Dian people actually relocated to Yanyuan or vice versa.

VIII.3.3.2 Looking South: Connections with Northern Yunnan

The connections between Yanyuan/Ninglang and immediately adjacent parts of northwest Yunnan are naturally much closer than those with the Dian culture realm. The metal assemblage of Ninglang Daxingzhen is largely identical with that from Deqin Yongzhi, and the graves are of similar form, both holding single interments placed in wooden coffins. This host of similarities shows that the people at Ninglang did not simply imitate or receive objects from people in Yunnan but probably shared the same cultural tradition. The assemblages from sites in Yanyuan show a close affinity with northwest Yunnan as well, especially in metal weapon and ornament types, but similar objects just as commonly occur in stone-cist graves along the upper Minjiang and Daduhe, making it difficult to decide were the actual source might have been. This concerns in particular the swords with three-pronged hilt, daggers with spiral handles, daggers with double-circle pommel, and daggers with fish-tail shaped handle, but also mirror-shaped objects, *ling* bells, button-shaped clothing applications, and double-handled vessels occur in graves in both places.

The combination of three specific types of daggers/swords — those with spiral-handles and three-pronged hilt, those with double-circle pommel, and those with fish-tail shaped handle — is particularly common in the mountains of Yongsheng and Deqin, but it occurs in Yanyuan and Ninglang as well (Figures 7.73-7.74 and 9.17). In Deqin and Yanyuan, such dagger/sword sets are furthermore usually associated with vessels with double-spiral decoration and ring-pommel knives that are not common in other parts of Yunnan. The same weapon set — without the vessels and ring-pommel knives — is frequently found in graves in Xiangyun and Chuxiong as well, but nearly always in combination with daggers with double-curved blades, Dian-style spearheads, and axes of forms that have no counterpart in Yunnan/Ninglang (Figures 9.18-9.22). It is particularly noteworthy that at a number of sites in Xiangyun, such assemblages furthermore contain small bird-shaped ornaments. Although smaller and slightly different in form, they resemble some of the staff heads found in Yanyuan.[14] However, swallow-shaped applications and complex staff-heads showing horses with or without riders and/or a human guiding them as they have been reported from Yanyuan, find no counterpart in Yunnan.

VIII.3.3.3 Looking North: Northwest Sichuan and Beyond

Stout double-handled vessels are common throughout northwest Sichuan and northwest Yunnan, but the variety with large double-spiral motive seems to occur exclusively along the upper Minjiang and Daduhe as well as in Yanyuan and Deqin (Figure 7.76). If the interpretation of the double spiral as symbolizing a ram's head is correct, the design may be connected with the importance assigned to sheep/goat in the northern mountains as well as in Yanyuan reflected in the ritual burning and interment of sheep shoulder blades at Yanyuan Laolongtou. The button-shaped ornaments that occur in Yanyuan and Huili Guojiabao are particularly close in form and decoration to objects found along the upper Minjiang and Daduhe, and even in megalithic graves (Figures 7.70, 7.72, and 9.23). Other types of objects that are common to both Yanyuan and northwest Sichuan are ring-pommel knives, scabbard tips, and certain types of belt hooks usually do not occur in Yunnan.

[14] Examples have been found at Midu Juli and various sites in Xiangyun Bingchuan and Xiangyun Jiancun (Li Chaozhen 1983, Yunnansheng Bowuguan 1986, Guo Jiyan 2002, Aba and Chengdu 2009:409-436). At Xiangyun Jiancun, they are additionally accompanied by rabbit-head shaped ornaments largely identical to those known from Huili Guojiabao and Yanyuan.

The specific type of composite swords seen at Yanyuan is most closely matched by objects from the upper Minjiang as well, but such weapons are also common in Ningxia, Inner Mongolia, and other places in the northern steppe and even in Northeast China (Figure 9.24). In fact, ring-pommel knives, arch-backed knives, and double-circle headed daggers occur all throughout the northern zone, often in connection with horse bits and other forms of horse gear, mirror ornaments, and clothing applications similar to those found in Yanyuan (Yang Jianhua 2004). As discussed in Chapter VI, the daggers with fish-tail shaped handle likely have a northern origin as well. The interment of horse bones and heads as seen in Yanyuan has no counterpart anywhere else in southwest China, but it is not uncommon throughout the northern steppe, the Ordos region, and in Central Asia throughout different periods, mostly with groups practicing a pastoral form of subsistence. Furthermore, the type of horse gear found in Yanyuan and at Huili Guojiabao is similar to objects that occur in the Ordos region and the northern steppe, especially in Upper Xiajiadian Culture context (1000-600 BC) (Wu'en Yueshitu 2008; Neimenggu and Ningchengxian 2009) and beyond throughout the Seima-Trubino Complex (~2000-1500 BC) (Grushin 2006; Anthony 2007:427-448; Kohl 2007:168-171; Chernykh 1992 and 2008).

Throughout the whole region, decorative elements depicting horses are common in Bronze and Iron Age contexts, but they occur mostly on dagger handles or plaques and less frequently as yoke ornaments that are structurally similar to the staff heads from Yanyuan (Figure 9.25). Yoke ornaments commonly occur in the Ordos region, mostly around the 9th to 7th century BC, but they depict single animals (horses, rams, more rarely birds) executed in three-dimensional fashion, not flat arrangement of two horses and one or several people (Wu'en Yuesitu 2008). The Luristan bronzes from Iran (conventionally dated to 1500-500 BC) include

— likewise three-dimensional — staff heads with two juxtaposed rams or horses (Figure 9.26), but the overall form and execution are different and the quality of the objects is much higher than what is common in Yanyuan (Calmeyer 1969, Moorey 1974a and 1974b, Tenri and Tenri 1998). Juxtaposed horses — with or without a person standing in their middle guiding them — are a fairly common motive throughout northern China, Central Asia, and the Near East, seen on plaques, pendants, rock art, and even as clan signs on metal weapons (Lin Meicun 2000:28-32). Structurally, the composition of the groups on clan signs and engraving on rocks in the Tianshan Mountains shows the closest correspondence (Figure 9.27), but in the specific combination of elements and in overall shape and execution, the staff heads from Yanyuan are unique.

VIII.3.3.4 Summary and Conclusions

This wide range of comparanda for objects from Yanyuan in many different places covering a wide time span are associated with object types unique to Yanyuan such as the bronze stands with snake, frog, and/or bird depictions, swallow-shaped bird applications, double-cross staffs, and various forms of staff heads depicting horses with or without human figures, wheels, or a combination of these elements (Figure 9.28). Furthermore, the complex set of burial customs involving earth-pits, wooden coffins, stone cists, stone lids, or a combination thereof, small-group interment, cremation, application of cinnabar, burning of objects in the grave, interment of horse bones, skulls, and other animal bones, seems to be unique to Yanyuan as well.

It is fairly clear that connections with places as far east as the Shu or the Dian culture realm are sparse and may have been indirect, occurring through intermediaries handing gifts or trade items from hand to hand. Contact with the Anning River Valley was more direct, with a small number of people relocating to Yanyuan and being integrated into the local group. Objects from Yanyuan may have reached the Anning River Valley, but as the weapon and ornament types shared by both places frequently occur in graves in northwest Yunnan and northwest Sichuan as well, it is equally likely that the inhabitants of Yanyuan and the builders of the megalithic graves where introduced to this type of objects from a third common source. A movement out of Yanyuan becomes clear from the graves of Huili Guojiabao whose assemblages are virtually identical with those observed in graves in Yanyuan. If the salt of Yanyuan and the metal of Huili were indeed exploited at the time, it is likely that the people buried at Huili Guojiabao were involved in an exchange of those two raw materials. Regardless of the actual commodity exchanged, the rich object assemblages at Huili Guojiabao indicates that it was an elite-level transaction and not a mere mercenary exchange. The same likely holds true for the contact with the Dian culture realm that is reflected in high-quality ritual objects and weapons that may have been prestige goods.

The nature of the connection of Yanyuan with both northwest Yunnan and northwest Sichuan is less clear, mainly because the relationship between the two regions as well as between the two places and the northern steppes and beyond is a continued point of debate. Due to the unclear chronology and immense amount of material involved, this problem cannot be solved here, but I will venture to suggest an explanation for the situation in Yanyuan/Ninglang. The graves known so far from Ninglang clearly were built by a community closely related to the one whose members buried and were buried at Deqin Yongzhai and neighboring sites. The ceramic assemblage of Ninglang Daxingzhen suggests that the local community had integrated people from the Anning River Valley as well.

It is remarkable that the similarities between weapons and ornaments from Ninglang/Yanyuan and from the mountains of Deqin and Yongsheng are strong; furthermore, the objects from all three places show more similarities with the assemblages from the stone-cist graves in the upper Minjiang and Dadu River Valleys than with objects typical for earth-pit graves with or without stone installations in other parts of Yunnan. Most weapon types seen in Yanyuan and especially clothing ornaments and ceramics (i.e., object categories that are usually seen as particularly closely linked to cultural, social, and individual identity) are most similar in form and style to those from northwest Sichuan and the Northern Steppe. At the same time, the great importance attached to horses and the interment of horse gear and horse skulls and bones in graves in Yanyuan is matched by similar customs in northwest Sichuan and the northern zone.

It is therefore not unlikely that the people living in Ninglang and Deqin as well as Yanyuan shared a certain sense of community with those in northwest Sichuan, possibly even migrated from there toward the South. The groups in Ninglang and Deqin — after all extremely mountainous and remote places — do not seem to have entered into close or frequent contact with people in other places, but the situation in Yanyuan and especially the Yanyuan Basin was apparently different. The special burial customs observed there combined with the importance attached to horses and armed combat, and the vessels with double-spiral decoration, indicate that the group who settled in the Yanyuan Basin was of a northern origin, possibly even coming from a place beyond northern Sichuan. If people from the northern steppe or the Ordos region did indeed venture into Yanyuan, they probably reached the Yanyuan Basin by way of the Daduhe and Yalongjiang, possibly staying in northwest Sichuan for a while and adopting local ceramic traditions, before some of them moved on, maybe taking members of the local population with them. Conversely, it might have been people living in northwest Sichuan who decided to move south and take some of the immigrants with them.

After these people settled down in Yanyuan, mostly in the Yanyuan Basin, new local traditions developed that seem to have entailed complex rituals involving staffs, special tables, and other objects indicating rituals revolving around horses and birds among other things. It is unclear of which nature the encounter with the local population in Yanyuan may have been. The wide variety of different object types of different dates showing a northern connection indicates that some form of interaction between Yanyuan and the North continued, be it through people moving southward, be it through direct or indirect forms of exchange of goods or other forms of contact. I would highly doubt, however, that the form that these rituals took and/or the objects used in them were directly related to cultural developments as far away as the Near East or even Central Asia, especially as the execution and quality of the metal objects in Yanyuan differ so much from anything seen further west. It is much more likely that a common importance attached to horses, horse-riding, and fighting combined with a similar environment and likely similar economies led to the emergence similar customs and material expressions, possibly even similar social structures, each element influencing the other.

The exploitation of salt quarries in Yanyuan may have enabled the immigrants to establish a considerable wealth through wide-ranging exchanges of various kinds. Part or all of this exchange network seems to have been based on contact between various elite groups exchanging gifts when visiting each other or sending items through emissaries. In Yanyuan, the access to these exchange networks and possibly to the raw material salt seems to have been restricted to a small part of the population, showing a highly stratified society in which elite status was apparently connected to abilities in armed combat and possibly horse riding, a kind of society extremely different to what we see in the valleys of Yongsheng.

VIII.3.4 The Far Southwest: Yongsheng and Beyond

The valleys of Yongsheng are different from other parts of the Southwest, both in environmental preconditions, cultural composition, and contact networks. The finds from Yongsheng Duizi reflect a partially agricultural form of subsistence and a settled way of living lacking the emphasis on armed combat seen in the adjacent mountains. Due to the lack of proper publication, it is unclear whether there was a significant difference in the wealth of objects between different graves that would indicate a highly stratified society; extremely rich graves similar to some Yanyuan Laolongtou M4, M6, or M9 are probably not present, indicating a more even distribution of wealth than among the people inhabiting the Yanyuan Basin. Both in subsistence practice and ceramic assemblage, the commonalities between Yongsheng and adjacent parts of Yunnan (particularly Dali Prefecture) are remarkable, but the groups in Yongsheng were by no means isolated from places further north either (Figures 7.81-7.84).

The stone-construction graves from Duizi Phase IV with their multiple interments contain sets of objects somewhat reminiscent of those for less well-equipped individuals in graves in Yanyuan/Ninglang, i.e., a combination of arrowheads, bronze knives, bracelets, beads, *ling* bells, cowrie shells, and double-handled vessels, but at Duizi, such sets can furthermore contain spindle whorls as they never occur in graves in the mountains of Yanyuan and southwest Yunnan. The typical swords, daggers, and other weapons common in the latter graves are completely missing in Yongsheng, let alone horse gear, armor, clothing decoration, or special ritual objects such as drums, bells, or staff heads characterizing particularly rich graves in Yanyuan. It is furthermore remarkable that the double-handled vessels at Yongsheng Duizi have a middle-rib as it is otherwise only known from ceramics in Yanyuan, but the elongated vessel form with protruding foot is perfectly unique to Yongsheng.

Similarly noteworthy is the combination of many different interment types at the site of Yongsheng Duizi, including earth-pit graves with or without stone installations with single interments, urn graves for infants, stone-construction graves with multiple interments, some of them primary burials resembling the megalithic graves in the Anning River Valley (albeit significantly smaller and below the ground), others secondary interments reminding of the stone-construction graves in Zhaojue. Graves of similar construction containing secondary interments have been reported from various sites in Xiangyun, Dali Prefecture, (Li Chaozhen 1983, Yunnansheng Bowuguan 1986), but their assemblages consist of weapons and ornaments showing close similarity to the graves in the Yanyuan Basin and the mountains of northwest Yunnan. Some of the graves at Duizi yielded ring-pommel knives, bracelets, and arrowhead similar to specimens found in many of the graves further north; however the dagger, sword, or axe forms, or complex ornaments typical to the northern graves are absent from Duizi. Instead, some of the graves at Duizi yielded perforated cowrie and snail shells as they were reported from Huili Xiaoyingpan M21, Puge Wadaluo M1, Zhaojue Erba Keku M11, and Yanyuan, in some cases as single perforated specimens, in others as complete chains of shells and animal teeth.

Tens of thousands of cowries have been excavated from Dian culture tombs in Yunnan, but significant amounts have also been found at Sanxingdui on the Chengdu Plain and in graves of the Shang (1600-1046 BC) and Zhou periods (1034-771 BC) in the Central Plains (Yang Bin 2004). As Li Yung-ti (2003) has argued convincingly, the function of cowries in the Shang and Early Western Zhou (1046-771 BC) periods in Central China were largely ornamental or ritual. From the Middle or Late Western Zhou until the Qin and Han, cowries were used as a form of currency, and throughout South and Southeast Asia this tradition continued into fairly recent historic periods.[15] As Peng Ke and Zhu Yanzhi (Ke and Zhu 1995), among others, have showed convincingly, the cowries found throughout China came from the Indian and the Pacific Ocean, but there is some disagreement on the transportation routes: based on the early evidence of cowrie use in Majiayao 馬傢窯 culture (3300-2000 BC) cemeteries in Qinghai and northwest Sichuan, Ke and Zhu (1995) argue for a trade route across the Eurasian Steppe; Yang Bin (2004) and many other scholars instead suggest an exchange along the Southwest Silk Road from India through Burma into Yunnan (Figure 9.2). Judging from the cowrie distribution pattern as currently known (i.e., large numbers of cowries in Yunnan and a few examples throughout Sichuan and Qinghai), the second alternative seems more likely, but both routes might have been used, albeit at different times and with different intensities.

Interesting to note is the elite context of the exchange of cowries as represented in the Dian culture graves (Pirazzoli-t'Serstevens 1992). In the research area, cowries occur only in small numbers in stone graves that do not show any clear signs of the deceased buried there in having a position higher than that of people interred in neighboring graves without such shells. It is therefore questionable whether they were associated with elite exchange networks. The cowries may have gone through a number of hands and reached Zhaojue, Yanyuan, and Yongsheng on roundabout ways in a random manner. Considering the small number of specimens, the mere presence of cowries is not a clear proof of direct contact let alone a common identity between groups living so far away as Zhaojue and Yongsheng. It is more likely that cowries reached either of these places independently, passing through many hands along a series of exchange networks that must have linked up to the Indian Ocean.

[15] For an overview on the spread of cowries in East Asia see Namio Egami 1974.

Overall, the people living at Yongsheng Duizi and related sites were likely of local origin, related to and in constant exchange with people living throughout the valleys of Jianchuan, Xiangyun, Yongping, and other parts of Dali Prefectures and adjacent parts of Yunnan. They were clearly culturally different from the combative groups living in the mountains further north and west, but commonalities in part of the ceramic assemblage, certain knife forms, and even some aspects of burial ritual show that the relationship was close, probably involving social contacts possibly even to the point of intermarriage or other forms of bonding. The special form of subterranean graves made of coarse stone cobbles holding multiple primary or secondary interment seems to be a custom that arose independently from the one in Zhaojue and — as the subterranean placements suggests — probably independent from the megalithic-grave tradition of the Anning River Valley as well. A connection between people in the river valleys of Yongsheng and groups in the mountains of Dali Province, however, seems more likely considering the similarities in ceramics between the two regions. As objects of Yanyuan at Yongsheng Duizi and vice versa shows, the connections between the two places seem to have been remote and infrequent. The major contact network was therefore concentrated on the South and Southeast with a focus on the immediate neighbors. Nevertheless, Yongsheng must have been connected to the far-ranging exchange networks that brought cowries into Yunnan; however, considering the scarceness of evidence for contacts reaching beyond the neighboring parts of Yunnan, the contacts were likely indirect and infrequent in nature.

VIII.3.5 The Northeast: Zhaojue and Its Neighbors

As has been argues in Chapter VII, the Northeast is a place in between, an entryway to the Liangshan region from the Sichuan Basin and places further East, used most extensively by the Han in their search of a pathway to Yunnan and beyond. From the Eastern Han (AD 25-220) period at the latest, the Han did not only traverse but also settled down in Zhaojue, as the large number of Han graves shows. The Han grave constructions were sometimes imitated by other groups living in this sub-region, and imported Han bronze vessels were interred in different types of graves; however, all of these graves seem to have followed local burial customs of multiple secondary interments sometimes accompanied by calcinated ropes in stone-construction graves aligned with the slope of the hill. The assessment of the exact relations between the Han and other groups living in the Northeast during the Western and Eastern Han (206 BC - AD 220) will require a separate study beyond the scope of this dissertation.

It is noteworthy, however, that the nature of contact with the Han seems to have been different from the forms of interactions with groups in other parts of the research area reflected in earlier graves. The coexistence of different grave forms next to each other combined with the association of ceramics indicating outside influence with local traditions of group-interment and related rituals indicates that culturally different groups of different origins lived next to each other, respecting each other's monuments, and being in sufficiently close contact to adapt certain object forms. It is even possible that a social intermingling of the groups may have taken place that may have gone as far as intermarriage. In any case, it seems to have been a relationship among equals and not a colonial situation. The contact with the Han, on the other hand, seems to have been a story of emulation, acculturation, and partial population replacement that will need to be told somewhere else in greater detail.

Even though the lack of fieldwork and related research currently make it impossible to assess the exact relations between the different groups inhabiting Zhaojue, it is obvious that the Northeast as a whole served as a transit region for people moving into the Liangshan region from the East and/or North, and even for people moving out of the Liangshan region coming from Puge, Huili, and possibly other places. What the reasons for these movements may have been is not quite clear, particularly considering the forbidding nature of the mountains that cover the whole Northeast which cannot have been a very inviting place to move into or even move through. In any case, the local population clearly absorbed many foreign customs and people while at the same time preserving certain beliefs and traditions of their own that must have been essential to their group identity (e.g., the secondary form of burial, the interment of calcinated ropes) and their relationship with their natural environment (e.g., the orientation of the graves facing toward the river). On the other hand, people from Zhaojue seem to have relocated to other places as well, most notably Puge, with whose inhabitants they seem to have shared certain social ties.

The exact routes and extent of the overall contact network are not clear, but it must have stretched from the Chengdu Plains through Meigu and Zhaojue to Puge and Huili, finally linking up to a larger exchange network connecting Yunnan with places as far away as the Indian Ocean, as the presence of cowrie in other shells in a small number of graves in Zhaojue indicates. Contact along this exceedingly cumbersome route may have been intermitted, being barely existent at some times and much-travelled at others; however, there are no clear signs that people or goods from Zhaojue moved much further than Puge, while the Han — entering through both the Northeast and the easier northern entryway into the Anning River Valley — eventually spread through all of Southwest China, settling in Zhaojue, the Anning River Valley, even Yanyuan, and in the Southeast, were they were majorly involved in local metal extraction and production.

Which role Yuexi may have played in this scenario is not quite clear. Judging from the combination of stone-construction graves, megalithic graves, and earth-pit graves with assemblages nearly identical to those from stone-cist graves in the upper Minjiang River Valley and objects showing Han connections observed there, Yuexi probably served as a thoroughfare similar to Zhaojue. From the geographical point of view, Yuexi is a natural transit region between the Anning and Dadu River Valleys; Yuexi furthermore lies on one of the possible routes between the Chengdu Plain and Zhaojue, following first the Daduhe, and then one of its side arms, the Nirihe 尼日河, which runs through Yuexi and provides access to the Anning River Valley. The parallel route through Meigu is considerably shorter but more hazardous, following another side-arm of the Daduhe, the Guanmiaohe 管廟河, which runs through even narrower valleys with even steeper hill slopes than those along the Nirihe. To develop a better understanding of the routes as well as of the nature of the contacts between different local and foreign groups in the northeastern part of the research area, further extensive survey work and excavations are needed.

VIII.4 The Contact Network(s) Through Time and Space: Routes, Places, and People in the Liangshan Region and Beyond

As has become clear from the analyses and comparisons conducted in this and the previous chapter, the research area falls into four main sub-regions with distinct geographic and cultural characteristics and local developments. The high mountains of the Hengduanshan separate these sub-regions from each other as well as from the outside world; nevertheless, the archaeological record shows that they were by no means isolated from each other, nor were they cut off from outside contact. Each of these sub-regions was part of various short-, medium-, and long-distance exchange networks that were of varying importance at different times, some of them overlapping or connecting to larger networks.

The Anning River Valleys seems to have been fairly self-contained during the early to middle Neolithic. The various communities living there mostly seem to have belonged to three main culture groups who came to be in increasingly close contact with each other, probably through various forms of social interaction including marriage, adoption, or communal celebrations. Economic exchange was probably of less importance as the local environment is congenial and all of these groups exploited it in mixed forms of economy that should have provided a reliable basis of subsistence. The exact nature of these mixed forms of economy varied somewhat from place to place, emphasizing either agriculture, hunting, or fishing, partially depending on the natural surroundings, partially on cultural choice. Especially the decision to pursue fishing on a larger scale was a possible but by no means imperative choice for groups living in the Anning River Valley with its fertile soil ideal for agriculture.

Only the groups living in Puge with its steep forested hills and narrow river valleys seem to have concentrated nearly exclusively on hunting. This form of specialization was probably only possible because the communities in Puge were in frequent contact with groups in the Anning River Valley from whom they could acquire various staples that they might have lacked. The groups in the Northeast — an area even more mountainous and even less favorable for agriculture than Puge — did not have such easy access to the Anning River Valley or similar places from where they could have obtained agricultural produce. It is therefore not surprising that they relied on a mixed form of subsistence that allowed them to mitigate the risks that the harsh environment in this sub-region posed to them.

It was probably the attractive environment that induced an increasing number of people to move into the Anning River Valley; however, evidence from northwest Sichuan and northwest Yunnan indicates that the Anning River Valley may have been a connecting route for people moving from North to South and vice versa already during Neolithic times. These passing groups naturally came into contact with the local population who adopted certain elements of ceramic decoration from them. Only in the late Neolithic and Early Bronze Age do we see clear evidence for people of foreign origin settling down in the Anning River Valley. They came not only from neighboring Puge, probably following the Zemuhe 則目河 to Lake Qionghai, but also from places further away such as the upper Minjiang or even Gansu. Coming from the North, their route of travel probably led along the Xiaojinchuan 小金川 or Dajinchuan 大金川 in Jinchuan 金川 in northwest Sichuan through the river valley of the Daduhe to Shimian, then following the Nanayahe 南亞河 further south and reaching the Anning River Valley in Mianning.

Whereas the influence of people from Puge on developments in the Anning River Valley is hardly noticeable, interaction with the northern groups are clearly visible in ceramic forms and the advent of metal technology. The relatively rapid acculturation of the foreign groups visible in ceramic technology, forms, and even burial customs, indicates that contact was close, involving various kinds of social interaction probably including intermarriage, adoption, and/or other forms of integration. At the onset of the tradition of building megalithic graves, these foreign groups seem to have been already fully integrated. This new burial tradition and the increasingly complex rituals surrounding it seem to have been a local development in the Anning River Valley that drew in and united people from all throughout the valley and even the adjacent mountains. Although the megalithic graves contain evidence for a wide range of outside contacts, mostly toward northwest Sichuan, to a lesser extent northern Yunnan and Yanyuan, and rarely toward the East, they are less the sign of immigration but rather indicators of more superficial or indirect kinds of exchange through intermediaries. Considering the close similarities in object assemblages and burial customs between Northwest Sichuan and Northern Yunnan and the idiosyncrasies of the megalithic graves of the Anning River Valley, it seems that for outside groups at that time the Anning River Valley had become a place to move through rather than to settle down. This changed only with the advent of them Han, to whom the Anning River Valley was both an important entry way into Yunnan and the starting point of the Southern Silk Route, and a place to settle and set up a new stronghold on routes for trade and military campaigns throughout the Southwest.

The entry ways into the Anning River Valley from the Chengdu Basin and beyond must have run from the Daduhe either along the Nirihe through Yuexi and into Luguzhen 濾沽鎮 in Mianning or along the Guanmiaohe through Meigu and Zhaojue directly to Lake Qionghai in Xichang. In spite of the hazardous nature of the access route through Meigu and Zhaojue, the Northeast seems to have served as the main thoroughfare for the Han and other groups trying to move into or out of the Liangshan region toward the East. A safer but apparently less-used option would have been to follow the old North-South contact route through the Anning River Valley, turning toward the East in Shimian toward Hanyuan and the Chengdu Basin instead of venturing further north. Why a more cumbersome and dangerous route through a seemingly unattractive area such as the mountains of the Northeast should have been chosen over a well-established safer path is not quite clear. It is obvious, however, that serving as a thoroughfare has made Zhaojue a meeting place for many people from many different places and cultures who came and sometimes even stayed for a variety of reasons still poorly understood. The relationship of the different groups intermingling here seems to have been one of mutual acceptance. In spite of their readiness to incorporate foreign elements even in their graves, the local groups nevertheless preserved certain unique traditions of their own that had developed in the relative seclusion of the mountains.

Some local people also seem to have left Zhaojue and Meigu, moving into the less forbidding mountains of Puge following the Mashuihe which eventually connects to the Jinshajiang around Qiaojia and also provides access Huidong and Huili, although in a roundabout way. Unless one wanted to travel first into the Anning River Valley and then from there to Huili or take a path leading directly across and through the high mountains, this would be the only possible connection between the Northeast and the Southeast.

Even from the Anning River Valley Huili is not easily accessible and it is therefore not surprising that the cultural groups there follow their own path of development independent and different from what occurred in the Anning River Valley or any other part of the research area at the same time. There is no direct connection between the Anning River Valley and the Southeast, but the slight similarities in ceramic decoration motives between Huili Dongzui and various Neolithic sites in Dechang and the close resemblance in ceramic forms between Huili Fenjiwan and Xichang Lizhou shows that a contact route must have existed already during the mid or late Neolithic. People may have followed the Anninghe to the Jinshajiang, entering Huili through the only moderately hilly areas in the South; another option would be to cut directly through the mountains between Dechang and Huili, much as the modern highway does but without modern-day equipment to cut a road into the sheer rock of the mountains. Future survey work along both routes might help to solve the question of which of these possible avenues may have been used.

Considering how the terrain of the Southeast slopes down gently toward Yunnan, the close connection between communities on either side of the Jinshajiang is not surprising.

Nevertheless, the Jinshajiang still forms a formidable barrier that can only be crossed at a few points; in spite of constant contact with Yunnan, independent developments took place in the southeastern part of the research area (including the northernmost part of Luquan). Furthermore, people from this sub-region seem not to have ventured out too much, as the lack of typical local objects in other places indicates. The fertile soil, pleasant climate, and highly varied and abundant fauna and flora are indeed an ideal environment to live in that would have attracted considerable numbers of people from the northern mountains had it not been so difficult to reach.

At a later time, the rich metal resources of Huili and Huidong were probably a great attraction for metal-working groups in other places, but the local interest in metal seems to have remained low. Metal seems to have been extracted and smelted locally, as the finds from Huili Washitian show, and metal from the Northeast may have been exported to places as far away as Yanyuan (following the Jinshajiang), to Lake Dian (be it along one of the many side arms of the Jinshajiang flowing south or through the gently sloping hills in between), and possibly even the Sichuan Basin (be it through the Anning River Valley, along the Jinshajiang, or through Zhaotong in northeast Yunnan).

All of these contacts are only reflected in a small number of objects, some of which (such as the Shu-type weapons) may have reached Huili through various intermediaries; however, the presence of evidentially highly-valued Dian bronze drums in the deposits of Huili Guoyuan and Luoluochong and the Yanyuan-style bronzes in the graves of Huili Guojiabao reflect a more direct kind of contact. The burying group of Guojiabao had probably relocated from Yanyuan to Huili, possibly to facilitate exchange of salt and metal between the two sub-regions, and the drums may have reached Huili through a network of elite exchange. At the current stage of research it is by no means proven that metal from Huili was traded outside of the area prior to the advent of the Han, and it is likewise unsure if the salt of Yanyuan was exploited and widely traded at this time. Considering the clear indicators for wide-ranging exchange networks for both of these places, it is a likely supposition that salt and metal were the *movens* behind these contacts, but further survey work, excavations, and metal analysis of objects from all of these places are necessary to move this suggestion from mere speculation to certainty — or to refute it.

Whatever the source of wealth and power of the people in the Yanyuan Basin may have been, it led to the development of a highly stratified society and allowed the local elite to amass a large number of valuable objects from many different places; however, the graves containing all these objects date to the 2nd century BC and later, and earlier developments in the Southwest are largely unclear. The considerable number of idiosyncrasies in object types and burial rituals observable in the Yanyuan Basin, indicate that the remote location might have allowed for the development of a unique local culture. After all, the Yanyuan Basin is surrounded by high mountains that are particularly steep in the East, North, and Southeast, and only a little less forbidding in the Southwest, from where the Meiyuhe enters the Basin.

It is therefore not surprising that connections with the Anning River Valley, which would have had to go directly through the mountains and across the Yalongjiang or in a long detour along the Jinshajiang, entering the Yanyuan Basin from the Southwest, were limited. Nevertheless, people from the Anning River Valley seem to have made it as far as Ninglang, although those were probably single instances of migration rather than patterns of constant exchange. Connections with places even further East such as the Shu or the Dian culture realm may have been indirect, with the objects passing through various instances of exchange and gift-giving, possibly in elite circles as the nature of the objects suggests. The large drums, if they were indeed part of an elite exchange network, might have come in a more direct way, be it through emissaries or members of the Dian elite themselves, possibly through Yuanmou and along the Jinshajiang, but other routes are perceivable as well.

The communities in Ninglang were clearly part of the culture group inhabiting the mountains in the utmost Northwest of Yunnan (i.e. Deqin, Yongsheng, Yulong). Their relationship with groups in northwest Sichuan seems to have been close in spite of the difficult terrain in between the two places. Possible routes of contact would lead over the Litanghe 理塘河 or Yalongjiang to Kangding or Danba in northwest Sichuan and they might traverse through Yanyuan and/or the Anning River Valley, but the distances are considerable, the roads dangerous, and the exact routes unclear. Nevertheless, the archaeological assemblages from the mountains in the southwestern part of the research area and northwest Yunnan show a much closer similarity to each other and to the archaeological finds from northwest Sichuan, than they do to material from central or northeast Yunnan. The people who lived in the mountains seem to have stayed in the mountains and contact with the agriculturalists in the wide river valleys of adjacent parts of Yunnan seem to have been rare.

In the Yanyuan Basin, the situation is different: The special burial customs observed there combined with the importance attached to horses and armed combat, and the vessels with double-spiral decoration, indicate that the group who settled in the Yanyuan Basin was of a northern origin, possibly even coming from a place beyond northern Sichuan. If people from the northern steppe or the Ordos region did indeed venture into Yanyuan, they probably reached the Yanyuan Basin by way of the Daduhe and Yalongjiang in northwest Sichuan, but it might just as well have been people from northwest Sichuan who moved into the Yanyuan Basin. Another noteworthy point is the presence of signs of northern influence spanning a wide time period but all present in the same graves of the 2nd century BC or later. A possible explanation would be that the relative seclusion of the basin in between the high mountains allowed for the continuation of design elements and object forms long after they had fallen out of fashion in the place where they first occurred. Furthermore, certain elements such as the depiction of horses on objects of ritual function may have developed independently, emerging from a society that placed great value on horses and horse-riding without imitating objects from places and times as far away as the Luristan bronze tradition of Iran.

The communities in the valleys of Yongsheng are only marginally related to any other groups living throughout the research area. They are instead closely connected with people living in neighboring parts of Yunnan characterized by a similar environment such as Dali. The terrain is crisscrossed by a large number of rivers and overall only hilly without dangerous mountains blocking the way, and the possible contact routes are therefore plentiful and do not require detailed description. Nevertheless, the assemblage of Yongsheng Duizi is so far perfectly unique, combining local idiosyncrasies with close relationships (possibly through marriage bonds or similar social ties) with groups in Dali, as well as possibly connections with groups in the mountains further north or even in the Anning River Valley. Furthermore, Yongsheng was linked to the cowrie exchange network running through Yunnan, as were Yanyuan, Huili, and Zhaojue. The most likely route along which cowries might have been transported from the Pacific Ocean into Southwest China runs from India through Burma into Yunnan, but the details of this route are unclear. Considering the small number of cowries found in the research area, it is not unlikely that they passed through many hands in various kinds of exchange, and that their final resting place was not actually on or even closely connected to this far-flung exchange route.

The various exchange routes and contact networks suggested here necessarily paint a somewhat oversimplified picture, but the geographic preconditions and practical questions of such exchanges as well as the actors involved and some of the possible underlying motivations for movements and interactions have become clear. In the future, the routes suggested here can serve as a basis for further survey and excavation work that will help to clarify the relationship between the different groups identified in this study and the connections of both with other parts of Southwest China and beyond. At the present juncture, it has already become clear that the research area has attracted many people and groups for a long time, both as a place to settle, a place to extract various resources from, and a place to traverse on the way to other regions, especially toward Yunnan and later even South and Southeast Asia. Although the direction of movement was mainly one from North to South and to a lesser extent from East to West, contacts in the other direction have been identified as well. As especially the case of the various types of stone graves has shown, the material from the Liangshan area is crucial for understanding general prehistoric and early historic cultural developments and contacts throughout Southwest China and beyond, including the beginnings of the Southern Silk Route.

The highly varied environment and the large number of different groups who have lived in and moved through the research area since the middle Neolithic at the latest, have furthermore made it necessary to consider the geographic preconditions both for local cultural developments and for the movement of people and the contact between different groups and regions. This study has therefore provided an opportunity to reconsider general questions of human-environment interaction and inter-group contact that will be discussed further below.

VIII.5 Reconsidering Questions of Culture, Contact, and Human-Environment Interaction

Throughout the preceding chapters, it has been stressed that the environment is more than a mere backdrop or a stage on which the story of cultural development and inter-group interaction is played, and it is also more than a limiting or determining factor. The geomorphology, climate, and hydrology of any location can be met with a number of different strategies. The rich environment of the Anning River Valley, for example, can and was used in various forms of mixed economy, relying most heavily on agriculture, fishing, or hunting and gathering. It is likewise possible for different groups to inhabit different parts of a given region, each specializing on one form of subsistence most suitable for the chosen micro-area (e.g., hunting in the forested mountains of Puge) and trading other goods from neighboring groups pursuing a different mode of subsistence.

The forms of contact that take place in such a scenario are likely interactions between equals who may or may not decide to embark onto close kinds of social contact such as common gatherings or even intermarriage, which leave a more profound imprint on any given community and its material traces than a purely economical exchange of perishable goods. If the subsistence practices of different groups are particularly unlike each other and furthermore connected with different belief systems (as for example in the case of the inhabitants of Puge to whom hunting and the hunted animals seem to have had a profound cultural and ritual meaning), contact between the different groups may remain fairly superficial. Close social connections between communities that may even regard themselves as culturally related is usually visible in the archaeological record as strong similarities in material culture, even if economic exchange did not play an important role in their interactions. Groups in different micro-areas (e.g., in different parts of the Anning River Valley with slightly different geomorphological characteristics such as Dechang, Mianning, and Xichang) might still be characterized by slightly different traditions of ceramic decoration or have different preferences in object forms, reflecting the presence of different identities, i.e., various sub-group identities existing simultaneously with a group identity encompassing various groups living in a certain sub-region (e.g., the majority of communities living in the Anning River Valley during the Neolithic).

Shared religious beliefs connected with complex and laborious rituals such as those surrounding the megalithic graves can unite a variety of different groups, leading to the emergence of a new supra-group identity transcending previous cultural and local group boundaries without necessarily obliterating them. The case of the megalithic graves furthermore shows that religious beliefs or traditions can transgress natural and cultural boundaries but do not travel completely freely either. Depending on their nature and depending on the character of the groups involved, the adoption of foreign religious practices and beliefs may require personal experience and participation in group practices rather than a recounting or teaching of abstract "ideas" transmitted from mouth to mouth. If such an experience is given, foreign practices can be adopted by people with a different cultural identity living in a region where the same practices are exceedingly more cumbersome to conduct or disadvantageous to the group. In the wide Anning River Valley around Xichang, blocking off some of the most fertile agricultural land by building megalithic graves on it may not be an economically sound decision, but it would not seriously endanger the groups living there. In Puge, however, where flat ground is scarce, building megalithic graves on some of the best parcels of land is not an advantageous decision, not even for a group pursuing mixed economic practices with an emphasis on hunting.

Other religiously motivated practices such as the orientation of burial monuments and/or the deceased toward a river or a mountain (seen in Huili, Zhaojue, and the Anning River Valley), or the interment of cobbles for the life-giving river running through the region into the grave (seen in Huili and Yanyuan) may arise in different places independently. People depended on nature for their survival, and rivers and mountains naturally become associated with divine powers. The same applies to the use of stone of special quality or stone or soil from special places in the erection of burials or other monuments, as reflected in the megalithic graves of the Anning River Valley, the silt pits in Xichang Dayangdui, and possibly other forms of stone-construction graves throughout Southwest China as well. At the same time, burial traditions can be influenced by geomorphological preconditions, even if the burying group might not be aware of it. The location of graves at elevated spots on particularly steep hill slopes in Zhaojue may be explained by a local group as a means of brining the deceased closer to a holy place, but this practice at the same time preserves the scarce flat land for agricultural activities.

Living in high-risk marginal environments can lead to a wide range of different reactions, as does living in particularly congenial places. Neither people in Huili nor in the Anning River Valley seem to have felt much of a need to venture far outside their own sub-region, but they managed their local resources differently and showed different reactions to people moving into or through their territory. Most communities in Huili seem to have made use of the ample local resources through a mixed economy avoiding a sole reliance on work-intensive and high-risk agriculture and never settling long in the same place; however, the long-term settlement of Huili Dongzui, which was likely inhabited by a foreign group with a mainly agricultural subsistence practice, shows that the local environment can be used in a different way as well. It is interesting to note that the people living in Huili Dongzui seem not to have had strong connections to other local communities, possibly because their different life ways made them too foreign to each other for much social interaction. Especially during later periods, people in the Anning River Valley relied increasingly more on agriculture instead of continuing mixed forms of economy with equal amounts of hunting, fishing, and planting of various crops. The fertile environments of the Center and the Southeast of the research area lend themselves to either.

In both sub-regions there are examples of various different reactions to foreign groups moving in or through the area. In both places there are instances of foreign communities living separately from local groups without much acculturation, imitation, exchange, or mixing of the populations (e.g., Huili Dongzui and Guojiabao, Xichang Yangjiashan). Furthermore, in both regions there are clear instances of local groups adopting certain parts of foreign object forms or decorations, but the mechanisms of this adoption are highly varied and not always clearly identifiable. They include various types of interaction (including exchange, intermarriage, communal celebrations) with foreign people who had settled in the vicinity, the integration of single individuals of foreign origin (be they lone immigrants or members of groups living at medium or further distances who had social relations with the local group in question), medium- or long-distance economic exchange with other groups, or fleeting contact with groups traveling through or settling down in the vicinity.

Among the Neolithic and Early Bronze Age groups of the Anning River Valley, a combination of all of these different reactions seems to have taken place. Furthermore, certain groups who moved into this sub-region were slowly acculturated while at the same time leaving their imprint on local cultural developments (e.g., the group of probable Qijia-origin at Xichang Qimugou). In a much-traversed area such as the Anning River Valley, such a mixture of different reactions to and of foreign groups or single people moving through or into the area seems natural. During the time of the megalithic graves, however, the interest of foreigners to stay seems to have declined or they were more rapidly acculturated to local ways of living and burying. At the same time, foreign decorative elements and weapon forms were readily adopted and imitated by the local population, but the burial customs remained unique and the overall set of cultural expressions stayed rather idiosyncratic, indicating a fairly solid local cultural identity.

In Huili, archaeological evidence speaks for limited interest in foreign objects or foreign contacts beyond the immediately adjacent parts of Yanyuan, except for a few instances of probably elite-level encounters reflected in the presence of Dian-style drums and bells and a small number of cowrie shells. It is furthermore remarkable how limited the interest in metal objects among people in the Southeast seems to have been in spite of the abundance of local metal quarries that were clearly exploited. As the comparison with Yanyuan shows, the presence of a valuable and widely-traded resources (e.g., the salt in Yanyuan or the metal in Huili) can but does not have to lead to the emergence of a highly stratified society with an elite that controls said resource and/or exchange.

The example of Yanyuan furthermore indicates that exchange of valuable resources do not have to be conducted in a mercantile type of transaction but can be an exchange between elites that may involve special objects of more than monetary value such as drums, staff-heads, or highly decorated weapons. Considering the presence of Dian-style bronze drums form different periods both in Yanyuan and Huili, i.e., in two sub-regions that hold valuable natural resources but are characterized by completely different social structures, one elite-driven, the other apparently lacking a clear elite, the contact network involving drums throughout Southwest China and Southeast Asia requires a careful re-evaluation. If the drums indeed symbolized a formalized alliance network between elites, as Alice Yao (2010) suggests, why should a place without a clear social elite be involved? On the other hand, if there was indeed such an elite network and Huili was part of it, one cannot help wonder why the presence of such an elite found no expression in the material record. This question may be answered with the help of large-scale excavation work at some of the large cemeteries in Huili, which may provide evidence on local social structures.

It has in any case already become clear that the presence of a valuable resource and/or integration into a wide-ranging elite-driven contact network may not necessarily lead to the emergence of a highly stratified society, but these preconditions can be part of the driving forces behind such a development. Another driving force may be a high-risk marginal environment as the case of Yanyuan shows. The harsh mountains around the Yanyuan Basin, the relative scarcity of arable land, and the dry climate, possibly combined with the presence of a valuable resource, may have contributed to the development of a society that valued combative abilities. The preponderance of weapons all throughout the mountains of Yanyuan, Ninglang, and Yongsheng, as well as northwest Yunnan and northwest Sichuan clearly shows the competitive nature of the groups inhabiting the area, whereas communities living in the adjacent fertile river valleys in northern Yunnan do largely not bury their deceased with weapons. These communities inhabiting the valleys pursue a settled, agricultural way of living, whereas for the groups living in the mountains hunting seems to be important.

Although the natural environment may play a role in the emergence of these strong cultural difference between groups living in neighboring regions, the examples of the Yanyuan Basin, Puge, and Zhaojue show that the emergence of a combative society is not the only possible reaction to a marginal environment, nor is settled agricultural living the only possible reaction to the presence of flat arable land. Puge and Zhaojue are both characterized by high mountains ill-suited for agricultural activities, and the groups living in both areas practice hunting, but they balance out the lack of suitable arable soil in different ways, and neither of them is characterized by a particular emphasize on weaponry apart from arrowheads. The people of Puge seem to have practiced limited amounts of agriculture and fishing while at the same time probably trading with agricultural groups in the Anning River Valley; the people of Zhaojue pursued a mixed form of subsistence that helped them to mitigate the high-risk marginal environment while staying independent from produce traded in from the outside. On the other hand, the combative nature of the groups in the Southwest and particularly Yanyuan may be connected with their possible northern origin: if they were indeed a group that had come from the steppes were horse riding and armed combat were the basis for economic success and high social status, such basic attitudes and social structures might be preserved even in an environment that might allow for agriculture as the Yanyuan Basin does. The character of any of these groups is just as much the product of cultural decision as it is influence by environmental preconditions and contacts with neighboring regions or foreign groups.

The reaction of groups living in marginal environments to foreigners moving into or through their territory can differ widely as well, as can the reaction of the immigrants themselves when they meet local people. In Yanyuan, it is not unlikely that assimilation of the local population and partial population replacement took place. A similar tactic was pursued by the Han throughout Southwest China. Another possible reaction is acceptance of foreign groups, be it by keeping apart from them without either trying to change or imitate them (as seen in Puge and Huili), be it by assimilating them completely, or by entering into various forms of social relations with them that may lead to reciprocal influence (as seen in various forms and degrees in the Anning River Valley, Huili, and Zhaojue). A particularly fascinating example of the latter of these various alternatives is Zhaojue, where various groups — both local and foreign — intermingled and lived next to each other, accepting each others different burial traditions (see Chapter VIII.3.5 for a detailed discussion). The local population seems to have incorporated objects, object forms, and even grave forms they saw with foreign groups into their own repertoire while at the same time preserving certain idiosyncrasies in their burial traditions.

It is therefore possible for many different groups to live together in such a contact zone, intermingling, imitating, and accepting each other while at the same time preserving a separate group identity. This serves to show that contact zones and marginal environments with limited resources are not necessarily places of conflict and contrasting identities displayed in a conspicuous manner, but they can be places of low-conflict coexistence and interaction. Furthermore, foreign objects can be received in many different ways, depending on where they come from, how they reach their destination, and how they fit into the repertoire of the groups who receive them. In the case of Zhaojue, we see both the treatment of Han bronzes as precious foreign goods, and the incorporation of foreign ceramic types into the local repertoire. Both kinds of reactions can be seen in Huili as well, although the interest in foreign objects seems to have been limited.

The graves in the Yanyuan Basin combine a number of probably highly valued imported objects (some of them having come trough direct elite-level exchange, others probably through indirect forms of exchange) with local imitations of foreign object types (mostly weapons) and unique local forms of relatively low quality (mostly staff-heads and swallow-shaped applications). All of these different elements usually occur together in particularly richly equipped graves following unique local burial customs. This mixture combined with the lack of evidence for the presence of foreign individuals indicates the existence of a far-flung contact network reaching in many directions and to many places, as well as a strong interest in foreign objects as prestige goods for the local elite. It seems, however, as if foreigners themselves were either unwelcome or so completely assimilated into the local group that they are not identifiable in the archaeological record. The somewhat isolated geographical situation of the Yanyuan Basin would have greatly facilitated such a partial seclusion and selection in contacts.

This combination of seclusion and far-reaching contacts reflected in the archaeological material both from Yanyuan and Zhaojue furthermore throws an interesting light on the influence of geographic preconditions on the emergence and nature of various contact network, as do the rather independent Southeast and the transit region in the center. The presence of a viable route of travel in various directions (such as the Anninghe with its connection to the Jinshajiang and close proximity to the Daduhe) does not necessarily mean that the people living along such a route are necessarily interested in making use of it. They are likely to encounter many foreign groups and individuals traveling along this route — of course unless they decide to block it — and may gain access to foreign goods from many places, but how much they want to accept and how strongly they may be influenced by foreign customs is largely a function of the particular situation of the local group at the time and the nature of the incoming groups. In the middle and late Neolithic, when the groups in the Anning River Valley were less unified, they readily accepted foreign influences, but the strong bonds of the new supra-group identity surrounding the megalithic graves, acceptance of foreign cultural traits declined, even though foreign objects were accepted and used. Cultural decisions are therefore just as important as local geographic preconditions, or they might be even more important, as the existence of vivid contact networks through extremely mountainous and hazardous terrain shows.

The *movens* behind the existence of some of these exchange networks and routes of migration may be pure necessity: the "push" of a harsh environment in the place of origin of the travelers and the "pull" of fertile valleys or special resources such as metal or salt in the distance can clearly move people to traverse a terrain that seems to present hardly any reasonable passage way. Before whole groups of migrants may embark upon such a journey, they must have received some news from scouts moving ahead and returning, as Anthony has suggested, or from members of foreign groups moving in the opposite direction. The reasons for scouts to move ahead may be manifold, including economic necessities, social pressures, religiously motivated quests, maybe even personal motives such as curiosity. In any case, if the pull and push factors are strong enough, a dangerous route may change from a deterrent for movement into an obstacle to be overcome.

It is certainly remarkable that one of the least accessible parts of the research area (i.e., Yanyuan) shows the largest number of indicators for outside connections in all different connections, and that the most dangerous thoroughfare into the Anning River Valley (i.e., Zhaojue) seems to have been the most travelled. This shows clearly that a simple calculation of likely routes based on geomorphological characteristics (e.g., through least-cost-path analysis or other forms of geospatial calculations) might not go far in explaining past avenues and mechanisms of mid- and long-distance exchange. Even the identification of natural resources and other pull factors may not be enough, especially if it is not completely clear if they have been exploited in the past. As this study has shown, we instead need to consider geographic factors at the place of origin, the destination, and the area in between, as well as local cultural developments, social structures, and religious beliefs as far as known on both sides of the proposed contact.

The highly complex case of the Liangshan area clearly shows that any of a wide variety of different types of inter-group interaction — such as various forms of migration (temporary or long-term, single or in groups, to a known or unknown place), direct or indirect trade through an infinite number of intermediaries, social relations (such as intermarriage, adoption, communal events), elite-level exchange, integration, acculturation, imitation, emulation — can and do take place simultaneously and can often be identified in the material record. To ascertain the nature of this exchange, detailed studies and a deep understanding of the recipient community, as is a thorough understanding of the groups at the other end of such an exchange. This study has combined all of these different aspects, painting a multi-dimensional picture of local and regional developments and intra- and inter-regional contacts. Furthermore, the last chapter has provided an overview of indicators for a wide variety of long-distance contacts. A detailed analysis of the local preconditions on each end (and all intermittent steps) for long-distance exchange between places as far away from each other as the northern steppe and Yanyuan will require a various separate studies. Nevertheless, based on the detailed analysis of the material from the research area I was already able to provide a few suggestions as to the nature of the various instances of long-distance exchange, the routes taken, the actors, and their motivations for such movements.

Throughout the study, it has furthermore become clear that questions of identity, contact, and human-environment interaction cannot be treated separately but have to be considered in concert. Starting from the micro-level of single objects, moving on to single features and sites, then continuing to sub-regions and regions before addressing questions of contact and large-scale development on the supra-regional level (i.e., Southwest China and beyond), allows for a deepened understanding and far-reaching inferences securely based in material evidence. Approached in this fashion, the highly complex archaeological material and natural environment of the Liangshan region provides a unique opportunity for reconsidering mechanisms of inter-cultural contact and human-environment interaction, as well as their reflection in the archaeological record, both for this study and for many future studies on the micro-, macro-, and intermediate level.

Appendices

Appendix A: Catalogue

This catalogue comprises material from 314 sites from 20 counties in the two provinces of Sichuan and Yunnan. Given that some site names appear several times but in different counties, the site names are always presented as two-partite names, starting with the county name, followed by the site name. I have assigned reference numbers to all sites in alphabetical order, which are used on maps and in tables to facilitate cross-referencing (Figure 1.6). The sites are organized by the highest distinguishing institutional unit (province, prefecture, or prefecture-level city respectively), followed by county, and then site names in alphabetical order. The names and exact location are provided both in English and in Chinese characters, observing the customary sequence for each language, i.e. the English names are provided starting from the smallest unit – the site or village – and end in the highest unit – the province -, while for the Chinese names the sequence is reverse. The transcription system used throughout is pinyin and all characters are written in the traditional form (*fantizi* 繁體字). To simplify the use of this catalog, I am providing several reference tables listing all sites by reference umber and county name, sites by site type, sites by site name, and an overview chart on the extent and reliability of information on the different sites (Appendix B).

The main information provided in every entry are: site type, status (excavated or surveyed), reliability index, location, site morphology, surface are, natural and man-made environment, researchers, storage (of finds), data sources (publications and/or personal encounter with the material), site description, cultural layers, and (if applicable) information on features, finds by material type, absolutes dates, date suggested by excavators, relative chronology, and suggested cultural affiliation. The reliability index is composed of the four factors: amount of field research (i.e. extensiveness of excavation and survey work), preservation, state of publication, and access to original material, with a maximum number of 2 or 2.5 points per category, resulting in a maximum of 8 points altogether and a minimum of 1 points, as unknown and unreported sites can naturally not be listed. The evaluation scale is the following:

1. Fieldwork: 0-2 points

several excavations	2
one excavation	1.5
trial excavation	1
extensive survey	0.5
survey	0

2. State of Publication: 0-2.5 points

fully published	2.5
extensive preliminary report	2
preliminary report	1.5
mentioned with some details	1
mentioned	0.5
unpublished	0

3. Preservation: 0-2 points

well preserved	2
slightly disturbed	1.5
disturbed	1
badly disturbed	0.5
destroyed	0

4. Access to material: 0-1.5 points

access to all original material	1.5
access to most original material	1
access to some original material	0.5
no access to original material	0

The number provided in the column "accuracy" in Table IX.1 is an indicator for the reliability of the site location provided on maps throughout the dissertation. The different levels of accuracy are:

5	coordinates taken myself
4	exact coordinates published
3	rough coordinates published
2	map published
1	location description published
0	exact location unclear

This is an important piece of metadata that helps to judge the relative accuracy of the different geographical analyses conducted in this dissertation (Table IX.4).

1. Liangshan Yi Autonomous Prefecture 涼山彝族自治州

1.1 Dechang County 德昌縣

Dechang Arong 德昌縣阿榮 (DAR) [1]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 6

Location: Arong Village Group 4, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮阿榮村四組

Morphology: second-level terrace, level 1345 m asl.

Surface Area: 15.5 m^2

Natural and Man-Made Environment: on eastern bank of the Anning River, 450 m east and 25 m above the river, level ground, red clay soil, agricultural fields around,

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research:

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a and 2006e, Zhongguo Wenwuju 2009, data collection

Features: 5 megalithic graves, 13-60 m distance between them, 4 graves excavated, M1 and M3 (240°) and M2 and M4 (150°) aligned the same way, around graves ground paved with pebbles, probably as a means of moving the large stones (Liu Hong 2009:72)

M1: *orientation*: 240°; *form*: rectangular

construction: 8.2 by 1 by 2.3 m (inner), 9.5 x 2.4 (outer measurements); *walls*: made of large boulders (7-8 per long side, 1 large one for the back) with smaller stones to fill in the gaps; large boulders resting in a regular ditch (0.44-0.72 x 0.25-0.32; lower than grave floor), space filled in with small pebbles, stabilizing the boulders, between earth of tumulus and stone walls large number of smaller stones probably meant to meet the pressure of the large stones and preserve the construction; *floor*: 0.4 m sunken into virgin soil, layer of pebbles of 3-8 cm diameter; soil under that of rammed earth; *cover*: several large boulders, 2 of them broken; *door*: on one of the short sides, agglomeration of small stones, between them broken pottery sherds; *tumulus*: partially destroyed, 12 x 6.1 x 1.8 m; *tail* sloping up the hill

content: 4 layers, 1. loose grey clay-loam with red-baked earth, 2. firm grey clay-loam with red-baked earth, 3. firm grey-brown clay-loam, few ceramic sherds, 4. loose grey-brown clay-loam, ash, ceramic sherds, bronze ornaments, bronze spear heads, bone beads; directly behind the door and partially under the closing stones many ceramic sherds, all badly broken, no human bones; close to the door iron knife and significant number of scattered ceramic sherds; 66+ ceramic vessels, 2 bronze vessels, 2 bronze ornaments *outside installations*: door at one short side, on each side 1 large stone boulder erected, creating a folding-screen-like construction, trapezoidal (*bazixing shi* 八字形石) stone construction in front

M2: *orientation*: 220°; *construction*: rectangular, nearly completely destroyed; 2.5 x 2.2 x 0.7 ext., made of large and small stones

M3: *orientation*: 150°; *construction*: rectangular; grave chamber: 9 x 3 x 2.2 m (outer measurements), 7.2 x 2.3 x 1.9 m (inner measurements); *walls*: large boulders placed in ditch of 1.2 x 0.28-0.4 m, surrounding area of 8.6 x 3.5 x 0.8, gap filled with small pebbles, earth, stones; 15 large stones, smoothed surface towards the inside; gaps filled with small stones and soil; *floor*: layer of pebbles of 4-8 cm diameter; soil under that of rammed earth; *cover*: 6 large stone boulders, max. 2.8 x 1.8 x 0.7 m, 8.75 t, min. 0.43 m^2, 1.5 t, irregular, smoother side turned towards inside of the grave; *door*: in the middle of the eastern long side, 0.8 m wide;

tumulus: made of 4 layers, 1. 0-0.6 m of yellow-brown clay-loam with small stones, 2. 0-0.44 m of black-brown clay-loam with small stones, 3. 0-0.26 m of yellow-grey clay-loam with carbonized grass and wood, 4. 0-0.28 m of black-brown loam with many stones; between tumulus and walls of the grave chamber gap of 70-140 cm width building a pit, starting below layer 1, cutting through layer 2-4, filled in with rectangular stone slabs, yellow loam/clay, pebbles; probably to support the stone construction of the grave

outside installation: access ramp, largely destroyed; on eastern side of the door, 1 erected stone, 2 on western side

filling: 2 layers, 1. layer: black clay-loam, 2. layer: yellow-gray clay-loam of 0.46-0.72 m thickness, bone fragments and 1 iron knife at eastern short side, ceramic fragments close to the bottom of the grave along northern long-side; few fragments of human skulls and long-bones, number of interments unclear; 15 ceramic vessels, 1 iron knife, 2 turquoise beads

M4: *orientation*: 240°; *construction*: rectangular; *grave chamber*: 9.4 x 3 x 2 m (outer), 8.3 x 1.8 x 1.6 m (inner measurements); *walls*: made of large boulders, south 8, north 7, inner side relatively smooth, some maybe worked; large boulders resting in a regular ditch which fits them neatly; *floor*: tumulus resting on foundation of purple-reddish stones, tightly packed to create an even surface, extends also the way to the tail, 0.6 m high, 0.4 m sunken into virgin soil, layer of pebbles of 3-8 cm diameter; soil under it of rammed earth; *cover*: 6 large boulders, between them small stones to fill in the gaps, largest 1 m^2, 3.5 t, smallest 0.2 m^2, 0.7 t; *door*: on one of the short sides, 0.72 m wide, stones broken

tumulus: disturbed, highest at the tail (1.16 m), large amount of ceramic sherds inside

outside installations: tail of 2 large stone boulders sloping up the hill, access ramp, on each side 1 large stone boulder erected, creating a folding-screen-like construction, trapezoidal (*bazixing shi* 八字形石) stone construction in front

content: close to the collapsed door iron knife, large number of scattered ceramic sherds; 13 layers, 3 in the front part, 5 in rear; *front*: 1. dense yellow-grey clay-loam, 0.3-0.82 m, 4-handled *guan* beaker, 2. loose grey-brown clay-loam, red-baked soil, 0.5-0.8 m, 3. yellow clay-loam, 0.04-0.22 m, double-handled *guan* beaker, spouted *hu* pots, bronze *zhuo* bracelets, oblong stone objects, below virgin soil; *back*: 1. dense grey clay-loam, 0.05-0.31 m, some red-baked soil, ash, iron nails; 2. yellow clay-loam with some black and grey spots, dense, 0-0.08 m, close to tail; 3. loose grey-brown clay-loam, 0.3-0.47 m, many stones, lumps of red-baked soil, ash, some ceramic sherds; 4. loose yellow-grey clay-loam, 0.27 m, red-baked soil, ash, ceramics; 5. dense yellow clay-loam, 0.3-0.33 m, number of ceramic spouts, agate beads; overall 14 ceramic vessels, 2 bronze bracelets, 1 oblong stone tool, 1 agate bead, iron nails

M5: unexcavated; *orientation*: 285°; *construction*: rectangular, cover and sides made of large stone slabs, badly disturbed, 8 of the wall stones extant, top stones largely missing, ext. measurements: 6.2 x 2.5 x 0.8 m, tumulus largely disturbed, 15.5 m diameter

Ceramic Objects: mainly black and brown, but also some gray sad-tempered ceramics, burned at low temperature, leaf-vein pattern on most vessel bottoms

M1: 66 *guan* beaker with and without handles; *M3*: 15 ceramics, 6 *guan* beaker, 3 with one, 2 with two and 2 without handles; 2 spouted *hu* pots, 2 handles, 3 bottoms; *M4:* 14 ceramic object, 3 double-, 1 four-handled, and 6 *guan* beakers without handles, 1 *pen* basin, 2 *hu* pots, 1 bottom

Metal Objects: *M1*: 2 bronze *mao* halberds, 2 bronze ornaments; *M3*: 1 iron *dao* knife; *M4:* 2 bronze *zhuo* bracelets, iron nails

Stone Objects: *M3:* 2 turquoise beads; *M4*: 1 oblong stone tool, 1 agate bead

Relative Date: iron knife: Xichang Beishan, Xiaohuashan > upper layer Arong M3 > Xide Guluqiao M1, Xichang Huangshuitang; ceramics lower layer Arong M3 ≈ Miyi Wanqiu (early-middle Warring States to beginning of the Eastern Han)

Suggested Date: Warring States to Western Han

Dechang Ayong 德昌縣阿雍 (DAX) [2]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 200 m East of Ayong Village, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮阿雍村

Morphology: first-level terrace, 1311 m asl.

Surface Area: 50 m^2

Natural and Man-Made Environment: on eastern bank of the river, very close to the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 2 megalithic graves, 8 m between them, both oriented towards the West, **M1**: walls and cover made of large stone boulders, 8.6 x 2.6 m

Suggested Date: Warring States to Western Han

Dechang Ayue 德昌縣阿月 (DAU) [3]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 50 m NW of Ayue Village Group 10, Tongchang Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮銅廠鄉阿月村十组

Morphology: second-level terrace, 1511 m asl.

Surface Area: 50 m^2

Natural and Man-Made Environment: close to the river, south of a small road, plantings of millet, maize, rice paddies, potatoes, tobacco, mulberry trees

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 2 megalithic graves, rectangular, walls and cover made of large stone boulders

M1: orientation: 90°, 7.7 x 3 x 1.8 m, walls made of 11 stone slabs, cover made of 3 large stone boulders, door on one short side, made of 4 irregular stones

M2: orientation: 0°, 7.7 x 3 x 1.8 m

Suggested Date: Warring States to Western Han

Dechang Cizhuping 德昌縣茨竹坪 (DCZ) [4]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 60 m South of Cizhuping Village, Tongchang Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮銅廠鄉茨竹坪村

Morphology: on mountain-slope, 2604 m asl.

Surface Area: 30 m^2

Natural and Man-Made Environment: close to the river, south of a small road, plantings of millet, maize, rice paddies, potatoes, tobacco, mulberry trees

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, rectangular, walls and cover made of large stone boulders; orientation: 180°, 10 x 2.6 m

Suggested Date: Warring States to Western Han

Dechang Daba 德昌縣大垻 (DDB) [5]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 250 m East of Daba Village, Mali Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮麻裏鄉大垻村

Morphology: second-level terrace, 1452 m asl.

Surface Area: 490 m^2

Natural and Man-Made Environment: on eastern bank of the Anning River, very close to the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 4 megalithic graves, rectangular, walls and cover made of large stone boulders

M1: orientation: 180°, 9.8 x 2.8 m; **M2:** East-West oriented, 10.5 x 3.5 x 1.2 m; **M3:** East-West oriented, 8.1 x 4.7 x 1.1 m, **M4:** South-North oriented, disturbed, ext. width 2.7, ext. height 1.7 m

Suggested Date: Warring States to Western Han

Dechang Dachangba (Dashiba) 德昌縣大廠垻（大石包） (DCB) [6]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: Ayue Village Group 2, Dezhou Tongchang Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮德州鎮阿雍村二組

Morphology: first-level terrace, 1330 m asl.

Natural and Man-Made Environment: on eastern river bank, close to the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, rectangular, walls and cover made of large stone boulders; orientation: 300°, 9.4 x 3.2 x 1.2 m

Suggested Date: Warring States to Western Han

Dechang Dashipai 德昌縣大石排 (before: Chayuancun 茶園村) (DDS) [7+8]

Type: settlement site, megalithic grave site

Status: surveyed

Reliability Index: 4.5

Location: 300 m NE of Chayuan Village Group 3, Wangsuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣王所鄉茶園村三组

Morphology: second-level terrace, 1383.4 m asl (settlement) - 1383.8 m asl (graves)

Surface Area: 27347 m^2

Natural and Man-Made Environment: on western band of Cida river, 50 m East of the river, fields of wheat, corn, vegetables

State: well-preserved

Researchers: Sichuansheng Wenwu Kaogu Yanjiuyuan 四川省文物考古研究院, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所, Dechangxian Wenwu Guanlisuo 德昌縣文物管理所

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: listed in Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, and Liu Hong 2009, data collection 12/2010

Site Description: grey-brown sandy soil, 0.5 m cultural layers

Features: 1 megalithic grave, orientation: 20°, 11 x 3 x 1 m, rectangular, malls made of several large stone slabs, covered with 7 large stone boulders, 2 standing stones in front of the entrance

Ceramics: *surface finds*: coarse red and brown sand-tempered ceramic sherds, small stones visible in temper, low-burned, largely undecorated, some line decoration, flat bottoms, no other forms discernable

Stone Tools: *surface finds*: large coarse flaked and few polished stone tools, mainly of soft white-yellow to grey-yellow stone, *fu* axes, large chopper, *zao* pestle, square to rectangular polishing stones

Suggested Date: settlement: Neolithic to Warring States, megalithic graves: Warring States to Western Han

Dechang Dianma 德昌縣點馬 (DDM) [9]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: Dianma Village, Mali Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣麻栗鄉點馬村

Morphology: second-level terrace, 1400 m asl.

Surface Area: 3200 m^2

Natural and Man-Made Environment: on eastern river bank, close to the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 4 megalithic grave, rectangular, walls and cover made of large stone boulders; orientation unknown, all around 20 x 2-4 m

Suggested Date: Warring States to Western Han

Dechang Dongjiapo (before: Guanshanba) 德昌縣董家坡（原為觀山垻）(DDP) [10]

Type: settlement site

Status: partially excavated

Reliability Index: 5.5

Location: Dongjiapo, Shuipo Village Group 2, Wangsuo Township, Dechang County, Mimilang, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣王所鄉水塘村二組

Morphology: second-level terrace, level, 1373 m asl

Surface Area: 71171.8 m^2

Natural and Man-Made Environment: close to intersection of Anning and lower Cida River 茨达河, on second-level terrace of the western bank of the Cida River, 1 km from Anning River, 500 m East of the Cida River; train tracks from Chengdu to Kunming and highway from Dechang to Nanshan pass by in SW, 300 m from train tracks, 100 m from highway; mainly plantations of mulberry trees, some modern graves, area formerly covered with grave mounds, in 1960s leveled

State: slightly disturbed by late Qing graves and present-day agricultural activities

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Dechangxian Wenwu Guanlisuo 德昌縣文物管理所

Research: discovered in December 2008, surveyed, excavation November 21-29 2009, 10 excavation trenches of 5 x 5 m (2009LDDT1-10, T2, T4, T5 not excavated), 112 m^2 excavated, second excavation campaign October 25-30 2010, 10 excavation trenches, 9 of 4 x 4 m, 1 of 2 x 4 m (2010SDDT1-10), North-South extension 25 m, East-West extension 10 m, 250 m^2 excavated

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhou Zhiqing 2011, excavation notes 2009, excavation participation 10/2010

Site Description: on low hill, high in the East, low in the West; moat North of the hill, on other side modern settlement (Shuitangcun Group 2), cultural layers 0.2-0.5 m thick

Description Layers:

2009 Excavation

Layer 1: throughout the whole excavation area, loose grey-brown humus, 0.05-0.1 m thick, much modern trash, roots, Ming-Qing ceramic sherds, many Ming-Qing graves starting from here, cutting layer 2

Layer 2: thick in the South, shallow in the North, throughout whole excavation area, dense black-grey sandy soil, 0.15-0.2 thick, Han bricks, *wuzhu* coins 五銖錢, black and red sand-tempered ceramic sherds

Layer 3: thick in the South, shallow in the North, loose black-brown sandy soil, 0.15-0.5 cm thick; many objects, mainly red-brown sand-tempered ceramics and stone tools, house features and earth pits starting from here

Layer 4: thick in the South, shallow in the North, loose brown-red sandy soil, 0.1-0.3 m thick; small number of red-brown sand-tempered ceramic sherds, badly fragmented

Below layer 4: dense red-brown virgin soil

2010 Excavation

Layer 1: loose brown-red humus, 0.16-0.29 m, modern trash, roots, Ming/Qing porcelain

Layer 2: loose red-brown soil, 0.08-0.18 m thick, some red-burned earth, small stones, roots, modern trash, some stone tools

Layer 3: loose red-brown sandy soil, 0.1-0.15 m thick, many un-worked stones and stone tools, red-baked earth, many sand-tempered ceramic sherds, H1-4 starting from here

Layer 4: firm red sandy soil, parts loamy, many un-worked stones of different sizes, red-burned earth, small amount of sand-tempered ceramic sherds and stone tools, only in small part of the excavation area

Below Layer 4: dense red-brown virgin soil

Features:

2009 Excavation: 4 ash pits, remains of 1 building

H1: in SE of T5, eastern half cut off by rim of excavation trench, opening below layer 3, cuts layer 4; oval form, curved walls, nearly flat bottom; opening 1.5 x 1.46, depth 0.76 m; sides not evened out; filled with loose black-brown sandy soil; burned grass, sherds of sand-tempered ceramics, 1 stone tool

H2: in NE of T6, cut by eastern wall of excavation trench; starting below layer 3, cuts layer 4; oval form, curved sides, nearly flat bottom; opening 1.3 x 0.84, 0.6 m deep, sides irregular; filled with loose black-brown sandy soil, burned grass, sherds of sand-tempered ceramics

H3: in SE of T1, cut by eastern wall of excavation trench; starting from layer 3, cuts layer 4; oval form, straight sides, flat bottom; opening 1.82 x 1.4, 0.62 m deep, sides irregular; filled with loose grey-brown sandy soil, burned grass, sherds of sand-tempered ceramics

H4: in SE of T1, cut by eastern wall; starting from layer 3, cuts layer 4; oval form, curved sides, flat bottom; opening 1.62 x 1.24, 0.36 m deep, sides irregular; filled with loose grey-brown sandy soil; sherds of sand-tempered ceramics

F1: in middle of T8, starting from layer 3, cutting layer 4, cut by eastern wall of excavation pit, SE and NE corner cut by Ming graves; rectangular semi-subterranean building, opening 3.2 x 2.4, 0.23 m deep; uneven size, roundish, straight walls, flat bottom, 8 post holes (D1-D8) on all four sides, area of 0.8 m diameter of red-burned earth in the West, in the middle post hole of 0.3 m diameter and 0.2 m depth; in NE grey-yellow a round post hole with straight walls and flat bottom; in the middle thin layer of burned earth of 0.8 m, in the middle a round post hole with straight walls and flat bottom, diameter 0.3, depth 0.2; in NE grey-yellow occupation layer of 1.2-1.4 m width, maybe originally the entrance, loose grey-brown sandy soil, small number of red-baked earth pellets, charcoal, and clay blocks with grass imprint

2010 Excavation

H1-4: starting from layer 3, cutting through layer 4 into virgin soil, number of post holes, also below layer 3

<u>Ceramics:</u> mostly red-brown, some yellow-brown and black-brown sand-tempered pottery, no fine ware, some finely smoothed but most coarse, little stones in temper

2009 Excavation

Layer 1: mainly red-brown sand-tempered pottery, similar to material from layer 3 and 4, mixed with modern material, 7 *guan* jars, 2 dish-shaped, 1 with hooked rim, 3 with short and 1 with long outward-flaring rim, 1 flat bottom; incised zigzag, fishbone pattern, impressed point pattern on the rim, horizontal application bands, mainly sand-tempered red-brown ceramics

Layer 2: mainly red-brown sand-tempered pottery, mixed with Han tiles, coins, and handled vessels of black sand-tempered pottery; 15 *guan* jars, 4 with dish-shaped opening, 5 with short curved outward-flaring mouth, 6 with angular outward flaring mouth, impressed traversal point-lines or net-pattern on some, 1 small round coarse *bei* cup, 1 lid with knob-handle

Layer 3: mainly red-brown and a few sherds of grey-brown sand-tempered pottery, 31 *guan* jars with dish-shaped, curved outward-flaring, or sharply outward-turning mouth, with neck and shoulder decorations, mainly of incised net pattern but also line pattern, point pattern and a few application bands, 3 bottoms, 2 flat, 1 indented (faux ring-foot)

H1: broken sand-tempered pottery sherds, too small to reconstruct

H2: 1 *guan* jar of red-brown sand-tempered pottery

H3: 4 *guan* jars, curved or sharply outward-turning, 1 flat bottom, all red- to grey-brown sand-tempered pottery

H4: 11 *guan* jars of red- or grey-brown sand-tempered pottery, either curved, oblique, or sharply outward flaring, straight, or with dish-shaped mouth, with application bands with finger-tip impressed pattern below the rim, impressed point pattern or incised line pattern

Layer 4: all sand-tempered pottery, no fine ware, mainly red-brown, 13 *guan* jars, 1 straight-walled *bo* bowl, 1 bottom, impressed points, line pattern, net pattern, zigzag pattern

2010 Excavation

Layer 2: sand-tempered red-brown ceramic sherds, 8 *guan* jars, 1 flat bottom, thin band-handles, incised net-pattern, application bands with fingertip-impressed pattern, incised net-pattern, impressed point-pattern, awl pattern

Layer 3: sand-tempered red-brown and a few black- and yellow-brown ceramic sherds, large number of *guan* jars, some dish-shaped, others sharply outward-flaring or outward-curved opening, some with 1-2 thin or thick band-handles, some made of several vertical clay strips with one horizontal clay-strip above, 2 flat bottoms, many decorated sherds with application bands with fingertip-impressed pattern, incised net-pattern, impressed point-pattern, awl pattern, zigzag pattern

Layer 4: fragments of sand-tempered red-brown pottery, badly fragmented, 3 parts of *guan* jars identifiable, zigzag and net pattern

H1: fragments of sand-tempered red-brown pottery, 5 *guan* jars, 1 of them with dish-shaped opening, the other curved outward flaring, incised horizontal lines and impressed point pattern, some in fish-bone pattern, also 2 horizontally aligned knobs, 1 flat bottom

H3: fragments of sand-tempered red-brown pottery, 11 *guan* jars, curved to oblique outward-flaring mouths, some also dish-shaped, impressed points or corded ware on some lips, incised net pattern, impressed traversal point lines, below some rims application bands with fingertip-impressed pattern

H4: 6 red- to yellow-brown *guan* jars, either dish-shaped or curved outward-flaring rims, some necks or rims with incised lines or net pattern or impressed traversal lines, some lips with corded ware decoration

<u>Stone Tools:</u>

2009 Excavation

Surface collection: 3 *lishi* grinding stones of triangular or square-rectangular shape, 4 long-rectangular *fu* axes, 2 trapezoidal *ben* adzes, all made by chipping and polishing

Layer 1: 1 irregular *lishi* grinding stone, 1 small trapezoidal *ben* adze, 1 d-shaped perforated tool, probably a *dao* knife, 1 plow

Layer 2: 1 double-perforated oval *dao* knife, 1 rectangular and 1 trapezoidal serpentine *ben* adze, 1 rectangular *fu* axe, 1 smooth oval stone ball

Layer 3: 2 long-oval and 1 d-shaped *dao* knife, 2 tongue-shaped and 1 d-shaped *zao* chisel, 3 trapezoidal *ben* adzes, 2 spindle whorls, 3 kidney-shaped net weights, 3 irregular roughly rectangular *lishi* grinding stones

H1: 1 finely polished *ben* adze

Layer 4: 2 long-oval single-perforated *dao* knives, 2 long-rectangular and 1 trapezoidal *ben* adze, 2 wide leaf-shaped *mao* spear-heads, 1 half-moon shaped polished blank

2010 Excavation

Layer 1: 1 trapezoidal *zu* axe

Layer 2: 6 trapezoidal *ben* adzes, 1 loom-weight, 1 single-perforated crescent-shaped *dao* knife, 1 oval double-ended *shichu* pestle, 1 bi-pointed *zu* arrowhead, 1 pointed irregular drill or plow

Layer 3: 4 trapezoidal *ben* adzes, 2 halfmoon-shaped and 2 long-oval double-perforated *dao* knives, 3 long-rectangular *zao* chisel, 2 long-rectangular *zu* axes, 1 net-weight, 2 middle-perforated loom-weights, 1 round-bottom ovaloid *shichu* pestle

H1: 2 triangular and 1 rectangular *ben* adze, all polished with some flaking at the sides, 1 finely polished trapezoidal *zu* adze

H4: 1 rectangular *ben* adze, 1 coarse irregular tongue-shaped *shichu* pestle

Absolute Dates:

2010SDDH1.1: 3930+-30	2560-1100BC / 2500-2290BC
2010SDDH1.3: 3850+-30	2460BC-2200BC
2010SDDH1.4: 4035+-30	2830-2820BC / 2630-2470BC
2010SDDT5.3: 3965+-25	2570-2450BC / 2420-2400BC / 2380-2350BC
2010SDDT9.3: 4015+-25	2580-2470BC

Suggested Date: Neolithic to Eastern Han; *layer 3-4*: Neolithic, *layer 2*: Eastern Han, *layer 1*: Ming-Qing; early phase similar in date to Henglanshan (4500-4200 BP)

Relative Chronology: Dongjiapo ≈ late Henglanshan?

Suggested, cultural affiliation: *layer 3-4*: possible Henglanshan-connection, *layer 2*: connection to megalithic graves

Dechang Fangjiacun 德昌縣方家村 (DFJ) [11]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: 300 m south of Xiaogao Village, Fangjia Village Group 3, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮方傢村三組小高鄉

Morphology: on mountain-slope, level, 1436 m asl.

Surface Area: 50 m^2

Natural and Man-Made Environment: on western river bank of Anning River, close to the river, ground level, agricultural fields all around

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, data collection 12/2010

Features: 2 megalithic grave, 300 m between them; **M1**: *orientation:* 90°, *construction*: rectangular, 9 x 2 m, 0.9 m protruding from the earth, originally with earthen tumulus above, now largely destroyed, walls made of large regular stone slabs, 3 for each side wall, originally 1 large slate as door (now broken in two pieces), 3 larger stone boulders as cover; **M2:** *orientation:* 90°, *construction*: 13 x 2.6 x 1 m, rectangular grave form, walls made of smoothed stone slabs, cover of 2 large stone boulders

Suggested Date: Warring States to Western Han

Dechang Ganhai 德昌縣干海 (DGH) [12]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Ganhai Village Group 4, Yinlu Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣銀盧鄉干海村四組

Morphology: on mountain-slope, 1567 m asl.

Surface Area: 50 m^2

Natural and Man-Made Environment: in deep ravine on eastern bank of Anning River, close to the river, agricultural fields all around

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, SSW oriented, rectangular, 10 x 7.3 x 1.4 m, walls made of large stone slabs, 1 large slate as door, several large stone boulders as cover

Suggested Date: Warring States to Western Han

Dechang Guadi 德昌縣瓜地 (DGD) [13]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Zhifang Village Group 2, Laonian Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣老碾鄉紙房村二

Morphology: first-level terrace, sloped, 1432 m asl.

Surface Area: 50 m^2

Natural and Man-Made Environment: on eastern bank of Laonian River 老碾河, 100 m East of the river, on moderate slope, reddish clay soil

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: data collection 12/2010

Features: 2 megalithic graves, **M2:** *orientation:* 320°, *construction*: rectangular, severely disturbed, remaining stones scattered over 26 m^2, 8 x 3.2 x 1.7 m extant, walls made of 10+ large irregular boulders, several large stone boulders as cover, 3 preserved

Suggested Date: Warring States to Western Han

Dechang Guoyuan 德昌縣果園 (DGY) [14]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 4.5

Location: 100 m SE of Guoyuan Village, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮果園村

Morphology: second-level terrace, 1402 m asl.

Surface Area: 300 m^2

Natural and Man-Made Environment: on western bank of the Anning River, at about 1.5 km distance from the river, on level ground, close to mountains

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Xichang Diqu 1978b, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 11/2010

Features: 9 megalithic graves, 2 excavated, rectangular, walls and cover made of large stone boulders, most with access ramp and door, **M1:** *orientation:* 65°, *construction*: 7.2 x 1.95 x 2.2 m, **M2:** *orientation:* 190°, *construction*: 6.1 m length, 2 m height, 1 bronze knife, 1 arrowhead, 3 bracelets, other decorative items, 5 bone beads, turquoise beads, **M3**: *orientation:* 0°, *construction*: 8 x 5 x 0.8, access ramp; **M3**: *orientation:* 0°, *construction*: 12.3 x 2.8 m, cover made off 11 stone slabs, door made of 1 stone slab, access ramp

Bronze Objects: *M2*: 1 *dao* knife, 2 *zhuo* and 1 *huan* bracelet, 1 arrowhead, other decorative items

Other Objects: *M2*: 6 bone beads, 2 turquoise beads

Suggested Date: Warring States

Dechang Hejia Fenshan 德昌縣何家墳山 (DHF) [15]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 250 m NW of Yuejin Village Group 1, Cida Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣茨達鄉躍進村一組

Morphology: close to mountain-slope, on level ground, 1498 m asl.

Natural and Man-Made Environment: on top of Hejiafen Mountain 何傢墳山

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, **M1:** *orientation:* 0°, *construction*: rectangular, 8 x 2.2 m, walls made of large stones, cover made of large stone boulders

Suggested Date: Warring States

Dechang Hejiashan 德昌縣何傢山 (DHS) [16]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 1.5 km NW of Gaofeng Village, Xiaogao Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣小高鄉高峰村

Morphology: second-level terrace, 1416 m asl.

Surface Area: 20 m^2

Natural and Man-Made Environment: on eastern river bank, close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, *orientation:* 90°, *construction*: rectangular, 9 x 2.6 m, walls made of large stones, cover made of large stone boulders

Suggested Date: Warring States to Western Han

Dechang Hezui 德昌縣何嘴 (DHZ) [17]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Badong Township, Dechang County, Mimilang, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣巴洞鄉

Morphology: river valley, level ground, 1476 m asl

Surface Area: 20000 m^2

State: probably destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所, Dechangxian Wenwu Guanlisuo 德昌縣文物管理所

Storage: unknown

Data sources: mentioned in Liu Hong 2009, no details

Site Description: 0.4 m settlement layers

Suggested Date: Neolithic

Dechang Hongmiao 德昌縣紅廟 (DHM) [18]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: 1 km NW of Gaofeng Village, Xiaogao Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣小高鄉高峰村

Morphology: second-level terrace, 1295 m asl.

Surface Area: 20 m^2

Natural and Man-Made Environment: on eastern bank of the Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 3 megalithic graves, *orientation:* 90°, *construction*: rectangular, sides and cover made of large stone boulders

M1: 11 m long 0.7 m high, width unclear, 'tail' made of two large lying stone slabs; **M2:** 9 x 3 x 1.6 m, **M3:** largely destroyed

Suggested Date: Warring States to Western Han

Dechang Hongmiaocun 德昌縣紅廟村 (DHC) [19]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Hongmiao Village Group 2, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣紅廟村二組

Morphology: second-level terrace, 1406 m asl.

Natural and Man-Made Environment: 3 km East of the Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, *orientation:* 270°, *construction*: rectangular, sides and cover made of large stone boulders, 11 x 2 x 0.7

Suggested Date: Warring States to Western Han

Dechang Huangjiaba 德昌縣黃家垻(DHJ) [20]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 1 km West of Huangjiaba Village, Ayue Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣阿月鄉黃傢垻村

Morphology: on alluvial fan, 1421 m asl.

Surface Area: 25 m^2

Natural and Man-Made Environment: on the right bank of the Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, *orientation:* 90°, *construction*: rectangular, sides and cover made of several large stone boulders, 10 x 3 x 1.3 m, used to have tumulus

Suggested Date: Warring States to Western Han

Dechang Liangsanpo (Yuelufen) 德昌縣涼傘坡（月魯墳）(DLS) [21]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Hongqi Village Group 3, Badong Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣巴洞鄉紅旗村三組

Morphology: on hill top, 1442 m asl.

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, *orientation:* 130°, *construction*: rectangular, sides made of several large stone boulders, cover made of two large stone boulders, 13.2 x 3 x 1.1 m

Suggested Date: Warring States to Western Han

Dechang Luojiabao 德昌縣儸家堡 (DLJ) [22]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3.5

Location: Ayue Village Group 10, Ayue Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣巴洞鄉紅旗村三組

Morphology: on alluvial fan, sloped, 1451 m asl.

Surface Area: 35.72 m^2

Natural and Man-Made Environment: on alluvial fan of Ayue Creek 阿月沟, 1 km west of the Anning River, 50 m north of Ayue Creek, 500 m east of the main road of Ayue, 1.2 km south of Xianfengyun Mountain 先鋒云山, on slope, red clay soil, agricultural fields around

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, material collection 12/2010

Features: 3 megalithic graves, *orientation:* 270°, *construction*: rectangular, sides and cover made of several large stone boulders, **M1:** 9.4 x 3.8 x 1 m, cover made of 4 large stone boulders, originally with tumulus; **M2:** 8 x 3.6 x 1.4 m; **M3:** 9.4 x 3.8 x 0.5 m, originally with tumulus

Suggested Date: Warring States to Western Han

Dechang Ma'anzi 德昌縣馬鞍子 (DMA) [23]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: Xinhua Village Group 7, Cida Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣茨達鄉新華村七組

Morphology: on hill-slope, 1502 m asl.

Natural and Man-Made Environment: on the eastern bank of the Cida River 茨達河, 30 km SW of the Anning River, close to the megalithic grave sites of Dechang Yuejin and Hejia Fenshan

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, *orientation:* 140°, *construction*: rectangular, sides made of several large stone boulders, cover stone(s) missing, 11 x 2.6 x 0.5 m

Suggested Date: Warring States to Western Han

Dechang Maliang Zhanbei 德昌縣麻栗糧站北 (DML) [24]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 250 m NW of Minzhu Village, Mali Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣麻栗鄉民主村

Morphology: first-level terrace, 1469 m asl.

Surface Area: 20 m^2

Natural and Man-Made Environment: on left bank of the Anning River, very close to the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, *orientation:* 270°, *construction*: rectangular, sides and cover of several large stone boulders, 9.4 x 2.4 m, originally covered by tumulus

Suggested Date: Warring States to Western Han

Dechang Maliang Zhannan 德昌縣麻栗糧站南 (DMN) [25]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3.5

Location: 250 m NW of Minzhu Village, Mali Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣麻栗鄉民主村

Morphology: on first-level terrace, level, 1481 m asl.

Surface Area: 42 m^2

Natural and Man-Made Environment: on left bank of the Anning River, 200 m East of the river, 5 m north of Mali School, ground level, red clay soil

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, material collection 12/2010

Features: 1 megalithic grave, *orientation:* 385°, *construction*: rectangular, sides and cover made of several large stone boulders, 5 stones for cover, tumulus of 2 m height preserved, 11 x 3.8 x 2 m

Suggested Date: Warring States to Western Han

Dechang Maojiaba 德昌縣毛傢埧 (DMB) [26]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 150 m West of Fenghuang Village, Dechang Township, Dechang County, Mimilang, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德昌鎮鳳凰村

Morphology: second-level terrace, level, 1619 m asl

Surface Area: 7500 m^2 (EW 150 m, NS 500 m)

Natural and Man-Made Environment: on eastern bank of Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所, Dechangxian Wenwu Guanlisuo 德昌縣文物管理所

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 1 m cultural layers, 5-6 layers, layer 4-6 probably Neolithic

Ceramics: mainly flat bottoms, some ring-foot bottoms, *guan* jars and *bei* cups identified

Stone Tools: polished *dao* knives, *fu* axes, *ben* adzes, *zao* chisel

Suggested Date: Neolithic

Dechang Maojiakan 德昌縣毛傢坎 (DMK) [27]

Type: settlement site

Status: partially excavated

Reliability Index: 5.5

Location: Fenghuang Maojiakan, Jinchuan Township, Dechang County, Mimilang, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣錦川鄉鳳凰毛傢坎

Morphology: second-level terrace, sloped, 1405 m asl.

Surface Area: 75000 m^2 (150 x 500 m)

Natural and Man-Made Environment: on the eastern bank of the Anning River, 100 m West of and 30 m above the river, leaning against the mountain, facing the water

State: upper layers heavily disturbed, from layer 3 onwards no traces of modern disturbance

Researchers: Sichuansheng Wenwu Kaogu Yanjiuyuan 四川省文物考古研究院, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: surveyed in July 2003, May-June 2004, 59 excavation pits of 5 x 5 m, 4 long trenches, 1-IV in northern part, V-VIII in southern part

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Sichuansheng and Liangshan 2007, data collection 11/2010

Internal Chronology: virgin soil > H1, layer 4, layer 5 > H2 > layer 4, virgin soil > G1 > layer 3

Description Layers (04DMVIIT1 described): in northern part layers thicker and richer in content

Layer 1: soft brown agricultural soil, 0.07-0.15 m thickness, many roots, pebbles, broken stone tools

Layer 2: dense purple-brown fine soil, 0.08 m thick, contains sand-tempered ceramic sherds, stone *ben* adzes, *zao* chisel, blue-and-white porcelain and celadon sherds

Layer 3: soft yellow sandy soil, 0.02-0.1 m thick, many red-brown sand-tempered ceramic sherds, broken stone tools, many *dao* knives

Layer 4: soft fertile black-grey earth, 0.48 m thick, not in the East, much charcoal and ash inside, red-brown and yellow-brown sand-tempered ceramic sherds, mainly flat bottom vessels, *guan* jars, many small stone tools, polished *ben* adzes, *zao* chisel, *zu* arrowheads, scraper

Layer 5: yellow-brown loose sandy soil, 0.2-0.45 m thick, thicker in the West, much charcoal and ash, many natural pebble and broken stone tools, mainly polished *ben* adzes, *zao* chisel, *dao* knives, grey and black sand-tempered ceramic sherds

Below layer 5: red clay virgin soil with many natural pebbles

Features: 3 ash pits, 1 ash trench

H1: in NE of area III T030, below layer 4, cutting into virgin soil; nearly round, opening small, uneven in form, sides not smoothed, bottom flat, loose brown earth, rim diameter 0.52 m, bottom diameter 0.18 m, depth 0.32 m; brown sand-tempered ceramic sherds, 1 flat-bottom *guan* jar

H2: in NW of area VI T0201, below layer 4, cuts into layer 5; round, wide opening, bottom small, not smoothed, dense brown earth; fine grey sand-tempered ceramic sherds, 1 *guan* jar, 1 semi-finished *dao* knife

G1: in NW of area I T0302, below layer 3, filled with red sandy virgin soil, aligned in SW-NE direction, orientation 242°, 1.47 m ext. length, upper width 0.36 m, bottom width 0.24 m, depth 0.05-0.18 m, flattened bottom, filled with black-brown soil, loose, ash and charcoal inside, no objects

Ceramics: 5000 sherds, mainly sand-tempered ceramics, also fine sand-tempered ceramics, 90% undecorated, some impressed points, incised line and net pattern, some application bands below the rim, mainly hand-thrown, small amount of wheel-thrown pottery; mainly flat-bottomed ceramics, some ring-foot bottoms, mainly *guan* jars, few *bei* cups, maybe some stemmed *dou* bowls

Surface finds: flat bottoms, *guan* jars

Layer 3 and 4: mainly yellow-brown and red, grey secondary, small amount of black pottery, relatively low burning temperature

Layer 4: lids, *bei* cups, large number of *guan* jars

H1: 1 *guan* jar

H2: one high round-bodied flat-bottomed *guan* jar of fine grey sand-tempered pottery

Layer 5: mainly grey and black sand-tempered pottery, brown ceramics secondary, small amount of red ceramics, burned at higher temperature, thinner, many small white stones in temper visible, *bei* cups, large number of *guan* jars

Stone Tools: 149 polished (*zu* arrowheads, *zao* chisel, *fu* axes, *ben* adzes, grinding stone) and 29 flaked stone tools (microliths, cores, scraper, chopper, *dao* knives), and broken stone tools and small flakes

Surface finds: 1 chopper, 1 core, 1 hammer, 1 *zao* chisel, microliths, scraper, *zao* chisel, double perforated *dao* knives, *fu* axes, 1 grinding stone

Layer 1: microliths, scraper, 1 *dao* knife half-product, *zao* chisel, *ben* adzes

Layer 2: *zao* chisel, double perforated *dao* knives, *ben* adzes

Layer 3: *ben* adzes

Layer 4: microliths, scraper, *zu* arrowheads, *zao* chisel, *ben* adzes

H2: 1 *dao* knife half-product

Layer 5: scraper, flakes, *zu* arrowheads, double perforated *dao* knives, *ben* adzes, stone tool fragments

Suggested Date: *layer 1-2* modern and mixed layer, *layer 3-5* Neolithic

Relative Chronology: Maojiakan < Henglanshan < Lizhou

Dechang Minzhucun 德昌縣民主村 (DMZ) [28]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Minzhu Village Group 6, Mali Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣麻栗鄉民主村六組

Morphology: on second-level terrace, level, 1428 m asl.

Natural and Man-Made Environment: on left bank of the Anning River, next to a wide creek

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 3 megalithic graves, rectangular, sides and cover made of several large stone boulders, **M1:** *orientation:* 180°, 19 x 4.5 x 3.5 m; **M2:** *orientation:* 270°, 11 x 3.6 x 2.1 m; **M3:** *orientation:* 180°, 11.6 x 4 x 1.5 m

Suggested Date: Warring States to Western Han

Dechang Nanhua Baobao 德昌縣南華包包 (DNB) [29]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1

Location: Guoyuan Village Group 3, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮果園村三組

Morphology: on second-level terrace, sloped, 1522 m asl.

Natural and Man-Made Environment: on left bank of the Anning River, leaning against the mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, South-North oriented, rectangular, sides and cover made of several large stone boulders, measurements unclear

Suggested Date: Warring States to Western Han

Dechang Nanhuagong 德昌縣南華宮 (DNH) [30]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: 250 m NW of Guoyuan Village, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮果園村

Morphology: on second-level terrace, sloped, 1540 m asl.

Surface Area: 20 m^2

Natural and Man-Made Environment: on left bank of the Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oriented towards the East, rectangular, sides and cover made of several large stone boulders, badly disturbed, 9 x 2 m, tumulus largely destroyed

Suggested Date: Warring States to Western Han

Dechang Shaba 德昌縣沙垻 (DSB) [31]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Shaba Village Group 3, Dezhou Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣德州鎮沙垻村九組

Morphology: on mountain-slope, 1347 m asl.

Natural and Man-Made Environment: on western bank of the Anning River, leaning against the mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, East-West oriented, rectangular, sides and cover made of several large stone boulders, 7 x 4 x 1 m, on one end 3 erected stone slabs

Suggested Date: Warring States to Western Han

Dechang Shaorenba 德昌縣燒人垻 (DSL) [32]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Ayue Village Group 3, Ayue Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣阿月鄉阿月村九組

Morphology: on alluvial plain, 1524 m asl.

Natural and Man-Made Environment: 1 km north of Yunnanhui Mountain 云南会山, little depression on the East, agricultural fields all around, red clay soil

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, material collection 12/2010

Features: 1 megalithic grave, *orientation:* 110°, *construction*: rectangular, sides and cover made of several large stone boulders, 10+ stones for sides, 5 stones for cover, 12 x 8.45 x 3.3 m

Suggested Date: Warring States to Western Han

Dechang Shengli 德昌縣勝利 (DSL) [33]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Shengli Village Group 1, Liusuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣六所鄉勝利村一組

Morphology: second-level terrace, 1688 m asl.

Natural and Man-Made Environment: on eastern bank of Ma River 馬河

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, *orientation:* 0°, *construction*: rectangular, sides and cover made of several large stone boulders, 8 x 2.5 x 2 m

Suggested Date: Warring States to Western Han

Dechang Shuijingwan 德昌縣水井灣 (DSJ) [34]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Minzhu Village Group 1, Mali Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣麻栗鄉民主村一組

Morphology: second-level terrace, 1458 m asl.

Natural and Man-Made Environment: on eastern bank of Anning River, leaning against the mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 2 megalithic graves, *orientation:* 270°, *construction*: rectangular, sides and cover made of several large stone boulders, **M1:** 8.2 x 3.4 x 1.3 m; **M2:** 8.5 x 2.5 x 0.9 m

Suggested Date: Warring States to Western Han

Dechang Shuitangcun 德昌縣水塘村 (DSC) [35]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: Wangsuo Town, Shuitang Village Group 3, Fenghuang Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣鳳凰鄉王所鄉水塘村三組

Morphology: first-level terrace, 1324 m asl.

Natural and Man-Made Environment: 250-900 m north of the public road running between Dechang to Liusuo, 500 m east of the Anning River, ground level, rice paddies and fruit orchards in the surroundings

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 12 megalithic graves, densely spaced, on average 50 m between them, *orientation:* 270°, *construction*: rectangular, sides and cover made of several large stone boulders, all with access ramp, which is was in most cases severely disturbed, cover stones preserved only for M2, M3, M6-8, and M10, exact measurements unclear for M4-5, M10, and M12, **M1:** 8.4 x 2.8 x 1.4 m; **M2:** 12 x 10 x 2.5 m; **M3:** ext. 4.2 x 4.8 x 1.7 m; **M6:** 6.6 x 4.2 x 1.3 m; **M7:** 7.1 x 3.8 x 1.1; **M8:** 6.1 x 3.5 x 1.4 m; **M9:** 7.4 x 4.6 m, original height unclear, door made of two erected stone slabs; **M11:** 12 x 2.3 m, original height unclear

Suggested Date: Warring States to Western Han

Dechang Wangjiaping 德昌縣汪家坪 (DWP) [36]

Type: settlement site

Status: partially excavated

Reliability Index: 5

Location: Hongqi Village Group 4, Badong Township, Dechang County, Mimilang, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣巴洞鄉紅旗村四組

Morphology: second-level terrace 1445 m asl

Surface Area: 2000 m^2 preserved, originally at least 20000 m^2

Natural and Man-Made Environment: on northern bank of Cida River 茨達河 (small tributary of the Anning River); rice paddies, very fertile earth on the foot of the mountain, important agricultural area within Dechang

State: badly disturbed by agricultural activities

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Dechangxian Wenwu Guanlisuo 德昌縣文物管理所

Research: discovered and surveyed in August 2008; second survey and trial excavation of 1 trench of 10 x 2.5 m (2008SDWTG1) in November 2008

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Chengdushi, Liangshanzhou, and Dechangxian 2009

Internal Chronology: virgin soil > H1, H2, D2 > layer 3

Description Layers: layers thin, thicker in the North than in the South

Layer 1: loose brown-grey agricultural soil, 0.15-0.2 m thick, mainly roots of rice plants, some modern porcelain sherds and tile fragments

Layer 2: firm yellow-grey sandy soil, 0.05-0.15 m thick, many sherds of blue-and-white and celadon porcelain, also some sand-tempered ceramic sherds

Layer 3: loose black-grey clay-loam, 0.15-0.25 m, shallow in the north, thicker in the south, red-backed earth pellets, ash and charcoal, small broken stones, small number of sand-tempered ceramic sherds, below H1, H2, D2 which all cut into virgin soil

Below layer 3: yellow-brown virgin soil

Features:

2 ash pits of irregular form (H1-2), 2 post holes (D1-2)

H1: southern part of TG1, below layer 3, cuts into virgin soil, irregular form, cut by northern, eastern, and southern wall of the excavation trench, 2.5 x 1.2-1.9 x 0.18 m, filled with brown-black-grey sandy soil; red baked earth and pellets, broken stone tools, and sand-tempered ceramic sherds

H2: in eastern part of TG1, cut by eastern wall of excavation trench, below layer 3, cutting into virgin soil, 0.49 long, 0.31 wide, 0.12 deep, disturbed, loose black-grey sandy soil, red burned earth pieces and small pellets, ash and charcoal, heavily fragmented sand-tempered ceramic sherds

D1: middle of the southern part of TG1 below layer 3, cutting into virgin soil; round post hole, 0.36 m diameter, 0.36 m deep, filling of brown-black soil, small number of red-baked pellets, charcoal and one pebble, no objects

D2: in western part of TG1, cut by western wall of excavation trench, below layer 3, cutting into virgin soil; round post hole of 0.36-0.58 m diameter, 0.34 m deep, loose brown-black soil; inside small number of red baked earth pellets, charcoal, on the bottom 5 pebbles, small number of small sand-tempered ceramic sherds

Ceramics: mainly badly broken grey-brown sand-tempered ceramic sherds, few black-grey sherds, mainly undecorated, some net pattern, corded ware, application bands; mainly *guan* jars, maybe *hu* ewers, lids, flat bottoms

H1: 2 *guan* jars, 1 with net pattern, 3 flat bottoms, 1 body sherd with cross-pattern

H2: 1 object stand with net pattern

D2: 1 flat bottom

Layer 3: 7 *guan* jars, 1 with application band with impressed fingertip pattern below the rim, 1 lid, 8 flat, 1 small flat, 1 indented bottom

Stone Tools: many coarse stone tools, heavily fragmented, mainly polished, *ben* adzes, *fu* axes, *li* plows

D2: 1 long-oval half-product

Layer 3: 1 *li* plow, 2 *ben* adzes, 3 blanks, 5 fragments, many probably of *fu* axes or *ben* adzes, 2 flaked fragments, 1 of them probably of a *dao* knife, 1 polished oval piece

Absolute Dates: *layer 3*: BP3865 +- 35, BC 2470-2270

Suggested Date: *layer 3*: Neolithic, 4500-4200, very close in date to Henglanshan

Relative Chronology: Dechang Wangjiaping ≈ Dechang Dongjiapo ≈ Henglanshan, Ma'anshan, early Yingpanshan

Dechang Wangjiatian 德昌縣王家田 (DWT) [37]

Type: settlement site

Status: excavated

Reliability Index: 4

Location: 50 m south of Luoni Village, Jinchuan Township, Dechang County, Mimilang, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣錦川鄉儸乜村

Morphology: second-level terrace, level, 1185 m asl

Surface Area: 21000 (NS 700 m, EW 300 m)

Natural and Man-Made Environment: very close to Miyi Wanqiu, leaning against Wachang Mountain 瓦厰山, Luomigou River 儸密溝 (side arm of the Anning River) passes by from East to West, highway runs through the site

State: heavily disturbed

Researchers: Sichuansheng Wenwu Kaogu Yanjiuyuan 四川省文物考古研究院, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered and surveyed in July 2003, excavation of 49 pits of 5 x 5 m (1225 m^2) in May 2004 (2004LDJW), two main areas I and II, both north of Luomigou

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Sichuansheng and Liangshan 2006, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, 11/2010 data collection

Secondary Studies:

Site Description: sloped from West to East, 0.3-0.45 m of cultural layers, shallow layers

Internal Chronology: Virgin soil > H3 > H2 > layer 3 > H1 > layer 2 > layer 1

Description Layers: as observed in area II

Layer 1: loose grey-brown agricultural soil, 0.15-0.25 m

Layer 2: firm yellow clay-loam, 0.15-0.35 m, H1 below this layer

Layer 3: firm grey-brown earth layer, unevenly thick, 0.15-0.4 m thick, much burned grass and wood, red burned earth and stone pebble, large number of fine sand-tempered ceramic sherds and stone tools, H2-3 below this layer, H2 cutting H3

Below layer 3: virgin soil

Features: 3 ash pits

H1: below layer 2, cuts through layer 3 and into virgin soil, nearly round, flat bottom, rim diameter 3.4 m, depth 0.55 m, soft dark grey earth, many pebbles and coarse low-burned sand-tempered ceramic sherds

H2: below layer 3, cuts H3, round, flat bottom, rim diameter 3.68, depth 0.28 m, soft deep grey earth, many pebbles, coarse low-burned sand-tempered ceramic sherds, some flaked stone tools

H3: below layer 3, cut by H2, round, flat bottom, rim diameter 2.04, depth, 0.21, pebbles, mottled earth, one polished stone knife, and broken stone tools

Ceramics: mainly coarse sand-tempered ceramics, small number of fine sand-tempered ceramics; mainly hand-thrown, larger objects coil-built; burning temperature low, texture soft and coarse, color mottled, mainly grey-brown, some red-brown, black-brown, yellow, or grey-white: mainly undecorated; small number of leaf-vein pattern, spiral application, lug handles, incised lines, applications; mainly flat bottoms, some slightly indented or thickened, *guan* jars with or without two large or small double handles, spindle whorls, 107 objects identified

H1: 1 coarse double-handled *guan* jar, 1 rim sherd with spiral-application

H2: 2 large *guan* jars, 1 with two band-handles made of several vertical clay strips, 1 indented and 1 flat thickened bottom

H3: 1 flat bottom

Layer 3: 11 double-handled large *guan* jars, 27 *guan* jars, 1 thin rounded strip handle, 3 band handles, 9 bottoms with shallow ring feet, 3 indented, 12 thickened and 38 other flat bottoms, few with leaf-vein pattern; 3 spindle whorls; some incised horizontal lines, few horizontal application bands, 1 sherd with knob application, but mostly undecorated

Stone Tools: 18 flaked and 5 polished stone tools, large number of microliths

H2: 1 flaked scraper

H3: 1 rectangular polished *dao* knife

Layer 3: 2 flaked scrapers, 2 flaked cores, 10 microliths, 1 *dao* knife, 3 polished grinding rollers

Suggested Date: mid Warring States to mid Western Han

Relative Chronology: Dechang Washitian > Miyi Wanqiu

Suggested Cultural Affiliation: megalithic graves

Dechang Wangsuo (Liangshan Dashimu qun) 德昌縣王所（涼山大石墓群） (DWS) [38]

Type: megalithic grave site

Status: surveyed

Reliability Index: 4

Location: 400 m South of Wangsuo Village Unit 1, Wangsuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣王所鄉王所村一組

Morphology: second-level terrace, 1438 m asl.

Surface Area: 2100 m^2

Natural and Man-Made Environment: on the Western bank of the Ceda River, water channel running by in the West, rice paddies in the South, road in the West, ground sloped

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 12/2010

Features: over 40 megalithic graves, in 2006 only 3 preserved and described in greater detail, some graves completely below ground, some protruding 2 m from the ground, neatly aligned in rows, all oriented in the same direction; *orientation:* 105°, *construction*: rectangular, sides and cover made of several large stone boulders, large stone slab as door, **M1:** 7.4 x 3.5 x 1.4 m, 6+ large stone boulders for the walls, 1 + large stone boulders as cover, small part of the covering tumulus preserved; **M2:** 9 x 2.8 x 1.4 m, 6 large stone boulders as cover, tumulus partially preserved; **M3**: 10.8 x 3 x 1, 6+ large stone boulders for the walls, 1 + large stone boulders as cover, small part of the covering tumulus preserved

Suggested Date: Warring States to Western Han

Dechang Wujia 德昌縣吳傢 (DWJ) [39]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: Xinmin Village Group 6, Liusuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣六所鄉新民村六組

Morphology: second-level terrace, 1848 m asl.

Natural and Man-Made Environment: on western bank of Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 2 megalithic graves, *orientation:* 270°, *construction*: rectangular, sides made of several large stone boulders, cover stones not present, 8.6 x 2.6 x 1.6 m

Suggested Date: Warring States to Western Han

Dechang Xiaogao 德昌縣小高 (DXG) [40]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1

Location: Xiaogao Town, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣小高鄉

Morphology: first-level terrace, 1446 m asl.

Natural and Man-Made Environment: on eastern bank of Anning River, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 2 megalithic graves, orientation, measurements, and overall construction unclear

Suggested Date: Warring States to Western Han

Dechang Xiaoliusuo 德昌縣小六所 (DXL) [41]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: Yongxing Village Group 5, Liusuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣六所鄉永興村五組

Morphology: second-level terrace, sloped, 1399 m asl.

Natural and Man-Made Environment: on eastern bank of Cida River, leaning against the mountain, facing the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, data collection 12/2012

Features: 8 megalithic graves, densely distributed in regular rows, spacing between them < 50 m, *construction*: rectangular, sides and cover made of several large stone boulders; **M1**: *orientation:* 330°, 10.3 x 3.9 x 1.6 m; **M2**: *orientation:* 280°, 7.2 x 3.6 x 2.4 m, 1 large stone boulder of the cover stones preserved; **M3**: *orientation:* 295°, 7 x 3.1 x 1.4 m, tumulus of 21.7 m diameter; **M4**: *orientation:* 275°, 9.3 x 4.2 x 2.8 m, originally probably tumulus of 40.17 m; **M5**: *orientation:* 275°, 7.7 x 3 x 1.5 m, walls consisting of 10+ large stone boulders, 3 cover stones preserved, originally probably tumulus of 25.5 m, disturbed by peasant house; **M6**: *orientation:* 300°, 8.5 x 3 x 2 m; **M7**: *orientation:* 280°, 6.2 x 2.4 x 1.35 m, 2 of several cover stones preserved; **M8**: *orientation:* 270°, 6.8 x 3 x 0.8 m, 3 of several cover stones preserved

Suggested Date: Warring States to Western Han

Dechang Xiaomiaoshan 德昌縣小廟山 (DXM) [42]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 100 m North of Yongxing Village Group 5, Liusuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣六所鄉永興村五組

Morphology: second-level terrace, sloped, 1402 m asl.

Surface Area: 210 m^2

Natural and Man-Made Environment: on the foot of Xiaomiao Mountain, leaning against the mountain, agricultural fields all around

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 12/2010

Features: 7 megalithic graves, severely disturbed, most cover stones already destroyed; form rectangular, sides and cover made of several large stone boulders; **M1:** *orientation:* 270°, 2 cover stones extant, 8 x 3.4 x 1.5 m; **M2:** *orientation:* 295°, 1 cover stone extant, 9.5 x 3.1 x 1.2 m, remains of tumulus of about 30 m diameter; **M3:** *orientation:* 300°, 10.2 x 2.6 x 1.2 m, remains of tumulus of about 27 m diameter, cover stones missing; **M4:** *orientation:* 300°, 1 cover stone extant, 7.8 x 3 x 1.1 m, remains of tumulus of about 23 m diameter; **M5:** *orientation:* 300°, cover stones missing, 10.4 x 3.4 x 1.3 m, remains of tumulus of about 36 m diameter; **M6:** *orientation:* 270°, cover stones missing, 9.8 x 2.8 x 2.8 m; **M7:** *orientation:* 270°, cover stones missing, 6.3 x 2 x 1.1 m

Suggested Date: Warring States to Western Han

Dechang Xinmin Wujia 德昌縣新民吳家 (DXW) [43]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: Xinmin Village Group 6, Liusuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣六所鄉新民村六組

Morphology: first-level terrace, 1984 m asl.

Natural and Man-Made Environment: West of the Anning River, on right bank of a tributary of the Cida River, close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, East-West, rectangular, sides made of several large stone boulders, badly disturbed, cover stones missing, 8.6 x 2.6 x 1.6 m

Suggested Date: Warring States to Western Han

Dechang Yinzipo 德昌縣銀子坡 (DYZ) [44]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 1 km south of Ayue Village, Ayue Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣阿月鄉阿月村

Morphology: first-level terrace, 1389 m asl.

Surface Area: 100 m^2

Natural and Man-Made Environment: on right bank of the Anning River, close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 2 megalithic graves, 4 m between them, both oriented towards the West, rectangular, sides and cover made of several large stone boulders, tumuli largely destroyed, **M1:** 13.8 x 4 m

Suggested Date: Warring States to Western Han

Dechang Yongxing 德昌縣永興 (DYX) [45]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Yongxing Village Group 5, Liusuo Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣六所鄉永興村五組

Morphology: second-level terrace, sloped, 1449 m asl.

Surface Area: 45 m^2

Natural and Man-Made Environment: on eastern bank of Cida River, at 300 m distance of the river, sloped, red clay soil

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009, data collection 12/2010

Features: 2 megalithic graves, both oriented towards the West, rectangular, sides and cover made of several large stone boulders, **M1:** 10 x 4.5 x 2 m, 10+ stones for sides, 7 stones for cover; **M2:** 6.4 x 3.4 m, disturbed, original height unclear

Suggested Date: Warring States to Western Han

Dechang Yuejin 德昌縣躍進 (DYJ) [46]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 100 m north of Yuejin Village, Cida Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣茨達鄉躍進村

Morphology: close to mountain-slope, on level ground, 1482 m asl.

Surface Area: 25 m^2

Natural and Man-Made Environment: on eastern bank of Cida River, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oriented towards the West, rectangular, sides and cover made of several large stone boulders, 2 large boulders for cover, 7.5 x 3 x 1.3 m

Suggested Date: Warring States to Western Han

Dechang Zhangjiaba 德昌縣張家垻 (DZJ) [47]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Renshou Village Group 1, Ayue Township, Dechang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州德昌縣阿月鄉人壽村一組

Morphology: on mountain-slope, 1470 m asl.

Natural and Man-Made Environment: on eastern bank of Cida River, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oriented towards the North, rectangular, sides and cover made of several large stone boulders, 5 x 2.7 x 2 m

Suggested Date: Warring States to Western Han

1.2 Huidong County 會東縣

Huidong Dashanbao 會東縣大山包 (HDS) [48]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 3 km SW of Huidong Township, Huidong County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會東縣會東鎮

Morphology: foothills, sloped, 1791 m asl

Surface Area: 2000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009, 11/2010 data collection

Surface finds: small number of yellow-brown sand-tempered low-burned ceramic sherds; polished stone tools, too fragmented to identify forms

Suggested Date: Neolithic to Shang-Zhou

Huidong Liujiawan 會東縣劉傢灣 (HLW) [49]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Liujiawan, 70 m West of Xinhong Village, Xiaochahe Township, Huidong County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會東縣小岔河鄉新洪村

Morphology: foothills, sloped, 1653 m asl

Surface Area: 1200 m^2 (EW 20 m, SN 60 m)

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Site Description: 0.3-0.5 m thick, some red-burned earth and ash and large number of ceramic sherds and stone tools

Surface finds: mainly grey and some red sand-tempered ceramic sherds, incised line pattern, corded ware, leaf-vein pattern, faux ring-foot *guan* jars, *bo* bowl, perforated *dao* knives

Suggested Date: Neolithic

1.3 Huili County 會理縣

Huili Dachonggou 會理縣大冲溝 (HDG) [50]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: Yunshan Village, Hekou Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣河口鄉云山村

Morphology: on mountain slope, 1809 m asl

Surface Area: 18000 m^2 (EW 90 m, NS 200 m)

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Surface collection: mainly undecorated brown sand-tempered ceramics, flat bottomed round-bodied *guan* jars, 26 stone tools: *fu* axes, *ben* adzes, *zao* chisel, *zu* arrowhead, spindle whirl, double-winged bronze *zu* arrowheads

Suggested Date: Neolithic to Shang-Zhou

Huili Dazhaizi 會理縣大寨子 (HDZ) [51]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Nange Village Group 8, Nange Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣南閣鄉南閣村 8 組

Morphology: on terrace, level, 1815 m asl

Surface Area: 5958 m^2

Natural and Man-Made Environment: 6 km SE of Huili, on the Western bank of Chenghe River 城河, 16.7 m above the river, fields of wheat and grassy plants, in surrounding fields corn, potato, and wet-rice agriculture, peasant's houses on both sides of the river

State: well-preserved

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: personal communication Liu Hong 2009

Surface Finds: no details

Suggested Date: Shang

Huili Dongzui 會理縣東咀 (HDJ) [52]

Type: settlement site

Status: surveyed, partially excavated

Reliability Index: 5

Location: Dongzui, Nange Village Group 5, Nange Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣南閣鄉南閣村五組東咀; 5 km away from Chengguan 城關鎮, south of Leijiashan site

Morphology: first-level terrace, level, 1745.8 m asl

Surface Area: currently 12000 m^2 preserved (in 2006 15000 m^2 measured)

Natural and Man-Made Environment: halfway up a mountain slope at the intersection of the rivers Malang 麻郎河 and Chenghe 成河, overlooking river valley, leaning against mountain; fields of wheat, vegetables and tobacco

State: East badly disturbed

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Huilixian Wenwu Guanlisuo 會理縣文物管理所

Research: 1977 discovered, first survey and excavation in December 2005 [unpublished!], more survey and excavations in November 2006, south of excavation area of 2005, 3 pits of 4 x 5 m, 70.75 m excavated

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Chengdu, Liangshanzhou, and Huilixian 2008, data collection 11/2010

Site Description: in West thick cultural layers, in East shallow layering, 1.1 m of cultural layers, 80 cm below the surface

Internal Chronology: Virgin soil > F1, F2, > layer 3 > layer 2 > layer 1; Virgin soil > H1-5 > layer 5 > layer 3; Virgin soil > H1-5 > layer 5 > layer 4 > layer 3 > layer 2 > layer 1; H3 > H2; H3 > H5

Excavation 2005: unpublished, three excavation pits T1-4

Description Layers (2006 excavation, T5-6):

Layer 1: soft grey-brown agricultural soil, 0.3-0.4 m, level layers, roots of vegetable plants, modern trash

Layer 2: dense brown clay-loam, 0.2-0.3 m, ash and charcoal, broken stone tools, large number of blue-and-white porcelain and blue-and-green porcelain, some sand-tempered pottery sherds

Layer 3: soft yellow-brown sandy soil, 0.1-0.15 m, shallow in the West, thick in the East, many broken stones and ash and charcoal fragment, F1 and F2 start from here and cut directly into virgin soil

Layer 4: soft black-grey clay-loam, 0.1-0.15 m, shallow in the West, thick in the East, only in some parts of the site, mainly in the West, a few ceramic sherds and a large number of charcoal and small broken stones

Layer 5: dense red-brown clay-loam, 0-0.15 m, only in NE, disturbed by features starting under layer 3, some charcoal and red-burned pellets, H1-5 starting from here

Below Layer 5: virgin soil made of dense yellow-brown soil

Features: 5 ash pits (H1-5), 2 building remains (F1-2), many post holes with unclear context

H1: in NE part of T7, under layer 5, cuts into virgin soil, irregular form, kidney-shaped, 0.76 x 1.5 x 0.06-0.15 m, bottom length 0.6-0.8 m, dense black-grey clay loam, small number of red baked pellets and many pieces of red baked earth, ash, charcoal and stones, some sand-tempered ceramic sherds and stone tools

H2: southern part of T5 and N of T6, under layer 5, cutting H3, roughly round in form, rim diameter 2.9-3.1 m, bottom length 2.82-3.06 m, depth 0.1-0.16 m, dense black-grey clay-loam, small number of red burned earth pellets and charcoal fragment, at the bottom large number of stones, broken stone tools, semi-finished products, small number of ceramic sherds

H3: southern part of T5, under layer 5, cut by H2, oval in form, diameter 1.2-1.52 m, depth 0.1-0.26 m, bottom diameter 1.02-1.36 m, soft black-grey sandy soil, small number of red-baked earth pellets, much charcoal, burned wood, few stones, small number of ceramic sherds and broken stone tools

H4: middle of T5, under layer 5, cuts H3, round, rim diameter 1.02-1.1 m, depth 0.14-0.2 m, bottom diameter 0.94-1.28 m, soft black-grey sandy soil, red-burned pellets, burned wood, stones, few ceramic sherds

H5: middle of T5, under layer 5, cuts into virgin soil, long-rectangular, cut by northern border of excavation pit, top 2.3 x 1.64 x 0.12-0.18 m, bottom 2.26 x 1.58 m, grey-black clay-loam, small number of ceramic sherds

F1: NW part of T7, under layer 3, cuts virgin soil, only one corner lying within the excavation pit, rest cut off by northern and western wall of T7, rectangular, 2 round post holes in wall trench, post holes round, 0.2-0.3 m diameter, 0.15 m deep, inside soft brown-grey clay-loam, small number of ceramic sherds and ash

F2: SE part of T6, under layer 3, cuts into virgin soil, one line of 8 round post holes filled with soft brown-grey clay-loam and some charcoal, post hole diameter 0.2-0.4 m, 0.1-0.15 m deep

<u>Ceramics:</u>

2005:

Layer 4a: 98% sand-tempered, 2 % fine ware, mainly brown and black, some red, few grey and yellow, coarse with little stones in temper; 88 % undecorated, decorations mainly incised lines, some impressed points, water-ripple pattern, net-pattern, corded ware, especially on the rim but also on the body; badly fragmented, some band handle fragments and lug handles, some *guan* jars with trumpet-shaped opening; 4 flat bottoms

Layer 4b: 98% sand-tempered, 2% fine ware, mainly brown and black, some grey, yellow, and red; 90% undecorated; some application bands with fingertip-impressed pattern, incisions, water-ripple pattern, line pattern, corded ware, lines of impressed points or other forms, net pattern; badly fragmented; 6 flat bottoms, 1 with impressed vein-pattern, some lug-handles; 2 *guan* jars with funnel-shaped opening

Layer 4c: 99% sand-tempered pottery, mainly black and brown, some grey, red, and yellow; 89% undecorated; some corded ware on the rim, some incised lines, water-ripple pattern, net-pattern, impressed points, 3 *guan* jars with wide opening, 1 with corded ware on the lip

Layer 5: few badly fragmented ceramic sherds, all sand-tempered, mainly undecorated, some application bands with fingertip-impressed decoration, some incised lines

2006:

Layer 4: 2 *guan* jars, one of them with corded-ware impression on the rim, 2 flat bottoms

Layer 5: large number of badly fragmented ceramic sherds, mainly sand-tempered grey-brown and brown pottery, small number of red, grey, and black-brown pottery, and some clay ceramics, mainly black or grey, mainly undecorated, small number of corded ware design, incised wave pattern, impressed leaf-vein pattern on vessel bottoms, overall rather rough surface but relatively thin, small stones in temper

H1: 5 *guan* jars with corded ware design on the rim

H2: 4 *guan* jars, one with single handle, one separate single band-handle with protruding ridge in the middle, 3 small flat and one ring-bottom

H3: 5 *guan* jars with flaring or trumpet-shaped rim opening

H4: 4 *guan* jars with funnel-shaped opening, 1 flat bottom with impressed leaf-vein decoration, 1 body sherd with knob application, 1 piece of dried clay with clear impressions of rice straw

H5: 1 flat bottom

<u>Stone Tools:</u>

2005:

Layer 4a: stone fragments, no clear stone tool forms distinguishable, mainly igneous rock, some sandstone

Layer 4b: 2 small irregular translucent quartz fragments, smooth polished stone tools, mainly handstones and pestles, some small stone balls

2006:

Layer 4: 1 *ben* adze fragment, 1 square-rectangular *lishi* grinding stone fragment

Layer 5: mainly fragments and cores or half-products and blanks, mainly igneous rock and sandstone, slate for knives, 1 *fu* axe, 2 *dao* knives made of polished shale, 1 *ben* adze, 2 several half-finished objects, 5 stone fragments with drilling marks, probably half-products, some large fragments of *fu* axes

H1: half-products and fragments of polished stone tools

H2: three half-products of flaked stone tools, 1 grinding slab, 1 spindle whorl fragment

H3: 1 long thin *zao* chisel, 1 *fu* axe fragment

H5: 1 *dao* knife fragment, 1 polished stone tool fragment

Other:

Layer 4: 1 coarse kidney-shaped bronze fragment

Suggested Date: most material Neolithic to pre-Qin, *layer 2*: Ming-Qing

Huili Fenjiwan 會理縣糞箕湾 (HFJ + HFS) [53 + 54]

Type: settlement site, stone-construction grave site, earth-pit grave site

Status: largely excavated, not fully published

Reliability Index: 6

Location: Yunshan Village, Hekou Township, Lixi District, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣黎溪區河口鄉云山村

Morphology: on mountain slope, 1792.8 m asl. (settlement), 1838.8 m asl. (graves)

Surface Area: 40000 m^2 (EW 160 m, NS 200-300 m)

Natural and Man-Made Environment: on western bank of Xiaohe 小河, in basin of Lixi Township 黎溪鎮, two areas at Shuiping Liangzi 水坪梁子 (11200 m^2) and area above Xiaotuanshan 小團山 (3000 m^2), altogether 14200 m^2, holding several hundred of both earth-pit graves and stone-construction graves, part of the Shuiping Liuzi cemetery already turned into farmland, many graves destroyed or partially disturbed, preservation conditions for Xiaotuanshan better; surrounded by sites from Neolithic through to Han

State: partially disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Research: discovered during a survey in 1987, parts excavated in 1989 to 1992 in four excavation seasons; 1989 41 earth-pit graves excavated on the southern slope of Shuiping Lianzi (89SHFM1-41), 3 pits (89SHFK1-3); in April 1990 42 earth-pit graves excavated (90SHFM42-83), all of them on the upper portion of the northern slope; April to May 1991 49 earth-pit graves on the lower portion of the northern slope excavated (91SHFM84-132); November 1992 17 earth-pit graves excavated on the hill top and in the southern part of the cultivated area (92SHFM133-150), 1 pit (92SHFK4)

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Tang Xiang 1992, Huilixian, Liangshan, and Sichuansheng 2004, Zhongguo Wenwuju 2009, Sichuansheng, Liangshan, and Huilixian 2009, data collection 11/2010

Site Description: 0.25-1 m cultural layers, 150+ earth-pit graves on northern slope oriented following the hill slope, densely but regularly spaced, mostly on northern slope, M21 cutting M1, M41 cutting M37, M113 cutting M112, M116 cutting M117; stone-construction graves located 30 m SE of earth-pit graves, 0.1-0.24 below the surface, arranged in regular rows, oriented in North-South direction,

Internal Chronology: M1 > M21, M37 > M41, M112 > M113, M117 > M116

Description Layers (2004 excavation):

Features: 4 ash pits (89SHFK1-3, 92SHFK4), located on southern slope and on top of the hill, regular in shape, filled with red-baked earth intermingled with ash and charcoal

K1: filled with red-baked earth intermingled with ash particles, at the bottom number of green sandstone slates and boulders

K2: 0.5 m north of M27; irregular-round and with a trapezoidal profile, filled with red-baked earth intermingled with ash particles, at the bottom 4 green sandstone slates and 2 boulders

150+ earth-pit graves, 150 excavated (89SHFM1-41, 90SHFM42-83, 91SHFM84-132, 92SHFM133-150);

construction: narrow rectangular shaft-pit graves, 2-4 m long, 0.5-0.6 m wide and 0.2-1.4 m deep; only a few over 4 m long (M3 the longest, 4.9 m; M137 the deepest, 2.38 m), some with a few small stone slates, mainly placed in head area

content: no remains of coffins or human bones except for M17 (traces of lower long-bones in extended supine position), three devoid of objects, in others uneven numbers of ceramic vessels, objects placed in head part, some also in middle; most contained 2-3 smooth flat round to oval stones (large pebbles or small cobbles) , for details consult Table IX.5

6+ stone-construction graves, 6 excavated (SM1-6), rectangular in shape, all with stone slate as cover, mostly oriented in North-South direction, all without burial goods except for SM6, for details consult Table IX.5

Ceramics: *settlement layers and surface finds*: large numbers of low-burned coarse red to red-brown sand-tempered ceramic sherds

earth-pit graves: mainly brown-red sand-tempered ceramic single- and double-handled *guan* beakers, *hu* ewers, stemmed *dou* bowls, *bei* cups and goblets, overall 165 ceramics, mainly fine sand-tempered material, a few coarse, mainly brown or yellow-brown, few grey, low firing temperature, coarsely made, mostly hand-thrown, few on slow-turning wheel, only double-handled *guan* beakers (116 vessels) and stemmed *dou* cups (16 vessels) more finely made, others (11 *bo* bowls, 4 *hu* pots, 1 *guan* jar, 10 spindle whorls) coarsely made, for details consult Table IX.5

Bronze Objects: *graves:* 4 *yue* halberds (M4, M 12, M26, M29), 1 *mao* spear-head (M3), 1 *xiao* knife (M38), 3 button ornaments (M13), 7 *zhuo* bracelets (M3, 4 in M13, M6, M149), 1 finger-ring (M13)

Stone Objects: *settlement layers and surface finds*: large number of coarse large stone tools showing both flaking and varying degrees of polishing, some of them probably half-products, 9 *fu* axes, 5 axe half-products, 11 *chan* shovel or coarse squat axes, 11 *ben* adzes and one adze half-product, 1 *dao* knife and 1 knife half-product, 5 *zao* chisel, 1 chisel half-product, large number of hammer stones, pestles, and half-products and stones of unclear function

graves: 3 stone awls (M26), 1 arrowhead (M26), 49 smooth flat round to oval stones (large pebbles or small cobbles), 1 nephrite *zhuo* bracelet (M3), 2 finger-rings (unclear from which grave), 1 white quartz stone (M148)

Suggested Dates: early phase: beginning to early middle Warring States, late phase: latter half of mid Warring States to late Warring States

Huili Gong'anju (also Huili 1994) 會理縣公安局 (HGU) [55]

Type: confiscated by the police, objects from surface finds and objects taken from graves; probably originally all from graves, maybe not all from Huili but from Yanyuan, northern Yunnan, and other places

Reliability Index: 1.5

Location: Huili, Yanyuan?, Yunnan?, exact original location unknown

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Huilixian Wenguansuo 會理縣文管所

Research: objects confiscated by police in June 1994, traces of soil still on them

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Tang Xiang 1996

Bronze objects: 9, 1 three-pronged sword, 1 short-sword, 1 *ge* halberd, 1 *zhuo* bracelet, 1 double-handled *dao* knife, 1 *jie* knife, 1 *mao* spear-head, 1 staff-head

Suggested Date: Warring States to Western Han

Relative Chronology: ≈ Yanyuan Gong'anju, Xichang Hexi megalithic graves, Northwestern Yunnan stone-construction graves

Huili Guantianshan and Yingpanshan 會理縣觀田山、營盤山 (HGS) [56]

Type: settlement site, stone-construction grave site

Status: surveyed

Reliability Index: 3

Location: Xinqiao Village, Xin'an Township, Lixi Town, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣黎溪鎮新安鄉新橋村

Morphology: foothills, sloped, 1840 m asl

Surface Area: 3000 m^2

State: slightly disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Research: surveyed in March 2009

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Sichuansheng, Liangshan, and Huilixian 2009, data collection 12/2010

Site Description: only 200 m between the two locations, probably originally belonging to one site; 0.5 m settlement layers, not clearly distinguishable

Features: unclear number of graves with unclear amount of stone installation

Ceramics: mainly brown, some red-brown and a little grey sand-tempered pottery, mainly undecorated, some body-covering corded ware, 1 open-mouthed *guan* jar distinguishable

Stone Tools: very coarse chipped stone tools, only some polishing; 1 double-perforated leaf-shaped polished *dao* knife, 3 blanks, probably of knives, one of them perforated, 1 trapezoidal *ben* adze with polished blade, 1 long-oval *fu* axe, 4 coarse triangular choppers

Suggested Date: late Neolithic to Shang

Relative Chronology: Guantianshan & Yingpanshan > Dongzui (late Western Zhou - Spring-and-Autumn) > Fenjiwan (Warring States - early Western Han)

Huili Guojiabao 會理縣郭傢堡 (HGJ) [57]

Type: stone cist and earth-pit graves

Status: surveyed

Reliability Index: 4

Location: Tongchang Village Group 3, Xinfa Township, Tong'an Town, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣新安鄉通安鎮銅廠村三組

Natural and Man-Made Environment: on southern side channel flowing by in East-West direction; plantations of maize, tobacco, wheat ,sweet potato, due to much agriculture in the area surface changed much, graves disturbed much by channel building in the 1960s

Morphology: on mountain-slope, 1928 m asl

Surface Area: 3000 m^2

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: survey in July 2009, excavation of 4 most disturbed graves, second survey in October 2009, further finds by peasants in 2010

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Sichuansheng, Liangshan, and Huilixian 2009, Zhongguo Wenwuju 2009, data collection 12/2010

Site Description: North high, South low, North-South aligned graves, mainly on SW slope of the site, badly disturbed, graves directly under agricultural layer or protruding on surface, surface finds probably originally from graves

Internal Chronology: M2 > M1

Features: large number of badly disturbed graves, all oriented in NNW direction, measuring 1.5-2 x 0.3-1.4 x 0.1-0.5 m, 3 rectangular to trapezoidal earth-pit graves (M1-2, M4) and 1 stone-construction grave (M3) excavated, stone graves complete stone cists made of thin slates

filling: yellow-brown earth, relatively loose, bones largely not preserved, a few ceramics, bronze and stone ornaments

Ceramics: sand-tempered grey-brown to yellow-brown ceramic vessels, *M1:* 1 double-handled and 1 single-handled *guan* beaker; *M2*: 1 spindle whorl

Surface collection: 1 double-, 1 single-, and 3 *guan* beaker without handles, 1 spindle whorl

Peasant finds: 6 double-handled *guan* beakers

Stone Objects: *M2*: 2 agate and 41 turquoise beads of tubular form, 1 jade *zhui* ring (maybe earring)

Surface collection: 1 round flat *zhuo* turquoise bead, 1 agate bead

Bronze Objects: *M2*: 2 *zhuo* bracelet

Surface collection: 4 *ge* halberds, 39 *mao* spear-heads, 10 swords, 7 *xiao* knives, 1 *dao* knife, 14 *zhuo* bracelet, 10 round buttons, 1 *yue* axe, 1 arrowhead, 1 chape (scabbard-tip), 1 belt-hook, 48 wave-shaped decorative elements, possibly clothing applications, 1 horse bit, 1 drop-shaped ornament

Suggested Date: late Warring States to early Western Han

Relative Chronology: ≈ Yanyuan Laolongtou?

Huili Guoyuan, also known as Ganyingwan (Huili Drum 4) 會理縣果園鄉(甘營灣 (會理四號鼓)) (HGY) [58]

Type: object pit

Status: survey

Reliability Index: 1.5

Location: Southern Rim of Huili City, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣會理縣城

Morphology: on alluvial plain, 1825 m asl

Site Description: on Eastern bank of river, on level ground

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Research: bronze drum discovered by peasants in April 1988 when digging a channel

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Bao Yuehe 1989, Tang Xiang 1992

Finds: 1 Shizhaishan type bronze drum discovered, buried upside-down

Suggested Date: Warring States

Relative Chronology: ≈ Yunnan Jinning Shizhaishan

Huili Hedongtian 會理縣粪河東田 (HHT) [59]

Type: stone-construction grave site

Status: 1 grave excavated during survey

Reliability Index: 1

Location: Xintian Village Group 9, Xin'an Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣新安鄉新田村九組

Morphology: second-level terrace, 963 m asl

Surface Area: 1260 m^2

Site Description: on Eastern bank of river, level ground, overlooking surrounding area

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Research: surveyed in 2010, reported by peasants that here for decades often stone-construction graves found

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: data collection 12/2010

Features: large number of stone-construction graves, badly disturbed; **M1**: 1 x 0.5 m, EW oriented

Suggested Date: Warring States

Huili Hekoucun 會理縣河口村 (HHK) [60]

Type: single find

Status: survey

Reliability Index: 1

Location: Hekou Village Group 2, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣河口村二組

Morphology: first-level terrace, level, 1771 m asl

Site Description: on Eastern bank of Jinshajiang, on level ground, on foot of the mountain

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: bronze sword discovered in house of peasants in March 1993, had been in their possession since 1971

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Tang Xiang 1993

Finds: 1 bronze sword

Suggested Date: Warring States to beginning of Western Han

Huili Hewanwan 會理縣河灣灣 (HHW) [61]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣

Morphology: no information on exact location

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Storage: unknown

Data Sources: Tang Xiang 1992 (mentioned, finds described together with Yuanbaoshan, Fenjiwan, Dachonggou, Xiao'aozi, Tangjiaba)

Ceramics: sand-tempered coarse pottery, mainly brown or grey, also much red, a few sherds of black pottery, all hand-thrown, at relatively low temperature, flat bottoms, some high necks, handles, spouts, *guan* jars, mainly undecorated, some corded ware, net pattern, awl pattern, leaf-vein pattern, application bands; some round middle-perforated spindle whirls

Stone Tools: coarse flaked stone tools with some polishing on blades, *fu* axes, *ben* axes, *zu* arrowheads, *zao* chisels, *dao* knives, grinding stones, *zhui* awls, some plate-shaped choppers, some shouldered axes, few *huan* bracelets

Suggested Date: Neolithic

Relative Chronology: Hewanwan ≈ Karuo

Huili Houzidong 會理縣猴子洞 (HZD) [62]

Type: settlement site, stone-construction grave site

Status: surveyed

Reliability Index: 3

Location: 1 km South of Ma'an Village, Xin'an Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣新安鄉馬安村

Morphology: second-level terrace, 982 m asl

Surface Area: 2500 m^2 settlement (NS 1000 m, EW 250 m) + 2000 m^2 cemetery

State: heavily disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Research: discovered in 1991, surveyed for the first time in 2002, second survey in March 2009

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Sichuansheng, Liangshan, and Huilixian 2009, Zhongguo Wenwuju 2009, data collection 12/2010

Features: 3 graves with sides, bottom, lid made of stone slates, NS oriented, more slates of other graves scattered in the fields, 1 ash pit

Ceramics: *surface collection*: fine brown sand-tempered pottery, some polished with black slip, some with thin incised lines, awl pattern, raised application; 5 wide-mouthed to trumpet-shaped *hu* pitchers, 4 *guan* jars, 2 flat and 3 indented bottoms

Stone Tools: *surface collection*: many coarse stone tools, most of them flaked, 2 chopper, 19 *fu* axes, some shouldered, 4 *ben* axes, 1 scraper, 1 polishing stone, a few cores and half-products

Other objects: seashells

Suggested Date: settlement remains probably Neolithic to Shang, graves Warring States

Relative Chronology: stone material from settlement layers ≈ Hewanwan ≈ Karuo, ceramics ≈ Maoxian Neolithic sites

Huili Hunshuitang 會理縣渾水冶銅遺址 (HHS) [63]

Type: smelting site

Status: surveyed

Reliability Index: 2.5

Location: 4 km SW of Xinpucun Village, Tong'anqu Xinfa Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣通安區新發鄉新鋪村

Morphology: on mountain-top, 1978 m asl

Surface Area: 15000 m^2

State: heavily disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Chengdushi Kaogu Yanjiusuo 成都市考古研究所, Sichuan Daxue Kaoguxi 四川大學考古係

Research: discovered in 1987, surveyed in November 2009

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Sichuansheng, Liangshan, and Huilixian 2009, Zhongguo Wenwuju 2009

Site Description: on two separate hill tops aligned in NS direction, in EW ravine, at the southern end of Hunshui Lake

Features: 120+ smelting furnaces, single and double furnaces, built following and leaning against the mountain; walls and bottom coated with clay; one furnace recorded in more detail, but badly disturbed: walls 1.05 x 0.8-0.9, above thin (0.1-0.15), below thick (0.2-0.3), black layer on the bottom, bronze slag, in SW also lime, inside layers of red-brown sandy soil, in it stone fragments, bronze slag, and ore fragments

Surface Collection: *first survey*: mainly slag, red-burned earth, iron drill, ceramic sherds, charcoal, perforated malachite tool; *second survey*: stone fragments, bronze slag and ore fragments all over the site, ore fragments all of similar size

Suggested Date: Ming/Qing

Huili Jinmei 會理縣金梅 (HJM) [64]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 100 m East of Jinmei Village, Guoyuan Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣果園鄉金梅村

Morphology: first-level terrace, level, 1805 m asl

Surface Area: 2000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Huilixian Wenguansuo 會理縣文管所

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 0.3-0.5 m of cultural layers, red-baked earth, charcoal

Surface finds: red-brown sand-tempered ceramic sherds, some flat bottoms, stone *fu* axes

Suggested Date: Neolithic to Shang-Zhou

Huili Kangzipo 會理縣康芓坡 (HKP) [65]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣

Morphology: foothills, sloped, 1908 m asl

Researchers Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Huilixian Wenguansuo 會理縣文管所

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: data collection 12/2010

Surface finds: few stone tools, thin polished perforated *dao* stone knives, small *zao* chisel, 1 large hammer stone

Suggested Date: late Neolithic to Bronze Age

Huili Leijiashan 會理縣雷傢山 (HLJ) [66]

Type: earth-pit grave site

Status: excavated

Reliability Index: 5.5

Location: Nange Village Group 5, Nange Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣南閣鄉南閣村五組

Natural and Man-Made Environment: 1 m West of water channel, close to Chenghe 成河 and Malang River 麻郎河, close to settlement sites of Dongzui and Yuanbaoshan

Morphology: on mountain slope, 1805 m asl.

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshanzhou Bowuguan 涼山州博物館, and Huilixian Wenguansuo 會理縣文管所

Research: discovered during survey in December 2005, excavated completely in November 2006

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Chengdu, Liangshanzhou, and Huilixian 2009; Zhou Zhiqing et al. 2010, data collection 12/2010

Site Description: high in the North, low in the South, significantly disturbed by farm houses

Features: 1 disturbed earth-pit grave, 2/3 preserved, content disturbed throughout; under agricultural layer, cutting through virgin soil, disturbed by wall of modern house, eastern part thus missing

M1: *orientation*: 115°, *form*: rectangular earth-pit grave; ext. length 1-2.2 x 2.7 x 0.9; *filling:* loose red-brown sandy soil, roots and ash inside, large number of objects placed without perceivable order, also many pebbles; no human bones

Ceramic Objects: 114 vessels, mainly of fine ware, only small amount of sand-tempered ceramics, the latter mainly for single- and double-handled *guan* beaker, fired at high temperature, all of light grey color; 21 single-handled and 6 double-handled *guan* beaker, 3 *hu* pitcher, 23 *bei* beaker, 1 *guan* beaker, 36 stemmed *dou* bowls, 4 *zun* vessel, 1 flat bottom, 22 spindle whorls

Stone Objects: 49 polished objects, 1 *fu* axes, 17 grinding sticks and pestles, 1 stone ball, 1 *huan* bracelets, 4 *zhui* pendants, 13 arrowheads, 1 broken stone tool1, many oval pebble

Suggested Date: Spring and Autumn period

Relative Chronology: ≈ Fenjiwan, Dongzui

Huili Liantang 會理縣蓮塘 (HLT) [67]

Type: settlement site

Status: surveyed, unpublished

Reliability Index: 1.5

Location: 100 m SE of Liantang Village, Lixi Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣黎溪鎮蓮塘村

Morphology: foothills, sloped, 2005 m asl

Surface Area: 17000 m^2 (EW 200 m, SN 85 m)

State: slightly disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: listed in Tang Xiang 1992, Zhongguo Wenwuju 2009, data collection 12/2010

Ceramics: large number of heavily fragmented red sand-tempered ceramic sherds, some incised line pattern, short application bands

Stone Tools: large number of coarse and small number nicely polished stone tools, *fu* axes, *ben* adzes, perforated d-shaped and oval *dao* knives, willow-leaf shaped and swallow-tail shaped *zu* arrowheads), many half-products, polished thin stone squares with net-shaped sawed patterns

Suggested Date: Neolithic

Relative Chronology: coarse stone material ≈ Hewanwan ≈ Houzidong ≈ Liantang ≈ Karuo

Huili Luoluochong (Huili drum 3) 會理縣羅羅沖 (會理三號鼓) (HLL) [68]

Type: object pit

Status: survey

Reliability Index: 3.5

Location: northern rim of Huili City, Laojie Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣老街鄉會理縣城

Morphology: on mountain-slope, 1808 m asl

Natural and Man-Made Environment: on hill slope on the western bank of the lower Chenghe River

Site Description: on Eastern bank of river, on level ground

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered by peasants

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Huilixian Wenhuaguan 1977, Zhongguo Gudai Tonggu 1988, Tang Xiang 1992

Finds: 1 bronze drum buried upside down

Relative Chronology: ≈ Yunnan Jinning Shizhaishan

Huili Miaozi Laobao 會理縣廟子老堡 (HML) [69]

Type: earth-pit grave site

Status: surveyed

Reliability Index: 2

Location: Tongchang Village Group 3, Xinfa Township, Tong'an Town, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣新安鄉通安鎮銅廠村三組

Natural and Man-Made Environment: on southern side channel flowing by in East-West direction; plantations of maize, tobacco, wheat, sweet potato, due to much agriculture in the area surface changed much, graves disturbed much by channel building in the 1960s

Morphology: on mountain top, 1924 m asl

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: surveyed in 2009, no further excavations

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Sichuansheng, Liangshan, and Huilixian 2009, data collection 12/2010

Site Description: 500 m away from Guojiabao, now maize field, heavily disturbed

Features: 1 disturbed grave reported

Ceramics: *Surface collection*: 2 highly-decorated high stems of grey-black grey pottery, 1 spindle whorl

Stone Objects: *Surface collection*: 5 single-perforated *zhui* pendants, 1 needle

Suggested Date: Spring and Autumn period

Relative Chronology: ≈ Leijiashan M1

Huili Puling 會理縣普隆 (HPL) [70]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: 500 m South of Zhaizi Village, Puling Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣普隆鄉寨子村

Morphology: second-level terrace, level, 1002 m asl

Surface Area: 45 m^2

Natural and Man-Made Environment: very close to river, on level ground

State: slightly disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Tang Xiang 1992Zhongguo Wenwuju 2009

Features: 3 stone-construction graves, oriented towards the North, of similar form, relatively small, 1 x 0.6 m on average, walls made of 4-6 cm thin stone slates, no cover stones found

Suggested Date: Warring States

Huili Qiaoba 會理縣喬垻 (HQB) [71]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Tanxihe Village Group 1, Neidong Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣内東鄉潭溪河一組

Morphology: first-level terrace, level, 1822 m

Surface Area: 157500 (EW 250, NS 630)

Natural and Man-Made Environment: surrounded by hills, Malong River 麻龍河 flowing by 20 m West of the site, surface cover consisting of grass and shrubs, some fields of wheat, corn, and paddy fields around

State: well-preserved

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liu Hong personal communication

Description Layers:

Layer 1: 0.5 m, soft red clay soil, some roots and modern trash

Layer 2: 0.1-0.15 m, soft yellow-red sandy soil

Layer 3: 0.03 m, red clay soil

Layer 4: 0.15 m, soft yellow-red sandy soil

Below layer 4: 0.2 m, firm red clay virgin soil

Surface Finds: no details

Suggested Date: unclear

Huili Raojiadi 會理縣饒家地 (HRJ) [72]

Type: settlement site

Status: surveyed

Reliability Index: 1

Location: Yunshan Village, Lixi Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣黎溪鎮云山村

Morphology: terrace, level, 1796 m asl

Surface Area: 5300 m^2

Natural and Man-Made Environment: 500 m from the public road

State: slightly disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liu Hong personal communication, data collection 12/2010

Site Description: red-brown cultural layers 1 m below the surface

Surface finds: 6 chipped and 8 polished stone tools (2 flaked *fu* axes, 2 chopper, 2 flaked half-products, 2 polished *fu* axes, 2 *ben* adzes, 2 *zao* chisel, 2 polished half-products), and 15 ceramic sherds, no further information

Suggested Date: Shang-Zhou to Qin-Han

Huili Shenjiafen 會理縣沈傢墳 (HSJ) [73]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 80 m West of Jinyan Village, Laojie Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣老街鄉金岩村

Morphology: on hill-top, 1956 m asl

Surface Area: 1000 m^2

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Ceramics: red-brown sand-tempered ceramic sherds, *guan* jars, flat bottoms, some sherds perforated

Suggested Date: Neolithic to Shang-Zhou

Huili Tangjiaba 會理縣唐傢垻 (HTJ) [74]

Type: settlement site, stone-construction graves

Status: surveyed

Reliability Index: 1.5

Location: 20 m South of Shuoshui Village, Lixi Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣黎溪鎮鎖水村

Morphology: terrace, level, 1814 m asl

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Tang Xiang 1992 (mentioned, finds described together with Yuanbaoshan, Fenjiwan, Dachonggou, Xiao'aozi, Hewanwan)

Features: 1 rectangular grave with 2-3 m thick stone slates lining walls and bottom, relatively small, 1 x 0.38 m

Ceramics: sand-tempered coarse pottery, mainly brown or grey, also much red, a few sherds of black pottery, all hand-thrown, burned at relatively low temperature, flat bottoms, some high necks, handles, spouts, *guan* jars, mainly undecorated, some corded ware, net pattern, awl pattern, leaf-vein pattern, application bands; some spindle whorls

Stone Tools: mainly large coarse and some finer *fu* axes, *ben* axes, *zu* arrowheads, *zao* chisels, *dao* knives, grinding stones, *zhui* awls, some plate-shaped choppers, some shouldered axes, few *huan* bracelets

Suggested Date: Neolithic, graves Warring States

Relative Chronology: *settlement material*: coarse stone material from settlement layers ≈ Hewanwan ≈ Houzidong; *graves*: ≈ Fenjiwan / Leijiashan

Huili Tangjiapo 會理縣唐家坡 (HTP) [75]

Type: stone-construction graves

Status: surveyed

Reliability Index: 1.5

Location: 20 m South of Shuoshui Village, Lixi Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣黎溪鎮鎖水村

Morphology: on mountain slope, 1822 m asl

Surface Area: 1500 m^2 (NS 150 x EW 100 m)

Site Description: in river valley between mountains

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Tang Xiang 1992 (mentioned, finds described together with Yuanbaoshan, Fenjiwan, Dachonggou, Xiao'aozi, Hewanwan), Zhongguo Wenwuju 2009

Features: 1 rectangular grave with 2-3 m thick stone slates lining walls and bottom, relatively small, 1 x 0.38 m

Suggested Date: Warring States

Huili Tianbacun 會理縣田埧村 (HTC) [76]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: Pulong Township, Pulong Village Group 4, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣普隆鄉普隆村 4 組

Morphology: first level-terrace, level, 986 m asl

Surface Area: 1860 m^2

Natural and Man-Made Environment: on Western bank of Chenghe River 城河

State: severely disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Research: surveyed in March 2009

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Huilixian 2009

Site Description: 0.4 m of cultural layer

Ceramics: some yellow-brown and brown sand-tempered ceramic sherds, net pattern, impressed point pattern

Stone Tools: 2 coarse chopper, 2 cores, 2 polished leaf-shaped *zu* arrowheads

Suggested Date: Warring States

Relative Chronology: coarse stone material ≈ Hewanwan ≈ Houzidong ≈ Liantang ≈ Karuo

Huili Washitian 會理縣瓦石田 (HWT) [77]

Type: settlement site, earth-pit grave site, smelting site

Status: partially excavated

Reliability Index: 5

Location: Washitian Village, Xin'an Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣新安鄉瓦石田村

Morphology: second-level terrace, level, 1120 m asl

Surface Area: 1860/3500 m^2

Natural and Man-Made Environment: on Western riverbank of Chenghe

State: heavily eroded, many objects exposed on the surface

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所

Research: discovered in 1975, survey and excavation of 3 graves in 1975, 1987 surveyed, 1 grave excavated, third survey and excavation of 2 graves in 2009

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Tao and Zhaodian 1981, Zhongguo Wenwuju 2009, Sichuansheng, Liangshan, and Huilixian 2009, data collection 12/2010

Features: 30+ densely and regularly spaced earth-pit graves, all oriented towards the East, all extended supine primary single burials, burial objects in head compartment, 5 graves excavated

M1: 1 *guan* jar, 1 *wan* bowl, 1 flat bottom

M2: 1 *guan* jar, 1 *wan* bowl, 1 flat bottom, 2 spindle whorls

M3: 1 *guan* jar, 2 spindle whorls

M4: badly disturbed, 4 spindle whorls, 1 flat bottom

M5: 7 spindle whorls

Stone Tools: *surface finds*: 3 flaked chopper, 10 polished *zhen* needles, 2 polished *zu* arrowheads, 1 *zhui* drill, 1 stone *ge* dagger-axe mold, 1 stone mold for 14 *zu* arrowheads

M1: 1 needle

Metal: *surface finds*: 1 bronze *zu* arrowhead, 1 bronze *yue* axe, 1 bronze tube

Suggested Date: Warring States to Western Han (Sichuansheng, Liangshan, and Huilixian 2009), or Spring and Autumn to Warring States (Zhongguo Wenwuju 2009)

Huili Wuhuangqing 會理縣吳黃箐 (HWH) [78]

Type: earth-pit graves

Status: surveyed

Reliability Index: 1

Location: 100 m SW of Tianfang Village, Guanghe Township, Huili County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州會理縣関河鄉田房村

Morphology: first-level terrace, 1829 m asl.

Site Size: 1500 m^2

Researchers: Huilixian Wenwu Guanlisuo 會理縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: in 2000 during survey 10 earth-pit graves discovered

Storage: unknown

Data Sources: Tang Xiang 1999, Zhongguo Wenwuju 2009

Features: 10+ earth-pit graves, measuring 2-3 x 0.3-0.5 m

Suggested Date: Warring States

Relative Date: ≈ Washitian, Fenjiwan

Huili Xiao'aozi 會理縣小凹子 (HXA) [79]

Type: settlement site

Status: surveyed

Reliability Index: 3

Location: 1 km West of Yan Village, Kekou Village, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣河口鄉堰村

Morphology: river-valley, level, 1794 m asl

Surface Area: 32000 m^2 (NS 400, EW 80)

Natural and Man-Made Environment: in river valley between mountains

State: disturbed

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: surface collection in 1987

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Zhongguo Wenwuju 2009, data collection 12/2009

Ceramics: undecorated brown sand-tempered ceramic sherds, some flat bottoms

Stone Tools: 53 stone tools collected, mainly *fu* axes, some *ben* adzes, *zao* chisel, *dao* knives, unclear fragments

Suggested Date: late Neolithic

Huili Xiaotuanshan 會理縣小團山 (HXT+HXS) [80+81]

Type: earth-pit graves, with and without stone installations, settlement site

Status: surveyed

Reliability Index: 1.5

Location: Yunshan Village, Hekou Village, Huili County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州會理縣河口鄉云山村

Morphology: first-level terrace, 1821 m asl.

Site Size: 14860 m^2

Natural and Man-Made Environment: in the South site Fenjiwan, in the East Dachonggou, in the North Yunshancun, in the West leaning against Yunshan Mountain 云山

Researchers: Huilixian Wenwu Guanlisuo 會理縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: during first surveys in the 1970s and 80s over 100 graves recorded, most of them with stone installations, in November 2008 20 graves without and 4 with stone installations left

Storage: unknown

Data Sources: Tang Xiang 1999, Zhongguo Wenwuju 2009

Site Description: graves arranged in rows from East to West, longest extension in East-West direction, in North and South sloped

Features: originally 100+ graves, in most recent survey 20 earth-pit graves and 4 graves with stone installations clearly identifiable; 3 complete stone-construction graves, 4 stone graves without lid, all with 3-5 thick stone slates; earth-pit graves with single primary extended supine burials, some fragments of ceramics

Suggested Date: Spring and Autumn to Warring States or Han

Relative Date: ≈ Washitian, Fenjiwan

Huili Xiaoyingpan 會理縣小營盤 (HXP) [82]

Type: stone cist and earth-pit graves

Status: excavated

Reliability Index: 4.5

Location: 2 km East of Xintian Village, Xin'an Township, Huili County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州會理縣新安鄉新田村

Morphology: second-level terrace, 954 m asl.

Natural and Man-Made Environment: on the western bank of the Jinshajiang, very close to the river, terrace lying 60 m above the river, leaning against mountain, facing river

Site Size: 1960 m^2

Site Description: badly disturbed, over 100 stone-construction graves protruding on surface, probably another 100+ earth-pit graves

Researchers: Huilixian Wenwu Guanlisuo 會理縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiusuo 四川文物考古研究所

Research: discovered during survey in 1987, much disturbance already, excavation of 20 graves in 2002, 1 more in 2009

Storage: unknown

Data Sources: Kunmingshi Bowuguan et al. 2007, Sichuansheng, Liangshan, and Huilixian 2009

Features: 200+ graves, densely spaced, head oriented towards the hill top, feet towards the river, many protruding on surface, some covered by 0.1-0.5 m soil

construction: rectangular earth-pit graves lined with irregular slabs of green-grey slate, some also with stone slates as floor and / or cover; in 3 graves (XM13, 14, 20) head or foot compartment separated by other stone slab; 1.6-2.75 m length, 0.4-0.55 m width, 0.3-0.5 m depth

filling: in most of them human bones but largely decayed; all extended supine burials with the head towards the NE, about 1.46-1.6 m tall; in two cases (M13 and 16) skull placed in stomach area; very few burial goods, some ceramics, a few stone tools

Ceramic Objects: coarse sand-tempered brown ceramics, hand-thrown, some coil-built or mold-formed, burned at low temperatures, mottled surface-color, irregular and coarse

XM5: 1 *bei* beaker, *XM13*: 2 high-necked *guan* beaker, *XM14*: 1 large *guan* jar, *XM16*: 1 large *guan* jar, *XM20*: 1 *hu* pitcher, *XM21*: 1 *hu* pitcher

Stone Objects: *XM6*: 1 *fu* axe

Other: *M21*: 1 cowrie shell, 1 chain made of 130+ rounded and perforated small animal teeth

Suggested Date: late Neolithic, maybe into middle Warring States

Relative Date: Xiaoyingpan > Yingpanbao, ≈ Yunnan Chuxiong Yongren stone-construction graves (Yingpanbao probably a little earlier)

Huili Xicaodi 會理縣蓆草地 (HXC) [83]

Type: stone-construction graves

Status: surveyed

Reliability Index: 2.5

Location: 30 m north of Puling Village, Huili County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州會理縣普隆鄉

Morphology: on mountain slope, 1299 m asl.

Site Size: 10 m^2

Natural and Man-Made Environment: in between mountains

Researchers: Huilixian Wenwu Guanlisuo 會理縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Huilixian Wenwu Guanlisuo 會理縣文物管理所

Data Sources: Zhongguo Wenwuju 2009

Site Description: graves arranged in rows from East to West, longest extension in East-West direction, in North and South sloped

Features: 2+ rectangular graves with stone installations, *M1*: oriented towards the East, measuring 0.87 x 0.55 m, walls made of thin slates, in middle further slate partitioning grave into two halves, northern half 0.27 and southern half 0.24 m wide; other graves 0.87-1.58 m long, 0.52 m wide

Suggested Date: Warring States

Huili Yangjia Wuji 會理縣楊傢屋基 (HYW) [84]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 20 m East of Beisanyuan Village, Laojie Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣老街鄉北三元村

Morphology: on hilltop, 1814 m asl

Surface Area: 1000 m^2

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Surface finds: microliths, scrapers

Suggested Dating: early Neolithic

Huili Yimen Xiacunxiang 會理縣益門下村鄉 (HYX) [85]

Type: single find

Status: surveyed

Reliability Index: 1

Location: Yimen Xiacun Township, Huili County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州會理縣益門下村鄉

Morphology: first-level terrace, 1789 m asl.

Researchers: Huilixian Wenwu Guanlisuo 會理縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Tang Xiang 1999

Surface finds: 1 bronze *yue* axe

Suggested Date: Warring States

Huili Yingpanshan 會理縣營盤山 (HYP) [86]

<u>Type:</u> stone-construction graves

<u>Status</u>: surveyed

<u>Reliability Index</u>: 2

<u>Location:</u> 30 m north of Ma'anqiao Village, Xin'an Township, Huili County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州會理縣新安鄉馬鞍橋村

<u>Morphology</u>: on alluvial plain, 955 m asl.

<u>Site Size:</u> 2400 m^2

<u>Natural and Man-Made Environment</u>: very close to river, on level ground

<u>Researchers:</u> Huilixian Wenwu Guanlisuo 會理縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

<u>Storage:</u> Huilixian Wenwu Guanlisuo 會理縣文物管理所

<u>Data Sources:</u> Zhongguo Wenwuju 2009

<u>Features</u>: 10 rectangular graves, oriented towards the West, walls lined with stone slates, no cover stone, 1.5-1.7 m x 0.38-0.48 m

<u>Suggested Date:</u> Warring States

Huili Yuanbaoshan 會理縣元寶山 (HYB) [87]

<u>Type:</u> settlement site

<u>Status</u>: surveyed

<u>Reliability Index</u>: 2.5

<u>Location:</u> 1.5 km South of Heitaohe Village, Aiguo Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣愛國鄉黑濤河村

<u>Morphology</u>: on mountain slope, 1298 m asl

<u>Surface Area</u>: 8000 m^2 (100 x 80 m)

<u>Natural and Man-Made Environment</u>: on the eastern bank on the Hetao river, 60 m above the river

<u>State</u>: slightly disturbed

<u>Researchers:</u> Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

<u>Storage:</u> Huilixian Wenguansuo 會理縣文管所

<u>Data Sources:</u> Zhongguo Wenwuju 2009, data collection 12/2009

<u>Ceramics:</u> mainly undecorated red sand-tempered ceramic sherds, some corded ware decoration, some wide-mouthed rim sherds, narrow necks, flat bottoms

Stone Tools: 23 coarse stone tools, mainly flaked and polished *fu* axes, *ben* adzes, *zao* chisel, scraper, *dao* knifes, *zhui* awls, net weights, half-products

Suggested Date: Neolithic

Relative Chronology: probably same date as Houzidong

Huili Yunshancun 會理縣云山村 (HYS) [88]

Type: stone-construction graves

Status: surveyed

Reliability Index: 2

Location: 200 m SW of Yunshan Village, Hekou Township, Huili County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州會理縣河口鄉云山村

Morphology: second-level terrace, 1784 m asl.

Site Size: 200 m^2

Natural and Man-Made Environment: very close to river, on level ground

Researchers: Huilixian Wenwu Guanlisuo 會理縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Huilixian Wenwu Guanlisuo 會理縣文物管理所

Data Sources: Zhongguo Wenwuju 2009

Features: 19 rectangular graves, oriented towards the North, stone walls and lid, no stone for bottom, **M2**: 0.91 x 0.68 x 0.45

Ceramic Objects: *M2*: 1 *guan* beaker

Suggested Date: Warring States

Huili Zhuanchangba 會理縣轉場垻 (HZC) [89]

Type: object pit

Status: survey

Reliability Index: 4

Location: Lixi Township, Huili County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州會理縣黎溪鎮

Morphology: on mountain-slope, 1807 m asl

Natural and Man-Made Environment: on eastern slopes of a depression in between mountains, close to the public road, close to creek; 60 km north of the county capital and 30 km south of the border to Yuanmou County of Yunnan

Researchers: Huilixian Wenguansuo 會理縣文管所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: 6 bronze bells discovered by peasants, 3 severely damaged by peasants

Storage: Huilixian Wenguansuo 會理縣文管所

Data Sources: Tao Mingkuan 1982

Finds: 6 bronze bells stacked in three layers, handles all pointing towards the West

Relative Chronology: ≈ Yunnan Jinning Shizhaishan, Huili Luoluochong, also Han connections

1.4 Jinyang County 金陽縣

Jinyang Munagou 金陽縣木納溝 (JMG) [90]

Type: single find (might be objects from grave, reported as settlement site)

Status: surveyed

Reliability Index: 1.5

Location: Munagou Village, Mayizu Township, Jinyang County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州金陽縣馬依足鄉木納溝村

Morphology: first-level terrace, level, 1892 m asl

Surface Area: 13 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Surface finds: bronze *jian* sword and bronze *ge* halberd

Suggested Date: Warring States

1.5 Meigu County 美姑縣

Meigu Azu Bugu 美姑縣阿足 (MAB) [92]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: 150 m South of Azu Bugu Village, Lamu Ajue Township, Meigu County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州美姑縣拉木阿覺鄉阿足佈谷村

Morphology: mountain-slope, 1153 m asl

Site Size: 50 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 5 stone-construction graves, some oriented towards the West, others towards the North, **M2**: 270°, 2.9 x 0.73 x 1.3 m, only stone frame, no cover, ceramic sherds and 1 stone *fu* axe inside

Stone Tools: 1 *fu* axe

Suggested Date: Warring States to Western Han

Meigu Jiukou Jiaogu 美姑縣九口腳谷 (MJJ) [93]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: 100 m West of Jioukou Jiaogu Village, Jiukou Township, Meigu County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州美姑縣九口鄉九口腳谷村

Morphology: on mountain-slope, 2069 m asl

Site Size: 1000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 10 stone-construction graves, some oriented towards the West, others towards the North, **M8**: 270°, 2 x 0.74 x 1.2 m, only stone frame, no cover

Suggested Date: Warring States to Western Han

Meigu Shengdu Wage 美姑縣聖都瓦各 (MSW) [94]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Yiminxin Village District 3 Group 2, Lamu Ajue Township, Meigu County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州美姑縣拉木阿覺鄉移民新村三區二組

Morphology: on mountain-slope, 1463 m asl

Site Size: 500 m^2, 500 m North of Meigu River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: personal communication Liu Hong 12/2010

Features: 2 stone-construction graves, large stone slabs as cover stones

Suggested Date: Han

Meigu Wagujue Cunnan 美姑縣瓦姑覺村南 (MWC) [95]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: 700 m South of Wagujue Village, Longmen Township, Meigu County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州美姑縣龍門鄉瓦姑覺村

Morphology: on second-level terrace, 1988 m asl

Site Size: 10 m^2, East of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 stone-construction grave, 270°, 1.5 x 0.6 x 1.4, no stone cover

Suggested Date: Warring States to Western Han

Meigu Wagujue Dongbei 美姑縣瓦姑覺東北 (MWB) [96]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 420 m NE of Wagujue Village, Longmen Township, Meigu County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州美姑縣龍門鄉瓦姑覺村

Morphology: on second-level terrace, 1988 m asl

Site Size: 20 m^2, East of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 2 stone-construction graves, 5 m between the graves, graves oriented towards the West; **M1**: 2.4 x 0.6 x 1.1, no stone cover

Suggested Date: Warring States to Western Han

Meigu Wagujue Dongnan I 美姑縣瓦姑覺東南 I (MWD) [97]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: 350 m SE of Wagujue Village, Longmen Township, Meigu County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州美姑縣龍門鄉瓦姑覺村

Morphology: on second-level terrace, 1952 m asl

Site Size: 10 m^2, East of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 stone-construction graves, oriented towards the West, 1.5 x0.6 x 0.9 m, no stone coverSuggested Date: Warring States to Western Han

Meigu Wagujue Dongnan II 美姑縣瓦姑覺東南 II (MWT) [98]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 800 m SE of Wagujue Village, Longmen Township, Meigu County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州美姑縣龍門鄉瓦姑覺村

Morphology: on second-level terrace, 1944 m asl

Site Size: 10 m^2, East of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 stone-construction grave, oriented towards the West; 1.7 x 0.6 x 0.75, no stone cover

Suggested Date: Warring States to Western Han

Meigu Wagujue 美姑縣瓦姑覺 (MWG) [99]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 200 m East of Wagujue Village, Longmen Township, Meigu County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州美姑縣龍門鄉瓦姑覺村

Morphology: second-level terrace, level, 1960 m asl

Surface Area: 320000 m^2 (NS 800 m, EW 400 m)

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Site Description: cultural layers 0.3 m below the surface, 0.5 m of cultural layering

Surface finds: grey and red sand-tempered pottery sherds, 22 polished stone tools, mainly *fu* axes, *ben* adzes, *dao* knifes, *zao* chisel, and *zu* arrowheads

Suggested Date: Neolithic

1.6 Mianning County 冕寧縣

Mianning Beishanba 冕寧縣北山壩(MBB) [100]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3.5

Location: Da'ekou Village Group 2, Chengxiang Township, Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣城廂鎮大埡口村二組

Morphology: on first-level terrace, 1768 asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: excavated, not separately published, only mentioned

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Site Description: very close to river, on level ground

Features: 1 megalithic grave, *orientation*: 7°, 7.x x 1.2 x 1.8 m, rectangular, walls and cover made of large irregular stone boulders, 1 *guan* beaker, 1 bronze knife, 8 arrowheads, 10 bronze and 2 silver bracelets, 2 button ornaments, 2 stone beads

Ceramic Objects: 1 *guan* beaker

Bronze Objects: 1 knife, 8 arrowheads, 10 *zhuo* bracelets, 2 button ornaments

Stone Objects: 2 beads

Other: 2 silver *zhuo* bracelets

Suggested Date: Warring States to Western Han

Mianning Chengguan 冕寧縣城関(MCG) [101]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1

Location: Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣

Morphology: on first-level terrace, 1788 asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: mentioned in Yang Zhefen 2001

Site Description: close to river, on level ground

Features: unclear numbers of megalithic graves, no further information

Suggested Date: Warring States to Western Han

Mianning Gaopo 冕寧縣高坡 (2010MGP) [102]

Type: settlement site

Status: surveyed, test excavation conducted

Reliability Index: 3.5

Location: Gaopo, Jianshe Village Group 5, Fuxing Township, Mianning County Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣復興鎮建設村五組, 15 km West of Mianning public road, close to river-bent, on platform 50 m above the river, on western river bank, overlooking the river

Morphology: first-level terrace, level, 1684 m asl

Surface Area: 5600 m^2 (EW 70 m x NS 80 m)

Natural and Man-Made Environment: 20 m further North water channel of 20 m width, 200 m East of Anning River, on first-level terrace of Anning River, agricultural fields, mainly rice

State: slightly disturbed

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Mianningxian Wenwu Guanlisuo 冕寧縣文物管理所

Research: discovered during survey, excavation of one test pit of 5 x 4 m in October 2010, only excavated up to beginning of layer 4

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: participation in excavation, unpublished

Site Description: West high, east low, disturbed by river shifting towards the West

Description Layers:

Layer 1: loose yellow loamy agricultural soil, 0.5-0.55 m thick, few shallow roots, no objects

Layer 2: loose black-brown sandy soil, 0.1-0.46 m thick, some red-burned earth, some ash and charcoal fragments, many red and grey sand-tempered ceramic sherds, some also brown and very few fine black ware, mainly of large-size vessels, some small stemmed *dou* bowls, some incised patterns, leaf-vein pattern

Layer 3: soft grey-brown sandy soil, 0.18 m thick, small number of red sand-tempered ceramic sherds, badly fragmented, badly fragmented, mainly undecorated

Layer 4: yellow-brown sandy soil, small number of badly fragmented red sand-tempered ceramic sherds, only excavated for 2 x 1 m in the EW, there 0.5 m thick

Features: wall plaster fragments

Ceramics:

87.45% red-brown sand-tempered ceramic sherds, 12.2 % grey, black, and yellow sand-tempered sherds secondary, 0.15 % black and very few yellow-brown fine ware; mainly wheel-thrown, some coil-built; mainly undecorated, most common decorations are vein-pattern on vessel bottom and knob pattern on the shoulder, small number of application bands with fingertip-impressed decoration below the rim; *wan* and *bo* bowls, *guan* jars, lids, ring-foot bottoms, and spouted vessels common, carinated *wan* bowls, large *guan* jars with horn-shaped know-applications, duck-beak shaped spouts

Layer 1: fragmented red-brown, grey-black and yellow sand-tempered ceramic sherds

Layer 2: fragmented grey, red, yellow, and black sand-tempered ceramic pottery, some flat bottoms, ring-foot bottoms, rims of *wan* and *bo* bowls, large-sized *guan* jars, some leaf-vein pattern on bottoms, few incised lines

Layer 3: large amounts of red, yellow-brown, and black-brown sand-tempered, and a few fine bowls of black-brown fine ware, carinated *wan* bowls, large *guan* jars, many with horn-shaped knobs on the shoulder, large coarse coil-built beak-shaped spouts, flat leaf-vein impressed and ring-foot bottoms, some high trumpet-shaped ring-foot bottoms, 1 bi-conical spindle-whorl

Stone Tools: very few

Layer 3: 1 coarse flaked stone-tool fragment, 1 triangular *mopan* grinding-slab

Absolute Dates:

2010SMGT1.1:3010+-35	1390-1120BC
2010SMGT1.2: 3050+-30	1410-1250BC / 1240-1210BC
2010SMGT1.3: 2950+-25	1270-1050BC
2010SMGT1.3: 3110+-25	1440-1310BP

Suggested Date: *layer 3-4*: Neolithic to Shang-Zhou; *layer 2*: Western Han

Relative Chronology: Mianning Gaopo ≈ Guizhou Jigongshan, Yunnan Ludian Yeshishan

Mianning Gaopo Wanwan 冕寧縣高坡灣灣 (MGW) [103]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Gaopo Wanwan, Hongxing Village, Fuxing Township, Mianning County Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣復興鎮紅星村, 1 km south of Hongxing Village, south of Gaopo

Morphology: first-level terrace, level, 1722 m asl.

Surface Area: 6000 m^2 (EW 60 m, NS 100 m)

Natural and Man-Made Environment: on first-level terrace of Anning River, agricultural fields, mainly rice

State: heavily disturbed, eroded by river shifting to the West

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Mianningxian Wenwu Guanlisuo 冕寧縣文物管理所

Research: discovered and surveyed in March 2003

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: mentioned in Liu Hong 2009 and Zhongguo Wenwuju 2009, data collection 11/2010

Site Description: on Western bank of the river, overlooking the river, rice and vegetable fields, some red-burned earth

Ceramics: mainly brown and red sand-tempered ceramics, small number of highly polished black clay ceramic sherds, some incised line pattern and knob application, some impressed leaf-vein pattern on vessel bottoms, flat vessel bottoms, rims of large *guan* jars

Stone Tools: fragments a few coarse flaked and polished stone tools made of gabbro and other coarse material

Suggested Date: Shang-Zhou

Mianning Hujiazui 冕寧縣胡家嘴 (MHJ) [104]

Type: settlement site

Status: trial excavations

Reliability Index: 4

Location: Hujiazui, Xianfeng Township, Mianning County Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣先熢鄉

Morphology: on alluvial fan, 1659 m asl

Surface Area: 5500 m^2 (NS 90 m, EW 60 m)

Natural and Man-Made Environment: on the edge of the alluvial fan of the southern hills; on fields on the southern edge of Xinglongcun Group 1, 20 m further east water trench of 10 m width; 1.5 km north of Southern mountains, 2 km west of Anning River, 85 km North of Xichang, 430 km South of Chengdu, 2 km West of the Anning River, on SE fringe of the Kham plateau 康藏高原, on the eastern side of the Henglanshan mountain range; on vegetable field (cabbage, Sichuan pepper, explants, mulberry trees); located on Hebian river 河边河, on all three sides surrounded by fields

State: disturbed by Han graves

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Mianningxian Wenwu Guanlisuo 冕寧縣文物管理所

Research: discovered in October 2009, trial excavation in October 2010 of East-West oriented pit of 9 x 4 m, making 2 trenches of 4 x 4 m (2010SMZT1 and 2010SMZT2)

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: participation in excavation, unpublished, mentioned in Liu Hong 2009

Site Description: high in the South, low in the North, cultural layers disturbed by Han brick graves

Description Layers: top soil is agricultural soil, grey-yellow sandy soil 灰黄色沙土, loose, easy to move, small number of sand grains of 0.1-0.2 cm diameter, only 3 layers excavated

Layer 1: loose yellow sandy agricultural soil, 0.10-0.15 m thick, no objects

Layer 2: loose black sandy soil, 0.2-0.25 m thick, much red-burned earth, small number of ceramic sherds, mainly red and grey sand-tempered pottery, heavily fragmented

Ceramics: small number of coarse red and some black and grey sand-tempered ceramics, heavily fragmented, forms unclear, largely undecorated

Suggested Date: Warring States to Western Han

Relative Chronology: Hujiazui ≈ Mianning Gaopo

Mianning Manshuiwan 冕寧縣漫水灣(MMW) [105]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Songlin Village, Manshuiwan Township, Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣漫水灣鎮松林村

Morphology: on second-level terrace, sloped, 1654 asl.

Surface Area: 35 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, East-West oriented, 7.5 x 5.1 m, rectangular, walls and cover made of large stone boulders

Suggested Date: Warring States

Mianning Miaoshan 冕寧縣廟山 (MMS) [106]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: Miaoshan, Shanhe Village, Hongmo Township, Mianning County Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣宏模鄉山河鄉, 100 m South of Shanhe village, on eastern bank of Anning River

Morphology: first-level terrace, 1633 m asl

Surface Area: 6000 m^2 (EW 30 m, NS 200 m)

State: disturbed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Mianningxian Wenwu Guanlisuo 冕寧縣文物管理所

Research: briefly surveyed

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: mentioned in Liu Hong 2009 and Zhongguo Wenwuju 2009, data collection 11/2010

Site Description: 1.1 m cultural layers (1.7 below the surface, 2 layers), red-burned earth, charcoal and ash remains

Ceramics: grey and red sand-tempered pottery, mainly undecorated, small amount of corded ware, large coarse *guan* jars

Stone Tools: polished stone *dao* knives, fragments of large smooth polished stone tools of unclear function, probably hammer stones, flaked choppers

Suggested Date: Neolithic to Warring States

Mianning Ruoshuicun 冕寧縣若水村(MRS) [107]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 1.5 km NW of Ruoshui Village, Huilong Township, Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣回籠鄉若水村

Morphology: on first-level terrace, 1944 asl.

Surface Area: 2250 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 4 megalithic graves, oriented towards the East, rectangular, walls and cover made of large stone boulders, **M2**: 4 x 2.7 x 1.6 m

Suggested Date: Warring States

Mianning Sanfentun 冕寧縣三分屯 (MST) [108]

Type: settlement site

Status: trial excavation

Reliability Index: 4.5

Location: 1 km SW of Sanfentun Village, Chengxiang Town, Mianning County Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣城廂鎮三分屯村

Morphology: first-level terrace, level, 1792 m asl

Surface Area: 41850 m^2 (North-South 558, East-West 75 m)

Natural and Man-Made Environment: on the intersection of Nanhe 南河 and Anning River, 10 m above the river, on school grounds

State: severely disturbed through building activities in 1970s

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Mianningxian Wenwu Guanlisuo 冕寧縣文物管理所

Research: 1975 discovered in survey, second survey in June 1987, trial excavation in June 2003, two 5 x 5 m trenches (T1 and T2)

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan and Mianningxian 2006, Zhongguo Wenwuju 2009, data collection 12/2010

Secondary Studies: Liu Hong 2009

Description Layers (eastern Wall of T2):

Layer 1: soft black-brown topsoil, 0.05-0.1 m, some modern blue-and-white ceramic sherds, modern pit H1 starts from here

Layer 2: thick in the north, shallow in the south, soft grey-grown sandy soil, 0.2-0.50 m, some porcelain and ceramic sherds

Layer 3: firm brown sandy soil, 0.05-1 m, Ming/Qing porcelain and ceramic sherds

Layer 4: thick in the north, shallow in the south, 0-0.5 m, soft black clay soil, few ceramic sherds

Layer 5: thick in the north, shallow in the south, firm black-brown sandy soil 0.2-0.35 m thick, very few sand-tempered ceramic sherds

Layer 6: firm red-brown sandy soil, 0.1-0.5 m, mainly undecorated grey-brown sand-tempered ceramic sherds

Layer 7: thick in North and South, shallow in the middle, 0.1-0.35 m thick, firm grey-white sandy soil, small fragments of grey-brown sand-tempered ceramic sherds

Below layer 7: yellow-white sandy virgin soil

Ceramics:

Surface collection: 1 small *bei* cup with thickened flat bottom, 2 rhombus-shaped spindle-whorls

Layer 5-7: 87% grey, 7.4 red, 5.6 % black-brown sand-tempered pottery, 92.7 % undecorated, 2.4 % leaf-vein pattern, 2 % corded ware, 1.9 % line incisions, small amount of other kinds of incisions and tool-impressed patterns; 14 *guan* jars, 3 long band-handles and 2 wide band-handles made of 4 clay-strips, 14 flat bottoms, 11 of them with impressed leaf-vein pattern, 4 ring-foot bottoms, 11 thickened flat bottoms

Stone Tools:

Surface collection: 5 polished stone tools (3 perforated *dao* knives, 1 trapezoidal and 1 rectangular *fu* axe)

Layer 5: 1 polished trapezoidal *fu* axe, 2 plate-shaped flaked stone chopper

Layer 6: 2 polished stone tools (1 rectangular *dao* knife, 1 stick-shaped grinding roller), 3 plate-shaped flaked stone chopper

Suggested Date: late Warring States to Spring and Autumn or Western Han

Suggested Cultural affiliation: megalithic graves

Mianning Sankuaishi (Qingshiqiao)冕寧縣三塊石（青石橋）(MSK) [109]

Type: megalithic grave site

Status: excavated

Reliability Index: 4.5

Location: Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣

Morphology: on first-level terrace, 1850 asl.

Surface Area: 2250 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, orientation: 180°, 7.3 x 1.2 m, rectangular, 3 large boulders as cover stones, walls made of large boulders, tumulus of 10 m diameter and 1 m height; *content*: 17 human skeletons of both sexes, all wrapped in cloths, extended supine interments, a number of objects, among them ceramic *guan* beaker, 1 *bei* cup, bronze arrowheads, small knives, bronze and silver *zhuo* bracelets, button ornaments, bone and agate beads

Suggested Date: Warring States to Western Han

Mianning Songlin Laojie 冕寧縣松林老街(MSL) [110]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣

Morphology: on mountain-slope, 1812 asl.

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, orientation: 80°, 4.3 x 2.7 x 1 m, rectangular grave form, walls made of large stone boulders, cover made of 3 large stone boulders, 1 *guan* jar

Suggested Date: Warring States to Western Han

Mianning Wenjiatun 冕寧縣文家屯 (MWJ) [111]

Type: settlement site

Status: surveyed

Reliability Index: 1

Location: Wenjiatun, Hongmo Township 四川省涼山彝族自治州冕寧縣宏模鄉

Morphology: on alluvial fan, 1632 m asl

Surface Area: 150 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Mianningxian Wenwu Guanlisuo 冕寧縣文物管理所

Research: surveyed, unpublished

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: mentioned in Liu Hong 2009

Site Description: some brown sand-tempered ceramic sherds

Suggested Date: Warring States to Western Han

Mianning Xiangshi 冕寧縣响石(MXS) [112]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 100 m North of Xiangshi Village Group 1, Fuxing Township, Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣復興鎮响石村一組

Morphology: on rim of first-level terrace, on foot of Huangniu Mountain 黄牛山, 1812 asl.

Surface Area: 20 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, orientation: 0°, 5 x 2.4, rectangular grave form, cover and walls made of large stone boulders, largest 3.4 x 1.5 x 0.55 m

Suggested Date: Warring States

Mianning Xiaogoudi 冕寧縣小溝地(MXG) [113]

Type: earth-pit grave site, some with stone installations

Status: surveyed

Reliability Index: 2

Location: 700 m South of Hongxing Village, Fuxing Township, Mianning County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣復興鎮紅星村

Morphology: on first-level terrace, 1759 asl.

Surface Area: 2400 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 21 earth-pit graves, orientation: 90°, rectangular grave form, badly disturbed, graves densely distributed, 0.5 -1 m between them, 0.4-0.7 m wide, about 0.5 m depth preserved, some paved with stones on the ground, some with single ceramic *guan* jar with calcinated human bones inside

Suggested Date: Warring States

Mianning Zhaojiawan 冕寧縣趙家灣 (MZJ) [114]

Type: settlement site

Status: trial excavations

Reliability Index: 5

Location: Zhaojiawan Shuanghe Village Group 7, Xianfeng Township, Mianning County Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州冕寧縣先燧鄉雙河村七組, 500 m West of Luhe public road 瀘河公路

Morphology: on alluvial fan, 1632 m asl

Surface Area: 8800 m^2 (NS 90 m, EW 100 m)

Natural and Man-Made Environment: 85 km North of Xichang, 430 km South of Chengdu, 2 km West of the Anning River, on SE fringe of the Kham plateau 康藏高原, on the eastern side of the Henglanshan mountain range; on vegetable field (cabbage, eggplant, mulberry, pears) SW of Shuanghecun Group 7, 20 m towards the West gully of 10 m width; located on Hebian river 河边河, on all three sides surrounded by fields

State: disturbed by Han graves

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Mianningxian Wenwu Guanlisuo 冕寧縣文物管理所

Research: discovered in October 2009, trial excavation in October 2010 of East-West oriented pit of 9 x 4 m, making 2 trenches of 4 x 4 m (2010SMZT1 and 2010SMZT2)

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: participation in excavation, Chengdushi, Liangshan, and Mianningxian 2012, mentioned in Liu Hong 2009

Site Description: high in the South, low in the North, cultural layers disturbed by Han brick graves

Description Layers: top soil is agricultural soil, grey-yellow sandy soil 灰黄色沙土, loose, easy to move, small number of sand grains of 0.1-0.2 cm diameter, only 3 layers excavated

Layer 1: loose yellow sandy agricultural soil, 0.25-0.25 m thick, few ceramic sherds, modern roof tiles, stones, modern ash-pits

Layer 2: loose black sandy soil, high in the NW, shallow in the SE, 0.2-0.25 m thick, much red-burned earth, large number of ceramic sherds, mainly red and grey sand-tempered pottery, heavily fragmented, 1 Han tile with coin motive

Below layer 2: dense yellow virgin soil

Features: 6 postholes below layer 2 in northern part of T1, cut into virgin soil, 0.4-0.6 m diameter, 0.25 m deep

Ceramics: large number of coarse red and some black and grey sand-tempered ceramics, very few black fine ware, heavily fragmented, forms unclear, largely undecorated, some leaf-vein pattern, horn-shaped knobs, incised lines and corded ware decoration; mainly *wan* and *bo* bowls, large *guan* jars with horn-shaped knobs

Layer 2: many red sand-tempered ceramic sherds, some flat bottoms, some with leaf-vein pattern, some ring feet bottoms, few fine ceramic sherds

Stone Tools:

Layer 1: perforated *dao* knifes, hammer stones

Absolute Dates:

2010SMZT1.2: 3030+-25 1390-1210BC
2010SMZT1.3: 2810+-45 1120-1100BC / 1090-840BC

Suggested Date: Warring States to Western Han

Relative Chronology: Zhaojiawan ≈ Mianning Gaopo

1.7 Ningnan County 寧南縣

Ningnan Heinigou 寧南縣黑泥溝 (NHF) [127]

Type: settlement site

Status: surveyed

Reliability Index: 2.5

Location: Heinigou Village, Jingxing Township, Ningnan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州寧南縣景星鄉黑泥溝村

Morphology: third-level terrace, 1050 m asl

Surface Area: 13000 m^2

Natural and Man-Made Environment: on the left bank of Heishui River 黑水河

State: well-preserved

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Zhongguo Shehui Xueyuan Kaogu Yanjiusuo 中國社會學院考古研究所

Research: survey in 2002

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Description Layers:

Layer 1: black-brown sandy soil, 0.2 m thick

Layer 2: yellow-brown earth, modern alluvial debris, 0.02 m thick, stones inside

Layer 3: grey-black soil, 0.3 m thick, small number of ceramic sherds and large number of grinding stones

Layer 4: yellow earth, 0.3 m thick, large number of stone tool fragments and small number of ceramic sherds

Layer 5: red-brown soil, 0.3 m, small number of stones, small number of ceramic sherds

Layer 6: grey-brown soil, 0.3 m thick, small number of ceramics and stone tools

Surface finds: stone knives, red-brown sand-tempered ceramic sherds, large jars, line incisions

Suggested Date: Neolithic to Early Zhou

Ningnan Tangjiawan 寧南縣唐傢灣 (NTW) [128]

Type: settlement site

Status: surveyed

Reliability Index: 2.5

Location: Tangjiawan Group 5, Makou Village, Pisha Township, Ningnan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州寧南縣披砂鎮碼口村 5 社

Morphology: second-level terrace, 1038 m asl

Surface Area: 13100 m^2

Natural and Man-Made Environment: on the bank of Heishui River 黑水河, 50 m above the river, agricultural fields above, mainly corn and trees

State: well-preserved

Researchers: Sichuansheng Wenwu Kaogu Yanjiuyuan 四川省文物考古研究院, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: discovered during survey in 2007

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Description Layers:

Layer 1: soft black-brown sandy soil , 0.2 m thick

Layer 2: yellow-brown soil with stones, alluvial layer, 0.5 m thick

Layer 3: grey-black sandy soil, 0.3 m thick, small number of ceramic sherds and stone tools

Surface finds: 10 highly-burned yellow-brown ceramic sherds, some with black slip, one of them with trumpet-shaped mouth, some large *guan* jar forms, flat bottoms, some coarse corded ware, application bands, line incisions, stone *fu* axes, grinding slabs, and stone tool fragments

Suggested Date: Neolithic to early Zhou

1.8 Puge County 普格縣

Puge Amucun 普格縣阿木村 (PAM) [129]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: 40 m North Amu Village, Jiajie Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣夾鐵鄉阿木村

Morphology: on mountain-slope, 1828 asl

Surface Area: 20 m^2

State: severely disturbed before survey, now destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Features: 2 megalithic graves, oriented towards the South, 40 m between them; **M1**: walls made of large stone slabs, cover made of large stone boulders, 2.9 x 1.2 x 1 m; containing ceramic *hu* pots, spindle whorls, bronze *dao* knifes, *zhuo* bracelets, arrowheads, and stone tools

Suggested Date: Warring States

Puge Heping 普格縣和平 (PHP) [130]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1

Location: 40 m SW of Wanluo Village, Wadaluo Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣瓦打洛鄉灣洛村

Morphology: on mountain-slope, in narrow valley in between mountains, 1961 asl

Surface Area: 10 m^2

State: severely disturbed before survey, now destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oriented towards the East

Suggested Date: Warring States to Western Han

Puge Kangli 普格縣康利 (PKL) [131]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Kangli, Shunhe Village Group 2, Puji Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣普基鎮順河村 2 組

Morphology: first-level terrace, level, 1323 m asl

Natural and Man-Made Environment: below field of mulberry trees behind Wenquanshan 溫泉山 and Huashan mountains 華山

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: data collection 11/2010

Surface collection: 2 hook-shaped knob applications in coarsely stone-tempered red sand-tempered pottery, 2 kidney-shaped net weights, 1 triangular fragment of a grinding stone

Suggested Date: late Neolithic

Relative Chronology: ≈ early to middle Lizhou, Puge Tianba, Tuantian, Zhongcun

Puge Tianba 普格縣田坝 (PTB) [132]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 50 m NW of Tianba Village, Pule Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣普樂鄉田垻村

Morphology: second-level terrace, level, 1195 asl

Surface Area: 2000 m^2

Natural and Man-Made Environment: on eastern bank of Xiluo River, 4 km from Puge

State: surveyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Pugexian Wenhuaguan 普格縣文化館

Research: survey in December 1980

Storage: unclear

Data Sources: Liangshan and Pugexian 1982, Zhongguo Wenwuju 2009

Surface finds: many ceramics and stone tools, ceramics red-brown fine ware, burned at medium temperature, hand-thrown, 1 *guan* beaker, 2 flat bottoms, 6 large polished *fu* axes, some long-rectangular, some trapezoidal, 1 polished leaf-shaped *zu* arrowhead

Suggested Date: late Neolithic

Relative Chronology: ≈ early to middle Lizhou, Puge Kangli, Tuantian, Zhongcun

Puge Tuantian 普格縣團田 (PTT) [133]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 500 m South of Shunhe Village, Puge Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣普格鄉順河村

Morphology: foothills, sloped, 1257 asl

Surface Area: 10000 m^2 (EW 200 m, NS 500 m)

Natural and Man-Made Environment: on the western bank of the intersection of Muhe and Heishui River, on the foot of the mountain

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: survey in December 1980

Storage: unclear

Data Sources: Liangshan and Pugexian 1982, Zhongguo Wenwuju 2009

Site Description: 1 m cultural layers, red-brown earth, very few objects

Surface finds: 5 double-handled *guan* beakers, 2 *zao* chisel, 4 *fu* axes

Suggested Date: late Neolithic

Relative Chronology: ≈ early to middle Lizhou, Puge Kangli, Tianba, Zhongcun

Puge Wadaluo 普格縣瓦打洛 (PWL) [134]

Type: settlement site, megalithic grave site, earth-pit grave site, object pit

Status: surveyed, maybe partially excavated (no clear information)

Reliability Index: 1.5

Location: 100 m North of Wadaluo Village, Jiajie Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣夾鐵村瓦打洛村

Morphology: in valley in between mountains, on sloped ground, 1773 asl

Surface Area: 131400 m^2 (NS 730 m x EW 180 m)

Natural and Man-Made Environment: on the foot of Mahong Mountain 馬洪山，on the western bank of Xiluo river 西儸河, about 2 km North of Xiaoxingchang 小興場, 150 m East of the river at 30 m above the river level, very steep (30° elevation)

State: severely disturbed by water before survey, now destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered in 1981, survey in 1981, maybe some test excavations, survey in March 2009

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1983a, Zhongguo Wenwuju 2009, data collection 10/2010

Description Layers:

Upper Layer: grey clay, 0.2-0.5 m, ash, charcoal, a few stone tools and bone tools, many ceramics, small forms, graves protruding at the surface, M1-5 in this layer

Lower Layer: grey-brown ceramics, 1-1.5 m, a little less ceramics but better preserved, 1 ash pit H1 in this layer

Features: 2+ megalithic graves, 5+ earth-pit graves (M1-5), several ash or storage pits (H1)

M1: in upper layer, earth-pit grave, 1 chain made of 50 shells and bone beads

M2: in upper layer, earth-pit grave, 1 chain made of over 200 bone beads

M3: in upper layer, earth-pit grave, shells, 3 bone arrow heads

H1: in lower layer, 1 x 0.5 x 0.8 m, rectangular, 150+ objects, at least 4 *guan* jars with wide-flaring mouths, 1 *bei* cup, 1 footed *bo* bowl, 1 *ping* flask, 2 spindle whorls, mainly grey-brown clay-pottery, some with black slip, few sand-tempered red or grey

DM1: megalithic grave, orientation unclear, 6.7 x 5.4 x 1 m, rectangular, several large stones used for walls, large stone for cover, unexcavated, now destroyed

DM2: megalithic grave, orientation unclear, 7.3 x 2.3 x 1.6 m, rectangular, several large stones used for walls, large stone for cover, unexcavated, now destroyed

Ceramics:

objects from surface collection, upper and lower layer, and H1 reported together: mainly grey and some grey-brown or black-brown fine ware, few with black slip or highly polished, few red or grey sand-tempered pottery sherds, mainly hand-formed, high burning-temperature, some leaf-vein pattern, point pattern, fish-bone pattern, awl pattern, and more, 9 *guan* jars without handles with outward-flaring mouths, vessels with high necks, 1 elongated *ping* vase, 2 *bei* cups, one with a lug handle, the other funnel-shaped, 1 shallow *bo* bowl,[1] 3 flat bottoms, 3 loom weights, 1 of them with leaf-pattern

Stone Tools:

[1] Classified as *die* plate in the excavation report.

Surface collection: 6 *fu* axes, 4 rectangular, 2 trapezoidal, 1 rectangular and 1 trapezoidal *ben* adzes, 1 oval *dao* knife, 1 leaf-shaped arrow-head, all polished

Other:

M1: 1 chain of 50 shells and bone beads

M2: 1 chain of over 200 small and larger bone beads

M3: shells, 3 bone arrowheads

Suggested Date: early Warring States

Relative Chronology: middle Lizhou > Wadaluo > megalithic graves

Suggested cultural affiliation: developed from late Lizhou, beginning megalithic grave phase

Puge Xiaoxingchang (also: Ruoli Guolibu) 普格縣小興場 (若力果力不)(PXC) [135]

Type: settlement site, megalithic grave site

Status: partially excavated, settlement site only surveyed

Reliability Index: 3.5

Location: 10 m NE of Xiaoxingchang Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣小興場鎮

Morphology: in valley in between mountains, ground sloped, 1857 m asl

Surface Area: 5000 m^2

Natural and Man-Made Environment: 300 m SE of Xiaoxingchang, Luohe 儸河, Mahe 馬河 and Rihe River 日河 flow by in the West, 20 m above the river, on 4 sides surrounded by mountains, rice paddies above, dry farm land around, 35° slope; group A mainly on the mountain side of Amu Mountain 阿木山, halfway up the mountain slope; group B in SE, on terrace slope, very close to Xiluo River 西羅河, on northern bank of Maheri River 馬和日河, 20 m above water level at a slope of 35°

State: heavily eroded, now destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Pugexian Wenhuaguan 普格縣文化館, Pugexian Kexue Jishu Qingbao Weiyuanhui 普格縣科學技術情報委員會

Research: survey in December 1980

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan and Pugexian 1982 and 1987, Liangshan, Pugexian, and Pugexian Kexue 1982, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 10/2010

Site Description: northern and southern area, separated by ditch, southern part 400 m x 50 m, on slope of southern river bank, baldy disturbed, cultural layers hardly distinguishable, one of 0.5 m thickness, ash and ceramic sherds inside; group A containing about 30 graves on area of 150 x 80 m, severely disturbed; canal running right through area of group B containing 10 graves, badly disturbed

Features: about 40 megalithic graves, 30 in group A, AM1 and AM2 excavated, densely distributed, < 2 m apart from each other, 10 in group B, BM1,2, and 4 excavated

construction: all graves built of flat slates of 0.2-0.5 x 0.1-0.25 x 0.05-0.15, only AM2 of a few larger irregular stone slabs; cover made of 2-5 slabs of max. 2.75 x 1.9 x 9.55 m, ground leveled with sand-gravel mixture; most doors consisting of assemblage of small irregular cobbles and boulders; human bones all in disarray, badly preserved

AM1: *orientation*: 300°; *construction*: rectangular, 2.9 x 0.7-1.2 x 1 m, walls made of stone slates of 0.1-0.2 m thickness, door on one of the short sides, made of small irregular pebbles, covered with several large stone boulders, floor evened out with sand-gravel mixture; grave covered with soil tumulus

content: filled with washed-in earth, disturbed, human bones of 10+ people of men and women, mainly adult and senile, piled 30 cm high, scattered throughout the whole grave, in NE corner and middle of the western wall calcinated human bones and small amounts of charcoal and burned earth; 1 spouted *hu* pot with burn marks, 1 spindle whorl, 3 bronze knives, 4 arrowheads, 5 *zhuo* bracelets

AM2: *orientation*: 20°; *construction*: rectangular, 1.05 x 1 x 0.9 m, walls made of large rough stone slabs, covered with large stone boulder, door made of several cobbles, floor evened out with sand-gravel mixture

content: bones of 4+ people scattered throughout the whole grave, decorated ceramic sherds, 1 bronze arrowhead, 1 knife, 3 *zhuo* bracelets, 1 broken stone tool

BM1: *orientation*: 40°; *construction*: rectangular, 5 x 0.8-1.15 x 1.8 m, walls made of smoothed stone slabs of 0.3-0.5 x 0.1-0.25 x 0.05-0.15 m, door on one of the short sides, made of small irregular stones; covered with 3 large stone boulder of max. 2.75 x 1.9 x 0.55 m, access ramp, floor evened out with sand-gravel mixture

content: bones of 82+ people scattered throughout the whole grave, decorated ceramic sherds, 1 bronze arrowhead, 35 *zhuo* bracelets, 2 finger rings, 1 hair ornament, 3 oblong stone tools, 1 agate bead, 3 bone *huan* rings, 8 curved tooth ornaments; 3 animal tooth ornaments made from boar's fangs; found at head side of BM1 at the door, bronze sword on top

BM2: *orientation*: 45°; *construction*: rectangular, 5.2 x 1 x 2 m, ramp of 1.8 x 0.4 m, walls made of smoothed stone slabs of 0.3-0.5 x 0.1-0.25 x 0.05-0.15 m, front part separated into a separate small compartment by several small stone boulders; door on one of the short sides, made of small irregular stones; covered with 4 large stone boulder of max. 2.75 x 1.9 x 0.55 m, floor evened out with sand-gravel mixture

content: bones of 48+ people scattered throughout the whole grave, 1 double-handled ceramic *guan* beaker, 4 *zhuo* bracelets, 1 finger ring, 2 hair ornaments, 2 agate beads, 3 bone *huan* rings, 5 bone earrings, 19 tooth ornaments

BM3: unexcavated, now destroyed, *orientation*: unclear; *construction*: trapezoidal form ext. 4 x 1.5 x 1.2 m, walls made of small pebbles and boulders, door on one of the short sides, made of small irregular stones; covered with 2 large stone boulders, stone size of 0.3-0.5 x 0.1-0.25 x 0.05-0.15 m

BM4: *orientation*: 45°; *construction*: 5.7 x 1-1.3 x 1.7 m, walls made of smoothed stone slabs of 0.3-0.5 x 0.1-0.25 x 0.05-0.15 m, door made of one large stone slate; front part separated into a separate smaller compartment by one stone slate; covered with 4 large stone boulder of max. 2.75 x 1.9 x 0.55 m, floor evened out with sand-gravel mixture

content: bones of 152+ people scattered throughout the whole grave, both male and female, all ages, 8 *zhuo* bracelets, 4 hair ornaments, 3 oblong stone tools, 4 turquoise beads, 2 bone *jue* rings, 17 tooth ornaments

<u>Ceramics:</u>

Northern settlement area: sand-tempered ceramic sherds, hand-thrown, medium to high burning temperature, some with fine corded ware design, badly fragmented, only 1 large *guan* jar and 1 *ping* vase identifiable

Southern settlement area: sand-tempered hand-thrown low-burned ceramic sherds, some fine corded ware; 3 *bo* bowls, some fine, 1 *wan* bowl, 1 short *bei* cup, 1 high *guan* jar or *ping* vase, no handles, vessel-bottoms flat and thickened

AM1: 1 spouted *hu* pot, 1 spindle whorl

AM2: ceramic sherds with impressed leaf-vein pattern on bottoms, others with incised water-ripple pattern and application bands on shoulder and rim

BM1: ceramic sherds with impressed leaf-vein pattern on bottoms, others with incised water-ripple pattern and application bands on shoulder and rim

BM2: 1 double-handled *guan* beaker

<u>Stone Objects:</u>

Northern settlement area: 1 single-perforated crescent-shaped polished *dao* knife, 2 end-perforated rectangular *zao* chisel

Southern settlement area: 4 *fu* axes (3 rectangular, 1 long-oval), 1 rectangular *ben* adze, 6 bi-convex perforated *dao* knives, 1 thin leaf-shaped arrowhead, all polished, mainly large, except for small fine arrowhead

AM2: 1 broken stone tool

BM1: 3 oblong stone tools, 1 agate bead

BM2: 3 agate beads

BM4: 3 oblong stone tools, 4 turquoise beads

<u>Bronze Objects:</u> *M1:* 3 *dao* knives, 4 arrowheads, 5 *zhuo* bracelets

AM2: 1 arrowhead, 1 *dao* knife, 3 *zhuo* bracelets

BM1: 35 *zhuo* bracelets, 2 finger rings, 1 hair ornament, 1 sword

BM2: 3 *dao* knives, 4 *zhuo* bracelets, 1 finger ring, 2 hair ornaments

BM4: 8 *zhuo* bracelets, 4 hair ornaments

<u>Other Objects</u>: *BM1*: 3 bone *huan* rings, 11 animal tooth ornaments made from boar’s fangs

BM2: 5 bone earrings, 19 tooth ornaments

BM4: 2 bone *jue* rings, 17 tooth ornaments

Internal Chronology: AM2 > BM1, BM2, BM4

Suggested Date: settlement layers late Neolithic, megalithic graves Warring States to Western Han; AM1 middle to end of Warring States

Absolute Dates: AM1 human bones: 2470 +- 75 (BC520), 2400 +- 75 (BC450); BM2 human bones: 2470 +- 85 (BC520), 240+-85 (BC450) (Kaogu 1985.7)

Suggested Relative Chronology: Puge Kangli, Tianba, Tuantian, Zhongcun > Xiaoxingchang settlement > Wadaluo settlement > Xiaoxingchang megalithic graves > Wadaluo megalithic graves, BM1 and BM2 ≈ Xide Lake M8 or earlier, AM1 ≈ Bahe Baozi M6

Suggested Cultural affiliation: megalithic graves

Puge Zhongcun 普格县中村 (PZC) [136]

Type: settlement site

Status: surveyed

Reliability Index: 1

Location: Zhong Village, Gengdi Township, Puge County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州普格縣耿底鄉中村

Morphology: third-level terrace, 1373 m asl

Surface Area: 30000 m^2 (NS 300 m, EW 100 m)

Natural and Man-Made Environment: on the eastern bank of the Mu River 木河, on the eastern bank of the middle Puge River, 30 m above the river water level

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Pugexian Wenhuaguan 普格縣文化館

Research: surveyed in 1980

Storage: unclear

Data Sources: Liangshan and Pugexian 1982, Zhongguo Wenwuju 2009

Ceramics: red sand-tempered low-fired hand-thrown, undecorated ceramic sherds, several *guan* jars, carinated *bo* bowls, *ping* vases with and without one or two handles

Stone Tools: 4 trapezoidal *fu* axes, finely polished allover or only at blade

Suggested Date: late Neolithic to early Bronze Age

Relative Chronology: ≈ early to middle Lizhou, Puge Kangli, Tianba, Tuantian

1.9 Xichang County 西昌市

Xichang Bahe Baozi 西昌市壩河堡子 (XBB) [144]

Type: settlement site, megalithic grave site

Status: partially excavated

Reliability Index: 6

Location: 150 m south of the village of Bahe Baozi, Xinxing Village Group 6, Lizhou Town, Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市垻河堡子

Morphology: second-level terrace, sloped, 1612 m asl

Surface Area: 2000 m^2

Natural and Man-Made Environment: on a hill slope, leaning against the mountain, facing the river, 150 m from and 30 m above Lihe River 禮河, West of Lijiashan 李傢山, West of the Anning River; many Neolithic sites around

Researchers: Xichang Diqu Bowuguan 西昌地區博物館, Sichuansheng Bowuguan 四川省博物館, Sichuan Daxue Lishixi 四川大學歷史係, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所, Sichuansheng Bowuguan 四川省博物馆

Research: discovered and surveyed in march 1975, excavation of M1 April-May 1975, M2-6 excavated December 1975 - January 1976

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Sichuansheng and Anninghe 1976, Xichang et al. 1978, Sichuansheng, Liangshan, and Xichangshi 2006a, Liu Hong 2009, Zhongguo Wenwuju 2009

Site Description: 0.5 m of cultural layers

Features: 10+ megalithic graves, exact number unclear, some small protrusions on the ground around might be tumuli, 40-150 m distance between the graves, 6 graves excavated (M1-6); M1 150 m South of the village, M2 100 NW of M1, M4 40 m W of M1, M4 80 m N of M1, M5 150 m S of M1, M6 130 N of M1, stones mainly granite, some quartzite

M1: *orientation*: 80°; *construction*: long-narrow grave chamber with access ramp, stone and earth mound, and tail sloping up the hill, grave chamber: 5. 6 x 1.1-1.5 x 2.7, *walls*: layer of smoothed large stone slabs in lower part, above layer of smaller irregular stones, *door*: on one short side, closed with irregular stone cobbles, *cover*: 5 large covering stones, largest 2.8 x 1.7 x 0.7 m, smallest 1.35 x 1 x 0.45 m, *floor*: yellow sandy soil mixed with small pieces of broken stone;

access ramp: 4.1 x 1.1-0.82, *stone mound*: 3 x 13, made of irregular pieces of stone; *earth tumulus*: 0.7-1.2 m of earth, grey-brown sandy earth with some gravel, connected with slope behind through a *tail* of 10 m length

content: grey-brown sandy soil with some gravel and small amount of charcoal, 95 skulls, more than 100 skeletons, both genders, all ages, mostly in rear part of the grave, at the most 3 m from the rear wall of the grave, stones of different sizes in between bones, some covering 3 skulls and one skeleton, largest stone 0.7 x 0.4 x 0.5 m; close to bones and 0.3 m above the floor lump of burned black soil with calcinated rice husks in it *objects:* 1 spindle whorl, 10 bronze bracelets, 3 rings, 5 hair ornaments, 2 bells, 1 knife, 9 other bronze objects, 5 bone *huang* ornaments, 1 bead, 1 hair ornament, 4 agate, 1 turquoise, and 1 jade bead, calcinated rice husks

M2: *orientation*: 110°; *construction*: long-narrow grave chamber with access ramp, stone and earth mound, and tail sloping up the hill, grave chamber 4.2 x 1.8 x 2.5 m; *walls*: layer of smoothed large stone slabs in lower part, above layer of smaller irregular stones, *door*: on one short side, closed with irregular stone cobbles, *cover*: 4 stone slabs of max. 1.92 x 1.3 x 0.67 m *floor*: yellow sandy soil mixed with small pieces of broken stone;

access ramp: 3.2 x 0.7 m, *stone mound*: 2.69 x 8.2 m, soil tumulus above, largely destroyed, *tail*: 7 m

content: 17+ skeletons, 1 bronze bracelet, 1 turquoise bead

M3: *orientation*: 117°; *construction*: long-narrow grave chamber with access ramp, stone and earth mound, and tail sloping up the hill, grave chamber: 4.77 x 0.84 x 2.02 m; *walls*: layer of smoothed large stone slabs in lower part, above layer of smaller irregular stones, *door*: on one short side, closed with irregular stone cobbles, *cover*: fragments of large stone slabs *floor*: yellow sandy soil mixed with small stones;

access ramp: 3.3 x 0.65 m, *tail:* 9 m, *stone mound*: 2.62 x 6.5, soil layer above

content: 6+ skeletons, 1 *guan* beaker, 1 bronze bracelet, 2 beads of either jade or turquoise

M4: *orientation*: 115°; *construction*: long-rectangular, no access ramp, grave chamber: 3.15 x 1.22 x. 1.05 m, *walls*: 10+ large stone slabs with smaller cobbles filling the gaps; *door*: 1 large stone slab, some human bones crushed beneath; *cover*: fragments of 2 large stone slabs ob max. 2.05 x 0.9 x 0.69 m; *floor*: stones and yellowish-sandy soil;

stone mound: 1.9 x 3.6 m; *tumulus*: 0.7-1.2 m of earth, grey-brown sandy earth with some gravel, connected with mountain slope through *tail* of 4.6 m

content: heavily fragmented human bones, 6 ceramic vessels, 1 spindle whorl, 2 bracelets

M5: *orientation*: 98°; *construction*: long-rectangular, no access ramp, grave chamber: 3.2 x 1.1 x 1 m, *walls*: 10+ large stone slabs with smaller cobbles filling the gaps; *door*: 1 large stone slab, some human bones crushed beneath; *cover*: fragments of 3 large stone slabs ob max. 1.32 x 1.1 x 0.68 m; *floor*: stones and yellowish-sandy soil;

tumulus: 1.9 m diameter, *tail:* 4 m

M6: *orientation*: 98°; *construction*: long-rectangular, no access ramp, grave chamber: 4.3 x 1.2 x 1.15 m, 13+ large stone slabs with smaller cobbles filling the gaps; *door*: 1 large stone slab, some human bones crushed beneath; *cover*: 3 large stone slabs ob max. 1.93 x 1.46 x 0.62m; *floor*: stones and yellowish-sandy soil;

tumulus: 2.07 x 4.1 m; *tail*: 4.2 m

content: 55+ skeletons, 7+ ceramic vessels, 1 net weight, 2 stone arrowheads, 1 chopper

Ceramic Objects: *Surface finds*: brown sand-tempered ceramic sherds, *M1*: 1 spindle whorl of fine sand-tempered black ceramic material; *M3:* 1 *guan* beaker; *M4*: 3 *bei* beaker, 1 *guan* beaker, 1 spouted *hu* pot, 1 spindle whorl; *M6:* 1 spouted *hu* pot, 1 gu vessel, 1 net weight, 4 *bei cups*

Bronze Objects: *M1*: 9 *zhuo* and 1 *huan* bracelet, 5 hair ornaments, 3 rings, 2 *ling* bells, 1 *dao* knife; *M2*: 1 *zhuo* bracelet; *M3*: 1 *zhuo* bracelet; *M4*: 2 *huan* bracelets;

Stone Objects: *M1:* 4 agate, 1 turquoise, and 1 jade bead; *M2*: 1 turquoise bead; *M3*: 2 turquoise and 2 jade beads; *M6:* 2 arrowheads, 1 chopper

Bone Objects: *M1*: 5 *huang* ornaments, 1 bead, 1 hair ornament

Suggested Relative Date: ≈ Yunnan Deqin Yongzhai stone-construction graves

Suggested Date: pre-Warring States to pre-Western Han

Xichang Baijiazhai 西昌市白家寨 (XBJ) [145]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Kaoubing Koujie Village Group 4, Aqi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市阿七鄉口賓口解存四組

Morphology: first-level terrace, sloped, 1420 m asl

Surface Area: 800 m^2

Natural and Man-Made Environment: 800 m east of the Anning River, North of Aqi River 阿七河, rice paddies all around

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Site Description: ground high in the West, low in the East

Features: 5 megalithic graves, all oriented towards the West, cover and sides made of several large stone boulders; **M1**: 7.1 x 1.9 m, 4 stones as cover; **M2**: 8.2 x 2.6 m; **M3**: 9 x 2.1 m, 5 stones as cover; **M4**: 6.3 x 2.6 m, 3 stones for cover; **M5**: 7.7 x 2.5 m, 4 stones for cover

Suggested Date: Warring States to Eastern Han

Xichang Beishan 西昌市北山（北山村南） (XBS) [146]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 4

Location: 500 m north of Beishan Village, Beimen Village Group 4, Xijiao City, Xijiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西郊鄉西郊市北門村四組北山村

Morphology: on mountain-slope, 1513 m asl

Surface Area: 160 m^2

Natural and Man-Made Environment: on southern slope of Beishan 北山

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered 1985 by the police, subsequently surveyed and M1 excavated

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, Liangshan Yizu 1990

Site Description: ground high in the West, low in the East

Features: 2 megalithic graves, severely disturbed, unclear number of urns (10+); graves rectangular;

M1: *orientation*: 220°, *construction*: 8.2 x 1.2 x 2.8 m, rectangular, walls made of a large number of small stones, 6 large stone slabs as cover, floor made of gravel-earth mixture, doorway closed with irregular stone cobbles, ramp of 1.86 x 0.3-0.58 m; at later time wall of 1.7 m height built in the middle of the grave separating it into two halves; at the same time 10 urns placed inside, several more on top of covering stones and around the grave; 2 bronze *zhuo* bracelets, 1 earring, 3 hair ornaments, 1 *ling* bell, 1 tubular ornament, 2 stone *jue* rings;

M2: North-South oriented, 16 x 10 x 2.2 m, oval tumulus

Bronze Objects: *M1*: 2 *zhuo* bracelets, 1 earring, 3 hair ornaments, 1 *ling* bell, 1 tubular ornament

Stone Objects: *M1*: 2 stone *jue* rings

Suggested Date: Warring States to Western Han, urn graves time of the Kingdom of Dali (937-1253)

Xichang Changcun 西昌市長村 (XCC) [148]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 200 m west of Changcun Village, Yulong Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西郊鄉裕隆鄉長村村

Morphology: first-level terrace, 1536 m asl

Surface Area: 60 m^2

Natural and Man-Made Environment: on the western bank of the Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 2 megalithic graves, 14 m between them, both oriented towards the East, cover and sides made of large stone boulders; **M1**: 6 x 4 x 1.5 m; **M2**: 8 x 3.3 m

Suggested Date: Warring States to Western Han

Xichang Chenyuancun (Lizhou Chenyuan and Lizhou Zhongxue) 西昌市陳遠村 (禮周陳遠 + 禮州中學) (XCY) => consult Xichang Lizhou 西昌禮州 (XLZ) [149]

Xichang Dabaobao 西昌市大包包 (XDA) [150]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 200 m north of Luhe Village, Huangshui Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市黃水鄉鹿鶴村

Morphology: first-level terrace, 1488 m asl

Natural and Man-Made Environment: on the western bank of the Anning River, at 1 km distance from the river, 500 m from the public road

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oriented towards the East, sides made of large stone boulders, cover stones missing, part of the tumulus preserved, *orientation*: 90°, measurements 9.7 x 4.5 m

Suggested Date: Warring States to Western Han

Xichang Dabaozi 西昌市大堡子(XDB) [151]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 300 m north of Nanda Baozi Village, Huangshui Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市黃水鄉南大堡子村

Morphology: second-level terrace, 1542 m asl

Surface Area: 400 m^2

Natural and Man-Made Environment: on the eastern bank of the Anning River, leaning against the mountain, facing the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 10/2010

Features: 4 megalithic graves, oriented towards NE, oval tumuli partially preserved, sides and cover made of large granite slabs of max. 2.3 x 1.6 x 0.3 m; **M1**: 9.5 x 3 x 1.1 m, tumulus largely preserved, 4 large stones protruding on surface; **M2:** 9 x 4.5 x 1.8 m, tumulus largely preserved; **M3:** 9.7 x 4 x 2 m (now severely disturbed, only 3.1 x 3.1 m extant), door consisting of two large rectangular stone slabs arranged like two wings; **M4:** largely destroyed, originally about 12 m long, current measurements 6 x 2.6 m, height unclear

Suggested Date: Warring States to Western Han

Xichang Dacaoba 西昌市大草坝 (XDC) [152]

Type: megalithic grave site

Status: surveyed

Reliability Index:

Location: 10 m east of Datian Village, Aqi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市阿七鄉大田村

Morphology: first-level terrace, 1525 m asl

Surface Area: 2000 m^2

Natural and Man-Made Environment: on the western bank of the Anning River, on the rim of the terrace

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 9 megalithic graves, orientation in most cases unclear, sides and cover made of large stone boulders, **M1**: 14.9 x 2.6 x 1.6 m

Suggested Date: Warring States to Western Han

Xichang Damaliu 西昌市大麻柳 (XBT) [153]

Type: settlement site

Status: surveyed, test excavation

Reliability Index: 1.5

Location: 800 m North of Maliucun, Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉麻柳村

Morphology: second-level terrace, sloped, 1771 m asl

Surface Area: 12000 m^2 (EW 100 m, NS 120 m)

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 0.3-0.6 m cultural layers, in them red-burned earth, charcoal, ceramic sherds

Features: 1 ash pit, ceramic sherds and stone tools inside

Surface finds: low-burned red-brown sand-tempered ceramics, broken stone tools

Suggested Date: Western Han or Neolithic?

Xichang Daniba 西昌市大泥壩 (XDN) [155]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉

Morphology: on alluvial fan, 1513 m asl

Surface Area: 2000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liu Hong 2009

Site Description: 0.6 m cultural layers

Surface finds: red sand-tempered ceramic sherds

Suggested Dating: Warring States

Xichang Dashiban 西昌市大石板 (XDS) [155]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: 100 m west of Dashiban Village, Hainan Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市海南鄉大石板村

Morphology: on alluvial plain, 1534 m asl

Surface Area: 30 m^2

Natural and Man-Made Environment: on southern rim of Luguhu Lake, very close to the lake

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 10/2010

Features: 1 megalithic grave, East-West oriented, 16.4 x 1.9 x 1.4 m, sides and cover made of large stone boulders, part of earth tumulus preserved

Suggested Date: Warring States to Western Han

Xichang Dayangdui 西昌市大洋堆 (XDY) [156]

Type: settlement site, megalithic grave site, earth-pit graves, object pits

Status: excavated

Reliability Index: 5.5

Location: Dayangdui, Heying Village Group 6, Jingjiu Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市經久鄉合營村六組

Morphology: first-level terrace, level, 1494 m ASL

Surface Area: 8100 m^2 (NS 180 m, EW 54 m)

Natural and Man-Made Environment: on the eastern Bank of the Anning River, in the east opposite of Lushan, on a manmade platform towering about 10 m above the surrounding landscape; 2 km west of the Anning river, 350 m west of the Xichang-Yanyuan public road and 1.8 km northeast of the Jingjiu Township government, Yalongjiang and Anning River run trough from North to South, ground relatively flat, earth fertile

State: well-preserved

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: discovered in 1990 during survey, 1994 excavation of 140 m^2, 4 trenches of 4 x 4 m in northern area (T0-T3), in south 2 trenches of 6 x 6 m (T8-9), northern area severely disturbed

Storage: Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Data Sources: Xichangshi, Sichuansheng, and Liangshan 2004, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, material collection 11/2010

Secondary Studies: Jiang Xianjie 2007, Liu Hong 2009

Site Description: in North and South each one large mound (50 x 45 x 13 and 50 x 40 x 5 m), in between agricultural fields, at least 10 man-made mounds

Internal Chronology: *northern area*: virgin soil > layer 6, M1-9 > layer 5, Ka1-10, K23, K24 > layer 4, layer 3 > DM1, M4 > M1, M3 > Ka1; *southern area*: virgin soil > layer 3 > layer 2, layer 1 > Ka11-22 > DM2

Description Layers (1994 excavation):

Northern area (北區): complicated man-made layering, lower in the East than in the West, platform-like elevation in the middle

Layer 1: high in the east, shallow in the west, soft grey-yellow soil, 0.1-0.84 m, some Eastern Han bricks, corded ware sherds, modern ceramics

Layer 2: shallow in the east, thicker in the west, rising towards the west, hard yellow earth, 0.1-0.5 m, Eastern Han bricks, corded ware sherds, Han bronze and iron fragments, Qing porcelain fragments

Layer 3: grey-black soft loose earth, 0.16-0.3 m, Han bronze fragments, H1-2 starting from here

Layer 4: red-brown soft loose soil, 0.1-0.42 m, some sand-tempered red-brown ceramic sherds, pits Ka1-10, K23, K24 starting from here

Layer 5: roughly level, thicker in the middle, firm red earth, 0.04-0.3 m, few brown sand-tempered ceramic sherds; M1-9 starting from here

Layer 6: level, red-yellow firm sandy soil, 0.36-0.8 m, small number of brown sand-tempered pottery sherds

Below layer 6: yellow sandy virgin soil

Southern area (南區): layers roughly horizontal

Layer 1: soft loose grey-yellow agricultural soil, 0.34-0.54 m, red-yellow sand-tempered ceramic sherds and modern roof tiles, DM2

Layer 2: hard red earth, 0.2-0.52 m, few brown sand-tempered ceramic sherds, Ka11-22 starting from here

Layer 3: firm red-yellow sandy soil, 0.08-0.3 m

Below layer 3: yellow sandy virgin soil

Features: *layer 6*: 9 earth-pit graves M1-M9 in the northern quarter in; *layer 5*: 19 rectangular to oval pits filled with yellow soil (Kb1-19) and 24 with ceramic objects (Ka1-24), some of the former cutting the latter, more rarely the other way around; *layer 4*: 2 megalithic graves (DM1-2) and 2 ash pits (H1-2)

M1-9: all rectangular earth-pit graves with round corners, L: 1.38-2 m, W: 0.44-0.74 m, D: 0.15-0.2 m, only M3 overly long (3.07 x 0.74 x 0.2 m), all roughly same orientation (EW to NEE-SWW), filled with brown-mottled earth, no human bones, objects in different parts of the grave, 1-6 objects per graves, mainly high-burned ceramic vessels, some stone tools and beads, 1 short bronze sword

M2: 1.38 x 0.73 x 0.2 m, orientation: 60°, 4 ceramic vessels, 2 stone tools

M3: 3.07 x 0.73 x 0.2 m, orientation: 90°, 2 ceramic vessels, 1 bronze-sword, 2 stone tools

Ka1-24: mostly 2 horizontally placed ceramic vessels, larger one placed in smaller one, bottom of former intentionally broken, some with additional objects; filled with fine soil, no ash, charcoal, traces of fire, or bones

DM1: 2.56 x 1.04 x 0.5 m, orientation: 72°, door in the East, long-rectangular, walls: small stones, floor: rammed earth, cover: 1 large stone; bones: skulls in the West, long-bones in the middle, secondary interment of at least 6 people in 3 layers; no objects

DM2: 2.2 x 0.76 x 0.9 m, orientation: 105°, door in the East, long-rectangular; in one jar human bones, thigh bones; 5 *guan* jars; 3 in the East, 1 in the middle, 1 in the West

H1: Southern part of T3; uneven round shape, flat bottom, L: 1.35, W: 1.05, D: 0.35; Filling: dark black earth, soft loose soil; 14 ceramic vessels

H2: Southern part of T0; rectangular with rounded corners, flat bottom, L: 1.2 m, W: 1 m, D: 0.2 m, filling grey-black earth, soft loose soil, 8 ceramic vessels neatly stacked in the middle

<u>Ceramics:</u>

early phase (M1-9): 13 ceramic objects, fine, thin, medium- to high-burned, black clay-ceramics, hand-thrown, smoothed on slow wheel, some with line, awl, application, or impressed patterns, largely in shoulder area, some leaf-vein pattern on bottoms, double-handled *guan* jars with lying-ellipsoid bodies and straight collar-necks, double- and single-handled globular-bodied *guan* beakers with high funnel-shaped collar-like openings, footed goblets, *bo*, *wan*, and *dou* bowls, cups

middle phase (Ka1-24, Kb1-19): mainly brown and red sand-tempered ceramic vessels, few with black slip; hand-thrown, smoothed on slow wheel, many with line of knob-applications (maybe lug-handles) around rim, small number of application bands and incisions, 30 vessels (26 large *guan* jars, 1 smaller with two handles, 1 *gui* tureen, 1 *bei* cup, 1 *bo* bowl)

late phase I (H1-2): mainly brown, black, some red hand-thrown sand-tempered ceramic vessels, few coil-built; some incised stamp-impressed, and application patterns, mainly on the shoulder, some on body; 22 vessel (16 mainly high *guan* jars with dish-shaped rims; 4 *zun* vessels of similar form, some with ring-feet; 1 stemmed *dou* conical bowl, 1 globular *bei* cup)

late phase II (DM1-2): same character of ceramics as H1-2; 5 large *guan* jars

<u>Stone Objects:</u>

early phase (M1-9): 15 stone objects, all highly-polished, arrowheads, *fu* axes, long sticks with oval or round cross-section made of highly-polished chert, function unclear, 10 middle-perforated highly-polished oval and round beads of 3-4 cm diameter; not clear from which grave(s)

<u>Bronze Objects:</u>

early phase (M3): 1 tongue-shaped short bronze-word

<u>Suggested Date:</u> early phase: early Western Zhou, middle phase: Spring and Autumn, late phase: late Spring and Autumn to early Warring States

<u>Relative Chronology</u>: tongue-shaped sword similar to finds from Gansu, Shanzi and Beijing Western Zhou graves, handled ceramic beakers similar to Qijia material, similarities to Mimilang; some ceramics similar to Henglanshan, others to Lizhou

Xichang Dongping 西昌東坪 (XDP) [157]

Type: smelting site

Status: partially excavated

Reliability Index: 5.5

Location: 200 m NE of Dongping Village, Huanglianguan Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市黃聯関鎮東坪村

Morphology: second-level terrace, level, 1503 m asl

Surface Area: 1000000 m^2 (EW 4000 m, NS 250 m)

Natural and Man-Made Environment: on the eastern bank of Anning River, 30 km south of Xichang; on the foot of Luoji Mountain 螺髻山, the Chengdu-Kunming train line passes by on its western side; several fish ponds around, rice paddies, fields of wheat, corn, potato, apples, pepper corns, mulberry trees, tobacco; 20 km east copper source found

State: slightly disturbed

Researchers: Sichuansheng Wenwu Kaogu Yanjiuyuan 四川省文物考古研究院, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: discovered in 1976, excavation of 778 m^2 from October to December 1988 (4 long trenches, 27 excavation pits of 5 x 5 m); second excavation in 2004, about 1 km east of previous excavation spot, 12 trenches of 5 x 5 m, 201 m^2 excavated

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Sichuan and Xichang 1994, Sichuansheng, Liangshan, and Xichang 2006d, Zhongguo Wenwuju 2009

Secondary Studies: Jiang Xianjie 1994

Internal Chronology: F1, S3, S4 > G1, F1, S3, L4, F2 > G2, H3, S3, F2, F3, H5 > G3, H7 > G4, L4, F2 > S3, F2 > L4, F2 > S2, S2 > F3, L1 > L2, i.e. G1-3 relatively late, F2 relatively early

Description layers (1988 excavation, western wall of T5006):

Layer 1: grey-black agricultural soil, 0.15-0.2 m thick, Han ceramic sherds, modern pottery remains

Layer 2: black clay soil, 0.1-0.15 m thick, Han tile fragments, grey clay ceramic sherds, on *guan* jars, *pen* basins

Layer 3: yellow-brown clay soil, 0.3 m thick, in it red-baked earth pellets and charcoal, tiles with corded-ware or cloud pattern, grey ceramic sherds, line pattern, stamped lozenge pattern, application bands, on *guan* jars, *pen* basins, and *bo* bowls

Below layer 3: red-yellow virgin soil

Description layers (1988 excavation, T001):

Layer 1: agricultural soil

Layer 2: black-grey clay soil, 0.08-0.20 m thick

Layer 3: loose black clay soil, 0.02-0.1 m thick, some red-baked earth, slag, ore, black-slipped grey sand-tempered ceramic sherds with check pattern, furnaces in this layer

Layer 4: 0.04-0.12 m, many pieces of red-baked earth, slag, charcoal, stones with burn-marks, flat-bottomed *bo* bowls, furnaces

Layer 5: 0.05-0.1 m, slag, ore fragments

Layer 6: fine river-sand wash layer, 0.08-0.24 m, some red-burned earth pellets and charcoal, in NE only

Layer 7: 0.08-0.24 m, fine sand, few slag fragments

Layer 8: 0.05-0.25 m, red-baked earth, some broken pieces of Han ceramics, roof tiles, broken and burned stone pieces, all in one irregular pile, furnace L6 in here (probably a copper smelting furnace, wall of 0.17 m height, probably the furnace opening, bricks with patina, ash and slogs around; 2 ditches (G1-2) beneath, filled with hard red-burned earth, some brick fragments)

Layer 9: 0.15-0.25 m, black burned earth with some red and brown parts, very hard, few pieces highly fragmented ceramic sherds

Layer 10: 0.06 m, red-baked earth, trench G3 in this layer

Layer 11: 0.08-0.12 m, black burned earth, 15 ceramic sherds, furnace L8 in this layer

Layer 12: 0.24-0.32 m, grey-white firm earth, 165 Han ceramic sherds

Layer 13: 0.05-0.1 m, fire-blackened bricks, labeled as furnace L9, small amount of slag

Below layer 13: red-yellow virgin soil

Description Layers (2004 excavation):

Layer 1: red-brown agricultural soil, 0.25-0.35 m thick, modern pottery sherds

Layer 2: soft grey-black clay soil, 0.1-0.25 m thick, red-baked earth pellets, tiles with corded-ware or rhombic pattern, grey and grey-brown clay and grey sand-tempered ceramic sherds, line pattern, stamped lozenge pattern, on *guan* jars, *zeng* steamer, spindle whirls; iron *cha* spades; all features starting from here

Layer 3: grey-black clay soil, only in southern part, 0.1 m thick, in it gravel and red-baked earth pellets and charcoal, tiles with corded-ware pattern, grey and a little red clay and grey sand-tempered ceramic sherds, line pattern, stamped lozenge pattern, application bands, on *guan* jars and *bo* bowls

Below layer 3: virgin soil

Features:

1988 excavation: 11 furnaces (L2-6, L8-13), 3 workshops (Z1-3), 2 buildings

L2: in T303, below layer 2, oval in shape, sides curved, bottom slanted, inner diameter 1,8 m, 0.8 m wide, 1 ditch on bottom running through the whole length of the furnace, lined with fine hard earth, in NW opening, in SE pile of stones; on 3 sides 8 post holes, in front of furnace opening sand pit of 1.4 x 0.4 m filled with large pieces of hard earth, around many ceramic sherds of *guan* jars, *bo* bowls, and other objects, much slag, ore, and bronze fragments, 2 pottery air nozzles

L3: in T5004, below layer 2, same construction as L5, 2.45 m diameter, 0.58 m depth, some ash and slag, crucible on the bottom

L4: in T6004, below layer 2, same construction as L5, 2.6 m diameter, 0.9 m deep, slag, ceramic fragments, red-burned earth

L5: in T9004, below layer 2, round, slanted sides, sloped bottom 2.9 m diameter, extant depth 1.1 m, 0.45 m of burned earth inside, on SE side 3 ditches connected with the furnace wall, 0.6 m wide, 0.05-0.08 m deep, partially lined with bricks, between two of the ditches a further pit of 0.1 m diameter, probably a vent, close to it much ash and charcoal, some ceramic sherds

L6: in T001, irregular oval pit lined by stones, diameter 2.6-3 m, 2 ditches (G1-2) on the bottom, covered by masonry, two ends made of long-rectangular bricks, walls of ditches lined with pounded clay, coated with sandy soil, both ditches connected by a third, building an H; between them indentation of 0.4-0.6 m width and 0.6 m depth, probably furnace entry (similar constructions in Hubei Tonglüshan), pottery air nozzles, pottery sherds of *guan* jars, *bo* bowls, *pen* basins, long-rectangular bricks

L8: in T001, below layer 10, cut by L6, same construction as L6, 1 ditch G3, red-baked earth, burned stones, long-rectangular bricks, ceramic sherds, fragments of furnace lining

L9: in T001, below layer 12, cut by L8, same construction as L6, partially lined with bricks, 9 long-rectangular bricks

L10: in T8007, below layer 3, same construction as L5, inner diameter 2.9 m, 0.3 m depth, slag and ceramic sherd

L11: in same construction as L6, no further information

L12: in T1, below layer 2, square brick-built furnace, largely destroyed, probably 2 x 2 m, bricks layered with stones and sandy soil, filled with grey earth, slag, charcoal, brick fragments, 33 Eastern Han *wuzhu* coins with rough edges

L13: in T2, below layer 2, 20 m east of L12, East-West oriented very regular long-rectangular furnace in irregular oval pit, 2.9 x 0.9 x 0.86 m, walls coated with fine clay burned reddish, in the West pit of 1 m diameter, crucible fragments

Z1: in T2003, below layer 2, pit house of 1.3 m rim and 0.95 m bottom diameter, 1.9 m deep, loose black soil, on bottom sherds of *guan* jars and molds, maybe a water reserve, 2 large (70 cm diameter, with check pattern) *weng* urns close-by, one of them with 16 *wuzhu* coins inside, maybe used for cooling down coins during production process

Z2: heavily disturbed, 33 m^2 red-burned surface of 0.25-0.65 m thickness left, above virgin soil, 4 ditches in East-West direction, about 1.8-2 m between them, 2.4-3.7 m long, 0.55-0.65 m wide, 0.2 m deep, lined with red-burned clay, much charcoal and copper remains, 10 post holes on both sides of the building

Z3: 45 m east of Z1, disturbed, preserved surface of 5 x 4 m, 2 East-West oriented ditches (4.5 x 0.7 x 0.22 and 2.5 x 0.74 x 0.12 m; at 0.16-0.32 m distance), walls made of bricks and sandy loam, inside grey-white clay previously exposed to fire, burned to a hard red substance, ground evened out, much mold fragments, ash, bronze fragments

2004 excavation: 3 rectangular houses (F1-3, cut and partially destroyed by G2, G3, S2, fire pits in F1 and F3), 5 furnaces (L1-5, L1 disturbed by L2, L5 largely destroyed), 4 sand pits (S1-4, S4 largely destroyed), 5 ditches (G1-5, all long-rectangular, with straight sides and flat bottom, running from NE to SW, filled with grey-black loose clay loam, much ash inside, some grey fine ware), 7 ash pits (H1-7)

F1: 4.16 x 2.6 x 0.19 m, soft grey-black clay filling, red-burned earth pellets, heavily fragmented grey fine ware sherds, oval fire pit in the middle (0.45 x 0.3 x 0.12 m)

L2: 1.75 x 1.2 x 0.28 m, long-rectangular, rounded pit form, lined with stones, all around and in the middle red-baked earth, filled with hard grey-black soil, many red-baked earth pellets and charcoal, only one ceramic sherd

L3: 1.8 x 1.3 x 0.2 m, oval in shape, rounded pit form, irregular sized stone inside, filled with soft grey-black earth, red-baked earth pellets, no object

L4: disturbed by G2 and S3, 3.15 x 1.5 m extant, long-oval in shape, in the middle U-shaped pit of 2.8 x 0.76 x 0.18 m, red-baked earth on bottom, some red-burned earth pellets and charcoal, no objects

S1: 4.15 x 3.4 x 0.14, square, slanted walls, flat bottom with irregularly distributed small holes or indentations, sandy soil inside, red-burned earth pellets, no object

S2: cut by F3, 3.95 x 3.4 x 0.4, irregular, slanted walls, flat bottom, higher in the south, filled with red fine sand, large number of red-burned earth pellets, few charcoal fragments, 1 brick

G1: 22 x 0.75 x 0.35 m; **G2**: 24.8 x 0.6 x 0.35 m; **G3**: 22.5 x 0.8 x 0.3 m; **G4**: 13.4 x 0.65 x 0.4 m; **G5**: 4.2 x 0.75 x 0.35 m

H1: 1.5 x 0.9 x 0.2 m, rectangular, slanted sides, flat bottom, filled with loose grey-black clay loam, ash and large number of grey clay ceramic sherds inside, some with stamp-impressed lozenge pattern

H6: 1.62 x 1.54 x 0.59 m, irregular, round bottom, filled with hard grey-black clay loam, large number of red-baked earth pellets, slag, small number of grey clay ceramic sherds inside, some with stamp-impressed lozenge pattern

H7: disturbed by G4, 1.7 x 1.6 x 1 m, irregular in shape, firm light grey clay loam inside, some red-baked earth pellet, 0.2 m layer of gravel building a circle, thick layers of red-baked earth, on the bottom a piece of Han brick, usage unclear

Ceramics:

Surface finds: Han roof tiles, bricks, many previously exposed to fire, ceramic sherds, rectangular molds, *guan* jars, ceramic molds for metal tool production, crucibles

1988 excavation: *guan* jars, *bo* bowls, *pan* trays, *pen* basins, *zeng* steamers, *ding* tripods, concave tiles, barrel tiles, eaves-tiles; overall tiles most common, corded-ware decorated concave and barrel tiles typical Han

L2: 2 air nozzles

L6: air nozzles, fragments of *guan* jars, *bo* bowls, *pen* basins, long-rectangular bricks

L9: 5 long-rectangular bricks

L13: crucible fragments

Layer 3: 37% of all sherds from concave or barrel tiles with corded ware or cloud decoration, otherwise grey ceramic sherds with black slip, *guan* jars, *bo* bowls, *pan* trays, with corded ware pattern, check pattern, bow pattern

Layer 12: 165 ceramic sherds, 80% clay ceramics

1994 excavation:

H6: 1 *guan* jar with globular body and impressed lozenge pattern

Layer 2: 1 rhomboid net weight, cored-ware decorated roof tiles, sherds with stamp-impressed lozenge and check pattern

Stone Tools: *Surface finds:* molds for *wuzhu* coins, molds for *huaquan* coins

Layer 1: 1 long-rectangular piece of polished grey-green sandstone of unclear function

Metal objects:

Surface finds: bronze mirrors, nails, *zu* arrowheads, *dao* knives, iron *cha* spades, *wuzhu* coins

1988 L12: 33 Eastern Han *wuzhu* coins with rough edges

1988 excavation:

L12: 33 Eastern Han *wuzhu* coins with rough edges

Layer 4: 2 bronze mirror fragments with knob pattern, 3 U-shaped *cha* spades, two kinds of *wuzhu* coins

1994 excavations:

Surface finds: wuzhu coins, bronze fragments, bronze *fu* cauldrons and *xi* basin, iron *fu* axes, *dao* knives, and *zao* chisel, bronze nails, iron coins

Layer 1: 1 iron *dao* knife, 1 iron *cha* spade

Other finds: *Surface finds*: red-burned earth, ore fragments, charcoal

Suggested Date: Wang Mang interregnum to Eastern Han

Relative Chronology: *guan* jars like those Guangzhou Huaqiao Xincun Western Han earth-pit graves, Guizhou Qingzhen Pingba Wang Mang time graves, Chengdu Fenghuangshan late Western Han graves; *bo* bowls from L6 like those from Lizhou Wang Mang graves, *zeng* steamers, *ding* tripods similar to Sichuan Western Han wooden coffin graves and Eastern Han brick graves

Cultural affiliation: Han

Xichang Dongyuemiao 西昌市東嶽廟 (XDM) [158]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Lijiagou Village Group 4, Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉李傢溝村 4 組

Morphology: second-level terrace, level, 1500 m asl

Surface Area: 300 m^2 (EW 10 m, NS 30 m)

Natural and Man-Made Environment: on the western bank of the Anning River, 1 km east of the river, north of Dongyuemiao

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, mentioned in Liu Hong 2009

Site Description: 0.6 m cultural layers, large number of red-burned earth

Surface finds: red-brown sand-tempered ceramic sherds, wide-bodied *guan* jars

Suggested Date: Spring and Autumn

Xichang Guanjiashan 西昌市官家山 (XGJ) [159]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 300 m SE of Lijingbao Village, Xiaomiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市小廟鄉裏經堡村

Morphology: on hill-top, 1775 m asl

Surface Area: 1400 m^2

Natural and Man-Made Environment: on a platform of 60 m height

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 0.3-0.7 m cultural layers, some charcoal

Surface finds: ceramic sherds, stone *fu* axes

Suggested Date: Neolithic

Xichang Guanshan 西昌市関山 (XGS) [160]

Type: settlement site, megalithic grave site

Status: partially excavated

Reliability Index: 3

Location: North of Chang'an Village Group 11, Xijiao Township, Xiaomiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市小廟鄉西郊鄉長安村十一組

Morphology: on hill-top, 1601 m asl

Surface Area: 1400 m^2 (EW 40 m, NS 35 m)

Natural and Man-Made Environment: 3 km SE of Xichang, 500 m south of Yanjiashan, on the SE bank of the Anning river, on 60 m high terrace on mountain top, agricultural fields around

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: five megalithic graves around Xichang excavated in 1980 (M1-5), among them the one at Guanshan (M4)

Storage: unknown

Data Sources: Liangshan Yizu 1983a, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, mentioned as settlement site in Liu Hong 2009

Site Description: cultural layers of 0.7 m

Internal Chronology: settlement layers disturbed by megalithic grave

Features: 1 megalithic grave

M1: *orientation*: 255°, *form*: long-rectangular, *measurements*: 2.1 x 0.8-1 x 1.6 m, *floor*: loess, *installations*: several large stones for walls and cover, *content*: objects badly fragmented, 6+ ceramic vessels

Ceramics: *surface finds*: red and brown sand-tempered pottery sherds; *M1:* 4 *guan* jars, 1 *ping* vase, fragments of other ceramic objects, all red fine sand-tempered ceramics

Stone Tools: *surface finds*: stone *fu* axes, grinding stones

Suggested Date: Warring States for megalithic grave, settlement sites earlier

Xichang Guihuacun 西昌市桂花村 (XGH) [161]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 300 m SE of Yangjia Baozi, Guihua Village, Aqi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市阿七鄉桂花村楊傢堡子

Morphology: close to mountain, on level ground, 1588 m asl

Surface Area: 100 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 5 megalithic graves, 30 m between them, all oriented in the same direction (East-West according to Sichuansheng, Liangshan, and Xichangshi 2006a, South according to Zhongguo Wenwuju 2009), mostly rectangular, with several large stone boulders used for walls and cover; **M1:** 5.5 x 4.8 m, cover stones missing; **M2**: 11 x 6 m; **M3:** 15.5 x 9.2 m, 2 stone boulders as cover stones; **M4**: tumulus preserved, further construction details unclear; **M5:** 12 x 6.8 x 1.2 m

Suggested Date: Warring States to Western Han

Xichang Henglanshan 西昌橫欄山 (XHS) [162]

Type: settlement site

Status: surveyed, partially excavated

Reliability Index: 6

Location: Henglanshan, Jianxin Village, Daxing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市大興鄉建新村橫欄山遺址; 600 m W of the village, 1 km SE of Qionghai 邛海, 15 km SE of Xichang

Morphology: on terrace, sloped, 1632.7 m asl

Surface Area: in 1987 140,000 m^2 (NS 400 m, EW 350 m) surface area observed, today 2933 m^2 still extent, 84 m^2 excavated

Natural and Man-Made Environment: on terrace of 30 m relative elevation, ground sloped, Aolang river 凹朗河 passes in the N, flowing in E-W direction into the Qionghai; agriculturally used, mainly mulberry and Sichuan pepper trees with grassy plants in between; in vicinity many megalithic graves

State: eastern part better preserved, some erosion in western part, soil very soft and loose, in the northern part erosion channel of 3.5-4.8 m depth; partially excavated

Researchers: Xichangshi Wenwu Guanlisuo 西昌市文物管理所, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered in 1987, first surface collection; survey in August 2003; in 2004 excavation in connection with large Anning river survey (2004XDH), 5 trenches of 5 x 5 m excavated (T102, T201-203, T302)

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Xichangshi 1998, Chengdu, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 11/2010

Secondary Studies: Liu and Wang 2007, Liu Hong 2009

Site Description: high in SE, low in NW, cultural layers 0-0.5 m below surface, ceramic sherds protruding on surface; cultural layers 0.3-0.4 m thick, grey-brown soil, many stone tools, ceramic sherds, burned earth, charcoal sediments

Internal Chronology: [Layer 4] > [H1-3 (H2 > H1), F1-2] > [Layer 3] > [Layer 2]

Surface Collection 1987: 130+ stone objects (43 described), 400+ ceramic sherds (18 described and drawn), badly fragmented

Surface Collection 1993: 2 stone objects, 36 ceramic sherds, badly fragmented[2]

Description Layers (2004 excavation, T202):

Layer 1: 0.1-0.15 m, loose grey-brown agricultural soil, roots and modern debris, small number of ceramic sherds

Layer 2: 0-0.15 m, only in the eastern part, dense brown-yellow sandy soil, small number of ceramic sherds, charcoal, stone fragments

Layer3: 0.25-0.3 m, dense black-brown loam, large number of ceramic sherds, chunks and pellets of red-baked earth, charcoal, many stone tools, starting point for H1-3, F1, F2

Layer 4: 0-0.32 m, dense light grey-brown loam, cut by features H1-3 and F1-2; few ceramic sherds, scattered chunks and pellets of red-baked earth, charcoal, stone tools

Virgin soil: dense yellow-brown soil

Features: 5 features discovered in 2004: 3 pits (H1-3), 2 buildings (F1-2)

H 1: middle of T203, under layer 3, cuts H2; rectangular, rim diameter 1.25, bottom diameter 1.25, 0.7 m wide, 0.15-0.2 m deep; loose light grey-brown loam, few ceramic sherds, charcoal fragments

H2: eastern part of T203, under layer 3, NE part cut by H1; round, rim diameter 0.65-1.2, bottom diameter 0.6-1.15, depth 0.15-0.2 m; loose grey-black loam, small pellets of red-baked earth, ceramic sherds, burned plant remains

H3: in NE part of T201 and NW part of T202, not completely excavated, under layer 3, cuts layer 4; irregular oval shape, not smoothed out, rim diameter 1.8-2.8, depth 0.48 cm, dense black-grey loam; large number of red-baked earth and ash, many ceramic sherds, few stone tools

F1: NW of T203, under layer 3, cuts layer 4 and virgin soil; rectangular, complete measurements unclear, 6 round post holes (d. 0.2-0.4 m, 0.1-0.15 m deep, in one line of ca. 2 x 0.5 m), few oval, inside loose grey-brown loam; few ceramic sherds and charcoal

F2: SE part of T302, under layer 3, cuts virgin soil; dimensions and form unclear, rectangular, 7 round post holes filled with loose grey-brown loam and some charcoal (d. 0.2-0.4 m, 0.1-0.15 m deep, lined on an extent of ca. 2 x 0.8 m)

Ceramics:

Surface Collection 1987: mainly wheel-thrown; burned at medium to high temperature; large vessels thick, sand-tempered, mainly red, small vessels thin, especially the bowls, mainly black and clay-tempered;
not possible to reconstruct complete vessels; mainly large forms with outward flaring rims; 20% bottoms (d. 3.5-16.5 cm), largely flat; a few trumpet-shaped ring-foot vessels; of rim sherds 60% *guan* jars and *bo* bowls, 30% *ping* vase and *hu* ewer, and 10% other forms, e.g. *bei* cups and *dou*

[2] This is the number of finds kept in the storage facilities of the Liangshan Museum as representative examples. The original number of finds is unknown.

stemmed bowls;[3]
some decoration, mainly application bands below the rim with fingertip-impressed pattern and other kinds of incised and impressed patterns on the neck and body, like awl pattern, net pattern, corded ware, point pattern, line pattern; some appearing in combination; some with black slip

Surface Collection 2003: mainly sand-tempered red and yellow pottery, some black high-burned clay sherds, mainly thin body sherds with decoration; small stones in temper, some glittering particles in temper; 1 flat bottom, 5 *guan* jar rim sherds of sand-tempered pottery burned at medium temperatures; some decoration, mainly application-bands below the rim with fingertip-impressed decoration, incised vertical, horizontal and traversal lines and awl pattern

Layer 1-2 2004: small number of ceramic sherds, mainly sand-tempered pottery, 23 *guan* jars, 1 *ping* vase, 2 *hu* ewers, some decoration, mainly application-bands below the rim with fingertip-impressed decoration and awl pattern, some incised traversal and horizontal lines and lines of point pattern

Layer 3 2004: 73.8% sand-tampered grey-brown ware, 22% sand-tempered grey ware, 4.1% sand-tempered red-brown ware, 0.1% grey fine ware, pieces of quartz and coarse sand grains in temper; mainly hand-thrown, many coil-built, smoothed on a wheel; unevenly burned, thus mottled; 92.6% undecorated, decoration: stamp-impressed, application bands of fingertip-impressed pattern below the rim, incised awl-pattern, bundles of traversal and horizontal lines, some corded ware, narrow application bands; 67 *guan* jars, 1 *pen* basin, 3 *wan* bowls, 5 lids

H1: few ceramic sherds of sand-tempered pottery, no forms identifiable

H2: mainly grey-brown sand sand-tempered pottery, 1 *ping* vase, 1 *bo* bowl, 1 bottom, others unidentifiable

H3: mainly sand-tempered pottery, 13 *guan* jars, 2 *hu* ewers, 3 bottoms, 1 *bo* bowl, 2 *wan* bowls

F1: few ceramic sherds of sand-tempered pottery, no forms identifiable

Layer 4 2004: 70.5% sand-tempered brown ware, 25.2% sand-tempered grey ware, 4.2% sand-tempered red ware, 0.1% fine ware, very coarse gravel as temper; mainly hand-thrown, coil-building technique, smoothed on a wheel; unevenly burned, mottled color; 93% undecorated, decoration: mainly application bands below the rim with fingertip- impressed pattern, different kinds of incised and impressed patterns on the neck and body, like awl pattern, corded ware, point pattern, incised bundles of horizontal or traversal lines; some appearing in combination; original forms largely unclear, mainly rims; 23 *guan* jars, 5 *bo* bowls, 1 spout

Stone Tools:

Surface Collection 1987:[4] 21 chipped *fu* axes of grey-green gabbro, 5 polished basalt *ben* adzes, 5 polished shale *ben* adzes,[5] 4 polished black basalt *zao* chisels, 4 halfmoon-shaped *dao* knives,

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[3] This numbers are provided in the report of 1987 (Xichangshi 1998:7), but no exact numbers are given and the original material was not available. In my description I am therefore following the details and drawing provided in the report.

[4] The original material could not be found and the report provides a description, measurements, and information on the stone type is based on a small number of objects.

[5] The site report classifies them as end scrapers (*guaxiaoqi* 刮削器), which are usually chipped stone tools. Furthermore, the drawing, measurements and description show that they are formed like small adzes, and I am therefore classifying them as adzes.

probably formerly with a double perforation, 1 willow-leaf shaped arrowhead of polished grey-green gabbro with a convex base, 1 polished ring-shaped net sinker, 1 polished grind stone

Surface Collection 1992: 2 polished *ben* adzes

Surface Collection 2003: 1 *fu* axe, and 1 *ben* adze, both of flaked grey-green gabbro, both broken

Layer 1-2 2004: 3 *fu* axes of grey-green gabbro, 1 *zao* chisel of grey stone

Layer 3 2004: small, polished, 1 *zao* chisel of grey stone (damaged), 1 willow-leaf shaped arrowhead of grey-brown stone

H3: 1 finely polished willow-leaf shaped arrowhead made of grey stone, damaged

Layer 4 2004: all polished, all very similar, 3 *ben* axes of grey-green gabbro, 1 *zao* chisel of grey stone, all damaged

Absolute Dates: excavation 2004 14C dates (analyzed by mass spectrometry analysis in the laboratories of Peking University in March 2006)[6]

Charcoal dates: BAO5441-2004XDHT102③: 3710 ± 40, BAO5442-2004XDHT102④: 4020±40

Ceramic dates: BAO5448-2004XDHT202③: 4390±40, BAO5449-2—4XDHT2002④: 3810±40

Suggested Date: Neolithic

Relative Chronology: Henglanshan > Lizhou > Megalithic Graves

Suggested Cultural affiliation: Henglanshan culture 横栏山文化

Xichang Hexi Gongshe (Youjunzhen) 西昌市河西公社（佑君鎮）(XHG) [163]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 5.5

Location: Warring States Village Group 1, 4 and 6 (previously Hexi Gongshe) Youjun Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市佑群鎮站溝村一組、四組、六組（河西公社）

Morphology: on border between second and third-level terrace, on slight slope , 1567 m asl

Natural and Man-Made Environment: 5 km north and 50 m above the Anning River

Researchers: Xichang Diqu Bowuguan 西昌地區博物館

Research: discovered by local workmen in the winter of 1976, excavations of five graves in January and July 1977 in two 2-week excavation campaigns

Storage: Xichang Diqu Bowuguan 西昌地區博物館

Data Sources: Xichang Diqu 1978c, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 10/2010

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[6] Liu and Wang 2007:47, n. 4.

<u>Site Description:</u> high in the west, low in the eat, 10° slope, rice paddies and peasant houses around; severely disturbed

<u>Features:</u> 7 megalithic graves, oriented towards the river, 1 m distance between M5 and M3 and M3 and M4, M1 and M2 next to each other slightly further east, all roughly North-South oriented, long-rectangular or long-trapezoidal in shape, made of large and small stones, the small boulders probably worked to a limited extend, smoother side facing inside, largely made of granite, some made of quartzite

M1: *orientation*: 115°; *construction*: trapezoidal, more narrow in the front than in the rear part; 7.2 x 1.2-1.3 x 1.1 m; *walls*: made of large stone slabs, gaps filled with small irregular stones, *door*: 1 large boulder; *cover*: several large boulders; *floor*: leveled virgin soil + layer of pebbles + layer of yellow sandy clay; *outside installations*: in the area of the door lump of irregular stones of unclear function;

content: teeth of 6 people, some long-bones, some juvenile, others adult or senile; some ceramic sherds, 2 bronze weapons, further bronze fragments, 1 oblong stone-tool, 1 bone earring

M2: *orientation*: 115°; *construction*: trapezoidal, more narrow in the front than in the rear part, 7.1 x 1.2-1.4 x 1.4 m; *walls*: made of large stone slabs, gaps filled with small irregular stones, *door*: 1 large boulder; *cover*: several large boulders; *floor*: leveled virgin soil + layer of pebbles + layer of yellow sandy clay; *content*: upper layer: 0.2-0.4, brown earth, lower layer: yellow and yellow brown wash layer, 0.9-1.1, objects all from this layer, few fragments of human bones, *objects:* 1 ceramic vessel, 4 bronze weapons, 4 bells, 1 bracelet, 3 oblong stone-tools, 1 bone bead

M3: *orientation*: 275°; *construction*: long-rectangular, very narrow, 9 x 1.06-1.4 x 1.3 m; *walls*: made of large stone boulders, erected at some distance from each other, gaps filled with smaller irregular cobbles and earth, back made of irregular cobbles; stone boulders irregular, all different in size, 4 on the left, on southern side 0.2-0.7 m between them, stabilized with several small irregular cobbles on both sides, *door*: 1 large boulder; *cover*: several large stone boulders, *door*: 1 large boulder; *floor*: 5-10 cm thick layer of flat round pebbles; *outside installations*: on each side of the entrance 1 large stone slab erected, building the figure ba 八; on left side stone of 2.8 x 0.6 x 0.3 m, original position and function unclear

content: layer 1: 0.2-0.4 m of grey-brown color; layer 2: 0.9-1.1 m, yellow-brown soil and all of the grave goods, few fragments of human bones throughout; *objects*: 2 ceramics, 2 bronze coins, 3 iron objects of unclear function

M4: *orientation*: 320°; *construction*: long-rectangular, very narrow, 9.1 x 1.7 x 2.3 m; *walls*: made of large stone boulders, erected at some distance from each other, gaps filled with smaller irregular cobbles and earth, back made of irregular cobbles; *door*: 1 large boulder; *cover*: several large stone boulders; *outside installations*: on each side of the entrance 1 large stone slab erected, building the figure ba 八; *cover*: large stone boulders; *floor*: 5-10 cm thick layer of flat round pebbles;

content: some fragments of human bones, *objects:* 4 ceramic spindle whorls and a few vessel fragments, 2 bronze and 1 bone bracelets, 3 oblong stone-tools, 2 bone earrings

M5: *orientation*: 295°; *construction*: long-rectangular, very narrow, 8.4 x 1.4-1.6 x 2.1 m; *walls*: made of large stone boulders, erected at some distance from each other, gaps filled with smaller irregular cobbles and earth, back made of irregular cobbles; *door*: 1 large boulder; *cover*: several large stone boulders; *outside installations*: on each side of the entrance 1 large stone slab erected, building the figure ba 八; *cover*: large stone boulders; *floor*: 5-10 cm thick layer of flat round pebbles; *access ramp*: close to the door of M5 at the right sight;

content: some human bone fragments; *objects*: 1 bronze knife, 1 bell

M6: tumulus preserved, underlying construction therefore unclear, tumulus measurements: 12.4 x 8.2 x 1.5 m

M7: heavily disturbed

Ceramic Objects: largely broken, low-fired red and brown sand-tempered ceramics, some coil-built, some wheel-thrown; *M1:* fragments; *M2*: 1 *guan* beaker; *M3*: 1 four-handled *guan* beaker, 1 *bei* cup; *M4:* 4 ceramic spindle whorls, some vessel fragments

Bronze Objects: *M1:* 1 sword, 1 *xiao* knife, fragments; *M2*: 1 *dao* and 3 *xiao* knives, 1 *zhuo* bracelet, 4 *ling* bells; *M3*: 2 *wuzhu* coins; *M4*: 2 *zhuo* bracelets; *M5*: 1 *xiao* knife, 1 *ling* bell

Iron Objects: *M3:* 3 iron objects (fragments)

Stone Objects: *M1:* 1 oblong stone-tool; *M2*: 3 oblong stone-tools; *M4*: 3 oblong stone-tools

Bone Objects: *M1*: 1 earring; *M2*: 1 bead; *M4*: 2 earrings, 1 *huan* bracelet

Internal Chronology: M1-2 > M3-5

Suggested Relative Date: M1-2 ≈ Bahe Baozi and Lake Gongshi

Suggested Date: Warring States to Western Han, end-date M3 given by Han coins (after Xuandi)

Xichang Hongqi 西昌市紅旗 (XHQ) [164]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 700 m south of Hongqi Village Group 7, Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉紅旗村七組

Morphology: second-level terrace, sloped , 1567 m asl

Natural and Man-Made Environment: on eastern bank of the Anning River, leaning against the mountain, facing the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, North-South oriented, 17 x 4.5 x 1.8 m, rectangular, several large stone boulders used for walls and cover

Suggested Date: Warring States to Western Han

Xichang Huangshuitang (Luhe) 西昌市黃水塘(鹿鶴) (XHT) [165]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 4.5

Location: Luhe Village Group 6, Huangshui Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市黃水鄉鹿鶴村六組

Morphology: first-level terrace, 1527 m asl

Natural and Man-Made Environment: on eastern bank of Anning River, at 500 m from the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: excavation of 1 disturbed grave (M1) in March 1986

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1990, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 3 megalithic graves, 1 excavated, rectangular, sides and cover made of large oval to rectangular erected stone slabs, mainly granite; M3 largely destroyed

M1: *orientation*: 90°; *construction*: 6.8 x 1.5 x 1.8, rectangular, cover and sides made of regular slabs of max. 1.8 x 1.4 x 0.4 m, floor paved with 0.2 m of fine sandy soil; *content*: human bones largely deteriorated, original number unclear, access ramp largely destroyed, 2 ceramic vessels, 2 iron knives, 1 oblong stone tool;

M2: *orientation*: 90°; *construction:* 12.4 x 3.1 x 1.7 m, tumulus largely preserved, 10+ stones for walls, 7+ stones for cover

Suggested Date: Warring States to Western Han

Xichang Jiangjiabao 西昌市蔣傢包 (XJB) [166]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 100 m east of Chenyuan Village, Lizhou Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市禮州鎮陳遠村

Morphology: on terrace, level, 1621 m asl

Natural and Man-Made Environment: on the eastern bank of the Anning River, north of Heishui River 黑水河

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Surface finds: red sand-tempered ceramic sherds, some with fine corded ware pattern, stone tools

Suggested Date: Shang-Zhou

Xichang Jianxin 西昌市建新 (XJX) [167]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Surface Area: 30 m^2

Location: 100 m SW of Jianxin Village, Daxing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市大興鄉建新村

Morphology: in mountain valley, 1702 m asl

Natural and Man-Made Environment: in the SE of Yujia Mountain 余家山 in inter-mountain valley

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oriented towards the West, 7.5 x 3.5 m, rectangular, several large stone boulders used for walls and cover, covering tumulus largely preserved, cover stones protruding at the top

Suggested Date: Warring States to Western Han

Xichang Liguoshan 西昌市李果山 (XLG) [168]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 500 m west of Datian Village Group 1, Aqi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市阿七鄉大田村一組

Morphology: on mountain top, 1940 m asl

Natural and Man-Made Environment: on top of Liguo Mountain 李果山

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, East-West oriented, 9.5 x 3.5 x 1.2 m, rectangular, several large stone boulders used for walls and cover, covering tumulus largely preserved, cover stones protruding at the top

Suggested Date: Warring States to Western Han

Xichang Lijiagou cun 西昌市李傢溝村 (XLJ) [169]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 300 m north of Lijiagou Village, Zhanguqian Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉李傢溝村

Morphology: second-level terrace, 1940 m asl

Surface Area: 400 m^2

Natural and Man-Made Environment: on western bank of the Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 6 megalithic graves, all East-West oriented, oval tumuli, 11-15 x 3-4 x 1 m, rectangular, several large stone boulders used for walls and cover

Suggested Date: Warring States to Western Han

Xichang Lizhou 西昌禮州 (XLZ) [170], including Xichang Chenyuancun (Lizhou Chenyuan and Lizhou Zhongxue) 西昌市陳遠村 (禮周陳遠 + 禮州中學) (XCY) [149]

Type: settlement site, earth-pit graves, megalithic graves, Han graves

Status: excavated

Reliability Index: 4.5

Location: 400 m East of Town of Lizhou, Daxing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市大興鄉禮州鎮; 25 km north of Xichang, on the eastern rim of the Chengdu-Kunming highway, on the NW of Lizhou Middle School

Morphology: third-level terrace, level, 1621 m asl. (settlement), 1580 m asl. (megalithic graves)

Surface Area: 7000 m^2, 362 m^2 preserved

Natural and Man-Made Environment: on terrace on eastern bank of the Anning River; 5 km east of the Anning River; close to the intersection of Anning and Reshui River 熱水河; leaning against high mountain in the East, facing the river

State: badly disturbed

Researchers: Provincial Museum of Sichuan 四川省博物館, Xichang County Culture Center 西昌縣文化館, Xichang Museum 西昌地區博物館, Department of History of Sichuan University 四川大學歷史係

Research: discovered in 1974, first excavation November to December 1974, second excavation February to March 1976, third excavation in October 1976

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Lizhou 1980a and 1980b

Secondary Studies: Zhao 1981, Huang Jiaxiang 2000, Liu and Wang 2007

Internal Chronology: Layer 4 > BY1 > BK1-5, AK1-4 > layer 3 > graves; BM 4 > BM5; BM4 > BM3 > BM2

Description Layers:

Layer 1: grey-yellow agricultural soil, max. 0.4 m thick, fragments of modern bricks, tiles, broken stone tools

Layer 2: disturbed red-yellow earth, 0.2-0.3 m, bricks, ceramic sherds, tile fragments, horse bones

Layer 3: soft loose red-brown soil, 0.2-0.8 m, charcoal fragments, many red, grey, and brown sand-tempered ceramic sherds, stone tools

Layer 4: red-brownish firm soil with some stones, 0.2-0.4 m, badly broken ceramic sherds, much red-baked soil; fire pits and kilns

Below Layer 4: very sticky orange-red virgin soil with many stones

Features:

BY1: kiln, at bottom of layer 4 in BT2, only fire pit and part of the fire corridor preserved, both cut into virgin soil, grey filling, depth 1.87 m, pit diameter 0.6, depth 0.44; corridor 1.86 m long, 0.42 m wide, 0.14-0.2 m deep; charcoal fragments, fragments of red-baked earth with grass fiber

BK1-5, AK1-4: 9 fire pits in layer 4 of area A (AK1-4) and B (BK1-5), densely distributed, 3-5 m between them, 0.5-1 m diameter, 0.2-0.5 m depth; walls of pits burned grey for depth of 1-2 cm, burning temperature not very high, time not very long; pieces of black-burned partially cracked stone, ash, charcoal

21 earth-pit graves (AM1-13, BM1-8): in area A and B, opening in upper or lower part of layer 3, some disturbing each other, BM4 > BM5, BM3 > BM2, BM4 > BM3, rectangular shaft bit graves, earth pounded, relatively neatly aligned, mainly SN oriented (AM2-13, BM1, 3-5, 7), a few EW (BM2, 6, 8), l. 4-8 m, w. 0.8-1.3 m, d. 0.5-0.8 m, no bones, on both ends one group of ceramics, aligned neatly following the extension of the grave in 2-3 lines, some ceramic vessels of the same type piled up together, ceramics complete and well preserved, generally around 20 object, maximum 50 (AM1, BM3), minimum 5-6 (AM3, BM2), filled with grey-white fat clay, same kind of soil at mountain slope in the east; exact grave measurements, drawings, and / or photographs only for BM1-8

BM1: 1.25 x 0.95 m, 7 ceramic vessels

BM2: 4.25 x 1.8 x 0.5 m, 7 ceramic vessels

BM3: 5.6 x 1.1 x 0.75 m, 49 ceramic vessels (24 in the North, 25 in the South)

BM4: 8.5 x 1.3 x 0.7 m, 31 ceramic vessels (18 in the North, 13 in the South)

BM5: 5.8 x 1.04 m, 28 ceramic vessels (10 in the North, 13 in the South, others unclear)

BM6: 3.75 x 0.97 x 0.54 m, 9 ceramic vessels (2 in the East, 7 in the West)

BM7: 4.3 x 0.85 m, 34 ceramic vessels (11 in the North, 15 in the South, 8 unclear)

BM8: 3.22 x 1.8 m, 17 ceramic vessels

Lizhou Chenyuancun M1: megalithic grave, orientation 182°, length 6.2 m, width 4.8 m, height 1.55 n, no access ramp or bones, 2 or more ceramic vessels, broken stone tools, and bone ornaments (e.g. bone beads)

Lizhou Zhongxue M2: megalithic grave, orientation 360°, l. 7 m, width 0.9 m, height 1 m, no bones, access ramp, or objects

Han graves HM1-5: M1 cutting M2, rectangular earth-pit graves

HM1: orientation 177°, 5.4 x 3.05 x 2.5 m, second-level ledge of 0.5 m height and 0.25 m width on three sides, short access ramp on one short side, remains of wooden coffin, 37 ceramic vessels, 853 bronze and 11 iron objects, 5 stone objects, 2 lacquer vessels

HM2: orientation 177°, 4.5 x 2 x 1.5, rectangular, 22 ceramic vessels, 22 bronze and 4 iron objects, 2 stone objects

HM3: orientation 178°, 5.1 x 2.35 x 1.8 m, rectangular, second-level ledge, 22 ceramic vessels, 1067 bronze and 1 iron object, 2 lacquer objects, 5 silver and 3 gold bracelets

HM4: orientation 180°, 4.7 x 2.85 x 1.8 m, rectangular, second-level ledge, 13 ceramic objects, 85 bronze and 3 iron object, 1 lacquer vessel

HM5: orientation 176°, rectangular, 4.2 x 2.85 x 2.2.5 m, 8 ceramic vessels, 57 bronze and 3 iron objects

<u>Ceramic Objects:</u>

Layer 3-4: over 3000 sherds, badly fragmented, soft sand-tempered ceramics burned at low temperature, mottled colors, mainly yellow, grey, red; roughly made large vessels, small ones finer; hand-thrown, larger ones in coil-building technique; black slip on some; incised line, awl and point pattern, some comb pattern and application bands below the rim with fingertip-impressed pattern; 1 spouted *hu* ewer recognizable

AM1-13, BM1-8: 363 vessels, coarse, low-burned red, red-brown, red-yellow pottery, hand-thrown, coarse surface; large number of *wan* and *bo* bowls, stemmed bowls, basins, *bei* cups, *hu* pots with and without spouts, many of them highly decorated, large number of *guan* jars and beakers, largely without handles, some with one or two, high vases, some larger vats

M1-2: 2 *bei* cups

HM1: 2 stove models, 2 vats, 11 *guan* jars, 3 vases 2 *fu* vessels, 2 *pan* basins, 4 small *guan* jars, 6 *bo* bowls, 3 *weng* urns, 1 single-handled *fu* vessel, 1 *gui* vessel, 1 incense burner, 3 steamer, 1 urn, 1 *hu* pot

HM2: 1 shove model, 1 field model, 1 dyke model, 2 vats, 1 *hu* pot, 1 *weng* urn, 2 *bo* and 1 *wan* bowl, 6 *guan* jars, 4 small *guan* jars, 1 urn

HM3: 1 stove model, 2 single-handled *fu* vessel, 6 *guan* jars, 1 *fu* vessel, 1 vat, 1 *weng* urn, 1 *hu* pot, 3 *wan* bowls, 4 small *guan* jars, 1 steamer, 1 spindle whorl

HM4: 2 *weng* urns, 4 *guan* jars, 1 horn-handled *guan* jar, 1 stove model, 2 steamer, 1 spindle whorl, 1 *hu* pot, 1 *fu* vessel

HM5: 1 stove model, 1 vat, 1 *weng* urn, 1 *hu* pot, 1 *wan* bowl, 3 *guan* jars

Bronze Objects:

HM1: 2 *fu* vessels, 1 *guan* jar, 2 belt hooks, 1 *pan* basin, 4 horse ornaments, 3 rings, 1 round-headed ornamental nail, 840 *wuzhu* coins

HM2: 1 *fu* vessel, 1 *xi* basin, 19 *wuzhu* coins

HM3: 1 *hu* pot, 2 *xi* basins, 2 *fu* vessel, 1 *pen* basin, 1 *yu* vessel, 1 steamer, 1 mortar with pestle, 3 *dou* pots, 1047 *wuzhu* coins

HM4: 2 *fu* vessel, 2 *xi* basins, 1 chariot ornament, 79 *wuzhu* coins

HM5: 1 *fu* vessel, 2 small bronze ornaments, 40 *wuzhu* and 9 other coins

Iron Objects:

HM1: 1 hammer, 1 *fu* vessel, 1 *fu* axe, 2 *zao* chisel, 1 sword, 3 *xiao* and 1 *dao* knife

HM2: 1 sword, 2 *zao* chisel, 1 bow-shaped object

HM3: 1 *xiao* and 1 *dao* knife

HM4: 1 *dao* knife, other iron ornaments and fragments

HM5: 1 sword, 1 *fu* axe, 1 *dao* knife, 1 triangular stand, 1 *ben* adze

Stone Objects:

Layer 3-4: 97 objects, most badly broken, all polished stone tools except for choppers which are chipped; 23 *dao* knives (8 long-rectangular, 15 d-shaped), 20 choppers (12 plate-shaped, 8 oval), 12 trapezoidal *fu* axes, 3 trapezoidal *ben* adzes, 12 finely polished *zao* chisel (5 long-rectangular, 2 long-rectangular, 5 tongue-shaped),[7] 1 *zhui* drill or awl, 1 flat middle-perforated disk or ring-stone, 2 loom-weights, 1 half-finished drum-shaped bead,[8] 4 flat square single-perforated handstones, 3 *lishi* grinding slabs

M1: several, types unclear

HM1: 3 rectangular and 1 round stone, 1 whetstone

HM2: 2 rectangular stones

Other:

M1: 3 bone beads

HM1: 2 lacquer vessels

[7] They are classified as scraper in the excavation report, but their form suggests that they are rather chisel.
[8] Classified as net weight in the excavation report, but size and form suggest bead half-product.

HM3: 2 lacquer vessels, 5 silver bracelets, 3 gold bracelets

HM4: 1 lacquer basin

Suggested Dates: *layer 4*: Neolithic, *layer 3*: Neolithic to Bronze Age, *layer 2*: Eastern Han; cultural layers mainly Neolithic to pre-Warring States; Jiang Zhanghua: early Lizhou (layer 3 and 4; Henglanshan cultural layer) → middle Lizhou (AM10, maybe also BM4 and AM2) → late Lizhou (BM3, BM8, AM9)

Relative Chronology: Henglanshan > Lizhou > megalithic graves > Han

Cultural affiliation: early Lizhou = Henglanshan

Xichang Luzuishan 西昌市盧嘴山 (XLS) [171]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: 300 m NW of Shangxiang Village, Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西溪鄉上香村

Morphology: on mountain-slope, 1468 m asl

Surface Area: 20 m^2

Natural and Man-Made Environment: close to Xixi River 西溪河, on foot of Luzui Mountain 魯嘴山

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, North-South oriented, oval tumulus, 11.2 x 10 x 1.5 m, rectangular, several large stone boulders used for walls and cover

Suggested Date: Warring States to Western Han

Xichang Ma'anshan 西昌市馬鞍山 (XMS) [172]

Type: settlement site, earth-pit graves

Status: surveyed, partially excavated

Reliability Index: 5

Location: south of Ma'anshan Village Group 2, Jingjiu Town, Ma'an Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市馬鞍山鎮經久鄉马鞍山村二组, 20 km SW of Xichang, public road passing by in the south

Morphology: on terrace, sloped, 1520 m asl

Surface Area: about 20000 m^2

Natural and Man-Made Environment: east of the Anning River, on a slope, overlooks surrounding area; in the west a gully flows by in NS direction which disturbed the site badly; plantations of eucalyptus trees, grass and some sweet potato planting in between the trees

State: disturbed by gully and agricultural use

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: discovered in 2004, excavated in December 2005, 2 pits of 4 x 7 m (2005XJMT1 and T2) and one trench of 2.5 x 7 m (T3) 9 m east of it, 80 m2 excavated

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Chengdu, Liangshan, and Xichang 2007, data collection 11/2010

Site Description: high in the NE, low in the SW, layers unevenly thick throughout the site

Internal Chronology:
Virgin soil > H5, F1 > layer 8 > H3, H4 > layer 7
Virgin soil > H6 > layer 8 > layer 7 > layer 6 > layer 5 > layer 4 > M1 > layer 3
Virgin soil > H5, H6, F1 > layer 8> H3, H4 > layer 7 > layer 6 > layer 5 > layer 4 > M1, H1, H2 > layer 3
H5 > H3 > H2

Description Layers (2005 excavation):

very uneven, different in the different pits
T1 + T2:
Layer 1: grey-brown, roots of eucalyptus trees and grassy plants, 0.1-0.2 m
Layer 2: irregular in quality and color, mainly grey-yellow, deep grey, grey-red; soft and thick in the south, shallow in the north, 0.1-0.2 m deep, 0.15-1 m thick, Ming blue-and-white porcelain, Han tiles, small number of sand-tempered ceramic sherds
Layer 3: grey-black clay-loam, loose and soft, 0.3-1 m deep, 0-0.5 m thick, Han tiles, sand-tempered ceramic sherds
Layer 4, 5: not extant in T1 and T2
Layer 6: grey-brown clay-loam, soft and loose, in SE of T2, 1.45-1.5 m deep, 0-0.3 m thick, small number of sand-tempered ceramic sherds and red burned pellets
Layer 7: yellow-brown clay-loam, 0.3-1.5 m deep, 0.1-0.45 m thick, many red-burned pellets and sand-tempered ceramic sherds, H3 in T2 and H4 in T1 start under this layer and cut into layer 8
Layer 8: red-brown clay-loam, compact, 0.55-1.6 m deep, 0.1-0.5 m thick, some red burned earth pellets, small number of sand-tempered ceramic sherds, H5 in T2 and F1 in both T1 and T2 start under this layer and cut into virgin soil, F1 in T1-2
below layer 8: dense red virgin soil

T3:
Layer 1: soft grey-brown top soil, tree roots, sweet potatoes, 0.1-0.2 m

Layer 2: irregular in quality and color, mainly grey-yellow, deep grey, grey-red; soft, thick in the south, shallow in the north, 0.1-0.2 m deep, 0.15-0.8 m thick, blue-and-white porcelain, Han tiles, small number of sand-tempered ceramic sherds
Layer 3: grey-black clay-loam, loose and soft, 0.3-1 m deep, 0-0.25 m thick, Han tiles, small number of sand-tempered ceramic sherds, M1 starts from here and cuts into layer 4
Layer 4: red-brown clay-loam, dense, not in the north, 0.5-1 m deep, 0.0.25 m thick, much disturbed, no objects
Layer 5: black clay loam, dense, not in the north, 0.75-1.2 m deep, 0-0.4 m thick, small number of sand-tempered ceramic sherds, red burned pellets and charcoal
Layer 6: grey-brown clay-loam, soft and loose, 0.45-1.35 m deep, 0-0.5 m thick, small number of sand-tempered ceramic sherds and red burned pellets
Layer 7: not extant here
Layer 8: red-brown clay-loam, compact, 1-1.65 m deep, 0.15-0.2 m thick, some red burned earth pellets, small number of sand-tempered ceramic sherds, H6 starts under this layer and cuts virgin soil
below layer 8: dense red virgin soil

<u>Features:</u>

M1: earth-pit grave in T3 under layer 3 cutting layer 4, 0.75 below the surface, 3.76 x 2.9 x 2.02 m, orientation 75°, rectangular, flat bottom, second-level ledge all around, red virgin soil and whitish clay-loam as filling, no bones, 3 ceramic objects

F1: rectangular house feature under layer 8 cutting virgin soil, five round to oval post holes of 0.3-0.4 m diameter and 0.2-0.4 m depth, filled with yellow-brown loose clay-loam, some ceramic sherds and ash, on the bottom of some of the post holes pebbles

H1: under layer 3, cutting layer 7, rectangular to trapezoidal with rounded corners, straight walls, flat bottom, 1.4 x 1.06 x 0.8, grey-black clay-loam inside, some sand-tempered ceramic sherds

H2: under layer 3, cutting layer 7 and H3, irregular oval, straight sides, flat bottom, 1.8 x 1.54 x 0.28-0.4 m, grey-brown clay-loam, dense, small number of sand-tempered ceramic sherds

H3: under layer 7, disturbed by H2, cutting layer 8, irregular oval, straight sides, flat bottom, 2.5 x 1.9 x 0.88-1.08, grey-black clay-loam, soft, some grey spots, some sand-tempered ceramic sherds, small number of stone tools

H4: under layer 7, cutting layer 8, irregular shape, flat bottom, 2.4 x 0.98 x 0.92-1.3, grey-yellow clay-loam, small number of red-burned pellets, soft, some sand-tempered ceramic sherds, one stone arrow head, > 1/3 cut off by western wall of T1, thus not fully excavated

H5: under layer 8, cut by H 3, cutting virgin soil, > 1/4 cut off by eastern wall of T2, thus not fully excavated, irregular form, flat bottom, 1.88 x 1.8 x 0.5, yellow-brown clay-loam, small number of sand-tempered ceramic sherds

H6: under layer 8, cutting virgin soil, roughly rectangular, cut on two sides by walls of excavation pit, full extent unknown, 2.12 x 0.92 x 0.5, yellow-brown clay-loam, some ash, dense, some sand-tempered ceramics, one *ben* adze

Other: number of postholes in T1 and T2 under layer 3, 7, and 8 but not forming any clear feature

<u>Ceramics:</u>

Surface finds: many sand-tempered ceramic sherds, grey, grey-brown, and red-brown, 3 *guan* jars, 2 *bo* bowls, some decoration, mainly application-bands below the rim with fingertip-impressed pattern, some incised point and line pattern; some Han tiles, and Ming blue-and-white porcelain sherds

Layer 2: Han tiles, small number of sand-tempered ceramic sherds, Ming blue-and-white porcelain sherds, no further information

Layer 3: Han tiles, small number of sand-tempered ceramic sherds, no further information

H1: 6 *guan* jars, 1 *bo* bowl, 1 lid, all sand-tempered, mainly grey, also red-brown and grey-brown, some decoration, mainly application-bands below the rim with fingertip-impressed on *guan* jars, some traversal and horizontal point lines

H2: few sand-tempered ceramic sherds, red, grey-brown, and grey, 2 *guan* jars with application-band below the rim with fingertip-impressed decoration, incised traversal lines on one, 1 lid

M1: high-burned thin grey clay-pottery, 1 *guan* jar, 2 round-bottomed *fu* pots

Layer 5: few sherds of sand-tempered ceramics in grey-brown and red-brown, 2 *guan* jars, 1 clay-tempered spout, 2 flat bottoms, 1 with impressed vein pattern

Layer 7: many sand-tempered ceramic sherds, brown, grey-brown, yellow-brown, grey, 11 *guan* jars, 1 *wan* and 2 *wan* bowl, 1 *bei* cup,[9] some decoration, mainly application-bands below the rim with fingertip-impressed decoration, some incised point pattern, corded ware, and net-pattern

H3: few sherds of yellow-brown and grey sand-tempered pottery, 1 *guan* jar with application-band below the rim with fingertip-impressed decoration, 2 *bo* bowls, one with thin horizontal application band

H4: few sherds of yellow-brown, brown, and red sand-tempered ceramic sherds, 2 *guan* jars, 2 *bo* bowls

Layer 8: mainly sand-tempered ceramic sherds, 7 *guan* jars, 3 *wan* bowls, [10] some decoration, mainly application-bands below the rim with fingertip-impressed pattern on *guan* jars and *wan* bowls, lines of impressed points, incised traversal lines, thin application bands

H6: 2 brown sand-tempered *guan* jars, one with application-band below the rim with fingertip-impressed pattern, 1 clay-tempered brown and 1 sand-tempered grey *wan* bowl[11]

Stone Tools:

Surface finds: 1 fragmented polished *ben* adze

Layer 7: 2 fragmented polished *ben* adzes, 3 fragmented polished *zao* chisels

H3: 1 polished *ben* adze, 1 polished halfmoon-shaped double-perforated *dao* knife

H4: 1 polished *fu* axe, 2 polished willow-leaf shaped *zu* arrowheads

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[9] All four classified as *bo* in the excavation report, but three outwards-turning, two of them here thus classified as *wan*, one as *bei*.

[10] Classified as *bo* in the excavation report, but actually unrestricted form. One of them outward curved like a jar or vase, therefore here classified as unclear.

[11] Classified as *bo* in excavation report, but is an unrestricted form

Layer 8: 1 polished oval double-perforated *dao* knife, 1 polished *zao* axe, 1 polished willow-leaf-shaped *zu* arrowhead, 1 thin stone fragment

H6: 1 polished *ben* adze

Suggested Date: Layer 5-8 and below Neolithic, F1 Western Han, layer 3 Han, layer 1-2 Ming

Relative Chronology: Henglanshan > Ma'anshan, lower Qimugou, lower Yingpanshan

Suggested Cultural affiliation: Henglanshan, Han

Xichang Mahuangkan 西昌市螞蟥坎 (XMH) [173]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉

Morphology: on terrace, level, 1922 m asl

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009

Suggested Date: Warring States to Western Han

Xichang Majialin 西昌 (XMT) [174]

Type: smelting site

Status: surveyed

Reliability Index: 2.5

Location: NE of Huanglianguan Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市黃連関鎮東北

Morphology: on hill slope, 1536 m asl.

Natural and Man-Made Environment: on eastern bank of the Anning River, in hillsides surrounding the river valley

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered in February 1976

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 bronze kiln 0.6 m below surface, round in shape, 1.5 m diameter, in it 5 coin molds, 17 bronze nails, 2 small hammers

Suggested Date: Wang Mang interregnum to Eastern Han

Xichang Maliucun (Zhaoshanbei) 西昌市麻柳村（趙山碑） (XML) [175]

Type: megalithic grave site, object pits

Status: partially excavated

Reliability Index: 4

Location: Maliucun, Lijiagou Group 6, Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉李傢溝六組

Morphology: second-level terrace, level, 1556 m

Surface Area: 5000 m^2

Natural and Man-Made Environment: 0.5 km south of the village, about 1.5 km west of the Anning River

State: heavily disturbed (eroded by the river shifting to the West)

Researchers: Sichuansheng Wenwu Kaogu Yanjiusuo 四川省文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: in November 2011 pit discovered and objects removed by local peasants, later re-excavation, megalithic graves not touched

Storage: Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a and 2006b, data collection 11/2010

Site Description: 1.2 m of cultural layers

Features: 1 earth pit, 4 megalithic graves

H1: irregular, roughly oval, sloped walls, flat bottom, opening 3.68 x 2.06 m, bottom 3.35 x 1.52 m, 0.6 m deep; filled with red-brown clay-loam and large number of ceramics

M1: *orientation*: EW, *form*: long-rectangular, *measurements*: 7 x 3.2 x 1.2 m, *installations*: several large stones for walls, 4 large stones for cover, *state*: well-preserved, unexcavated

M2: *orientation*: EW, *form*: long-rectangular, *measurements*: 6.6 x 2.9 x 1.4 m, *installations*: several large stones for walls, 4 large stones for cover, door located in middle of southern long-side, tumulus largely destroyed, *state*: well-preserved, unexcavated

M3: *orientation*: EW, *form*: long-rectangular, *measurements*: 4.2 x 3.6 x 1.1 m, *installations*: several large stones for walls and cover, *state*: well-preserved, unexcavated

M4: *orientation*: EW, *form*: long-rectangular, *measurements*: 6.4 x 2.9 m, *installations*: several large stones for walls and cover, *state*: well-preserved, unexcavated

Ceramics: *H1:* mainly grey clay ceramics, some fine black and brown sand-tempered ceramics, all burned at high temperatures, coil-built, decorated with incised lines, water-ripple pattern, fish-bone pattern, lines of impressed points; 20 objects identifiable; 7 *bei* goblets, some of them with stem, 10 *hu* ewers, 1 stemmed *dou* bowl, 2 *guan* beakers

Suggested Date: Western Han / Spring and Autumn to Warring States?

Relative Chronology: early? Dashimu, type I megalithic graves according to Jiang Zhanghua, according to excavation report similar to Dashimu,, i.e. late Spring and Autumn to early Warring States; Sichuansheng, Liangshan, and Xichangshi 2006a holds that it is between late 2nd and early 3rd Dashimu phase, meaning early to middle Western Han material in pit similar to material from megalithic graves (Xide Lake Gongshe M6, Xiaoxingchang AM1, lake Sihe, Bahe Baozi), similarities to Wangjiatian and lower Qimugou

Xichang Maomaoshan 西昌帽帽山 (XMM) [176]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: 3 km NE of Shi'an Village Group 8, Daxing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市大興鄉石安村八組

Morphology: in valley between mountains, 1834 m asl

Surface Area: 50 m^2

Natural and Man-Made Environment: valley between Wugui Mountain 烏鬼山 and Maomao Mountain 帽帽山, 500 m north of Zhangbasi River 張巴司河, surrounded by mountains on all four sides

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 3 megalithic graves, 5 m between them, M2 and M3 oriented towards the South, M1 oriented towards the NW, rectangular, several large stone boulders used for walls and cover; **M1:** 7.61 x 1.25 x 1.05 m, 4 stone boulders as cover; **M2 and M3**: heavily disturbed, cover stones missing, original measurements unclear

Suggested Date: Warring States to Western Han

Xichang Mimilang 西昌咪咪啷 (XMI) [177]

Type: settlement site, megalithic grave site

Status: partially excavated

Reliability Index: 4

Location: Mimilang, Lijiagou Group 6, Zhangmu Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木鄉李傢溝六組, at 1 km distance of the Anning River

Morphology: second-level terrace, sloped, 1560 m asl

Surface Area: 48000 m^2

Natural and Man-Made Environment: on a slope on western Bank of the Anning River, passed on two sides by seasonal creeks passing from East to West; houses built in the middle; around agricultural fields, mainly vegetables, wheat, rice, pine trees

State: badly disturbed by recent building activities, especially in the middle part, where earth was extracted to build rammed-earth houses

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: trial excavations in May 2004, 4 trenches of 5 x 5 m and 1 of 3 x 5 m (T101-102, T201-202, T301), 79 m^2 excavated

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan, Chengdu, and Xichang 2006, Sichuansheng, Liangshan, and Xichangshi 2006a, data collection 11/2010

Site Description: cultural layers directly under the surface, high in West, low in the East

Internal Chronology: Virgin soil (layer 6) > F3 > F2 > F1 > H1 > layer 5 > layer 4 > layer 3 > layer 2 > layer 1

Description Layers (2004 excavation):

Layer 1: soft grey-black agricultural layer, 0.2-0.3 m, plant roots, modern trash, red-baked earth, sand-tempered pottery sherds

Layer 2: soft brown sandy soil, 0-0.60 m, high in the west, low in the east, some sand-tempered ceramic sherds, blue-and-white porcelain, iron objects and many stones

Layer 3: dense black-brown sandy soil, 0-0.35 m, disturbed in the East, large amount of eastern Han ceramic tiles with rhombus decoration, sand-tempered ceramic sherds, stone objects and unworked stones, some red-baked earth fragments and charcoal

Layer 4: loose black-grey sandy soil, 0-0.25 m, eastern part disturbed, many sand-tempered ceramic sherds and a few stone objects

Layer 5: dense black-brown sandy soil, 0.30-0.35 m, few sand-tempered ceramic sherds and stone tools and a lot of red-baked earth and ash and charcoal, H1 and F1-F3 starting from here, H1 cutting F1 and F3, F1 cutting F2, F2 cutting F3

Below layer 5: dense yellow-grey grit virgin soil

Features: 2 megalithic graves in SE part on top of upper layers

M1: 30 m north of M2, *orientation:* 28°; *construction:* rectangular, 15 x 10 x 2.5 m, walls and cover made of large granite boulders, oval tumulus largely destroyed

M2: 30 m south of M1, oriented towards the East, oval tumulus of 8.5 x 7 x 1.2 m, rectangular grave, sides and cover made of large stone boulders, 3 granite cover stones visible, 0.3 m thick, doorway at short side, made of large number of irregular stone cobbles

F1: in T101, below layer 5, cut by northern and western wall of the excavation pit, rectangular, 2 postholes of 0.2 and 0.3 m diameter, wall ditch of 0.25-0.3 m width and 0.35 m depth

F2: in T101, below layer 5, cut by eastern and southern wall of excavation pit, 3 post holes of 0.2-0.25 m diameter, wall ditch of 0.25-0.3 m width, 0.35 m depth

F3: in T101, below layer 5, cut by western wall of excavation pit, 2 wall ditches of 2.1 x0.2-0.3 x 0.2-0.25 m

H1: ash pit in West of T101, below layer 5, cut by western wall of excavation pit, cuts both F1 and F3, rectangular with rounded corners, extent unclear, 1.75 x 1.1. x 0.3 m; soft black-brown sandy soil, much red-baked earth, ash, and charcoal, some sand-tempered ceramic sherds, broken stone tools, and stones

<u>Ceramics:</u>

Surface collection: 1 ring-foot bottom and 1 flat bottom, both with impressed leaf-pattern, sand-tempered ceramic, largely undecorated, some impressed point-pattern, know-pattern, net-pattern, corded ware

Layer 3: 52 % grey, 46.7 % grey-brown, 2 % red-brown sand-tempered pottery, tempered with small stones or coarse sand, 0.1 % fine ware; 94.9% undecorated, decorations mainly incision, corded ware, stamp impressed patterns, fingertip-impressed pattern, bead-pattern, point pattern, vein pattern, water-ripple pattern, net pattern, line pattern, application strips, knob pattern, perforated holes; hand-thrown, mainly coil-built and smoothed on a wheel; badly fragmented; many small flat bottoms, few ring feet, 28 *guan* jars, 10 with slightly everted mouth, 9 with wide open mouth, 2 with trumpet-shaped mouth, 7 with plate-shaped mouth, some with net-pattern or corded ware pattern; 1 double-handled *guan* jar, 2 flat bottoms, 2 lid knobs, 1 spindle-whorl

Layer 4: 55.1 % grey-brown, 42.8 % grey, 2 % red-brown clay-tempered pottery, small stones or coarse sand as temper, 0.1 % fine ware; 89.8% undecorated, wide variety of decoration styles and patterns, mainly incision, corded ware, net pattern, bead pattern, vein pattern and other impressed patterns, water ripple pattern, line pattern, application bands with corded ware pattern, fish-bone pattern, traversal lines, knob pattern; hand-thrown, mainly coil-built and reworked on a wheel; unevenly burned, mottled color; badly fragmented; 12 *guan* jars, 5 with dish-shaped rim, 3 wide-mouthed, 4 with trumpet-shaped mouth, some with corded-ware design on lip and/or net-pattern on the neck; 1 double-handled *guan* jar with fish-bone pattern, 1 small *bei* cup, 1 small *ping* vase, 2 *pen* basins, 3 flat bottoms

Layer 5: 57.9 % grey, 39.9 % grey-brown, 2.1 red sand-tempered pottery, small stones or coarse sand as temper, 0.1 % fine ware; 94.5% undecorated, decorated mainly with incisions, impressed point pattern, line pattern, and corded ware; hand-thrown, mainly coil-built and reworked on a wheel; unevenly burned, mottled color; badly fragmented; forms largely unclear; 9 *guan* jars, 8 wide-mouthed, 1 with dish-shaped rim, 3 flat bottoms with impressed leaf-vein pattern, 1 leaf-vein impressed spindle-whorl

H1: 1 *hu* ewer, 1 plate-shaped lid, 2 flat bottoms

<u>Stone Tools:</u>

Layer1-2 4: broken d-shaped stone knives with 1-3 holes

Layer 3: 1 thin carefully polished long leaf-shaped *zu* arrowhead with slit in blade

Layer 4: 2 thin finely worked ground *zu* arrowheads

Layer 5: 6 trapezoidal polished *ben* adzes, 3 coarsely flaked long-rectangular *fu* axes, 1 round-oval black-brown iron-ore piece[12]

H1: 1 round-oval *lishi* grinding slab

Absolute Dates: *Layer 5*: 1910 ± 40 BP, *layer 4*: 2840 ± 40 BP (radiocarbon dates)

Suggested Date: *layer 4-5*: Neolithic through Bronze Age *layer 3*: Eastern Han *layer 2*: Ming-Qing

Relative Chronology: Lizhou > Mimilang > Megalithic graves

Xichang Nantan 西昌市 (XNT) [178]

Type: smelting site

Status: surveyed

Reliability Index: 2.5

Location: 700 m NW Nantan Village, Xijiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西郊鄉南壇村

Morphology: first-level terrace, level, 1536 m asl

Natural and Man-Made Environment: on western bank of the Anning River, close to river, on level ground, close-by Jin and Han graves

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered in August 1992

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 bronze kiln 1 m below surface, in it 1 bronze *xi* basin, 1 *fu* cauldron, 1 *gui* tureen

Suggested Date: Eastern Han

Xichang Qimugou 西昌市棲木沟 (XQG) [179]

Type: settlement site, earth-pit graves, object pits

Status: excavated

Reliability Index: 6

[12] Classified as *lishi* grinding stone in the excavation report but actual function unclear.

Location: Qimugou, Hongxing Village Group 5, Langhuan Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌琅環鄉紅星村 5 组棲木沟,

Morphology: second-level terrace, sloped, 1571 m asl

Surface Area: East-West extension 350 m, North-South extension 300 m, 105.000 m^2

Natural and Man-Made Environment: on a mountain slope about 800 m from the Anning river on its western bank, 50 m above Anning River; very close to Mimilang; divided in two parts by a seasonal trench, on surface fields with shallots, wheat, vegetables, corn, thus disturbances of the cultural layers

State: mildly disturbed by agricultural activities

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所, Sichuansheng Kaogu Yanjiuyuan 四川省考古研究院

Research: discovered during survey in 1975, surveyed in 1987 and 2003, first trial excavation of 4 5 x 5 m squares (T101, T102, T201, T202) in 2005, second excavation 2 m west of old excavation in 2006, 4 pits of 5 x 5 m (T1-4), 102 m^2 excavated

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Chengdu, Liangshan, and Xichang 2008, Sichuansheng, Liangshan, and Xichangshi 2006a and 2006c, Chengdu, Liangshanzhou, and Xichangshi 2009, data collection 11/2010

Internal Chronology: **Excavation 2005:** Layer 4 > F1 > layer 3B > layer 3A > layer 2 > layer 1; **Excavation 2006:** Layer 4 > M1, M2, H1-3, F1 > layer 3 > M3, W1 > layer 2 > layer 1, virgin soil > H3 > M1 > layer 3 > layer 2 > layer 1, virgin

Description Layers:

Excavation 2005

Layer 1: soft loose brown agricultural soil, 0.1-0.2 m, stones, contemporary tiles and blue-and-white porcelain sherds

Layer 2: firm grey-brown clay soil, 0.15-0.4 m, contemporary tiles and blue ceramic fragments, grey and sand-tempered red pottery

Layer 3A: firm black clay soil, 0.22-0.4 m, few red-baked earth fragments and charcoal, undecorated sand-tempered grey-brown pottery fragments

Layer 3B: firm black clay soil, 0-0.4 cm, undecorated sand-tempered grey-brown sand-tempered ceramic sherds and broken stone object, F1 starting from here

Layer 4: firm light grey clay soil, 0-0.4 m, few objects, some sand-tempered ceramic sherds

Excavation 2006

Layer 1: loose grey-brown agricultural soil, 0.2-0.3 m, loose, roots, modern trash, red-backed earth, fragments of roof tiles and bricks, sand-tempered ceramic fragments

Layer 2: dense grey-brown sandy earth, 0-0.6 m, sand-tempered ceramic fragments, blue-and-white porcelain sherds, white porcelain sherds, M3 and W1 starting from here

Layer 3: thicker in the NE than in the SW, loose black-grey sandy soil, 0-0.25 m, red-backed earth, charcoal remains, many sand-tempered and some black fine ware sherds, a few stone tools, M1, M2, H1-H3 and F1 start below here

Layer 4: mainly in the SE, dense grey-yellow sandy soil, 0.3-0.35 m, a few charcoal remains and many pebbles, no objects

Below layer 4: dense yellow-grey gravel

Features:

Excavation 2005

F1: in SE of T201, below layer 3B, shallow rectangular pit house feature of 2.8 x 2.15 x 0.3 m with 6 post holes (D1: diameter 0.2, depth 0.3, D2: diameter 0.23, depth 0.36, D3: diameter 0.28, depth 0.3, D4: diameter 0.22, depth 0.2 m, D5: diameter 0.15, depth 0.15, D6: diameter 0.29, depth 0.12, small number of grey-brown sand-tempered ceramic sherds inside

Excavation 2006

3 vertical shaft pit graves, 1 object pit, 1 house feature, 3 pits

M1: earth-pit grave, western part of T3, close to surface (0.34 m), severely disturbed, cuts H3 and virgin soil, below layer 3, orientation: 20°, L: 3.66 m, W: 1.8 m, D: 0.26 m, dense yellow-black clay soil, some charcoal, no bones; unclear which objects originally belonged into it; 25 ceramic objects, 1 stone knife, 1 bronze bracelet

M2: earth-pit grave, eastern part of T3, badly disturbed, cuts F1, cuts into virgin soil, orientation: 10°, L: 2.4 m, W: 1.56 m, D: 0.15, north high south low, dense yellow-black clay-soil, some charcoal, no bones, much broken pottery, not all of it necessarily belonging to the grave; 22 ceramic objects, 1 stone knife

M3: earth-pit grave, middle of T2, below layer 2, cuts layer 3, severely disturbed, Orientation 84°, L: 4.98 m, W: 3.1 m, D: 0.6 m, second-level ledge 0.2 x 1-1.64 m, grey-brown sandy soil, charcoal, no bones, small ceramic fragments, 5 stone choppers

W1: middle of T1, cuts layer 3, below layer 3; disturbed, rim diameter 0.51-0.54, bottom diameter 0.25, depth 0.3 m, densely-packed grey-brown sandy soil, bits of charcoal, 1 smaller jar inside larger *guan* jar, no bones

F1: below layer 3, cutting layer 4, cut by M1, only one corner of the rectangular building within excavation pit (2.69 x 2.04 m), wall ditch with 6 post holes (d: 0.15-0.3, depth: 0.15-0.2), soft brown-grey soil, some sand-tempered ceramic sherds, some charcoal

H1: below layer 3, cutting into virgin soil, upper diameter 1.11-2.4 m, depth 0.21-0.42 m, soft grey-brown sandy soil, red-burned clay, burned grass, few fragments of sand-tempered pottery

H2: below layer 3, cutting into virgin soil, rim diameter 1.98-2.85 m, depth 0.51 m, loose grey-brown sandy soil, red-baked earth pieces, burned grass, small number of sand-tempered pottery sherds

H3: below layer 3, cut by M1, cutting into virgin soil, rim diameter 1.05 -2.4 m, depth 0.78 m, loose grey-brown sandy soil, pieces of red-baked earth, burned grass, few sand-tempered pottery sherds

Ceramics:

Excavation 2005

Layer 3: 99% sand-tempered (71.1% grey, 15.3% black, 9.6% red), 1% fine ware, 81.5% undecorated, 4.7% corded ware , 3% leaf-vein pattern on the bottom, 2 % line incision, 1.7% application bands, small amounts of impressed oval, pointed, or triangular marks, water-ripple pattern, net pattern, S-shaped application, one complete object, rest badly fragmented; 1 *bo* bowl,[13] 20 double-handled *guan* beaker with flaring mount and short to medium-long neck, 24 *guan* jars with short rim, constricted neck, oblique outward-flaring rim, 17 handles, 8 flat long-rectangular wimple clay-strips, 9 short wide handles made of 4-5 vertical clay-strips, some with vertical clay-strip laid across, mainly from lip to shoulder, some from neck to shoulder, 24 flat bottoms, 10 small pedestal-bases, 2 indented bottoms, some with impressed leaf-vein pattern

Layer 4: 338 ceramic sherds, all sand-tempered, 82.2% grey-brown, 11.5 % black, 3.3% red; 88.1% undecorated, 7.4% Corded ware, 1.8% application bands, 1.5% line incision, 1.2 % rows of impressed oval, pointed, or triangular marks, 0.6% net pattern; 11 *guan* jars with wide mouths, some with horizontal application band with fingertip-impressed pattern below the rim and/or corded ware pattern on body and/or lip, 2 *guan* jars

Excavation 2006

Layer 3: ceramics badly fragmented, mainly fine ware with black surface-slip, mainly *bei* goblet, some grey-brown sand-tempered pottery, mainly *guan* jars and beakers and *hu* ewers; mostly decorated with impressed vein-pattern on the bottom, awl-pattern, rows of impressed points and triangles, incised lines, water-ripple pattern with thin vertical application band with impressed finger-point pattern, corded ware; 12 sand-tempered large globular short-necked *guan* jars, 1 high-necked *guan* jar, 3 rims of funnel-shaped openings in fine ware with a black slip, 8 band-handles made of 3-5 vertical bands of sand-tempered clay, 2 sand-tempered *guan* beaker with two short band handles of several vertical clay strips and a horizontal clay-strip above, with impressed corded ware on the body, 3 bottoms of high ring-footed *bei* goblets, 3 high and 2 short trumpet-shaped ring-feet, all of clay ceramic, 1 long-oval sand-tempered loom weight with horizontal incision and 1 perforation, 2 long spouts of sand-tempered pottery, 6 flat bottoms of sand-tempered pottery with impressed leaf-vein pattern

M1: 25 ceramic vessels, mainly well-polished, high-burned, black-slipped fine ware, few pieces of fine sand-tempered ceramics (8 high-stemmed *bei* goblets, stems of 8 further vessels, 2 flat bottoms, 1 *guan* jar, 2 *gu* goblets, all of clay potter, 1 spouted *hu* ewer, 1 flat bottom, 1 globular vessel, 1 handle, all in grey-brown sand-tempered pottery)

M2: 21 ceramic vessels (1 *guan* beaker of sand-tempered pottery, 6 high-stemmed and 4 pedestal-based *bei or gu* goblets, stems of 8 more cup- or goblet-sized vessels, 2 *hu* ewers, all of fine clay-pottery with black slip)

W1: 1 large and 1 smaller *guan* jar, both of grey-brown send-tempered pottery

<u>Stone Tools:</u>

Excavation 2005

Surface finds: 1 polished stone tool (1 kidney-shaped loom weight), 6 chipped stone tools (1 triangular scraper, 1 long-oval pestle, 4 plate-shaped choppers)

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[13] Classified as straight-mouth *guan* jar in the excavation report, but clear bowl form.

Layer 3: 8 polished stone tools (1 trapezoidal *ben* adzes, 2 coarse *fu* axes, 3 long pestles with round cross-section, 1 thin trapezoidal stone object of unclear function, 2 *dao* knives), 12 chipped stone tools (12 coarse chopper of round to square form)

F1: 4 plate-shaped choppers, 1 handheld grinding roller

Layer 4: 1 perforated oval to long-rectangular polished *dao* knife, 1 trapezoidal small flaked scraper

Excavation 2006

Surface finds: 1 long-oval pestle with one heavier end

Layer 3: 1 finely-polished *fu* axe, 3 long-oval pestle, 5 disk-shape chopper, 4 irregular square to rectangular *lishi* grinding stones

M1-2: each 1 perforated *dao* knife, fine-polished

M3: 5 coarse choppers

Other finds: *M1*: 1 bronze *huan* bracelet

Suggested Date: *layer 4:* Neolithic, *layer 3:* Spring and Autumn to Western Han, *layer 2*: Ming-Qing

Relative Chronology: layer 4 = Henglanshan

Suggested Cultural affiliation: layer 4 Henglanshan culture

Xichang Qujia Laokan 西昌市瞿家老坎 (XJJ) [180]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉

Morphology: on terrace, level, 1511 m asl

Surface Area: 24000 m^2

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Finds: unknown

Data Sources: mentioned in Liu Hong 2009

Suggested Date: Warring States

Xichang Reshuitang West 西昌市熱水塘西 (XRS) [181]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: 700 m West of Reshuitang, Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西溪鄉熱水塘村

Morphology: first-level terrace, 1743 m asl

Surface Area: 80 m^2

Natural and Man-Made Environment: east of the Anning River, very close to the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, rectangular, several large stone boulders used for walls and cover, covered by oval tumulus, cover stones protruding on the surface, orientation unclear, 15 x 6 x 3 m

Suggested Date: Warring States to Western Han

Xichang Sanhe 西昌市三和 (XSH) [182]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Lizhou Town, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市禮州鎮

Morphology: on terrace, level, 1575 m asl

Surface Area: 2500 m^2

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009

Suggested Date: Warring States

Xichang Shajiapo 西昌市沙家坡 (XSJ) [183]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Xixi Village (originally: Shajiapo Village), Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西溪鄉西溪村（原為沙傢坡）

Morphology: in mountain valley, 1896 m asl

Surface Area: 80 m^2

Natural and Man-Made Environment: on the southern bank of Xixi River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, rectangular, several large stone boulders used for walls and cover, tumulus largely destroyed, 9.8 x 1.65 m

Suggested Date: Warring States to Western Han

Xichang Shangxiang 西昌市上香 (XSX) [184]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: 500 m South of Shangxiang Village, Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西溪鄉上香村

Morphology: on foot of mountain, 1624 m asl

Surface Area: 20 m^2

Natural and Man-Made Environment: on the southern bank of Xixi River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, rectangular, oriented towards the North, several large stone boulders used for walls and cover, oval tumulus largely preserved, 4 cover stones protruding on the top, 8.7 x 4.4 x 1.7 m

Suggested Date: Warring States to Western Han

Xichang Shantou 西昌市山頭 (XST) [185]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉

Morphology: on alluvial fan, 1482 m asl

Surface Area: 5000 m^2

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009

Site Description: 0.6 m settlement layers

Suggested Date: Warring States

Xichang Shaojia Gaokan 西昌市肖傢高坎 (XSK) [186]

Type: settlement site

Status: partially excavated

Reliability Index: 0.5

Location: Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉

Morphology: on terrace, level, 1547 m asl

Surface Area: 4800 m^2

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009

Site Description: 0.6-0.8 m cultural layers

Suggested Date: Warring States

Xichang Shijia Baozi 西昌市施傢堡子 (XSB) [187]

Type: megalithic grave site

Status: surveyed

Reliability Index: 4

Location: Hongqi Village Group 7, Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉紅旗村七組

Morphology: first-level terrace, 1581 m asl

Surface Area: 204.45 m^2

Natural and Man-Made Environment: on eastern bank of Anning River, at 1 km distance of the river, 500 m west of the railway line connecting Chengdu and Kunming

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, data collection 12/2010

Features: 1 megalithic grave, rectangular, oriented towards the North, several large stone boulders used for walls and cover, 6 large cover stones visible on the surface, oval tumulus largely preserved, 17 x 5 x 3 m

Suggested Date: Warring States to Western Han

Xichang Shizuizi (Reshuitang) 西昌市石嘴子 (熱水塘) (XSZ) [188]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: 400 m South of Reshuitang Village, Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西溪鄉熱水塘村

Morphology: on mountain-slope, 1763 m asl

Surface Area: 120 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 1 megalithic grave, rectangular, *orientation*: 220°, several large stone boulders used for walls and cover, oval tumulus largely preserved, large cover stones visible on the surface, 15 x 8.5 x 2 m

Suggested Date: Warring States to Western Han

Xichang Shuanggudui 西昌市雙谷堆 (XSG) [189]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: 400 m South of Reshuitang Village, Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市小廟鄉安寧村四組

Morphology: first-level terrace, 1509 m asl

Surface Area: 120 m^2

Natural and Man-Made Environment: on eastern bank of Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 2 megalithic graves, oriented towards the North, rectangular, several large stone boulders used for walls and cover, oval tumuli badly disturbed, original measurements unclear

Suggested Date: Warring States to Western Han

Xichang Tanshan 西昌市壇山 (XTS) [190]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 300 m east of Chenyuan Village, Lizhou Town, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市禮州鎮陳遠村

Morphology: on hill-top, level, 1594 m asl

Surface Area: 20000 m^2 (EW 100 m, NS 200 m)

Natural and Man-Made Environment: on the eastern bank of the Anning River, leaning against the mountain, bordering south on the Heishui River 黑水河, on small mound

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 0.4-1 m cultural layers

Surface finds: low-burned red sand-tempered ceramic sherds, forms unclear; some stone tools

Suggested Date: Neolithic

Xichang Tianbacun 西昌市田垻村(XTC) [191]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Tianba Village Group 4, Lizhou Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市禮州鎮田垻村四組

Morphology: third-level terrace, sloped, 1591 m asl

Natural and Man-Made Environment: east of the Anning River, on northern bank of the Reshui River 熱水河, facing the river, leaning against the mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, *orientation*: 275°, *construction:* rectangular, several large stone boulders used for walls and cover, 20 x 11.5 x 2.8 m

Suggested Date: Warring States to Western Han

Xichang Tianwangshan 西昌市天王山 (XTH) [192]

Type: megalithic / stone construction grave, earth pit / brick graves

Status: partially excavated

Reliability Index: 5

Location: Tianwangshan, Hongqi Gongshe, Xiaomiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市小廟鄉紅旗公社天王山

Morphology: second-level terrace, sloped, 1634 m asl.

Surface Area: 1000 m^2

Natural and Man-Made Environment: NW of the city of Xichang, close to Qionghai lake; 300 m West of railway-line, East of the Anning River

State: disturbed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: M10 excavated from 07/16 to 09/13/1977, one Eastern Han brick grave excavated in 10/1977

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1984, Zhongguo Wenwu 2009, data collection 11/2010

Site Description: on edge of gentle hill-slope

Internal Chronology: M10 > M1-9, M11-15

Features:

1 stone-construction (megalithic) grave (M10) with object-pit next to it, 14 Han earth-pit and brick graves (M1-9, M11-M15; no further information); rectangular brick-construction, probably building of Tang date (no further information)

M10:
grave-mound: ext. measurements NS 21.8 m, EW 16.55 m, 20° slope; built against hill-slope of 40°; made of 22 layers of rammed earth each 0.2-0.25 m thick, rammed with round pestles of 20

cm diameter; probably using yellowish soil dug out to form grave-pit; in eastern part disturbed by rectangular brick-construction, possibly of Tang date; *stone-construction grave* in center; grave chamber 2.2 x 0.8 x 0.4 m, rectangular; *walls*: made of large, worked erected rectangular stone slates, regular; *cover* made of irregular small stone slabs; floor made of stone slates; *floor*: leveled with stone-slates; *filling*: in grave chamber yellow soil washed in from surrounding area; no human bones or objects

object deposit: on eastern side outside of the stone construction 9 ceramic vessels deposited; further SE within grave mound stone frame made of 11 slates (0.8 x 0.4 x 0.44 m), inside 4 ceramic vessels, 1 lying with small stone slate underneath

<u>Ceramics:</u> all low-burned reddish clay-pottery vessels, no spouts or handles

M10: 9 *guan* jars with wide-outward-flaring openings, flat bottoms or ring-foots, some with cut-out triangles, some with line-patter; 3 flat-bottomed *guan* jars with wide-outward-flaring openings and 1 high *ping* vase in stone-frame

<u>Suggested Date:</u> *M10:* Liu Hong 2009: early phase of megalithic graves (phase I according to Liu Hong 2009), i.e. end of Spring and Autumn to early Warring States; excavation report: Western Han to Jin, *M1-9 and M11-15:* Eastern Han to Jin

<u>Relative Chronology</u>: ≈ Dayangdui DM1

<u>Suggested Cultural affiliation</u>: Han, megalithic graves

Xichang Tuanbao 西昌市團堡 (XTU) [193]

<u>Type:</u> megalithic grave site

<u>Status</u>: surveyed

<u>Reliability Index</u>: 1.5

<u>Location:</u> Ningle Village Group 4, Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉寧樂村四組

<u>Morphology</u>: first-level terrace, 1591 m asl

<u>Surface Area</u>: 120 m^2

<u>Natural and Man-Made Environment</u>: on western bank of Anning River, at 210 m of the river, severely disturbed

<u>Researchers:</u> Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

<u>Storage:</u> unknown

<u>Data Sources:</u> data collection 12/2010

<u>Features:</u> 6 megalithic graves, 0.3-0.5 m between the graves, **M5**: *orientation*: 135°, *construction*: 9.5 m long, severely disturbed, rectangular, 4 large stones as cover (1.2 x 0.7 m, 1.6 x 0.7 m, 2.7 x 1.2 m, 1.7 x 1.4 m), 15+ smaller stones for access ramp, rest of construction unclear, close to grave sand-tempered ceramic sherds; **M6:** East-West oriented, rectangular, 8 x 3 m extant, walls and cover made of large granite stone boulders, severely disturbed, 3+ large stone boulders as

cover, 2 stones preserved on western wall (2.5 x 1.5 m, 1.6 x 0.4 m), 4 stones preserved on eastern wall (0.4 x 0.3 m, 0.8 x 0.4 m, 0.7 x 0.6 m)

Suggested Date: Warring States to Western Han

Xichang Tuanshanbao 西昌市團山包 (XTB) [194]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉

Morphology: on mountain slope, 1595 m asl

Surface Area: 3000 m^2

Natural and Man-Made Environment: on eastern bank of Anning River, north of Heishui River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, Liu Hong 2009

Site Description: 0.5-0.6 m cultural layers

Surface finds: low-burned red sand-tempered ceramic sherds, forms unclear, stone *fu* axes

Suggested Date: Neolithic

Xichang Tu'ershan 西昌市兔兒山 (XTE) [195]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Xijiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西郊鄉

Morphology: on mountain slope, 1594 m asl

Surface Area: 500 m^2

Natural and Man-Made Environment:

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009

Site Description: 0.2 m cultural layers

Suggested Date: Neolithic

Xichang Wanao 西昌市窪堖 (XWN) [196]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 5.5

Location: Wanao Village Group 4, Huangshui Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市黃水鄉窪堖村四組

Morphology: first-level terrace, 1538 m asl

Surface Area: 5000 m^2

Natural and Man-Made Environment: on eastern bank of the Anning River, 450 m from the river, 40 km north of Xichang city, leaning against Luoji mountain 螺髻山

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuansheng Wenwu Kaogu Yanjiuyuan 四川省文物考古研究院, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: discovered during survey in 1987, excavation in July to August 2004 in connection with the construction of Xi-Pan expressway 西攀高速公路

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a and 2006e, Zhongguo Wenwuju 2009, data collection 10/2010

Features: 5 megalithic graves, 25-160 m distance between them, M1-2 excavated

M1: *orientation*: 240°, *construction*: trapezoidal, *grave measurements*: outer measurements of 11.8 x 0.64-12 x 1.4-1.96 m encompassing grave chamber and access ramp, *grave chamber*: 8.4 x 0.6-1.1 x 1.8 m, *walls*: 9 erected rectangular stones smoothed on the inside, stabilized by piled up irregular stones on both sides, placed at distance of 1.4-1.7 m, space filled with large number of small irregular stones, rear wall of one large boulder (1.24-1.4 m); *cover*: 13 large stones of 2.2-1.3 x 1.3-0.7 x 0.9-0.4 m, smooth but not visibly worked; *floor*: 5 groups of stone slates, between them 1.5 m distance, ground leveled,

access ramp: 3.4 x 0.64-0.72 m, walls made of long-rectangular stone slates; *tumulus*: 25 x 12.6 x 2.9 m, wider in the northern than in the southern part, long-narrow trapezoidal shape, made of small stones and yellow-grayish clay-soil, higher in the north than in the south, creating a slope continued by a *tail* sloping up the hill; *outside installations*: about 2 m from the northern end 1 large rectangular stone of about 1.2 m height, on both the northern and the southern side of the tumulus rows of doorway-like outward-opening rows of stones, on the East and West large stones of 0.8-1.5 m height providing a frame to the grave, in front of the door irregular stones measuring 0.5-0.3 x 0.3-0.15 x 0.2-0.15 m piled up;

content: 7 layers, **layer 1** loose black-grey clay-loam, carbonized wood and grass, 0.2-0.46 m, 1.44-1.58 below the ceiling, **layer 2:** loose yellow-grey clay-loam, 0-0.54 m, no cultural remains, **layer 3:** loose yellow-grey clay-loam, relatively firmly packed, 0.06-0.58 m, **layer 4:** dense grey-brown clay-loam, few ceramic sherds, mainly towards the rear, 0-0.22 m thick; **layer 5:** firm brown clay-loam, some red-baked earth and bone fragments, 0.32-0.56 m, **layer 6:** loose brown clay-loam, some bones and ceramic fragments, 0.06-0.5 m, **layer 7:** firm grey clay-loam, 0.06-0.1 m; human bones severely fragmented, original number unclear

objects: close to the collapsed door iron knife, scattered ceramic sherds and a large amount of bone fragments; outside the grave chamber in front of the large stones on the south side heap of four layers two of which contained a considerable amount of ceramic objects and sherds; original number of objects unclear, 70 ceramic vessels, 1 oblong stone-tool, 1 bronze button-shaped ornament, 2 iron knives

M2: *orientation*: 255°, *construction*: rectangular; *grave chamber*: 6.6 x 1.5 x 1.758 m; *walls*: made of 18 erected rectangular stone boulders smoothed on the inside, stabilized by piled up irregular stones on both sides, largest stone 1.9 x 1.2 x 0.6, smallest 1 x 0.65 x 0.5 m; *cover*: 7 large irregular stone boulders of max. 2.6 x 1.8 x 0.5 m;

access ramp: 2.4 x 1.5 m, largely destroyed; *tail*: sloping up the hill; *outside installations*: large stone slabs on both sides of the entrance, building a *ba*-shaped doorway; many other stones at different locations outside the grave door, largest 0.5 x 0.3 x 0.2 m, smallest 0.3 x 0.15 m

content: no human bones in grave, a few scattered on access ramp; 5 layers; **layer 1:** loose grey-black clay-soil, some ash, ceramics, 0.06-0.3 m; **layer 2:** brown-black clay with some sand, some ash, 0-0.18 m thick; **layer 3**: yellow-brown sandy soil, ground stone tools, 0.74 m; **layer 4:** dense grey-brown clay-loam, burned wood fragments, bronze slag, ceramics, many stones, 0.4-0.6 m; **layer 5:** loose grey-brown soil, human bones, bone beads, earrings, triangular bone ornaments, turquoise beads, 0.12-0.34 m

objects: all objects heavily fragmented, ascription of types questionable, 17 ceramic vessels, 1 oblong stone-tool, 32 bone beads, 2 agate beads, bronze slag

M3: East-West oriented, tumulus well-preserved, form and measurements of grave chamber unclear, tail sloping up the hill, 1 large stone boulder visible on it, tumulus: 25 x 9.6 x 2.8 m

M4: North-South oriented, rectangular, sides and cover made of large stone boulders, significantly disturbed, extant measurements 4.1 x 3.2 x 1.5 m

M5: *orientation*: 290°, *construction*: rectangular, sides and cover made of large stone boulders, 7.8 x 4.2 x 1.5 m

<u>Ceramic Objects:</u> severely fragmented, red-brown, grey-brown, and yellow sand-tempered ceramics, coil-built, mainly undecorated, only a few with leaf-impressed decoration on the bottom or S-pattern on the sides; *M1*: 26 *guan* beaker, 33 flat bottoms, 1 pointed bottom, 1 pedestal base; *M2:* 16 *guan* beaker, 1 *bei* cup (all layer 4)

<u>Bronze Objects:</u> *M1*: 1 button ornament; *M2:* bronze slag from layer 4

<u>Iron Objects:</u> *M1*: 2 *dao* knives

<u>Stone Objects:</u> *M1*: 1 oblong stone-tool, *M2*: 1 oblong stone-tool (layer 3), 2 agate beads (layer 5)

<u>Other Objects:</u> *M2:* 32 bone beads, 1 bone earring (all layer 5)

Suggested Date: Warring States to Western Han

Xichang Wuguishan 西昌市烏龜山 (XNG) [197]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 300 m NE of Jianxing Village, Daxing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市大興鄉建興村

Morphology: in valley between mountains, 2172 m asl

Surface Area: 50 m^2

Natural and Man-Made Environment: east of the Anning River, relatively close to small tributary, on slope of Wugui mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 4 megalithic graves, orientation largely unclear, sides and cover made of several large stone boulders, **M1**: 3.5 x 1.05 m; **M2:** 3.5 x 1.05 **M3**: *orientation*: 180°, 6.35 x 1.05 m; **M4:** severely disturbed, measurements unclear

Suggested Date: Warring States to Western Han

Xichang Xiaohuashan 西昌市小華山 (XXH) [198]

Type: settlement site, megalithic grave site

Status: partially excavated

Reliability Index: 4

Location: 1 km east of Jiaojiabao Village Group 2, Chuanxing Town, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市川興鎮焦家堡村二組

Morphology: on mountain slope, 1659 m asl

Surface Area: 3600 m^2 (EW 40 m, NS 90 m)

Natural and Man-Made Environment: 13 km east of Xichang, 1.5 km west of Chuanxing Town, on SW slope of Xiaohuashan 小華山, close to Qionghai, very close to Henglanshan

State: disturbed

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: 1 grave each excavated at Beishan, Xiaohuashan, and Huangshuitang from 09/1985 to 03/1986

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1990, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Site Description: 0.8-1 m of cultural layers, charcoal and red-baked earth inside

Internal Chronology: megalithic graves overlaying settlement layers

Features: 2 megalithic graves

M1: *orientation*: 285°, *form*: long-rectangular, *measurements*: 7.3 x 1.3-1.4 x 2 m, *floor*: stone labs, *installations*: several large stone slabs for walls, cover, and floor, *content*: 2 stone knives, 1 agate bead, 36 bronze objects (4 weapons/tools, 7 pieces of armor, 25 personal ornaments), 1 iron *xiao* knife, 1 ceramic cup

M2: orientation and measurements unclear, 2 stones of cover left

Ceramic Objects: *M1:* 1 *bei* cup; *surface finds:* low-burned red and yellow sand-tempered ceramic sherds, some decorated with application bands and line incision

Metal Objects: *M1:* 36 bronze objects: 1 *dao* knife, 1 *lian* sickle, 1 *fu* axe, 2 *zu* arrowheads, 6 hairpins, 4 *huan* bracelets, 1 button-ornament, 7 pieces of armor, 12 perforated cones, 2 wheel-shaped objects; 1 iron *xiao* knife

Stone Objects: *M1:* 2 perforated stone *dao* knives, 1 agate bead; *surface finds:* stone *fu* axes

Suggested Date: settlement Neolithic, grave Warring States to Western Han

Xichang Xijiao Gongshe (Xijiao Number 1) 西昌市西郊公社（西郊一號墓）(XXJ) [199]

Type: megalithic grave site

Status: excavated

Reliability Index: 6.5

Location: Nantan Village Group 6, Xijiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西郊鄉南壇村六組

Morphology: in valley of Qionghai Lake 邛海, 1529 m asl

Natural and Man-Made Environment: 50 m north of Xichang - Zhaojue public road, 4 km south of Qionghai Lake, leaning against foot of Jiangpo Mountain 姜坡山, facing Dong River 東河, ground only mildly sloped, nearly level

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Xichang Diqu 1978d, Liangshan Yizu 1983b, Sichuansheng, Liangshan, and Xichangshi 2006a, data collection 10/2010

Features: 3 megalithic grave, information only on 1 grave

M1: *orientation*: 240°, *construction*: long-rectangular, 11.1 x 1.5 x 1.9 m, *walls*: made of large regular stone slabs spaced at 2-3 m distance, space filled with smaller irregular cobbles, all on fundament of horizontally places square smaller slabs; *floor*: made of rammed earth of 0.2 m height, covering floor of both grave and access ramp; *cover*: 3 large stone boulders; *door*: on short side;

access ramp: disturbed, ext. length 3.6 x 0.2-0.7 x 1.3 m; *tumulus*: largely destroyed, original diameter about 20 m (extant EW extension 19.5 m, extant NS extension 14.5 m); made from soil and stone cobbles, originally probably stone mound of 6 m diameter; on it soil layer of 0.7 m; ext. height 1.7 m; *outside installations:* on each side one large rectangular regular stone slab erected;

content: objects and bones staggered in 12 layers of 1.7, 1.6, 1.5, 1.3, 1.2, 1.1, 1, 0.9, 0.7, 0.6, 0.5 and 0.3 m;

burial mode: bones of at least 123 individuals (all ages, both sexes, possibly primary interments) piled up with the burial goods and some of them covered by part of stone construction; pile highest (0.6 m) between grave chamber and access ramp; in western part about 1.5 m above the floor remains of cremated body, in several places carbonized bones and objects, traces of ash;

objects: 230 objects, 199 listed in detail, mainly personal ornaments still in original position, ceramics and weapons along-side objects

Ceramic Objects: 14 objects: 6 single- and 1 double-handled *guan* beaker, 5 spouted *hu* pots, 2 spindle whorls

Bronze Objects: 131 objects: 2 arrowheads, 1 *mao* spearhead, 1 weapon handle, 3 bells, 12 *zhuo* and 2 *huan* bracelets, 14 button ornaments, 18 round-headed ornaments, 11 hair pins, 1 hair need, 1 gilded belt hook in tiger-head shape, 11 needles, 31 cones, 12 circular ornaments, 11 other ornaments

Stone Objects: 7 objects: 2 *dao* knives, 4 agate and 1 turquoise bead

Other: 28 objects: 1 iron spade, 2 pieces of gold foil, 25 frit (sintered glass) beads

Bone Objects: 19 objects: 10 *jue* and 7 *huan* rings, 1 half-ring

Internal Chronology: 12 layers (long usage period)

Suggested Relative Chronology: ≈ Xide Lake Gongshe

Suggested Date: late Warring States to Western Han

Xichang Xiaojia Gaokan 西昌市肖傢高坎 (XXG) [200]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 1 km north of Ziku Village, Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彜族自治州西昌市樟木箐鄉字庫村

Morphology: first-level terrace, level, 1555 m asl

Surface Area: 4800 m^2

Natural and Man-Made Environment: on the western bank of Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhonggguo Wenwuju 2009

Site Description: 0.6-0.8 m of cultural layers, some red baked earth and charcoal inside

Surface finds: mostly brown and some black sand-tempered ceramic sherds, some stone tools

Suggested Date: Warring States or Neolithic

Xichang Xingsuo 西昌市星宿 (XXS) [201]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: Xingsuo Village Group 5, Yulong Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市裕隆鄉星縮村五組

Morphology: second-level terrace, sloped, 1723 m asl

Natural and Man-Made Environment: west of the Anning River, 500 m NE of the market square, at 4 km distance to the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 2 megalithic graves, severely disturbed, orientation and measurements unclear, rectangular, sides made of small stone cobbles, cover made of large stone boulders

Suggested Date: Warring States to Western Han

Xichang Xinxingcun 西昌市新興村 (XXC) [202]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 50 m south of Xinxing Village, Yuehua Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市月華鄉新興村

Morphology: second-level terrace, level, 1574 m asl

Surface Area: 700 m^2

Natural and Man-Made Environment: on western bank of the Anning River, very close to river, on level ground

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 6 megalithic graves, oval tumuli partially preserved, graves 13-17 x 3.5-5 x 1.4-2.5 m in measurements; **M1**: oriented towards the East, multiple secondary burials, 100+ skeletons, bronze knives, halberds, arrowheads, bracelets, ceramics, and stone spindle whorls

Ceramic Objects: *M1:* unclear number of ceramic vessels

Bronze Objects: *M1:* unclear number of *dao* knives, *mao* halberds, arrowheads, *zhuo* bracelets

Stone Objects: *M1*: unclear number of spindle whorls

Suggested Date: Warring States to Western Han

Xichang Xinying 西昌市新營 (XXY) [203]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 50 m NE of Xinying Village Group 6, Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西溪鄉新營村六組

Morphology: in valley between mountains, 1557 m asl

Surface Area: 150 m^2

Natural and Man-Made Environment: on southern bank of Xixi River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 2 megalithic graves, 100 m between them, both oriented towards the North, tumuli largely destroyed, cover and sides made of large stone boulders; **M1**: 13.2 x 1.7 x 2 m, cover made of 4 stone boulders of max. 2.9 x 1.2 x 0.5 m; **M2**: 11 x 5 x 2.6 m, 1 large boulder of the stone cover extant

Suggested Date: Warring States to Western Han

Xichang Xixicun 西昌市西溪村 (XXX) [204]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 50 m NE of Xinying Village Group 6, Xixi Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西溪鄉西溪村三組

Morphology: in valley between mountains, 1577 m asl

Natural and Man-Made Environment: in river delta of Xixi River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 1 megalithic grave, North-South oriented, 21 x 10.8 m, rectangular, sides and cover made of large stone boulders

Suggested Date: Warring States to Western Han

Xichang Yangjiashan 西昌市楊傢山 (XYG) [205]

Type: settlement site, earth-pit grave site, cremation burial site

Status: partially excavated

Reliability Index: 3.5

Location: Xijiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木鄉西郊鄉

Morphology: on mountain slope, 1789 m asl

Surface Area: 2000 m^2

Natural and Man-Made Environment: 4 km south of Xichang, leaning against the northern slope of Yangjiashan 楊傢山, originally probably facing the water of Qionghai lake (0.5 km NW of Qionghai, whose water level has sunken significantly within the last 60 years, now 20 m above water level)

State: heavily disturbed, found by peasants

Researchers: Lizhou Bowuguan 禮州博物館

Research: September 1978 pottery discovered by workers, subsequently surveyed

Storage: unknown

Data Sources: Liu Shixu 1981, Liangshan Yizu 1987a, Zhongguo Wenwuju 2009

Internal Chronology: Song graves overlaying and cutting into settlement layers

Description Layers: site largely destroyed, original layering only visible from a small patch of undisturbed land

Layer 1: grey-brown agricultural layer, 0.2-0.5 m thick, modern buildings

Layer 2: red-brown earth, 0.4-0.9 m, red-burned earth, some charcoal, burned wood remains, ash, all stone tools from this layers, moderate number of red clay ceramic sherds, burning temperature low, disturbed by Western Han graves

Layer 3: reddish brown earth, 1.3-1.5 m thick, much red-burned earth and hard grey-brown pieces of earth, many low-burned ceramic sherds, forms largely unclear

Below layer 3: virgin soil

Features: 3+ earth-pit graves (1 in layer 2, 1 in layer 1, location of third not reported), 9 Song dynasty cremation burials (not treated here)

Ceramics: mainly of brown and some grey clay or sand-tempered pottery, some worked on a wheel, some incised horizontal and traversal lines some corded ware, net and point pattern

Surface collection: 4 coarse ceramic vessels (3 *guan* beaker, 1 *ping* vase)

M1: 5 ceramic vessels, high-burned hand- or coil-built fine ware, some incised decoration (2 *guan* beakers, 2 high-necked oval-bodied *hu* pitchers, 1 straight-walled bowl / cup)

M3: 4 *guan* beaker, coarser low-burned hand- or coil-built fine ware, some incised or grooved decoration

Stone Tools:

Surface collection: polished stone tools, 1 perforated *dao* knife, 1 *fu* axe, 1 *zao* chisel, 3 middle-perforated hammers

Suggested Date: late Neolithic to Western Han

Relative Chronology: Henglanshan > middle Lizhou > Yangjiashan > Miyi Wanqiu, Yangjiashan ≈ Mimilang

Xichang Yanjiashan 西昌市燕家山 (XYJ) [206]

Type: megalithic grave site

Status: excavated

Reliability Index: 5

Location: Chang'an Village Group 1, Xijiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西郊鄉長安村一組

Morphology: on level ground, 1533 m asl

Natural and Man-Made Environment: on slope of Yanjia Mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1983a, Sichuansheng, Liangshan, and Xichangshi 2006a, data collection 10/2010

Features: 3 megalithic graves, rectangular, cover and sides made of large stone boulders, floor of surface soil, no human bones; **M1**: *orientation*: 125°, *construction*: 4.25 x 1.1 x 1.1 m, 1 *guan* beaker, 3 spindle whorls, 1 stone arrowhead, 1 hair pin; **M2**: *orientation*: 213°, *construction*: 5 x 1.27 x 1.15 m, 3 ceramic decorative items, 3 handles, 1 pot, 1 bottom, 7 spindle whorls, 2 stone arrowheads, 1 adze; **M3**: *orientation*: 190°, *construction*: 3.25 x 1 x 1.25 m, 1 *gu* vessel, 2 spindle whorls, 1 stone arrowhead

Ceramic Objects: *M1*: 1 *guan* beaker, 3 spindle whorls; *M2*: 1 ram's-head and 2 drop-shaped decorative items, 3 handles, 1 *hu* pot, 1 vessel bottom 7 spindle whorls; *M3*: 1 *gu* vessel, 2 spindle whorls

Stone Objects: *M1*: 1 arrowhead, 1 hair pin; *M2*: 2 arrowheads, 1 *ben* adze; *M3*: 1 arrowhead

Suggested Date: Warring States to Western Han

Xichang Yangshanpo 西昌市羊山坡 (XYS) [207]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉

Morphology: on alluvial fan, 1536 m asl

Surface Area: 3000 m^2

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009

Site Description: 0.6 m cultural layers

Suggested Date: Neolithic

Xichang Yezhugou 西昌市野豬溝 (XYZ) [208]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: Lijiagou Village Group 3, Zhangmu Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木鄉李家狗村三組

Morphology: second-level terrace, sloped, 1772 m asl

Natural and Man-Made Environment: leaning against the mountain, facing the river, on the Western bank of Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 4 megalithic graves, East-West oriented, rectangular, cover and sides made of large stone boulders; **M1**: 5 x 2 x 1 m, 5 stones for cover; **M2**: 7.3 x 3.6 x 1.4 m, 2 stones for cover; **M3**: 6.7 (ext.) x 2.2 m, 4 stone boulders as cover; **M4:** 4.8 x 4.3 x 1.2, tumulus largely preserved, inner construction therefore unclear

Suggested Date: Warring States to Western Han

Xichang Yingpanshan 西昌營盤山 (XYP) [209]

Type: settlement site, ash pits, earth-pit graves, object pits

Status: surveyed, partially excavated

Reliability Index: 4.5

Location: Yingpanshan, Maliu Village Group 2, Zhangmuqiang Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉麻柳村2祖營盤山遺址; 38 km NW of Xichang city, 7 km from administrative center of Zhangmuqiang Township, on hill slope of Yingpanshan

Morphology: second-level terrace, sloped, 1547 m asl

Surface Area: 2000 m^2, only 500 m^2 well preserved

Natural and Man-Made Environment: on western bank of Anning River, on slope, therefore cultural layers also sloped; now planting of corn, pumpkin, and pine trees

State: badly disturbed by street built in 1975; sherds badly fragmented

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Research: Survey and small-scale excavation in October 2005; 3 pits of 5 x 5 m (T1-3), 1 trench of 15 x 2.5 x 15 m (T4), overall 82.5 m^2

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Chengdu, Liangshan, and Xichangshi 2007, data collection 11/2010

Site Description: West high, East low

Internal Chronology: layer 6 > layer 5 > W12 > W2-11, W13, M1-2 > layer 4 > W1 > H1-2 > layer 3

Description Layers (2005 excavation, northern wall of T3):

Layer 1: sloped, 0.05-0.15 m, soft grey-brown agricultural soil, many roots, modern trash
Layer 2: sloped, all throughout the site, 0.3-0.35 m, dense red-brown sandy soil, red baked earth pallets, charcoal fragments, broken stone tools, large number of blue-white porcelain sherds
Layer 3: sloped, in T4 H1-2, M1-2, W1 starting from here, cutting into virgin soil, 0.35-0.45 m, loose grey-brown sandy soil, burned remains of burned grass and wood, charcoal fragments, small number of sand-tempered pottery sherds, blue-green tiles, some white porcelain

Layer 4: thin in the West, thick in the east, not in T4, in T2-3 W2-13 starting from here, cutting into layer 5, 0.5-0.8cm, loose black-grey loam, many red baked earth pellets, small amount of sand-tempered pottery sherds, blue-grey tiles, brown glazed porcelain sherds
Layer 5: high in the west, shallow in the east, not in T4, severely disturbed by urn graves under layer 4, 0.2-0.3 m, dense red-brown loam, many red baked earth pellets, small amount of sand-tempered ceramic sherds, some stone tools
Layer 6: high in the west, shallow in the east, loose grey sandy soil, 0.25 m, many red baked earth pellets and ash, many sand-tempered ceramic sherds, few stone tools
below layer 6: yellow-brown virgin soil

Features: 13 urn pits, 2 earth-pit graves and 2 ash pits

W12: below layer 5, cutting layer 4, next to W7; NW oriented, oval, regular; rim diameter 0.62-0.64 m, depth 0.18-0.2 m, bottom diameter 0.58 m, soft loose grey-brown sandy soil; horizontally placed *guan* jar, net weight inside

W2: below layer 4, cutting layer 5; disturbed by W1; NE oriented, oval, regular, rim diameter 1.3-1.62 m, 0.1-0.24 m deep, bottom diameter 0.4 m, soft black-grey sandy soil, red-burned earth pellets; 2 *guan* jars horizontally placed

W3: below layer 4, cutting layer 5, next to W6; SW oriented, irregular form roughly following the form of the urn; rim diameter 0.58-0.7 m, extant depth 0.12-0.3 m, bottom diameter 0.2 m, soft black-grey sandy soil; 1 *guan* jar horizontally placed

W4: below layer 4, cutting layer 5, next to W10; rim diameter 0.55-0.56 m, soft grey-brown sandy soil, 1 *guan* jar horizontally placed

W5: below layer 4, cutting layer 5, right next to W8 and W11; SE oriented, disturbed, roughly oval, rim diameter 0.52-0.7 m, ext. depth 0.3 m, bottom diameter 0.24 m, dense black-grey clay-loam, red-burned earth pellets and ash inside; 1 *guan* jar, 1 high ring-foot, horizontally placed

W6: below layer 4, cutting layer 5, next to W3 and W2; SE oriented, oval shape, rim diameter 0.68-0.88 m, depth 0.1-0.3 m, bottom diameter 0.5 m, soft grey-black sandy soil; 1 *guan* jar and 1 handled *guan* beaker, horizontally placed

W7: below layer 4, cutting layer 5, next to W4 and W12, disturbed; NE oriented; oval; rim diameter 0.8-0.9 m, extant depth 0.16-0.2 m, bottom diameter 0.64 m, soft grey-brown sandy soil; 2 *guan* jars, placed horizontally

W8: below layer 4, cutting layer 5, next to W5, N oriented, rim diameter 0.7-0.9 m, depth 0.18-0.24 m, bottom diameter 0.7 m, dense black-grey clay-loam, many red-burned earth pellets and ash inside, 2 *guan* jars horizontally placed inside

W9: below layer 4, cutting layer 5, next to W4 and W13, SE oriented, oval, rim diameter 0.76-0.82 m, bottom diameter 0.42 m, filling of black-grey sandy soil, many red-burned earth pellets and ash inside, 1 *guan* jar horizontally placed

W10: below layer 4, cutting layer 5, next to W4 and W13, badly disturbed, orientation unclear, oval, soft black-grey sandy soil, rim diameter 0.56-0.62 m, depth 0.2-0.32 m, bottom diameter 0.46 m, 1 *guan* jar placed horizontally, encircled on one side by three stone slabs

W11: below layer 4, cutting layer 5, next to W5 and W13, NE oriented, oval, rim diameter 0.64-0.78 m, depth 0.28-0.34 m, bottom diameter 0.52 m, dense grey-brown clay-loam, red-burned earth pellets and ash inside, 3 *guan* jars, 1 high ring-foot, horizontally placed

W13: below layer 4, cutting layer 5, next to W10 and W9, NW oriented, oval, rim diameter 0.72-0.76 m, depth 0.1-0.3 m, bottom diameter 0.4 m, soft-loose grey-brown sandy soil, 5 ceramic vessels horizontally placed, 1 *guan* jar placed above another *guan* jar, 1 lid, 1 *wan* bowl

W1: below layer 3, cuts pit H2, NW oriented, round, flat bottom, rim length 1.25 m, 0.7 m rim width, depth 0.15-0.2 m, bottom length 1.25 m, bottom width 0.65 m, soft brown clay soil, 1 *guan* jar

M1: below layer 3, cuts virgin soil, south of M2, NW of H2, rectangular with rounded corners, deep in the West, more shallow in the east, EW orientation, length 1.92, width 0.9 m, depth 0.53-0.72 m, brown-mottled earth, red-burned pellets, charcoal, no bones 3 ceramic vessels and 2 stone tools in hip area

M2: below layer 3, cuts virgin soil, north of M1, SE of W1, rectangular, flat bottom, no bones, EW orientation, length 2.14 m, width 0.94, depth 0.36-0.4, brown-mottled earth, red-burned pellets, charcoal, no bones, 1 *guan* jar, badly broken

H1: south of H2, below layer 3, cuts virgin soil, cut by southern rim of excavation pit, thus only partially excavated, excavated rim diameter 0.6-3.4, depth 0.1-0.4, bottom diameter 1.6, curved bottom and sides; soft grey-black sandy soil, burned fragments of grass and wood, blue-green tile fragments with rhombus-shaped pattern, small number of sand-tempered ceramic sherds

H2: north of H1, below layer 3, cuts virgin soil, cut by northern rim of excavation pit, thus only partially excavated, excavated rim diameter 1.5, depth 0.2-0.3, bottom diameter 1.2, soft yellow-brown sandy soil, red-burned earth pellets, sand-tempered ceramic sherds, blue-green tile fragments with rhombus-shaped pattern

<u>Ceramics:</u>

Layer 6: 50 % grey-brown, 29 % grey, and 21 % red-brown sand-tempered pottery, hand-thrown, mainly coil-built, some smoothing with slow wheel, burning temperature not well controlled, mottled surface, 98 % undecorated, mainly application bands below the rim with fingertip-impressed pattern, different kinds of incised and impressed patterns on the neck and body (awl pattern, corded ware, line pattern); badly fragmented, 4 *guan* jars with dish-shaped opening, long neck, and application band below the rim with fingertip-impressed pattern, 2 *guan* jars with high neck and trumpet-shaped opening, 8 *guan* jars with short constricted neck and short, sharply outward turning rim, with water-ripple or corded ware pattern

Layer 5: 47.6 % grey-brown, 39.3 % grey, and 10.7 % red-brown sand-tempered, and 2.4 % grey fine ware sherds; hand-thrown, mainly coil-building techniques, some smoothing with slow wheel; 94.6 % undecorated, most often corded ware, mainly application bands below the rim with fingertip-impressed pattern, line pattern, point pattern; badly fragmented; 7-8 *guan* jars, one nearly plate-shaped mouth, the other lavish opening and long neck, two with application bands below the rim with fingertip-impressed pattern; 2 *pen* basins, 2 *bo* bowls, 1 flat bottom

W12: 1 *guan* jar

W2: 2 *guan* jars

W3: 1 *guan* jar

W4: 1 *guan* jar

W5: 1 *guan* jar, 1 high ring-foot

W6: 1 *guan* jar and 1 handled *guan* beaker

W7: 2 *guan* jars

W8: 2 *guan* jars

W9: 1 *guan* jar

W10: 1 *guan* jar

W11: 3 *guan* jars, 1 high ring-foot

W13: 2 *guan* jars, 1 lid, 1 *wan* bowl

W1: 1 *guan* jar

M1: 2 *guan* jars, 1 stemmed *dou* bowl

M2: 1 *guan* jar

H1: 1 trumpet-shaped *guan* jar, 1 *bo* bowl with deep body and fine corded-ware design

Stone Tools:

Layer 6: 1 long-oval pestle, 1 roundish-flat handstone

Layer 5: 1 long-oval double-perforated *dao* knife, 4 kidney-shaped net-sinkers

W12: 1 kidney-shaped net-weight

W 10: 3 roughly rectangular stone slabs

M1: 1 polished broken *fu* axe, 1 flat oval stone (knife?)

Suggested Date: *early* (layer 6): 4000 BC, *middle* (layer 5): Western Han, *late* (layer 4): Western to Eastern Han; layer 3: Song; layer 2: Ming-Qing

Relative Chronology: layer 6 = early Henglanshan, Qimugou layer 5, early Ma'anshan

Cultural affiliation: layer 6 early Henglanshan culture, later Han influence

Xichang Yuanjiashan 西昌市袁家山 (XYU) [210]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 5.5

Location: 20 m south of Yuanjiashan Village Group 4, Xiaomiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市小廟鄉袁傢山村四組

Morphology: on low mountain-top, level, 1509 m asl

Surface Area: 320 m^2

Natural and Man-Made Environment: on eastern bank of Anning River, on level ground, on top of Yuanjia Mountain, 1 km west of Xichang

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1983a, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009, data collection 10/2010

Features: 3 megalithic graves, 1 excavated, 30 m between the graves, rectangular, sides and cover made of large stone boulders, **M1:** *orientation*: 255°, *construction*: floor made of evened-out loess; *content*: no bones, 2 ceramic vessels, 2 spindle whorls, 1 arrowhead; **M2:** 4.5 x 1.5 x 1.25 m; **M3**: *orientation*: 25°, *construction*: 20 x 16 m

Ceramic Object: 1 *guan* jar, 1 flat bottom, 2 spindle whorls

Stone Objects: *M1*: 1 arrowhead

Suggested Date: Warring States to Western Han

Xichang Yunduanshan 西昌市云斷山 (XYD) [211]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2.5

Location: 1 km West of Tianba Village, Lizhou Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市禮州鎮田埧村

Morphology: first-level terrace, level, 1541 m asl

Surface Area: 30 m^2

Natural and Man-Made Environment: on eastern bank of Anning River, on level ground, close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oval tumulus, 20 x 11.5 x 2.8 m, large stone boulders of cover protruding at the surface, 2 x 2 x 0.6 m, orientation unclear

Suggested Date: Warring States to Western Han

Xichang Zengjiabao 西昌市曾傢堡 (XZJ) [212]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 500 m NW of Hongxing Village, Langhuan Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市琅環鄉紅星村

Morphology: first-level terrace, level, 1555 m asl

Surface Area: 10000 m^2 (EW 130 m, NW 80 m)

Natural and Man-Made Environment: on the western bank of the Anning River, 1 km east of the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 0.4-0.6 m of cultural layers

Surface collection: red sand-tempered ceramic sherds

Suggested Date: Neolithic

Xichang Zhenjiafen 西昌市鄭傢墳 (XZF) [213]

Type: megalithic grave site

Status: surveyed

Reliability Index: 3

Location: 200 m NW of Zhangou Village, Youjun Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市佑君鎮站溝村

Morphology: first-level terrace, level, 1590 m asl

Surface Area: 30 m^2

Natural and Man-Made Environment: on western bank of Anning River, on side-arm, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 megalithic grave, oval tumulus largely preserved, inside construction therefore unclear, orientation unclear, 12.4 x 8.2 x 2 m

Suggested Date: Warring States to Western Han

Xichang Zhongguanpo 西昌市鉀官坡 (XZP) [214]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Xijiao Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市西郊鄉

Morphology: on mountain slope, 1592 m asl

Surface Area: 4000 m^2

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009, no details

Site Description: 0.9 m cultural layers

Suggested Date: Spring and Autumn

Xichang Zhongjia Shanzui 西昌市 鉀傢山嘴 (XZS) [215]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 1.3 km north of Maliu Village, Zhangmuqing Township, Xichang City, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州西昌市樟木箐鄉麻柳村

Morphology: on alluvial fan, 1554 m asl

Surface Area: 8000 m^2 (EW 80 m, NS 100 m)

Natural and Man-Made Environment: on the Western bank of Anning River

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: cultural layers 0.5 m thick

Surface collection: brown sand-tempered ceramic sherds, form unclear; stone *dao* knives and grinding slabs

Suggested Date: Neolithic or Warring States

1.10 Xide County 喜德縣

Xide Guluqiao 喜德縣軲轤橋 (XGQ) [216]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 4

Location: 162 m SW of Xingfu Village Group 3, Lake Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣拉克鄉幸福村三組

Morphology: in between mountains, 1820 m asl

Surface Area: 700 m^2

Natural and Man-Made Environment: on southern bank of Sunshui River 孫水河, 2 km West of Lake Sihe site

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: 3 graves discovered by peasants in 1981, subsequently surveyed, most disturbed grave excavated in April 1981

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1987b, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 6 rectangular graves, sides made of several large slates, cover made of large stone boulders

M1: *construction:* 65°, 7.4 x 0.9 x 1.7 m; floor paved with stone pebbles; originally with access ramp, but destroyed; in the area of the door lump of irregular stones of unclear function

content: 2 layers, both severely disturbed, 1. wash layer: 0.6 m thick; 2. bone layer of about 1.1 m, 3 sub-layers, bones piled up in no distinguishable order; 2.1: upper, bones here better preserved and more neatly piled; coins, gold plated objects and ring-headed iron knives from this layer; 2.2: wash layer of 5-10 cm; 2.3 only very few bones, not very well preserved; here hair ornaments, bracelets, bronze bells and the like

human bones: over 20 people

burial goods: large number of objects, only 78 listed by type

M2: N-S oriented, 10 x 3 x 1.5 m; **M3**: E-W oriented, 6 x 3 x 1.4 m; **M4**: E-W oriented, 5.5 x 3 x 1.5 m; **M5:** E-W oriented, 11 x 5 x 1.7 m; **M6:** E-W oriented, 8 x 3 x 1.2 m

Ceramic Objects: 4 single-handled *guan* beakers

Bronze Objects: 8 *zhuo* bracelets, 6 *huan* bracelets, 1 of them gilded, 15 small *huan* rings, 10 of them gilded, 1 *ling* bell, 4 gilded button ornaments, 7 buttons, 1 hair pin, 2 coins

Iron Objects: 4 *dao* and 3 *xiao* knives

Stone Objects: 1 staff-shaped object, 7 agate and 2 turquoise beads

Suggested Date: late Western Han

Xide Guoyuancun 喜德縣果園村 (XGY) [217]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: Guoyuan Village, Guangming Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣光明鎮果園村

Morphology: on alluvial plain, 1909 m asl

Surface Area: 650 m^2

Natural and Man-Made Environment: on eastern bank of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in March 1978

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: 2 graves made of large stone boulders

Surface Finds: bronze arrowheads, small knives, *zhuo* bracelets, *guan* bone beads

Suggested Date: Han

Xide Lake Sihe (Huoba / Gaza Hepushan) 喜德縣拉克公社四合 (火把 / 呷咱合普山) (XLK) [218]

Type: megalithic grave site

Status: excavated

Reliability Index: 4

Location: Sihe Village Group 2, Lake Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣拉克鄉四合村二組

Morphology: second-level terrace, on mountain slope, level, 1813 m asl

Surface Area: 2400 m^2

Natural and Man-Made Environment: on southern bank of the Sunshui River, 50 m above and 450 north of the river, dry-field farms; leaning against mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: from 11/10 to 12/25/1976 excavation of 5 better preserved tombs, M1, M5-8

Storage: unclear

Data Sources: Liangshan Yizu 1977a and 1978, Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 10 graves all oriented in roughly the same direction (20-25°), aligned in NW – SE oriented row along the river, M1-7 all relatively close to each other, only between M7 and M8 approximately 8 m distance; build of large natural boulders, large regularly worked stone slabs, and small irregular stones

M1: excavated *orientation*: 20°, door pointing to the NE; *construction*: 7.6 x 3.5 x 2.4 m, T-shaped, access ramp in the middle of NE long-side, closed with door of large number of small stones, access to grave chamber in 3 steps, ground lined with irregular stone slabs; walls made of large rectangular regularly worked stone plates, space between them filled with gravel, grave covered with 5 large stone boulders, whole grave covered with soil mound; *content*: bones of 10+ people, both sexes, all ages; 13 ceramic vessels, 4 bronze coins, 2 bronze hair pins, 1 stone arrowhead

M2: unexcavated *orientation*: 20°, *construction*: 4.9 x 2.4 x 1.2 m; walls made of large stone slates below and smaller stones above, cover made of large boulders, door made of smaller stone cobbles and boulder; no further outside installations

M3: unexcavated *orientation*: 20°, *construction*: 4.2 x 2.8 x 1.2 m; walls made of large stone slates below and smaller stones above, cover made of large boulders, door made of smaller stone cobbles and boulder; no further outside installations

M4: unexcavated *orientation*: 20°, *construction*: 5.8 x 3.4 x 1.2 m; walls made of large stone slates below and smaller stones above, cover made of large boulders, door made of smaller stone cobbles and boulder; no further outside installations

M5: excavated *orientation*: 20°; *construction*: 5.4 x 4 x 1.1 m, walls made of large stone slates below and smaller stones above, cover made of large boulders, door made of smaller stone cobbles and boulder; further stone fragments inside, some crushing bones and burial objects, maybe fragments of previous door pushed aside during reopening; *content*: bones of 10+ people, both sexes, all ages; 1 stone arrowhead

M6: excavated *orientation*: 20°; *construction*: 11 x 6 x 1.7 m, walls made of large stone slates below and smaller stones above, cover made of large boulders, door made of smaller stone cobbles and boulder; further stone fragments inside, some crushing bones and burial objects, maybe fragments of previous door pushed aside during reopening; *content*: bones of 10+ people, both sexes, all ages; 11 ceramic vessels, 1 bronze knife, 4 bronze ornaments, 1 iron and 1 bone *huan* ring, 1 bone needle

M7: excavated *orientation*: 20°, door pointing to the NE; *construction*: 7.2 x 3.3 x 1.4 m, T-shaped, access ramp in the middle of NE long-side, closed with door of large number of small stones, access to grave chamber in 3 steps, ground lined with irregular stone slabs; walls made of large rectangular regularly worked stone plates, space between them filled with gravel, grave covered with 5 large stone boulders, whole grave covered with soil mound; *content*: bones of 10+ people, both sexes, all ages, objects in between bones; 2 bronze *zhuo* bracelets, 1 bronze knife

M8: excavated *orientation*: 20°; *construction*: 6.8 x 1 x 2.2 m, long-rectangular, walls made of large stone slates below and smaller stones above, cover and door made of irregular cobbles and boulders, floor made of sand-gravel mixture, tumulus of 11.5 m diameter, disturbed access ramp, 4.7 m extant; *content*: bones of 10+ people, both sexes, all ages, objects in between bones; 16 ceramic vessels, 3 bronze *ling* bells, 8 bronze ornaments, 1 bronze seal, 1 bronze knife, 1 iron bracelet, 1 stone pendant, 1 nephrite and 1 bone ornament

M9: 20°; 5.3 x 2.3 x 1.3 m; **M10**: 20°; 5.2 x 3.5 x 1.7 m

Ceramic Objects: *M1*: 1 *hu* pitcher, 4 *fu* pots; *M6*: 2 spindle whorls, 2 double-handled *guan* beaker, 2 spouted *hu* pitcher, 2 *guan* beaker, 2 *bei* cups; *M8*: 1 spindle whorl, 1 double and 14 single-handled *guan* beaker; *unclear location*: 1 double-handled *guan* beaker

Bronze Objects: *M1*: 2 hair ornaments, 4 coins; *M6:* 1 *dao* knife, 1 tubular ornament, 1 button ornament, 1 cylindrical object, *M7*: 1 *dao* knife; 2 *huan* bracelets; *M8:* 2 *dao* knives, 1 hair ornament, 2 *huan* bracelets, 1 finger ring, 3 button ornaments, 1 cylindrical ornament, 1 seal, 3 *ling* bells, 1 coin; *unclear location*: 32 *huan* bracelets, 6 button ornaments, 2 finger rings, 17 hair ornaments, 54 conical ornaments

Iron Objects: *M6*: 1 *huan* bracelet, *M8*: 1 finger ring; *unclear location*: 10 *huan* bracelets

Stone Objects: *M1*: 1 arrowhead, *M5*: 1 arrowhead; *M8:* 1 *zao* chisel, 1 nephrite *guan* bead; *unclear location*: 7 arrowheads, 37 turquoise and 5 nephrite tubular-shaped beads

Bone Objects: *M5*: 1 arrowhead; *M6*: 1 *zhui* awl, 1 *huang* ring; *M8*: 1 earring; *unclear location*: 6 earrings, 120 bone beads

Internal Chronology: M5 and M6 > M8 > M1 and M7

Suggested Relative Date: ≈ Xichang Bahe Baozi

Suggested Date: late Spring and Autumn to late Western Han

Xide Lanfenba 喜德縣爛墳垻 (XLF) [219]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 300 m East of Xingfu Village, Lake Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣拉克鄉幸福村

Morphology: in between mountains, 1838 m asl

Surface Area: 50 m^2

Natural and Man-Made Environment: on western bank of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unclear

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: 3 graves, cover made of large stone boulders, walls of large slates, oriented towards the West, 15 m between them; **M1**: 3.5 x 2.5 x 1 m; **M2**: 6 x 5.5 x 1.5 m; **M3:** 7 x 3 x 1.5 m

Suggested Date: Han

Xide Laoniuchang 喜德縣老牛場 (XLN) [220]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 250 m NW of Xingfu Village, Lake Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣拉克鄉幸福村

Morphology: on mountain slope, 1877 m asl

Natural and Man-Made Environment: on western bank of the river, close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: 1 grave, walls of large stones, large boulder as cover, measurements: 4.2 x 2.5 x 1.3 m, oriented towards the North

Suggested Date: Han

Xide Qingli 喜德縣清理 (XQL) [221]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1.5

Location: Lake Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣拉克鄉

Morphology: in between mountains, level ground, 1796 m asl

Natural and Man-Made Environment: on western bank of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unclear

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

Features: unclear number of graves built of large stone boulders and slates

Suggested Date: Han

Xide Wadegu (previously called Sihe Site) 喜德縣瓦得姑（原為四合遺址） (XWD) [222]

Type: settlement site, stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: Wadegu, 320 m NW of Sihe Village, Lake Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣拉克鄉四合村

Morphology: on terrace, level, very close to river, 1809 m asl

Surface Area: 25000 m^2

Natural and Man-Made Environment: on the southern bank of the Sunshui River 孫水河, which is a small tributary of the Jinshajiang, 5 km from Sihe Village

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in the Spring of 1965

Storage: unclear

Data Sources: Wang Hengjie 1979, Zhongguo Wenwuju 2009

State: disturbed at time of survey, now largely destroyed

Site Description: cultural layers 1-2.5 m below the surface, 0.1-0.25 m thick

Features: 5 stone-construction graves aligned in irregular row from NW to SE, made of natural stone slabs

M1: disturbed, long-rectangular, 7 x 1.5 x 1 m

M2: 30 m from M1, disturbed, large number of ceramic sherds

M3: 10 m from M2, protruding at the surface, about 2.5 m high

M4 and M5: 35 m from M3, disturbed

H1: 5 m from M4, ash pit with red-burned earth and ash and many ceramic sherds inside

Ceramics: red and black sand-tempered ceramic sherd, large *guan* jars, some with horn-shaped knobs at the shoulders, outward-flaring rims, *bo* bowls, largely undecorated

Stone Tools: large number of broken stone tools, large long-ovaloid or rectangular and small triangular *fu* axes, triangular *ben* adzes, 2 long-ovaloid or d-shaped perforated *dao* knives, 1 willow-leaf shaped *zu* arrowhead, 2 long-oval grinding rollers

Suggested Date: late Neolithic

Relative Chronology: Xide Wadegu ≈ Wamu

Xide Wamu 喜德縣瓦木 (XWM) [223]

Type: settlement site

Status: partially excavated

Reliability Index: 2

Location: 3 km SW of Guangming Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣光明鎮

Morphology: second-level terrace, 1830 m asl

Surface Area: 20000 m^2 (EW 100 m, NS 200 m)

Natural and Man-Made Environment: on the southern bank of the Sunshui River, south of Chengguan Township 城関鎮

State: disturbed at time of survey, now largely destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in the Spring of 1965

Storage: unclear

Data Sources: Wang Hengjie 1979, Zhongguo Wenwuju 2009

Site Description: cultural layers 1-2.5 m below the surface, 0.2-0.3 m thick, very few objects

Ceramics: few, badly fragmented, no forms recognizable, 1 sherd with net pattern

Stone Tools: 1 rectangular *fu* axe, 3 rectangular *ben* adzes, 1 long grinding roller with round cross-section

Suggested Date: late Neolithic

Relative Chronology: Xide Wadegu ≈ Wamu

Xide Wenjiaba 喜德縣溫傢壩 (XWJ) [224]

Type: megalithic grave site

Status: surveyed

Reliability Index: 2

Location: 150 m NE of Xingfu Village, Lake Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣拉克鄉幸福村

Morphology: in between mountains, level ground, 1860 m asl

Natural and Man-Made Environment: on eastern bank of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: 1 grave built of large stone slates for walls and large stone boulders as cover, measurements: 7 x 3 x 1.5 m

Suggested Date: Han

Xide Wuhe (also: Liangshan Megalithic Grave) 喜德縣伍合（涼山大是墓） (XWH) [225]

Type: settlement site, stone-construction grave site

Status: surveyed

Reliability Index: 2.5

Location: 200 m North of Wuhe Village Group 2, Mianshan Township, Xide County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州喜德縣冕山鎮伍合村二組

Morphology: on level ground in between mountains, 1750 m asl

Surface Area: 520 m^2

Natural and Man-Made Environment: on southern bank of Sunshui River 孫水河, in river-valley, on level ground, level ground

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in the Spring of 1965

Storage: unclear

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a, Zhongguo Wenwuju 2009

State: disturbed at time of survey, now largely destroyed

Site Description: graves densely distributed on narrow East-West running stretch of 6 km

Features: 14 rectangular graves, sides made of several large slates, cover made of large stone boulders

M1: 10°, 4.3 x 1.8 x 1.2 m; **M2**: 115°, 3.9 x 2.7 x 1.5 m; **M3**: 120°, 4.1 x 2.6 x 1.85 m; **M4**: 115°, 4.1 x 2.6 x 2.1 m; **M5:** 115°, 4.2 x 1.72 x 1.15 m; **M6:** 112°, 4.2 x 1.7 x 1.2 m; **M7:** 118°, 3.65 x 2.1 x 1.2 m; **M8**: 118°, 4.8 x 2.2 x 1.5 m; **M9:** N-S-oriented; 2.5 x 1.35 x 0.35; **M10 and M14**: N-S-oriented, measurements unclear; **M11-13:** E-W-oriented, measurements unclear

Suggested Date: Warring States to Western Han

1.11 Yanyuan County 鹽源縣

Yanyuan Bei Ganhaixiang 鹽源縣北干海乡 (YBG) [233]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 1.5

Location: Northern Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣北干海鄉

Morphology: on alluvial plain, 2386 m asl

Natural and Man-Made Environment: close to river, on flat ground

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed, no further information

Storage: unclear

Data Sources: Liangshan and Chengdu 2009

Features: unclear number of earth-pit graves, possibly with stone installations

Suggested Date: Warring States period to late Western Han or early Eastern Han

Yanyuan Boshucun 鹽源縣博樹村 (YBS) [234]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 1.5

Location: 1.5 km south of Boshu Village Luguhu Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣瀘沽湖鎮博樹鄉

Surface Area: 700 m^2

Morphology: on alluvial plain, 2704 m asl.

Natural and Man-Made Environment: on eastern rim of Luguhu, on flat ground

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed, objects from disturbed grave collected

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: number of earth-pit graves, 1 earth-pit grave (M1) protruding on the surface

Ceramics: 30+ double-handled *guan* beakers

Bronze objects: *M1:* 1 sword, 1 *mao* halberd, 1 *yue* axe, 1 *xiao* knife

Suggested Date: Warring States to Western Han

Yanyuan Caojiawan 鹽源縣曹傢灣 (YCJ) [235]

Type: earth-pit graves, some with stone cover, stone-construction graves

Status: unexcavated

Reliability Index: 2.5

Location: 1.5 km North of Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉

Morphology: on first-level terrace, level, 2355 m asl.

Surface Area: 3000 m^2

Natural and Man-Made Environment: close to river, on even ground

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Research: surveyed in September 1989, no further information

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009, Li and Liu 1992

Features: unclear number of earth-pit graves, NS-oriented, rectangular graves, 3-5.8 m long, 1.8-3.3 m wide, 07.-1 m deep, some covered with one large stone

M4: stone-slate grave, 3.56 x 1.5 x 1.57 m, worked slates of 1.15-0.95 x 0.48-0.52 x 0.2-0.22 m, already robbed

Ceramic objects: *guan* beaker with two large band-handles

Metal objects: bronze drums, three-pronged swords, wrist-guards, *ge* halberd, *xiao* and *dao* knives, some with arched backs, bracelets, *yue* axes, arrowheads, horse-gear, small ornaments, cones; composite-swords with iron blades and bronze handles, composite and iron *mao* spear-heads

M4: 8 bronze *wuzhu* coins, 1 iron *xiao* knife

Suggested Date: Warring States to late Western Han, probably rather Western Han

Yanyuan Ganhai Sandadui 鹽源縣干海三大隊 (YGH) [236]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Ganhai Sandadui Group 5, Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉干海三大隊 5 小隊

Morphology: on terrace, level, 2376 m asl

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: data collection 11/2010

Surface finds: 1 perforated *dao* knife, 1 kidney-shaped net weight

Yanyuan Gesa 鹽源縣格撒 (YGS) [237]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 2.5

Location: Gesa Village, 2 km West of Xiahai Village, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣瀘沽湖鎮下海鄉格薩村

Morphology: on alluvial plain, 2685 m asl.

Surface Area: 2000 m^2

Natural and Man-Made Environment: on eastern bank of Lugu Lake, on flat ground

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed, no further information

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009, Huang Chengzong 1983

Features: number of earth-pit graves

Ceramic objects: *surface finds: red* and black clay-ceramics with corded ware, net, line, and impressed patterns, 2 double-handled *guan* beaker of red clay ceramic

Bronze objects: 1 sword, 1 *mao* spear-head, 1 *qiao* scabbard, 1 sword-handle, 1 *yue* axe

Other: 2 gold decorative plaques

Suggested Date: Warring States to late Western Han

Relative Chronology: ≈ NW Yunnan and Sichuan Baoxing

Yanyuan Gong'anju 鹽源縣鹽源公安局 (YGJ) [238]

Type: confiscated by the police, objects from surface finds and objects taken from graves, mainly from grave-robbery; probably originally all from graves

Reliability Index: 1.5

Location: Yanyuan, some could also be from neighboring regions in Yunnan

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Storage: Yanyuanxian Wenhuaguan 鹽源縣文化館

Data Sources: Liangshan and Chengdu 2009, data collection 12/2011

Ceramic objects (80): 48 flat-bottomed and 24 ring-bottomed double-handled *guan* beaker, 2 single-handled *guan* beakers, 2 other *guan* beakers; 4 coarse small double-handled *guan* beaker

Metal objects: **Bronze (584)**: 54 swords, 52 *ge* halberds, 47 *yue* axes, 22 *mao* spear-head, 1 *dun* spear-handle, 16 *ren* and 37 *xiao* knives, 6 arm-guard plates, 46 arrowheads, 2 drums, 2 shield ornaments, 35 *ling* bells, 1 *zu* and 4 *an* stands, 4 staffs, 21 tree-shaped staff-heads, 9 horse bits, 2 pieces of halfter decoration, 11 rein guides, 1 mirror, 1 *mou* cap, 20 *fu* axes, 4 *zao* chisel, 3 belt hooks, 26 belt ornaments, 3 ox-horn shaped decorative elements, 1 head-ornament, 31 *zhuo* and 1 *huan* bracelet,16 pendants, 19 button-shaped ornaments, 9 finger-rings, 3 tiger-shaped, 1 human-shaped, 1 spiral-shaped, 20 chicken-shaped, 20 swallow-shaped, 2 double-bird shaped, 4 bird-shaped ornaments, 1 pen-shaped object, 4 tubular objects, 3 wheel-shaped objects, 1 decorated band, 1 lid with tiger-decoration, 1 *guan* beaker; **Iron (2)**: 2 *fu* axes; **Composite (24)**:

16 swords, 2 *mao* spear-heads, 1 trident, 5 *xiao* knife; **Mingqi**: 1 bronze sword, 1 *mao* spear-head, 13 swords, 4 *yue* axes

Stone objects (47): 38 arrowheads, 9 single-perforated grinding-rods

Other (3): 2 sea shells, 1 gold strip

Suggested Date: Warring States to Western Han

Yanyuan Haimatang 鹽源縣海馬塘 (YHT) [239]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 1.5

Location: 1 km SE of Xiaobaozi Village, Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉小堡子村

Morphology: on alluvial plain, 2361 m asl.

Surface Area: 1500 m^2

Natural and Man-Made Environment: close to river, on flat ground

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed, no further information

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: number of earth-pit graves, 1 earth-pit grave (M1) protruding on the surface

Stone objects: *M1:* 1 pebble

Bronze objects: *M1:* 1 sword, 1 *ge* halberd, 1 *yue* axe

Suggested Date: Warring States to late Western Han or early Eastern Han

Yanyuan Jiaodingshan 鹽源縣轎頂山 (YJD) [240]

Type: settlement site, earth-pit graves with stone installations

Status: partially excavated

Reliability Index: 2.5

Location: Jiaodingshan Yuji Village, Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉魚脊村, 1 km North of the Village, on the SE slope of Jiaoding Hill

Morphology: on mountain slope, 2390 m asl

Surface Area: 50,000 m^2 (EW 500 m, NS 100 m)

Natural and Man-Made Environment: settlement 9 km NE of Yanyuan, at the rim of the Yanyuan basin on SE slope of Jiaoding Hill, facing towards the basin; graves 200 m further West on the other side of the hill; hill not very high, on the foot of the mountain Baiji River 白雞河 flows by in North-South direction

State: badly disturbed by water

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Research: surveyed, very limited information available; discovered and surveyed in November 1980

Storage: unclear

Data Sources: Sichuan, Liangshan and Yanyuanxian 1984, Zhongguo Wenwuju 2009

Features: ash-pits and earth-pit graves

3 round ash pits: diameter 1 m, 0.4-0.5 m depth, inside large number of red-burned earth, charcoal fragments, ceramic sherds, small number of stone tools)

earth-pit graves: large number, badly disturbed, each grave encircled by 1-2 m diameter ring of small to middle-sized irregular stones, 0.5 m deep, small coarse fine ware *guan* beakers burned at low temperature

Ceramics: mainly red and some grey and black sand-tempered pottery, hand-thrown, much undecorated, incised line pattern, corded ware, leaf-vein pattern, *guan* jars with and without handle, with flat or indented bottom (faux ring-foot)

Stone Tools: 24 stone tools, mainly polished, 1 trapezoidal chipped *fu* axe, 2 fine-polished trapezoidal and 2 smaller rectangular *ben* adzes, 1 small rectangular and 1 long-rectangular perforated *zao* chisel, 7 broken *dao* knives, some perforated, 7 long thin *zu* arrowheads with long stems, 1 teardrop-shaped pecked *zhui* awl or drill, 2 polished kidney-shaped loom weights with chipped indentations on both sides

Suggested Date: late Neolithic

Yanyuan Jiejiafen (Bajiacun I) 鹽源縣解傢墳（八傢村（二號地點））(YBI) [241]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 2

Location: Meiyu Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣梅雨鎮

Morphology: on hill-slope, 2458 m asl.

Surface Area: 2000 m^2

Natural and Man-Made Environment: close to river, on hill-slope

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed in 2000, bronze weapons and ceramics collected

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: number of earth-pit graves, 0.2-0.7 m below surface, 2 m long, 0.6-1 m wide, oriented towards the North

Ceramic objects: *guan* beaker

Bronze objects: knives, *mao* halberds, arrowheads

Suggested Date: Warring States to late Western Han or early Eastern Han

Yanyuan Laolongtou 鹽源縣老龍頭 (YLL) [242]

Type: earth-pit graves with or without stone installations

Status: partially excavated

Reliability Index: 6

Location: Village 7, Group 3 (before: Maojiaba Village, Laolongtou (also: Miaomiaoshan)), Shuanghe Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣雙河鄉七村三組（原為：毛傢垻村老龍頭（也成爲廟廟山））

Morphology: on terrace, 2416 m asl.

Surface Area: 2416 m^2 (18125.6 according to 2010 survey)

Natural and Man-Made Environment: on terrace, overlooking surrounding area, in close distance to river

State: intensively robbed several times

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: discovered in December 1987 by local peasants, 3 excavation campaigns 1988, 1999, and 2002, 4 graves and 1 pit excavated

Storage: Yanyuanxian Wenhuaguan 鹽源縣文化館, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Huilixian Wenwu Guanlisuo 會理縣文物管理所, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Data Sources: Liu and Li 1991, Liu Shixu 1998, Liu and Tang 2006, Lang Jianfeng 2006, Jiang Zhanghua 2008 and 2009, Liangshan and Chengdu 2009, Zhongguo Wenwuju 2009; data collection 12/2011

Secondary literature: Zhong Yali 2002, Cui Jianfeng et al. 2010

Features: large number of graves, all EW-oriented, following the mountain-ridge, none overlapping or disturbing each other, 13 earth-pit graves of various sizes and with various kinds of installations and 1 offering pit (might be a grave, too) reliably identified, 0.2-0.3 m distance between the graves; until 1960s two stones erected close to the graves

M4: *conditions*: severely robbed, at four corners grave- robber pits, opening completely destroyed; N and E damaged

orientation: 350°; *form*: rectangular earth-pit grave with stone cover; *measurements*: ext. length 4 x 1.1-3.15 x 0.7-0.96 m; *cover*: probably originally several stone-boulders; in middle of the grave one boulder of 1.35 x 0.5-0.85 x 0.17 m left, made of lime-stone

installations: second-level ledge in the northern part, 3.25 x 0.7 x 0.34 m; foot compartment of 2.3 x 0.6 x 0.2 m; wooden coffin (10 bronze nails around the coffin bed still extant, throughout the whole grave layer of 1-2 cm black ashy traces of a wooden plank, probably traces of the lid of the coffin)

floor: middle part leveled and about 5 cm higher than the rest of the grave, creating a coffin bed; *filling:* medium-hard red-brown mottled earth, ceramic sherds, ash, bronze fragments, human bone fragments; *human bones*: complete skeleton on second-level ledge (S1), 1.7 m long, primary burial, extended supine burial, head in the west; in the east set of human teeth (S2) with traces of cinnabar

object placement: **on second-level ledge in North:** S1, around neck bone *jue* disk; south of the head a triangular bronze *ge* dagger-axe and 2 stone balls, on the right arm right above the hand set of armor plates, at right femur horse head facing east and ornamented with a gilded horse-harness (rein guide/ terret or halter-decoration) and a bronze horse-bit, at the feet small double-handled *guan* beaker, stone ball at feet; **on second-level ledge in South:** 2 bronze-strips, 1 bronze sword, 1 horse skull and 2 horse long-bones; **foot-compartment:** 2 bronze *fu* cauldron, 1 bronze drum, 1 bronze *bianzhong* bell, 1 ceramic single-handled and 4 double-handled *guan* beakers, 1 bronze *xiao* knife, 2 horse-bits, 1 piece of halter-decoration, bone *zhu* beads; **main grave-pit, East:** S2, cinnabar on teeth, below and on western side agate and turquoise beads, probably once belonging to a pendant, north of it painted double-handled *guan* beakers; **Middle and lower part**: large number of pottery sherds and bronze ornaments; **West**: small apricot-core shaped bronze ornaments, among them a chicken-shaped ornament; **SW corner**: bronze *mao* spear and *dun* spear point, bronze *ge* halberd, bronze harness, other bronze bits of unknown function; **NW**: lower palate of a horse and further horse-skull, stone ball

objects: 153 (7 ceramics, 15 stone objects, 21+ bone objects, 108 bronze objects, 2 iron objects)

M5: *form*: rectangular earth-pit grave; *conditions*: badly disturbed, protruding from the surface; *objects:* 3 fragments of body armor (helmet or breast plates)

M6: *conditions*: relatively well preserved, 0.6 m below the surface

orientation: 275°; *form*: rectangular earth-pit grave with stone cover; *measurements*: 6.1 x 2.5-2.8 x 0.3 m; *cover*: 4 large stone-slabs (1.53-2 x 1.12-1.8 x 0.13-0.28 m), 2 limestone, 2 sedimentary rock; *installations*: wooden coffin with foot compartment of 0.93 m depth in the East; middle-partitioning running in splitting grave in larger southern (4.4 x 1.05 m) and smaller northern half; *human bones*: 5 skeletons, heads in the West, all extended supine, 3 in southern compartment (1 further West (S3), 1.8 m tall, 2 others side by side further West (S1-2)), 1 in northern part (S4), 1.63 m, lower long-bones south of the coffin *object placement*: **S1**: on both sides round bronze earrings, ceramic sherds on the left, 1 bronze bracelet on right ulna, 1 long-oval polishing-stone, close to the lower palate and the right shoulder each one block of carmine-red soil; **S2**: only long-bones preserved, 1 small bronze *ling* bell in pelvis area, at right foot pile of ceramic sherds; **S3:** head and long-bones preserved, on head bronze tubes (probably hair-ornaments), on the right string of agate beads, at left shoulder and the left pelvis each 1 pile of ceramic sherds, 1 belt ornament in the pelvis area, at the left femur 1 long pointed bronze piece of unknown function, 1 composite knife with bronze handle and iron blade and 1 bronze *ge* dagger-axe; **S4**: 8 round belt-ornaments at upper end of upper long-bones, remains of textiles below, on right side bronze-box, 1 belt hook, in foot-area various animal-bones and carmine-red lump of soil, western part badly disturbed, large number of bronze-nails, round bronze-plaques, bracelets, arrowheads, butterfly-shaped ornaments, agate beads; **on divider**: 1 large and 1 small round reddish pebble, 10+ quartz stones of different sizes, 1 black shiny stone (probably obsidian), all of them worked, 1 rectangular perforated cutter, 1 small bronze *fu* axe, 1 bronze knife, 1 bronze chisel, 2 bronze cones, all placed in tree-bark container; **foot compartment**: 1 hair-pin, 10 stone arrow-heads, 3 horse long-bones; s**outh of coffin**: 1 horse-skull, 3 horse long-bones, 6 bronze nails, lower long-bones of human

objects: 78 (2 ceramic vessels and sherds of some more, 21 stone tools, 9 stone ornaments, 6 bronze weapons, 39 bronze ornaments, 1 bronze knife)

M7: *conditions*: 0.7 m below the surface, in NE corner a grave robbers pit

orientation: 90°; *form*: rectangular earth-pit grave, top wider than bottom; *measurements*: top 4.65 x 2.3 m, bottom 4.23 x 1.91 m, depth 1.7-1.9 m; *cover*: in eastern part large natural stone slab of 1.55 x 1.2 x 0.1, east of it three medium-sized stones with smaller stones in between; probably originally completely covered by stone slates, all limestone

installations: wooden coffin, wooden planks 0.2-0.35 m thick, fastened with nails, fitting neatly into the pit; 2 layers of stones inside coffin (all limestone); 1. in the middle made of large stone slates, 0.9 m below the top, 1 in the east (0.86 x 0.67 x 0.1), 1 in the west (0.84 x 0.2-0.48 x 0.08); 2. close to the bottom, at depth of 1.4-1.55, 10+ stone pieces of uneven size, mainly in the middle, in disorder, largest 0.59 x 0.45 x 0.06, smallest 0.2 x 0.1 x 0.04; platform in the west, about 0.3 thick; in eastern part of northern wall 1.3 m above the bottom oval niche (0.3 x 0.22 x 0.24)

filling: on top up to 1. stone layer soft grey-brown clay soil with yellow and red dots, some black-slipped fine black sand-tempered ceramic sherds, charcoal, bronze fragments, bone fragments; between 1. and 2. stone layer soft yellow-brown clay soil, large number of black-slipped fine black sand-tempered ceramic sherds, charcoal, bronze fragments, 1 broken stone *fu* axe, bone beads, clam shells; no human bones

object placement: **in niche**: large number of ceramic sherds, sheep shoulder blades; 30+ bone and turquoise beads and ceramic sherds in between; **on the bottom of the pit** sheep shoulder blades, 1 of them calcinated, other animal bone fragments; the **middle** of the pit at the bottom 1 sword; 8 nails in between wooden board fragments

objects: 10 (ceramic sherds, 1 bronze sword, 8 bronze nails). 10 sheep shoulder-blades

M8: rectangular earth-pit grave; nearly completely destroyed before excavation, small, some remnants of human bones, no objects left

M9: *conditions*: relatively well preserved, 1.45 m below the surface *orientation*: 275°; *form*: rectangular earth-pit grave with stone cover and stone cist, wider at the top than at the bottom; *measurements*: 6.55 x 2.8-3.65 x 1.45 m; *cover*: 5 large uneven stone-slates, layered from east to west, gaps filled with 13 small stones, all limestone, largest in the middle, north higher than south; over it 1.1-1.5 m earth layer, probably originally grave mound; *filling:* red-brown clay soil with sherds of black clay-ceramics, ceramic spindle-whorl and many animal bones; *floor*: evened-out

installations: traces of carbonized wooden boards of a coffin close to walls of the grave pit; close to northern wall stone-coffin made of 10+ irregular limestone slates, EW-oriented, 4.88 x 0.95 m, complete with stone cover and bottom, bottom made of 6 very regular worked stone slates, sides and cover already collapsed; in middle of the grave 10 irregular stone-slates (each 0.5-0.9 x 0.15-0.5 m); in SW on bottom of the grave ash layer of 1.4 x 1.35 x 0.1 m, on four sides surrounded by stones, in it pieces of human skull bones, teeth, ceramic sherds, and other objects, all burned; in West further stone-slate with composite-sword and a few bronze fragments

human bones: single human rib bone in west of stone coffin; human long-bones in the south outside of the coffin; in south and middle ash, scattered human palate bone pieces and teeth; human skull bones and teeth in ash layer in SW surrounded by stones, all calcinated

object placement: **in stone cist**: 1 bronze arrowhead next to human rib-bone; in middle small bronze ornaments; in East complete pig skeleton; **West of stone cist**: scattered bronze belt ornaments; **in South**: human long-bones; **South and Middle**: ash, scattered pieces of human palate and teeth, animal bones, small bronze ornaments, ceramic sherds, 2 sets of round belt ornaments; **in stone-frame:** ash layer, in it pieces of human skull bones and teeth, ceramic sherds, beaker-fragments, bronze bells, leaf-shaped bronze ornaments, bronze arrowheads, chicken bones, antler, fragments of other animal bones, all burned; **West**: on stone slate composite sword and a few small bronze fragments; **SE** of stone coffin: 3 stone-balls, **SE and NE corners**: horse long-bones

objects: 65 (ceramic sherds, 1+ beaker, 13 bronze weapons, 2 bronze bells, 16 belt ornaments, 29+ bronze ornaments, 1 composite sword)

M10: *form*: rectangular earth-pit grave; *conditions:* largely destroyed, only part of the grave bottom left, no bones, most objects probably lost, only few ceramic sherds, 1 bronze *yue* axe

M11: *conditions*: 2.32 m below the surface, well-preserved except for the northeastern corner which has been damaged by grave robbers

orientation: 195°; *form*: rectangular earth-pit grave; *measurements*: 3.64 x 1.2 x 0.2 m; *cover*: 3 large irregular stone slabs (blackish-brown sandstone) covering only 1/3 of the grave (originally more?)

installations: wooden coffin of 3.64 x 1.2 m, fitting neatly into the pit, preserved only in blackish ash-traces

human bones: 1 robust tall human skeleton (1.9 m height), extended supine position, in middle of the coffin, head in the West

object placement: **left**: 1 bronze *ge* halberd, 1 *fu* axe, 1 *dao* knife, 1 bronze and 1 iron *mao* spear, 2 flat polishing stones, 1 shattered ceramic vessel; **right**: 1 halfmoon-shaped polishing-stone, bronze and iron fragment in long-rectangular tree-bark container; **over head**: 1 small bronze *yue* axe, 1 sword, 1 *dao* knife, 1 bronze fragment, 1 polishing stone; **right ear**: 1 flat turquoise ornament, 1 oval jade ornament; **on head**: 10 small bronze tubular ornaments; **around neck**: 38 agate beads, **on right arm**: 1 *zhuo* bracelet of 20 bronze segments; **right side of neck**: halfmoon-shaped stone *dao* knife; **SE corner**: heap of animal-bones, resting on carmine-red lump of soil

objects: 101 (1+ ceramics, 4 stone tools / weapons, 43 stone ornaments, 25 bronze tools, 27 bronze ornaments, 1 iron weapon)

<u>Ceramic objects:</u>

M4: 1 red-incrusted double-handled *guan* beaker, 4 double- and 2 single-handled *guan* beaker; *M6:* 2 double-handled *guan* beaker; *M7:* 1+ ceramic vessels; *M9:* 1 double-handled *guan* beaker; *M11:* 1+ ceramic vessels

<u>Metal objects</u>:

M4: **Bronze**: 1 drum, 2 *fu* cauldron, 1 *ling* bell, 1 *bianzhong* bell, 1 sword, 1 *ge* halberd, 1 *xiao* knife, 4 flat long-rectangular pieces, 1 cock-shaped staff-head, round halter-decoration, 1 gilded horse-harness (rein guide/ terret or halter-decoration), 2 horse-bits, 38 apricot-stone shaped objects, 3 button-ornaments, armor-plates, 50 nails; **Iron**: 1 *mao* spear-head, 1 triangular tip

M5: 3 fragments of bronze body armor (helmet or breast plates)

M6: **Bronze:** 1 *ge* halberd, 1 *ling* bell, 1 *zao* chisel, 4 arrowheads, 1 point-tool, 1 hairpin, 18 round belt-ornaments, 1 long handle, 4 button-ornaments, 6 nails, 3 butterfly-shaped ornaments; **Other**: 1 composite knife/sword

M7: **Bronze**: 1 sword, 8 nails

M9: **Bronze:** 1 *qi* battle-axe, 2 *ge* halberds, 10 arrowheads, 2 *ling* bells, 2 rectangular and 16 round belt decoration elements, 17 other decorative elements, 10+ bronze *guan* beads; **Other**: 1 composite sword

M10: 2 bronze *yue* axes

M11: **Bronze**: 2 *ge* halberds, 1 *mao* spear-head, 1 swords, 1 knife, 1 *yue* axe, 1 *fu* axe, 1 knife, 17 arrowheads, 1 *zao* chisel, 1 triangular object, 10 *zhuo* bracelets, 16 double-bead shaped ornaments; **Iron**: 1 *mao* spear-head

<u>Stone</u>:

M4: 2 balls, 3 turquoise and 10 agate *zhu* beads

M6: 2 polishing-stones, 19 arrowheads, 1 jade *zhui* earring, 8 agate *zhu* beads

M9: 3 stone balls

M11: 2 polishing-stones, 1 *zhui* pendant, 1 halfmoon-shaped cutter, 1 knife, 38 agate and 3 turquoise *zhu* beads, 1 jade *jue* ring

<u>Bone</u>:

M4: 1 *jue* ring, 10+ large and 10 small *zhu* beads

<u>Suggested Date:</u> Warring States to late Western Han

Relative Chronology: M4 ≈ upper Minjiang stone-construction graves, Yunnan Shizhaishan, Kunming Yangfutou phase IV; M11 ≈ Baoxing stone-construction graves, M 6 and M9 ≈ Kunming Yangfutou phase III

Yanyuan Luowa 鹽源縣洛瓦 (YLW) [243]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 1.5

Location: Xiahai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣下海鄉

Morphology: on hill-slope, 1985 m asl.

Surface Area: 7000 m^2

Natural and Man-Made Environment: close to river, on hill-slope

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed, no further information

Storage: unclear

Data Sources: Liangshan and Chengdu 2009

Features: unclear number of earth-pit graves

Suggested Date: Warring States to late Western Han or early Eastern Han

Yanyuan Maojiaba 鹽源縣毛傢埧 (YMB) [244]

Type: earth-pit and stone-construction graves

Status: partially

Reliability Index: 4

Location: Shuanghe Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣雙河鄉

Morphology: on hill-slope, 2609 m asl.

Natural and Man-Made Environment: on hill-slope

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Research: discovered in 1988

Storage: unclear

Data Sources: Liu Shixu 1991, Liu and Tang 2001

Features: 1 earth-pit (M1) and 3 stone-construction graves (M2-4)

M2: large stone-slate as cover, 8 metal weapons, 3+ ceramic vessels, 1 horse skull and long-bones

Ceramic Objects: double-handled *guan* beakers with large spiral-pattern

M2: several double-handled *guan* beakers and other ceramics

Metal Objects: bronze drums, *mao* spear-heads, bronze armor, *yue* axes, composite swords with bronze handle and iron blade, iron *ge* halberds with bronze handle

M1: 2 bronze drums, 1 three-pronged short bronze sword, 1 double-winged bronze arrowhead

M2: 1 bronze drum, 1 three-pronged short bronze sword, 1 iron *ge* halberd with bronze handle, 1 composite and 1 iron *mao* spear-head, 1 bronze *yue* axe, 1 bronze arm-guard, 1 bronze wrist-guard

Internal Chronology: M1 > M2-4, M4 < M1, M3-4

Suggested Date: Warring States to late Western Han

Yanyuan Meiyu Bacun Sanzu 鹽源縣梅雨八村三組 (YMY) [245]

Type: earth-pit graves

Status: unexcavated

Reliability Index: 1

Location: Bajia Village Group 3, Meiyu Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣梅雨鎮八傢村三組

Morphology: on second-level terrace, 2326.5 m asl.

Surface Area: 4711.94 m^2

Natural and Man-Made Environment: close to Yuhe river, 500 m South of public road

State: badly disturbed, mainly by grave robbers

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Research: surveyed, no further information

Storage: unclear

Data Sources: personal communication Liu Hong 11/2011

Features: unclear number of earth-pit graves; all rectangular, all roughly EW-oriented, some ceramic sherds

Suggested Date: Warring States to late Western Han

Yanyuan Meiyuzhen 鹽源縣梅雨鎮 (YMZ) [246]

Type: smelting site

Status: unexcavated

Reliability Index: 3.5

Location: on eastern side of SE Fenghuang Mountain, Meiyu Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣梅雨鎮鳳凰山

Morphology: on mountain-slope, 2338 m asl.

Surface Area: 4711.94 m^2

Natural and Man-Made Environment: close to Yuhe river, 500 m South of public road

State: badly disturbed

Site description: on small platform just beneath the mountain-top

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Research: surveyed in November 1980

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: smelting-pit

Bronze Objects: 600 *daquan wushi* 大泉五十 coins, 2.5-2.7 cm in diameter

Suggested Date: Han

Yanyuan Nanbianhe 鹽源縣南边河 (YNH) [247]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 1.5

Location: Shuanghe Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣雙河鄉

Morphology: on alluvial plain, 2365 m asl.

Surface Area: 1500 m^2

Natural and Man-Made Environment: close to river, on hill-slope

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed, no further information

Storage: unclear

Data Sources: Liangshan and Chengdu 2009

Features: unclear number of earth-pit graves

Suggested Date: Warring States to late Western Han or early Eastern Han

Yanyuan Tangguan Liandi 鹽源縣唐光連地 (YTL) [248]

Type: earth-pit graves with or without stone installations

Status: unexcavated

Reliability Index: 0.5

Location: Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉

Morphology: on alluvial plain, 2393 m asl.

Surface Area: 9600 m^2

Natural and Man-Made Environment: close to river

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed, no further information

Storage: unclear

Data Sources: Liangshan and Chengdu 2009

Features: unclear number of earth-pit graves

Suggested Date: Warring States to late Western Han or early Eastern Han

Yanyuan Tangshidi 鹽源縣唐氏地 (YTS) [249]

Type: earth-pit graves

Status: unexcavated

Reliability Index: 2

Location: 1 km East of Qianwugu Village, Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉千五股村

Morphology: on alluvial plain, 2398 m asl.

Surface Area: 760 m^2

Natural and Man-Made Environment: close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: several dozens earth-pit graves, neatly aligned with 2 m spacing between them

Ceramic objects: sand-tempered ceramic sherds on surface

Suggested Date: Warring States to late Western Han

Yanyuan Wuming Baobao 鹽源縣無名包包 (YWM) [250]

Type: earth-pit graves

Status: unexcavated

Reliability Index: 2

Location: 1 km North of Qianwugu Village, Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉千五股村

Morphology: on alluvial plain, 2345 m asl.

Surface Area: 3000 m^2

Natural and Man-Made Environment: close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009

Features: several dozens earth-pit graves

Ceramic objects: black ceramic sherds, wooden coffins visible in some

Suggested Date: Warring States to late Western Han

Yanyuan Wuqiu 鹽源縣烏丘 (YWQ) [251]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Wuqiu Group, Pingchuan District, Yanhai Commune, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣沿海公社平川地帶烏丘大隊

Morphology: on terrace, level, 2390 m asl

Surface Area: 1000 m^2

Natural and Man-Made Environment: NE of Lugu Lake 瀘沽湖

State: destroyed

Researchers: Sichuansheng Bowuguan 四川省博物館, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Research: surveyed in April 1977

Storage: unclear

Data Sources: Xichang Diqu 1978a, mentioned in Liangshan and Chengdu 2009

Site Description: dense scatter of ceramic sherds over entire area, 0.5 m of cultural layers

Surface finds: red sand-tempered ceramic sherds, some fine corded ware pattern; polished perforated stone *dao* knives and *fu* axes

Suggested Date: Neolithic?

Yanyuan Wushidi II (Bajiacun II) 鹽源縣伍氏地（八傢村（一號地點））(YWS) [252]

Type: earth-pit graves

Status: unexcavated

Reliability Index: 2

Location: Baijia Village, Meiyu Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣梅雨鎮八傢村

Morphology: on mountain slope, 2388 m asl.

Surface Area: 2500 m^2

Natural and Man-Made Environment: close to river, on slope

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed in 2000

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009, Liangshan and Chengdu 2009

Features: unclear number of earth-pit graves, oriented towards the north, 0.2-0.7 m below the surface, measuring 2 x 0.6-1 m

Ceramic objects: 2 double-handled *guan* beakers and ceramic sherds found on surface

Suggested Date: Warring States

Yanyuan Wushidi III (Bajiacun III) 鹽源縣吳氏地（八傢村（三號地點））(YBIII) [253]

Type: earth-pit graves

Status: unexcavated

Reliability Index: 2

Location: Baijia Village, Meiyu Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣梅雨鎮八傢村

Morphology: on mountain slope, 2355 m asl.

Surface Area: 2500 m^2

Natural and Man-Made Environment: close to river, on slope

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed in 2000

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009, Liangshan and Chengdu 2009

Features: unclear number of earth-pit graves, oriented towards the north, 0.2-0.7 m below the surface, measuring 2 x 0.6-1 m, 1-3 m distance between them

Ceramic objects: ceramic sherds found on surface

Suggested Date: Warring States

Yanyuan Xiaoguan Liangzi 小官梁子 (YXG) [254]

Type: settlement site, earth-pit grave site

Status: surveyed

Reliability Index: 2

Location: 2 km North of Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉

Morphology: on hill-top, 2398 m asl

Surface Area: 25000 m^2 (EW 140 m, NS 180 m)

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Site Description: on the western bank of the Baiji river 白吉河, 1.5 km North of Jiaodingshan, 0.5 m of cultural layers, red-baked earth and charcoal

Features: unclear number of earth-pit graves

Surface finds: grey fine ware, *guan* jar forms, some incised line and application pattern; stone *fu* axes, choppers, net weights, pestles, stone balls

Suggested Date: Neolithic

Yanyuan Xiaohebian 鹽源縣小河邊 (YXH) [255]

Type: earth-pit graves

Status: unexcavated

Reliability Index: 2

Location: Xiaohe Village, Meiyu Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣梅雨鎮小河村

Morphology: on open plain, 2345 m asl.

Surface Area: 1600 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館, Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所

Research: surveyed in 2000

Storage: unclear

Data Sources: Zhongguo Wenwuju 2009, Liangshan and Chengdu 2009

Features: unclear number of earth-pit graves, oriented towards the north, 0.2-0.7 m below the surface, measuring 2 x 1 m

Surface finds: 40+ objects, double-handled *guan* beakers, bronze swords, *yue* axes

Ceramic objects: large number of surface finds

Suggested Date: Warring States

Yanyuan Xifan 鹽源縣西藩 (YXF) [256]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 2 km SE of Zhong Village, Qiansuo Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣前所鄉中村

Morphology: first-level terrace, level, 3006 m asl

Surface Area: 20000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Site Description: on the eastern bank of Wangsuo river, 0.2-0.8 m of cultural layers, red baked earth and charcoal

Surface finds: grey, yellow, and brown clay ceramics

Features: 3 ash pits, no details

Suggested Date: Neolithic

Yanyuan Yingpanshan (North) 鹽源縣營盤山（北區） (YYN) [257]

Type: settlement site, earth-pit grave site, some lined with stone slates

Status: surveyed

Reliability Index: 1.5

Location: 1 km North of Qianwugu Village, Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉千五股村

Morphology: on terrace, level, 2341 m asl

Surface Area: 4000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, mentioned in Liangshan and Chengdu 2009

Features: several dozen earth-pit graves, some lined with stone slates, 2 x 1.5 x 2-4 m in dimensions

Surface finds: bronze *ling* bells, *guan* jars and other ceramic sherds, unclear if from settlement or graves

Suggested Date: Warring States to Western Han

Yanyuan Yingpanshan (South) 鹽源縣營盤山（南區） (YYS) [258]

Type: settlement site, earth-pit graves, some possibly lined with stone slates

Status: surveyed

Reliability Index: 1.5

Location: Ganhai Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣干海鄉

Morphology: on terrace, level, 2380 m asl

Surface Area: 7200 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, mentioned in Liangshan and Chengdu 2009

Features: some surface finds and earth pit or stone-construction graves, no details known

Suggested Date: Warring States to Western Han

Yanyuan Zhushiba 鹽源縣豬屎垻 (YZS) [259]

Type earth-pit graves, some possibly lined with stone slates

Status: surveyed

Reliability Index: 1.5

Location: Wali Township, Yanyuan County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州鹽源縣窪裏鄉

Morphology: on mountain-slope, 1889 m asl

Surface Area: 1000 m^2

Site description: very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Yanyuanxian Wenhuaguan 鹽源縣文化館

Storage: unknown

Data Sources: Liangshan and Chengdu 2009

Features: unclear number of earth pit, some possibly with stone installations, no details known

Suggested Date: Warring States to Western Han

1.12 Yuexi County 越西縣

Yuexi Huayang 越西縣華陽 (YYH) [269]

Type earth-pit graves

Status: surveyed

Reliability Index: 2

Location: 200 m East of Huayang Village, Datun Township, Yuexi County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州越西县大屯鄉華陽村

Morphology: on mountain-slope, 1732 m asl

Site description: very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 2 earth pits, 20 m in between, oriented towards the West

M1: 4.3 x 3.7 x 1.2 m

Metal Objects: 12 bronze objects (*fu* kettle, *guan* beaker, *pen* basin, sword, seal), 1 three-legged iron tray

Suggested Date: Warring States to Western Han

Yuexi Liaojiashan 越西縣聊家山 (YLS) [270]

Type earth-pit graves, surface finds probably from graves

Status: surveyed

Reliability Index: 2.5

Location: 1 km NW of Qinglong Village, Yuexi Township, Yuexi County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州越西县越西鎮青龍村

Morphology: on alluvial plain, 1653 m asl

Surface Area: 2400 m^2

Site description: very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in August 1987, surface collection of bronze and iron objects

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, Mao and Zou 1991

Features: 4 earth pit, all oriented towards the East

M1: 4.3 x 3.7 x 1.2 m

Metal Objects: **Bronze:** 1 sword, 2 handled *mou* pots, 1 *xi* basin, 3 button-ornaments, 3 *xiao* knives, 1 *guan* beaker with one long band-handle, 1 double-handled *guan* beaker, various bronze ornaments; **Iron:** 3 *xiao* knives, 1 sword, various ornaments **Other:** 1 composite sword, 1 gilded bronze bracelet

Suggested Date: Warring States to Western Han

Yuexi Que'ershan 越西縣雀兒山 (YQS) [271]

Type stone-construction graves, megalithic graves

Status: surveyed

Reliability Index: 1.5

Location: 1.5 km North of Qietuo Village, Puxiong Township, Yuexi County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州越西县越西鎮普雄鎮且拖村

Morphology: on first-level terrace, 1874 m asl

Surface Area: 3000 m^2

Site description: close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: surveyed

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 7 stone-construction graves, all oriented towards the South (M1-4, M6-8), 1 megalithic grave (M5)

M1: 1.74 x 1 x 0.6 m, orientation: 180°, 4 large stones for cover

M5: 8 x 3 m, orientation: 180°, large stone for cover

Ceramic Objects: *M1*: 1 *guan* beaker, 1 *wan* bowl

Metal Objects: **Bronze:** 1 *fu* axe, 3 *zhuo* bracelets

Stone Objects: 1 *fu* axe, 1 perforated grinding roller

Suggested Date: Warring States to Western Han

Yuexi Wajimu 越西縣瓦吉木 (YWJ) [272]

Type stone-construction graves

Status: surveyed

Reliability Index: 2

Location: 50 m SW of Gongmo Village, Puxiong Township, Yuexi County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州越西县越西鎮普雄鎮貢莫鄉

Morphology: on first-level terrace, 1874 m asl

Surface Area: 3000 m^2

Site description: close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 stone-construction grave, measurements: 1.8 x 0.9 x 0.5 m, orientation: 270°

Suggested Date: Warring States to Western Han

1.13 Zhaojue County 昭覺縣

Zhaojue Ada Bobu 昭覺縣阿打波補 (ZAB) [273]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 100 m SW of Sikai Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開鄉

Morphology: on second-level terrace, 2219 m asl

Site Size: 150 m^2, East of the river, very close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 6 stone-construction graves, oriented towards the North; **M4**: 1.8 x 1 m, no stone cover

Suggested Date: Warring States to Western Han

Zhaojue Bagu Erjue 昭覺縣巴古爾覺 (ZBE) [274]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Niaopo Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣烏坡鄉

Morphology: on second-level terrace, 2491 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojuexian 2009 (mentioned)

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Bakeku cun 昭覺縣巴克苦村 (ZBK) [275]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Bakeku Village, Niaopo Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣烏坡鄉巴克苦村

Morphology: on mountain-slope, 2785 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojuexian 2009 (mentioned)

Features: unclear number of stone-construction graves

Suggested Date: Han

Zhaojue Chike Boxixian 昭覺縣齒可波西鄉 (ZCB) [276]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 3

Location: E'er District, Heping Village, Chike Boxi Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣齒可波西鄉和平村俄爾區

Morphology: on mountain-slope, 1924 m asl

Site Description: leaning against the mountain, facing the river, heavily disturbed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojuexian 2009

Features: 10 stone-construction graves (M1-10), 6 (M1-6) excavated, all of roughly the same construction; grave pit opened running perpendicular to the mountain slope, one side of the circle not closed, building a U; bottom covered with stone slates; both sides of graves lined with irregular medium-sized boulders, covered with larger regular stone slate, closed with one further slate; floor slates covered with yellow clay

M1: *orientation*: 60°; *construction*: 1.15 x 0.6 x 0.6 m; back made of 1 regular slate, 8 cm thick, on both sides 4 stone slates, 8-10 cm thick; cover of 4 large stone slate, 13.5 – 20 cm thick; floor made of 3 smoothed stone slates, 5 cm high, 1 straight stone slate as door, gap between door and cover stone filled with small stones; *content*: no human bones preserved; each one ceramic vessel at rear wall and at the entrance, other objects along the walls (1 *fu* kettle, 1 iron *dao* knife, 3 Han coins, 1 chain of 9 bone beads, 1 amber *zhu* bead)

M2: similar construction like M1 but smaller

M3: *orientation*: 80°; *construction*: 3.3 x 1.45 x 1.8 m; walls of several layers of smaller stones with clay in between; several stone slates covering the floor, 5 large slates as cover, door not preserved; *content:* long-bones distributed throughout the grave in several stacks, at least 9 people, probably secondary burial; pile of ash on northern long-side under some bones, 9 bronze coins, 1 silver ring, and broken iron objects in between bones

M4: similar to M3 in construction but a little larger, made from small stones, 1 bronze coin

M5: similar to M3 in construction but a little larger, made from small stones, 1 silver ring, 1 spindle whorl

M6: similar to M3 in construction but a little larger, made from small stones, 1 agate bead, 1 spindle whorl, 1 silver ring, 4 bronze coins

Ceramic Objects: *M1:* 1 *guan* jar and other ceramic sherds; *M5*: 1 spindle whorl, *M6:* 1 spindle whorl

Metal Objects: *M1*: 1 bronze *fu* kettle, 3 coins, 1 iron *dao* knife; *M3*: 9 bronze coins, 1 silver ring, iron fragments; *M4*: 1 bronze coin; *M5*: 1 silver ring; *M6:* 1 silver ring, 4 bronze coins

Stone Objects: *M1*: 1 agate bead; *M6*: 1 agate bead

Other Objects: *M1*: 1 chain of 9 bone beads

Suggested Date: Eastern Han

Zhaojue Daba Gongshe 昭覺縣大垻公社 (ZDG) [277]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Daba Gongshe, Sikaiqu, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開區大垻公社

Morphology: on mountain-slope, 2193 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: discovered during survey in the 1970, now already destroyed

Storage: unknown

Data Sources: Liangshan Yizu 1977a (mentioned)

Features: 100+ stone-construction graves, slightly different in orientation

Suggested Date: Han

Zhaojue Dabaozi Gezi 昭覺縣大堡子格則 (ZDZ) [278]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2258 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Han

Zhaojue Da'edou Gezi 昭覺縣大俄都格則 (ZDD) [279]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彞族自治州昭覺縣

Morphology: on mountain-slope, 2261 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Han

Zhaojue Dawenquan 昭覺縣大溫泉 (ZDQ) [280]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彞族自治州昭覺縣

Morphology: on mountain-slope, 2137 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Liangshan Yizu 1977a (mentioned)

Features: 2 stone-construction graves, not excavated, now destroyed

Suggested Date: Han

Zhaojue Dipo Cier 昭覺縣氐坡此爾 (ZDC) [281]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: 100 m North of Sikai Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開鄉

Morphology: on mountain-slope, 2201 m asl

Surface Area: 200 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 12 stone-construction graves, both oriented towards the West, **M10**: 1.9 x 1.2

Suggested Date: Warring States to Western Han

Zhaojue Eba Buji 昭覺縣俄巴佈吉 (ZJE) [282-3]

Type: stone construction grave site

Status: partially excavated

Reliability Index: 3.5

Location: Haogu Village, Sikai Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開鄉好古村

Morphology: on mountain-slope, 2152 m asl

Natural and Manmade Environment: in East and West surrounded by high mountains, close to Sanwen River 三灣河, much fertile level ground in river valley, close to stone grave sites of Bagu Erjue, Machu Nawo, Keri Watuo, Jinzi Niabo, Mucuo Najie, Naituo, Pusu Bohuang, Teluo, Wazhaishan, andYihe Gece

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: surveys in 1976, 1987, and 2005, discovery of large number of graves, in 2005 excavation of 14 graves at Pusu Bohuang, Eba Buji, and Jinzi Niaobu

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojuexian 2009

Features: 4 stone cist tombs (EM1-2, EM4-5) and 1 stone cover tomb (EM3), EM1-4 located relatively close together on three neighboring peaks of the hill, EM5 further north on the mountain slope, EM1-3 excavated

EM1: *orientation*: 65°; *construction*: 2.98 x 1.3 x 1.44 m, only 2 slates of the stone walls left (1 for each front and back), floor of green-grey bedrock with a layer of reddish-brown soil and an additional stone slate at one end; *content:* tiny human skull fragments, 1 bronze *pen* basin, originally wrapped in cloth, unclear bronze fragment, 2 stone *huan* rings, 1 stone arrowhead, 1 agate bead

EM2: *orientation*: 275°; *construction*: 2.4 x 1.25 x 1.2 m, only 2 slates of the stone walls left (1 for each front and back), floor of leveled soil; *content:* no bones, 1 nephrite *zhui* pendant

EM3: *orientation*: 28°; *construction*: cut into mountain slope, 2 x 1.8 x 0.5 m, 1 large stone slate as cover (1.5 x 1.45 x .024, 800 kg), walls lined with roughly rectangular stone slabs, bedrock as floor; *content:* scattered bone fragments, 6 teeth, 1 bronze hairpin, 1 bronze *yue* axe

Bronze Objects: *E1*: 1 large curved bronze fragment, *pen* basin with ring-handles and animal-head anchor; *E3*: 1 hairpin, 1 *yue* axe

Stone Objects: *E1:* 1 agate *guan* bead, 1 arrowhead, 2 perforated *huan* rings; *E2*: 1 green nephrite *zhui* pendant

Absolute Dates: ash from EM1 dates to 1180 ± 148 BP (questionable)

Suggested Date: Han

Suggested Relative Date: ≈ Puge Xiaoxingchang AM2?

Zhaojue Erba Keku 昭覺縣尔巴克苦 (ZEK) [284]

Type: stone construction grave site

Status: excavated

Reliability Index: 3.5

Location: Zhuhe District, 2 km West of Qingheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣慶恆鄉竹核區

Morphology: on mountain-slope, 2268 m asl

Site Description: graves arranged in rows on both banks of the rivers up the slope, some 20-30 m above the water level, some up to 100-200 m, hardly any on the mountain top

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: during survey in December 1976 14 cemeteries discovered in Fucheng, Zhuke, and Sikai, altogether over 200 graves, excavations at the same time

Storage: unknown

Data Sources: Liangshan Yizu 1977a and 1981c, Liangshan, Sichuan, and Zhaojuexian 2010 and 2011

Features: 12 graves with stone installations, 3-4 m distance between them, orientation all roughly in the same way, with the head towards the mountain and the feet towards the river, but forming no particular lines

construction: constructed of four thick slates (significantly thicker than for stone-construction graves) and one slate for the bottom, bottom slate covered with a layer of soil before interring body and objects; then filling in with clay soil; covering soil not very thick, some of them not even filling the whole grave pit; large differences in size and relative dimensions; all made of two long slates keeping two short slates in place

M1: *orientation*: 20°; *construction*: 1.23 x 0.41 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no bones, 1 ceramic *guan* beaker

M2: *orientation*: 25°; *construction*: 2 x 0.71 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no bones, carbonized ropes

M3: *orientation*: 31°; *construction*: 1.31 x 0.57 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* 5 human teeth, 1 stone arrowhead, 4 beads, 5 ceramic *guan* beakers

M4: *orientation*: 30°; *construction*: 1.7 x 0.84 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* 1 stone *fu* axe, 8 stone arrowheads, 1 broken bronze *fu* basins and other bronze fragments, calcinated ropes

M5: *orientation*: 25°; *construction*: 1.48 x 0.51, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* 1 stone arrowhead

M6: *orientation*: 20°; *construction*: 2.03 x 0.53 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no human bones or objects

M7: *orientation*: 22°; *construction*: 1 x 0.55 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* 17 human teeth, no objects

M8: *orientation*: 54°; *construction*: 2.25 x 0.56 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* 1 human bone fragment

M9: *orientation*: 48°; *construction*: 1.85 x 0.63 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no human bones, 1 stone *fu* axe, 1 decorated oval object of white nephrite

M10: *orientation*: 18°; *construction*: 1.36 x 0.28 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; bottom slate 2 cm thick, eastern slate 6 cm, western slate 18 cm, northern 12 cm, and southern slate 6 cm thick; *content:* 1 human longbone

M11: *orientation*: 30°; *construction*: 1.75 x 0.88 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* 1 bronze earring, 1 perforated shell

M12: *orientation*: 18°; *construction*: 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* 3 human teeth, 1 stone arrowhead, some ceramic sherds

Ceramic Objects: *M1*: 1 *guan* beaker; *M3:* 5 *guan* beaker; *M4:* 1 *fu* axe, 8 arrowheads; *M5*: 1 arrowhead; *M12*: ceramic sherds

Bronze Objects: *M4*: 1 broken bronze *fu* basins and other bronze fragments; *M11*: 1 earring

Stone Objects: M3*:* 1 arrowhead, 4 beads; *M9*: 1 *fu* axe; *M12*: 1 arrowhead

Other Objects: *M2 and M4:* calcinated ropes, *M11*: 1 perforated shell

Suggested Date: Warring States to slightly before Han

Suggested Relative Date: ≈ Puge Xiaoxingchang AM2?, before Han Wudi, no Han-influence

Zhaojue Ergu Zege 昭覺縣爾姑則格 (ZEZ) [285]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2248 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Erwu 昭覺縣二五 (ZEW) [286]

Type: stone-construction grave site

Status: surveyed

Reliability Index:

Location: 500 m NW of Sikai Village, Daba Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣大垻鎮四開鄉

Morphology: on mountain-slope, 2322 m asl

Surface Area: 100 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 2 stone-construction graves, both oriented towards the West, **M2**: 2 x 0.7 m, no cover

Suggested Date: Warring States to Western Han

Zhaojue Fuchengqu 昭覺縣附城區 (ZFC) [287]

Type: stone construction grave site

Status: excavated

Reliability Index: 3.5

Location: Fucheng District, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣附城區

Morphology: on mountain-slope, 2119 m asl

Site Description: graves arranged in rows on both banks of the rivers up the slope, some 20-30 m above the water level, some up to 100-200 m, hardly any on the mountain top

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: during survey in December 1976 14 cemeteries discovered in Fucheng, Zhuke, and Sikai, altogether over 200 graves, excavations at the same time

Storage: unknown

Data Sources: Liangshan Yizu 1977a and 1981c, Liangshan, Sichuan, and Zhaojuexian 2010 and 2011

Features: 3 graves with stone installations, 3-6 m distance between them, orientation all roughly in the same way, with the head towards the mountain and the feet towards the river, but forming no particular lines

construction: constructed of four thick slates (significantly thicker than for stone-construction graves) and one slate for the bottom, bottom slate covered with a layer of soil before interring body and objects; then filling in with clay soil; covering soil not very thick, some of them not even filling the whole grave pit; large differences in size and relative dimensions; all made of two long slates keeping two short slates in place

M1: *orientation*: 10°; *construction*: 0.92 x 0.36 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no bones, 5 ceramic objects

M2: *orientation*: 45°; *construction*: 1.7 x 0.78 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no bones, 1 stone *ben* adze

M3: *orientation*: 35°; *construction*: 2.5 x 1.2 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; two tiers, like an inner and an outer coffin; in the lower layer some animal teeth; *content:* no human bones, some animal teeth, 6 ceramic vessels

Stone Objects: *M2*: 1 *ben* adze

Ceramic Objects: *M1*: 3 *guan* beaker 2 stemmed *dou* beaker

Other Objects: *M3:* animal teeth

Suggested Date: Warring States to slightly before Han

Suggested Relative Date: ≈ Puge Xiaoxingchang AM2?, before Han Wudi, no Han-influence

Zhaojue Geze Yangpeng 昭覺縣格則羊棚 (ZGY) [288]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2209 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Haba Qiehe 昭覺縣哈巴切合 (ZHQ) [289]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2227 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Hangan Yide 昭覺縣汗干依德 (ZHY) [290]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2263 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Hebo 昭覺縣合波 (ZHB) [291]

Type: settlement site

Status: surveyed

Reliability Index: 1

Location: Niren Village, Zhuhe Township, Zhaojue County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州昭覺縣竹核鄉尼惹村

Morphology: foothills, sloped, 1897 m asl

Surface Area: 2000 m^2 (NS 200 m, EW 100 m)

Natural and Man-Made Environment: 13 km West of Zhaojue, in small mountain valley, on the eastern foot of a hill, 50 m NW of the settlement remains there are Han brick tombs, partially covered by agricultural fields (corn, potato, yam, beans) and buildings

State: heavily disturbed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in 12/2009

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: personal communication Liu Hong 12/2010

Surface finds: Han ceramic tiles, broken stone tools (fine *ben* adzes made of grey-green stone, *dao* knives), red and yellow-brown sand-tempered ceramic sherds

Suggested Date: Han

Zhaojue Heiluo 昭覺縣黑洛 (ZHL) [292]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2203 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Jike Jijie (Layimu) 昭覺縣吉克傑覺（拉一木）(ZLY) [293]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 3

Location: 200 m North of Layimu Village, Layimu Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣拉一木鄉拉一木村

Morphology: on mountain-slope, 2500 m asl

Human and Manmade Environment: NE of Zhaojue, very close to Meigu, on western bank of Shamayi Dahe 沙瑪依達河, in river-bent

Site Description: graves all arranged in regular rows in slanted rows following mountain slope, graves leaning against mountain, facing river, badly disturbed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojue 2009

Features: 32+ stone-construction graves, badly disturbed, unclear if all originally with cover or not, 8 most severely disturbed graves excavated; all neatly lined with regular stone slates on sides and bottom, some also with stone cover, most rectangular, few trapezoidal in form, no bones preserved, largely no objects; all oriented at about 225°

M1: 2.5 x 1 x 0.86 m; **M2**: 1.8 x 0.8 x.45 m, 2 stone tools; **M3**: 1.8 x 0.7 x 0.9 m; **M4**: 1.9 x 0.7 x 0.8 m; **M5**: 1.36 x 0.3 x 0.35 m; **M6**: 1.75 x 1.05 x 0.75 m; **M7**: 2.2 x 0.6 x 0.5 m; **M8**: 1.6 x 1.25 x 0.2 m

Stone Objects: *M2:* 1 *ben* adze, 1 *zao* chisel

Suggested Date: Warring States to Western Han

Zhaojue Jinzi Niaobu 昭覺縣金子鳥佈 (ZJN) [294]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Sikai Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開鄉

Morphology: on mountain-slope, 2177 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojue 2009

Features: unclear number of stone construction graves

Suggested Date: Warring States to Western Han

Zhaojue Juntun 昭覺縣軍屯 [295]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: Juntun Village, Sikai Township, Zhaojue County, Liangshan Yi Autonomous Province, Sichuan 四川省涼山彝族自治州昭覺縣四開鄉軍屯村

Morphology: on mountain-slope, 2305 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in 12/2010

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: personal communication Zhao Deyun 04/2011

Surface finds: roof tiles

Suggested Date: Shu-Han

Zhaojue Keri Watuo 昭覺縣克日瓦托 (ZKW) [296]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 1 km South of Qingheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣慶恆鄉

Morphology: on mountain-slope, 1924 m asl

Surface Area: 160 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 3 of stone-construction graves, oriented towards the South, **M1**: 0.36 m below surface, no cover stone, 1.7 x 1.2 m

Suggested Date: Warring States to Western Han

Zhaojue Kujia Ebu 昭覺縣庫家俄佈 (ZKE) [297]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2235 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Machu Nawo 昭覺縣馬処鈉窩 (ZME) [298]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 5 km South of Qingheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣慶恆鄉

Morphology: on mountain-slope, 2129 m asl

Surface Area: 100 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 3 stone-construction graves, oriented towards the West, **M3**: 0.2 m below surface, 1.5 x 1 m

Suggested Date: Warring States to Western Han

Zhaojue Mucuo Naijie 昭覺縣木措乃姐 (ZMC) [299]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Hagoushe, Sikai Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開鄉好谷社

Morphology: on mountain-slope, 2270 m asl

Surface Area: 40000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojue 2009

Features: 56 stone-construction graves, oriented towards the North or East; largest measuring 2.8 x 0.9 m, smallest 0.45 x 0.2 m, all disturbed, all arranged in regular lines

Ceramic Objects: 1 *guan* jar found on surface

Suggested Date: Warring States to Western Han

Zhaojue Muerguo 昭覺縣木爾果 (ZMK) [300]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 1 km West of Xincheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣新城鎮

Morphology: on mountain-slope, 2105 m asl

Surface Area: 20 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 1 stone-construction grave, oriented towards the South, 12 x 1.6 m, no cover stone

Suggested Date: Warring States to Western Han

Zhaojue Mujueke 昭覺縣墓覺柯 (ZMK) [301]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: Nanping Village, 1.5 km West of Xincheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣新城鎮南坪鄉

Morphology: on mountain-slope, 2213 m asl

Surface Area: 200 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 3 stone-construction graves, oriented towards the South, **M2:** 2.1 x 1.1 m

Suggested Date: Warring States to Western Han

Zhaojue Naituo 昭覺縣乃托 (ZNT) [302]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: Nanping Village, 1.5 km West of Xincheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣新城鎮南坪鄉

Morphology: on mountain-slope, 2213 m asl

Surface Area: 80 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 4 stone-construction graves, oriented towards the South, **M2:** 1.9 x 1.2 m, no stone cover

Suggested Date: Warring States to Western Han

Zhaojue Niaopo 昭覺縣鸟坡 (ZNP) [303]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2075 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojuexian 2009 (mentioned)

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Pusu Bohuang 昭覺縣濮蘓波湟 (ZPB) [304]

Type: stone construction grave site

Status: partially excavated

Reliability Index: 4.5

Location: Haogu Village, Sikai Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開鄉好古村

Morphology: on mountain-slope, 2152 m asl

Natural and Manmade Environment: in East and West surrounded by high mountains, close to Sanwen River 三灣河, much fertile level ground in river valley, close to stone grave sites of Bagu Erjue, Machu Nawo, Keri Watuo, Jinzi Niabo, Mucuo Najie, Naituo, Pusu Bohuang, Teluo, Wazhaishan, andYihe Gece

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: surveys in 1976, 1987, and 2005, discovery of large number of graves, in 2005 excavation of 14 graves at Pusu Bohuang, Eba Buji, and Jinzi Niaobu

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojuexian 2009

Site Description: graves regularly distributed in lines following extension of the hill in slanted line, 3-6 m distance in between graves

Features: 27 graves: 9 round grave mounds consisting of piled-up earth and stones measuring 4-8 m in diameter (PM19-27), mostly robbed; 5 cliff tombs cut into bedrock (PM13-17), 13 stone construction graves (in three groups: PM1-4, PM5-12, PM18); PM1-11 excavated

PM1: *orientation*: 80°; *construction*: 2 x 0.84 m, sides lined with stone slates, one for each side, stones of short sides held in place by those for long sides, 8 stone slates left, floor made of leveled virgin soil; *content:* 2 human long-bones and a few fragments, 1 bracelet of organic material

PM2: *orientation*: 45°; *construction*: 2.28 x 0.96 x 1 m, sides lined with stone slates, one for each side, stones of short sides held in place by those for long sides, 8 stone slates left, floor made of leveled virgin soil; *content:* 3 human skulls, several longbones, all in one pile, 2 ceramic objects

PM3: *orientation*: 60°; *construction*: 2.48 x 1.04 m, sides lined with stone slates, badly disturbed, only 6 left, floor leveled and covered with stone boulders; *content:* 3 skull fragments 2 teeth, 3 ceramic vessel, 3 bracelets of organic material, 1 calcinated rope

PM4: *orientation*: 60°; *construction*: cut into mountain-slope, 2.8 x 1.1 x 0.98 m, bottom of grave sloping downwards, sides originally lined with thin stone slates, 4 left, floor leveled with soil and pebbles; *content:* 1 small skull fragment, 2 ceramic vessels, 1 organic bead, 1 calcinated rope

PM5: *orientation*: 30°; *construction*: 0.96 x 0.42 m, sides originally lined with thin stone slates, 3 fragments left, short sides kept in place by long sides; *content:* no human bones or objects

PM6: *orientation*: 60°; *construction*: 0.61 x 0.24 x 0.27 m, sides lined with thin stone slates, one slate for each side, short sides held in place by slates for long sides, leaving space at both top and bottom; *content:* no human bones or objects

PM7: *orientation*: 35°; *construction*: 0.92 x 0.37 m, , sides lined with thin stone slates, one slate for each side, short sides held in place by slates for long sides, leaving space at both top and bottom, floor made of leveled virgin soil; *content:* no human bones or objects

PM8: *orientation*: 50°; *construction*: 1.02 x 0.44 m, sides lined with stone slates, 3 fragments left, floor made of stone slates; *content:* no human bones, 4 ceramic vessels

PM9: *orientation*: 30°; *construction*: 1.5 x 0.5 m, sides lined with stone slates, 2 fragments left, floor lined with stone slates; *content:* some long-bones, mainly in the NW and middle, at least 3 people, 2 ceramic vessels

PM10: *orientation*: 20°; *construction*: 1.68 x 0.48 m, soils originally lined with stone slates, only few fragments left; floor of green-grey bedrock with layer of red-brown soil above; *content:* no bones or objects

PM11: *orientation*: 10°; *construction*: 2.2 x 1 m, sides lined with stone slates, 1 each for left, front, back (the latter broken in 3 pieces), 2 slates for the right side, short sides held in place by slates for long sides, leaving space at both top and bottom; floor of leveled virgin soil of reddish clay; *content:* no human bones, 2 ceramic vessels

PM14: cliff-tomb, door in the SW, mimicking wood, 1.4 m high, 3.4x 1.2 m, rectangular with an arched ceiling bearing chisel marks made with a long instrument; ceiling 3.7 m long, 2.5 m wide and 1.68 m high; floor level of the access ramp higher than the bottom of the grave chamber, on the eastern side two steps carved into the stone, at two places niches cut into the wall, one of them in the western part already largely destroyed

PM17: double cliff-tomb, narrow short passage connecting two chambers, walls made of regular sandstone, robbed long ago, no objects or bones left

<u>Ceramic Objects:</u> *PM2*: 1 ceramic *zun* vessel and further ceramic sherds of fine black-brown sand-tempered ceramics; *PM3*: 3 *hu* pitcher; *PM8*: 1 *guan* beaker, fragments of 3 other ceramic vessels, all sand-tempered pottery; *PM9*: 1 *guan* beaker, fragments of 1 other ceramic vessel, both sand-tempered; *PM11*: 1 *guan* beaker, fragments of 1 other ceramic vessel, both sand-tempered

<u>Other Objects:</u> *PM1*: 1 bracelet of organic material, *PM3*: 3 bracelets of organic material, 1 calcinated rope

Absolute Dates: human bones from PM2 Date to 3170 ± 145 BP

Suggested Date: Han

Suggested Relative Date: ≈ Puge Xiaoxingchang AM2?

Zhaojue Qianjinshe 昭覺縣前進社 (ZQJ) [305]

Type: megalithic grave and stone-construction grave site

Status: surveyed

Reliability Index: 2.5

Location: 300 m South of Heping Village, Chike Buxi Village, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣齒可佈西鄉和平村

Morphology: on mountain-slope, 2003 m asl

Natural and Man-Made Environment: 300 m south of the village, on southern mountain slope, badly disturbed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 11 megalithic graves (M1-2, M4-12), 1 stone-construction grave (M3), all badly disturbed, mainly built of grey sandstone and other sedimentary rock, more rarely igneous rock for large cover stones

M2: 45°, 1.02 x 0.35 m, deepened into the mountain slope, small, 1 large irregular stone slab as cover, sides and bottom lined with smaller and thinner slabs

M3: 45°, 1.02 x 1.2 x 1.09 m, large irregular stone slabs as cover, three slabs for back wall, a few more for other sides, many missing, no stones for bottom, badly disturbed

M4: 45°, 3.04 x 0.82 x 1.28 m, deepened into the mountain slope, small, built of coarse irregular stones, larger ones for cover and two sides, closed with jumble of smaller very irregular stones

M6: 90°, 4.8 x 2.4 x 1.05 m, rectangular, built of irregular medium-sized stones and Han tiles for walls, 1 large stone slab as cover, partitioned by further stones into front (1.8 x 2.4 m) and rear chamber (1.9 x 1.1 m): grey-brown sand-tempered ceramic sherds

M7: 45°, 2 x 1.7 x 1.2 m, large stone slates as cover, on sides each one smoothed white-ish stone slate in middle of each side with smaller irregular stones around, 4 stone slates covering the floor, but part left uncovered; access-ramp but largely destroyed, some long-bones in rear part, but probably disarticulated either before interment or because of later disturbance

M8: 45°, 3.04 x 0.82 x 1.28, built into mountain-slope, 1 large stone slate as cover, layered small irregular stones for walls, irregular stones intermingled with yellowish-sandy soil covering bottom, door closed with medium to small-sized irregular stones

M9: 45°, 3.04 x 0.82 x 1.28, built into mountain-slope, 1 large stone slate as cover, layered small irregular stones for walls, irregular pebbles covering bottom, door closed with medium to small-sized irregular stones; some irregular purple sandstone boulders and charcoal inside, some fragments of human bones

M10: 45°, 3.04 x 0.82 x 1.28, built into mountain-slope, 1 large stone slate as cover, layered small irregular stones for walls, irregular pebbles covering bottom, door closed with medium to small-sized irregular stones

M11: 45°, 3.04 x 0.82 x 1.28, built into mountain-slope, 1 large stone slate as cover, layered small irregular stones for walls, irregular pebbles covering bottom, door closed with large stone slates

Suggested Date: Han

Zhaojue Sikaixiang 昭覺縣四開鄉 (ZSX) [306]

Type: single find

Status: surveyed

Reliability Index: 1

Location: 1 km NE of Jiequ, Sikai Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣四開鄉街區

Morphology: on alluvial fan, 2444 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered in January 1977

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: close to Han settlement site

Find Description: 17 bronze coins discovered 10 m below surface

Suggested Date: Han

Zhaojue Siyi Ergu 昭覺縣司益爾古 (ZSE) [307]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 5 km NE of Qingheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣慶恆鄉

Morphology: on mountain-slope, 1752 m asl

Surface Area: 200 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 8 stone-construction graves, oriented towards the North **M4:** 1.8 x 1.2 m, no stone cover

Suggested Date: Warring States to Western Han

Zhaojue Teluocun 昭覺縣特洛村 (ZTL) [308]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: Teluo Village, Daba Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣大埧鄉特洛村

Morphology: on mountain-slope, 2205 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Liangshan, Sichuan, and Zhaojuexian 2009 (mentioned)

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Tiaowoba 昭覺縣跳窩埧 (ZTW) [309]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 10 km SW of Xincheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣新城鎮

Morphology: on mountain-slope, 2084 m asl

Surface Area: 80 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 3 stone-construction graves, oriented towards the North **M2:** 1.8 x 1.4 x 1.2 m, no stone cover

Suggested Date: Warring States to Western Han

Zhaojue Waluo Gece 昭覺縣瓦洛格側 (ZWG) [310]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 2 km West of Qingheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣慶恆鄉

Morphology: on mountain-slope, 2174 m asl

Surface Area: 100 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 3 stone-construction graves, oriented towards the North **M2:** 2.2 x 1 m, no stone cover

Suggested Date: Warring States to Western Han

Zhaojue Watuo 昭覺縣瓦托 (ZWT) [311]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 2 km West of Qingheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣慶恆鄉

Morphology: on mountain-slope, 2248 m asl

Surface Area: 600 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 20 stone-construction graves, oriented towards the South **M15:** 2.5 x 1.5 x 1.7, no stone cover

Suggested Date: Warring States to Western Han

Zhaojue Wazhaishan 昭覺縣瓦寨山 (ZWS) [312]

Type: stone construction grave site

Status: excavated

Reliability Index: 3.5

Location: Zhuhe District, Niaoba Gongshe, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣竹竹核區鳥巴公社

Morphology: on mountain-slope, 1907 m asl

Site Description: graves arranged in rows on both banks of the rivers up the slope, some 20-30 m above the water level, some up to 100-200 m, hardly any on the mountain top

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Research: during survey in December 1976 14 cemeteries discovered in Fucheng, Zhuke, and Sikai, altogether over 200 graves, excavations at the same time

Storage: unknown

Data Sources: Liangshan Yizu 1977a and 1981c, Liangshan, Sichuan, and Zhaojuexian 2010 and 2011

Features: 5 graves with stone installations, 3-6 m distance between them, orientation all roughly in the same way, with the head towards the mountain and the feet towards the river, but forming no particular lines

construction: constructed of four thick slates (significantly thicker than for stone-construction graves) and one slate for the bottom, bottom slate covered with a layer of soil before interring body and objects; then filling in with clay soil; covering soil not very thick, some of them not even filling the whole grave pit; large differences in size and relative dimensions; all made of two long slates keeping two short slates in place

M1: *orientation*: 40°; *construction*: 2.64 x 0.76 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no bones, 1 stone arrowhead, calcinated ropes

M2: *orientation*: unclear; *construction*: 1.75 x 0.46 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no bones, calcinated ropes

M3: *orientation*: 20°; *construction*: 1.78 x 0.69 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no human bones or objects

M4: *orientation*: 30°; *construction*: 1.7 x 0.84 m, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it ; *content:* 3 skull fragments arranged on stone, some long-bones in the middle parallel arranged, larger number of long-bones in parallel rows at the end, at least 4 people, no objects

M5: *orientation*: 350°; *construction*: 2.68 x 0.95, 1 stone slate for each side, 1 stone slate for the bottom, soil layer on it; *content:* no human bones, a few bronze fragments

Bronze Objects: *M5*: fragments

Stone Objects: *M1*: 1 stone arrowhead

Other Objects: *M1:* calcinated ropes; *M2:* calcinated ropes

Suggested Date: Warring States to slightly before Han

Suggested Relative Date: ≈ Puge Xiaoxingchang AM2?, before Han Wudi, no Han-influence

Zhaojue Yibijia 昭覺縣依比甲 (ZYB) [313]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣

Morphology: on mountain-slope, 2259 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: personal communication Zhao Deyun 04/2011

Features: unclear number of stone-construction graves

Suggested Date: Warring States to Western Han

Zhaojue Yihe Gece 昭覺縣依合格側 (ZYG) [214]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 1 km West of Nanping Village, Xincheng Township, Zhaojue County, Liangshan Yi Autonomous Prefecture 涼山彝族自治州昭覺縣新城鎮南坪鄉

Morphology: on mountain-slope, 2079 m asl

Surface Area: 600 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Sichuan Daxue Kaoguxi 四川大學考古係

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: 2 stone-construction graves, oriented towards the South **M2:** 1.7 x 0.8, no stone cover

Suggested Date: Warring States to Western Han

2. Panzhihua City 攀枝花市

2.1 Miyi County 米易縣

Miyi Hejiaba 米易縣何傢垻 (MHB) [115]

Type: settlement site

Status: surveyed

Reliability Index: 2.5

Location: 200 m West of Guabang Village, Guabang Township, Miyi County, Panzhihua City 攀枝花市米易縣挂榜鎮挂榜村

Morphology: third-level terrace, 1170 m asl

Surface Area: 10000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009, data collection 11/2010

Site Description: on the intersection of Anning and Guabang River 挂榜何, 0.3-1.5 m of cultural layers

Surface finds: mainly grey and some red and black sand-tempered pottery sherds, some flat bottoms, largely undecorated, few sherds with corded ware and line pattern; stone *ben* adzes, *fu* axes, perforated *dao* knives, *zu* arrowheads, spindle whorls

Suggested Date: late Neolithic to early Bronze Age

Miyi Lianhua Gongshe 米易縣蓮花公社 (MLG) [116]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Lianhua Gongshe, Miyi County, Panzhihua City 攀枝花市米易縣蓮花公社, exact location unknown

Morphology: third-level terrace, 1239 m asl

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: data collection 11/2010

Surface finds: red sand-tempered ceramic sherds with impressed fish-bone pattern

Suggested Date: late Neolithic to early Bronze Age

Miyi Sanjingxiang 米易縣三井巷(MSJ) [117]

Type: megalithic grave site

Status: surveyed

Reliability Index: 1

Location: Sanjingxiang, Miyi County, Panzhihua City 攀枝花市米易縣三井巷

Morphology: on edge of second-level terrace, sloped, 1119 m asl

Natural and Man-Made Environment: on Western bank of Anning River, very close to river, leaning against mountain

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Panzhihuashi Wenguansuo 攀枝花市文管所

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 5 megalithic graves; **M1:** EW oriented, 3.2 x 1.7 m

Suggested Date: Warring States to Western Han

Miyi Tianba 米易縣田垻(MTB) [118]

Type: megalithic grave site

Status: partially excavated

Reliability Index: 3.5

Location: Tianba Village Unit 5, Guabang Township, Miyi County, Panzhihua City 攀枝花市米易縣挂榜鎮田垻村五組

Morphology: second-level terrace, level, 1148 m asl

Natural and Man-Made Environment: on Western bank of Anning River, close to river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Panzhihuashi Wenguansuo 攀枝花市文管所

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 3 megalithic graves, two (M1 and M2) excavated; **M1:** 50°, 8.4 x 1.42 m, **M2:** 10°, 9.4 x 2.2 m

Bronze Objects: *M1*: 1 coin; *M2*: 1 coin, 1 *huan* bracelet

Stone Objects: *M1*: 1 *fu* axe

Suggested Date: Western Han

Miyi Wanqiu 米易縣彎丘(MWQ) [119]

Type: megalithic grave site

Status: excavated

Reliability Index: 5.5

Location: Hongxing Erdadui, Wanqiu Yizu Township, Miyi County, Panzhihua City 攀枝花市米易縣彎丘彝族鄉紅星二大隊

Morphology: second-level terrace, level, 1198 m asl

Natural and Man-Made Environment: on Eastern bank of Anning River, 200-500 m away from to river, 30-40 m above the water level, 50 km south of the Jinshajiang; very close to Washitian

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Panzhihuashi Wenguansuo 攀枝花市文管所

Research: 2 graves excavated between 11/29 and 12/13/1978

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Liangshan Yizu 1981, Liu Shixu 1995, Sichuansheng, Liangshan, and Xichangshi 2006a

Site Description: M1 in 50 m distance from train station of Wanqiu, M2 km 1 km SE of M1; M2 disturbed, cover stone missing

Features: 2 megalithic graves excavated (M1-2), roughly same orientation, 1000 m between them

M1: *preservation*: grave-mound destroyed

construction: 325°, rectangular, 5 x 1.1 x 1.57 m, walls and lids of several large stones, door on short side, made of medium-sized long-rectangular or oval irregular cobbles; *ba*-shaped stone arrangement outside

filling: filled with wash layer, ash remains close to grave bottom; objects and human skeletons mainly in rear part, intermingled, some bones crushed beneath objects; some of the small objects (smaller vessels, beads) placed in larger vessels, weapons between long-bones; 1 stone *ben* adze outside of grave

human bones: secondary burial of at least 5 people, bones disarticulated, middle to old age, badly preserved

M2: *preservation*: grave-mound destroyed, cover stone missing, cut by a ditch

construction: 340°, rectangular 4.05 x 1.45 x 1.6 m, walls and lids of several large stones, door on short side, made of medium-sized long-rectangular or oval irregular cobbles; *ba*-shaped stone arrangement outside

filling: filled with wash layer, ash remains close to grave bottom; objects and human skeletons mainly in rear part, intermingled, some bones crushed beneath objects; some of the small objects (smaller vessels, beads) placed in larger vessels, weapons between long-bones

human bones: badly preserved, number, age, and sex of skeleton(s) unclear

Ceramic Objects: mainly coarse red and brown sand-tempered ceramics, low burning-temperature, mainly wheel-thrown, some with leaf-vein pattern on the bottom, some with water-ripple pattern, lying s-shaped applications, cloud pattern and other decorations, many plain

M1: 71 vessels (13 single-handled, 24 double-handled, and 21 *guan* beaker without handles, 4 *bei* cups with and 2 without handle, 6 *ping* vases, 3 spouted *hu* pots);

M2: 87 vessels (9 single-handled, 60 double-handled, and 15 *guan* beaker without handle, 1 *ping* vase, 1 stemmed *dou* bowl, 1 *gui* vessel

Bronze Objects: *M1*: 1 sword, 1 arrowhead, 6 *zhuo* bracelets; *M2*: 1 arrowhead

Stone Objects: *M1*: 1 arrowhead, 1 *ben* adze, 2 turquoise beads

Suggested Date: late Warring States

Suggested Relative Date: Washitian > Wanqiu; ≈ Yunnan Deqin Yongzhi stone cist tombs, Yunnan Jiangzhou Lijiashan M13, Chuxiong Wanjiaba M72

Miyi Yuanjiabao 米易縣袁傢寳 (MYJ) [120]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 1 km NE of Shagou Village, Binggu Township, Miyi County, Panzhihua City 攀枝花市米易縣丙谷鎮沙溝村

Morphology: on mountain slope, 1085 m asl

Surface Area: 5000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 0.4-0.5 m of cultural layers

Surface collection: mainly brown, grey, and small number of red sand-tempered ceramic sherds, burned at relatively high temperature, mainly undecorated, a little line decoration; a few polished *fu* axes

Suggested Date: late Neolithic to early Bronze Age

Miyi Zhaizishan 米易縣寨子山 (MZS) [121]

Type: settlement site

Status: surveyed

Reliability Index: 0.5

Location: Binggu Village, Binggu Township, Miyi County, Panzhihua City 攀枝花市米易縣丙谷鎮丙谷鄉

Morphology: 山坡地

State: destroyed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: mentioned in Liu Hong 2009

Suggested Date: late Neolithic to early Bronze Age

Objects: no information

2.2 Panzhihua City, Renhe District 攀枝花市仁和區

Renhe Baihushan 仁和區白虎山 (RBH) [137]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: 1 km SW of Bailagu Village, Pingdi Township, Renhe District, Panzhihua City 攀枝花市仁和區平地鎮白拉古村

Morphology: second-level terrace, level, 1858 m asl

Site Size: 2000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Panzhihuashi Wenguansuo 攀枝花市文管所

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: 12 stone-construction graves, in regular rows, 2-4 m space in between them, all oriented towards NE; stone covers and sides made of irregular natural slabs of grey slate, 2-2.2 x 0.4-0.6 x 0.5-0.7 m

Suggested Date: Han

Renhe Baila Gucun 仁和區白拉古村(RBG) [138]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1.5

Location: 100 m south of Bailagu Village, Pingdi Township, Renhe District, Panzhihua City 攀枝花市仁和區平地鎮白拉古村

Morphology: second-level terrace, level, 1875 m asl

Site Size: 180 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Panzhihuashi Wenguansuo 攀枝花市文管所

Research: discovered during survey in 1970s

Storage: unknown

Data Sources: Sichuansheng, Liangshan, and Xichangshi 2006a

Features: unclear number of stone-construction graves, badly disturbed, in regular rows running from NE to SW, 2-3 m space in between them, all oriented towards NE; stone covers and sides made of irregular natural slabs of grey slate, 2-3 x 0.5-0.6 m

Stone Tools: 1 *fu* axe

Suggested Date: Han

Renhe Gonghe 仁和區共和 (PGH) [139]

Type: settlement site

Status: surveyed

Reliability Index: 1.5

Location: 300 m north of Gonghe Village, Tongde Township, Renhe District, Panzhihua City 攀枝花市仁和區同德鎮共和村同德鎮共和村

Morphology: second-level terrace, level, 1370 m asl

Surface Area: 3000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: on the northern bank of Dahe River 大河, 0.5 m of cultural layers, red-burned earth, charcoal

Surface finds: sand-tempered pottery sherds, microliths

Suggested Date: early Neolithic

Renhe Huilongwa Cave 仁和區回龍灣洞穴 (PHD) [140]

Type: cave site

Status: test excavation

Reliability Index: 2

Location: Baguanhe Village, Minzheng Township, Renhe District, Panzhihua City 攀枝花市仁和區民政鄉把関河村

Morphology: on mountain slope, in cave, 1167 m asl

Surface Area: 35 m^2

Natural and Man-Made Environment: on northern bank of the Jinshajiang, on a western mountain slope, in a natural cave

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: in 1987 9 m^2 excavated, cultural layers 2 m thick

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Site Description: cave 3 m high, surface area of 35 m^2, 2 m of cultural layers, over 700 objects (stone and bone tools), animal bones

Stone Tools: chipped small stone tools, microliths, scraper, chopper, cutter, microliths, *chui* hammer, cores, blanks, points

Other: bone tools, 20 different kinds of animal bones (deer, bison, mouse, cowries)

Suggested Date: late Paleolithic (18000-12000 BP)

Renhe Xiawan 仁和區下灣 (PXW) [141]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 300 m North of Gonghe Village, Tongde Township, Renhe District, Panzhihua City 攀枝花市仁和區同德鎮共和村同德鎮共和村

Morphology: second-level terrace, level, 1387 m asl

Surface Area: 1000 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: on the intersection of Dahe 大河 Dahe and Miluo River 蔑蘿河, 0.3-0.5 m of cultural layers, red-burned earth

Surface finds: black and brown sand-tempered ceramics, mainly undecorated, some corded ware, some net pattern; some polished stone tools: 1 *zao* chisel, 3 *fu* axes, 1 half-worked core, some blanks, polishing tools

Suggested Date: Neolithic

Renhe Xicaoping 仁和區席草坪 (PXP) [142]

Type: cave site

Status: partially excavated

Reliability Index: 3

Location: Pingjiang Township, Renhe District, Panzhihua City 攀枝花市仁和區平江鎮

Morphology: on mountain slope, in cave, 1511 m asl

State: upper layers heavily disturbed

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: excavations 1988-1989, not published

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Site Description: 2 km West of Wuguqing bamboo forest 烏龜箐, on the northern bank of Jinsha River, inside a cave, 1.5 m culture layers

Stone Tools: over 300 chipped stone tools, scrapers, choppers, hammer, anvils, cores, and tool blanks, made of sandstone, quartz, chert, igneous rock, sedimentary rock

Other finds: fossils of bones and teeth of pig, cattle, sheep, deer, tiger, elephant, monkey, deer, rhinoceros and other kinds of animals

Suggested Date: late Paleolithic

Renhe Yangjiashan (also: Dashibao) 仁和區楊傢山（又命大石包） (PYJ) [143]

Type: settlement site

Status: surveyed

Reliability Index: 2

Location: 300 m West of Gonghe Village, Tongde Township, Renhe District, Panzhihua City 攀枝花市仁和區同德鎮共和村同德鎮共和村

Morphology: on mountain slope, 1341 m asl

Surface Area: 20 m^2

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Data Sources: Zhongguo Wenwuju 2009

Site Description: 1 m of culture layers, pieces of red-burned earth, charcoal, ceramics, stone tools

Surface finds: fine sand-tempered ceramics, flat bottoms; *ben* adzes and *zu* arrowheads

Suggested Date: Neolithic

2.3 Panzhihua City, Western District 攀枝花市西區

Xiqu Yanwan (Dashibao) 西區岩灣（大石包） (PYW) [226]

Type: open-air and cave site

Status: surveyed

Reliability Index: 1.5

Location: Geliping Village Group 2, Western District of Panzhihua City 攀枝花市西區格裏坪村二組

Morphology: on mountain-slope, 1070 m asl

Surface Area: 220 m^2 (cave of 30 m^2 + open settlement of 180 m^2)

Natural and Man-Made Environment: 100 m north of the Township Administration, on the northern bank of the Anning River, on a slope 100-200 m above the river

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Surface finds: chipped stone tools, heavily fragmented ceramic sherds

Suggested Date: early Neolithic

2.4 Panzhihua City, Yanbian District 攀枝花市鹽邊綫

Yanbian Huimin 鹽邊綫惠民 (YHM) [227]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Huimin Township, Yanbian County, Panzhihua City 攀枝花市鹽邊惠民鄉

Morphology: first-level terrace, level, 1239 m asl

Natural and Man-Made Environment: on western river bank

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: large number of stone-construction graves, no further information

Suggested Date: Western Han

Yanbian Pulongcun 鹽邊綫普隆村 (YPC) [228]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Pulong Township, Yanbian County, Panzhihua City 攀枝花市鹽邊普隆鄉

Morphology: on mountain-slope, 1308 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: large number of stone-construction graves, no further information, probably now destroyed

Suggested Date: Western Han

Yanbian Xicaodi 鹽邊綫席草地 (YXD) [229]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Pulong Township, Yanbian County, Panzhihua City 攀枝花市鹽邊普隆鄉

Morphology: on mountain-slope, 1308 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: large number of stone-construction graves, no further information, probably now destroyed

Suggested Date: Western Han

Yanbian Xinlin 鹽邊綫新林 (YXL) [230]

Type: settlement site

Status: test excavation

Reliability Index: 2.5

Location: 2 km SW of Xinlin Village, Huimin Township, Yanbian County, Panzhihua City 攀枝花市鹽邊綫惠民鄉新林村

Morphology: second-level terrace, level, 1252 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: test excavation in 1998, but unpublished

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Ceramics: grey and brown sand-tempered ceramic sherds, corded ware, net pattern, incised lines

Stone Tools: polished stone tools, d-shaped double-perforated *dao* knives, *fu* axes, *ben* adzes, net weights, polishing stones, flaked scrapers

Suggested Date: Neolithic

Yanbian Yongxing 鹽邊綫永興 (YYX) [231]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 1

Location: Huimin Township, Yanbian County, Panzhihua City 攀枝花市鹽邊惠民鄉

Morphology: on mountain-slope, level, 1386 m asl

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009

Features: large number of stone-construction graves, no further information

Suggested Date: Western Han

Yanbian Yumen Wanxiao 鹽邊綫漁門完小 (YYW) [232]

Type: settlement site, stone-construction grave site

Status: partially excavated

Reliability Index: 4.5

Location: Sangyuan Village, Yumen Township, Yanbian County, Panzhihua City 攀枝花市鹽邊綫桑園村 (before part of Dukou City 渡口市)

Morphology: first-level terrace, sloped, 1479 m asl

Natural and Man-Made Environment: about 7 km north of the rim of the county capital, about 100 m away from the Sanyuan river 三源河

Researchers: Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Dukoushi Wenwu Guanlichu 渡口市文物管理處

Research: discovered in July 1980 large number of stone-slate graves 石板墓 in Yanbian County, most of them around Yongxing Gongshe Fancai 永興公社範材 and Yumen Gongshe Wanxiao 漁門公社完小, some also around Huimin 惠民; in 1980 and 1981 4 graves at Yumen Gongshe Wanxiao and 1 disturbed grave at Yongxing Fancai excavated; only report on 4 graves from Wanxiao, mentioning of settlement remains

Storage: unknown

Data Sources: Zhongguo Wenwuju 2009, Dukoushi Wenwu 1968

Features: 4+ stone-construction graves, 4 graves at Yumen Wanxiao excavated and reported (BWXM1, 2, 3, 4); all uneven trapezoidal form, wider in the head part than in the foot part and slightly sloped (2-3°) so that the head part rests higher than the feet; all lined with irregular overlapping natural stone slates, also bottom and cover of slate; no human bones in any of them, all badly disturbed; hardly any objects; all filled with reddish-brown soil

M1: 262°, 1.58 x 0.22 x 0.15 m; **M2:** 262°, **M3:** 320°, 0.99 x 0.35 x 0.17 m; **M4:** 356°, 2.05 x 0.40 x 0.24 m

Surface collection: no details about settlement finds reported

Ceramic Objects: very few, low-fired, hand-built, coarse grey sand-tempered ceramics; *M1*: 1 double handled *guan* beaker, *M3:* 2 small *guan* beaker, *M4:* 1 small *guan* beaker

Suggested Date: Warring States to Western Han

3. Yunnan Province 雲南省

3.1 Luquan County 祿勸縣

Luquan Yingpanbao 祿勸縣營盤寶 (LYB) [91]

Type: stone-construction graves

Status: excavated

Reliability Index: 4

Location: Aqiao Township, Luquan County, Yunnan Province 雲南省祿勸縣阿巧鄉

Morphology: on terrace, 1546 m asl

Site Size: 1000 m EW x 500 m NS

Site Description: on the southern bank of the Jinshajiang, terrace lying 800 m above the river, surrounded by mountains on three sides (south, north, west), badly disturbed

Researchers: Huilixian Wenwu Guanlisuo 會理縣文物管理所, Kunmingshi Bowuguan 昆明市博物館, Luquanxian Wenwu Guanlisuo, 錄勸縣文物管理所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館

Research: discovered during survey in the 1980s, excavation of 8 disturbed graves from December 2004 to January 2005

Storage: unknown

Data Sources: Kunmingshi Bowuguan et al. 2007

Features: 8 graves excavated (overall number of graves unclear), aligned along the southern hill slope, most pointing towards the hilltop, densely spaced (0.36 m on average)

construction: rectangular (AM1, AM3-5, AM7-8) or trapezoidal (AM2, AM6) earth-pit graves lined with local natural rectangular or irregular stone slates, also stone cover, except for M3 no stone slates on floor; 1.4-2.34 m length, 0.2-0.6 m width; AM3 and AM5 tilted (one end higher than the other)

filling: loose brown sediment mixed with ash, charcoal, coarse stones, tiny pieces of red-baked earth; some bone fragments, probably all extended supine burials, M5 interpreted as secondary burial; in some graves large number of ceramic sherds

Ceramic Objects: sand-tempered brown ceramics, hand-thrown, burned at high temperatures

AM1: 1 *ping* vase, *AM2*: ceramic fragments: *AM3*: 2 *guan* beaker; AM8: 1 *ping* vase

Suggested Date: late Neolithic

Relative Date: Xiaoyingpan > Yingpanbao, ≈ Yunnan Chuxiong Yongren stone-construction graves (Yingpanbao probably a little earlier)

3.2 Ninglang Yi Autonomous County 寧蒗彝族自治縣

Ninglang Cunyi 寧蒗彝族自治縣翠依銅器出土點(NCY) [122]

Type: single finds, probably from graves

Status: surveyed

Reliability Index: 0.5

Location: West of Caijiaping Village, Cunyi Township, Ninglang Yi Autonomous County, Yunnan Province 雲南省寧蒗彝族自治縣翠依鄉蔡傢坪村

Morphology: in mountain valley, 2195m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: since 1960s continuously bronze objects discovered

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: ground level, surrounded by mountains

Bronze Objects: *fu* axes and other objects

Suggested Date: Bronze Age

Ninglang Daxingzhen 寧蒗彝族自治縣大興鎮(NDX)] [123]

Type: earth-pit graves

Status: excavated

Reliability Index: 4.5

Location: Bainiuchang Village, Badou Township, Ninglang Yi Autonomous County, Yunnan Province 雲南省寧蒗彝族自治縣白牛場村

Morphology: on mountain foot, 2800 m asl

Surface Area: 200 m^2, at foot Bainiu Mountain 白牛山, ground level

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: 1969 bronze objects discovered, in April 1979 11 earth-pit graves excavated

Storage: unknown

Data Sources: Yunnansheng Bowuguan 1983, Zhongguo and Yunnansheng 2001

Site Description: on level ground at foot of the mountain, graves arranged in rows, relatively regular

Features: 11 rectangular earth-pit graves, all oriented towards the South, relatively deep, well-preserved, no human bones, different forms and installations

M1: 1.5 x 0.65 x 1.12 m, orientation 200°, 3 ceramic vessels

M2: 2.05 x 0.9 x 1.64 m, 200°, wooden coffin, head compartment with 6 ceramic vessels inside, 4 metal weapons in coffin, layer of white clay above coffin, grey-brown top-soil above

M3: 2.38 x 0.82 x 2.4 m, 205°, wooden coffin, head compartment with 5 ceramic vessels inside, layer of white clay above coffin, grey-brown top-soil above

M4: 2.3 x 0.75 x 2.5 m, 210°, wooden coffin, head compartment with 4 ceramic vessels inside, 2 metal weapons in coffin, layer of white clay above coffin, grey-brown top-soil above

M5: 2.5 x 0.84 x 3.25 m, 212°, wooden coffin, head compartment with 15 ceramic vessels and 5 wooden objects inside, 1 bronze weapon, 1 turquoise bead, 1 ceramic vessel, and 4 wooden objects in coffin, layer of white clay above coffin, grey-brown top-soil above

M6: 1.58 x 0.6 x 2 m, 195°, 4 ceramic vessels

M7: 2.45 x 0.95 x 1.75 m, 210°, wooden coffin, head compartment with 5 ceramic vessels, 2 bronze weapons in coffin

M8: 1.75 x 0.65 x 1.67 m, 198°, wooden coffin, 2 bronze weapons

M9: 2.1 x 0.82 x 2.2 m, 220°, wooden coffin, 5 ceramic vessels, 1 bronze ornament

M10: 2.1 x 0.85 x 2.45 m, 210°, wooden coffin, 4 ceramic vessels inside

M11: 1.75 x 0.56 x 1.1 m, 216°, 1 ceramic vessel inside

Ceramic objects: 53 objects, mainly brown sand-tempered and grey clay-pottery, many with one or two handles, some with water-ripple pattern on shoulders or impressed leaf-vein pattern on the bottom

M1: 3 grey clay-pottery *guan* beaker

M2: 6 *guan* beaker (2 double-handled, 3 single-handled, 1 without handles), mainly red or brown sand-tempered, 1 double-handled beaker made of grey clay-pottery

M3: 2 single- and 3 double-handled *guan* beaker of grey clay-pottery

M4: 1 single- and 2 double-handled *guan* beaker of grey clay-pottery, 1 single-handled *guan* beaker of brown sand-tempered pottery

M5: 9 single-handled and 5 double-handled *guan* beaker, 2 *guan* beaker without handles, all of grey clay-pottery except for one beaker without handles

M6: 4 single-handled *guan* beakers, 2 of them grey clay-potter, 1 red and 1 brown sand-tempered pottery

M7: 5 *guan* beakers, 2 single-handled, 1 double-handled, 2 without handles, all grey clay-pottery except for 1 beaker without handles

M9: 3 *guan* beaker, 2 of grey clay-pottery, 1 of red sand-tempered pottery, 1 sand-tempered spindle whirl, 1 unidentifiable

M10: 1 single- and 3 double-handled *guan* beaker, the former of brown sand-tempered, the latter 3 of clay-pottery

M11: 1 brown sand-tempered single-handled *guan* beaker

Bronze Objects: 13 bronze objects; *Surface finds*: 3 swords, 1 *fu* axe; *M2:* 1 *fu* axe, 2 *mao* spear-heads, 1 *xiao* knife; *M4:* 1 composite sword, 1 *fu* axe; *M5:* 1 *xiao* knife; *M7:* 1 sword, 1 *fu* axe; *M8:* 1 sword, 1 *mao* spear-head; *M9:* 1 mirror-shaped ornament

Stone Objects: *M5*: 1 turquoise bead

Wooden Objects: *M5*: 1 lid, 1 oval object, 1 footed bowl, 2 arrowheads, 2 quiver, 1 long stick, 1 spoon

Suggested Date: Bronze Age, middle Warring States

Suggested Relative Date: ≈ Yunnan Xianyun Dabona, Deqin Nagu > Daxingzhen > Chuxiong Wanjiaba, upper Minjiang stone-construction graves, Xide Lake megalithic graves

Suggested Cultural Affiliation: Erhai Bronze Age Culture

Ninglang Jinyangcun 寧蒗彝族自治縣金鍚村 (YJY) [124]

Type: settlement site

Status: surveyed

Reliability Index: 2.5

Location: on the northern side of Jinyang Village, Xichuan Township, Ninglang Yi Autonomous County, Yunnan Province 雲南省寧蒗彝族自治縣西川鄉金錫村

Morphology: on terrace, level, 2880 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: surface collections in the 1950s

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Surface finds: 15 polished stone tools: 5 *fu* axes, 3 *ben* adzes, 2 *zao* chisel, 5 net weights; objects made of ram's horns and deer antler, bone *chui* hammers and *zhen* needles

Suggested Date: Neolithic

Ninglang Kaijicun 寧蒗彝族自治縣開基村 (YKJ) [125]

Type: settlement site

Status: surveyed

Reliability Index: 2.5

Location: south of Kaiji Village, Shuining Township, Ninglang Yi Autonomous County, Yunnan Province 雲南省寧蒗彝族自治縣水寧鄉開基村水寧鄉開基村

Morphology: on terrace, level, 3775 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: surveyed in the 1950s and 60s

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Surface finds: large number of stone *ben* adzes, *fu* axes, and net weights

Suggested Date: Neolithic

Ninglang Pijiangcun 寧蒗彝族自治縣皮匠村 (YPJ) [126]

Type: settlement site

Status: surveyed

Reliability Index: 2.5

Location: Pijiang Village, Yongning Township, Ninglang Yi Autonomous County, Yunnan Province 雲南省寧蒗彝族自治縣永寧鄉皮匠村

Morphology: on terrace, level, 2954 m asl

Researchers: Chengdu Wenwu Kaogu Yanjiusuo 成都文物考古研究所, Liangshan Yizu Zizhizhou Bowuguan 涼山彝族自治州博物館, Xichangshi Wenwu Guanlisuo 西昌市文物管理所

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: surface collection in 1958

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Surface finds: 28 polished stone tools (long-oval *fu* axes, perforated *dao* knives), *guan* beakers with broad band-handles

Suggested Date: Neolithic to Bronze Age

Suggested Cultural Connection: megalithic graves

3.3 Yongsheng County 永勝縣

Yongsheng Duizi 永胜堆子遗址 (YDZ) [260]

Type: settlement site, stone-construction graves, earth-pit graves, urn graves

Status: excavated, unpublished

Reliability Index: 3.5

Location: Duizi Taoyuan Village, Taoyuan Township, Yongsheng County, Yunnan Province 雲南省永勝縣濤源鄉濤源村

Morphology: first-level terrace, level, 1203 m asl

Surface Area: unclear

Natural and Man-Made Environment: on the left bank of the Jinshajiang, on the first-level terrace; on grounds of local elementary school; plantations of Longan trees 龙眼树

State: much modern disturbance

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所, Lijiangshi Bowuyuan 麗江市博物院, Lijiangshi Yongshengxian Wenwu Guanlisuo 麗江市永勝縣文物管理所

Research: discovered in 1973, surveyed during Second National Culture Survey 1981-1985, rescue excavation in 2010 (electric station to be built there); excavation area oriented along North-South axis

Storage: Lijiangshi Yongshengxian Wenwu Guanlisuo 麗江市永勝縣文物管理所

Data Sources: unpublished, information from power-point presentation given in Chongqing in 12/2010, data collection 04/2011

Site Description: 1 m cultural layers, 4 layers distinguished and ascribed to 4 phases

Internal Chronology: 1. phase represented by layer 4, 2. phase represented by early earth-pit graves M2, 10, 17, 55, 58, 59, 62, 85 and house remains F1, 7, 8, 9, 12, 3. phase represented by layer 3, 4. phase represented by stone-construction graves M11, 12, 15, 16, 57, 131, megalithic (?) graves M1, 77, 91, 106, 139, urn graves M23, 32, 37, 39, 40, 47, 48, 49, 66, 96, 97, 102, 123, 127, 134, late earth-pit graves M71, 88

Description Layers:

Layer4: all throughout the site, dense fine yellow earth, 0-0.5 m thick, some small red-baked earth pellets, not many objects, below earth-pit graves M2, 10, 17, 55, 58, 59, 62, 85 and house remains F1-18

Layer 3: only through part of the site, mainly in NW, loose grey soil, 0-0.4 m thick, mixed with charcoal, red baked earth pellets, many objects; below stone-construction graves M11, 12, 15, 16, 57, 131, stone construction graves M1, 77, 91, 106, 139, urn graves M23, 32, 37, 39, 40, 47, 48, 49, 66, 96, 97, 102, 123, 127, 134, earth-pit graves M71, 88

Features: 18 building features, 140 graves (earth pit, stone cist, stone structure graves, and urn burials), 30 ash pits, mainly round and oval, some with large amounts of amorphous red-baked earth beds

early earth-pit graves M2, 10, 17, 55, 58, 59, 62, 85 all opening below layer 3 or 2, cutting into layer 4 or virgin soil; rectangular, North-South oriented, filled with dense yellow-brown solid, mixed with pellets of red-baked earth, 7 covered with stone slates; *guan* beakers, *bo* bowls, *hu* ewers, bone hairpins, finger- and earrings

M2: earth-pit grave with several stone slates as cover, supine extended burial, head in the north, 2 *guan* beaker, 2 *bo* bowls, 2 *hu* ewer, 1 bone hairpin, 1 bone *huan* bracelet and other objects

M10: few scattered bones, probably secondary burial, 2 *guan* beaker, 3 *bo* bowls, 1 *hu* ewer, 3 bone hairpin, 1 bone *huan* bracelet and other objects

M17: irregular grave form, very few bones, probably secondary burial, 6 *guan* beaker

M55: on bottom irregularly placed stone slates, head in the north, supine extended burial, 7 *guan* beaker, 2 *bo* bowls, 1 *hu* ewer and other objects

M58: irregular stone slates as cover, head towards the North, extended supine primary burial, 1 *hu* ewer and 2 *guan* beakers at foot

M59: head towards the North, supine extended burial, 9 *guan* beakers, mainly in the foot area, 1 in hip region, 1 next to head, 1 *hu* ewer, 1 *bo* bowl also in foot region, some other objects on hip and chest

M62: head towards the North, supine extended burial, 1 *hu* ewer and 1 *bo* bowl at feet, 2 bone hair-pins in head area, 2 bone rings at hands

M85: head towards the North, supine extended burial, 43+ objects, 23 ceramic objects (*guan* beaker, *bo* bowls, *hu* ewer), shell ornaments and other objects

house features F1-18: opening below layer 3 or 2, cutting into layer 4 or virgin soil, 1 stilt house with number of regular round post holes, other semi-subterranean, the latter, rectangular with round corners, 10-30 cm preserved height, walls and floor made of red-baked earth with surfaces sintered 3 cm deep, in the middle each two round post holes aligning with the direction of the house, around the house further less regular post holes

stone-construction graves M11, 12, 15, 16, 57, 131: rectangular, natural stone slates placed along the walls and on the floor, also covering stones, but some disturbed and cover missing; mainly East-West oriented, sometimes a little slanted towards the South; mainly secondary burials of up to over 10 people, M11 primary double burial, M12 primary and secondary burial in one grave; *guan* beakers, mainly double- and single-handled, stemmed *dou* bowls, bronze *zhuo* bracelets, *ling* bells, iron objects, cowrie shells, turquoise beads

stone construction graves M1, 77, 91, 106, 139: oriented in East-West direction, using large natural stones to build the walls of the graves; 1. *knife-handle shaped type (e.g. M1):* rectangular grave pit and access ramp on one short side, mainly secondary burials with small number of skull, limb and rib bones; small double-handled ceramic *guan* beakers and spindle whorls; 2. *rectangular type (e.g. M77, 91, 94, 106, 139):* bottom covered with stone slates, stone slate as cover if not disturbed; objects mainly single- and double-handled ceramic *guan* beakers and spindle whorls, bronze *dao* knives, *jian* swords, *mao* spear heads, *zu* arrowheads, personal ornaments, turquoise beads, cowrie shells, bone ornaments

Urn graves M23, 32, 37, 39, 40, 47, 49, 66, 96, 97, 102, 123, 124, 127, 134: oriented in East-West direction, *1. single-urn horizontal deposition (M37, 40, 102)*: pits roughly oval, urns mainly *guan* jars with or without two handles, opening of the vessels sometimes closed with stone slate, in the vessels infant bones, *2. single-urn vertical deposition (M40, 47, 102)*: pits roughly oval, urns mainly in urns mainly *guan* jars or *fu* caldrons, vessel opening usually covered with a stone slate, often double-handled *guan* jars as burial goods; *3. double-urn vertical deposition (M23. 96, 97)*: pits oval, urns mainly *guan* jars opening often covered with stone slate, often double-handled *guan* jars as burial goods; *4. two urns placed mouth to mouth (M32, 66, 124, 127, 140)*: roughly oval, usually one small and one large *guan* jar placed mouth to mouth, some with two handles, some without handles, burial goods mainly *guan* jars with or without a single handle, in M134 stemmed *dou* bowl, in most urns bones of infants, in some personal ornaments like bronze *zhuo* bracelets and turquoise ornaments

Late earth-pit graves (M71, 88): rectangular, oriented in East-West direction, sometimes a little slanted towards the south, only few or no burial goods, some *guan* beakers, bronze objects, and turquoise ornaments

<u>Ceramic Objects:</u> large amount of *guan* jars and beakers, *bo* bowls, *hu* ewers, *fu* cauldrons, spindle whorls and other objects

Layer 4: mainly grey sand-tempered ceramic sherds, largely decorated with fine corded ware, small number undecorated or with net pattern or application bands, wide vessel openings, flat bottoms

Layer 3: many objects, mainly undecorated grey sand-tempered pottery, *guan* jars and beakers, stemmed *dou* bowls, and spindle whorls most common

<u>Stone Objects:</u> large amount of *fu* axes, *ben* adzes, *zao* chisels, *zhen* needles, *dao* knives, *yue* battle-axe, *zu* arrowheads, *bi* disks, *huan* and *zhuo* bracelets, *lishi* grinding stones, polishing stones

Layer4: some *fu* axes, *ben* adzes, *zao* chisels

Layer 3: many objects, *fu* axes, *ben* adzes, *zao* chisels, *zhen* needles, halfmoon-shaped *dao* knives, *zu* arrowheads, *bi* disks, *huan* and *zhuo* bracelets, polishing stones

Bronze Objects: *dao* knives, *jian* swords, *mao* spear heads, *zu* arrowheads, *ling* bells, *zhen* needles, fish hooks, *zhuo* bracelets and other personal ornaments

Layer 3: few *zhen* needles and bronze fragments

Bone Objects: earrings, fingerings, *zan* hair needles, *zhui* cones and other ornaments

Layer4: few *zhui* cones

Layer 3: few *zhui* cones and other ornaments

Other Objects: a small amount of iron objects, tooth and shell ornaments, cowrie shells

Suggested Date: late Neolithic to Wang Mang

Yongsheng Haiyancun 永勝縣海沿村 (YHC) [261]

Type: settlement site

Status: surveyed

Reliability Index: 3

Location: East of Haiyan Village, Chenghai Township, Yongsheng County, Yunnan Province 雲南省永勝縣程海鄉海沿村

Morphology: on mountain slope, 1519 m asl

Surface Area: 5000 m^2

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: surface collections in 1983

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: on eastern slope of Majun River 馬駿河, 0.7-1.5 m of cultural layers, 2 layers

Surface finds: grey-black sand-tempered ceramics, single-handled *guan* beakers, bowls, mainly undecorated, some corded ware and fishbone pattern; *fu* axes, 20 scrapers, polishing stones

Suggested Date: late Neolithic to Bronze Age

Suggested Cultural Connections: megalithic graves

Yongsheng Laoying 永胜老營箐銅器出土點 (YLY) [262]

Type: single find (probably from graves)

Status: surveyed

Reliability Index: 2

Location: Machong Village, Lianguan Township, Yongsheng County, Yunnan Province 雲南省永勝縣梁官鎮麻沖村

Morphology: in mountain valley, 1588 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: discoveries in spring 1984 and June 1990

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: level ground, close to lake

Surface finds: bundle of 20 much corroded bronze swords discovered 0.6-0.8 m below the surface, on surface 1 bronze *fu* cauldron, 1 *zhuo* bracelet and 5 ceramic *guan* beaker

Suggested Date: Bronze Age

Yongsheng Longtan 永胜龍潭銅器出土點 (YLZ) [263]

Type: single find (probably from graves)

Status: surveyed

Reliability Index: 2

Location: Ruiguan Village, Jinguan Township, Yongsheng County, Yunnan Province 雲南省永勝縣金官鎮芮官村

Morphology: in mountain valley, 1604 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: discoveries in 1956

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: level ground, close to Longtan water reservoir 龍潭水庫

Surface finds: 300 bronze object (them swords, *ge* halberds, *mao* spear-heads, *yue* and *fu* axes, *chu* hoes, composite swords and *mao* spear-heads, iron *mao* spear-heads), ceramic *guan* beaker

Suggested Date: Bronze Age

Yongsheng Lujiajie 永勝縣陸傢界 (YLJ) [264]

Type: settlement site

Status: surveyed

Reliability Index: 3

Location: Lujiajie, Jinguan Township, Yongsheng County, Yunnan Province 雲南省永勝縣金官鎮陸傢界

Morphology: on mountain slope, 1609 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: surface collections in October 1989

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: settlement layers 0.6-0.8 m below the surface

Surface finds: grey, red, and brown sand-tempered and fine ware, mainly undecorated, some fish-bone and awl decoration; 1 crescent-shaped perforated *dao* knife, 1 d-shaped *dao* knife

Suggested Date: Neolithic

Yongsheng Qiaodiping 永胜蕎地坪(YQD) [265]

Type: stone-construction grave site

Status: surveyed

Reliability Index: 2

Location: South of Hekou Village, Chenghai Township, Yongsheng County, Yunnan Province 雲南省永勝縣程海鄉河口村

Morphology: on mountain-slope, 2839 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: discovered in 1985

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: ground level, very close to lake, grave 0.5 m below surface

Features: 1 rectangular grave 0.5 m below surface, coarse unworked stones for walls, coarse stone for cover, no stone for floor

Ceramic Objects: spindle whorls

Bronze Objects: arrowheads, head decoration

Suggested Date: Bronze Age

Yongsheng Sankuaishi 永勝縣三塊石 (YSK) [266]

Type: settlement site

Status: surveyed

Reliability Index: 3

Location: Xinhua Village, Lianguan Township, Yongsheng County, Yunnan Province 雲南省永勝縣梁官鎮新華村

Morphology: on mountain slope, 1876 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: surface collections in February 1988

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: East of village, on foot of the mountain, settlement layers 1 m below surface

Surface finds: 2 polished trapezoidal *fu* axes and *ben* adzes, 2 d-shaped *dao* knives, 1 loom weight

Suggested Date: Neolithic

Yongsheng Taoyingcun 永勝縣陶營村 (YTY) [267]

Type: cave site

Status: surveyed

Reliability Index: 3

Location: North of Taoying Village, Taoyuan Township, Yongsheng County, Yunnan Province 雲南省永勝縣濤源鄉陶營村

Morphology: on mountain slope, 2676 m asl, in cave

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: surface collections in February 1973

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: on the northern bank of the Jinshajiang, located in a cave

Surface finds: polished *fu* axes and *ben* adzes

Suggested Date: Neolithic

Yongsheng Yanjiaqing 永胜嚴傢箐銅鼓出土點 (YYJ) [268]

Type: single find (probably from graves)

Status: surveyed

Reliability Index: 1.5

Location: Junhe Village Number 6, Jinguan Township, Yongsheng County, Yunnan Province 雲南省永勝縣金官鎮軍河鄉六村

Morphology: in mountain valley, 1571 m asl

Researchers: Yunnansheng Wenwu Kaogu Yanjiusuo 雲南省文物考古研究所

Research: in April 1986 2 bronze drums discovered by peasants, about 0. 6 m below surface, together with 2 bronze *bei* cups, bronze decorative items, ceramic *guan* beaker and other objects, probably from one or several graves

Storage: unknown

Data Sources: Zhongguo and Yunnansheng 2001

Site Description: north of Yanjiaqing 嚴傢箐, on level ground, close to lake

Ceramic Objects: *guan* beaker

Bronze Objects: 2 drums, 2 *bei* cups, bronze decorative items

Suggested Date: Bronze Age

Appendix B: Reference Tables

Table 1: Sites by Reference Number and Name. Accuracy Refers to the Precision of Location on the Map

Number	ID	Name	Accuracy	Site type
1	DAR	Dechang Arong	5	Grave site
2	DAX	Dechang Ayong	2	Grave site
3	DAU	Dechang Ayue	5	Grave site
4	DCZ	Dechang Cizhuiping	2	Grave site
5	DDB	Dechang Daba	2	Grave site
6	DCB	Dechang Dachangba	2	Grave site
7	DDG	Dechang Dashipai Graves	5	Grave site
8	DDS	Dechang Dashipai Settlement	5	Settlement site
9	DDM	Dechang Dianma	2	Grave site
10	DDP	Dechang Dongjiapo	5	Settlement site
11	DFJ	Dechang Fangjiacun	5	Grave site
12	DGH	Dechang Ganhai	2	Grave site
13	DGD	Dechang Guadi	5	Grave site
14	DGY	Dechang Guoyuan	2	Grave site
15	DHF	Dechang Hejia Fenshan	2	Grave site
16	DHS	Dechang Hejiashan	2	Grave site
17	DHZ	Dechang Hezui	1	Settlement site
18	DHM	Dechang Hongmiao	2	Grave site
19	DHC	Dechang Hongmiaocun	2	Grave site
20	DHJ	Dechang Huangjiaba	2	Grave site
21	DLS	Dechang Liangsanpo	2	Grave site
22	DLJ	Dechang Luojiaba	4	Grave site
23	DMA	Dechang Ma'anzi	2	Grave site
24	DML	Dechang Maliliang Zhanbei	2	Grave site
25	DMN	Dechang Maliliang Zhannan	5	Grave site
26	DMB	Dechang Maojiaba	2	Settlement site
27	DMK	Dechang Maojiakan	3	Settlement site
28	DMZ	Dechang Minzhucun	2	Grave site
29	DNB	Dechang Nanhua Baobao	1	Grave site
30	DNH	Dechang Nanhuagong	2	Grave site
31	DSB	Dechang Shaba	1	Grave site
32	DSR	Dechang Shaorenba	5	Grave site
33	DSL	Dechang Shengli	2	Grave site
34	DSJ	Dechang Shuijingwan	2	Grave site
35	DSC	Dechang Shuitangcun	2	Grave site
36	DWP	Dechang Wangjiaping	4	Settlement site
37	DWT	Dechang Wangjiatian	2	Settlement site
38	DWS	Dechang Wangsuo	5	Settlement site
39	DWJ	Dechang Wujia	2	Grave site
40	DXG	Dechang Xiaogao	1	Grave site
41	DXL	Dechang Xiaoliusuo	5	Grave site
42	DXM	Dechang Xiaomiaoshan	4	Grave site
43	DXW	Dechang Xinmin Wujia	1	Grave site
44	DYZ	Dechang Yingzipo	2	Grave site
45	DYX	Dechang Yongxing	5	Grave site
46	DYJ	Dechang Yuejin	2	Grave site
47	DZJ	Dechang Zhangjiaba	2	Grave site
48	HDS	Huidong Dashanbao	2	Settlement site
49	HLW	Huidong Liujiawan	2	Settlement site

50	HDG	Huili Dachonggou	2	Settlement site
51	HDZ	Huili Dazhaizi	4	Settlement site
52	HDJ	Huili Dongzui	4	Settlement site
53	HFJ	Huili Fenjiwan Stonecist Graves	4	Grave site
54	HFS	Huili Fenjiwan	4	Settlement and grave site
55	HGU	Huili Gong'anju (Huili94)	0	Single find
56	HGS	Huili Guantianshan/Yingpanshan	1	Settlement and grave site
57	HGJ	Huili Guojiabao	5	Settlement and grave site
58	HGY	Huili Guoyuan (Huili drum 4)	1	Single find
59	HHT	Huili Hedongtian	5	Grave site
60	HHK	Huili Hekoucun	1	Single find
61	HHW	Huili Hewanwan	0	Settlement site
62	HZD	Huili Houzidong	5	Settlement and grave site
63	HHS	Huili Hunshuitang	4	Settlement site
64	HJM	Huili Jinmei	2	Settlement site
65	HKP	Huili Kangzipo	1	Settlement site
66	HLJ	Huili Leijiashan	4	Grave site
67	HLT	Huili Liantang	5	Settlement site
68	HLL	Huili Luoluochong (Huili drum 3)	1	Object pit
69	HML	Huili Miaozi Laobao	5	Grave site
70	HPL	Huili Puling	1	Grave site
71	HQB	Huili Qiaobo	5	Settlement site
72	HRJ	Huili Raojiadi	5	Settlement site
73	HSJ	Huili Shenjiafen	2	Settlement site
74	HTJ	Huili Tangjiaba	1	Settlement and grave site
75	HTP	Huili Tangjiapo	2	Grave site
76	HTC	Huili Tianbacun	5	Settlement site
77	HWT	Huili Washitian	2	Settlement and grave site
78	HWH	Huili Wuhuangqing	2	Grave site
79	HXA	Huili Xiao'aozi	4	Settlement site
80	HXS	Huili Xiaotuanshan Graves	4	Grave site
81	HXT	Huili Xiaotuanshan Settlement	4	Settlement site
82	HXP	Huili Xiaoyingpan	3	Grave site
83	HXC	Huili Xicaodi	2	Grave site
84	HYW	Huili Yangjia Wuji	2	Settlement site
85	HYX	Huili Yimen Xiacunxiang	1	Single find
86	HYP	Huili Yingpanshan	2	Grave site
87	HYB	Huili Yuanbaoshan	5	Settlement site
88	HYS	Huili Yunshancun	2	Grave site
89	HZC	Huili Zhuanchangba	2	Object pit
90	JMG	Jinyang Munagou	2	Settlement site
91	LYB	Luquan Yingpanbao	3	Grave site
92	MAB	Meigu Azu Bugu	2	Grave site
93	MJJ	Meigu Jiukou Jiaogu	2	Grave site
94	MSW	Meigu Shengdu Wage	5	Grave site
95	MWG	Meigu Wagujue Cunnan	2	Grave site
96	MWC	Meigu Wagujue Dongbei	2	Grave site
97	MWB	Meigu Wagujue Dongnan I	2	Grave site
98	MWD	Meigu Wagujue Dongnan II	2	Grave site
99	MWT	Meigu Wagujue	2	Grave site
100	MBB	Mianning Beishanba	2	Grave site
101	MCG	Mianning Chengguan	1	Grave site

102	MGP	Mianning Gaopo	5	Settlement site
103	MGW	Mianning Gaopo Wanwan	3	Settlement site
104	MHJ	Mianning Huijiazui	5	Settlement site
105	MMW	Mianning Manshuiwan	4	Grave site
106	MMS	Mianning Miaoshan	2	Settlement site
107	MRS	Mianning Ruoshuicun	2	Grave site
108	MST	Mianning Sanfentun	5	Settlement site
109	MSK	Mianning Sankuaishi	2	Grave site
110	MSL	Mianning Songlin Laojie	1	Grave site
111	MWJ	Mianning Wenjiatun	1	Settlement site
112	MXS	Mianning Xiangshi	5	Grave site
113	MXG	Mianning Xiaogoudi	2	Grave site
114	MZJ	Mianning Zhaojiawan	5	Settlement site
115	MHB	Miyi Hejiaba	2	Settlement site
116	MLG	Miyi Lianhua Gongshe	1	Settlement site
117	MSJ	Miyi Sanjingxiang	2	Grave site
118	MTB	Miyi Tianba	2	Grave site
119	MWQ	Miyi Wanqiu	2	Grave site
120	MYJ	Miyi Yuanjiabao	2	Settlement site
121	MZS	Miyi Zhaizishan	1	Settlement site
122	NDX	Ninglang Cunyi	2	Single find
123	NJY	Ninglang Daxingzhen	2	Grave site
124	NKJ	Ninglang Jingyangcun	2	Settlement site
125	NPJ	Ninglang Kaijicun	2	Settlement site
126	NCY	Ninglang Pijiacun	2	Settlement site
127	NHG	Ningnan Heinigou	5	Settlement site
128	NTW	Ningnan Tangjiawan	5	Settlement site
129	PAM	Puge Amucun	2	Grave site
130	PHP	Puge Heping	2	Grave site
131	PKL	Puge Kangli	1	Settlement site
132	PTB	Puge Tianba	2	Settlement site
133	PTT	Puge Tuantian	2	Settlement site
134	PWL	Puge Wadaluo	2	Settlement and grave site
135	PXC	Puge Xiaoxingchang	2	Settlement and grave site
136	PZC	Puge Zhongcun	2	Settlement site
137	RBH	Renhe Baihushan	2	Grave site
138	RBG	Renhe Baila Gucun	2	Grave site
139	RGH	Renhe Gonghe	2	Settlement and grave site
140	RHD	Renhe Huilongwa Cave	2	Settlement site
141	RXW	Renhe Xiawan	2	Settlement site
142	RXP	Renhe Xicaoping	2	Settlement site
143	RYJ	Renhe Yangjiashan	2	Settlement site
144	XBB	Xichang Bahe Baozi	2	Settlement and grave site
145	XBJ	Xichang Baijiazhai	2	Grave site
146	XBS	Xichang Beishan	2	Graves site and object pits
147	XBT	Xichang Bengtukan	2	Settlement site
148	XCC	Xichang Changcun	2	Grave site
149	XCY	Xichang Chenyuancun	2	Grave site
150	XDA	Xichang Dabaobao	2	Grave site
151	XDB	Xichang Dabaozi	5	Grave site
152	XDC	Xichang Dacaoba	2	Grave site
153	XDL	Xichang Damaliu	2	Settlement site

154	XDN	Xichang Daniba	1	Settlement site
155	XDS	Xichang Dashiban	2	Grave site
156	XDY	Xichang Dayangdui	5	Settlement, graves, object pits
157	XDP	Xichang Dongping	5	Smelting site
158	XDM	Xichang Dongyuemiao	2	Settlement site
159	XGJ	Xichang Guanjiashan	2	Settlement site
160	XGS	Xichang Guanshan	2	Settlement and grave site
161	XGH	Xichang Guihuacun	2	Grave site
162	XHS	Xichang Henglanshan	5	Grave site
163	XHG	Xichang Hexi Gongshe	2	Grave site
164	XHQ	Xichang Hongqi	2	Grave site
165	XHT	Xichang Huangshuitang	4	Grave site
166	XJB	Xichang Jiangjiabao	2	Settlement site
167	XJX	Xichang Jianxin	2	Grave site
168	XLG	Xichang Liguoshan	2	Grave site
169	XLJ	Xichang Lijiagou cun	2	Grave site
170	XLZ	Xichang Lizhou	5	Settlement and grave site
171	XLS	Xichang Luzhuishan	2	Grave site
172	XMS	Xichang Ma'anshan	5	Settlement and grave site
173	XMH	Xichang Mahuangkan	1	Settlement site
174	XMT	Xichang Majialin	2	Smelting site
175	XML	Xichang Maliucun (Zhaoshanbei)	5	Settlement and grave site
176	XMM	Xichang Maomaoshan	5	Settlement and grave site
177	XMI	Xichang Mimilang	5	Settlement and grave site
178	XNT	Xichang Nantan	2	Smelting site
179	XQG	Xichang Qimugou	5	Settlement, graves, object pits
180	XJJ	Xichang Qujia Laokan	1	Grave site
181	XRS	Xichang Reshuitang West	2	Grave site
182	XSH	Xichang Sanhe	1	Settlement site
183	XSJ	Xichang Shajiapo	2	Grave site
184	XSX	Xichang Shangxiang	2	Grave site
185	XST	Xichang Shantou	1	Settlement site
186	XSK	Xichang Shaojia Gaokan	1	Settlement site
187	XSB	Xichang Shijia Baozi	5	Grave site
188	XSZ	Xichang Shizuizi	2	Grave site
189	XSG	Xichang Shuanggudui	2	Grave site
190	XTS	Xichang Tanshan	2	Settlement site
191	XTC	Xichang Tianbacun	2	Grave site
192	XTH	Xichang Tianwangshan	5	Settlement and grave site
193	XTE	Xichang Tuanbao	5	Grave site
194	XTU	Xichang Tuanshanbao	2	Settlement site
195	XTB	Xichang Tu'ershan	1	Settlement site
196	XWN	Xichang Wanao	4	Grave site
197	XNG	Xichang Wuguishan	2	Grave site
198	XXH	Xichang Xiaohuashan	2	Settlement and grave site
199	XXG	Xichang Xiaojia Gaokan	2	Settlement site
200	XXJ	Xichang Xijiao Gongshe	2	Grave site
201	XXS	Xichang Xingsuo	2	Grave site
202	XXC	Xichang Xinxingcun	2	Grave site
203	XXY	Xichang Xinying	2	Grave site
204	XXX	Xichang Xixicun	2	Grave site
205	XYG	Xichang Yangjiashan	2	Settlement and grave site

206	XYJ	Xichang Yanjiashan	2	Grave site
207	XYS	Xichang Yangshanpo	2	Settlement site
208	XYZ	Xichang Yezhugou	2	Grave site
209	XYP	Xichang Yingpanshan	5	Settlement, graves, object pits
210	XYU	Xichang Yuanjiashan	2	Grave site
211	XYD	Xichang Yunduanshan	2	Grave site
212	XZJ	Xichang Zengjiabao	2	Settlement site
213	XZF	Xichang Zhengjiafen	2	Grave site
214	XZP	Xichang Zhongguanpo	1	Settlement site
215	XZS	Xichang Zhongjia Shanzui	2	Settlement site
216	XGQ	Xide Guluqiao	5	Grave site
217	XGY	Xide Guoyuancun	2	Grave site
218	XLK	Xide Lake Sihe	5	Grave site
219	XLF	Xide Lanfenba	2	Grave site
220	XLN	Xide Laoniuchang	2	Grave site
221	XQL	Xide Qingli	1	Grave site
222	XWD	Xide Wadegu	2	Settlement and grave site
223	XWM	Xide Wamu	2	Settlement site
224	XWJ	Xide Wenjiaba	2	Grave site
225	XWH	Xide Wuhe	5	Grave site
226	XYW	Xiqu Yanwan	2	Settlement site
227	YHM	Yanbian Huimin	1	Grave site
228	YPC	Yanbian Pulongcun	1	Grave site
229	YXD	Yanbian Xicaodi	1	Grave site
230	YXL	Yanbian Xinlin	2	Settlement site
231	PYX	Yanbian Yongxing	1	Grave site
232	YYW	Yanbian Yumen Wanxiao	2	Settlement and grave site
233	YBG	Yanyuan Bei Ganhaixiang	2	Grave site
234	YBS	Yanyuan Boshucun	2	Grave site
235	YCJ	Yanyuan Caojiawan	2	Grave site
236	YGH	Yanyuan Ganhai Sandadui	1	Settlement site
237	YGS	Yanyuan Gesa	2	Grave site
238	YGJ	Yanyuan Gong'anju	0	Single find
239	YHT	Yanyuan Haimatang	2	Grave site
240	YJD	Yanyuan Jiaodingshan	2	Settlement and grave site
241	YBI	Yanyuan Jiejiafen	2	Grave site
242	YLL	Yanyuan Laolongtou	5	Grave site
243	YLW	Yanyuan Luowa	2	Grave site
244	YMB	Yanyuan Maojiaba	2	Grave site
245	YMY	Yanyuan Meiyu Bacun Sanzu	5	Grave site
246	YNH	Yanyuan Meiyuzhen	2	Smelting site
247	YMZ	Yanyuan Nanbianhe	2	Grave site
248	YTL	Yanyuan Tangguan Liandi	2	Grave site
249	YTS	Yanyuan Tangshidi	2	Grave site
250	YWM	Yanyuan Wuming Baobao	2	Grave site
251	YWQ	Yanyuan Wuqiu	2	Settlement site
252	YWS	Yanyuan Wushidi II	2	Grave site
253	YBIII	Yanyuan Wushidi III	2	Grave site
254	YXG	Yanyuan Xiaoguan Liangzi	2	Settlement and grave site
255	YXH	Yanyuan Xiaohebian	2	Grave site
256	YXF	Yanyuan Xifan	2	Settlement site
257	YYN	Yanyuan Yingpanshan (North)	2	Settlement and grave site

258	YYS	Yanyuan Yingpanshan (South)	2	Settlement and grave site
259	YZS	Yanyuan Zhushiba	2	Grave site
260	YDZ	Yongsheng Duizi	4	Settlement, graves, object pits
261	YHC	Yongsheng Haiyancun	2	Settlement site
262	YLY	Yongsheng Laoying	2	Single find
263	YLZ	Yongsheng Longtan	2	Single find
264	YLJ	Yongsheng Lujiajie	2	Settlement site
265	YQD	Yongsheng Qiaodiping	2	Grave site
266	YSK	Yongsheng Sankuaishi	2	Settlement site
267	YTY	Yongsheng Taoyingcun	2	Settlement site
268	YYJ	Yongsheng Yanjiaqing	2	Grave site
269	YYH	Yuexi Huayang	2	Grave site
270	YLS	Yuexi Liaojiashan	2	Grave site
271	YQS	Yuexi Qu'ershan	5	Grave site
272	YWJ	Yuexi Wajimu	2	Grave site
273	ZAB	Zhaojue Ada Bobu	5	Grave site
274	ZBE	Zhaojue Bagu Erjue	1	Grave site
275	ZBK	Zhaojue Bakeku cun	1	Grave site
276	ZCB	Zhaojue Chike Boxixiang	1	Grave site
277	ZDG	Zhaojue Daba Gongshe	1	Grave site
278	ZDZ	Zhaojue Dabaozi Geze	5	Grave site
279	ZDD	Zhaojue Da'edou Gezi	5	Grave site
280	ZDQ	Zhaojue Dawenquan	1	Grave site
281	ZDC	Zhaojue Dipo Cier	2	Grave site
282	ZJE	Zhaojue Eba Buji Shigaimu	5	Grave site
283	ZJE	Zhaojue Eba Buji Shiguanmu	5	Grave site
284	ZEK	Zhaojue Erba Keku	2	Grave site
285	ZEZ	Zhaojue Ergu Zege	5	Grave site
286	ZEW	Zhaojue Erwu	2	Grave site
287	ZFC	Zhaojue Fuchengqu	1	Grave site
288	ZGY	Zhaojue Geze Yangpeng	5	Grave site
289	ZHQ	Zhaojue Haba Qiehe	5	Grave site
290	ZHY	Zhaojue Hangan Yide	5	Grave site
291	ZHB	Zhaojue Hebo	4	Settlement site
292	ZHL	Zhaojue Heiluo	5	Grave site
293	ZLY	Zhaojue Jike Jiejue (also: Layimu)	4	Grave site
294	ZJN	Zhaojue Jinzi Niaobu	3	Grave site
295	ZJT	Zhaojue Juntun	5	Settlement site
296	ZKW	Zhaojue Keri Watuo	2	Grave site
297	ZKE	Zhaojue Kujia Ebu	5	Grave site
298	ZME	Zhaojue Machu Nawo	2	Grave site
299	ZMC	Zhaojue Mucuo Naijie	5	Grave site
300	ZMK	Zhaojue Muergguo	2	Grave site
301	ZMJ	Zhaojue Mujueke	2	Grave site
302	ZNT	Zhaojue Naituo	2	Grave site
303	ZNP	Zhaojue Niaopo	1	Grave site
304	ZJP	Zhaojue Pusu Bohuang	5	Grave site
305	ZQJ	Zhaojue Qianjinshe	5	Grave site
306	ZXS	Zhaojue Sikaixiang	2	Single find
307	ZSE	Zhaojue Siyi Ergu	2	Grave site
308	ZTL	Zhaojue Teluocun	1	Grave site
309	ZTW	Zhaojue Tiaowoba	2	Grave site

310	ZWG	Zhaojue Waluo Geci	2	Grave site
311	ZWT	Zhaojue Watuo	2	Grave site
312	ZWS	Zhaojue Wazhaishan	1	Grave site
313	ZYB	Zhaojue Yibijia	5	Grave site
314	ZYG	Zhaojue Yihe Geci	2	Grave site
273	ZAB	Zhaojue Ada Bobu	5	Grave site
274	ZBE	Zhaojue Bagu Erjue	1	Grave site
275	ZBK	Zhaojue Bakeku cun	1	Grave site
276	ZCB	Zhaojue Chike Boxixiang	1	Grave site
277	ZDG	Zhaojue Daba Gongshe	1	Grave site

Table 2 Sites by Site Type

Name	Characters	County	Other features	Number
Grave sites				
Ada Bobu	阿打波補	Zhaojue County		273
Amucun	阿木村	Puge County		129
Arong	阿榮	Dechang County		1
Ayong	阿雍	Dechang County		2
Ayue	阿月	Dechang County		3
Azu Bugu	阿足	Meigu County		92
Bagu Erjue	巴古爾覺	Zhaojue County		274
Bahe Baozi	垻河堡子	Xichang County	Settlement	144
Baihushan	白虎山	Renhe County		137
Baijiazhai	白家寨	Xichang County		145
Baila Gucun	白拉古村	Renhe County		138
Bakeku cun	巴克苦村	Zhaojue County		275
Bei Ganhaixiang	北干海乡	Yanyuan County		233
Beishan	北山	Xichang County		146
Beishanba	北山垻	Mianning County		100
Boshucun	博樹村	Yanyuan County		234
Caojiawan	曹傢灣	Yanyuan County		235
Changcun	長村	Xichang County		148
Chengguan	城関	Mianning County		101
Chenyuancun	陳遠村	Xichang County		149
Chike Boxixiang	齒可波西鄉	Zhaojue County		276
Cizhuiping	茨竹坪	Dechang County		4
Daba	大垻	Dechang County		5
Daba Gongshe	大垻公社	Zhaojue County		277
Dabaobao	大包包	Xichang County		150
Dabaozi	大堡子	Xichang County		151
Dabaozi Geze	大堡子格則	Zhaojue County		278
Dacaoba	大草垻	Xichang County		152
Dachangba	大廠垻	Dechang County		6
Da'edou Gezi	大俄都格則	Zhaojue County		279
Dashiban	大石板	Xichang County		155
Dashipai Graves	大石排	Dechang County		7
Dawenquan	大溫泉	Zhaojue County		280
Daxingzhen	大興鎮	Ninglang County		123
Dayangdui	大洋堆	Xichang County	Settlement and object pits	156

Dianma	點馬	Dechang County		9
Dipo Cier	氐坡此爾	Zhaojue County		281
Duizi	堆子	Yongsheng County	Settlement	260
Eba Buji	俄巴佈吉	Zhaojue County		282
Erba Keku	尔巴克苦	Zhaojue County		284
Ergu Zege	尔姑	Zhaojue County		285
Erwu	二五	Zhaojue County		286
Fangjiacun	方家村	Dechang County		11
Fenjiwan	粪箕湾	Huili County	Settlement	54
Fenjiwan Stone Graves	糞箕灣石棺葬	Huili County		53
Fuchengqu	附城區	Zhaojue County		287
Ganhai	干海	Dechang County		12
Gesa	格撒	Yanyuan County		237
Geze Yangpeng	格則羊棚	Zhaojue County		288
Guadi	瓜地	Dechang County		13
Guanshan	関山	Xichang County	Settlement	160
Guantianshan	觀田山	Huili County	Settlement	56
Guihuacun	桂花村	Xichang County		161
Guluqiao	軲轤橋	Xide County		216
Guojiabao	郭傢堡	Huili County	Settlement	57
Guoyuan	果園	Dechang County		14
Guoyuancun	果園村	Xide County		217
Haba Qiehe	哈巴切合	Zhaojue County		289
Haimatang	海馬塘	Yanyuan County		239
Hangan Yide	汗干依德	Zhaojue County		290
Hedongtian	河東田	Huili County		59
Heiluo	黑洛	Zhaojue County		292
Hejia Fenshan	何家墳山	Dechang County		15
Hejiashan	何傢山	Dechang County		16
Heping	和平	Puge County		130
Hexi Gongshe	河西公社	Xichang County		163
Hongmiao	紅廟	Dechang County		18
Hongmiaocun	紅廟村	Dechang County		19
Hongqi	紅旗	Xichang County		164
Houzidong	猴子洞	Huili County	Settlement	62
Huangjiaba	黃家垻	Dechang County		20
Huangshuitang	黃水塘	Xichang County		165
Huayang	華陽	Yuexi County		269
Huimin	惠民	Yanbian County		227
Jianxin	建新	Xichang County		167
Jiaodingshan	轎頂山	Yanyuan County	Settlement	240
Jiejiafen	解傢墳	Yanyuan County		241
Jike Jiejue	吉克傑覺	Zhaojue County		293
Jinzi Niaobu	金子鳥佈	Zhaojue County		294
Jiukou Jiaogu	九口腳谷	Meigu County		93
Keri Watuo	克日瓦托	Zhaojue County		296
Kujia Ebu	庫家俄佈	Zhaojue County		297
Lake Sihe	拉克公社四合	Xide County		218

Lanfenba	爛墳垻	Xide County		219
Laolongtou	老龍頭	Yanyuan County		242
Laoniuchang	老牛場	Xide County		220
Leijiashan	雷傢山	Huili County		66
Liangsanpo	涼傘坡	Dechang County		21
Liaojiashan	聊家山	Yuexi County		270
Liguoshan	李果山	Xichang County		168
Lijiagou cun	李傢溝村	Xichang County		167
Lizhou	禮州	Xichang County	Settlement	170
Luojiaba	儸家堡	Dechang County		22
Luowa	洛瓦	Yanyuan County		243
Luzhuishan	盧嘴山	Xichang County		171
Ma'anshan	馬鞍山	Xichang County	Settlement	172
Ma'anzi	馬鞍子	Dechang County		23
Machu Nawo	馬処鈉窩	Zhaojue County		298
Malilang Zhanbei	麻栗糧站北	Dechang County		24
Maliliang Zhannan	麻栗糧站南	Dechang County		25
Maliucun	麻柳村	Xichang County	Settlement, object pit	175
Manshuiwan	漫水灣	Mianning County		105
Maojiaba	毛傢垻	Yanyuan County		244
Maomaoshan	帽帽山	Xichang County		176
Meiyu Bacun Sanzu	梅雨八村三組	Yanyuan County		245
Miaozi Laobao	廟子老堡	Huili County		69
Mimilang	咪咪啷	Xichang County	Settlement	177
Minzhucun	民主村	Dechang County		28
Mucuo Naijie	木措乃姐	Zhaojue County		299
Muergguo	木爾果	Zhaojue County		300
Mujueke	莫覺柯	Zhaojue County		301
Naituo	乃托	Zhaojue County		302
Nanbianhe	南边河	Yanyuan County		247
Nanhua Baobao	南華包包	Dechang County		29
Nanhuagong	南華宫	Dechang County		30
Niaopo	鸟坡	Zhaojue County		303
Puling	普隆	Huili County		70
Pulingcun	普隆村	Yanbian County		228
Pusu Bohuang	濮蘓波湟	Zhaojue County		304
Qianjinshe	前進社	Zhaojue County		305
Qiaodiping	蕎地坪	Yongsheng County		265
Qimugou	棲木沟	Xichang County	Settlement and object pits	179
Qingli	清理	Xide County		221
Qu'ershan	雀兒山	Yuexi County		271
Reshuitang West	熱水塘西	Xichang County		181
Ruoshuicun	若水村	Mianning County		107
Sanjingxiang	三井巷	Miyi County		117
Sankuaishi	三塊石	Mianning County		109
Shaba	沙垻	Dechang County		31
Shajiapo	沙家坡	Xichang County		183
Shangxiang	上香	Xichang County		184

Shaorenba	燒人垻	Dechang County		32
Shengdu Wage	聖都瓦各	Meigu County		94
Shengli	勝利	Dechang County		33
Shijia Baozi	施傢堡子	Xichang County		187
Shizuizi	石嘴子	Xichang County		188
Shuanggudui	雙谷堆	Xichang County		189
Shuijingwan	水井灣	Dechang County		34
Shuitangcun	水塘村	Dechang County		35
Siyi Ergu	司益爾古	Zhaojue County		307
Songlin Laojie	松林老街	Mianning County		110
Tangguan Liandi	唐光連地	Yanyuan County		248
Tangjiaba	唐傢垻	Huili County	Settlement	74
Tangjiapo	唐傢坡	Huili County		75
Tangshidi	唐氏地	Yanyuan County		249
Teluocun	特洛村	Zhaojue County		308
Tianba	田垻	Miyi County		118
Tianbacun	田垻村	Xichang County		191
Tianwangshan	天王山	Xichang County	Settlement	192
Tiaowoba	跳窩垻	Zhaojue County		309
Tuanbao	團堡	Xichang County		193
Wadaluo	瓦打洛	Puge County	Settlement, object pit	134
Wadegu	瓦得姑	Xide County	Settlement	222
Wagujue Cunnan	瓦姑覺村南	Meigu County		95
Wagujue Dongbei	瓦姑覺東北	Meigu County		96
Wagujue Dongnan I	瓦姑覺東南 I	Meigu County		97
Wagujue Dongnan II	瓦姑覺東南 II	Meigu County		98
Wajimu	瓦吉木	Yuexi County		272
Waluo Geci	瓦洛格側	Zhaojue County		310
Wanao	窪堖	Xichang County		196
Wangsuo	王所	Dechang County		38
Wanqiu	彎丘	Miyi County		119
Washitian	瓦石田	Huili County	Settlement	77
Watuo	瓦托	Zhaojue County		311
Wazhaishan	瓦寨山	Zhaojue County		312
Wenjiaba	溫傢垻	Xide County		224
Wuguishan	烏龜山	Xichang County		197
Wuhe	伍合	Xide County		225
Wuhuangqing	吳黃箐	Huili County		78
Wujia	吳傢	Dechang County		39
Wuming Baobao	無名包包	Yanyuan County		250
Wushidi II	伍氏地	Yanyuan County		252
Wushidi III	吳氏地	Yanyuan County		253
Xiangshi	响石	Mianning County		112
Xiaogao	小高	Dechang County		40
Xiaogoudi	小溝地	Mianning County		113
Xiaoguan Liangzi	小官梁子	Yanyuan County	Settlement	254
Xiaohebian	小河邊	Yanyuan County		255
Xiaohuashan	小華山	Xichang County	Settlement	198
Xiaoliusuo	小六所	Dechang County		41

Xiaomiaoshan	小廟山	Dechang County		42
Xiaotuanshan Graves	小團山石棺葬	Huili County		80
Xiaoxingchang	小興場	Puge County	Settlement	135
Xiaoyingpan	小營盤	Huili County		82
Xicaodi	蓆草地	Huili County		83
Xicaodi	席草地	Yanbian County		229
Xijiao Gongshe	西郊公社	Xichang County		200
Xingsuo	星宿	Xichang County		201
Xinmin Wujia	新民吳家	Dechang County		43
Xinxingcun	新興村	Xichang County		202
Xinying	新營	Xichang County		203
Xixicun	西溪村	Xichang County		204
Yangjiashan	楊傢山	Xichang County	Settlement	205
Yanjiashan	燕家山	Xichang County		206
Yezhugou	野豬溝	Xichang County		208
Yibijia	依比甲	Zhaojue County		313
Yihe Geci	依合格側	Zhaojue County		314
Yingpanbao	營盤寶	Luquan County		91
Yingpanshan	營盤山	Huili County		86
Yingpanshan	營盤山	Xichang County	Settlement and object pits	209
Yingpanshan (North)	營盤山（北區）	Yanyuan County	Settlement	257
Yingpanshan (South)	營盤山（南區）	Yanyuan County	Settlement	258
Yingzipo	銀子坡	Dechang County		44
Yongxing	永興	Dechang County		45
Yongxing	永興	Yanbian County		231
Yuanjiashan	袁家山	Xichang County		210
Yuejin	躍進	Dechang County		46
Yumen Wanxiao	漁門完小	Yanbian County	Settlement	232
Yunduanshan	云斷山	Xichang County		211
Yunshancun	云山村	Huili County		88
Zhangjiaba	張家壩	Dechang County		47
Zhengjiafen	鄭傢墳	Xichang County		213
Zhushiba	豬屎壩	Yanyuan County		259
Settlement sites				
Bahe Baozi	壩河堡子	Xichang County	Graves	144
Bengtukan	崩土坎	Xichang County		147
Dachonggou	大沖溝	Huili County		50
Damaliu	大麻柳	Xichang County		153
Daniba	大泥壩	Xichang County		154
Dashanbao	大山包	Huidong County		48
Dashipai Settlement	大石排	Dechang County		8
Dayangdui	大洋堆	Xichang County	Graves and object pits	156
Dazhaizi	大寨子	Huili County		51
Dongjiapo	董家坡	Dechang County		10
Dongyuemiao	東嶽廟	Xichang County		158
Dongzui	東咀	Huili County		52

Duizi	堆子	Yongsheng County	Graves	260
Fenjiwan	粪箕湾	Huili County	Graves	54
Ganhai Sandadui	干海三大隊	Yanyuan County		236
Gaopo	高坡	Mianning County		102
Gaopo Wanwan	高坡灣灣	Mianning County		103
Gonghe	共和	Renhe County		139
Guanjiashan	官家山	Xichang County		159
Guanshan	関山	Xichang County	Graves	160
Guantianshan	觀田山	Huili County	Graves	56
Guojiabao	郭傢堡	Huili County	Graves	57
Haiyancun	海沿村	Yongsheng County		261
Hebo	合波	Zhaojue County		291
Heinigou	黑泥溝	Ningnan County		127
Hejiaba	何傢壩	Miyi County		115
Henglanshan	橫欄山	Xichang County		162
Hewanwan	河灣灣	Huili County		61
Hezui	何嘴	Dechang County		17
Houzidong	猴子洞	Huili County	Graves	62
Huijiazui	胡家嘴	Mianning County		104
Huilongwa Cave	回龍灣洞穴	Renhe County		140
Hunshuitang	渾水塘	Huili County		63
Jiangjiabao	蔣傢包	Xichang County		166
Jiaodingshan	轎頂山	Yanyuan County	Graves	240
Jingyangcun	金錫村	Ninglang County		124
Jinmei	金梅	Huili County		64
Juntun	軍屯	Zhaojue County		295
Kaijicun	開基村	Ninglang County		125
Kangli	康利	Puge County		131
Kangzipo	康芓坡	Huili County		65
Lianhua Gongshe	蓮花公社	Miyi County		116
Liantang	蓮塘	Huili County		67
Liujiawan	劉傢灣	Huidong County		49
Lizhou	禮州	Xichang County	Graves	170
Lujiajie	陸傢界	Yongsheng County		264
Ma'anshan	馬鞍山	Xichang County	Graves	172
Mahuangkan	螞蟥坎	Xichang County		173
Maliucun (Zhaoshanbei)	麻柳村	Xichang County	Graves	175
Maojiaba	毛傢壩	Dechang County		26
Maojiakan	毛傢坎	Dechang County		27
Miaoshan	廟山	Mianning County		106
Mimilang	咪咪啷	Xichang County	Graves	177
Munagou	木納溝	Jinyang County		90
Pijiacun	皮匠村	Ninglang County		126
Qiaobo	喬壩	Huili County		71
Qimugou	棲木沟	Xichang County	Graves and object pits	179
Qujia Laokan	瞿家老坎	Xichang County		180
Raojiadi	饒家地	Huili County		72
Sanfentun	三分屯	Mianning County		108

Sanhe	三和	Xichang County		182
Sankuaishi	三塊石	Yongsheng County		266
Shantou	山頭	Xichang County		185
Shaojia Gaokan	肖傢高坎	Xichang County		186
Shenjiafen	沈傢墳	Huili County		73
Tangjiaba	唐傢壩	Huili County	Graves	74
Tangjiawan	唐傢灣	Ningnan County		128
Tanshan	壇山	Xichang County		190
Taoyingcun	陶營村	Yongsheng County		267
Tianba	田坝	Puge County		132
Tianbacun	田壩村	Huili County		76
Tuanshanbao	團山包	Xichang County		194
Tuantian	團田	Puge County		133
Tu'ershan	兔兒山	Xichang County		195
Wadaluo	瓦打洛	Puge County	Graves, object pit	134
Wadegu	瓦得姑	Xide County	Graves	222
Wagujue	瓦姑覺	Meigu County	Settlement	99
Wamu	瓦木	Xide County		223
Wangjiaping	汪傢坪	Dechang County		36
Wangjiatian	王家田	Dechang County		37
Washitian	瓦石田	Huili County	Graves	77
Wenjiatun	文家屯	Mianning County		111
Wuqiu	烏丘	Yanyuan County		251
Xiao'aozi	小凹子	Huili County		79
Xiaoguan Liangzi	小官梁子	Yanyuan County	Graves	254
Xiaohuashan	小華山	Xichang County	Graves	198
Xiaojia Gaokan	肖傢高坎	Xichang County		199
Xiaotuanshan Settlement	小團山	Huili County		81
Xiaoxingchang	小興場	Puge County	Graves	135
Xiawan	下灣	Renhe County		141
Xicaoping	席草坪	Renhe County		142
Xifan	西藩	Yanyuan County		256
Xinlin	新林	Yanbian County		230
Yangjia Wuji	楊傢屋基	Huili County		84
Yangjiashan	楊傢山	Renhe County		143
Yangjiashan	楊傢山	Xichang County	Graves	205
Yangshanpo	羊山坡	Xichang County		207
Yanwan	岩灣（大石包）	Xiqu County		226
Yingpanshan	營盤山	Xichang County	Graves and object pits	209
Yingpanshan (North)	營盤山（北區）	Yanyuan County	Graves	257
Yingpanshan (South)	營盤山（南區）	Yanyuan County	Graves	258
Yuanbaoshan	元寶山	Huili County		87
Yuanjiabao	袁傢寶	Miyi County		120
Yumen Wanxiao	漁門完小	Yanbian County	Graves	232
Zengjiabao	曾傢堡	Xichang County		212

Zhaizishan	寨子山	Miyi County		121
Zhaojiawan	趙家灣	Mianning County		114
Zhongcun	中村	Puge County		136
Zhongguanpo	鉀官坡	Xichang County		214
Zhongjia Shanzui	鉀傢山嘴	Xichang County		215
Single finds				
Cunyi	翠依	Ninglang County		122
Hekoucun	河口村	Huili County		60
Huili Gong'anju	公安局	Huili County		55
Laoying	老營	Yongsheng County		262
Longtan	龍澤	Yongsheng County		263
Sikaixiang	四開鄉	Zhaojue County		306
Yanjiaqing	嚴傢箐	Yongsheng County		268
Yanyuan Gong'anju	鹽源公安局	Yanyuan County		238
Yimen Xiacunxiang	益門下村鄉	Huili County		85
Smelting sites				
Dongping	東坪	Xichang County		157
Majialin	麻家林	Xichang County		174
Meiyuzhen	梅雨鎮	Yanyuan County		246
Nantan	南壇	Xichang County		178
Object pits				
Dayangdui	大洋堆	Xichang County	Settlement and graves	156
Guoyuan	果園鄉	Huili County		58
Luoluochong	羅羅沖	Huili County		68
Maliucun	麻柳村	Xichang County	Settlement and graves	175
Qimugou	棲木沟	Xichang County	Settlement and graves	179
Wadaluo	瓦打洛	Puge County	Settlement and graves	134
Yingpanshan	營盤山	Xichang County	Settlement and graves	209
Zhuanchangba	轉場垻	Huili County		89

Table 3: Sites by Site Name

Name	Characters	Province	County	Site type	Number
Ada Bobu	阿打波補	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	273
Amucun	阿木村	Liangshan Yi Autonomous Prefecture	Puge County	Grave site	129
Arong	阿榮	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	1
Ayong	阿雍	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	2
Ayue	阿月	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	3
Azu Bugu	阿足	Liangshan Yi Autonomous Prefecture	Meigu County	Grave site	92
Bagu Erjue	巴古爾覺	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	274
Bahe Baozi	垻河堡子	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	144
Baihushan	白虎山	Panzhihua City	Renhe District	Grave site	137
Bajiacun II	八傢村二號地點	=> *see: Jiejiafen*			241
Bajiacun III	八傢村三號地點	=> *see: Wushidi III*			253
Baijiazhai	白家寨	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	145
Baila Gucun	白拉古村	Liangshan Yi Autonomous Prefecture	Renhe District	Grave site	138
Bakeku cun	巴克苦村	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	275
Bei Ganhaixiang	北干海乡	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	233
Beishan	北山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site and object pits	146
Beishanba	北山垻	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	100
Beishancun South	名北山村南	=> *see: Beishan*			146
Bengtukan	崩土坎	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	147
Boshucun	博樹村	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	234
Caojiawan	曹傢灣	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	235
Changcun	長村	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	148
Chayuancun Graves	茶園村	=> *see: Dashipai Graves*			7
Chayuancun Settlement	茶園村	=> *see: Dashipai Settlement*			8
Chengguan	城関	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	101
Chenyuancun	陳遠村	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	149
Chike Boxixian	齒可波西鄉	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	276
Cizhuping	茨竹坪	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	4
Cunyi	翠依銅器出土點	Yunnan Province	Ninglang County	Single find	122
Daba	大垻	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	5
Daba Gongshe	大垻公社	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	277

Dabaobao	大包包	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	150
Dabaozi	大堡子	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	151
Dabaozi Geze	大堡子格則	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	278
Dacaoba	大草垻	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	152
Dachangba	大廠垻	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	6
Dachonggou	大沖溝	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	50
Da'edou Gezi	大俄都格則	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	279
Damaliu	大麻柳	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	153
Daniba	大泥垻	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	154
Dashanbao	大山包	Liangshan Yi Autonomous Prefecture	Huidong County	Settlement	48
Dashibao	大石包	=> *see: Dachangba*			6
Dashiban	大石板	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	155
Dashipai Grave site	大石排	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	7
Dashipai Settlement site	大石排	Liangshan Yi Autonomous Prefecture	Dechang County	Settlement	8
Datu Baobao	大土包包	=> *see: Xijiao Gongshe*			200
Dawenquan	大溫泉	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	280
Daxingzhen	大興鎮	Yunnan Province	Ninglang	Grave site	123
Dayangdui	大洋堆	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement, graves, object pits	156
Dazhaizi	大寨子	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	51
Dianma	點馬	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	9
Dipo Cier	氐坡此爾	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	281
Dongjiapo	董家坡	Liangshan Yi Autonomous Prefecture	Dechang County	Settlement	10
Dongping	東坪	Liangshan Yi Autonomous Prefecture	Xichang City	Smelting site	157
Dongyuemiao	東嶽廟	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	158
Dongzui	東咀	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	52
Duizi	堆子	Yunnan Province	Yongsheng County	Settlement, graves, object pits	260
Eba Buji	俄巴佈吉	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	282
Eba Buji Grave site I	俄巴佈吉	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	283
Eba Buji Grave site II	俄巴佈吉	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	284
Erba Keku	尔巴克苦	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	285
Ergu Zege	尔姑	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	286
Erwu	二五	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	11

Fangjiacun	方家村	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	54
Fenjiwan	粪箕湾	Liangshan Yi Autonomous Prefecture	Huili County	Settlement and grave site	287 + 53
Fuchengqu	附城區	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	12
Ganhai	干海	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	236
Ganhai Sandadui	干海三大隊	Liangshan Yi Autonomous Prefecture	Yanyuan County	Settlement	260
Ganyingwan	甘營灣	=> *see Guoyuan*			58
Gaopo	高坡	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement	102
Gaopo Wanwan	高坡灣灣	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement	103
Gaza Hepushan	呷咱合普山	=> *see: Lake Sihe*			218
Gesa	格撒	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	237
Geze Yangpeng	格則羊棚	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	288
Gonghe	共和	Panzhihua City	Renhe District	Settlement	139
Guadi	瓜地	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	13
Guanjiashan	官家山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	159
Guanshan	関山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	160
Guanshanba	觀山垻	=> *see: Dongjiapo*			10
Guantianshan	觀田山	Liangshan Yi Autonomous Prefecture	Huili County	Settlement and grave site	56
Guihuacun	桂花村	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	161
Guluqiao	軲轤橋	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	216
Guojiabao	郭傢堡	Liangshan Yi Autonomous Prefecture	Huili County	Graves and object pits	57
Guoyuan	果園	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	14
Guoyuan	果園鄉	Liangshan Yi Autonomous Prefecture	Huili County	Single	58
Guoyuancun	果園村	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	217
Haba Qiehe	哈巴切合	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	289
Haimatang	海馬塘	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	239
Haiyancun	海沿村	Yunnan Province	Yongsheng County	Settlement	261
Hangan Yide	汗干依德	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	290
Hebo	合波	Liangshan Yi Autonomous Prefecture	Zhaojue County	Settlement	291
Hedongtian	河東田	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	59
Heiluo	黑洛	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	292
Heinigou	黑泥溝	Liangshan Yi Autonomous Prefecture	Ningnan County	Settlement	127
Hejia Fenshan	何家墳山	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	15

Hejiaba	何傢垻	Panzhihua City	Miyi County	Settlement	115
Hejiashan	何傢山	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	16
Hekoucun	河口村	Liangshan Yi Autonomous Prefecture	Huili County	Single	60
Henglanshan	橫欄山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	162
Heping	和平	Liangshan Yi Autonomous Prefecture	Puge County	Grave site	130
Hewanwan	河灣灣	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	61
Hexi Gongshe	河西公社	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	163
Hezui	何嘴	Liangshan Yi Autonomous Prefecture	Dechang County	Settlement	17
Hongmiao	紅廟	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	18
Hongmiaocun	紅廟村	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	19
Hongqi	紅旗	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	164
Houzidong	猴子洞	Liangshan Yi Autonomous Prefecture	Huili County	Settlement and grave site	62
Huangjiaba	黃家垻	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	20
Huangshuitang	黃水塘	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	165
Huayang	華陽	Liangshan Yi Autonomous Prefecture	Yuexi County	Grave site	269
Hujiazui	胡家嘴	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement site	104
Huili94	會理 94	=> *see Huili Gong'anju*			55
Huili drum 3	會理三號鼓	=> *see: Luoluochong*			68
Huili drum 4	會理四號鼓	=> *see: Guoyuan*			58
Huili Gong'anju	公安局	Liangshan Yi Autonomous Prefecture	Huili County	Single find	55
Huilongwan Cave	回龍灣洞穴	Panzhihua City	Renhe District	Settlement	140
Huimin	惠民	Panzhihua City	Yanbian County	Grave site	227
Hujiacui	胡家嘴	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement	63
Hunshuitang	渾水塘	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	55
Huoba	火把	=> *see: Lake Sihe*			218
Jiangjiabao	蔣傢包	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	166
Jianxin	建新	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	167
Jiaodingshan	轎頂山	Liangshan Yi Autonomous Prefecture	Yanyuan County	Settlement and grave site	240
Jiejiafen	解傢墳	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	241
Jike Jijie	吉克傑覺	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	293
Jinmei	金梅	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	64
Jinyangcun	金錫村	Yunnan Province	Ninglang County	Settlement	124
Jinzi Niaobu	金子烏佈	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	294

Jiukou Jiaogu	九口腳谷	Liangshan Yi Autonomous Prefecture	Meigu County	Grave site	93
Juntun	軍屯	Liangshan Yi Autonomous Prefecture	Zhaojue County	Settlement	295
Kaijicun	開基村	Yunnan Province	Ninglang County	Settlement	125
Kangli	康利	Liangshan Yi Autonomous Prefecture	Puge County	Settlement	131
Kangzipo	康芧坡	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	65
Keri Watuo	克日瓦托	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	296
Kujia Ebu	庫家俄佈	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	297
Lake Sihe	拉克公社四合	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	218
Lanfenba	爛墳垻	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	219
Laolongtou	老龍頭	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	242
Laoniuchang	老牛場	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	220
Laoying	老營箐銅器	Yunnan Province	Yongsheng County	Single	262
Layimu	拉一木	=> *see: Jike Jijie*			293
Leijiashan	雷傢山	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	66
Liangsanpo	涼傘坡	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	21
Liangshan Dashimu qun	涼山大石墓群	=> *see: Wangsuo*			38
Lianhua Gongshe	蓮花公社	Panzhihua City	Miyi County	Settlement	116
Liantang	蓮塘	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	67
Liaojiashan	聊家山	Liangshan Yi Autonomous Prefecture	Yuexi County	Grave site	270
Liguoshan	李果山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	168
Lijiagou cun	李傢溝村	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	169
Liujiawan	劉傢灣	Liangshan Yi Autonomous Prefecture	Huidong County	Settlement	49
Lizhou	禮州	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	170
Lizhou Chenyuancun	禮周陳遠	=> *see: Chenyuancun*			149
Lizhou Zhongxue	禮州中學	=> *see: Chenyuancun*			149
Longtan	龍澤銅器出土點	Yunnan Province	Yongsheng County	Single	253
Lujiajie	陸傢界	Yunnan Province	Yongsheng County	Settlement	264
Luojiabao	儸家堡	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	22
Luoluochong	羅羅沖	Liangshan Yi Autonomous Prefecture	Huili County	Object pits	68
Luowa	洛瓦	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	243
Luzuishan	盧嘴山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	171
Ma'anshan	馬鞍山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	172
Ma'anzi	馬鞍子	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	23

Machu Nawo	馬処鈉窩	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	298
Mahuangkan	螞蟥坎	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	173
Majialin	麻家林	Liangshan Yi Autonomous Prefecture	Xichang City	Smelting site	174
Maliliang Zhanbei	麻栗糧站北	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	24
Maliliang Zhannan	麻栗糧站南	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	25
Maliucun	麻柳村	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	175
Manshuiwan	漫水灣	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	105
Maojiaba	毛傢垻	Liangshan Yi Autonomous Prefecture	Dechang County	Settlement	26
Maojiaba	毛傢垻	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	244
Maojiakan	毛傢坎	Liangshan Yi Autonomous Prefecture	Dechang County	Settlement	27
Maomaoshan	帽帽山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	176
Meiyu Bacun Sanzu	梅雨八村三組	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	245
Meiyuzhen	梅雨鎮	Liangshan Yi Autonomous Prefecture	Yanyuan County	Smelting site	246
Miaoshan	廟山	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement	106
Miaozi Laobao	廟子老堡	Liangshan Yi Autonomous Province	Huili County	Grave site	69
Mimilang	咪咪啷	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	177
Minzhucun	民主村	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	28
Mucuo Naijie	木措乃姐	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	299
Muerguo	木爾果	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	300
Mujueke	莫覺柯	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	301
Munagou	木納溝	Liangshan Yi Autonomous Prefecture	Jinyang County	Settlement	90
Naituo	乃托	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	302
Nanbianhe	南边河	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	247
Nanhua Baobao	南華包包	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	29
Nanhuaguan	南華官	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	30
Nantan	南墰	Liangshan Yi Autonomous Prefecture	Xichang City	Smelting site	178
Niaopo	乌坡	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	303
Pijiangcun	皮匠村	Yunnan Province	Ninglang County	Settlement	126
Puling	普隆	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	70
Pulongcun	普隆村	Panzhihua City	Yanbian County	Grave site	228
Pusu Bohuang	濮蘓波湟	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	304
Qianjinshe	前進社	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	305
Qiaobo	喬垻	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	71

Qiaodiping	蕎地坪	Yunnan Province	Yongsheng County	Grave site	265
Qimugou	棲木沟	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement, graves, object pits	179
Qingli	清理	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	221
Qingshiqiao	青石橋	=> *see: Sankuaishi*			109
Que'ershan	雀兒山	Liangshan Yi Autonomous Prefecture	Yuexi County	Grave site	271
Qujia Laokan	瞿家老坎	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	180
Raojiadi	饒家地	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	72
Reshuitang	熱水塘	=> *see: Shizuizi*			188
Reshuitang West	熱水塘西	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	181
Ruoshuicun	若水村	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	107
Sanfentun	三分屯	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement	108
Sanhe	三和	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	182
Sanjingxiang	三井巷	Panzhihua City	Miyi County	Grave site	117
Sankuaishi	三塊石	Yunnan Province	Yongsheng County	Settlement	109
Sankuaishi	三塊石	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	266
Shaba	沙壩	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	31
Shajiapo	沙家坡	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	183
Shangxiang	上香	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	184
Shangxiangcun	上香村	=> *see: Luzuishan*			171
Shantou	山頭	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	185
Shaojia Gaokan	肖傢高坎	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	186
Shaorenba	燒人壩	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	32
Shengdu Wage	聖都瓦各	Liangshan Yi Autonomous Prefecture	Meigu County	Grave site	94
Shengli	勝利	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	33
Shenjiafen	沈傢墳	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	73
Shijia Baozi	施傢堡子	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	187
Shizuizi	石嘴子	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	188
Shuanggudui	雙谷堆	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	189
Shuijingwan	水井灣	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	34
Shuitangcun	水塘村	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	35
Sihe	四合	=> *see: Wadegu*			222
Sikaixiang	四開鄉	Liangshan Yi Autonomous Prefecture	Zhaojue County	Smelting site	306
Siyi Ergu	司益爾古	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	307

Songlin Laojie	松林老街	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	110
Tangguang Liandi	唐光連地	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	248
Tangjiaba	唐傢垻	Liangshan Yi Autonomous Prefecture	Huili County	Settlement and grave site	74
Tangjiapo	唐傢坡	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	75
Tangjiawan	唐傢灣	Liangshan Yi Autonomous Prefecture	Ningnan County	Settlement	128
Tangshidi	唐氏地	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	249
Tanshan	壇山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	190
Taoyingcun	陶營村	Yunnan Province	Yongsheng County	Settlement	267
Teluocun	特洛村	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	308
Tianba	田垻	Panzhihua City	Miyi County	Grave site	118
Tianba	田坝	Liangshan Yi Autonomous Prefecture	Puge County	Settlement	132
Tianbacun	田垻村	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	76
Tianbacun	田垻村	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	191
Tianwangshan	天王山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	192
Tiaowoba	跳窩垻	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	309
Tongchangjie	銅廠街	=> *see Hunshuitang*			63
Tuanbao	團堡	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	193
Tuanshanbao	團山包	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	194
Tuantian	團田	Liangshan Yi Autonomous Prefecture	Puge County	Settlement	133
Tu'ershan	兔兒山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	195
Wadaluo	瓦打洛	Liangshan Yi Autonomous Prefecture	Puge County	Settlement and grave site	134
Wadegu	瓦得姑	Liangshan Yi Autonomous Prefecture	Xide County	Settlement and grave site	222
Wagujue	瓦姑覺	Liangshan Yi Autonomous Prefecture	Meigu County	Settlement	99
Wagujue Cunnan	瓦姑覺村南	Liangshan Yi Autonomous Prefecture	Meigu County	Grave site	95
Wagujue Dongbei	瓦姑覺東北	Liangshan Yi Autonomous Prefecture	Meigu County	Grave site	96
Wagujue Dongnan I	瓦姑覺東南 I	Liangshan Yi Autonomous Prefecture	Meigu County	Grave site	97
Wagujue Dongnan II	瓦姑覺東南 II	Liangshan Yi Autonomous Prefecture	Meigu County	Grave site	98
Wajimu	瓦吉木	Liangshan Yi Autonomous Prefecture	Yuexi County	Grave site	272
Waluo Gece	瓦洛格側	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	310
Wamu	瓦木	Liangshan Yi Autonomous Prefecture	Xide County	Settlement	223
Wanao	窪瑙	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	196
Wangjiaping	汪傢坪	Liangshan Yi Autonomous Prefecture	Dechang County	Settlement	36
Wangjiatian	王家田	Liangshan Yi Autonomous Prefecture	Dechang County	Settlement	37

Wangsuo	王所	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	38
Wanqiu	彎丘	Panzhihua City	Miyi County	Grave site	119
Washitian	瓦石田	Liangshan Yi Autonomous Prefecture	Huili County	Settlement and grave site	77
Watuo	瓦托	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	311
Wazhaishan	瓦寨山	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	312
Wenjiaba	溫傢壩	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	224
Wenjiatun	文家屯	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement	111
Wuguishan	鳥龜山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	197
Wuhe	伍合	Liangshan Yi Autonomous Prefecture	Xide County	Grave site	225
Wuhuangqing	吳黃箐	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	78
Wujia	吳傢	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	39
Wuming Baobao	無名包包	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	250
Wuqiu	烏丘	Liangshan Yi Autonomous Prefecture	Yanyuan County	Settlement	251
Wushidi I	伍氏地	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	252
Wushidi III	吳氏地	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	253
Xiangshi	响石	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	112
Xiao'aozi	小凹子	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	79
Xiaogao	小高	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	40
Xiaogoudi	小溝地	Liangshan Yi Autonomous Prefecture	Mianning County	Grave site	113
Xiaoguan Liangzi	小官梁子	Liangshan Yi Autonomous Prefecture	Yanyuan County	Settlement and grave site	254
Xiaohebian	小河邊	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	255
Xiaohuashan	小華山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	198
Xiaojia Gaokan	肖傢高坎	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	199
Xiaoliusuo	小六所	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	41
Xiaomiaoshan	小廟山	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	42
Xiaotuanshan Graves	小團山石棺葬	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	80
Xiaotuanshan Settlement	小團山	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	81
Xiaoxingchang	小興場	Liangshan Yi Autonomous Prefecture	Puge County	Settlement and grave site	135
Xiaoyingpan	小營盤	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	82
Xiawan	下灣	Panzhihua City	Renhe District	Settlement	141
Xicaodi	蓆草地	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	83
Xicaodi	席草地	Panzhihua City	Yanbian County	Grave site	229
Xicaoping	席草坪	Panzhihua City	Renhe District	Settlement	142

Xifan	西藩	Liangshan Yi Autonomous Prefecture	Yanyuan County	Settlement	256
Xijiao Gongshe	西郊公社	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	200
Xijiao Grave 1	西郊一號墓	=> *see: Xijiao Gongshe*			200
Xingsuo	星宿	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	201
Xinlin	新林	Panzhihua City	Yanbian County	Settlement	230
Xinminwu	新民吳	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	43
Xinxingcun	新興村	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	202
Xinying	新營	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	203
Xixicun	西溪村	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	204
Yangjia Wuji	楊傢屋基	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	84
Yangjiashan	楊傢山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement and grave site	205
Yangjiashan	楊傢山	Panzhihua City	Renhe District	Settlement	143
Yangshanpo	羊山坡	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	207
Yanjiaqing	嚴傢箐銅鼓	Yunnan Province	Yongsheng County	Single	268
Yanwan	岩灣	Panzhihua City	Western District	Settlement	206
Yanyuan Gong'anju	鹽源公安局	Liangshan Yi Autonomous Prefecture	Yanyuan County	Single find	226
Yezhugou	野豬溝	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	238
Yibijia	依比甲	Liangshan Yi Autonomous	Zhaojue County	Grave site	313
Yihe Gece	依合格側	Liangshan Yi Autonomous Prefecture	Zhaojue County	Grave site	314
Yimen Xiacunxiang	益門下村鄉	Liangshan Yi Autonomous Prefecture	Huili County	Single site	85
Yingpanbao	營盤寶	Yunnan Province	Luquan County	Grave site	91
Yingpanshan	營盤山	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	86
Yingpanshan	營盤山	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement, graves, object pits	209
Yingpanshan (North)	營盤山（北區）	Liangshan Yi Autonomous Prefecture	Yanyuan County	Settlement and grave site	257
Yingpanshan (South)	營盤山（南區）	Liangshan Yi Autonomous Prefecture	Yanyuan County	Settlement and grave site	258
Yinzipo	銀子坡	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	44
Yongxing	永興	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	45
Yongxing	永興	Panzhihua City	Yanbian County	Grave site	231
Yuanbaoshan	元寶山	Liangshan Yi Autonomous Prefecture	Huili County	Settlement	87
Yuanjiabao	袁傢寶	Panzhihua City	Miyi County	Settlement	120
Yuanjiashan	袁家山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	210
Yuejin	躍進	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	46
Yuelufen	月魯墳	=> *see: Liangshanpo*			21

Yumen Wanxiao	漁門完小	Panzhihua City	Yanbian County	Settlement and grave site	232
Yunduanshan	云斷山	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	211
Yunshancun	云山村	Liangshan Yi Autonomous Prefecture	Huili County	Grave site	88
Zengjiabao	曾傢堡	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	212
Zhaizishan	寨子山	Panzhihua City	Miyi County	Settlement	121
Zhangjiaba	張家垻	Liangshan Yi Autonomous Prefecture	Dechang County	Grave site	47
Zhaojiawan	趙家灣	Liangshan Yi Autonomous Prefecture	Mianning County	Settlement	114
Zhaoshanbei	趙山碑	=> *see: Maliucun*			175
Zhengjiafen	鄭傢墳	Liangshan Yi Autonomous Prefecture	Xichang City	Grave site	213
Zhongcun	中村	Liangshan Yi Autonomous Prefecture	Puge County	Settlement	136
Zhongguanpo	鉀官坡	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	214
Zhongjia Shanzui	鉀傢山嘴	Liangshan Yi Autonomous Prefecture	Xichang City	Settlement	215
Zhuanchangba	轉埸垻	Liangshan Yi Autonomous Prefecture	Huili County	Object pits	89
Zhushiba	豬屎垻	Liangshan Yi Autonomous Prefecture	Yanyuan County	Grave site	259

Table 4: Extent and Reliability of Information on the Sites (Reliability Index)

Site Name	**Reliablity Index Overall**	**Fieldwork**	**State of publication**	**Preservation**	**Access**
Dechang Arong	6	1.5	2	1.5	1
Dechang Ayong	2.5	0	1	1.5	0
Dechang Ayue	2.5	0	1	1.5	0
Dechang Cizhuping	2	0	1	1	0
Dechang Daba	2.5	0	1	1.5	0
Dechang Dachangba (also: Dashibao)	3	0	1	2	0
Dechang Dashipai (before: Chayuancun)	4.5	0.5	1	2	1
Dechang Dianma	3	0	1	2	0
Dechang Dongjiapo (before: Guanshanba)	5.5	1.5	1.5	1.5	1
Dechang Fangjiacun	3	0	1	1.5	0.5
Dechang Ganhai	2.5	0	1	1.5	0
Dechang Guadi	2	0	0	1	1
Dechang Guoyuan	4.5	1.5	1.5	1	0.5
Dechang Hejia Fenshan	2.5	0	1	1.5	0
Dechang Hejiashan	2.5	0	1	1.5	0
Dechang Hezui	0.5	0	0.5	0	0
Dechang Hongmiao	1.5	0	1	0.5	0
Dechang Hongmiaocun	2.5	0	1	1.5	0
Dechang Huangjiaba	2.5	0	1	1.5	0

Dechang Liangsanpo	2	0	1	1	0
Dechang Luojiaba	3.5	0	1	1.5	1
Dechang Ma'anzi	1.5	0	1	0.5	0
Dechang Maliliang Zhanbei	2	0	1	1	0
Dechang Maliliang Zhannan	3.5	0	1	1.5	1
Dechang Maojiaba	1.5	0	0.5	1	0
Dechang Maojiakan	5.5	1.5	2	1	1
Dechang Minzhucun	2.5	0	1	1.5	0
Dechang Nanhua Baobao	1	0	1	0	0
Dechang Nanhuaguan	1.5	0	1	0.5	0
Dechang Shaba	2	0	1	1	0
Dechang Shaorenba	2.5	0	0.5	1	1
Dechang Shenglicun	2	0	1	1	0
Dechang Shuijingwan	2	0	1	1	0
Dechang Shuitangcun	1.5	0	1	0.5	0
Dechang Wangjiaping	5	1.5	2	1	0.5
Dechang Wangjiatian	4	1.5	1.5	0.5	0.5
Dechang Wangsuo	4	0.5	2	0.5	1
Dechang Wujia	1.5	0	1	0.5	0
Dechang Xiaogao	1	0	1	0	0
Dechang Xiaoliusuo	3	0.5	1	1	0.5
Dechang Xiaomiaoshan	2	0	1	0.5	0.5
Dechang Xinmin Wujia	1.5	0	1	0.5	0
Dechang Yingzipo	2	0	1	1	0
Dechang Yongxing	2	0	1	1	0
Dechang Yuejin	2.5	0	1	1.5	0
Dechang Zhangjiaba	2	0	1	1	0
Huidong Dashanbao	2	0	0.5	1	0.5
Huidong Liujiawan	1.5	0	0.5	1	0
Huili Dachonggou	2	0	1	1	
Huili Dazhaizi	1.5	0	0.5	1	0
Huili Dongzui	5	2	1.5	1	0.5
Huili Fenjiwan	6	2	1.5	1.5	1
Huili Gong'anju (Huili94)	1.5	0	1.5	0	0
Huili Guantianshan & Yingpanshan	3	0	1.5	1	0.5
Huili Guojiabao	4	1.5	1.5	0.5	0.5
Huili Guoyuan	1.5	0	1.5	0	0

Huili Hedongtian	1	0.5	0	0.5	0
Huili Hekoucun	1	0	1	0	0
Huili Hewanwan	1.5	0	0.5	1	0
Huili Houzidong	3	0	1.5	1	0.5
Huili Hunshuitang (Tongchangjie)	2.5	0	1.5	1	0
Huili Jinmei	2	0	1	1	0
Huili Kangzipo	1.5	0	0	1	0.5
Huili Leijiashan	5.5	1.5	1.5	1	1.5
Huili Liantang	1.5	0	0.5	1	1
Huili Luoluochong (Huili drum 3)	3.5	0	1	1	1.5
Huili Miaozi Laobao	2	0	1.5	0.5	0
Huili Puling	1.5	0	1	0.5	0
Huili Qiaobo	1.5	0	0	1.5	0
Huili Raojiadi	1	0	0	1	0
Huili Shenjiafen	1.5	0	0.5	1	0
Huili Tangjiaba	1.5	0	0.5	1	0
Huili Tangjiapo	1.5	0	1	0.5	0
Huili Tianbaoshan	2	0	1.5	0.5	0
Huili Washitian	5	2	1.5	1	0.5
Huili Wuhuangqing	1	0	0.5	0.5	0
Huili Xiao'aozi	3	0	1.5	1	0.5
Huili Xiaotuanshan	1.5	0	1	0.5	0
Huili Xiaoyingpan	4.5	2	1.5	0.5	0.5
Huili Xicaodi	2.5	0	1	1	0.5
Huili Yangjia Wuji	2	0	1	1	0
Huili Yimen Xiacunxiang	1	0	0.5	0.5	0
Huili Yingpanshan	2	0	1	1	0
Huili Yuanbaoshan	2.5	0	1	1	0.5
Huili Yunshancun	2	0	1	1	0
Huili Zhuanchangba	4	0	1.5	1	1.5
Jinyang Munagou	1.5	0	0.5	1	0
Meigu Azu Bugu	1.5	0	1	0.5	0
Meigu Jiukou Jiaogu	1.5	0	1	0.5	0
Meigu Shengdu Wage	1	0	0	1	0
Meigu Wagujue Cunnan	1.5	0	1	0.5	0
Meigu Wagujue Dongbei	1.5	0	0.5	1	0
Meigu Wagujue Dongnan I	2	0	1	1	0

Meigu Wagujue Dongnan II	1.5	0	1	0.5	0
Meigu Wagujue Settlement	2	0	1	1	0
Mianning Beishanba	3.5	1.5	1	1	0
Mianning Chengguan	1	0	0.5	0.5	0
Mianning Gaopo	3.5	1	0	1.5	1
Mianning Gaopo Wanwan	1.5	0	0.5	0.5	0.5
Mianning Huijiazui	4	1	0.5	1.5	1
Mianning Manshuiwan	2	0	1	1	0
Mianning Miaoshan	2	0	0.5	1	0.5
Mianning Ruoshuicun	2	0	1	1	0
Mianning Sanfentun	3.5	1	1.5	0.5	0.5
Mianning Sankuaishi	4.5	1.5	1.5	1	0.5
Mianning Songlin Laojie	2	0	1	1	0
Mianning Wenjiatun	1	0	0.5	0.5	0
Mianning Xiangshi	2	0	1	1	0
Mianning Xiaogoudi	2	0	1	1	0
Mianning Zhaojiawan	5	1	1.5	1.5	1
Ningnan Heinigou	2.5	0	0.5	2	0
Ningnan Tangjiawan	2.5	0	0.5	2	0
Puge Amucun	1.5	0	1	0.5	0
Puge Heping	1	0	1	0	0
Puge Kangli	1.5	0	0	1	0.5
Puge Tianba	2	0	1	1	0
Puge Tuantian	2	0	1	1	0
Puge Wadaluo	1.5	0	1	0	0.5
Puge Xiaoxingchang	3.5	1.5	1.5	0	0.5
Puge Zhongcun	1	0	1	0	0
Xichang Bahe Baozi	6	2	2	1.5	0.5
Xichang Baijiazhai	2.5	0	1	1.5	0
Xichang Beishan	4	1.5	1.5	0.5	0.5
Xichang Bengtukan	1.5	0	0.5	1	0
Xichang Changcun	2.5	0	1	1.5	0
Xichang Chenyuancun	4.5	2	1.5	0.5	0.5
Xichang Dabaobao	2	0	1	1	0
Xichang Dabaozi	2	0	1	0.5	0.5
Xichang Dacaoba	2.5	0	1	1.5	0
Xichang Damaliu	1.5	0	0.5	1	0

Xichang Daniba	1.5	0	0.5	1	0
Xichang Dashiban	3	0	1	1.5	0.5
Xichang Dayangdui	5.5	1.5	1.5	1.5	1
Xichang Dongping	5.5	2	1.5	1.5	0.5
Xichang Dongyuebao	1.5	0	0.5	1	0
Xichang Guanjiashan	1.5	0	0.5	1	0
Xichang Guanshan	3	1.5	0.5	1	0
Xichang Guihuacun	2.5	0	1	1.5	0
Xichang Henglanshan	6	2	2	1.5	0.5
Xichang Hexi Gongshe	5.5	1.5	1.5	1.5	1
Xichang Hongqi	2.5	0	1	1.5	0
Xichang Huangshuitang	4.5	1.5	1.5	1	0.5
Xichang Jiangjiabao	1.5	0	0.5	1	0
Xichang Jianxin	3	0	1	2	0
Xichang Liguoshan	2.5	0	1	1.5	0
Xichang Lijiagou cun	2.5	0	1	1.5	0
Xichang Lizhou	4.5	2	1.5	0.5	0.5
Xichang Luzhuishan	3	0	1	2	0
Xichang Ma'anshan	5	2	2	0.5	0.5
Xichang Maliucun (Zhaoshanbei)	4	1.5	1.5	0.5	0.5
Xichang Mahuangkan	0.5	0	0.5	0	0
Xichang Majialin	2.5	0	1	1.5	0
Xichang Maomaoshan	1.5	0	1	0.5	0
Xichang Mimilang	4	1.5	1.5	0.5	1
Xichang Nantan	2.5	0	1	1.5	0
Xichang Qimugou	6	2	2	1.5	0.5
Xichang Qujia Laokan	0.5	0	0.5	0	0
Xichang Reshuitang West	3	0	1	2	0
Xichang Sanhe	0.5	0	0.5	0	0
Xichang Shajiapo	2.5	0	1	1.5	0
Xichang Shangxiang	3	0	1	2	0
Xichang Shantou	0.5	0	0.5	0	0
Xichang Shaojia Gaokan	0.5	0	0.5	0	0
Xichang Shijiao Baozi	4	0	1	2	1
Xichang Shizuizi / Reshuitang	3	0	1	2	0
Xichang Shuanggudui	1.5	0	1	0.5	0
Xichang Tanshan	1.5	0	0.5	1	0

Xichang Tianbacun	2.5	0	1	1.5	0
Xichang Tianwangshan	5	1.5	1.5	1	1
Xichang Tuanbao	1.5	0	0.5	0	1
Xichang Tuanshanbao	1.5	0	0	0.5	1
Xichang Tu'ershan	1.5	0	0.5	1	0
Xichang Wanao	5.5	1.5	1.5	1.5	1
Xichang Wuguishan	2	0	1	1	0
Xichang Xiaohuashan	4	1.5	1.5	1	0
Xichang Xiaojia Gaokan	1.5	0	0.5	1	0
Xichang Xijiao Gongshe	6.5	1.5	2	2	1
Xichang Xingsuo	1.5	0	1	0.5	0
Xichang Xinxingcun	2.5	0	1	1.5	0
Xichang Xinying	2	0	1	1	0
Xichang Xixicun	2.5	0	1	1.5	0
Xichang Yangjiashan	3.5	1.5	1.5	0.5	0
Xichang Yanjiashan	5	1.5	1.5	1.5	0.5
Xichang Yangshanpo	0.5	0	0.5	0	0
Xichang Yezhugou	2.5	0	1	1.5	0
Xichang Yingpanshan	4.5	1.5	2	0.5	0.5
Xichang Yuanjiashan	5.5	1.5	1.5	1.5	1
Xichang Yunduanshan	2.5	0	1	1.5	0
Xichang Zengjiabao	2	0	1	1	0
Xichang Zhengjiafen	3	0	1	2	0
Xichang Zhongguanpo	0.5	0	0.5	0	0
Xichang Zhongjia Shanzui	1.5	0	0.5	1	0
Xide Guluqiao	4	1.5	1.5	1	0
Xide Guoyuancun	2	0	1	1	0
Xide Lake Sihe	4	1.5	1.5	1	0
Xide Lanfenba	2	0	1	1	0
Xide Laoniuchang	2	0	1	1	0
Xide Qingli	1.5	0	0.5	1	0
Xide Wadegu	2	0	1	1	0
Xide Wamu	2	0	1	1	0
Xide Wenjiaba	2	0	1	1	0
Xide Wuhe	2.5	0	1	1	0.5
Yanyuan Bei Ganhaixiang	1.5	0	0.5	1	0
Yanyuan Boshucun	1.5	0	1	0.5	0

Yanyuan Caojiawan	2.5	0	1.5	1	0
Yanyuan Ganhaixiang Sandadui	0.5	0	0	0	0.5
Yanyuan Gesa	2.5	0	1.5	1	0
Yanyuan Haimatang	1.5	0	1	0.5	0
Yanyuan Jiaodingshan	3.5	0.5	1.5	0.5	0
Yanyuan Jiejiafen	2	0	1	1	0
Yanyuan Laolongtou	6	2	2.5	1	0.5
Yanyuan Luowa	1.5	0	0.5	1	0
Yanyuan Maojiaba	4	1	1.5	1	0.5
Yanyuan Meiyu Bacun Sanzu	1	0	0	0.5	0
Yanyuan Meiyuzhen	2.5	0	1	1	0.5
Yanyuan Nanbianhe	1.5	0	0.5	1	0
Yanyuan Tangguan Liandi	0.5	0	0.5	0	0
Yanyuan Tangshidi	2	0	1	1	0
Yanyuan Wuming Baobao	2	0	1	1	0
Yanyuan Wuqiu	1.5	0	0.5	1	0
Yanyuan Wushidi	2	0	1	1	0
Yanyuan Wushidi II	2	0	1	1	0
Yanyuan Wushidi III	2	0	1	1	0
Yanyuan Xiaoguan Liangzi	2	0	1	1	0
Yanyuan Xiaohebian	2	0	1	1	0
Yanyuan Xifan	2	0	1	1	0
Yanyuan Yingpanshan (North)	1.5	0	0.5	1	0
Yanyuan Yingpanshan (South)	1.5	0	0.5	1	0
Yanyuan Zhushiba	1.5	0	0.5	1	0
Yuexi Huanyang	2	0	1	1	0
Yuexi Liaojiashan	2.5	0	1.5	1	0
Yuexi Qu'ershan	1.5	0	1	0.5	0
Yuexi Wajimu	2	0	1	1	0
Zhaojue Ada Bobu	2	0	1	1	0
Zhaojue Bagu Erjue	1	0	0.5	0.5	0
Zhaojue Bakeku cun	1	0	0.5	0.5	0
Zhaojue Chike Boxixiang	3	1	1.5	0.5	0
Zhaojue Daba Gongshe	1	0	0	1	0
Zhaojue Dabaozi Geze	1	0	0	1	0
Zhaojue Da'edou Gezi	1	0	0	1	0
Zhaojue Dawenquan	1	0	0	1	0

Zhaojue Dipo Cier	1.5	0	1	0.5	0
Zhaojue Eba Buji	3.5	1.5	1.5	0.5	0
Zhaojue Ergu Zege	1	0	0	1	0
Zhaojue Erba Keku	3.5	1.5	1.5	0.5	0
Zhaojue Erwu	2	0	1	1	0
Zhaojue Fuchengqu	3.5	1.5	1.5	0.5	0
Zhaojue Geze Yangpeng	1	0	0	1	0
Zhaojue Haba Qiehe	1	0	0	1	0
Zhaojue Hangan Yide	1	0	0	1	0
Zhaojue Hebo	1	0	0	0.5	0.5
Zhaojue Heiluo	1	0	0	1	0
Zhaojue Jike Jiejue (also: Layimu)	3	1	1.5	0.5	0
Zhaojue Jinzi Niaobu	1	0	0.5	0.5	0
Zhaojue Juntuan	1.5	0	0	1	0.5
Zhaojue Keri Watuo	2	0	1	1	0
Zhaojue Kunjia Ebu	1	0	0	1	0
Zhaojue Machu Nawo	2	0	1	1	0
Zhaojue Mucuo Naijie	1	0	0.5	0.5	0
Zhaojue Muergguo	2	0	1	1	0
Zhaojue Mujueke	2	0	1	1	0
Zhaojue Naituo	2	0	1	1	0
Zhaojue Niaopo	1.5	0	0.5	1	0
Zhaojue Pusu Bohuang	4.5	1.5	2	1	0
Zhaojue Qianjinshe	2.5	1	0	0.5	1
Zhaojue Sikaixiang	1	0	0.5	0	0.5
Zhaojue Siyi Ergu	2	0	1	1	0
Zhaojue Teluocun	1.5	0	0.5	1	0
Zhaojue Tiaowoba	2	0	1	1	0
Zhaojue Waluo Geci	2	0	1	1	0
Zhaojue Watuo	2	0	1	1	0
Zhaojue Wazhaishan	3.5	1.5	1.5	0.5	0
Zhaojue Yibijia	1	0	0	0.5	0.5
Zhaojue Yihe Geci	2	0	1	1	0
Miyi Hejiaba	2.5	0	1	1	0.5
Miyi Lianhua Gongshe	0.5	0	0	0	0.5
Miyi Sanjingxiang	1	0	1	0	0
Miyi Tianba	3.5	1.5	1	1	0

Miyi Wanqiu	5.5	1.5	2	1	1
Miyi Yuanjiabao	2	0	1	1	0
Miyi Zhaizishan	0.5	0	0.5	0	0
Renhe Baihuashan	2	0	1	1	0
Renhe Baila gucun	1.5	0	1	0.5	0
Renhe Gonghe	1.5	0	0.5	1	0
Renhe Huilongwa Cave	2	0	1	1	0
Renhe Xiawan	2	0	1	1	0
Renhe Xicaoping	3	1	1	1	0
Renhe Yangjiashan	2	0	1	1	0
Xiqu Yanwan (Dashibao)	1.5	0	0.5	1	0
Yanbian Huimin	1	0	0.5	0.5	0
Yanbian Xicaodi	1	0	0.5	0.5	0
Yanbian Xinlin	2.5	1	0.5	1	0
Yanbian Yongxing	1	0	0.5	0.5	0
Yanbian Yumen Wanxiao	4.5	2	1.5	1	0
Luquan Yingpanbao	4	1.5	1.5	1	0
Ninglang Cunyi	0.5	0	0.5	0	0
Ninglang Daxingzhen	4.5	1.5	1.5	1.5	0
Ninglang Jinyangcun	2.5	0	1	1.5	0
Ninglang Kaijicun	2.5	0	1	1.5	0
Ninglang Pijiangcun	2.5	0	1	1.5	0
Yongsheng Duizi	3.5	1.5	0	1.5	0.5
Yongsheng Haiyancun	3	1.5	0	1.5	0
Yongsheng Laoying, Longtan	2	0	1	1	0
Yongsheng Lujiajie	3	1.5	0	1.5	0
Yongsheng Qiaodiping	2	0	1	1	0
Yongsheng Sankuaishi	3	1.5	0	1.5	0
Yongsheng Taoyingcun	3	1.5	0	1.5	0
Yongsheng Yanjiaqing	1.5	0	1	0.5	0

Tables

Table 1.1: Overview of the History of Archaeological Research in the Liangshan Area

Year	Discovery / Excavation	Research Institutions	Details	Estimated Date
Phase I: 1974-1986				
1974—1975	First survey conducted in the Anning River Valley 安宁河流域进行了首次大规模考古田野调查	Joined Archaeological Team of Jinshajiang Dukou and Xichang for Research on the Anning River Valley, Xichuan 四川省金沙江渡口、西昌段、安宁河流域联合考古调查队[1]		various
1974	Lizhou Chenyuancun 陳遠村, Lizhou Zhongxue 禮洲中學, 2 megalithic graves	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	discovered in 1974, date of excavation unclear	Warring States to Western Han
1974-1976	Xichang Lizhou 西昌禮州, 21 earth-pit graves, Neolithic (?) settlement remains, 5 Han earth-pit graves	Provincial Museum of Sichuan 四川省博物館, Xichang County Culture Center 西昌縣文化館, Xichang Museum 西昌地區博物館, Department of History of Sichuan University 四川大學歷史係	discovered in 1974, 3 excavation campaigns November – December 1974, February – March 1976, and October 1976	Neolithic to Han
1975	Dechang Guoyuan 德昌縣果園, 9 megalithic graves discovered, 2 excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	discovered in 1975, date of excavation unclear	Warring States to Western Han
1975, 1987, 2007, 2009	Huili Washitian 會理縣瓦石田, 30 earth-pit graves, 6 excavated, settlement remains	Culture Commission Sichuan 四川省文管会, Department of History Sichuan University 四川大学历史系, Xichang Museum 西昌博物馆, Culture Center Huili 会理县文化馆	in 1975 30 graves discovered, 3 graves excavated, 1 more excavated in 1987, survey in 2007, 2 graves excavated in March 2009	Spring and Autumn to Warring States
1975	Mianning Beishanba 冕寧縣北山垻, Sankuaishi 冕寧縣三塊石, and Chengguan 冕宁城关, 1 megalithic grave each	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	discovered in 1975, date of excavation unclear	Warring States to Western Han

[1] Participating units: Culture Commission Sichuan 四川省文管会、Provincial Museum Sichuan 四川省博物馆、Department of History of Sichuan University 四川大学历史系、Dukou City Department of Cultural Affairs 渡口市文化局、Cultural Affairs Bureau of the Xichang Area 西昌地区文化局、Xichang Museum 西昌地区博物馆, Culture Centers of the Counties of Xichang, Dechang, Huili, Huidong, Yanyuan, and Miyi 西昌、德昌、会理、会东、盐源、米易等县的文化馆.

1975	Huili Laojie Township Luoluochong 會理縣老街鄉 羅羅沖, single find of Shizhaishan style bronze drum 石寨山銅鼓 (also Huili drum 3 會理三號鼓)	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館, Culture Center of Huili County 会理縣文化管		Warring States to Eastern Han
1975, 1987, 2003	Mianning Sanfentun 冕宁三分屯遗址 settlement remains	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館, Culture Institute of Mianning County 冕寧縣文化管	1975 discovered in survey, 6.1987 surveyed again, 18.6.-25.6.2003 surveyed again with trial excavation	Spring and Autumn to end of Western Han
1975-1976	Bahe Baozi 西昌新华坝河堡子, 10 megalithic graves discovered, 6 excavated	Joined Archaeological Team of Jinshajiang Dukou and Xichang for Research on the Anning River Valley, Xichuan 四川省金沙江渡口、西昌段、安宁河流域联合考古调查队	1 grave excavated in May 1975, 5 more excavated December 1975 to January 1976	Warring States to Western Han
1975, 1987, 2003, 2005, 2006	Xichang Qimugou 西昌琅环乡棓木沟, 3 earth-pit graves, 3 pits and other settlement remains, and 1 urn grave excavated	Chengdu City Institute of Archaeology 成都文物考古研究所、Sichuan Provincial Institute of Archaeology 四川省考古研究院、Liangshan Museum 凉山州博物馆、Culture Center of Xichang 西昌市文物管理所	discovered during survey in 1975, surveyed once more in 1987, again in 8.2003, trial excavation in 1.2005, further excavations in 11.2006	Warring States to Western Han
1976	Tianwangshan 10 西昌天王山十号墓, 1 megalithic grave excavated, 14 earth-pit graves, 1 Han brick tomb	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	excavated from 16.07. to 13.09.1977, in October 1977 Eastern Han grave excavated	Warring States to Western Han
1976	Xide Lake Sihe 喜德拉克 10 megalithic graves, 5 excavated	Archaeological Research Group of the Liangshan Yi Autonomous Area 涼山彝族地區考古[2]	10.11.-25.12.1976 excavation of 5 better preserved tombs, M1, M5-8	Western Han
1976	Excavations in connections with survey in Zhaojue 昭覺縣 and Xide 喜德縣	Archaeological Research Group of the Liangshan Yi Autonomous Area 涼山彝族地區考古隊	survey conducted 15.11.1976 – 15.12.1976	Warring States?
1977	Xichang Hexi Gongshe 西昌河西公社, 7 megalithic graves 5 excavated	Xichang Museum 西昌地區博物館	discovered in winter 1976, excavated in 1977	late Warring States to Han

[2]Participating units: Provincial Ethnic Affairs Commission Sichuan 四川省民委，Liangshan Revolutionary Council 涼山州革委，Provincial Museum Sichuan 四川省博物館，Department of History and Archaeology of Sichuan University 四川大學歷史係考古專業, Culture Commission of Liangshan 涼山文化館.

1977	Yanyuan Yanhai Gongshe 盐源县沿海公社, 1 stone-construction grave, 1 earth-pit grave and settlement remains discovered	Provincial Museum Sichuan 四川省博物館, Xichang Museum 西昌地區博物館, Culture Bureau Yanyuan 鹽源縣文化館	not fully published, only mentioned	unclear
1977	Huili Lixi Zhuanchangba 會理縣 黎溪轉場壩, single find of 6 bells	Culture Bureau Huili 會理縣文物管, peasant find		unclear
1977	Xichang Xijiao 西昌西郊, 3+ megalithic graves, 1 excavated	Xichang Museum 西昌地區博物館	excavated 4.-19.10.1977	long period of usage
1977, 2005, 2006	Huili Dongzui 会理南阁乡东咀 settlement remains excavated	Chengdu Institute of Archaeology 成都文物考古研究院、Liangshan Museum 凉山州博物馆、Culture Bureau Huili 會理縣文物管	1977 discovered, first survey and excavation in December 2005, more surveying in November 2006	Neolithic or early BA
1978	Miyi Wanqiu 米易米易弯丘, 2 megalithic graves excavated	Museum of Liangshan Yi Prefecture 涼山彝族自治州博物館	excavated 29.11. – 13.12.1978	Warring States
1978	Xichang Yangjiashan 楊傢山 2 earth-pit graves excavated, settlement remains discovered	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	September 1978 pottery discovered, subsequently surveyed	Neolithic?
1980	Survey in Puge in December 1980	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Puge County 普格县文化馆	survey in December 1980	Late Neolithic?
1980-1981	Puge Xiaoxingchang 普格小兴场 , settlement remains and 40 megalithic graves discovered, 5 excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Puge County 普格县文化馆	discovered December 1980, 1 grave excavated in December 1980, 4 graves excavated 15.2.-7.3.1981	Warring States
1980	excavation of 3 megalithic graves at Xichang Yanjiashan 西昌燕家山 , 1 at Guanshan 关山, 1 at Yuanjiashan 袁家山	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館		late Neolithic
1980-1981	Yanbian Yumen Wanxiao 鹽邊縣攀枝花市漁門鎮完小 several stone slate graves discovered, 5 graves excavated	Culture Bureau of the City of Dukou 渡口市文物管理所	July 1980 discovered, two excavation campaigns in 1980 and 1981	Warring States or Qin/ Han
1979-1980	Yuexi Huayangcun 越西縣華陽村, 2 earth-pit graves excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	bronze objects discovered in March 1979, 2 earth-pit graves excavated in 1980	unclear

since 1980s	large number of Bronzes recovered from the black market in Yanyuan	recovered by police		mainly early Han
1980?	Yanyuan Jiaodingshan 盐源县轎頂山, settlement remains and big number of graves with stone installations discovered	Culture Bureau of Yanyuan County 鹽源縣文管所	surveyed, not excavated	Neolithic?
1981	Xide Lake Guluqiao 喜德拉克轱辘桥, 6+ megalithic graves discovered, 1 excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Xide County 喜德縣文化館	discovered by peasants in 1981, most badly disturbed one excavated the same year	late Western Han
1981-1985	Second National Culture Survey 第二次全國文物普查	various local, regional, and supra-regional units		
1981, 2009	Puge Wadaluo 普格縣瓦達洛 settlement remains, 2 megalithic, and 5 earth-pit graves discovered, 1 grave excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Puge County 普格县文化馆	survey in 1981, 1 earth-pit or megalithic grave excavated (information inconclusive), second survey in March 2009	pre-Warring States
1985	Xichang Beishan 西昌北山, 2 megalithic grave discovered, 1 excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館		Warring States to Western Han
1986	Xichang Huangshuitang 西昌黄水塘 3 megalithic graves discovered, 1 excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	1 grave excavated in March 1986	Warring States to Western Han
1986	Xichang Chuanxing Xiaohuashan 西昌川兴小花山, 2 megalithic graves, 1 excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	1 grave excavated in April 1986	Warring States to Western Han
Phase II: 1986-1998				
1987-1988	Liangshan Culture Survey 涼山州文物普查	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館 and various local institutions	survey from March 1987 to August 1988, recording 16 cemeteries, 6 settlements, 7 buildings, 21 other places with cultural relics	Neolithic to Western Han
1987	Huili Yimen Xiacun 會理縣益門區下村鄉, bronze yue ax 銅鉞 found	peasant find	not published, only mentioned	unclear
1987	Huili Xiao'aozi 小凹子 Liantang 蓮塘, Yuanbaoshan 會理縣云寶山 settlement	Culture Bureau Huili 會理縣文物管	discovered during survey, not excavated	late Neolithic?
1987	Huili Tangjiapo 唐傢婆, settlement + graves	Culture Bureau Huili 會理縣文物管	discovered during survey	Shang

1987	Survey at Zhaojue Sikai 昭覺縣四開; stone-construction graves discovered in Mucuo Najie 木措乃姐, Daba 大垻鄉, Nanping 南坪鄉 in Mujueke 莫覺柯, Niaoba 鳥坡鄉, Bagu Erjue 巴古爾覺, Teluo 特洛村, Bakeku 巴克苦村, Machu Nagu 馬处鈉窩, Keri Watuo 克日瓦托, Yihe Gece 依合格側, Muerguo 木爾果, Naituo 乃托	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Department of Archaeology of Sichuan University 四川大學考古學係、Culture Bureau of Zhaojue County 昭覺縣文物管理所		various, largely unclear
1987	Huili Xiaotuanshan 小团山, 4 stone-construction and 100+ earth-pit graves	Culture Bureau Huili 會理縣文物管	discovered during survey, not excavated	Warring States to Western Han
1987	Xichang Lizhou Tanshan 西昌礼州镇坛山, and Tuanshanbao 团山包 settlement remains	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館		Neolithic
1987, 2004	Xichang Henglanshan, 西昌大兴乡横栏山 settlement remains	西昌市文物管理所, Chengdu Institute of Archaeology 成都文物考古研究所, Museum of Liangshan Yi Prefecture 涼山彝族自治州博物館	discovered in 1987, excavation in connection with Anning river survey	Neolithic
1987, 1988, 1999, 2000, 2001	Yanyuan Laolongtou 盐源老龙头, unknown number of graves with stone installations discovered, 11 excavated, most already robbed and destroyed	Museum of Liangshan Yi Prefecture 涼山彝族自治州博物館，Culture Bureau of Yanyuan 鹽源縣文管所, Chengdu City Institute of Archaeology 成都文物考古研究所、Culture Bureau of Huili County 會理縣文物管理所	discovered in December 1987 discovered by peasants, excavations in 1988, 1999, 2000, 2001	Warring States to Western or early Eastern Han
1987, 1989, 1990, 1991, 1992	Huili Fenjiwan 四川會理縣糞箕灣, some stone-construction graves discovered and excavated, large number of earth-pit graves discovered, 150 excavated	Culture Bureau of Huili County 會理縣外文物管理所、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Sichuan Provincial Institute of Archaeology 四川省文物考古研究所	discovered during survey in 1987, parts excavated in 1989 to 1992 in four excavation season	Warring States
1987, 2002, 2009	Huili Xiaoyingpan 會理縣小營盤, over 100 stone-construction graves, 21 graves excavated	Museum of Liangshan Yi Prefecture 涼山彝族自治州博物館, Culture Bureau Huili 會理縣文物管理所, Sichuan Provincial Institute of Archaeology 四川文物考古研究所	1987 discovered during survey, 20 graves excavated in December 2002, one more excavated in 2008 during survey	late Neolithic to middle Warring States

1988	Huili Guoyuan 會理縣果元, Shizhaishan bronze drum 石寨山銅鼓 (Huili drum 4)	peasant find, Culture Bureau Huili 會理縣文物管		late Warring States to Han
1988	Yanyuan Shuanghe Township Maojiaba 盐源县雙河鄉毛傢垻, 3 stone-construction and 1 earth-pit grave excavated, bronze staff discovered close-by	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館, Culture Bureau of Yanyuan County 鹽源縣文管所		Warring States to Early Western Han
1991, 2002, 2009	Huili Houzidong 會理縣猴子洞, 3+ stone-construction graves and settlement remains discovered	Sichuan Provincial Institute of Archaeology 四川省文物考古研究院、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Huili County 會理縣文化管理所	discovered in 1991, survey in 2002, survey in March 2009	Shang
1990, 1994	Xichang Dayangdui 西昌大洋堆, 2 megalithic graves, 9 earth-pit graves, and settlement remains (24 object pits, 19 yellow-earth-pits) excavated	Sichuan Provincial Institute of Archaeology 四川省考古研究元、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau Xichang 西昌市文物管理所	1990 survey, 24.20.-14.12.1994 excavation	late Spring and Autum to Warring States or Han
1993	Huili Fenjiwan 會理縣糞箕灣, bronze sword 柄青銅劍 in a peasant's home	peasant find		unclear
1993	Huili Hekoucun 會理縣河口村, 1 bronze sword discovered in the house of a peasant; retrieved when repairing city wall in 1971	peasant find		unclear
1994	Huili Police Station 會理縣公安局, 8 bronze objects from antiquities market	recovered by police		unclear
Phase III: 1998 – today				
1998	Huili Guanhexiang Wuhuangqing 會理縣関河鄉吳黃箐, 10 earth-pit graves discovered, 1 excavated	Culture Bureau of Huili County 會理縣文化管理所		unclear
2003, 2005	Xichang Maliucun pit 西昌市麻柳村灰坑 excavated	Sichuan Provincial Institute of Archaeology 四川省考古研究元、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau Xichang 西昌市文物管理所	discovered in November 2003, later re-excavation	Warring States to Western Han

2003, 2004	discovery of Dechang Jianchuan Wangjiatian 德昌锦川乡王家田遗址 and Dechang Maojiakan 德昌凤凰毛家坎遗址 settlement remains	Sichuan Provincial Institute of Archaeology 四川省考古研究元、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	discovered in connection with construction of Panzhihua-Xichang Express Way 攀西高速公路, excavation 2004	Neolithic to Warring States
2004	Anning Megalithic Grave Survey 安寧河流域大石墓調查: 232 megalithic graves at 45 sites known, 47 excavated until 2006	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	surveyed 06/2004-10/2004	all Warring States to Western Han
2004	Dechang Ayue 德昌阿雍, 2 megalithic graves discovered	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	November 2004 surveyed	Warring States to Western Han
2004	Xichang Mimilang, 西昌樟木箐乡咪咪啷 settlement remains, excavation in connection with Anning river valley survey 安寧河流域文物考古調查	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館, Chengdu City Institute of Archaeology 成都文物考古研究院, Culture Bureau Xichang 西昌市文物管理所	trial excavation in May 2004, further excavations in November 2004	Western Zhou to early Western Han
2004	Dechang Arong 德昌阿榮, 4 megalithic graves excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Sichuan Provincial Institute of Archaeology 四川省文物考古研究院、Culture Bureau Xichang 西昌市文物管理所	September to December 2004 excavated	Warring States to early Eastern Han
2004	Xichang Huangshui Wanao 西昌黄水洼垴大石墓群, 5 megalithic graves discovered, 2 excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Sichuan Provincial Institute of Archaeology 四川省文物考古研究院、Culture Bureau Xichang 西昌市文物管理所	excavation July to August 2004 in connection of the Xichang Panzhihua expressway	middle of Western Han to the beginning of eastern Han
2005	Xichang Yingpanshan 西昌營盤山, 2 earth-pit graves, ash pits and other settlement remains, and 13 urn graves excavated	Chengdu City Institute of Archaeology 成都文物考古研究元, Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館, Culture Bureau Xichang 西昌市文物管理所	survey and small-scale excavation in October 2005	Western to Eastern Han

2004, 2005	Xichang Ma'anshan, 西昌经久乡马鞍山, 1 earth-pit grave, 6 pits, 1 building, and other settlement remains excavated	Chengdu City Institute of Archaeology 成都文物考古研究元、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau Xichang 西昌市文物管理所	discovered during survey December 2004, excavated in December 2005	Neolithic to Western Han
2005	Xichang Xiaomaliu, 西昌樟木箐乡小麻柳遗址 settlement remains excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	trial excavations in December 2005	unclear
2005	excavation of 14 graves at Zhaojue Pusu Bohuang 濮蘇波湟 and Eba Buji 俄巴佈吉 and Eba Buji; at Zhaojue Haogu 昭覺縣好故村 excavation of 14 of 27 graves	Museum of Liangshan Yi Prefecture 涼山彝族自治州博物館, Department of Archaeology Sichuan University 四川大學考古係	survey and excavations in Zhaojue 11.-25.10.2005	various
2005, 2006	Huili Leijiashan 會理縣雷傢山 1 earth-pit grave excavated	Chengdu Institute of Archaeology 成都文物考古研究所、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Huili 會理縣文物管理所	discovered during survey in December 2005, excavated in November 2006	Spring and Autumn
2007	Huili Raojiadi 饶家地 settlement remains discovered	Culture Bureau of Huili County 會理縣文物管理所		late Neolithic
2007-2010	Third National Cultural Survey 第三次全國文物普查	Sichuan Provincial Institute of Archaeology 四川省文管会、Department of History Sichuan University 四川大学历史系、Xichang Museum 西昌博物馆、Culture Bureau of Huili County 会理等县文化馆	survey June 2007 to December 2010	various
2008-2010	Xichang Tuanbao 團堡 2 megalithic graves discovered	Sichuan Provincial Institute of Archaeology 四川省文管会, Department of History Sichuan University 四川大学历史系, Xichang Museum 西昌博物馆, Culture Bureau Huili 会理等县文化馆	only surveyed, not excavated	Qin to Han

2008-2010	settlement remains at Huili Dazhaizi 大寨子, Guojiabao 郭家堡, Raojiadi 饒家地, Zhoujiadi 周家地, at Guojiabao 郭傢包古墓群 earth-pit graves, in Hedongtian 河東田 stone-construction graves observed	Sichuan Provincial Institute of Archaeology 四川省文管会、Department of History Sichuan University 四川大学历史系、Xichang Museum 西昌博物馆、Culture Bureau Huili 会理县文化馆	only surveyed, not excavated	Qin to Han
2008-2010	settlement remains at Zhaojue Hebo 合波	Xichang Museum 西昌博物馆	only surveyed, not excavated	Qin to Han
2008-2010	Dechang Guadi 瓜地 M2 discovered	Xichang Museum 西昌博物馆	only surveyed, not excavated	Qin to Han
2008-2010	in Zhaojue Qianjinshe 前進社 12 megalithic graves, Zhaojue Jike Jiejue 吉克傑覺 9 and in Meigu Shengdu Wage 聖都瓦各 stone-construction graves	Sichuan Provincial Institute of Archaeology 四川省文管会、Department of History Sichuan University 四川大学历史系、Xichang Museum 西昌博物馆	only surveyed, not excavated	Qin to Han
2008-2010	Yanyuan Meiyu Bacun Sanzu 梅雨八村三組 earth-pit graves discovered	Xichang Museum 西昌博物馆	only surveyed, not excavated	Qin to Han
2008	Dechang Wangjiaping 德昌王傢坪 settlement remains discovered, test excavations	Chengdu Institute of Archaeology 成都文物考古研究所, Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Dechang 德昌縣文管所	first survey August 2008, more in November 2008, test excavations	Neolithic
2008, 2009	Huili Guojiabao 郭傢包古墓群, 1 stone-construction and 3 earth-pit graves excavated, 1 disturbed grave and other remains at the neighbouring Huili Miaozi Laobao 會理縣廟子老包地點, at both sites also settlement remains; Huili Hunshuitang bronze working site 會理縣渾水塘冶銅遺址 discovered	Chengdu City Institute of Archaeology 成都文物考古研究所，Culture Bureau Huili County 會理縣文物管理所，Department of Archaeology Sichuan University 四川大學考古係，Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	discovered in 08/2008, excavations in 10/2010	unclear
2009	stone-construction graves at Huili Houzidong 猴子洞, Yingpanshan 營盤山, Guantianshan 观田山, earth-pit graves at Washitian 瓦石田, settlement at all sites and Yingdingshan 营顶山	Sichuan Provincial Institute of Archaeology 四川省文物考古研究院、Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Huili County 會理縣文化管理所	survey and excavations of most badly destroyed graves, 12.-20.3.2009	late Neolithic?

2009	Yanyuan bronze finds	Culture Bureau Xichang 西昌市文物管理所	collection of recently found Yanyuan bronzes	unclear
2010	Mianning Gaopo 冕寧高坡, Zhaojiawan 傢灣 and Hujiazui 胡傢嘴 settlement remains, test excavations	Chengdu City Institute of Archaeology 成都文物考古研究所, Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館	test excavations in October 2010	Warring States to Western Han
2008, 2010	Dechang Dongjiapo 德昌董傢坡 settlement excavation	Chengdu City Institute of Archaeology 成都文物考古研究所, Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Culture Bureau of Dechang County 德昌縣文管所	survey and test excavation 2008, more 2009	Warring States to early Eastern Han
2010	excavations in Meigu 美姑縣 and Zhaojue 昭覺縣	Sichuan University 四川大學	excavations in October 2010	late Warring States to Western Han
2009	29 stone-construction graves discovered at Zhaojue Layimu 拉一木乡拉一木村, 9 at Chike Boxi 齿可波西乡 and Pingcun 平村, 2 Han brick tombs at Sikai Haogucun 四開鄉好故村; disturbed ones excavated	Museum of Liangshan Yi Autonomous Prefecture 涼山彝族自治州博物館、Department of Archaeology Sichuan University 四川大學考古學係、Culture Bureau of Zhaojue County 昭覺縣文管所	survey and excavation in spring 2009	Han

Table 1.2a: Overview of Archaeological Sites in the Liangshan Area by Type. [3]

County	Settlement Sites				Megalithic Graves					
	all	excavated	published	listed	sites	graves	excavated sites	excavated graves	published	listed
Butuo	0	0	0	0	0	0	0	0	0	0
Dechang	47	8	6	34	41	105	3	6	2	34
Gange	0	0	0	0	0	0	0	0	0	0
Huidong	2	0	0	2	0	0	0	0	0	0
Huili	41	15	18	12	0	0	0	0	0	0
Jinyang	1	0	0	1	0	0	0	0	0	0
Leibo	0	0	0	0	0	0	0	0	0	0
Meigu	8	0	0	7	0	0	0	0	0	0
Mianning	15	6	2	20	8	31	4	4	1	5
Miyi	7	2	1	4	3	10	2	4	1	1
Muli	0	0	0	0	0	0	0	0	0	0
Ningnan	2	0	0	1	0	0	0	0	0	0
Panzhihua	8	2	1	7	0	0	0	0	0	0
Puge	9	2	2	6	5	49	2	5	2	3
Xichang	73	23	22	42	47	145	16	26	15	24
Xide	11	2	1	9	9	39	1	26	1	7
Yanbian	6	2	1	1	0	0	0	0	0	0
Yanyuan	26	4	5	13	1	1	0	0	0	1
Yuexi	6	1	1	4	1	1	0	0	0	1
Zhaojue	31	6	7	14	1	12	0	0	0	0
Yongsheng	9	1	0	8	0	0	0	0	0	0
Huaping	0	0	0	0	0	0	0	0	0	0
Ninglang	5	1	1	4	0	0	0	0	0	0
	307	**75**	**68**	**189**	**116**	**393**	**28**	**71**	**22**	**76**

[3] Counted were all sites recorded, also those that have by now been destroyed through erosion, construction, grave robbery or – in the best case – excavation. Sites that have both settlement finds and burials were counted only once in the overall number of sites, but are counted once each among settlement finds and the respective type of burial. The number of grave, settlements, and single finds when added up thus exceeds the overall number of graves listed in the first column. For many sites, especially if they have not been excavated yet, the number of graves is unclear. In those cases I assigned the number 1 as this is the minimum number of graves present, even if reports speak of 'many graves', as it is not possible to assign any other number without guessing.

Table 1.2b: Overview of Archaeological Sites in the Liangshan Area by Type.

	Earth-pit Graves						Stone graves					
County	sites	graves	excavated sites	excavated graves	published	listed	sites	graves	excavated sites	excavated graves	published	listed
Butuo	0	0	0	0	0	0	0	0	0	0	0	0
Dechang	0	0	0	0	0	0	0	0	0	0	0	0
Gange	0	0	0	0	0	0	0	0	0	0	0	0
Huidong	0	0	0	0	0	0	0	0	0	0	0	0
Huili	10	406	6	157	7	2	15	253	3	34	5	5
Jinyang	0	0	0	0	0	0	0	0	0	0	0	0
Leibo	0	0	0	0	0	0	0	0	0	0	0	0
Meigu	0	0	0	0	0	0	7	22	0	0	0	6
Mianning	0	0	0	0	0	0	0	0	0	0	0	0
Miyi	0	0	0	0	0	0	0	0	0	0	0	0
Muli	0	0	0	0	0	0	0	0	0	0	0	0
Ningnan	0	0	0	0	0	0	0	0	0	0	0	0
Panzhihua	0	0	0	0	0	0	2	13	2	0	0	2
Puge	0	0	0	0	0	0	0	0	0	0	0	0
Xichang	7	53	7	40	7	0	0	0	0	0	0	0
Xide	0	0	0	0	0	0	0	0	0	0	0	0
Yanbian	0	0	0	0	0	0	5	8	1	4	1	0
Yanyuan	17	34	2	1	1	10	2	16	2	16	2	0
Yuexi	3	8	1	2	1	1	2	8	0	0	0	2
Zhaojue	0	0	0	0	0	0	28	318	5	29	7	14
Yongsheng	1	1	1	1	0	0	2	2	1	1	0	1
Huaping	0	0	0	0	0	0	0	0	0	0	0	0
Ninglang	1	11	1	11	1	0	0	0	0	0	0	0
	39	**513**	**18**	**212**	**17**	**13**	**63**	**640**	**14**	**84**	**15**	**30**

Table 1.2c: Overview of Archaeological Sites in the Liangshan Area by Type.

County	Single Finds			Urn Pits					
	all	published	listed	sites	pits	excavated sites	excavated pits	published	listed
Butuo	0	0	0	0	0	0	0	0	0
Dechang	0	0	0	0	0	0	0	0	0
Gange	0	0	0	0	0	0	0	0	0
Huidong	0	0	0	0	0	0	0	0	0
Huili	10	9	0	0	0	0	0	0	0
Jinyang	0	0	0	0	0	0	0	0	0
Leibo	0	0	0	0	0	0	0	0	0
Meigu	0	0	0	0	0	0	0	0	0
Mianning	0	0	0	0	0	0	0	0	0
Miyi	0	0	0	0	0	0	0	0	0
Muli	0	0	0	0	0	0	0	0	0
Ningnan	0	0	0	0	0	0	0	0	0
Panzhihua	0	0	0	0	0	0	0	0	0
Puge	0	0	0	0	0	0	0	0	0
Xichang	0	0	0	3	38	4	38	4	0
Xide	0	0	0	0	0	0	0	0	0
Yanbian	0	0	0	0	0	0	0	0	0
Yanyuan	1	1	0	0	0	0	0	0	0
Yuexi	1	0	1	0	0	0	0	0	0
Zhaojue	0	0	0	0	0	0	0	0	0
Yongsheng	0	0	0	1	1	1	1	0	0
Huaping	0	0	0	0	0	0	0	0	0
Ninglang	0	0	0	0	0	0	0	0	0
	12	**10**	**1**	**5**	**39**	**5**	**39**	**4**	**0**

Table 1.3: Sites at which the Author took GPS Coordinates (October - December 2010).

Site Name	Characters	Feature Type
Dechang County		
Ayue M1	阿月	Megalithic Grave
Dashipai M1 (Chayuancun)	大石排（茶園村）	Megalithic Grave
Dashipai Settlement	大石排（茶園村）	Settlement
Dongjiapo (Guanshanba)	董家坡（觀山埧）	Settlement
Wangsuo M1	王所	Megalithic Grave
Wangsuo M2	王所	Megalithic Grave
Wangsuo M3	王所	Megalithic Grave
Mianning		
Gaopo	高坡	Settlement
Sanfentun	三分屯	Settlement
Zhaojiawan	趙家灣	Settlement
Xichang		
Dabaozi	大堡子	Megalithic Grave
Dayangdui	大洋堆	Settlement, formerly also Megalithic Graves and Earth-pit Graves
Henglanshan	横欄山	Settlement

Lizhou	禮州	Settlement, formerly also Earth-pit Graves and Megalithic Grave
Ma'anshan	馬鞍山	Settlement, formerly also Earth-pit Grave
Mimilang	咪咪啷	Settlement
Mimilang M1	咪咪啷	Megalithic Grave
Mimilang M2	咪咪啷	Megalithic Grave
Qimugou	棲木沟	Settlement, formerly also Earth-pit Graves and Urn Pits
Zhaoshanbei M2	趙山碑	Megalithic Grave
Xide		
Wuhe M1	伍合	Megalithic Grave
Wuhe M10	伍合	Megalithic Grave
Wuhe M2	伍合	Megalithic Grave
Wuhe M3	伍合	Megalithic Grave
Wuhe M4	伍合	Megalithic Grave
Wuhe M5	伍合	Megalithic Grave
Wuhe M6	伍合	Megalithic Grave
Wuhe M7	伍合	Megalithic Grave
Wuhe M8	伍合	Megalithic Grave
Yanyuan		
Laolongtou	老龍頭	Stone-construction Grave Site
Meiyu Bacun Sanzu	梅雨八村三組	Stone-construction Grave Site
Zhaojue		
Hebo	合波	Settlement
Jike Jiejue	吉克傑覺	Stone-construction Grave Site
Mucuo Naijie	木措乃姐	Stone-construction Grave Site
Sikai Geluocun	四開鄉滐洛村	Stone-construction Grave Site
Dechang County		
Arong	阿榮	Megalithic Grave Site
Ayue M1	阿月	Megalithic Grave
Dashipai M1 (Chayuancun)	大石排（茶園村）	Megalithic Grave
Dashipai Settlement	大石排（茶園村）	Settlement
Dongjiapo (Guanshanba)	董家坡（觀山垻）	Settlement
Fangjiacun M1	方家村	Megalithic Grave
Guadi M2	瓜地	Earth-pit Grave
Luojiabao	儸家堡	Megalithic Grave
Maliliang Zhannan	麻栗糧站南	Megalithic Grave
Shaorenba	燒人垻	Megalithic Grave
Wangjiaping	汪傢坪	Settlement
Wangsuo M1	王所	Megalithic Grave
Wangsuo M2	王所	Megalithic Grave

Table 1.4: Sites and Features for which GPS Coordinates are available.

Site Name	Characters	Feature Type
WangsuoM3	王所	Megalithic Grave
Xiaoliusuo M1	小六所	Megalithic Grave
Xiaoliusuo M3	小六所	Megalithic Grave
Xiaoliusuo M4	小六所	Megalithic Grave
Xiaoliusuo M6	小六所	Megalithic Grave
Xiaomiaoshan M2	小廟山	Megalithic Grave
Xiaomiaoshan M3	小廟山	Megalithic Grave
Xiaomiaoshan M4	小廟山	Megalithic Grave
Xiaomiaoshan M5	小廟山	Megalithic Grave
Yongxing M1	永興	Megalithic Grave
Huili County		
Dazhaizi	大寨子	Settlement
Dongzu	東咀	Settlement
Fenjiwan	粪箕湾	Earth-pit Grave Site
Fenjiwan Stone-construction Graves	粪箕湾	Stone-construction Grave Site
Guojiabao	郭家堡	Settlement
Hedongtian	河東田	Stone-construction Grave
Houzidong	猴子洞	Stone-construction Grave Site
Houzidong Settlement	猴子洞	Settlement
Leijiashan	雷傢山	Earth-pit Grave
Liantang	蓮塘	Settlement
Qiaoba	喬垻	Settlement
Raojiadi	饒家地	Settlement
Tianbacun	田垻村	Earth-pit Grave Site
Xiao'aozi	小凹子	Settlement
Xiaotuanshan	小團山	Earth-pit Grave Site
Xiaotuanshan Stone-construction Graves	小團山	Stone-construction Grave Site
Yuanbaoshan	元寶山	Settlement
Meigu		
Shengdu Wage	聖都瓦各	Stone Slate Grave
Mianning		
Gaopo	高坡	Settlement
Manshuiwan	漫水灣	Megalithic Grave
Sanfentun	三分屯	Settlement, Megalithic Grave
Xiangshi	响石	Megalithic Grave
Zhaojiawan	趙家灣	Settlement
Ningnan		
Heinigou	黑泥溝	Settlement
Tangjiawan	唐傢灣	Settlement
Xichang		
Dabaozi	大堡子	Megalithic Grave
Dayangdui	大洋堆	Settlement, Megalithic Grave and Earth-pit Grave

Dongping	東坪	Metallurgical Site
Henglanshan	橫欄山	Settlement
Henglanshan Earth-pit Graves	橫欄山	Earth-pit Grave Site
Huangshuitang (before: Luhe)	黃水塘(鹿鶴)	Megalithic Grave
Lizhou	禮州	Settlement, Earth-pit Graves and Megalithic Grave
Ma'anshan	馬鞍山	Settlement, Earth-pit Grave
Mimilang	咪咪啷	Settlement
Mimilang M1	咪咪啷	Megalithic Grave
Mimilang M2	咪咪啷	Megalithic Grave
Qimugou	棲木沟	Settlement, Earth-pit Graves and Urn Pits
Shijia Baozi	施傢堡子	Megalithic Grave
Tianwangshan	天王山	Megalithic Grave
TuanbaoM5	團堡	Megalithic Grave
TuanbaoM6	團堡	Megalithic Grave
WanaoM2	窪瑙	Megalithic Grave
WanaoM3	窪瑙	Megalithic Grave
Yingpanshan	營盤山	Settlement, Urn Pits
Zhaoshanbei M2	趙山碑	Megalithic Grave
Hunshuitang (also: Tongchangjie)	黃水塘(鹿鶴)	Settlement
Xide		
GuluqiaoM1	軲轤橋	Megalithic Grave
GuluqiaoM5	軲轤橋	Megalithic Grave
Lake Sihe M10 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Lake Sihe M2 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Lake Sihe M3 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Lake Sihe M4 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Lake Sihe M5 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Lake Sihe M6 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Lake Sihe M7 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Lake Sihe M9 (also called Huoba)	拉克公社四合(又稱火把)	Megalithic Grave
Wuhe M1	伍合	Megalithic Grave
Wuhe M10	伍合	Megalithic Grave
Wuhe M2	伍合	Megalithic Grave
Wuhe M3	伍合	Megalithic Grave
Wuhe M4	伍合	Megalithic Grave
Wuhe M5	伍合	Megalithic Grave
Wuhe M6	伍合	Megalithic Grave
Wuhe M7	伍合	Megalithic Grave
Wuhe M8	伍合	Megalithic Grave
Yanyuan		
Laolongtou	老龍頭	Stone-construction Grave Site
Meiyu Bacun Sanzu	梅雨八村三組	Stone-construction Grave Site
Yuexi		
Que'ershanM1	雀兒山	Stone Slate Grave
Que'ershanM3	雀兒山	Stone Slate Grave

Que'ershanM5	雀兒山	Megalithic Grave
Zhaojue		
Hebo	合波	Settlement
Jike Jiejue	吉克傑覺	Stone-construction Grave Site
Jike Jiejue M1	吉克傑覺	Stone-construction Grave
Jike Jiejue M2	吉克傑覺	Stone-construction Grave
Jike Jiejue M3	吉克傑覺	Stone-construction Grave
Jike Jiejue M4	吉克傑覺	Stone-construction Grave
Jike Jiejue M5	吉克傑覺	Stone-construction Grave
Jike Jiejue M6	吉克傑覺	Stone-construction Grave
Jike Jiejue M7	吉克傑覺	Stone-construction Grave
Jike Jiejue M8	吉克傑覺	Stone-construction Grave
Mucuo Naijie	木措乃姐	Stone-construction Grave Site
QianjinsheM10	前進社	Megalithic Grave
QianjinsheM12	前進社	Megalithic Grave
QianjinsheM2	前進社	Megalithic Grave
QianjinsheM3	前進社	Megalithic Grave
QianjinsheM4	前進社	Megalithic Grave
QianjinsheM6	前進社	Megalithic Grave
QianjinsheM7	前進社	Megalithic Grave
QianjinsheM8	前進社	Megalithic Grave
QianjinsheM9	前進社	Megalithic Grave
Sikai Geluocun	四開鄉淉洛村	Stone-construction Grave Site

Table 1.5: Structure of the Database Created for this Project.

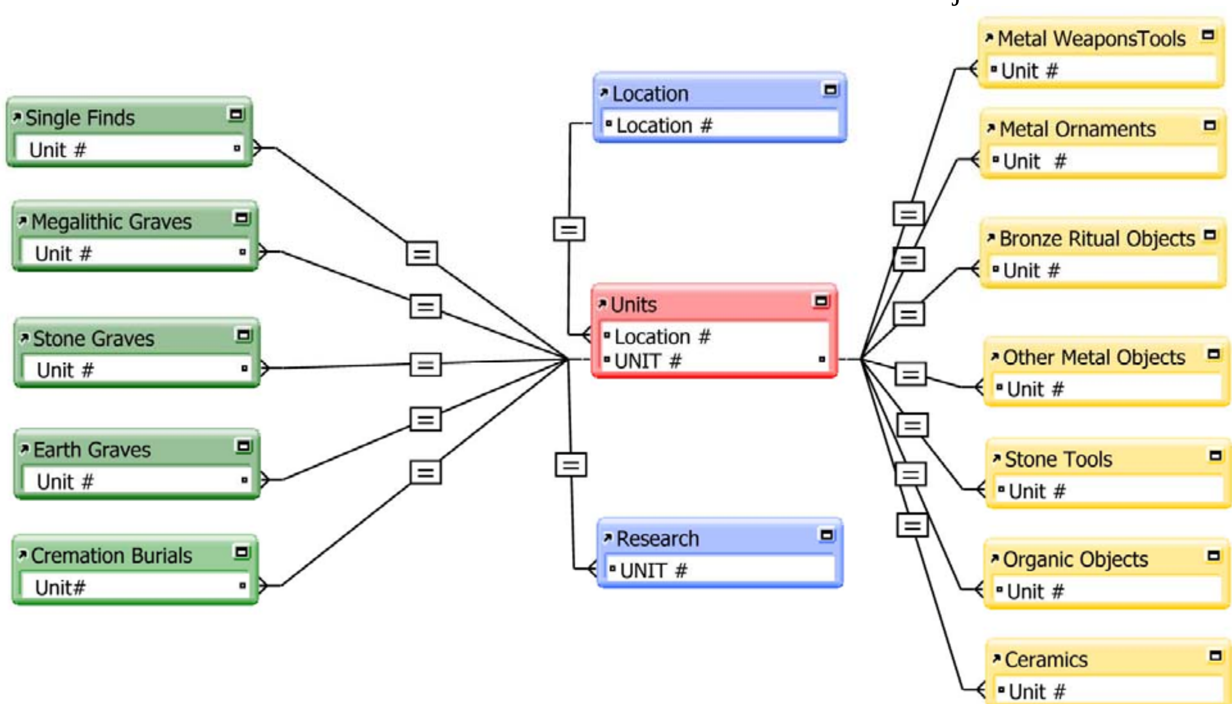


Table 2.1: Vegetation Zones on Mount Gonga (Zhao, Yang, and Shen 1990, and Zhong, Zhang, and Luo 1999).

<table>
<tr><th></th><th>Western Slope</th><th>Eastern Slope</th></tr>
<tr><td>Above 5100</td><td>Perpetual snow</td><td rowspan="2">Perpetual snow</td></tr>
<tr><td>4900-5100 m</td><td rowspan="2">Desert belt with sparse grass on alpine tundra soil</td></tr>
<tr><td>4700-4900 m</td><td rowspan="2">Desert belt with sparse grass on alpine tundra soil</td></tr>
<tr><td>4600-4700 m</td><td rowspan="2">Meadow belt on alpine meadow soil</td></tr>
<tr><td>4400-4600 m</td><td rowspan="2">Meadow belt on sub-alpine and alpine meadow soil</td></tr>
<tr><td>4200-4400 m</td><td rowspan="2">Shrub and grass belt on sub-alpine meadow soil</td></tr>
<tr><td>4000-4200 m</td><td rowspan="3">Shrub and grass belt on sub -alpine grey soil and meadow soil</td></tr>
<tr><td>3700-4000 m</td><td>Dark coniferous forest belt with sclerophyllous forest sub-belt on montane drab brown soil</td></tr>
<tr><td>3600-3700 m</td><td rowspan="2">Dark coniferous forest belt with fir and spruce forest sub-belt on montane brown soil /montane drab brown soil</td></tr>
<tr><td>3000-3600 m</td><td rowspan="2">Dark coniferous forest belt on montane drab brown soil / sub-alpine grey soil</td></tr>
<tr><td>2800-3000 m</td><td></td></tr>
<tr><td>2400-2800 m</td><td></td><td>Coniferous and deciduous broadleaved mixed forest belt on montane brown soil</td></tr>
<tr><td>2000-2400 m</td><td></td><td>Evergreen broadleaved forest and deciduous broadleaved mixed forest belt on montane brown soil</td></tr>
<tr><td>1600-2000 m</td><td></td><td>Evergreen broadleaved forest belt on montane drab soil</td></tr>
<tr><td>1000-1600 m</td><td></td><td>Evergreen broadleaved forest belt with woods and shrub and grass sub-belt on red and yellow earth</td></tr>
</table>

Table 2.2: Base Belts and their Distribution in the Hengduan Mountains (after Yao et al. 2010:Table 1).

Base belt	East flank	West flank	Base belt	East flank	West flank
Subtropical monsoon evergreen broad-leaved forest	2200-3000 m	1100 - 2200 m	Subtropical dry and hot valley bush belt	800 -3200 m	1000 -3400 m
Subtropical evergreen broad-leaved forest	600-2800 m	1200-2700 m	Subtropical evergreen sclerophyllous shrub belt	2700-2900 m	1780 -1980 m
Subtropical evergreen coniferous forest	1000 -3200 m	1500-3200 m	Frigid temperate dark coniferous forest	---	2900 -4300 m
Subtropical evergreen sclerophyllous & broad-leaved forest	---	2400 -4200 m			

Table 2.3: Mountain Altitudinal Belts and their Distribution in the Hengduan Mountains (after Yao Yonghui et al. 2010:Table 2).

Altitudinal belt	East flank	West flank	Altitudinal belt	East flank	West flank
Monsoon evergreen broad-leaved forest	1300- 1900 m	--	Subalpine/alpine frigid temperate kurmmholz belt	4000-4200 m	---
Evergreen broad-leaved forest	1 600-3100 m	1400-3200m	Montane evergreen sclerophyllous shrub belt	3700-4000 m	3700-4000 m
Semi-evergreen broad-leaved forest	1900-2800 m	--	Subalpine/alpine evergreen shrub belt	2800-3300 m	2800-3300 m
Evergreen sclerophyllous & broad-leaved forest	2500 -3100 m	2800-4300 m	Subalpine/alpine deciduous shrub belt	---	3680-4280 m
Evergreen & deciduous broad-leaved forest	1600 -2400 m	---	Subalpine/alpine bush & meadow belt	3800-4600 m	3800-4200 m
Evergreen & deciduous broad-leaved &coniferous mixed forest	2700 -3000 m	2700-3000 m	Alpine evergreen Leather-leaved shrub	3500-4800 m	3500-4700 m
Deciduous broad-leaved forest	---	2300-2500 m	Alpine deciduous shrub	3500-4100 m	3500-4700 m
Broad-leaved &coniferous mixed forest	1600 -3300 m	2000-3500 m	Alpine shrub & meadow belt	3500-4500m	3800-4800 m
Warm evergreen coniferous forest	2200 -3200 m	2400-3450 m	Alpine meadow	3700-4600 m	3500-4900 m
Temperate coniferous forest	2500-3600 m	2500-3700 m	Alpine desert	4200-5000 m	---
Bright coniferous forest	3000-3800 m	2700-3600 m	Alpine desert-steppe	3800-4500 m	---
Dark coniferous forest	2500-4500 m	3000-4500 m	Sub-nival belt	4000-5000 m	4200-5100 m
Subalpine / alpine krummholz belt	2800 -2900 m	2800-2900 m	Nival belt	Above 4500m	Above 4600m

Table 2.4: Western and Eastern Slope on the Western Bank of the Jinshajiang in the Hengduanshan Mountains (after Liu, Xu, and Zhang 1984: fig. 2-4).

	Western slope	Eastern slope
Above 4900	permanent ice	
4600-4900 m	drift stone slopes	
4200-4600 m	high-altitude meadow	
4000-4200 m	rhododendron scrubs	high-altitude meadow with sparse dry bush vegetation, mainly rhododendron
3500-4000 m	fir forest	fir forest with much oak
3300-3500 m	spruce forest with high percentage of oak and pine	spruce forest with much oak, pine, and rhododendron
3000-3300 m	pine forest with some oak	
2800-3000 m	warm temperate semi-arid folial scrubs with pine and oak	temperate semi-arid folial scrub with much pine and oak
2000-2800 m	subtropical arid folial scrub	subtropical arid folial scrubs between

Table 2.5: Main taxa on the Western Slope on the Western Bank of the Jinshajiang in the Hengduanshan Mountains (after Liu, Xu, and Zhang 1984: fig. 2-4).

2100-2800 m	Bauhinia faberi var. microphylla, Jasminium nudiflorum var. pulvinatum, Excoecaria acerifolia, Buddleja crispa, Indigofera lenticellata, Osteomeles scherinae, Vitex microphylla, Phyllanthus sp., Leptodermis microphylla, Rabdosia oresbia, Selaginella tamaricina var. pulvinat,a Sophora vicifolia, Cymbopogon distans, Campylotropis polyantha, Pertya phylicoides, Daphne sp
2800-3000 m	Phyllanthus sp., Leptodermis microphylla, Rabdosia oresbia, Selaginella tamaricina var. pulvinat,a Sophora vicifolia, Cymbopogon distans, Campylotropis polyantha, Campylotropia polyantha, Pertya phylicoides, Spiraea yunnanensis, Platycladus orientalis, Cotoneaster adpressus, Pinus densata, Pinus armandii, Quercus longispica
3000-3300 m	Sophora vicifolia, Spiraea yunnanensis, Pinus densata, Pinus armandi, Quercus pannosa, Quercus guyavefolia, Picea brachytyla var. complanda
3300-3500 m	Spiraea yunnanensis, Pinus densata, Pinus armandii, Quercus pannosa, Quercus guyavaefolia, Picea brachytyla var. complanda, Rubus loropetalus, Betulus patyphylla, Dryopteris sinofibillosa, Abies georgii
3500-4000 m	Picea brachytyla var. complanata, Rubus loropetalus, Betulus patyphylla, Dryopteris sinofibillosa, Abies georgii, Latrix potaninii var. macrocarpa
4000-4200 m	Abies georgii, Thododendron sp., Latrix potaninii var. macrocarpa, Rhododendron adenogynum, Rhododendrom nivale, Potentilla stenophylla
4200-4600 m	Latrix potaninii var. macrocarpa, Rhododendron adenogynum, Rhododendrom nivale, Potentilla stenophylla, Phododendronprimulaeflorum Thododendron sp., Sabina squamata, Phododendron saluenense, Polygonum sphaerostachyum, Thermopsis alipn, Kobresia spp., Potentilla coriandrifolia var. dumosa
4200-4600 m	Vitex microphyllla, Cymbopogon distans, Buddleja crispa, Bauhinia faberi var. microphylla, Exoecaria acerifolia, Indigofera lenticellata, Selaginella tamaricina var. pulvinata, Leptodermis microphylla, Jasminium nudiflorum var. pulvinatum, Rabdosia oresbiaCampylotropis polyantha, Phyllantus sp., Osteomeles scherinae, Sophora vicifolia, Spiraea yunnanensis, Dapne sp.

Table 2.6: Main Taxa on the Eastern Slope on the Western Bank of the Jinshajiang in the Hengduan Mountains (after Liu, Xu, and Zhang 1984: fig. 2-4).

2050-2800 m	21 species of *Leptodermis microphylla, Jasminium nudiflorum var. pulvinatum, Rabdosia oresbia, Phyllantus sp., Osteomeles scherinae, Sophora vicifolia, Spiraea yunnanensis, Sinarundinaria sp., Daphne sp., Pertya phylicoides, Quercus longispica, Pinus densata, Petya phylicoides, Cotoneaster adpressus, Phododendron racemosum, Quercus pannosa, Quercus monimotricha, Betula patyphylla, Picea brachytyla, Rhododendron sp.*
2800-3300 m	18 species of of *Pinus densata, Petya phylicoides, Rhododendron racemosum, Quercus pannosa, Quercus monimotricha, Betula patyphylla, Picea brachytyla, Rhododendron sp., Dryopteris sinofibrillosa, Rhododendron rubiginosum, Rubus loropetalus, Sinarundinaria nitida, Latrix potaninii var. macrocarpa, Abies georgii, Sabina squamata, Palygonum sphaerostachyum*
3300-3500 m	13 species, mainly *Quercus mannosia, Quercus monimotricha, Betula patyphylla, Picea brachytyla, Rhododendron rubiginosum, Rubus loropetalus, Abies georgii, Rhododdendron adenogynum, Cassiope selaginoides, Sabina squamata, Polygonum sphaerostachyum*
3550-3900 m	11 species of *Quercus pannosa, Abies georgii, Rhododdendron adenogynum, Cassiope selaginoides, Sabina squamata, Polygonum sphaerostachyum, Rhododendron primulaeflorum, Rhododendron nivale, Potentilla coriandrifolia var. dumosa, Potentilla stenophylla*

Table 2.7: Vegetation Distribution according to Yu Xiao-Gan (1984).

	SO Tibet		NW Yunnan	
	Medong	Zayu	Wixing/Yunlingshan	Yongnin
Snow	up to 5000 m	5000 m	5000 m	n.a.
Stones	up to 4600 m	5800 m	5800 m	n.a.
bush/grass meadow	up to 4200	4400 m	4500 m	n.a.
needle forest	up to 3700 m	4000 m	4400 m	4200 m
moderate mixed needle and coniferous zone	up to 2800 m	3000 m	3100 m	3100 m
evergreen coniferous forest zone	up to 2100 m	2300 m	2500 m	2700 m
	Tropical monsunal rainforest up to 1000 m		subtropical dry bush zone up to 1200 m	

Table 2.8: Model of the Vegetation Zonation on the Western and Eastern Slope of Mountains in West Sichuan and North Yunnan (after Guo Jinhui et al. 1985:fig. 1-2, and Ren, Yang, and Bao 1985 fig. 27).

<table>
<tr><th></th><th>Winward, sun-exposed slope</th><th>Leeward slope</th></tr>
<tr><td>Above 4100 m</td><td colspan="2">Alpine cold desert soil</td></tr>
<tr><td>4100 - 4300 (4600) m</td><td colspan="2">Alpine shrub meadow or subalpine meadow</td></tr>
<tr><td>3000 (3200) - 4100 (4300) m</td><td rowspan="2">Dark needle-leaf forest on mountain dark brown earth
Mixed needle-leaf and broadleaf forest on mountain brown earth</td><td>Dark needle-leaf forest on mountain dark brown earth
Mixed needle-leaf and broadleaf forests on mountain brown earth</td></tr>
<tr><td>2100 (2800) - 3200 (3000) m</td><td rowspan="2">Yunnan pine forest on red earth / drab red earth</td></tr>
<tr><td>2000 (3000) - 2100 (2800) m</td><td>evergreen broadleaf forest on yellow earth / yellow brown earth</td></tr>
<tr><td>Below 2000 (3000) m</td><td colspan="2">River valley dry shrubs on drab soil / drab red earth</td></tr>
</table>

Table 3.1: Numbers and Percentages of Vessels and Sherds by Decoration.

	Urn Pits		**Graves**		**Settlements**		**All**	
	Number	*Perc.*	*Number*	*Perc.*	*Number*	*Perc.*	*Number*	*Perc.*
Decorated	19	24.68%	552	28.89%	297	28.70%	868	28.71%
Undecorated	22	28.57%	753	39.40%	273	26.38%	1048	34.67%
Unknown	36	46.75%	606	31.71%	465	44.93%	1107	36.62%
SUM	**77**	**100.00%**	**1911**	**100.00%**	**1035**	**100.00%**	**3023**	**100.00%**

Table 3.2: Numbers and Percentages of Vessels and Sherds by Decoration.

	Urn Pits		**Graves**		**Settlements**		**All**	
	Number	*Perc.*	*Number*	*Perc.*	*Number*	*Perc.*	*Number*	*Perc.*
Decorated	19	46.34%	552	42.30%	297	52.11%	868	45.30%
Undecorated	22	53.66%	753	57.70%	273	47.89%	1048	54.70%
SUM	**41**	**100.00%**	**1305**	**100.00%**	**570**	**100.00%**	**1916**	**100.00%**

Table 3.3: Number and Percentage of Decoration Motifs Listed by Technique.

Code	**Description**	**Number**	**Perc I**	**Perc. II**
ap1	appliqué band, horizontal, single	224	80.29%	17.24%
ap2	appliqué bands, two	2	0.72%	0.15%
ap3	appliqué points or knobs	3	1.08%	0.23%
ap4	appliqué large double spirals (rams head)	8	2.87%	0.62%
ap5	appliqué: recumbent S	16	5.73%	1.23%
ap6	appliqué strip, vertical	12	4.30%	0.92%
ap7	application-strips, crossed	4	1.43%	0.31%
ap8	appliqué-points on top, two	8	2.87%	0.62%
ap9	appliqué: comma-shaped	1	0.36%	0.08%
ap10	appliqué: knob below	1	0.36%	0.08%
	Subtotal	**279**	**100.00%**	**21.48%**
in1	incised horizontal lines	168	46.67%	12.93%
in2	incised transverse lines	32	8.89%	2.46%
in3	incised vertical lines	5	1.39%	0.38%
in4	incised net pattern	54	15.00%	4.16%
in5	incised water-ripple pattern	46	12.78%	3.54%
in6	incised zigzag	19	5.28%	1.46%
in7	incised fish-bone pattern	7	1.94%	0.54%
in8	incised cross pattern	6	1.67%	0.46%
in9	incised v-shaped pattern	1	0.28%	0.08%
in10	incised triangles	6	1.67%	0.46%
in11	incised bands of alternate triangles	1	0.28%	0.08%
in12	incised ovals	1	0.28%	0.08%
in13	incised large double spirals (rams head)	2	0.56%	0.15%
in14	incised cross	4	1.11%	0.31%
in15	incised character (tree-like)	2	0.56%	0.15%
in16	incised half-circles	2	0.56%	0.15%
in17	incised rhombic pattern	2	0.56%	0.15%
in18	incised rectangles	1	0.28%	0.08%
in19	incised stars	1	0.28%	0.08%
	Subtotal	**360**	**100.00%**	**27.71%**

Table 3.3: Number and Percentage of Decoration Motifs Listed by Technique (Cont.).

Code	**Description**	**Number**	**Perc I**	**Perc. II**
im1	impressed leaf-vein pattern	241	38.62%	18.55%
im2	impressed cord pattern	71	11.38%	5.47%
im3	impressed triangles	13	2.08%	1.00%
im4	impressed traces of rice straw	1	0.16%	0.08%
im5	impressed: horizontal lines of impressed point-pairs	38	6.09%	2.93%
im6	impressed: horizontal lines of impressed points	110	17.63%	8.47%
im7	impressed small indentations	1	0.16%	0.08%
im8	impressed bundles of horizontal point lines	2	0.32%	0.15%
im9	impressed bundles of transverse point lines	13	2.08%	1.00%
im10	impressed fish-bone pattern of impressed points	5	0.80%	0.38%
im11	impressed net pattern of impressed points	3	0.48%	0.23%
im12	Impressed: zigzag of impressed points	1	0.16%	0.08%
im13	impressed: fingertip decoration	125	20.03%	9.62%
	Subtotal	**624**	**100.00%**	**48.04%**
cu1	cut-out holes	1	2.94%	0.08%
cu2	cut-out ovals	11	32.35%	0.85%
cu3	cut-out points	4	11.76%	0.31%
cu4	cut-out triangles	18	52.94%	1.39%
	Subtotal	34	100.00%	2.62%
ic	incrustation	1	100.00%	0.08%
co	coloring: double-spirals (rams head) in red and white colors	1	100.00%	0.08%
	SUM	**1299**	**100.00%**	**100.00%**

Table 3.4: Decoration Motifs Combining Several Elements in One Decoration Field.

Code	**Description**	**Numb.**	**Perc. I**	**Perc. II**	**Per. III**
ap1+ap10	appliqué: horizontal appliqué band and knob	5	62.50%	1.46%	0.38%
ap1+ap8	horizontal appliqué band and two points	3	37.50%	0.88%	0.23%
	Subtotal appliqué	**8**	**100.00%**	**2.34%**	**0.62%**
ap5+in5	appliqué/ incised: band of water-ripple pattern with recumbent S-appliqué in middle	22	73.33%	6.43%	1.69%
ap9+in5	band of water-ripple pattern with vertical comma-shaped appliqué in middle	2	6.67%	0.58%	0.15%
ap3+in2	band of transverse lines with round appliqué in the middle	1	3.33%	0.29%	0.08%
ap5+in1	bundle of incised horizontal lines with recumbent S-appliqué in middle	3	10.00%	0.88%	0.23%
ap6+in7	incised fish-bone pattern with vertical appliqué band in middle	1	3.33%	0.29%	0.08%
ap1+in4	incised net pattern on horizontal appliqué band	1	3.33%	0.29%	0.08%
	Subtotal appliqué/ incised	**30**	**100.00%**	**8.77%**	**2.31%**
ap1+im13	appliqué-band with fingertip-impressions	122	93.85%	35.67%	9.39%
ap4+im3	line of impressed triangles with round appliqué	2	1.54%	0.58%	0.15%
ap7+im3	line of impressed triangles with thin vertical appliqué strip	6	4.62%	1.75%	0.46%
	Subtotal appliqué/ impressed	**130**	**100.00%**	**38.01%**	**10.01%**
in1+in2	incised horizontal lines and transverse lines	3	3.70%	0.88%	0.23%
in1+in4	incised horizontal lines and net pattern	11	13.58%	3.22%	0.85%

in1+in4	incised horizontal lines and zigzag	2	2.47%	0.58%	0.15%
in1+in5	incised horizontal lines and water-ripple	49	60.49%	14.33%	3.77%
in1+in7	incised horizontal lines and fish-bone pattern	7	8.64%	2.05%	0.54%
in1+in8	incised horizontal lines and cross pattern	1	1.23%	0.29%	0.08%
in1+in10	incised horizontal lines and triangles	2	2.47%	0.58%	0.15%
in1+in16	incised horizontal lines and half-circles	2	2.47%	0.58%	0.15%
in1+in17	incised horizontal lines and rhombic pattern	1	1.23%	0.29%	0.08%
in1+in18	incised horizontal lines and rectangles	1	1.23%	0.29%	0.08%
in1+in19	incised horizontal lines and stars	1	1.23%	0.29%	0.08%
in5+in8	incised water-ripple pattern and cross pattern	1	1.23%	0.29%	0.08%
	Subtotal incised	**81**	**100.00%**	**23.68%**	**6.24%**
in1+im6	horizontal bands of impressed points between incised lines	5	83.33%	1.46%	0.38%
in4+im6	horizontal bands of net and point pattern	1	16.67%	0.29%	0.08%
	Subtotal incised/ impressed	**6**	**100.00%**	**1.75%**	**0.46%**
ap5+in1+ in6	horizontal lines, zigzag, angular recumbent S-pattern	1	2.22%	0.29%	0.08%
ap6+in5+ im13	bundles of incised water-ripple pattern, vertical appliqué-band with fingertip-impressed motif above	40	88.89%	11.70%	3.08%
ap6+in1+ im13	horizontal incised lines, vertical fingertip-impressed appliqué band	4	8.89%	1.17%	0.31%
	Subtotal appliqué/ incised / impressed	**45**	**100.00%**	**13.16%**	**3.46%**
in1+in2+ in10	incised horizontal lines, transverse lines, triangles	1	4.00%	0.29%	0.08%
in1+in5+ in10	incised horizontal lines, water-ripple, triangles	19	76.00%	5.56%	1.46%
in1+in5+ in6	incised horizontal lines, water-ripple pattern, zigzag	1	4.00%	0.29%	0.08%
in1+in5+ im6	horizontal bands of water-ripple, line, and point pattern	1	4.00%	0.29%	0.08%
in1+in7+ im6	horizontal bands of fish-bone pattern between lines of impressed points and horizontal lines	3	12.00%	0.88%	0.23%
	Subtotal incised/ impressed	**25**	**100.00%**	**7.31%**	**1.92%**
in1+in2+in6+ in8	incised horizontal lines, transverse lines, zigzag, cross pattern	3	17.65%	0.88%	0.23%
in1+in5+ in17+im6	incised line, water-ripple, and rhombic pattern, impressed point pattern	1	5.88%	0.29%	0.08%
in1+in5+ in16+cu4	horizontal bands of incised lines, water-ripple, half-circles, cut-out triangles	12	70.59%	3.51%	0.92%
ap6+in2+in6 +in7+im13	incised transverse lines, zigzag pattern, fish-bone pattern, and vertical appliqué band with finger-tip impressed motif	1	5.88%	0.29%	0.08%
	Subtotal other	**17**	**100.00%**	**4.97%**	**1.31%**
	SUM	**342**		**100.00%**	**26.33%**
	ALL	**1299**			**100.00%**

Table 3.5a: Decoration Motifs by Technique, Type, and Position I.

Code	Description	Number	Perc. I	Perc. II	inside	lip	rim	neck	shoulder	body	handle	foot	bottom
ap1	appliqué band, horizontal, single	100	70.92%	7.70%	0	1	8	0	2	8	81	0	0
ap2	appliqué bands, two	2	1.42%	0.15%	0	0	0	2	0	0	0	0	0
ap3	appliqué points or knobs	2	1.42%	0.15%	0	0	0	0	0	2	0	0	0
ap4	appliqué large double spirals (rams head)	6	4.26%	0.46%	0	0	0	0	0	6	0	0	0
ap5	appliqué: recumbent S	13	9.22%	1.00%	0	0	0	1	9	1	2	0	0
ap6	appliqué strip, vertical	9	6.38%	0.69%	0	0	0	0	3	1	5	0	0
ap7	appliqué-strips, crossed	2	1.42%	0.15%	0	0	0	0	0	0	2	0	0
ap8	appliqué-points on top, two	7	4.96%	0.54%	0	0	0	0	0	0	7	0	0
ap9	appliqué: comma-shaped	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0
ap10	appliqué: knob below	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0
	Subtotal appliqué	**141**	**100.00%**	**10.85%**	**0**	**1**	**8**	**3**	**14**	**18**	**97**	**0**	**0**
in1	incised horizontal lines	148	47.44%	11.39%	0	4	8	37	73	21	0	3	2
in2	incised transverse lines	28	8.97%	2.16%	0	1	3	10	9	5	0	0	0
in3	incised vertical lines	5	1.60%	0.38%	0	1	0	1	3	0	0	0	0
in4	incised net pattern	50	16.03%	3.85%	0	0	2	13	30	5	0	0	0
in5	incised water-ripple pattern	42	13.46%	3.23%	0	0	1	4	28	5	4	0	0
in6	incised zigzag	16	5.13%	1.23%	0	1	4	2	7	2	0	0	0
in7	incised fish-bone pattern	4	1.28%	0.31%	0	0	1	0	2	1	0	0	0
in8	incised cross pattern	3	0.96%	0.23%	0	0	1	0	1	1	0	0	0
in9	incised v-shaped pattern	1	0.32%	0.08%	0	0	0	1	0	0	0	0	0
in10	incised triangles	5	1.60%	0.38%	0	0	1	0	2	0	2	0	0
in11	incised bands of alternate triangles	1	0.32%	0.08%	0	0	0	0	0	1	0	0	0
in12	incised ovals	1	0.32%	0.08%	0	0	0	0	0	0	0	1	0
in13	incised large double spirals (rams head)	2	0.64%	0.15%	0	0	0	0	0	2	0	0	0
in14	incised cross	4	1.28%	0.31%	0	0	0	0	1	0	1	0	2
in15	incised character (tree-like)	2	0.64%	0.15%	0	0	0	2	0	0	0	0	0
in16	incised half-circles	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0
in17	incised rhomic pattern	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0

in18	incised rectangles	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0
in19	incised stars	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0
	Subtotal incised	**312**	**100.00%**	**24.02%**	**0**	**7**	**21**	**70**	**156**	**43**	**7**	**4**	**4**
im1	impressed leaf-vein pattern	241	48.98%	18.55%	0	0	0	0	0	0	0	0	241
im2	impressed cord pattern	71	14.43%	5.47%	0	31	6	12	7	15	0	0	0
im3	impressed triangles	9	1.83%	0.69%	0	0	0	1	2	0	6	0	0
im4	impressed traces of rice straw	1	0.20%	0.08%	0	0	0	0	0	1	0	0	0
im5	impressed: horizontal lines of impressed point-pairs	38	7.72%	2.93%	0	4	2	11	13	7	1	0	0
im6	impressed: horizontal lines of impressed points	107	21.75%	8.24%	1	13	8	34	34	6	1	10	0
im7	impressed small indentations	1	0.20%	0.08%	0	1	0	0	0	0	0	0	0
im8	impressed bundles of horizontal point lines	2	0.41%	0.15%	0	0	0	0	2	0	0	0	0
im9	impressed bundles of transverse point lines	13	2.64%	1.00%	0	0	9	0	2	2	0	0	0
im10	impressed fish-bone pattern of impressed points	5	1.02%	0.38%	0	0	1	1	1	1	0	1	0
im11	impressed net pattern of impressed points	3	0.61%	0.23%	0	1	0	2	0	0	0	0	0
im12	impressed zigzag of impressed points	1	0.20%	0.08%	0	0	0	1	0	0	0	0	0
im13	impressed: fingertip decoration	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0
	Subtotal impressed	**492**	**100.00%**	**37.88%**	**1**	**50**	**26**	**62**	**61**	**32**	**8**	**11**	**241**
cu1	cut-out holes	1	2.94%	0.08%	0	0	1	0	0	0	0	0	0
cu2	cut-out ovals	11	32.35%	0.85%	0	0	0	0	0	0	0	11	0
cu3	cut-out points	4	11.76%	0.31%	0	0	0	0	0	0	0	4	0
cu4	cut-out triangles	18	52.94%	1.39%	0	0	0	0	0	0	0	18	0
	Subtotal	34	100.00%	2.62%	0	0	1	0	0	0	0	33	0
ic	incrustation	1	100.00%	0.08%	0	0	0	0	0	1	0	0	0
co	coloring: double-spirals (rams head) in red and white colors	1	100.00%	0.08%	0	0	0	0	0	1	0	0	0

Table 3.5b: Decoration Motifs by Technique, Type, and Position II.

Code	Description	Number	Perc. I	Perc. II	inside	lip	rim	neck	shoulder	body	handle	foot	bottom
ap1+ap8	horizontal appliqué band and two points above	3	37.50%	0.23%	0	0	0	0	0	0	3	0	0
ap1+ap10	horizontal appliqué band and knob below	5	62.50%	0.38%	0	0	0	0	0	0	5	0	0
	Subtotal appliqué	**8**	**100.00%**	**0.62%**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**
ap5+in5	band of water-ripple pattern with recumbent S-appliqué in middle	22	73.33%	1.69%	0	0	0	0	22	0	0	0	0
ap9+in5	band of water-ripple pattern with vertical comma-shaped appliqué in the middle	2	6.67%	0.15%	0	0	0	0	2	0	0	0	0
ap3+in2	band of transverse lines with round appliqué in the middle	1	3.33%	0.08%	0	0	0	0	1	0	0	0	0
ap5+in1	bundle of incised horizontal lines with recumbent S-appliqué in middle	3	10.00%	0.23%	0	0	0	0	3	0	0	0	0
ap6+in7	fish-bone pattern with vertical appliqué band in middle	1	3.33%	0.08%	0	0	0	0	1	0	0	0	0
ap1+in4	net pattern on horizontal appliqué band	1	3.33%	0.08%	0	0	0	1	0	0	0	0	0
	Subtotal appliqué and incision	**30**	**100.00%**	**2.31%**	**0**	**0**	**0**	**1**	**29**	**0**	**0**	**0**	**0**
ap1+im13	appliqué-band with fingertip-impressed decoration	122	93.85%	9.39%	0	0	109	0	9	4	0	0	0
ap4+im3	line of impressed triangles with round appliqué	2	1.54%	0.15%	0	0	0	0	2	0	0	0	0
ap7+im3	line of impressed triangles with thin vertical appliqué strip	6	4.62%	0.46%	0	0	0	0	6	0	0	0	0
	Subtotal appliqué and impression	**130**	**100.00%**	**10.01%**	**0**	**0**	**109**	**0**	**17**	**4**	**0**	**0**	**0**
in1+in2	incised horizontal and transverse lines	3	3.70%	0.23%	0	0	0	1	2	0	0	0	0
in1+in4	incised horizontal lines and net pattern	11	13.58%	0.85%	0	0	0	10	1	0	0	0	0
in1+in4	incised horizontal lines and zigzag	2	2.47%	0.15%	0	0	1	0	0	1	0	0	0
in1+in5	horizontal lines and water-ripple pattern	49	60.49%	3.77%	0	0	0	1	23	24	0	1	0
in1+in7	horizontal lines and fish-bone pattern	7	8.64%	0.54%	0	0	0	0	5	2	0	0	0

in1+in8	horizontal lines and cross pattern	1	1.23%	0.08%	0	0	0	0	1	0	0	0	0
in1+in10	incised horizontal lines and triangles	2	2.47%	0.15%	0	0	1	0	0	0	0	1	0
in1+in16	incised horizontal lines and half-circles	2	2.47%	0.15%	0	0	0	0	0	2	0	0	0
in1+in17	horizontal lines and rhombic pattern	1	1.23%	0.08%	0	0	0	0	0	1	0	0	0
in1+in18	incised horizontal lines and rectangles	1	1.23%	0.08%	0	0	0	1	0	0	0	0	0
in1+in19	incised horizontal lines and stars	1	1.23%	0.08%	0	0	0	0	0	1	0	0	0
in5+in8	water-ripple pattern and cross pattern	1	1.23%	0.08%	0	0	0	0	1	0	0	0	0
	Subtotal incisions	**81**	**100.00%**	**6.24%**	**0**	**0**	**2**	**13**	**33**	**31**	**0**	**2**	**0**
in1+im6	horizontal bands of impressed points between incised lines	5	83.33%	0.38%	0	0	0	0	0	3	0	2	0
in4+im6	horizontal bands of net and points	1	16.67%	0.08%	0	0	0	0	0	1	0	0	0
	Subtotal incision and impression	**6**	**100.00%**	**0.46%**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**2**	**0**
ap5+in1+ in6	horizontal lines, zigzag, angular recumbent S-pattern	1	2.22%	0.08%	0	0	0	0	0	0	0	1	0
ap6+in5+ im13	bundles of incised water-ripple pattern, vertical appliqué-band with fingertip-impressed motif above	40	88.89%	3.08%	0	0	0	0	40	0	0	0	0
ap6+in1+ im13	horizontal incised lines, vertical fingertip-impressed appliqué band above	4	8.89%	0.31%	0	0	0	0	4	0	0	0	0
	Subtotal appliqué and incisions	**45**	**100.00%**	**3.46%**	**0**	**0**	**0**	**0**	**44**	**0**	**0**	**1**	**0**
in1+in2+ in10	incised horizontal lines, transverse lines, triangles	1	4.00%	0.08%	0	0	0	0	0	0	0	1	0
in1+in5+ in10	incised horizontal lines, water-ripple pattern, triangles	19	76.00%	1.46%	0	0	0	0	0	1	0	18	0
in1+in5+ in6	incised horizontal lines, water-ripple pattern, zigzag	1	4.00%	0.08%	0	0	0	0	0	0	0	1	0
in1+in5 +im6	horizontal bands of water-ripple, line, and point pattern	1	4.00%	0.08%	0	0	0	0	1	0	0	0	0
in1+in7+ im6	bands of fish-bone pattern between lines of impressed points and lines	3	12.00%	0.23%	0	0	0	0	3	0	0	0	0
	Subtotal incisions and impressions	**25**	**100.00%**	**1.92%**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**20**	**0**

in1+in2+ in6+in8	incised horizontal lines, transverse lines, zigzag, cross pattern	3	17.65%	0.23%	0	0	0	1	2	0	0	0	0
in1+in5+ in17+im6	incised line, water-ripple, and rhombic pattern, impressed point pattern	1	5.88%	0.08%	0	0	0	0	0	0	0	1	0
in1+in5+in16+cu4	horizontal bands of incised lines, water-ripple pattern, half-circles, and cut-out triangles	12	70.59%	0.92%	0	0	0	0	0	0	0	12	0
ap6+in2+ in6+in7+ im13	incised transverse lines, zigzag pattern, fish-bone pattern, and vertical appliqué band with finger-tip impressed motif	1	5.88%	0.08%	0	0	0	0	1	0	0	0	0
	Subtotal other	**17**	**100.00%**	**1.31%**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**13**	**0**
	Sum			**105.62%**	**1**	**114**	**223**	**206**	**417**	**186**	**176**	**140**	**301**
	SUM				**0.06%**	**6.46%**	**12.64**	**11.68**	**23.64**	**10.54**	**9.98**	**7.94**	**17.06%**

Table 3.6: Types of Surface Finish by Context.

Surface treatment	Object Pits	Perc. I	Perc. II	Graves	Perc. I	Perc. II	Settle-ment	Perc. I	Perc. II	SUM	Perc. I	Perc. II
Black slip	8	100.00%	10.39%	129	46.40%	6.75%	19	10.61%	1.84%	156	33.55%	11.37%
Red slip	0	0.00%	0.00%	6	2.16%	0.31%	0	0.00%	0.00%	6	1.29%	0.44%
White slip	0	0.00%	0.00%	2	0.72%	0.10%	0	0.00%	0.00%	2	0.43%	0.15%
Black slip + polished	0	0.00%	0.00%	3	1.08%	0.16%	1	0.56%	0.10%	4	0.86%	0.29%
Burnished	0	0.00%	0.00%	137	49.28%	7.17%	159	88.83%	15.36%	296	63.66%	21.57%
Glazed	0	0.00%	0.00%	1	0.36%	0.05%	0	0.00%	0.00%	1	0.22%	0.07%
SUM	**8**	**100.00%**	**10.39%**	**278**	**100.00%**	**14.55%**	**179**	**100.00%**	**17.29%**	**465**	**100.00%**	**33.89%**

Table 3.7: Amount of Decoration by Vessel Type.

Object type	Decor.	Un-decorated	Burnished	Black slip	Red slip	White slip	Glazed	Num.	Perc. I	Perc. II	Perc. III	Deco. + Burn.	Deco. + Slip
basin	2	16	2	0	0	0	0	18	11.11%	0.21%	0.07%	1	0
bo bowl	28	92	28	6	0	0	0	120	23.33%	2.93%	0.98%	9	4
wan bowl	21	106	6	2	0	0	0	127	16.54%	2.20%	0.73%	4	2
dou bowl	5	15	2	1	0	0	0	20	25.00%	0.52%	0.17%	1	1
goblet	74	38	4	21	1	0	0	112	66.07%	7.75%	2.59%	4	9
cup	15	65	3	3	0	0	0	80	18.75%	1.57%	0.52%	1	0
urn	24	62	4	10	0	0	0	86	27.91%	2.51%	0.84%	4	4
beaker	21	36	0	0	0	0	0	57	36.84%	2.20%	0.73%	0	0
jar	67	296	2	16	0	0	0	363	18.46%	7.02%	2.34%	0	1
guan	287	393	41	4	0	0	0	680	42.21%	30.05%	10.03%	36	4
single-handled	44	66	4	15	5	0	0	110	40.00%	4.61%	1.54%	4	7
double-handled	171	151	61	12	0	2	0	322	53.11%	17.91%	5.98%	59	6
four-handled	0	2	0	0	0	0	0	2	0.00%	0.00%	0.00%	0	0
jar with handle	4	12	0	0	0	0	0	16	25.00%	0.42%	0.14%	0	0
double-jar	2	1	0	0	0	0	0	3	66.67%	0.21%	0.07%	0	0
handle	7	52	1	1	0	0	0	59	11.86%	0.73%	0.24%	0	1
ewer	13	24	3	2	0	0	0	37	35.14%	1.36%	0.45%	3	2
vase	43	105	4	8	0	0	0	148	29.05%	4.50%	1.50%	1	5
vat	0	32	0	5	0	0	0	32	0.00%	0.00%	0.00%	0	0
fu pot	1	6	0	0	0	0	0	7	14.29%	0.10%	0.03%	0	0
mou pot	0	4	0	0	0	0	0	4	0.00%	0.00%	0.00%	0	0
lid	4	18	9	0	0	0	0	22	18.18%	0.42%	0.14%	0	0
vessel stand	2	0	0	0	0	0	0	2	100.00%	0.21%	0.07%	0	0
bottom	101	286	22	25	0	0	0	387	26.10%	10.58%	3.53%	6	6
wall sherd	18	26	3	1	0	0	0	44	40.91%	1.88%	0.63%	3	0
net weight	0	2	0	0	0	0	1	2	0.00%	0.00%	0.00%	0	0
SUM	**955**	**1909**	**199**	**132**	**6**	**2**	**1**	**2864**	**100.00%**	**100.00%**	**33.39%**	**136**	**130**

Table 3.8: Ceramic Material in Relation to Method of Forming

	Fine Clay	**Clay**	**Coarse Clay**	**Fine Sand**	**Sand-Tempered**	**Coarse Sand**	**Unclear**	**All**
Coil-built	0	6	0	0	128	2	0	136
Fast wheel	0	3	0	26	207	3	4	243
Slow wheel	0	0	0	7	12	0	0	19
Hand-thrown	2	34	0	16	542	13	40	647
SUM I	*2*	*43*	*0*	*49*	*889*	*18*	*44*	*1045*
Unclear	28	325	1	91	1071	82	380	1978
SUM II	**30**	**368**	**1**	**140**	**1960**	**100**	**424**	**3023**

Table 3.9: Ceramic Material in Relation to Firing Temperature

	Fine Clay	**Clay**	**Coarse Clay**	**Coarse Sand**	**Sand-Tempered**	**Fine Sand**	**Unknown**	**All**
High	24	163	0	1	33	54	1	276
Low	0	26	0	13	605	7	0	651
Medium	0	6	0	0	19	2	0	27
Uneven	0	1	0	0	122	0	15	138
SUM I	*24*	*196*	*0*	*14*	*779*	*63*	*16*	*1092*
Unclear	6	172	1	86	1181	77	408	1931
SUM II	**30**	**368**	**1**	**100**	**1960**	**140**	**424**	**3023**

Table 3.10: Sherd Color in Relation to Ceramic Material I.

	Black	**Black-Brown**	**Black-Grey**	**Grey**	**Grey-Brown**	**Red**	**Red-Brown**	**Yellow**	**Yellow-Brown**	**Yel.-Red**
Fine clay	11	2	0	2	0	15	0	0	0	0
Clay	90	8	12	142	43	24	4	0	1	5
Fine sand	51	7	0	8	17	10	15	1	9	0
Sand	26	28	10	117	414	332	510	57	64	30
Coarse sand	14	2	1	8	38	19	11	0	1	2
Unclear	0	0	0	0	0	0	0	0	0	0
SUM	**192**	**47**	**23**	**277**	**507**	**400**	**540**	**58**	**75**	**37**

Table 3.11: Sherd Color in Relation to Ceramic Material II.

	Black/Grey	**Grey-Brown/Red**	**Brown/Red**	**Yellow**	**Unclear**	**SUM**
Clay	267	43	80	6	1	397
Sand	272	464	1108	164	192	2200
Unclear	0	0	3	0	0	3
SUM	**539**	**507**	**1191**	**170**	**193**	**2600**

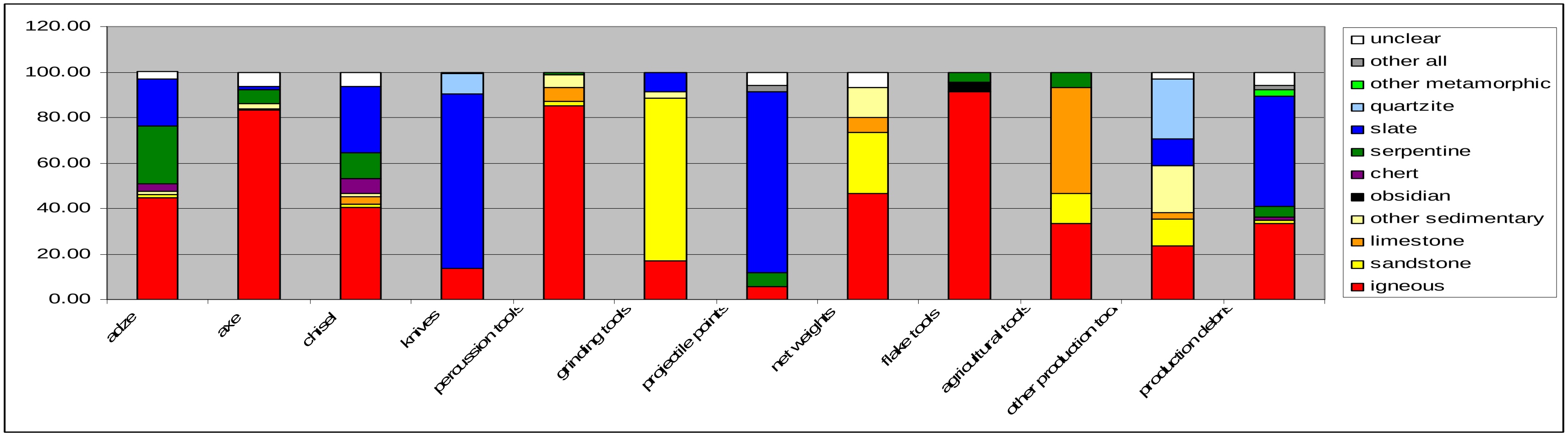
Table 3.12: Nature of Inclusions in Sand-Tempered Ceramics.

Temper	**Number**	**Percentage**
Coarse stone	6	1.37%
Fine sand	13	2.97%
Glittering inclusions	14	3.20%
Small stones	268	61.33%
Stones and coarse sand	136	31.12%
SUM	**437**	**100.00%**

Table 3.13: Pottery Quality in Relation to Object Type.

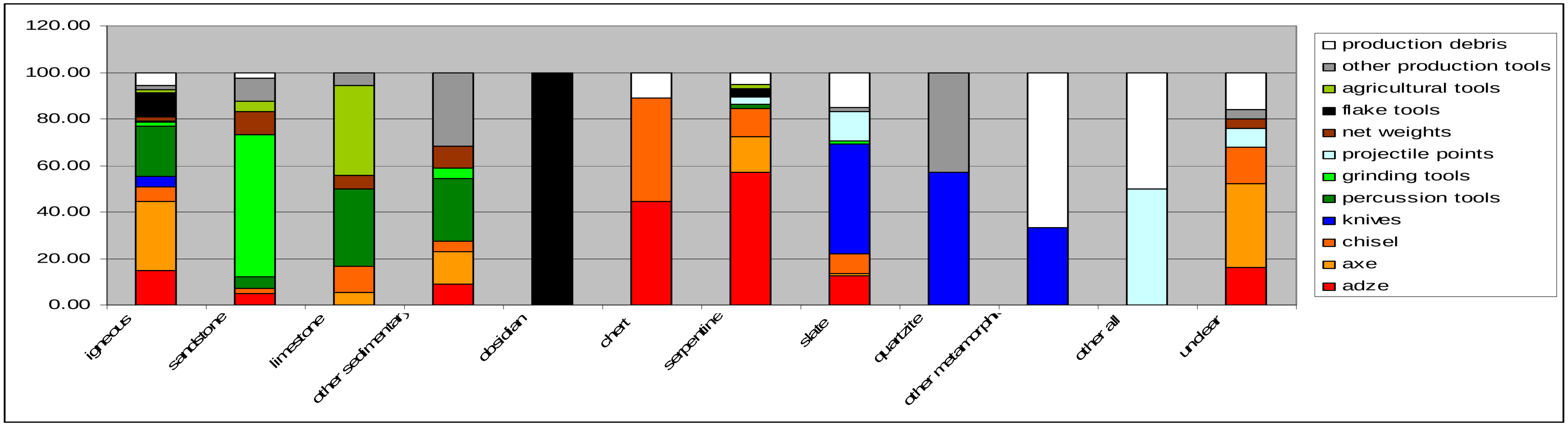
	Clay	**Percentage II**	**Sand**	**Percentage II**	**SUM**
Basin	2	12.50%	14	87.50%	16
Bo bowl	11	10.68%	92	89.32%	103
Wan bowl	11	8.80%	114	91.20%	125
Dou Bowl	3	15.79%	16	84.21%	19
Cup	6	8.00%	69	92.00%	75
Goblet	82	76.64%	25	23.36%	107
Urn	3	4.35%	66	95.65%	69
Jar	53	14.13%	322	85.87%	375
Beaker	0	0.00%	55	100.00%	55
Guan	27	5.33%	480	94.67%	507
Single-Handled Jar	53	49.07%	55	50.93%	108
Double-Handled Jar	58	22.39%	201	77.61%	259
Jar with Handles	1	9.09%	10	90.91%	11
Double-Jar	0	0.00%	3	100.00%	3
Four-Handled Jar	0	0.00%	2	100.00%	2
Handle	1	1.72%	57	98.28%	58
Ewer	5	14.71%	29	85.29%	34
Spout	1	11.11%	8	88.89%	9
Vase	20	14.60%	117	85.40%	137
Vat	0	0.00%	29	100.00%	29
Fu Pot	2	28.57%	5	71.43%	7
Mou Pot	0	0.00%	3	100.00%	3
Lid	0	0.00%	17	100.00%	17
Vessel stand	0	0.00%	2	100.00%	2
Drop-shaped pendant	0	0.00%	2	100.00%	2
Ram's Head Object	0	0.00%	1	100.00%	1
Spindle Whorl	29	34.52%	65	65.48%	84
Net Weight	0	0.00%	2	100.00%	2
SUMI	**339**	**15.88%**	**1796**	**84.12%**	**2135**
Bottom	47	12.84%	319	87.16%	366
Wall Sherd	2	8.33%	22	91.67%	24
SUMII	**388**	**15.37%**	**2137**	**84.63%**	**2525**

Table 3.14: Raw Material used for Different Tool Types in Percentages (I).



	igneous	sandstone	limestone	other sedimentary	obsidian	chert	serpentine	slate	quartzite	other metamorphic	other all	unclear
adze	44.62	1.54	0.00	1.54	0.00	3.08	25.38	20.77	0.00	0.00	0.00	3.08
axe	83.10	0.00	0.70	2.11	0.00	0.00	6.34	1.41	0.00	0.00	0.00	6.34
chisel	40.32	1.61	3.23	1.61	0.00	6.45	11.29	29.03	0.00	0.00	0.00	6.45
knives	13.64	0.00	0.00	0.00	0.00	0.00	0.00	76.52	9.09	0.76	0.00	0.00
percussion	85.00	2.00	6.00	6.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
grinding	17.14	71.43	0.00	2.86	0.00	0.00	0.00	8.57	0.00	0.00	0.00	0.00
projectile points	5.88	0.00	0.00	0.00	0.00	0.00	5.88	79.41	0.00	0.00	2.94	5.88
net weights	46.67	26.67	6.67	13.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67
flake tools	91.11	0.00	0.00	0.00	4.44	0.00	4.44	0.00	0.00	0.00	0.00	0.00
agricultural tools	33.33	13.33	46.67	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00
production tools	23.53	11.76	2.94	20.59	0.00	0.00	0.00	11.76	26.47	0.00	0.00	2.94
production debris	33.33	1.52	0.00	0.00	0.00	1.52	4.55	48.48	0.00	3.03	1.52	6.06
	48.77	5.06	2.22	2.72	0.25	1.11	7.16	26.42	2.59	0.37	0.25	3.09

Table 3.15: Raw Material used for Different Tool Types in Percentages (II).



	igneous	sandstone	limestone	other sedimentary	obsidian	chert	serpentine	slate	quartzite	other metamorphic	other all	unclear
adze	14.68	4.88	0.00	9.09	0.00	44.44	56.90	12.62	0.00	0.00	0.00	16.00
axe	29.87	0.00	5.56	13.64	0.00	0.00	15.52	0.93	0.00	0.00	0.00	36.00
chisel	6.33	2.44	11.11	4.55	0.00	44.44	12.07	8.41	0.00	0.00	0.00	16.00
knives	4.56	0.00	0.00	0.00	0.00	0.00	0.00	47.20	57.14	33.33	0.00	0.00
percussion	21.52	4.88	33.33	27.27	0.00	0.00	1.72	0.00	0.00	0.00	0.00	0.00
grinding	1.52	60.98	0.00	4.55	0.00	0.00	0.00	1.40	0.00	0.00	0.00	0.00
projectile points	0.51	0.00	0.00	0.00	0.00	0.00	3.45	12.62	0.00	0.00	50.00	8.00
net weights	1.77	9.76	5.56	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
flake tools	10.38	0.00	0.00	0.00	100.00	0.00	3.45	0.00	0.00	0.00	0.00	0.00
agricultural tools	1.27	4.88	38.89	0.00	0.00	0.00	1.72	0.00	0.00	0.00	0.00	0.00
production tools	2.03	9.76	5.56	31.82	0.00	0.00	0.00	1.87	42.86	0.00	0.00	4.00
production debris	5.57	2.44	0.00	0.00	0.00	11.11	5.17	14.95	0.00	66.67	50.00	16.00
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 3.15: Raw Material used for Different Tool Types in Absolute Numbers.

	igneous	sandstone	limestone	other sedimentary	obsidian	chert	serpentine	slate	quartzite	other metamorph.	other all	unclear	SUM
adze	58	2	0	2	0	4	33	27	0	0	0	4	130
axe	118	0	1	3	0	0	9	2	0	0	0	9	142
chisel	25	1	2	1	0	4	7	18	0	0	0	4	62
knives	18	0	0	0	0	0	0	101	12	1	0	0	132
percussion	85	2	6	6	0	0	1	0	0	0	0	0	100
grinding	6	25	0	1	0	0	0	3	0	0	0	0	35
projectile	2	0	0	0	0	0	2	27	0	0	1	2	34
net weights	7	4	1	2	0	0	0	0	0	0	0	1	15
flake tools	41	0	0	0	2	0	2	0	0	0	0	0	45
agricultural	5	2	7	0	0	0	1	0	0	0	0	0	15
production	8	4	1	7	0	0	0	4	9	0	0	1	34
debris	22	1	0	0	0	1	3	32		2	1	4	66
SUM	395	41	18	22	2	9	58	214	21	3	2	25	810

Table 3.16: Descriptive Statistics for Standard Measurements for Swords.

	Length	*Blade Length*	*Blade Width*	*Handle Length*	*Handle Width*	*Blade/Handle*	*Blade L/W*	*L/W*
Mean	30.78	21.67	3.79	7.34	3.07	3.10	5.93	9.00
Standard Error	1.14	1.04	0.09	0.23	0.10	0.15	0.38	0.46
Median	29.80	20.70	3.80	7.20	3.00	2.99	5.21	8.13
Mode	36.00	22.00	4.50	8.00	3.00	3.50	#N/A	8.50
Standard Deviation	10.85	8.60	0.83	2.20	0.90	1.18	2.97	3.78
Sample Variance	117.79	73.88	0.69	4.83	0.81	1.39	8.80	14.32
Kurtosis	0.01	0.21	1.16	1.32	0.34	-0.27	5.48	5.46
Skewness	0.62	0.83	-0.33	0.55	0.13	0.52	1.91	1.81
Range	52.60	39.40	4.90	13.00	4.80	5.22	17.31	22.13
Minimum	8.90	6.60	1.10	1.00	1.00	1.01	1.69	4.17
Maximum	61.50	46.00	6.00	14.00	5.80	6.23	19.00	26.30
Count	90.00	68.00	80.00	93.00	78.00	64.00	62.00	68.00
Confidence (95.0%)	2.27	2.08	0.18	0.45	0.20	0.29	0.75	0.92

Table 3.17: Descriptive Statistics for Standard Measurements for Dagger-Axes.

	Length	Blade L	Blade W	Butt L	Butt W	Thickness	L/W	Blade L/W	Blade/Butt
Mean	25.17	19.11	8.38	6.36	3.63	0.51	3.24	2.47	3.08
Standard Error	0.49	0.37	0.34	0.14	0.28	0.02	0.14	0.10	0.08
Median	25.60	19.00	8.80	6.40	3.70	0.50	3.22	2.41	3.00
Mode	22.00	19.00	8.90	6.00	4.30	0.50	#N/A	#N/A	3.00
Standard Deviation	3.36	2.72	2.10	0.99	0.73	0.14	0.76	0.59	0.53
Sample Variance	11.30	7.42	4.40	0.98	0.53	0.02	0.58	0.35	0.28
Kurtosis	0.51	0.41	1.15	0.30	-1.11	32.01	4.14	2.66	0.66
Skewness	-0.46	-0.31	-0.61	0.01	-0.73	3.88	1.47	1.35	0.39
Range	17.10	14.30	10.30	4.80	1.80	1.40	3.98	2.94	2.42
Minimum	16.20	11.50	3.20	4.00	2.50	0.00	1.90	1.44	1.98
Maximum	33.30	25.80	13.50	8.80	4.30	1.40	5.88	4.38	4.40
Count	47.00	54.00	37.00	48.00	7.00	52.00	29.00	34.00	43.00
Confidence Level(95.0%)	0.99	0.74	0.70	0.29	0.67	0.04	0.29	0.21	0.16

Table 3.18: Descriptive Statistics for Standard Measurements for Spearheads.

	Length	Cross section	Blade L	Blade W	Shaft L	Shaft W	L/W	Blade L/W	Blade/Shaft
Mean	17.00	1.85	9.35	2.75	7.52	1.95	5.95	3.27	1.21
Standard Error	0.90	0.20	0.61	0.11	0.40	0.10	0.33	0.16	0.08
Median	15.50	1.75	8.15	2.95	7.80	1.90	5.90	3.07	1.13
Mode	21.00	1.20	7.50	3.00	11.50	1.80	#N/A	#N/A	#N/A
Standard Deviation	5.77	0.63	3.74	0.70	2.21	0.39	2.03	0.97	0.46
Sample Variance	33.28	0.39	13.97	0.49	4.90	0.15	4.10	0.94	0.21
Kurtosis	1.98	-1.71	0.10	-0.18	-0.70	-0.86	1.01	-1.29	1.20
Skewness	1.09	0.36	0.76	0.07	-0.01	0.18	-0.24	0.27	1.03
Range	27.70	1.60	15.70	3.20	8.30	1.30	10.25	3.29	2.04
Minimum	9.30	1.20	3.30	1.30	3.20	1.30	0.00	1.77	0.49
Maximum	37.00	2.80	19.00	4.50	11.50	2.60	10.25	5.06	2.53
Count	41.00	10.00	38.00	40.00	30.00	14.00	38.00	35.00	30.00
Confidence Level(95.0%)	1.82	0.45	1.23	0.22	0.83	0.23	0.67	0.33	0.17

Table 3.20: Descriptive Statistics for *Fu* and *Yue* Axes

Fu	Length	Blade W	Handle W	L/W1	L/W2	*Yue*	Length	Blade W	Handle W	L/W1	*L/W2*
Mean	9.93	5.49	4.65	1.80	2.01	**M**	8.65	5.89	4.30	1.53	2.06
Standard Error	0.51	0.15	0.11	0.06	0.05	**SE**	0.31	0.25	0.14	0.05	0.05
Median	9.55	5.40	4.70	1.76	2.02	**ME**	8.20	6.20	4.30	1.48	2.05
Mode	10.00	5.40	4.70	#N/A	2.00	**MO**	10.70	6.30	5.00	#N/A	1.71
Standard Deviation	2.59	0.76	0.51	0.31	0.20	**SD**	2.31	1.83	0.91	0.40	0.36
Sample Variance	6.70	0.58	0.26	0.09	0.04	**SV**	5.32	3.33	0.83	0.16	0.13
Kurtosis	14.03	1.38	2.45	3.54	1.08	**K**	-0.31	1.21	0.02	12.51	0.97
Skewness	3.17	0.35	-1.15	1.31	-0.25	**S**	0.60	0.38	0.13	2.80	0.51
Range	14.80	3.50	2.20	1.48	0.88	**R**	9.60	9.50	4.30	2.62	1.94
Minimum	6.20	4.00	3.20	1.32	1.59	**Min**	4.70	2.10	2.50	0.96	1.24
Maximum	21.00	7.50	5.40	2.80	2.47	**Max**	14.30	11.60	6.80	3.58	3.18
Count	26.00	26.00	20.00	26.00	20.00	**Count**	55.00	55.00	45.00	55.00	45.00
Conf. Level(95.0%)	1.05	0.31	0.24	0.12	0.10	**CL**	0.62	0.49	0.27	0.11	0.11
Qi	6.9	3.40	1.5								

Table 3.21: Descriptive Statistics for Knives

	Length	*Cross section*	*Blade Length*	*Blade Width*	*Handle L*	*Handle W*	*Blade/Handle*	*L/W*	*Pommel length*
Mean	21.60	0.35	13.90	2.31	6.94	1.80	2.22	9.31	2.55
Standard Error	0.78	0.02	0.52	0.08	0.23	0.05	0.10	0.39	0.12
Median	21.25	0.30	13.50	2.20	6.60	1.80	2.07	9.12	2.50
Mode	20.00	0.30	17.00	2.00	6.00	2.00	#N/A	10.00	3.00
Standard Deviation	7.02	0.13	4.12	0.72	1.93	0.42	0.75	3.49	0.71
Sample Variance	49.33	0.02	16.97	0.52	3.74	0.18	0.56	12.15	0.50
Kurtosis	11.62	4.58	1.04	0.65	-0.40	1.97	0.78	1.71	9.50
Skewness	2.11	1.21	0.20	0.74	0.36	0.87	0.28	0.38	2.20
Range	54.20	0.90	22.00	3.60	8.00	2.20	3.97	20.40	4.10
Minimum	7.00	0.20	3.00	1.00	3.50	1.00	1.33	3.43	1.50
Maximum	61.20	0.90	25.00	4.60	11.50	3.20	3.97	20.40	5.60
Count	82.00	63.00	63.00	87.00	69.00	61.00	57.00	78.00	35.00

Table 3.22: Results of ICP-AES Analyses Compiled from Liangshan and Chengdu 2009:219 and Chen et al. 2009.

Object type	**Subtype**	**Object ID**	**Cu**	**Sn**	**Pb**	**Fe**	**Zn**	**As (ppn)**	**Sb (ppn)**	**Ni (ppn)**	**Material type**
bracelet	AcI	YGJC526	79.59	0.22	0.24	0.02	0.03	0.94%	424	44.5	?
bracelet		YY19	93.97					6.03%			arsenic bronze
bracelet		YY04	85.99	14.01							tin-broze
bracelet		YY12	85.6	14.4							tin-broze
bracelet		YY13	91.43	3.7	1.37	3.51					arsenic tin bronze
decorative band?		YY02	88.73	9	2.27						lead-tin bronze
bronze application		YY03	91.84	8.16							tin-bronze
bronze application		YY39	77.52	12.44	10.04						lead-tin bronze
staff-head	B	YGJC643	57.64	24.53	1.71	0.15	0.16	1547	0.83%	64.1	tin-bronze
staff-head	Da	YGJC400	50.17	36.92	0.75	0.02	0.01	997	513	20.8	tin-bronze
staff-head		YY50	87.87	7.89	4.24						lead-tin bronze
staff-head		YY15	86.85	9.63	2.96						lead-tin bronze
staff-head		YY14	83.5	11.72	4.79						lead-tin bronze
staff-head		YY13	83.5	11.72	4.79						lead-tin bronze
bianzhong bell	A	YLLM4.12	43.65	30.46	2.19	0.21	0.06	1186	312	16.7	lead-tin bronze
bianzhong bell	B	HZCU1	92.49	7							tin-bronze
ling bell	Ab	YGJC425	76.57	12.71	2.01	0.01	0.02	202	99	34.3	lead-tin bronze
ling bell		YY07	88.76	7.29	3.62						lead-tin bronze
drum	Ca	YLLM4.11	75.45	17.93	0.8	0.03	0.04	792	384	4.5	tin-bronze
drum	A	YGJC641	99		1						copper
bronze plate	Ab	YGJC375	68.49	22.82	2.71	0.06	0.08	210	18	37.6	lead-tin bronze
fu axe		YY40	90.01	9.94							tin-bronze
yue axe	Ab	YGJC199	80.94	10.01	1.32	0.37	0.2	3883	1.88%	216.3	tin-bronze
yue axe	Db	YGJC730	78.66	10.13	0.63	0.03	0.01	1257	492	34.6	tin-bronze
yue axe	EaI	YGJC6a	76.12	13.31	0.61	0.03	0.02	957	975	155.4	tin-bronze
dagger-axe	AaV	YGJC332	79.19	10.46	0.08	0	0	0	0	0	tin-bronze
sword	Aa	YGJC226	55.57	15.35	0.16	0.05	0.14	88	55	10.5	tin-bronze?
sword	Aa	YGJC248	54.9	5.1	12.28	0.05	0.2	124	124	11.8	lead-tin bronze?
sword	BaI	YGJC195	73.26	20	0.19	0.06	0.04	945	126	8.3	?
sword	BaI	YGJC365	75.16	19.03	0.07	0.03	0.08	711	209	41.6	tin-bronze?
sword	BaI	YGJC730	72.23	25.7	0.42	0.04	0.08	225	111	39.9	tin-bronze
knife	Cc	YGJC614	44.51	7.77	16.62	0.23	0.65	282	10935	303.9	lead-tin bronze
knife		YY41	98								copper

knife	Af	YGJC697	75.11	19.96	0.56	0.17	0.08	992	805	119.6	tin-bronze?
knife	Af	YY11	85.42	13.53	4.05						lead-tin bronze
knife		YY38	86.45	10.34	3.21						lead-tin bronze
arrowhead		YY16	85.8	7.25	6.95						lead-tin bronze
arrowhead	IDa	YGJC629	48.94	15.03	9	0.02	0.06	347	88	13.5	lead-tin bronze
spearhead	AbII	YLLM11.2	67.11	19.85	2.83	0.29	0.04	2994	926	97.5	lead-tin bronze
body armor	Ab	YLLM5.1	64.17	26.85	1.14	0.04	0.04	285	554	31.6	tin or lead/tin?
body armor	Ab	YLLM5.2	71.63	29.08	0.13	0.03	0.06	2405	313	5307	tin-bronze
body armor	B	YGJC158	72.16	24.78	0.12	0.61	0.04	2776	903	225.8	tin-bronze
body armor	B	YY09	87.46	12.54							tin-bronze
horse harness	A	YY28	94.22	4.22	1.56						lead-tin bronze
horse harness	A	YY47	79.86	6.03	14.11						lead-tin bronze
container		YY29	86.38	13.62							tin-bronze
nail		YY06	67.55	17.64	14.42						lead-tin bronze
nail		Huili?	76	8.1	14.2						lead-tin bronze
coin		Huili?	81.3	1.9	15.8						lead-tin bronze

Table 3.19: Relative Frequency of Different Arrowhead Types by Raw Material.

	Stone	**Bronze**	**Wood**	**Bone**	**SUM**
IAa	1	1	0	0	2
IAb	32	0	2	0	34
IBa	4	4	0	0	8
IBb	5	5	0	0	10
IC	0	5	0	0	5
IDa	0	7	0	0	7
IDbI	0	43	0	0	43
IDbII	0	4	0	0	4
IE	0	6	0	0	6
IF	0	1	0	0	1
IGa	0	16	0	0	16
IGb	0	4	0	0	4
IIA	5	0	0	0	5
IIAa	19	0	0	0	19
IIAbI	15	0	0	0	15
IIB	11	0	0	0	11
IIBaI	13	0	0	0	13
IIBaI	5	2	0	0	7
IIBaII	12	0	0	0	12
IIBbI	4	0	0	0	4
IIBbII	1	0	0	0	1
IIBc	2	0	0	0	2
IIBd	1	0	0	0	1
IICa	2	0	0	0	2
IICbII	7	0	0	0	7
IICbIII	2	0	0	0	2
IID	2	2	0	0	3
Unknown	4	23	0	4	31
SUM	**147**	**123**	**2**	**4**	**275**

Table 3.23: Relationship Between Bead Type and Raw Material Excluding Beads in Chains.

	Aa	**Ab**	**Ac**	**Ba**	**Bb**	**Bc**	**C**	**Da**	**Db**	**Dc**	**E**	**F**	**G**	**SUM**
Stone	45	3	9	48	15	76	2	2	9	4	0	2	2	**217**
Bone	0	3	0	13	57	5	0	0	0	0	1	0	0	**76**
Frit	0	7	1	5	25	2	0	0	0	0	0	0	0	**40**
Organic	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
SUM	**45**	**13**	**10**	**66**	**98**	**83**	**2**	**2**	**9**	**4**	**1**	**2**	**2**	**334**

Table 3.24: Relationship Between Bead Type and Raw Material Including Beads in Chains.

	Aa	**Ab**	**Ac**	**Ba**	**Bb**	**Bc**	**C**	**Da**	**Db**	**Dc**	**E**	**F**	**G**	**SUM**
Stone	45	3	9	48	15	76	2	2	9	4	0	2	2	**217**
Bone	0	133	0	263	57	5	0	0	0	0	10	0	0	**468**
Frit	0	7	1	5	25	2	0	0	0	0	0	0	0	**40**
Organic	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
SUM	**45**	**143**	**10**	**316**	**98**	**83**	**2**	**2**	**9**	**4**	**10**	**2**	**2**	**726**

Table 3.25: Relationship Between Stone Beads and Raw Material.

	Aa	**Ab**	**Ac**	**Ba**	**Bb**	**Bc**	**C**	**Da**	**Db**	**Dc**	**E**	**F**	**G**	**SUM**
Agate	40	3	9	16	4	10	2	1	0	0	0	0	0	**85**
Turquoise	3	0	0	32	2	64	0	8	4	2	0	1	1	**117**
Nephrite	1	0	0	0	2	0	0	0	0	0	0	1	1	**5**
Blue Stone	0	0	0	0	4	0	0	0	0	0	0	0	0	**4**
Stone	0	0	0	0	2	0	0	0	0	0	0	0	0	**2**
SUM	**44**	**3**	**9**	**48**	**14**	**74**	**2**	**9**	**4**	**2**	**0**	**2**	**2**	**213**

Table 3.26: Relationship Between Ornaments and Raw Material.

	Stone	Bone	Tooth	Shell	Frit/Ceramic	Organic	**SUM**
Pendant	3	1	48+130	67+	2	0	**150+130**
Slit-ring	1	32	0	0	0	0	**33**
Bracelet	1	13	0	0	0	3	**26**
Ring segment	2	11	0	0	0	0	**13**
Closed ring	2	4	0	0	0	0	**6**
Hair needle	0	12	0	0	0	0	**12**
Bead	217	76+392	0	0	40	1	**334+392**
SUM	**226**	**148+392**	**48+130**	**67+**	**42**	**4**	**557+522**

Table 4.1: Statistics for Aspect, Slope, and Elevation at Settlement Sites.

Settlements	*Elevation*	*Slope*	*Aspect*	*Distance to river*
Mean	1693.36	8.73	174.93	1.97
Standard Error	42.80	0.81	8.48	0.22
Median	1620.00	5.70	173.19	1.17
Mode	1809.00	#N/A	#N/A	#N/A
Standard Deviation	444.78	8.43	88.15	2.31
Sample Variance	197829.15	71.10	7771.27	5.35
Kurtosis	4.71	1.37	-0.99	5.68
Skewness	1.61	1.35	-0.11	2.25
Range	2793.00	39.10	345.08	11.77
Minimum	982.00	0.34	2.98	0.004
Maximum	3775.00	39.44	348.06	11.77
Count	108.00	108.00	108.00	108.00

Table 4.2: Statistics for Aspect, Slope, and Elevation at Non-Sites.

Non-sites	*Elevation*	*Slope*	*Aspect*	*Distance to river*
Mean	2492.74	21.37	181.38	4.39
Standard Error	33.01	0.42	3.91	0.12
Median	2412.50	20.93	180.76	3.70
Mode	2016.00	#N/A	#N/A	#N/A
Standard Deviation	808.57	10.19	95.86	3.02
Sample Variance	653781.02	103.78	9188.42	9.10
Kurtosis	0.20	0.38	-1.24	-0.15
Skewness	0.42	0.52	0.03	0.70
Range	4351.00	61.67	347.80	14.28
Minimum	578.00	0.97	2.05	0.01
Maximum	4929.00	62.64	349.85	14.29
Count	600.00	600.00	600.00	600.00

Table 4.3: Kolmogorov-Smirnov Test for Elevation and Slope, Comparing Site vs. Non-Site Samples.

Test Statistics[a]

		Elevation
Most Extreme Differences	Absolute	.632
	Positive	.027
	Negative	-.632
Kolmogorov-Smirnov Z		6.047
Asymp. Sig. (2-tailed)		.000

Test Statistics[a]

		Slope
Most Extreme Differences	Absolute	.571
	Positive	.000
	Negative	-.571
Kolmogorov-Smirnov Z		5.460
Asymp. Sig. (2-tailed)		.000

Table 4.4: Kolmogorov-Smirnov Test for Aspect and Distance to Rivers, Comparing Site vs. Non-Site Samples.

Test Statistics[a]

		Aspect_new
Most Extreme Differences	Absolute	.101
	Positive	.059
	Negative	-.101
Kolmogorov-Smirnov Z		.967
Asymp. Sig. (2-tailed)		.307

Test Statistics[a]

		Distance_river
Most Extreme Differences	Absolute	.466
	Positive	.000
	Negative	-.466
Kolmogorov-Smirnov Z		4.457
Asymp. Sig. (2-tailed)		.000

Table 4.5: Technical Details for Ceramics at Settlement Sites by Presence/Absence and Percentage if known.

Site		**Ceramic quality**		**Firing temperature**				**Technique**					
	Number	sand %	clay %	high	medium	low	uneven	hand-thr.	hand. %	coil	coil %	wheel	wheel %
DDP1	1	100	0										
DDP2	4	100	0										
DDP3	9	100	0										
DDP4	2	100	0										
DDPH1	3	100	0										
DDPH2	15	100	0										
DDPH3	1	100	0										
DDPH4	17	100	0										
DDS0	2	100	0			1							
DMB0	1	100	0										
DMK0	4	100	0			1		1	90			1	10
DMK1	1	100	0			1		1	90			1	10
DMK2	1	100	0			1		1	90			1	10
DMK3	1	100	0			1		1	90			1	10
DMK4	2465	100	0			1		1	90			1	10
DMK5	1771	100	0			1		1	90			1	10
DMKH1	2	100	0			1		1	90			1	10
DMKH2	1	100	0										
DWP3	17	100	0										
DWPD2	1	100	0										
DWPH1	6	100	0										
DWPH2	1	100	0										
DWT3	104	100	0			1		1	90	1	10		
DWTH1	4	100	0										
DWTH2	10	100	0										
DWTH3	1	100	0										
HDG0	1	100	0										
HDJ4	19	100	0										
HDJ4a	6	98	2										
HDJ4b	6	98	2										
HDJ4c	3	99	1										
HDJ5	19	100	0										

HDJH1	1	100	0										
HDJH2	7	88.8	11.2										
HDJH3	5	100	0										
HDJH4	4	86	14										
HDJH5	1	100	0										
HDS0	1	100	0										
HFS0	1	100	0										
HGS0	1	100	0										
HJM0	1	100	0										
HLT0	1	100	0										
HLW0	1	100	0										
HRJ0	1	100	0										
HSJ0	1	100	0										
HTC0	1	100	0										
HXA0	1	100	0										
HZD0	14	100	0										
MGP1	1	100	0					1	60	1	30	1	10
MGP2	1	100	0										
MGP3	44	98	2					1	60	1	30	1	10
MGW	1	98	2										
MHB0	1	100	0										
MHJ0	1	100	0										
MLG0	1	100	0										
MMS0	1	100	0										
MST0	32	100	0										
MST5	2	100	0										
MST6	3	100	0										
MST7	1	100	0										
MST5-7	43	100	0										
MWG0	1	100	0										
MWJ0	1	100	0										
MYJ0	1	100	0	1									
MZJ0	16	98	2										
NHF0	1	100	0										
NTW0	1	100	0	1									

PGH0	1	100	0										
PKL0	4	100	0										
PTB0	3	0	100		1			1	100				
PTT0	5	100	0										
PWL0	1	2	98	1				1	99				1
PXC0	8	100	0		1	1		1	99				1
PXW0	1	100	0										
PYJ0	1	100	0										
PZC0	3	100	0			1		1	100				
XBB0	1	100	0										
XBT0	1	100	0			1							
XDM0	1	100	0										
XDN0	1	100	0										
XDYH1	1	100	0					1	95			1	5
XDYH2	1	100	0					1	95			1	5
XGS0	1	100	0										
XHS0	20	99.9	0.1	1	1			1	95			1	5
XHS1-2	28	100	0										
XHS3	77	99.9	0.1										
XHSF1	1	100	0										
XHSH1	1	100	0										
XHSH2	3	100	0										
XHSH3	23	100	0										
XHS4	36	99.9	0.1			1				1	100		
XJB0	1	100	0										
XLZ1	1	100	0			1				1	100		
XLZ3-4	1	100	0					1	98	1	2		
XMI0	2	100	0					1	10	1	90		
XMI3	39	99.1	0.9					1	10	1	90		
XMI4	24	99.9	0.1				1	1	10	1	90		
XMI5	14	99.9	0.1				1	1	10	1	90		
XMIH1	3	100	0					1	100				
XMS0	5	100	0			1				1	100		
XMSH1	9	100	0			1		1	70	1	30		
XMSH2	3	100	0			1		1	70	1	30		

XMS5	5	99.9	0.1				1	1	70	1	30		
XMS7	18	99	1				1	1	70	1	30		
XMSH3	3	100	0				1	1	70	1	30		
XMSH4	4	100	0				1	1	70	1	30		
XMS8	12	100	0				1	1	70	1	30		
XMSH6	4	99	1		1		1	1	70	1	30		
XQG0	2	90	10										
XQG3	181	99	1										
XQG4	338	100	0										
XTB0	1	100	0			1							
XTS0	1	100	0			1		1	100				
XWD0	15	100	0			1		1	100				
XWM	1	100	0										
XXG0	1	100	0										
XXH0	1	100	0										
XYG0	8	90	10					1	95			1	5
XYP4	5	100	0				1						
XYP5	13	97.6	2.4				1	1	5	1	95		
XYP6	42	100	0				1	1	5	1	95		
XYPH1	8	100	0				1	1	100				
XYPH2	1	100	0							1	100		
XZJ0	1	100	0										
XZS0	1	100	0										
YDZ3	1	100	0										
YDZ4	1	100	0										
YHC0	1	100	0										
YJD0	1	100	0					1	100				
YJY0	1	100	0										
YPJ0	1	100	0										
YWQ0	1	100	0										
YXF0	1	0	100										
YXG0	1	0	100										
YXL0	1	100	0										
ZHB0	1	100	0										
SUM	5698			4	4	20	12	38	2826	22	1262	13	112

Table 4.6: Surface Color and Treatment for Ceramics from Settlement Site by Presence/Absence and Percentage if known.

	Surface color								**Surface treatment**		
	red	red-brown	yellow-brown	brown	grey-brown	grey	black-brown	black	polished/ burnished	black slip	white slip
DDP1	1	1			1		1				
DDP2		1			1						
DDP3		1	1		1		1				
DDP4		1									
DDPH1		1	1								
DDPH2		1			1						
DDPH3		1			1						
DDPH4		1			1						
DDS0	1	1		1							
DMB0											
DMK0	1					1					
DMK1						1					
DMK2						1					
DMK3			1			1					
DMK4	1	1	1			1		1			
DMK5	1	1	1			1		1			
DMKH1				1		1					
DMKH2						1					
DWP3					1						
DWPD2					1						
DWPH1					1	1		1			
DWPH2					1						
DWT3	1	1		1	1	1	1				
DWTH1	1	1									
DWTH2	1	1			1						
DWTH3											
HDG0				1							
HDJ4			1	1	1	1	1				
HDJ4a	1		1	1		1		1			
HDJ4b	1		1	1		1		1			
HDJ4c	1		1	1		1		1			

HDJ5	1			1	1	1					
HDJH1				1							
HDJH2				1	1		1				
HDJH3				1							
HDJH4				1	1						
HDJH5				1							
HDS0			1								
HFS0											
HGS0		1		1		1					
HJM0		1									
HLT0	1										
HLW0	1					1					
HRJ0											
HSJ0		1									
HTC0			1	1							
HXA0				1							
HZD0				1		1				1	
MGP1		1	1			1		1			
MGP2	1		1			1		1			
MGP3	1	1	1				1		1	1	1
MGW	1			1				1			
MHB0	1					1		1			
MHJ0	1					1		1			
MLG0	1										
MMS0	1					1					
MST0		1	1		1		3				
MST5					1						
MST6		1			1		1				
MST7					1						
MST5-7	1					1	1				
MWG0	1					1					
MWJ0				1							
MYJ0	1			1		1					
MZJ0	1	1		1			1				
NHF0		1									

NTW0			1							1	
PGH0											
PKL0	1	1									
PTB0		1									
PTT0	1										
PWL0	1					1			1	1	
PXC0	1				1						
PXW0				1				1			
PYJ0											
PZC0	1			1							
XBB0				1							
XBT0		1									
XDM0		1									
XDN0		1									
XDYH1		1		1				1		1	
XDYH2		1		1				1		1	
XGS0	1			1							
XHS0	1			1		1		1	1	3	
XHS1-2					1	1				1	
XHS3		1				1		1	1		
XHSF1											
XHSH1											
XHSH2					1						
XHSH3					1	1					
XHS4					1	1					
XJB0	1										
XLZ1									1	1	
XLZ3-4	1		1			1				1	
XMI0				1					1		
XMI3					1	1			1		
XMI4				1	1	1	1				
XMI5					1		1		1		
XMIH1					1		1		1		
XMS0		1			1	1			1		
XMSH1	1	1	1		1	1			1		

XMSH2	1					1			1		
XMS5		1			1	1			1		
XMS7					1	1			1		
XMSH3			1			1			1		
XMSH4	1		1						1		
XMS8	1			1	1	1			1		
XMSH6				1		1			1		
XQG0							1				
XQG3	1			1	1	1	1	1		1	
XQG4	1				1			1			
XTB0	1										
XTS0	1										
XWD0	1				1			1			
XWM	1										
XXG0				1				1			
XXH0	1		1								
XYG0				1		1					
XYP4	1			1		1			1		
XYP5	1			1	1	1			1		
XYP6	1			1		1			1		
XYPH1					1				1		
XYPH2					1				1		
XZJ0	1										
XZS0				1							
YDZ3						1					
YDZ4						1					
YHC0						1		1			
YJD0	1					1					
YJY0	1			1		1					
YLJ0	1			1		1					
YPJ0											
YWQ0	1										
YXF0				1							
YXG0				1							
YXL0				1		1					

ZHB0	1		1								
SUM	53	34	22	44	40	54	17	21	61	22	1
Average	0.42	0.27	0.17	0.35	0.31	0.43	0.13	0.17	0.44	0.16	0.01
Percentage	41.73	26.77	17.32	34.65	31.50	42.52	13.39	16.54	44.20	15.94	0.72

Table 4.7: Presence/Absence of Different Ceramic Types at Settlement Sites.

	jar	single-handled jar	double-handled jar	jar with handles	urn	cup	beaker	goblet	ewer	vase	basin	bo bowl
DDP1	1											
DDP2	1					1						
DDP3	1			1								
DDP4	1											1
DDPH1	1											
DDPH2	1											
DDPH3	1											
DDPH4	1											
DDS0												
DMB0	1					1						
DMK0	1											
DMK1												
DMK2												
DMK3												
DMK4	1					1						
DMK5	1					1	1					
DMKH1	1				1							
DMKH2	1											
DWP3	1											
DWPD2												
DWPH1	1											
DWPH2												
DWT3	1		1				1					
DWTH1	1		1									
DWTH2	1		1		1							
DWTH3			1									
HDG0												

HDJ4	1											
HDJ4a	1											
HDJ4b	1											
HDJ4c	1											
HDJ5	1									1		1
HDJH1	1					1				1		
HDJH2	1			1								
HDJH3	1											
HDJH4	1					1						
HDJH5												
HDS0												
HFS0												
HGS0	1											
HJM0												
HLT0												
HLW0	1											1
HRJ0												
HSJ0	1											
HTC0												
HXA0												
HZD0	1									1		
MGP1												
MGP2	1				1							1
MGP3	1											1
MGW												
MHB0												
MHJ0												
MLG0												
MMS0	1				1							
MST0						1		1				
MST5	1											
MST6	1											
MST7	1											
MST5-7	1											
MWG0												

MWJ0												
MYJ0												
MZJ0	1											1
NHF0	1				1							
NTW0	1				1							
PGH0												
PKL0												
PTB0	1											
PTT0	1		1									
PWL0	1									1		
PXC0	1									1		1
PXW0												
PYJ0												
PZC0	1					1				1		1
XBB0												
XBT0												
XDM0	1											
XDN0												
XDYH1	1					1						
XDYH2	1											
XGS0												
XHS0	1				1	1			1	1		1
XHS1-2	1								1	1		
XHS3	1				1						1	1
XHSF1												
XHSH1												
XHSH2										1		1
XHSH3	1								1	1		1
XHS4	1											1
XJB0												
XLZ1												
XLZ3-4									1			
XMI0												
XMI3	1					1						
XMI4	1				1	1				1	1	

XMI5	1											
XMIH1										1		
XMS0	1											1
XMSH1	1				1							1
XMSH2	1											
XMS5	1											
XMS7	1				1							1
XMSH3	1											1
XMSH4	1											1
XMS8	1							1				1
XMSH6	1											
XQG0	1								1			
XQG3	1		1	1	1	1		1	1	1		1
XQG4	1											
XTB0												
XTS0												
XWD0	1											1
XWM												
XXG0												
XXH0												
XYG0	1									1		1
XYP4												
XYP5	1									1	1	1
XYP6	1											
XYPH1	1											1
XYPH2												1
XZJ0												
XZS0												
YDZ3	1						1					
YDZ4	1											
YHC0	1	1										1
YJD0	1	1										
YJY0												
YPJ0	1	1										
YWQ0												

YXF0												
YXG0	1											
YXL0												
ZHB0												
YLJ0												
XGJ0												
SUM	81	3	6	3	12	13	3	3	6	15	3	26
Average	0.84	0.03	0.06	0.03	0.13	0.14	0.03	0.03	0.06	0.16	0.03	0.27
Percentage	84.38	3.13	6.25	3.13	12.50	13.54	3.13	3.13	6.25	15.63	3.13	27.08

Table 4.8: Presence/Absence of Different Ceramic Types at Settlement Sites.

	wan bowl	**dou bowl**	**lid**	**object stand**	**net weight**	**spindle whirl**	**flat bottom**	**ring-foot**	**pedestal base**	**handle**	**wall sherd**	**spout**
DDP1							1					
DDP2			1				1			1		
DDP3							1	1		1	1	
DDP4							1					
DDPH1							1				1	
DDPH2												
DDPH3			1				1					
DDPH4												
DDS0							1				1	
DMB0							1	1				
DMK0							1					
DMK1												
DMK2												
DMK3												
DMK4			1				1	1				
DMK5			1				1	1				
DMKH1												
DMKH2							1					
DWP3			1				1	1				
DWPD2							1					
DWPH1				1			3					
DWPH2				1								

DWT3					1		1	1		1		
DWTH1								1				
DWTH2				1			1					
DWTH3							1					
HDG0												
HDJ4							1			1	1	
HDJ4a							1					
HDJ4b							1					
HDJ4c												
HDJ5							1	1		1		
HDJH1							1					
HDJH2							1		1	1		
HDJH3							1					
HDJH4							1				1	
HDJH5							1					
HDS0												
HFS0												
HGS0												
HJM0												
HLT0												
HLW0												
HRJ0												
HSJ0												
HTC0												
HXA0												
HZD0							1	1				
MGP1												
MGP2	1						1	1				
MGP3	1		1			1	1	1	1	1		6
MGW												
MHB0							1					
MHJ0												
MLG0												
MMS0												
MST0						1	1	1		1		

MST5							1			1		
MST6							1			1		
MST7								1				
MST5-7							1	1		1		
MWG0												
MWJ0												
MYJ0												
MZJ0	1					1	1	1		1		
NHF0												
NTW0							1					
PGH0												
PKL0										1		
PTB0							1					
PTT0												
PWL0												
PXC0	1											
PXW0												
PYJ0							1					
PZC0												
XBB0												
XBT0												
XDM0												
XDN0												
XDYH1												
XDYH2		1										
XGS0												
XHS0		1					1	1			1	1
XHS1-2												
XHS3	1		1									
XHSF1												
XHSH1												
XHSH2							1					
XHSH3	1						1			1		
XHS4	1						1					1
XJB0												

XLZ1												1
XLZ3-4												
XMI0							1			1		
XMI3			1			1	1	1				
XMI4	1					1	1	1				
XMI5						1	1					
XMIH1			1				1					
XMS0												
XMSH1			1									
XMSH2			1									
XMS5							1					1
XMS7	1						1	1				
XMSH3												
XMSH4												
XMS8	1											
XMSH6	1											
XQG0												
XQG3					1		1	1	1	1		1
XQG4												
XTB0												
XTS0												
XWD0							1				1	
XWM												
XXG0												
XXH0												
XYG0	1										1	
XYP4												
XYP5							1					
XYP6												
XYPH1												
XYPH2												
XZJ0												
XZS0												
YDZ3		1				1				1		
YDZ4							1					

YHC0	1									1		
YJD0							1	1				
YJY0												
YPJ0												1
YWQ0												
YXF0												
YXG0												
YXL0												
ZHB0												
YLJ0												
XGJ0												
SUM	13	3	11	3	2	7	57	21	3	18	8	12
Average	0.14	0.03	0.11	0.03	0.02	0.07	0.59	0.22	0.03	0.19	0.08	0.13
Percentage	13.54	3.13	11.46	3.13	2.08	7.29	59.38	21.88	3.13	18.75	8.33	12.50

Table 4.9: Presence/Absence of Different Decoration Techniques at Settlement Sites.

	Decoration	**Decoration %**	**No decoration**	**No decoration %**	**appliqué**	**impressed**	**incision**	**cutting**
DDP1	1	1	1	90	1	1	1	
DDP2	1	1	3	90		1		
DDP3	1	10	1	90	1	1	1	
DDP4	0	0	1	100		1	1	
DDPH1	1	10	1	90	1	1	1	
DDPH3	0	0	1	100				
DDPH4	1	10	1	90		1	1	
DDS0	1	0.2	1	99.8			1	
DMK0	1	10	1	90	1	1	1	
DMK1	1	10	1	90	1	1	1	
DMK2	1	10	1	90	1	1	1	
DMK3	1	10	1	90	1	1	1	
DMK4	0	0	1	100	1	1	1	
DMK5	0	0	1	100	1	1	1	
DMKH1	0	0	1	100				
DWP3	1	10	1	90		1	1	
DWPD2	0	0	1	100				
DWPH1	1	10	1	90			1	

DWPH2	1	100	0	0			1	
DWT3	1	10	1	90		1	1	
DWTH1	0	0	1	100				
DWTH2	0	0	1	100				
DWTH3	0	0	1	100				
HDG0	0	0	1	100				
HDJ4	1	10	1	90		1	1	
HDJ4a	1	12	1	88		1	1	
HDJ4b	1	10	1	90		1	1	
HDJ4c	1	11	1	89				
HDJ5	1	2	1	98		1	1	
HDJH1	1	1	0	0		1		
HDJH2	0	0	1	100				
HDJH3	0	0	1	100				
HDJH4	1	10	1	90	1	1		
HDJH5	0	0	1	100				
HDS0	0	0	1	100				
HFS0	0	0	1	100				
HGS0	1	0.5	1	99.5		1		
HJM0	0	0	1	100				
HLT0	1	1	1	99	1		1	
HLW0	1	10	1	90		1	1	
HTC0	1	10	1	90		1	1	
HZD0	0	0	1	100	1	1	1	
MGP1	1	10	1	90		1	1	
MGP2	1	10	1	90		1	1	
MGP3	1	10	1	90		1	1	
MGW	1	10	1	90	1	1	1	
MHB0	1	1	1	99		1	1	
MLG0	1	10	1	90		1		
MMS0	1	10	1	90		1		
MST0	1	10	1	90	1	1		
MST5	1	7.3	1	92.7		1	1	
MST6	1	7.3	1	92.7		1	1	
MST7	1	7.3	1	92.7		1	1	

MST5-7	1	7.3	1	92.7		1	1	
MYJ0	1	0.1	1	99.9			1	
MZJ0	1	10	1	90		1		
NHF0	1	10	1	99			1	
NTW0	1	10	1	90	1	1	1	
PKL0	0	0	1	100				
PTB0	0	0	1	100				
PTT0	0	0	1	100				
PWL0	1	10	1	90		1	1	
PXC0	1	10	1	90	1			
PXW0	1	1	1	99		1	1	
PZC0	0	0	1	100				
XDYH1	1	10	1	90	1	1	1	
XDYH2	1	10	1	90	1	1	1	
XHS0	1	10	1	90		1	1	
XHS1-2	1	10	1	90			1	
XHS3	1	7.4	1	92.6	1	1	1	
XHSH2	1	10	1	90		1	1	
XHSH3	1	10	1	90	1	1	1	
XHS4	1	7	1	93	1	1	1	
XJB0	1	10	1	90		1		
XLZ1	0	0	1	100				
XLZ3-4	1	10	1	90		1	1	
XMI0	1	10	1	90		1		
XMI3	1	5.1	1	94.9	1	1	1	
XMI4	1	10.1	1	89.9	1	1	1	1
XMI5	1	5.5	1	94.5		1	1	
XMIH1	0	0	1	100				
XMS0	1	100	0	0	1	1	1	1
XMSH1	1	10	1	90		1	1	
XMSH2	0	0	1	100			1	
XMS5	1	10	1	90		1	1	
XMS7	1	10	1	90	1	1	1	
XMSH3	1	10	1	90	1			
XMSH4	0	0	1	100				

XMS8	1	10	0	0	1	1	1	
XMSH6	0	0	1	100				
XQG0	0	0	1	100				
XQG3	1	18.5	1	81.5	1	1	1	
XQG4	1	11.9	1	88.1				
XWD0	1	10	1	90		1		
XXH0	1	10	1	90	1		1	
XYG0	1	10	1	90		1	1	
XYP5	1	5.4	1	94.6		1	1	
XYP6	1	2	1	98		1	1	
XYPH1	1	100	0	0		1		
XYPH2	1	100	0	0		1		
YDZ3	1	1	1	99				
YDZ4	1	1	1	99	1	1	1	
YHC0	1	1	1	99		1	1	
YJD0	1	1	1	99		1	1	
YWQ0	1	1	1	99		1		
YXG0	1	1	1	99	1		1	
YXL0	1	1	1	99		1	1	
YLJ0	1	1	1	99		1	1	
SUM	80		104		31	70	66	2
Average	0.73	8.92	0.95	87.46	0.38	0.86	0.81	0.02
Percentage	72.73				38.27	86.42	81.48	2.47

Table 4.10: Presence/Absence of Different Decoration Motives at Settlement Sites.

	impressed leaf-vein pattern	corded pattern	appliqué band with fingertip	horizontal appliqué band	other appliqué	incised horizontal lines	incised traversal lines	net pattern	water-ripple pattern	fish-bone pattern	horizontal lines of points	cut-out geometric forms
DDP1										1	1	
DDP2	1											
DDP3	1			1		1	1					
DDP4							1	1			1	
DDPH1		1			1	1		1		1	1	
DDPH4		1				1	1	1				
DDS0						1						

DMK0			1	1		1		1			1	
DMK1			1	1		1		1			1	
DMK2			1	1		1		1			1	
DMK3			1	1		1		1			1	
DMK4			1	1		1		1			1	
DMK5			1	1		1		1			1	
DWP3						1						
DWPH1				1								
DWPH2								1				
DWT3	1			1								
HDJ4	1								1			
HDJ4a		1				1		1	1		1	
HDJ4b		1	1			1		1	1		1	
HDJ4c		1				1		1	1		1	
HDJ5	1	1	1		1	1		1	1		1	
HDJH1		1										
HDJH4	1				1							
HGS0		1										
HLT0				1		1						
HLW0	1	1				1						
HTC0								1			1	
HZD0					1	1					1	
MGP1	1		1		1	1						
MGP2	1		1		1	1						
MGP3	1		1		1	1					1	
MGW	1				1	1						
MHB0		1				1						
MLG0										1		
MMS0		1										
MST0	1						1					
MST5	1					1					1	
MST6	1					1					1	
MST7	1					1					1	
MST5-7	1					1					1	
MYJ0						1						

MZJ0	1											
NHF0						1						
NTW0		1	1	1		1						
PWL0	1					1				1	1	
PXC0				1								
PXW0		1						1				
XDYH1				1	1	1					1	
XDYH2				1	1	1					1	
XHS0		1	1			1	1				1	
XHS1-2			1			1	1				1	
XHS3		1	1	1		1	1					
XHSH2						1					1	
XHSH3		1		1		1		1				
XHS4			1	1		1						
XJB0		1										
XLZ3-4			1			1					1	
XMI0	1											
XMI3			1	1		1		1	1		1	
XMI4			1	1		1	1	1	1	1	1	1
XMI5	1	1				1					1	
XMS0			1			1					1	1
XMSH1			1			1	1				1	
XMSH2			1				1					
XMS5	1		1			1						
XMS7		1	1	1			1	1			1	
XMSH3				1								
XMS8			1	1			1				1	
XMSH6			1									
XQG3	1	1	1	1	1	1		1	1		1	
XQG4		1		1		1						
XWD0	1											
XXH0				1		1						
XYG0		1				1	1	1			1	
XYP5		1	1			1					1	
XYP6		1	1			1					1	

XYPH1		1										
XYPH2		1										
YDZ4		1		1		1		1				
YHC0		1								1		
YJD0	1	1				1						
YWQ0		1										
YXG0				1		1						
YXL0		1				1		1				
YLJ0						1				1	1	
SUM	24	31	29	27	11	56	13	24	8	6	38	2
Average	0.30	0.38	0.36	0.33	0.14	0.69	0.16	0.30	0.10	0.07	0.47	0.02
Percentage	29.63	38.27	35.80	33.33	13.58	69.14	16.05	29.63	9.88	7.41	46.91	2.47

Table 4.11: Numbers and Quality of Ceramic Vessels and Sherds of Selected Sites.

Site		**Ceramic quality**				**Firing temperature**				**Technique**		
	Number ceramics	sand %	clay %	sand	clay	high	medium	low	uneven	hand-thrown	wheel-thrown	coil-built
DDP1	1	100	0	1								
DDP2	4	100	0	4								
DDP3	9	100	0	9								
DDP4	2	100	0	2								
DDPH1	3	100	0	2								
DDPH2	15	100	0									
DDPH3	1	100	0	1								
DDPH4	17	100	0									
DDS0	2	100	0	2				2				
DMB	1	100	0									
DMK0	12	100	0	1				1		10	2	
DMK1	12	100	0	6				1		10	2	
DMK2	12	100	0	1				1		10	2	
DMK3	12	100	0	18				1		10	2	
DMK4	2465	100	0	6				1		10	2	
DMK5	1771	100	0	9				1		10	2	
DMKH1	12	100	0	1				1		10	2	
DMKH2	1	100	0	1								

DWP3	17	100	0	11								
DWPD2	1	100	0	1								
DWPH1	6	100	0	4								
DWPH2	1	100	0	1								
DWT3	104	100	0	72				1		10		2
DWTH1	4	100	0	2								
DWTH2	10	100	0	10								
DWTH3	1	100	0									
HDJ4	19	100	0	17								
HDJ4a	6	98	2	1	1							
HDJ4b	6	98	2	1	1							
HDJ4c	3	99	1	1	1							
HDJ5	19	100	0	8								
HDJH1	1	100	0	1								
HDJH2	7	88.8	11.2	7	1							
HDJH3	5	100	0									
HDJH4	4	86	14	4	1							
HDJH5	1	100	0	1								
HZD0	14	100	0	5								
MGP1	18	100	0							10	4	4
MGP2	1	100	0									
MGP3	44	98	2	44						3	15	4
MGW	1	98	2									
MST0	32	100	0	32								
MST5	2	100	0	2								
MST5-7	43	100	0									
MST6	3	100	0	3								
MST7	1	100	0	1								
MZJ0	16	98	2	15	1							
PKL0	4	100	0	2								
PTB	3	0	100		3		3			3		
PTT	5	100	0	5								
PWL	1	2	98		1	1				1		
PXC0	8	100	0	8			2	6		8		
PZC0	3	100	0	3				3		3		

XHS0	20	99.9	0.1	12	4	8	5			1	15	
XHS1-2	28	100	0	3								
XHS3	77	99.9	0.1	7	1							
XHS4	36	99.9	0.1	9				9				9
XHSF1	1	100	0									
XHSH1	1	100	0									
XHSH2	3	100	0	3								
XHSH3	23	100	0	10								
XLZ1	1	100	0	1				1				1
XLZ3-4	1	100	0							10		2
XMI0	2	100	0	2						2		10
XMI3	39	99.1	0.9		3					10		30
XMI4	24	99.9	0.1	7					1	8		25
XMI5	14	99.9	0.1	1					1	3		12
XMIH1	3	100	0	2						2		
XMS0	5	100	0	2				1				2
XMS5	5	99.9	0.1	2	1				1	1		3
XMS7	18	99	1	6	1				1	1		7
XMS8	12	100	0	4					1	1		4
XMSH1	9	100	0	3				1		1		3
XMSH2	3	100	0	1				1		1		1
XMSH3	3	100	0	2					1	1		2
XMSH4	4	100	0	2					1	1		2
XMSH6	4	100	0	1	1		1		1	1		2
XQG0	2	90	10	1	1							
XQG3	181	99	1	89	13							
XQG4	338	100	0									
XWD0	15	100	0	8				1		4		
XYG0	8	90	10	1	1					10	2	
XYP4	5	100	0						1			
XYP5	13	97.6	2.4	5					1	1		5
XYP6	42	100	0						1	1		10
XYPH1	8	100	0						1	1		
XYPH2	1	100	0	1								1
YLJ0	1	90	10									

YXF0	1	0	100									
YXG0	1	0	100									
SUM	5699	8029.9	470.1	493	36	9	11	33	12	169	50	141
Average	41.00	89.22	5.22	5.48	0.40	0.10	0.12	0.37	0.13	1.88	0.56	1.57
Percentage				547.78	40.00	10.00	12.22	36.67	13.33	187.78	55.56	156.67

Table 4.12: Frequency of Ceramic Colors and Surface Treatment by Object Numbers from Selected Sites.

Site	**Ceramic color**									**Surface treatment**		
	red	red-brown	yellow-brown	brown	yellow-grey	grey-brown	grey	black-brown	black	burnished	black slip	white slip
DDP1	1	1				1		1				
DDP2		2				2						
DDP3		5	2			1		1				
DDP4		2										
DDPH1		2	1									
DDPH2		4				1						
DDPH3		1				1						
DDPH4		11				4						
DDS0	1	1		1								
DMB												
DMK0	1						1					
DMK1							1					
DMK2							1					
DMK3			1				1					
DMK4	236	550	1061				667		162			
DMK5	411	120	282				530		428			
DMKH1				1			1					
DMKH2							1					
DWP3						11						
DWPD2						1						
DWPH1						3	1	1				
DWPH2						1						
DWT3	7	4		1		8	4	1				
DWTH1	1	1										
DWTH2	1	1				8						

DWTH3												
HDJ4				2	1	4	9	1				
HDJ4a	1		1	1			1		1			
HDJ4b	1		1	1			1		1			
HDJ4c	1		1	1			1		1			
HDJ5	1			4		2	1					
HDJH1				1								
HDJH2				3		2		1				
HDJH3				5								
HDJH4				3		1						
HDJH5				1								
HZD0				1			5				5	
MGP1		1	1				1	1				
MGP2	1		1				1		1			
MGP3	14	1	21					8		19	4	1
MGW	1			1					10			
MST0		3	1			25		3				
MST5						2						
MST5-7	1						1	1				
MST6		1				1		1				
MST7						1						
MZJ0	2	12		1				1				
PKL0	2	2										
PTB		3										
PTT	5											
PWL	1						1			1	1	
PXC0	6					2						
PZC0	1			2								
XHS0	9			1			2		2	3	3	
XHS1-2						2	1				1	
XHS3		1					4		1	1		
XHS4						8	1					
XHSH2						3						
XHSH3						2	5					
XLZ1										1	1	

XLZ3-4	1		1				1				1	
XMI0				2						2		
XMI3						2	1			10		
XMI4				2		1	1	3		8		
XMI5						2		1		3		
XMIH1						1		1		2		
XMS0		1				1	2			2		
XMS5		1				1	1			3		
XMS7						3	3			7		
XMS8	1			1		1	2			4		
XMSH1	1	1	1			1	1			3		
XMSH2	1						1			1		
XMSH3			1				1			2		
XMSH4	1		1							2		
XMSH6				1			1			2		
XQG0								1				
XQG3	13			3		52	1	1	28		3	
XQG4	3					82			11			
XWD0	7					1			1			
XYG0				1			1					
XYP4	1			1			1			1		
XYP5	1			1		3	1			5		
XYP6	1			1			1			1		
XYPH1						8				1		
XYPH2						1				1		
YLJ0	1			1			1					
YXF0				1								
YXG0				1								
SUM	737	720	1375	47	1	253	1264	26	647	85	19	1
Average	8.19	8.00	15.28	0.52	0.01	2.81	14.04	0.29	7.19	0.94	0.21	0.01
Percentage	818.89	800.00	1527.78	52.22	1.11	281.11	1404.44	28.89	718.89	94.44	21.11	1.11

Table 4.13: Number of Occurrences of Different Object Types for Selected Settlement Sites.

	jar	**single-handled jar**	**double-handled jar**	**jar with handles**	**urn**	**cup**	**beaker**	**goblet**	**ewer**	**vase**	**basin**	**bo bowl**
DDP1	7											
DDP2	25					1						
DDP3	50			2								
DDP4	16											1
DDPH1	5											
DDPH2	1											
DDPH3	15											
DDPH4	11											
DDS0												
DMB	1					1						
DMK0	3											
DMK1												
DMK2												
DMK3												
DMK4	1					1						
DMK5	6					1	1					
DMKH1	2				1							
DMKH2	1											
DWP3	7											
DWPD2												
DWPH1	2											
DWPH2												
DWT3	33		4				2					
DWTH1	2		1									
DWTH2	2		3		1							
DWTH3												
HDJ4	2											
HDJ4a	2											
HDJ4b	2											
HDJ4c	3											
HDJ5	11									1		2

HDJH1	5					1				1		
HDJH2	4			1								
HDJH3	5											
HDJH4	4					2						
HDJH5												
HZD0	4									5		
MGP1												
MGP2	10				1							1
MGP3	21											14
MGW												
MST0						1		1				
MST5	1											
MST5-7	14											
MST6	1											
MST7	1											
MZJ0	15											6
PKL0												
PTB	1											
PTT	5		5									
PWL	5									1		
PXC0	1									2		4
PZC0	1					1				2		1
XHS0	30%				2	1			1	4		4
XHS1-2	23								2	3		
XHS3	67				1						1	1
XHS4	23											5
XHSF1												
XHSH1												
XHSH2										1		1
XHSH3	13								1	1		2
XLZ1												
XLZ3-4									1			
XMI0												
XMI3	28					1						
XMI4	13				1	1				1	2	

XMI5	9											
XMIH1										1		
XMS0	3											2
XMS5	2											
XMS7	11				1							2
XMS8	7							1				3
XMSH1	6				1							1
XMSH2	2											
XMSH3	1											2
XMSH4	2											2
XMSH6	2											
XQG0	1								1			
XQG3	68		22	5	2	3		3	1	3		1
XQG4	13											
XWD0	7											4
XYG0	3									1		1
XYP4												
XYP5	7									1	2	2
XYP6	14											
XYPH1	1											1
XYPH2												1
YLJ0												
YXF0												
YXG0	1											
SUM	532.3	0	35	6	11	14	3	5	7	28	5	63
Average	5.91	0.00	0.39	0.07	0.12	0.16	0.03	0.06	0.08	0.31	0.06	0.70
Percentage	591.44	0.00	38.89	6.67	12.22	15.56	3.33	5.56	7.78	31.11	5.56	70.00

Table 4.14: Number of Occurrences of Different Object Types for Selected Settlement Sites.

	wan bowl	**dou bowl**	**net weight**	**spindle whirl**	**lid**	**object stand**	**bottom**	**flat bottom**	**ring-foot**	**pedestal base**	**handle**	**wall sherd**	**spout**
DDP3							5	3	2		1	1	
DDP4							1	1					
DDPH1							1	1				1	
DDPH2													

DDPH3					1		1	1					
DDPH4													
DDS0							1	1				1	
DMB							1	1	1				
DMK0							1	1					
DMK1													
DMK2													
DMK3													
DMK4					2		3	1	2				
DMK5					1		5	4	1				
DMKH1													
DMKH2							1	1					
DWP3					1		10	9	1				
DWPD2							1	1					
DWPH1						1	3	3					
DWPH2						1							
DWT3			3				58	50	8		7		
DWTH1							1		1				
DWTH2						1	4	4					
DWTH3							1	1					
HDJ4							10	10			6	1	
HDJ4a							4	4					
HDJ4b							4	4					
HDJ4c													
HDJ5							3	2	1		2		
HDJH2							5	4		1	1		
HDJH3							1	1					
HDJH1							1	1					
HDJH4							1	1				1	
HDJH5							1	1					
HZD0							5	3	2				
MGP1													
MGP2	1						1	1	1				
MGP3	2			1	4		19	12	1	6	1		6
MGW													

MST0				2			29	26	3		2		
MST5							1	1			1		
MST5-7							30	26	4		9		
MST6							1	1			2		
MST7							1		1				
MZJ0	1			2			6	4	2		5		
PKL0											2		
PTB							2	2					
PTT													
PWL													
PXC0	1												
PZC0													
XHS0		1					3	2	1			5	1
XHS1-2													
XHS3	3				5								
XHS4	4						3	3					1
XHSF1													
XHSH1													
XHSH2							1	1					
XHSH3	2						3	3			1		
XLZ1													1
XLZ3-4													
XMI0							1	1			1		
XMI3				1	3		6	5	1				
XMI4	1			1			4	3	1				
XMI5				1			4	4					
XMIH1					1		1	1					
XMS0													
XMS5							2	2					1
XMS7	2						2	1	1				
XMS8	1												
XMSH1					1								
XMSH2					1								
XMSH3													
XMSH4													

XMSH6	2												
XQG0													
XQG3			1				50	30	10	10	20		2
XQG4													
XWD0							4	4				2	
XYG0	1											2	
XYP4													
XYP5							1	1					
XYP6													
XYPH1													
XYPH2													
YLJ0													
YXF0													
YXG0													
SUM	21	1	4	8	20	3	301	243	43	17	60	12	12
Average	0.23	0.01	0.04	0.09	0.22	0.03	3.34	2.70	0.48	0.19	0.67	0.13	0.13
Percentage	23.33	1.11	4.44	8.89	22.22	3.33	334.44	270.00	47.78	18.89	66.67	13.33	13.33

Table 4.15: Number of Occurrences of Different Decoration Types for Selected Settlement Sites.

Site	**Decoration**		**Technique**				
	decoration	no decoration	appliqué	impressed	incision	cutting	appliqué/impressed
DDP1	1	1	1	1	1		
DDP2	1	3		1			
DDP3	6	3	1	2	2		
DDP4	0	2		1	1		
DDPH1	1	1	1	1	1		1
DDPH2							
DDPH3	0	1					
DDPH4	1	1		1	1		
DDS0	0.2	99.8			1		
DMK0	10	90	1	1	1		1
DMK1	10	90	1	1	1		1
DMK2	10	90	1	1	1		1
DMK3	10	90	1	1	1		1
DMK4	0	6	1	1	1		1

DMK5	0	8	1	1	1		1
DMKH1	0	1					
DMKH2	0	1					
DWP3	2	9		1	1		
DWPD2	0	1					
DWPH1	1	3			1		
DWPH2	1	0			1		
DWT3	2	70		1	1		
DWTH1	0	2					
DWTH2	0	10					
DWTH3	0	1					
HDJ4	2	15		1	1		
HDJ4a	12	88		1	1		
HDJ4b	10	90		1	1		1
HDJ4c	11	89					
HDJ5	2	98		1	1		1
HDJH1	1	0		1			
HDJH2	0	7					
HDJH3	0	5					
HDJH4	2	2	1	1			
HDJH5	0	1					
HZD0	0	5	1	1	1		
MGP1	1	1		1	1		1
MGP2	1	1		1	1		1
MGP3	15	29		14	1		1
MGW	1	1	1	1	1		
MST0	24	8	1	23			
MST5	7.3	92.7		1	1		
MST5-7	7.3	92.7		1	1		
MST6	7.3	92.7		1	1		
MST7	7.3	92.7		1	1		
MZJ0	3	13		3			
PKL0	0	2					
PTB	0	3					
PTT	0	5					

PWL	1	1		1	1		
PXC0	1	7	1				
PZC0	0	100					
XHS0	15	5		7	8		4
XHS1-2	1	2			1		1
XHS3	7.4	92.6	5	1	1		1
XHS4	7	93	2	1	3		
XHSH3	6	4	2	4	2		
XLZ1	0	1					
XLZ3-4	1	1		1	1		1
XMI0	1	1		1			
XMI3	5.1	94.9	1	1	1		1
XMI4	10.1	89.9	1	1	3	1	1
XMI5	5.5	94.5		3	1		
XMIH1	0	2					
XMS0	2	0	1	1	1	1	1
XMS5	1	2		1	1		
XMS7	4	2	1	1	1		1
XMS8	4	0	1	3	1		1
XMSH1	2	1		1	1		1
XMSH2	0	1			1		1
XMSH3	1	1	1				1
XMSH4	0	2					
XMSH6	0	2					1
XQG0	0	2					
XQG3	18.5	81.5	1	25	1		1
XQG4	11.9	88.1					
XWD0	1	7		1			
XYG0	2	2		1	2		
XYP5	5.4	94.6		2	1		1
XYP6	2	98		1	1		1
XYPH1	1	0		1			
XYPH2	1	0		1			
YLJ0	1	99		1	1		
YXF0							

YXG0	1	99	1		1		
SUM	283.3	2579.7	28	126	62	2	30
Average	3.15	28.66	0.31	1.40	0.69	0.02	0.33

Table 4.16: Number of Occurrences of Different Decoration Motives for Selected Settlement Sites.

	impressed leaf-vein pattern	corded pattern	horizontal appliqué band with fingertip	horizontal appliqué bands	other appliqué	incised horizontal lines	traversal lines	net pattern	fish-bone pattern	water-ripple pattern	lines of points	cut-out geometric forms
DDP1								1	1		1	
DDP2	1											
DDP3	1			1		1	1	1				
DDP4							1	1			1	
DDPH1		1			1	1		1	1		1	
DDPH2												
DDPH3												
DDPH4		1				1	1	1				
DDS0						1						
DMB												
DMK0			1	1		1		1			1	
DMK1			1	1		1		1			1	
DMK2			1	1		1		1			1	
DMK3			1	1		1		1			1	
DMK4			1	1		1		1			1	
DMK5			1	1		1		1			1	
DMKH1												
DMKH2												
DWP3						2						
DWPD2												
DWPH1				1								
DWPH2								1				
DWT3	1			1								
DWTH1												
DWTH2												
DWTH3												

HDJ4	1									1		
HDJ4a		1				1		1		1	1	
HDJ4b		1	1			1		1		1	1	
HDJ4c		1				1		1		1	1	
HDJ5	1	1	1		1	1		1		1	1	
HDJH1		1										
HDJH2												
HDJH3												
HDJH4	1				1							
HDJH5												
HZD0					1	1					1	
MGP1	1		1		1	1						
MGP2	1		1		1	1						
MGP3	12		1		1	1					4	
MGW	1				1	1						
MST0	23						1					
MST5	1					1					1	
MST5-7	1					1					1	
MST6	1					1					1	
MST7	1					1					1	
MZJ0	3											
PKL0												
PTB												
PTT												
PWL	1					1		1	1		1	
PXC0				1								
PZC0												
XHS0		3	5			1	2				7	
XHS1-2			1			1	1				2	
XHS3		1	1	5		1	1					
XHS4			1	2		4						
XHSF1												
XHSH1												
XHSH2						2					2	
XHSH3		3		2		3		1				

XLZ1												
XLZ3-4			1			1					1	
XMI0	1											
XMI3			1	1		1		1		1	2	
XMI4			1	1		1	2	1	1	1	2	1
XMI5	3	1				1					1	
XMIH1												
XMS0			1			1					1	1
XMS5	1		1			1						
XMS7		1	1	1			2	1			2	
XMS8			1	1			1				3	
XMSH1			1			1	1				1	
XMSH2			1				1					
XMSH3				1								
XMSH4												
XMSH6			1									
XQG0												
XQG3	24	2	1	1	1	2		1		1	1	
XQG4		1		1		1						
XWD0	1											
XYG0		1				1	1	2			2	
XYP4												
XYP5		1	1			1					1	
XYP6		1	1			1					1	
XYPH1		1										
XYPH2		1										
YLJ0						1			1		1	
YXF0												
YXG0				1		1						
SUM	**82**	**24**	**32**	**27**	**9**	**53**	**16**	**25**	**5**	**8**	**53**	**2**

Table 4.17: Object Types and Subtypes at Settlement Sites.

Type	Subtype	Vessel ID	Body ware texture	Body ware color
Bottom	IA	PTB0.2	clay pottery	red-brown
Bottom	IA	PTB0.3	clay pottery	red-brown
Bottom	IA	XHS0.19	sand-tempered pottery	red
Bottom	IA	XWD0.10	sand-tempered pottery	red
Bottom	IA	XWD0.8	sand-tempered pottery	red
Bottom	IAaI	DDP1.8	sand-tempered pottery	grey-brown
Bottom	IAaI	DDP2.26	sand-tempered pottery	red-brown
Bottom	IAaI	DDP3.53	sand-tempered pottery	red-brown
Bottom	IAaI	DDPH1.12	sand-tempered pottery	red-brown
Bottom	IAaI	DDPH3.5	sand-tempered pottery	grey-brown
Bottom	IAaI	DDS0.11	sand-tempered pottery	red-yellow
Bottom	IAaI	DMK5.1	sand-tempered pottery	grey
Bottom	IAaI	DMK5.2	sand-tempered pottery	yellow-brown
Bottom	IAaI	DMK5.3	fine sand-tempered pottery	yellow-brown
Bottom	IAaI	DMK5.4	fine sand-tempered pottery	yellow-brown
Bottom	IAaI	DWP3.10	sand-tempered pottery	grey-brown
Bottom	IAaI	DWP3.11	sand-tempered pottery	grey-brown
Bottom	IAaI	DWP3.12	sand-tempered pottery	grey-brown
Bottom	IAaI	DWP3.13	sand-tempered pottery	grey-brown
Bottom	IAaI	DWP3.14	sand-tempered pottery	grey-brown
Bottom	IAaI	DWP3.15	sand-tempered pottery	grey-brown
Bottom	IAaI	DWPD2.1	sand-tempered pottery	grey-brown
Bottom	IAaI	DWPH1.4	sand-tempered pottery	grey-brown
Bottom	IAaI	DWPH1.5	sand-tempered pottery	grey-brown
Bottom	IAaI	DWT3.22	coarse sand-tempered pottery	red
Bottom	IAaI	DWT3.23	coarse sand-tempered pottery	grey-brown
Bottom	IAaI	DWT3.25	coarse sand-tempered pottery	grey-brown
Bottom	IAaI	DWT3.26	sand-tempered pottery	red-brown
Bottom	IAaI	DWT3.58	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.59	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.60	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.61	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.62	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.63	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.64	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.65	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.66	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.67	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.68	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.69	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.70	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.71	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.72	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.73	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.75	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.76	sand-tempered pottery	unknown

Bottom	IAaI	DWT3.77	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.78	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.79	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.80	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.81	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.82	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.83	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.84	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.85	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.86	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.87	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.88	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.89	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.90	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.91	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.92	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.93	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.94	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.95	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.96	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.97	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.98	sand-tempered pottery	unknown
Bottom	IAaI	DWT3.99	sand-tempered pottery	unknown
Bottom	IAaI	DWTH2.4	coarse sand-tempered pottery	grey-brown
Bottom	IAaI	HDJ4.3	sand-tempered pottery	grey
Bottom	IAaI	HDJ4A10	sand-tempered pottery	grey-brown
Bottom	IAaI	HDJ4A11	sand-tempered pottery	grey-brown
Bottom	IAaI	HDJ4A12	sand-tempered pottery	grey-brown
Bottom	IAaI	HDJ4A9	sand-tempered pottery	grey-brown
Bottom	IAaI	HDJ4B1	sand-tempered pottery	grey
Bottom	IAaI	HDJ4B2	sand-tempered pottery	black-brown
Bottom	IAaI	HDJ4B3	sand-tempered pottery	grey
Bottom	IAaI	HDJ4B4	sand-tempered pottery	yellow-grey
Bottom	IAaI	HDJH2.7	sand-tempered pottery	unknown
Bottom	IAaI	HDJH5.1	sand-tempered pottery	brown
Bottom	IAaI	HZD0.10	sand-tempered pottery	grey
Bottom	IAaI	HZD0.11	sand-tempered pottery	grey
Bottom	IAaI	MGP3.17	sand-tempered pottery	red
Bottom	IAaI	XHS0.18	sand-tempered pottery	unknown
Bottom	IAaI	XHSH2.3	sand-tempered pottery	grey-brown
Bottom	IAaI	XMI0.1	clay pottery	brown
Bottom	IAaI	XMI3.33	unknow	unknown
Bottom	IAaI	XMI3.34	unknow	unknown
Bottom	IAaI	XMI3.35	unknow	unknown
Bottom	IAaI	XMI3.36	unknow	unknown
Bottom	IAaI	XMI4.20	sand-tempered pottery	grey-brown
Bottom	IAaI	XMI4.21	unknow	unknown
Bottom	IAaI	XMI5.10	sand-tempered pottery	grey-brown

Bottom	IAaI	XMI5.11	unknow	unknown
Bottom	IAaI	XMI5.12	unknow	unknown
Bottom	IAaI	XMIH1.3	sand-tempered pottery	black-brown
Bottom	IAaI	XMS5.4	sand-tempered pottery	grey-brown
Bottom	IAaI	XMS5.5	sand-tempered pottery	red-brown
Bottom	IAaI	XMS7.17	sand-tempered pottery	grey-brown
Bottom	IAaII	XWD0.14	sand-tempered pottery	grey-brown
Bottom	IAaIII	DDP3.31	sand-tempered pottery	red-brown
Bottom	IAaIII	DDP3.33	sand-tempered pottery	unknown
Bottom	IAaIII	MGP3.24	sand-tempered pottery	red
Bottom	IAaIII	MGP3.26	sand-tempered pottery	yellow-brown
Bottom	IAaIII	XQG3A63	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A64	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A65	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A66	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A67	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A68	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A69	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A70	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A71	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A72	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A73	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A74	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A75	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A76	coarse sand-tempered pottery	grey-brown
Bottom	IAaIII	XQG3A77	coarse sand-tempered pottery	red
Bottom	IAaIII	XQG3A78	coarse sand-tempered pottery	red
Bottom	IAaIII	XQG3A79	coarse sand-tempered pottery	red
Bottom	IAaIII	XQG3A80	coarse sand-tempered pottery	black
Bottom	IAaIII	XQG3A81	coarse sand-tempered pottery	black
Bottom	IAaIII	XQG3A82	coarse sand-tempered pottery	black
Bottom	IAaIII	XQG3A83	coarse sand-tempered pottery	black
Bottom	IAaIII	XQG3A84	coarse sand-tempered pottery	black
Bottom	IAaIII	XQG3A85	coarse sand-tempered pottery	black
Bottom	IAaIII	XQG3A86	coarse sand-tempered pottery	black
Bottom	IAb	DWP3.19	sand-tempered pottery	grey-brown
Bottom	IAb	HDJ5.18	sand-tempered pottery	brown
Bottom	IAb	MGP3.15	sand-tempered pottery	yellow-brown
Bottom	IAb	MGP3.20	sand-tempered pottery	yellow-brown
Bottom	IAb	MGP3.21	sand-tempered pottery	red
Bottom	IAb	MGP3.22	sand-tempered pottery	yellow-brown
Bottom	IAcI	DMK0.1	fine sand-tempered pottery	red
Bottom	IAcI	DMK4.1	fine sand-tempered pottery	yellow-brown
Bottom	IAcI	MST0.17	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.18	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.19	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.20	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.21	sand-tempered pottery	grey-brown

Bottom	IAcI	MST0.22	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.23	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.24	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.25	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.26	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.27	sand-tempered pottery	grey-brown
Bottom	IAcI	MST0.28	sand-tempered pottery	red-brown
Bottom	IAcI	MST0.29	sand-tempered pottery	red-brown
Bottom	IAcI	MST0.30	sand-tempered pottery	red-brown
Bottom	IAcI	MST0.31	sand-tempered pottery	black-brown
Bottom	IAcI	MST0.32	sand-tempered pottery	black-brown
Bottom	IAcI	MST6.3	fine sand-tempered pottery	grey-brown
Bottom	IAcII	DWTH2.3	coarse sand-tempered pottery	red
Bottom	IAdI	HDJ5.17	sand-tempered pottery	brown
Bottom	IAdI	HDJH2.4	sand-tempered pottery	brown
Bottom	IAdI	XQG3.38	coarse sand-tempered pottery	brown
Bottom	IAdII	HDJ4.4	sand-tempered pottery	brown
Bottom	IAdII	HDJH2.5	sand-tempered pottery	brown
Bottom	IAdII	HDJH2.6	sand-tempered pottery	grey-brown
Bottom	IAdII	HDJH4.6	sand-tempered pottery	brown
Bottom	IAdII	XYP5.13	sand-tempered pottery	grey-brown
Bottom	IAdIII	DWTH2.2	coarse sand-tempered pottery	grey-brown
Bottom	IAdIII	XMI3.31	clay pottery	grey-brown
Bottom	IAdIII	XQG3.39	sand-tempered pottery	grey-brown
Bottom	IBa	DWP3.16	sand-tempered pottery	grey-brown
Bottom	IBa	DWPH1.6	sand-tempered pottery	black-grey
Bottom	IBa	DWT3.24	coarse sand-tempered pottery	brown
Bottom	IBa	DWT3.27	sand-tempered pottery	red-brown
Bottom	IBbI	DDP3.54	sand-tempered pottery	yellow-brown
Bottom	IBbI	XQG3.40	sand-tempered pottery	grey-brown
Bottom	IBbI	XQG3.41	sand-tempered pottery	unknown
Bottom	IBbI	XQG3.42	sand-tempered pottery	unknown
Bottom	IBbI	XQG3.43	sand-tempered pottery	unknown
Bottom	IBbIII	MGP3.30	sand-tempered pottery	red
Bottom	IBc	DWTH2.1	coarse sand-tempered pottery	red-brown
Bottom	ICaI	DDP4.15	sand-tempered pottery	red-brown
Bottom	ICaI	DWP3.18	sand-tempered pottery	grey-brown
Bottom	ICaI	DWT3.57	coarse sand-tempered pottery	grey-brown
Bottom	ICaI	MGP3.19	sand-tempered pottery	yellow-brown
Bottom	ICaI	MGP3.23	sand-tempered pottery	red
Bottom	ICaI	MZJ2.19	sand-tempered pottery	brown
Bottom	ICaI	XWD0.9	sand-tempered pottery	red
Bottom	ICaII	DWT3.21	coarse sand-tempered pottery	grey-brown
Bottom	ICaII	MZJ2.22	sand-tempered pottery	red-brown
Bottom	ICaIII	MGP3.18	sand-tempered pottery	red
Bottom	ICaIII	MGP3.25	sand-tempered pottery	yellow-brown
Bottom	ICaIII	MZJ2.21	sand-tempered pottery	red-brown
Bottom	ICb	XHS4.29	sand-tempered pottery	grey-brown

Bottom	ICb	XHS4.30	sand-tempered pottery	grey-brown
Bottom	ICb	XHS4.31	sand-tempered pottery	grey-brown
Bottom	ICb	XHSH3.17	sand-tempered pottery	grey
Bottom	ICb	XHSH3.18	sand-tempered pottery	unknown
Bottom	ICb	XHSH3.19	sand-tempered pottery	unknown
Bottom	ICb	XMI4.19	sand-tempered pottery	black-brown
Bottom	ICc	HZD0.12	sand-tempered pottery	grey
Bottom	ICc	MST0.36	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.37	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.38	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.39	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.40	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.41	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.42	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.43	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.44	sand-tempered pottery	grey-brown
Bottom	ICc	MST0.45	sand-tempered pottery	grey-brown
Bottom	ICc	MST5.4	fine sand-tempered pottery	grey-brown
Bottom	IIAa	DDP3.32	sand-tempered pottery	grey-brown
Bottom	IIAa	XMS7.16	sand-tempered pottery	grey-brown
Bottom	IIAb	HZD0.13	sand-tempered pottery	grey
Bottom	IIAb	HZD0.14	sand-tempered pottery	grey
Bottom	IIAcI	DWP3.17	sand-tempered pottery	grey-brown
Bottom	IIAcI	XMI3.32	clay pottery	grey-brown
Bottom	IIAcII	DWT3.19	sand-tempered pottery	grey-brown
Bottom	IIAcII	DWT3.53	sand-tempered pottery	unknown
Bottom	IIAcII	DWT3.54	sand-tempered pottery	unknown
Bottom	IIAcII	DWT3.55	sand-tempered pottery	unknown
Bottom	IIAcII	DWT3.56	sand-tempered pottery	unknown
Bottom	IIAcII	XQG3A97	coarse sand-tempered pottery	black
Bottom	IIAcII	XQG3A98	coarse sand-tempered pottery	black
Bottom	IIAcIII	HDJ5.16	sand-tempered pottery	red
Bottom	IIAcIII	XMI4.18	sand-tempered pottery	black-brown
Bottom	IIBa	DWT3.17	sand-tempered pottery	red
Bottom	IIBa	DWT3.18	sand-tempered pottery	red
Bottom	IIBa	DWTH1.2	sand-tempered pottery	red-brown
Bottom	IIBa	MGP3.16	sand-tempered pottery	red
Bottom	IIBa	MST0.33	sand-tempered pottery	grey-brown
Bottom	IIBa	MST0.34	sand-tempered pottery	grey-brown
Bottom	IIBa	MST0.35	sand-tempered pottery	black-brown
Bottom	IIBa	MST7.2	fine sand-tempered pottery	grey-brown
Bottom	IIBa	MZJ2.20	sand-tempered pottery	red-brown
Bottom	IIBa	XQG3A89	fine sand-tempered pottery	grey-brown
Bottom	IIBa	XQG3A90	fine sand-tempered pottery	red
Bottom	IIBa	XQG3A91	fine sand-tempered pottery	red
Bottom	IIBa	XQG3A92	fine sand-tempered pottery	black
Bottom	IIBa	XQG3A93	fine sand-tempered pottery	black
Bottom	IIBa	XQG3A94	fine sand-tempered pottery	black

Bottom	IIBa	XQG3A95	fine sand-tempered pottery	grey-brown
Bottom	IIBa	XQG3A96	fine sand-tempered pottery	grey-brown
Bottom	IIBb	DWT3.20	coarse sand-tempered pottery	grey-brown
Bottom	IIBcI	DMK4.3	sand-tempered pottery	yellow-brown
Bottom	IIBcI	DMK5.6	sand-tempered pottery	black
Bottom	IIBcII	DMK4.2	sand-tempered pottery	grey
Bottom	IIIAaI	XQG3A87	fine sand-tempered pottery	grey-brown
Bottom	IIIAaI	XQG3A88	fine sand-tempered pottery	grey-brown
Bottom	IIIAaII	MGP3.10	sand-tempered pottery	red
Bottom	IIIAaII	MGP3.15	sand-tempered pottery	yellow-brown
Bottom	IIIAaII	MGP3.16	sand-tempered pottery	red
Bottom	IIIAaII	MGP3.27	sand-tempered pottery	yellow-brown
Bottom	IIIAaII	XQG3.29	clay pottery	black
Bottom	IIIAaII	XQG3.36	clay pottery	black
Bottom	IIIAb	XHS0.17	sand-tempered pottery	unknown
Bottom	IIIB	HDJH2.8	clay pottery	black-brown
Bottom	IIIBa	XQG3.27	clay pottery	black
Bottom	IIIBa	XQG3.28	clay pottery	unknown
Bottom	IIIBb	MGP3.28	sand-tempered pottery	red
Bottom	IIIBb	MGP3.29	sand-tempered pottery	yellow-brown
Bottom	IIIBbI	XQG3.33	clay pottery	black
Bottom	IIIBbI	XQG3.34	clay pottery	black
Bottom	IIIBbI	XQG3.35	clay pottery	black
Bottom	IIICa	HMLC13	clay pottery	black-grey
Bottom	IIICa	HMLM1.1	clay pottery	black-grey
Bottom	IV	XQG3.37	clay pottery	grey
Bottom	unknown	YGSC3	unknown	unknown
Basin	C	XYP5.10	sand-tempered pottery	unknown
Basin	C	XYP5.9	sand-tempered pottery	grey-brown
bo bowl	AaI	MGP3.1	sand-tempered pottery	black-brown
bo bowl	AaI	MGP3.10	sand-tempered pottery	red
bo bowl	AaI	MGP3.12	sand-tempered pottery	black-brown
bo bowl	AaI	MGP3.13	sand-tempered pottery	yellow-brown
bo bowl	AaI	MGP3.14	sand-tempered pottery	yellow-brown
bo bowl	AaI	MGP3.2	sand-tempered pottery	black-brown
bo bowl	AaI	MGP3.4	sand-tempered pottery	black-brown
bo bowl	AaI	MGP3.5	sand-tempered pottery	black-brown
bo bowl	AaI	MZJ2.24	sand-tempered pottery	red-brown
bo bowl	AaI	MZJ2.26	sand-tempered pottery	red-brown
bo bowl	AaI	MZJ2.27	sand-tempered pottery	red-brown
bo bowl	AaI	MZJ2.28	sand-tempered pottery	red-brown
bo bowl	AaI	MZJ2.29	sand-tempered pottery	red-brown
bo bowl	AaI	XQG3A1	coarse sand-tempered pottery	black
bo bowl	AaIa	MGP3.11	sand-tempered pottery	black-brown
bo bowl	AaIa	MGP3.3	sand-tempered pottery	black-brown
bo bowl	AaIa	MGP3.7	sand-tempered pottery	yellow-brown
bo bowl	AaIb	MGP3.9	sand-tempered pottery	yellow-brown
bo bowl	AaIc	MGP3.6	sand-tempered pottery	red

bo bowl	AaIIa	MGP3.8	sand-tempered pottery	red-brown
bo bowl	Ab	XMS7.15	sand-tempered pottery	grey-brown
bo bowl	Ab	XMS8.11	sand-tempered pottery	grey-brown
bo bowl	Ab	XYP5.12	sand-tempered pottery	unknown
bo bowl	Ba	MZJ2.25	sand-tempered pottery	red-brown
bo bowl	Ba	XMSH1.7	sand-tempered pottery	grey
bo bowl	BbI	XHS4.26	sand-tempered pottery	grey-brown
bo bowl	BbI	XHSH2.2	sand-tempered pottery	grey-brown
bo bowl	BbI	XYPH2.2	sand-tempered pottery	grey-brown
bo bowl	C	XMS8.9	sand-tempered pottery	grey
bo bowl	C	XMSH3.2	sand-tempered pottery	yellow-brown
bo bowl	C	XMSH3.3	sand-tempered pottery	grey
bo bowl	C	XMSH4.3	sand-tempered pottery	red
bo bowl	C	XMSH4.4	sand-tempered pottery	yellow-brown
bo bowl	C	XYP5.11	sand-tempered pottery	brown
bo bowl	D	DDP4.14	sand-tempered pottery	red-brown
bo bowl	D	HDJ5.12	sand-tempered pottery	brown
bo bowl	D	XWD0.5	sand-tempered pottery	red
bo bowl	Da	PXC0.3	sand-tempered pottery	red
bo bowl	Db	XWD0.12	sand-tempered pottery	red
bo bowl	Dc	PXC0.4	sand-tempered pottery	red
bo bowl	Dc	PXC0.5	sand-tempered pottery	red
bo bowl	Dc	PXC0.7	sand-tempered pottery	grey-brown
bo bowl	Ea	XWD0.4	sand-tempered pottery	red
bo bowl	Ea	XWD0.6	sand-tempered pottery	red
bo bowl	EaI	HDJ5.11	sand-tempered pottery	grey-brown
bo bowl	EaI	XHSH3.13	sand-tempered pottery	grey
bo bowl	EaI	XHSH3.20	sand-tempered pottery	grey
bo bowl	EaI	XMS7.13	clay pottery	grey
bo bowl	EaIa	XHS0.9	clay pottery	grey
bo bowl	EaIb	XMS0.4	sand-tempered pottery	grey
bo bowl	EaII	XHS0.4	sand-tempered pottery	red
bo bowl	EaII	XYG0.4	clay pottery	grey
bo bowl	EbI	XHS0.10	clay pottery	grey
bo bowl	EbII	XHS3.68	clay pottery	black
bo bowl	EbIII	XHS0.8	sand-tempered pottery	red
bo bowl	Fa	XMS0.5	sand-tempered pottery	grey
dou bowl	AbI	XDYH2.1	sand-tempered pottery	brown
wan bowl	Aa	MZJ2.23	clay pottery	black-brown
wan bowl	Aa	XHS4.24	sand-tempered pottery	grey-brown
wan bowl	Ab	XHS3.71	sand-tempered pottery	unknown
wan bowl	Ab	XHS4.25	sand-tempered pottery	grey-brown
wan bowl	Ab	XHS4.27	sand-tempered pottery	grey-brown
wan bowl	Ab	XHS4.28	sand-tempered pottery	grey-brown
wan bowl	Ab	XHSH3.22	sand-tempered pottery	unknown
wan bowl	Ab	XMS7.12	sand-tempered pottery	grey
wan bowl	Ab	XMS8.8	sand-tempered pottery	grey
wan bowl	Ba	XHS3.70	sand-tempered pottery	unknown

wan bowl	Ba	XMSH6.4	sand-tempered pottery	grey
wan bowl	BaI	XHS3.69	sand-tempered pottery	grey
wan bowl	BaI	XHSH3.21	sand-tempered pottery	grey-brown
wan bowl	BaI	XMSH6.3	clay pottery	brown
wan bowl	BbIIb	XMI4.16	sand-tempered pottery	brown
wan bowl	BcIIIa	XYG0.1	fine sand-tempered pottery	brown
wan bowl	Ca	PXC0.8	sand-tempered pottery	red
wan bowl	Ca	XMS7.14	sand-tempered pottery	grey
beaker	A	DMK5.11	sand-tempered pottery	yellow-brown
beaker	Ca	DWT3.8	coarse sand-tempered pottery	black-brown
beaker	Ca	DWT3.9	sand-tempered pottery	grey
cup	A	XMI3.29	clay pottery	grey
cup	A	XQG3.28	unknown	unknown
cup	CaI	XDYH1.6	sand-tempered pottery	brown
cup	Cb	DMK5.12	sand-tempered pottery	red-brown
cup	CbII	PZC0.3	fine sand-tempered pottery	brown
cup	Cc	DMK4.7	sand-tempered pottery	grey
cup	Cc	HDJH1.5	sand-tempered pottery	brown
cup	Cc	HDJH4.1	sand-tempered pottery	brown
cup	Cc	HDJH4.2	sand-tempered pottery	brown
cup	CdI	XDYH1.13	sand-tempered pottery	brown
cup	CdIII	DDP2.16	sand-tempered pottery	grey-brown
goblet	AfII	XDYH2.6	sand-tempered pottery	brown
goblet	B or C	XQG3.14	clay pottery	black
goblet	B or C	XQG3.15	clay pottery	black
goblet	B or C	XQG3.16	clay pottery	black
goblet	CaIII	XMS8.10	sand-tempered pottery	brown
goblet	Fb	MST0.1	sand-tempered pottery	yellow-brown
vase	Ab	PZC0.1	sand-tempered pottery	red
vase	BaII	XHS0.14	unknow	unknown
vase	BbI	XHS0.11	sand-tempered pottery	red
vase	BbI	XHS0.12	sand-tempered pottery	red
vase	Ca	XHS1.24	sand-tempered pottery	grey
vase	CaI	XHSH3.15	sand-tempered pottery	grey-brown
vase	DbII	XMI4.15	sand-tempered pottery	brown
vase	Fa	XHS0.13	unknow	unknown
vase	Fa	XHSH2.1	sand-tempered pottery	grey-brown
vase	FaII	HDJ5.15	sand-tempered pottery	grey
vase	FaII	XHS1.25	sand-tempered pottery	grey-brown
vase	Fb	PXC0.6	sand-tempered pottery	grey-brown
vase	Ha	PZC0.2	fine sand-tempered pottery	brown
vase	Hc	XMI4.17	sand-tempered pottery	black-brown
vase	unknown	PAMC3	unknow	unknown
vase	unknown	PXC0.2	sand-tempered pottery	red
vase	unknown	XHS1.26	sand-tempered pottery	grey-brown
ewer	BbI	PXAM1.9	fine clay pottery	black-brown
ewer	BbI	XQG0.1	unknown	unknown
ewer	BbII	XHS0.15	unknown	unknown

ewer	BbII	XHSH3.16	sand-tempered pottery	grey
Spout	A	MGP3.58	coarse sand-tempered pottery	black-brown
Spout	AaI	XQG3.31	sand-tempered pottery	grey-brown
Spout	AaI	XQG3.32	sand-tempered pottery	brown
Spout	Ab	XHS0.15	unknown	unknown
Spout	Ba	MGP3.56	coarse sand-tempered pottery	red
Spout	Ba	XMS5.3	clay pottery	grey
Spout	Bb	XHS4.32	sand-tempered pottery	grey
Spout	C	XLZ1.1	sand-tempered pottery	unknown
Spout	D	MGP3.57	coarse sand-tempered pottery	yellow-brown
Spout	D	MGP3.59	sand-tempered pottery	yellow-brown
Spout	D	MGP3.60	sand-tempered pottery	yellow-brown
Spout	D	MGP3.61	sand-tempered pottery	yellow-brown
urn	Aa	DWTH2.4	coarse sand-tempered pottery	grey-brown
urn	AaII/AbIIIb rim	XHS0.1	sand-tempered pottery	red
urn	AaII/AbIIIb rim	XHS0.5	sand-tempered pottery	red
urn	AaII/AbIIIb rim	XQG3A33	coarse sand-tempered pottery	grey-brown
urn	AaIII	XMI4.13	sand-tempered pottery	grey
urn	Bb/ Ea rim	XQG3.1	sand-tempered pottery	grey-brown
urn	Dd/AbIIIaII rim	DMKH1.1	sand-tempered pottery	brown
urn	Dd/AbIIIaII rim	XHS3.67	sand-tempered pottery	red-brown
urn	Dd/AbIIIaII rim	XMS7.8	sand-tempered pottery	unknown
urn	Dd/AbIIIaII rim	XMSH1.5	sand-tempered pottery	grey-brown
guan	Aa	DDP3.15	red-brown	sand
guan	Aa	DDP3.16	red-brown	sand
guan	Aa	DDPH4.16	red-brown	fine sand
guan	Aa	DWP3.8	grey-brown	sand
guan	Aa	XMS8.4	red	sand
guan	Aa	XMS8.6	brown	sand
guan	AaIa	XHS3.1	grey	sand
guan	AaIa	XHS3.2		
guan	AaIa	XHS3.3		
guan	AaIa	XHS3.4		
guan	AaIa	XHS3.5		
guan	AaIa	XHS3.6		
guan	AaIa	XHS3.7		
guan	AaIa	XHS3.8		
guan	AaIa	XHS4.1	grey-brown	sand
guan	AaIa	XHS4.2	grey-brown	sand
guan	AaIa	XMS0.2	grey-brown	sand
guan	AaIa	XMS8.1	yellow-brown	sand
guan	AaIa	XMSH2.2	grey-brown	sand

guan	AaIa	XQG4.1	grey-brown	clay
guan	AaIa	XQG4.2	grey-brown	clay
guan	AaIa	XQG4.3	grey-brown	clay
guan	AaIa	XQG4.5	red	clay
guan	AaIa	XYP6.1	grey-brown	sand
guan	AaIa	XYP6.10	grey-brown	sand
guan	AaIa	XYP6.11		sand
guan	AaIb	DDP2.7	red-brown	sand
guan	AaIb	DDP3.17	red-brown	sand
guan	AaIb	DDP3.23	red-brown	sand
guan	AaIb	DDP3.26	grey-brown	sand
guan	AaIb	DDP3.28		
guan	AaIb	DDP3.29		
guan	AaIb	DDP3.6	red-brown	sand
guan	AaIb	DDP4.11	red-brown	sand
guan	AaIb	DDP4.12	red-brown	sand
guan	AaIb	DDP4.13	red-brown	sand
guan	AaIb	DDP4.6	red-brown	sand
guan	AaIb	DDPH4.9	red-brown	sand
guan	AaIIb	DDP2.5	red-brown	sand
guan	AaIIb	DDP2.8	red-brown	sand
guan	AaIIb	DDP2.9		sand
guan	AaIIb	DDP3.14	red-brown	sand
guan	AaIIb	DDP3.24	red-brown	sand
guan	AaIIb	DDP3.4	red-brown	sand
guan	AaIIb	DDP3.5	red-brown	sand
guan	AaIIb	DDP4.4	red-brown	sand
guan	AaIIb	DDPH3.2	red-brown	sand
guan	AaIIb	MZJ2.12	red-brown	sand
guan	Ab	DDP1.4	grey-brown	sand
guan	Ab	DDP1.5		sand
guan	Ab	DDP3.30	red-brown	sand
guan	Ab	DMK0.4	grey	fine sand
guan	Ab	DWP3.6	grey-brown	sand
guan	Ab	HDJ4A4	yellow-brown	sand
guan	Ab	HDJ4A5	red	sand
guan	Ab	HDJ4B6	yellow-brown	sand
guan	Ab	HDJ4B7	grey	sand
guan	Ab	HDJ4C1	grey	sand
guan	Ab	HDJ4C2	grey	sand
guan	Ab	HDJ4C3	grey	sand
guan	Ab	HDJH2.2	grey-brown	sand
guan	Ab	XMS7.3	brown	sand
guan	Ab	XMS8.2	grey-brown	sand
guan	Ab	XWD0.11	red	sand
guan	Ab	XWD0.2	red	sand
guan	Ab	XYP5.2	grey-brown	sand
guan	Ab	XYP5.3		sand

guan	Ab	XYP6.2	yellow-brown	sand
guan	Ab	XYP6.3		sand
guan	AbIa	XHS3.30	grey	sand
guan	AbIa	XHS3.31		
guan	AbIa	XHS3.32		
guan	AbIa	XHS3.33		
guan	AbIa	XHS3.34		
guan	AbIa	XHS4.7	grey-brown	sand
guan	AbIa	XHS4.8	grey-brown	sand
guan	AbIa	XHS4.9	grey-brown	sand
guan	AbIa	XMS0.1	red-brown	sand
guan	AbIa	XMS7.1	yellow-brown	sand
guan	AbIa	XMS7.2	brown	sand
guan	AbIa	XMSH1.1	red	sand
guan	AbIa	XMSH1.2	grey-brown	sand
guan	AbIa	XMSH2.1	red	sand
guan	AbIa	XMSH3.1	yellow-brown	sand
guan	AbIa	XMSH6.1	brown	sand
guan	AbIa	XYP6.4	grey-brown	sand
guan	AbIa	XYPM1.5	grey-brown	sand
guan	AbIb	HDJH2.1	grey-brown	sand
guan	AbIb	XMI3.11	brown	clay
guan	AbIb	XMI5.6	brown	sand
guan	AbIb	XMSH1.3	red	sand
guan	AbIb	XYPM2.1	grey-brown	sand
guan	Ac	HDJ5.10	grey-brown	sand
guan	Ac	HDJH4.2	brown	sand
guan	Ac	HDJH4.4	brown	fine sand
guan	Ac	HDJH4.5	black	clay
guan	Ac	XHS0.21	red-brown	sand
guan	Ac	XHS0.22	red	sand
guan	Ac	XHS0.23	red	sand
guan	Ac	XHS0.24	black-brown	sand
guan	Ac	XHS0.28	black	sand
guan	Ac	XMS5.1	grey-brown	sand
guan	Ac	XWD0.3	red	sand
guan	AcI	XHS1.16	grey	sand
guan	AcI	XHS1.17	grey	sand
guan	AcI	XHS1.18		
guan	AcI	XHS1.19		
guan	AcI	XHS1.20		
guan	AcI	XHS1.4		
guan	AcI	XHS1.5		
guan	AcI	XHS1.6		
guan	AcI	XHS1.7		
guan	AcI	XHS1.8		
guan	AcI	XHS1.9		
guan	AcI	XHS3.36	grey-brown	sand

guan	AcI	XHS3.37	grey-brown	sand
guan	AcI	XHS3.38	grey	sand
guan	AcI	XHS3.40	grey-brown	sand
guan	AcI	XHS4.12	grey-brown	sand
guan	AcI	XHS4.21	grey-brown	sand
guan	AcI	XHS4.22	grey-brown	sand
guan	AcI	XHSH3.5	grey	sand
guan	AcI	XHSH3.6	grey-brown	sand
guan	AcI	XMI3.1	brown	clay
guan	AcI	XMI3.10		
guan	AcI	XMI3.19	grey-brown	clay
guan	AcI	XMI3.2		
guan	AcI	XMI3.3		
guan	AcI	XMI3.4		
guan	AcI	XMI3.5		
guan	AcI	XMI3.6		
guan	AcI	XMI3.7		
guan	AcI	XMI3.8		
guan	AcI	XMI3.9		
guan	AcI	XMI4.7	brown	sand
guan	AcI	XMI4.8		
guan	AcI	XMI5.7		
guan	AcI	XMI5.8		
guan	AcII	MZJ2.10	red-brown	sand
guan	AcII	MZJ2.11	red-brown	sand
guan	AcII	MZJ2.6	red-brown	sand
guan	AcII	MZJ2.8	red-brown	sand
guan	B	DDP4.18	red-brown	fine sand
guan	Ba	DDP3.20	red-brown	sand
guan	Ba	DDP3.21	red-brown	sand
guan	Ba	DDP3.22	red-brown	sand
guan	Ba	DDP3.27	red-brown	sand
guan	Ba	DDP3.35	red-brown	sand
guan	Ba	DDP3.39	red-brown	sand
guan	Ba	DDP3.42	yellow-brown	sand
guan	Ba	DDP3.43	red-brown	fine sand
guan	Ba	DDP3.44	red-brown	fine sand
guan	Ba	DDP3.45	red-brown	fine sand
guan	Ba	DDP3.46	red-brown	fine sand
guan	Ba	DDP4.16	red-brown	sand
guan	Ba	DMK0.2	grey	sand
guan	Ba	DMK0.3	red	sand
guan	Ba	DMK4.4	red-brown	sand
guan	Ba	DMK5.10	yellow-brown	sand
guan	Ba	DMK5.7	red	sand
guan	Ba	DMK5.8	yellow-brown	sand
guan	Ba	DMK5.9	yellow-brown	sand
guan	Ba	HDJ5.3	grey-brown	sand

guan	Ba	HDJH3.3	brown	sand
guan	Ba	MGP3.39	yellow-brown	sand
guan	Ba	MGP3.47	yellow-brown	sand
guan	Ba	MST0.46	grey-brown	sand
guan	Ba	MST0.47	grey-brown	sand
guan	Ba	MST0.48	red-brown	sand
guan	Ba	MST0.49	red-brown	sand
guan	Ba	MST0.50	red-brown	sand
guan	Ba	MST0.51	red-brown	sand
guan	Ba	MST5.1	grey-brown	fine sand
guan	Ba	XHSH3.1	grey	sand
guan	Ba	XHSH3.2	grey	sand
guan	Ba	XHSH3.3	grey	sand
guan	BaI	MZJ2.9	red-brown	sand
guan	Bb	DDP2.19	red-brown	sand
guan	Bb	DDP2.20	red-brown	sand
guan	Bb	DDP2.21	red-brown	sand
guan	Bb	DDP2.24	red-brown	sand
guan	Bb	DDP2.6	red-brown	sand
guan	Bb	DDP3.13	red-brown	sand
guan	Bb	DDP3.19	grey-brown	sand
guan	Bb	DWT3.10	red	coarse sand
guan	Bb	DWT3.49		sand
guan	Bb	DWT3.50		sand
guan	BbI	DWT3.12	grey-brown	coarse sand
guan	BbI	MZJ2.1	red-brown	sand
guan	BbI	MZJ2.4	red-brown	sand
guan	BbI	MZJ2.5	red-brown	sand
guan	BbI	MZJ2.7	red-brown	sand
guan	BbIIa	HDJ5.2	brown	sand
guan	BbIIa	MZJ2.13	red-brown	sand
guan	BbIIb	DDP3.10	grey-brown	sand
guan	BbIIb	DDP3.11	red-brown	sand
guan	BbIIb	DDP3.8	red-brown	sand
guan	BbIIb	DDP3.9	grey-brown	sand
guan	BbIIb	DDP4.5	red-brown	sand
guan	BbIIb	DDP4.7	red-brown	sand
guan	BbIIb	DDP4.8	red-brown	sand
guan	BbIIb	DDPH4.2	grey-brown	sand
guan	BbIIb	DDPH4.3	red-brown	sand
guan	BbIIb	DDPH4.4	grey-brown	sand
guan	BbIIb	DDPH4.7	red-brown	sand
guan	BbIIb	DWPH1.2	grey-brown	sand
guan	BbIIb	HDJ5.1	brown	sand
guan	BbIIb	MZJ2.3	red-brown	sand
guan	Bc	DDPH1.11	red-brown	sand
guan	BcIa	DDPH4.5	grey-brown	sand
guan	BcIa	HZD0.8	brown	sand

guan	BcIa	HZD0.9	brown	sand
guan	BcIa	XHS1.1	grey-brown	sand
guan	BcIa	XHS1.10		
guan	BcIa	XHS1.11		
guan	BcIa	XHS1.12		
guan	BcIa	XHS1.13		
guan	BcIa	XHS1.14		
guan	BcIa	XHS1.15		
guan	BcIa	XHS1.2	grey-brown	sand
guan	BcIa	XHS1.3	grey-brown	sand
guan	BcIa	XHS3.10		
guan	BcIa	XHS3.11	grey	sand
guan	BcIa	XHS3.12		
guan	BcIa	XHS3.13		
guan	BcIa	XHS3.14		
guan	BcIa	XHS3.15		
guan	BcIa	XHS3.16		
guan	BcIa	XHS3.17		
guan	BcIa	XHS3.18		
guan	BcIa	XHS3.19		
guan	BcIa	XHS3.20		
guan	BcIa	XHS3.21		
guan	BcIa	XHS3.22		
guan	BcIa	XHS3.23		
guan	BcIa	XHS3.24		
guan	BcIa	XHS3.25		
guan	BcIa	XHS3.26		
guan	BcIa	XHS3.27		
guan	BcIa	XHS3.28		
guan	BcIa	XHS3.29		
guan	BcIa	XHS3.9		
guan	BcIa	XHS4.3	grey	sand
guan	BcIa	XHS4.4	grey	sand
guan	BcIa	XHS4.5	grey	sand
guan	BcIa	XHS4.6	grey	sand
guan	BcIb	DDP2.12	red-brown	sand
guan	BcIb	DDP2.13	red-brown	sand
guan	BcIb	DDP2.15	red-brown	sand
guan	BcIb	DDPH3.4	grey-brown	sand
guan	BcIb	HZD0.6	grey	sand
guan	BcIb	HZD0.7	grey	sand
guan	BcIb	MGP3.38	red	sand
guan	BcIb	MZJ2.2	red-brown	sand
guan	BcIb	XHS3.41	grey	sand
guan	BcIb	XHS3.61	grey	sand
guan	BcIb	XYP5.7	grey-brown	sand
guan	BcIIa	DDP2.14	grey-brown	sand
guan	BcIIa	DWT3.11	grey	sand

guan	BcIIa	MGP3.40	red	sand
guan	BcIIa	MGP3.43	red	sand
guan	BcIIa	MGP3.54	red	sand
guan	BcIIa	MZJ2.14	red-brown	sand
guan	BcIIa	MZJ2.15	red-brown	sand
guan	BcIIa	XHS0.6	grey	sand
guan	BcIIa	XHS0.7	grey	sand
guan	BcIIa	XYP5.1	grey-brown	sand
guan	BcIIa	XYP6.7	grey-brown	sand
guan	BcIIa	XYP6.8		sand
guan	BcIIa	XYP6.9		sand
guan	BcIIb	XQG3A22	grey-brown	coarse sand
guan	BcIIb	XQG3A23	grey-brown	sand
guan	BcIIb	XQG3A24	grey-brown	sand
guan	BcIIb	XQG3A25	grey-brown	sand
guan	BcIIb	XQG3A26	grey-brown	sand
guan	BcIIb	XQG3A27	grey-brown	sand
guan	BcIIb	XQG3A28	grey-brown	sand
guan	BcIIb	XQG3A29	grey-brown	sand
guan	BcIIb	XQG3A30	grey-brown	sand
guan	BcIIb	XQG3A31	grey-brown	sand
guan	BcIIb	XQG3A32	grey-brown	sand
guan	BcIIb	XYP0.1	red-brown	sand
guan	Bd	DDP3.12	red-brown	sand
guan	Bd	DDP3.25	red-brown	sand
guan	Bd	DDP3.37	red	sand
guan	Bd	DDP3.38	red-brown	sand
guan	Bd	DDP3.41	red-brown	sand
guan	Bd	DDP3.47	red-brown	fine sand
guan	Bd	DDP3.48	red-brown	fine sand
guan	Bd	DDP3.7	red-brown	sand
guan	Bd	DDP4.10	red-brown	sand
guan	Bd	DDP4.9	red-brown	sand
guan	Bd	DDPH1.4	red-brown	sand
guan	Bd	DDPH1.6	red-brown	sand
guan	Bd	DDPH1.8	yellow-brown	sand
guan	Bd	DDPH3.13	red-brown	sand
guan	Bd	DDPH3.14	red-brown	sand
guan	Bd	DDPH3.24	red-brown	sand
guan	Bd	DDPH3.3	red-brown	sand
guan	Bd	DDPH3.6	red-brown	sand
guan	Bd	DDPH3.7	red-brown	sand
guan	Bd	DDPH3.8	red-brown	sand
guan	Bd	DDPH4.11	red-brown	fine sand
guan	Bd	DDPH4.13	red-brown	fine sand
guan	Be	DDP1.6	grey-brown	sand
guan	Be	DDP2.11	grey-brown	sand
guan	Be	DDP3.18	red-brown	sand

guan	Be	DDPH3.12	red-brown	sand
guan	Be	DDPH3.9	red-brown	sand
guan	Be	DDPH4.12	red-brown	fine sand
guan	Be	DDPH4.5	red-brown	sand
guan	Be	DDPH4.6	red-brown	sand
guan	Be	DDPH4.8	red-brown	sand
guan	Be	HDJ5.9	black-brown	sand
guan	Be	HJDJH1.2	brown	sand
guan	Be	XHS3.53	grey-brown	sand
guan	Be	XHS3.54	grey-brown	sand
guan	Be	XHS3.55		sand
guan	Be	XHS3.56		sand
guan	Be	XHS3.57		sand
guan	Be	XHS3.58		sand
guan	Be	XHSH3.7		sand
guan	Be	XMS7.6	brown	sand
guan	Be	XMSH1.6	red-brown	sand
guan	Be	XQG4.10	black	clay
guan	Be	XQG4.11	red	clay
guan	Be	XQG4.6	grey-brown	clay
guan	Be	XQG4.7	grey-brown	clay
guan	Be	XQG4.8	grey-brown	clay
guan	Be	XQG4.9	black	clay
guan	CaI	XHS3.35	grey-brown	sand
guan	CaI	XHS3.42	grey-brown	sand
guan	CaI	XHS4.10	grey	sand
guan	CaII	DWPH1.1	grey-brown	sand
guan	CaII	HDJH1.3	red-brown	sand
guan	Cb?	DMKH2.1	grey	fine sand
guan	CbI	XHS3.39	grey-brown	sand
guan	CbI	XHS3.43		
guan	CbI	XHS3.44		
guan	CbI	XHS3.45		
guan	CbI	XHS3.46		
guan	CbI	XHS3.47		
guan	CbI	XHS3.48		
guan	CbI	XHS3.49		
guan	CbI	XHS3.50		
guan	CbI	XHS3.59	grey-brown	sand
guan	CbI	XHS3.63	red-brown	sand
guan	CbI	XHS3.64		sand
guan	CbI	XHS3.65		sand
guan	CbI	XHS3.66		sand
guan	CbI	XHS4.13	grey-brown	sand
guan	CbI	XHS4.14	grey	sand
guan	CbI	XHS4.15	grey	sand
guan	CbI	XHS4.16	grey	sand
guan	CbI	XHS4.17	grey	sand

guan	CbI	XHS4.18	grey	sand
guan	CbI	XHS4.19	grey	sand
guan	CbI	XHS4.20	grey	sand
guan	CbI	XHSH3.4	grey	sand
guan	CbI	XMS8.7	brown	sand
guan	CbI	XMSH1.4	brown	sand
guan	CbI	XYP5.4	grey-brown	sand
guan	CbI	XYP5.5		sand
guan	CbI	XYP6.13	grey-brown	sand
guan	CbI	XYP6.14		sand
guan	CbII	DDP1.2	red-brown	sand
guan	CbII	XMS7.9	grey-brown	sand
guan	CbII	XMSH4.1	yellow-brown	sand
guan	CbII	XMSH4.2	brown	sand
guan	CbIII	XHS3.60	grey-brown	sand
guan	CbIII	XHS4.23	grey-brown	sand
guan	CbIII	XMS7.7	grey-brown	sand
guan	D	XQG3.11	brown	sand
guan	D	XWD0.1	red	sand
guan	D	XYP5.6	grey-brown	sand
guan	DaI	HDJ5.5	red-brown	sand
guan	DaI	HDJ5.6	brown	sand
guan	DaI	HDJ5.7	brown	sand
guan	DaI	HDJH1.4	red-brown	sand
guan	DaI	HDJH2.3	brown	sand
guan	DaI	HDJH3.4	brown	sand
guan	DaI	HDJH3.5	brown	sand
guan	DaI	XMI3.13	grey	clay
guan	DaI	XMI3.14	grey-brown	clay
guan	DaI	XMI3.15		
guan	DaI	XMI3.16		
guan	DaI	XMI3.17		
guan	DaI	XMI3.18		
guan	DaI	XMI4.6	black-brown	sand
guan	DaI	XMI5.1	grey	sand
guan	DaI	XMI5.2	grey	sand
guan	DaI	XMI5.3	grey	sand
guan	DaI	XMI5.4		
guan	DaI	XMI5.5		
guan	DaII	DDP1.7	red-brown	sand
guan	DaII	HDJ5.8	grey-brown	sand
guan	DaII	HDJH3.1	brown	sand
guan	DaII	HDJH3.2	brown	sand
guan	DaII	XMS5.2	grey-brown	sand
guan	DaII	XMS7.10	grey-brown	sand
guan	DaII	XMS7.11	grey-brown	sand
guan	DaII	XYP6.12	black-brown	sand
guan	DaIIa	HDJH1.1	brown	sand

guan	DaIIa	HDJH4.1	brown	sand
guan	DaIIa	HDJH4.3	brown	sand
guan	DaIIa	XQG3.5	red-brown	sand
guan	DaIIa	XQG3.6	grey-brown	sand
guan	DaIIa	XQG3.7		
guan	DaIIa	XQG3.8		
guan	DaIIa	XQG3.9		
guan	Db	MST0.13	black-brown	sand
guan	Db	MST0.14	black-brown	sand
guan	Db	MST5.2	black-brown	fine sand
guan	DbI	DDPH4.10	red-brown	sand
guan	DbI	DMK5.13	grey	sand
guan	DbI	DWT3.13	grey-brown	coarse sand
guan	DbI	MGP3.33	red	sand
guan	DbI	MGP3.34	red	sand
guan	DbI	MGP3.41	yellow-brown	sand
guan	DbI	MGP3.48	red	sand
guan	DbI	XQG4.12	grey-brown	clay
guan	DbI	XQG4.13	grey-brown	clay
guan	DbIIa	MGP3.53	yellow-brown	sand
guan	DbIIa	MGP3.63		sand
guan	DbIIa	MGP3.64		sand
guan	DbIIa	XWD0.13	red	sand
guan	DbIIa	XWD0.7	red	sand
guan	DbIIb	MGP3.35	red	sand
guan	DbIIb	MGP3.36	red	sand
guan	DbIIb	MGP3.37	red	sand
guan	DbIIb	MGP3.42	red	sand
guan	DbIIb	MGP3.44	red	sand
guan	DbIIb	MGP3.45	red	sand
guan	DbIIb	MGP3.46	red	sand
guan	DbIIb	MGP3.49	red	sand
guan	DbIIb	MGP3.50	yellow-brown	sand
guan	DbIIb	MGP3.51	red	sand
guan	DbIIb	MGP3.52	red-brown	sand
guan	Ea	XMIH1.1	grey-brown	sand
guan	Ea	XQG3.10	brown	sand
guan	Ea	XQG3.12		
guan	Ea	XQG3.2	grey-brown	sand
guan	Ea	XQG3.3		
guan	Ea/Bb urn?	XQG3.1	grey-brown	sand
guan	Ea/Bb urn?	XQG3.4	brown	sand
guan	Eb	DDP1.1	black-brown	sand
guan	Eb	DDP1.3	red-brown	sand
guan	Eb	DDP2.1	red-brown	sand
guan	Eb	DDP2.10	red-brown	sand
guan	Eb	DDP2.18	red-brown	sand
guan	Eb	DDP2.2	red-brown	sand

guan	Eb	DDP2.22	red-brown	sand
guan	Eb	DDP2.23	red-brown	sand
guan	Eb	DDP2.25	red-brown	sand
guan	Eb	DDP2.3	grey-brown	sand
guan	Eb	DDP2.4		sand
guan	Eb	DDP3.1	red-brown	sand
guan	Eb	DDP3.3	red-brown	sand
guan	Eb	DDP3.34	grey-brown	sand
guan	Eb	DDP3.36	red-brown	sand
guan	Eb	DDP3.40	red-brown	sand
guan	Eb	DDP3.49	black-brown	fine sand
guan	Eb	DDP3.51	red-brown	fine sand
guan	Eb	DDP4.1	red-brown	sand
guan	Eb	DDP4.17	red-brown	sand
guan	Eb	DDP4.2	red-brown	sand
guan	Eb	DDP4.3	red-brown	sand
guan	Eb	DDPH1.5	red-brown	sand
guan	Eb	DDPH2.1	red-brown	sand
guan	Eb	DDPH3.1	red-brown	sand
guan	Eb	DDPH3.10	red-brown	sand
guan	Eb	DDPH3.11	red-brown	sand
guan	Eb	DDPH3.12	red-brown	sand
guan	Eb	DDPH4.1	grey-brown	sand
guan	Eb	DDPH4.14	yellow-brown	fine sand
guan	Eb	DDPH4.15	yellow-brown	fine sand
guan	EbI	XMI3.23	brown	clay
guan	EbI	XMI3.24		
guan	EbI	XMI3.25		
guan	EbI	XMI3.26		
guan	EbI	XMI3.27		
guan	EbI	XMI3.28		
guan	EbI	XMI4.1	grey-brown	clay
guan	EbI	XMI5.9	grey	sand
guan	EbII	DDP3.2	red-brown	sand
guan	EbII	XMI3.20	brown	clay
guan	EbII	XMI3.21	brown	clay
guan	F	XYP5.8	grey-brown	sand
guan	Fa	HDJ5.4	brown	sand
guan	Fa	XMS0.3	grey	sand
guan	Fa	XMS7.4	grey-brown	sand
guan	Fa	XMS7.5	grey-brown	sand
guan	Fa	XMS8.3	brown	sand
guan	Fa	XMS8.5	grey-brown	sand
guan	Fa	XMSH6.2	grey-brown	sand
guan	Fa	XQG4.4	grey-brown	clay
guan	Fa	XYP6.5	grey-brown	sand
guan	Fa	XYP6.6		sand
guan	Fa	XYPH2.1	grey-brown	sand

guan	FaI	XHS1.21	grey-brown	sand
guan	FaI	XHS1.22		sand
guan	FaI	XHS1.23		sand
guan	FaI	XHS3.62	grey-brown	sand
guan	FaI	XHSH3.10	grey	sand
guan	FaI	XHSH3.11	grey-brown	sand
guan	FaI	XHSH3.12	grey	sand
guan	FaI	XHSH3.8	grey-brown	sand
guan	FaI	XHSH3.9	grey	sand
guan	FaII	HZD0.1	grey	sand
guan	FaII	HZD0.2	grey	sand
guan	FaII	HZD0.3	grey	sand
guan	FaII	HZD0.4	grey	sand
guan	FaII	HZD0.5	grey	sand
guan	Fb	XMI3.12	brown	clay
guan	FbI	DWP3.1	grey-brown	sand
guan	FbI	DWP3.2	grey-brown	sand
guan	FbI	DWP3.3	grey-brown	sand
guan	FbI	DWP3.4	grey-brown	sand
guan	FbI	DWP3.5	grey-brown	sand
guan	FbI	DWP3.7	grey-brown	sand
guan	FbI	DWT3.32		sand
guan	FbI	DWT3.33		sand
guan	FbI	DWT3.34		sand
guan	FbI	DWT3.35		sand
guan	FbI	DWT3.36		sand
guan	FbI	DWT3.37		sand
guan	FbI	DWT3.38		sand
guan	FbI	DWT3.39		sand
guan	FbI	DWT3.40		sand
guan	FbI	DWT3.41		sand
guan	FbI	DWT3.42		sand
guan	FbI	DWT3.43		sand
guan	FbI	DWT3.44		sand
guan	FbI	DWT3.45		sand
guan	FbI	DWT3.46		sand
guan	FbI	DWT3.47		sand
guan	FbI	DWT3.48		sand
guan	FbI	XMI3.22	brown	clay
guan	FbI	XMI4.10	grey	sand
guan	FbI	XMI4.11		
guan	FbI	XMI4.12		
guan	FbI	XMI4.14		
guan	FbI	XMI4.2		
guan	FbI	XMI4.3		
guan	FbI	XMI4.4		
guan	FbI	XMI4.5		
guan	FbI	XMI4.9	grey	sand

jar	BaI	XDYH1.5	sand-tempered pottery	brown
jar	BaI	XDYH2.3	sand-tempered pottery	brown
jar	BaII	XDYH1.10	sand-tempered pottery	brown
jar	BaII	XDYH2.2	sand-tempered pottery	brown
jar	BaIII	XDYH1.1	sand-tempered pottery	red
jar	Bb	XDYH2.4	sand-tempered pottery	brown
jar	Bb	XDYH2.5	sand-tempered pottery	brown
jar	Eb	PXC0.1	sand-tempered pottery	red
jar	Ec	XQG0.2	clay pottery	black-brown
jar	Ed	PTB0.1	clay pottery	red-brown
jar	Ha/BaI rim	DWT3.51	sand-tempered pottery	grey-brown
jar	Ha/BaI rim	DWTH2.4	coarse sand-tempered pottery	grey-brown
jar	Ha/BaI rim	DWTH2.4	coarse sand-tempered pottery	grey-brown
jar	Ha/BaI rim	XQG3.13	sand-tempered pottery	grey-brown
jar	Ha/BaI rim	XQG3.13	sand-tempered pottery	grey-brown
jar	unknown	XDYH1.11	sand-tempered pottery	red
jar	unknown	XDYH1.12	sand-tempered pottery	brown
jar	unknown	XDYH1.14	sand-tempered pottery	red
jar	unknown	XDYH1.2	sand-tempered pottery	red
jar	unknown	XDYH1.3	sand-tempered pottery	red
jar	unknown	XDYH1.4	sand-tempered pottery	red
jar	unknown	XDYH1.7	sand-tempered pottery	red
jar	unknown	XDYH1.8	sand-tempered pottery	brown
jar	unknown	XDYH1.9	sand-tempered pottery	brown
jar	unknown	XDYH2.7	sand-tempered pottery	brown
jar	unknown	XDYH2.8	sand-tempered pottery	brown
jar	unknown	YBIM1.3	unknown	unknown
jar	unknown	YGSC2	clay pottery	black-brown
jar	unknown	ZMCM1.1	unknown	unknown
jar with handle(s)	B	HDJH2.10	sand-tempered pottery	grey-brown
jar with handle(s)	unknown	DDP3.50	fine sand-tempered pottery	red-brown
jar with handle(s)	unknown	DDP3.52	fine sand-tempered pottery	yellow-brown
jar with handle(s)	unknown	XQG3.20	unknown	unknown
jar with handle(s)	unknown	XQG3.21	unknown	unknown
jar with handle(s)	unknown	XQG3.22	unknown	unknown
jar with handle(s)	unknown	XQG3.23	unknown	unknown
jar with handle(s)	unknown	XQG3.24	unknown	unknown
double-handled jar	Cb	XQG3A10	sand-tempered pottery	grey-brown
double-handled	Cb	XQG3A11	sand-tempered pottery	grey-brown

jar				
double-handled jar	Cb	XQG3A12	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A13	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A14	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A15	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A16	clay pottery	grey-brown
double-handled jar	Cb	XQG3A17	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A2	fine sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A3	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A4	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A5	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A6	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A7	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A8	sand-tempered pottery	grey-brown
double-handled jar	Cb	XQG3A9	sand-tempered pottery	grey-brown
double-handled jar	CcII	DWTH1.1	sand-tempered pottery	red
double-handled jar	Da	DWT3.5	coarse sand-tempered pottery	red-brown
double-handled jar	Da	XQG3.25	sand-tempered pottery	grey-brown

double-handled jar	Da	XQG3.26	unknown	unknown
double-handled jar	DaII	PXBM2.9	clay pottery	grey-brown
double-handled jar	Db	DWT3.3	coarse sand-tempered pottery	red-brown
double-handled jar	Db	DWTH2.5	coarse sand-tempered pottery	grey-brown
double-handled jar	Db	DWTH2.6	coarse sand-tempered pottery	grey-brown
double-handled jar	Db	DWTH2.7	coarse sand-tempered pottery	grey-brown
double-handled jar	Dc	DWT3.2	coarse sand-tempered pottery	red
double-handled jar	Dc	XQG3A18	coarse sand-tempered pottery	grey-brown
double-handled jar	Dc	XQG3A19	sand-tempered pottery	grey-brown
double-handled jar	Dc	XQG3A20	sand-tempered pottery	grey-brown
double-handled jar	Dc	XQG3A21	sand-tempered pottery	grey-brown
double-handled jar	E?	DWT3.1	sand-tempered pottery	grey
double-handled jar	unknown	PTT0.1	unknown	unknown
double-handled jar	unknown	PTT0.2	unknown	unknown
double-handled jar	unknown	PTT0.3	unknown	unknown
double-handled jar	unknown	PTT0.4	unknown	unknown
double-handled jar	unknown	PTT0.5	unknown	unknown
double-	unknown	YGSC1	clay pottery	red

handled jar				
double-handled jar	unknown	YGSM1.2	clay pottery	red
Handle	A	XHSH3.14	sand-tempered pottery	grey
Handle	Aa	DDP2.27	sand-tempered pottery	red-brown
Handle	Aa	DDP3.56	sand-tempered pottery	red-brown
Handle	Aa	DWT3.14	coarse sand-tempered pottery	grey
Handle	Aa	DWT3.52	coarse sand-tempered pottery	red
Handle	Aa	HDJ4A1	sand-tempered pottery	brown
Handle	Aa	HDJ4A6	sand-tempered pottery	grey
Handle	Aa	HDJ4A7	sand-tempered pottery	grey
Handle	Aa	HDJ5.13	sand-tempered pottery	grey-brown
Handle	Aa	MST0.15	sand-tempered pottery	grey-brown
Handle	Aa	MST0.16	sand-tempered pottery	grey-brown
Handle	Aa	MST5.3	fine sand-tempered pottery	grey-brown
Handle	Aa	MZJ2.30	sand-tempered pottery	red
Handle	Aa	MZJ2.31	sand-tempered pottery	red
Handle	Aa	XQG3A60	coarse sand-tempered pottery	red
Handle	Aa	XQG3A61	coarse sand-tempered pottery	black
Handle	Aa	XQG3A62	coarse sand-tempered pottery	grey-brown
Handle	Ab	HDJH2.9	sand-tempered pottery	brown
Handle	BaII	DWT3.6	coarse sand-tempered pottery	grey
Handle	BaII	DWT3.7	coarse sand-tempered pottery	grey-brown
Handle	Bb	MST6.2	fine sand-tempered pottery	red-brown
Handle	Bb	XQG3.17	sand-tempered pottery	grey-brown
Handle	Bb	XQG3.18	sand-tempered pottery	brown
Handle	Bb	XQG3.19	unknown	unknown
Handle	Bb	XQG3A46	sand-tempered pottery	red
Handle	Bb	XQG3A47	sand-tempered pottery	red
Handle	Bb	XQG3A48	sand-tempered pottery	grey-brown
Handle	Bb	XQG3A49	sand-tempered pottery	grey-brown
Handle	Bb	XQG3A50	sand-tempered pottery	grey-brown
Handle	Bb	XQG3A51	coarse sand-tempered pottery	black
Handle	Bb	XQG3A52	sand-tempered pottery	black
Handle	Bb	XQG3A53	sand-tempered pottery	black
Handle	Bb	XQG3A55	sand-tempered pottery	red
Handle	BcI	DWT3.4	sand-tempered pottery	red
Handle	BcI	MST6.1	fine sand-tempered pottery	black-brown
Handle	BcI	XMI0.2	clay pottery	brown
Handle	BcI	XQG3A54	coarse sand-tempered pottery	red
Handle	BcI	XQG3A56	sand-tempered pottery	red
Handle	BcI	XQG3A57	sand-tempered pottery	red
Handle	BcI	XQG3A58	sand-tempered pottery	black
Handle	BcI	XQG3A59	sand-tempered pottery	black
Handle	Bd	DWT3.16	coarse sand-tempered pottery	red
Handle	D	DWT3.31	sand-tempered pottery	unknown
Handle	E	HDJ4A2	sand-tempered pottery	grey

Handle	E	HDJ4A3	sand-tempered pottery	grey
Handle	E	HDJ4B5	sand-tempered pottery	grey
Handle	E	HDJ5.14	sand-tempered pottery	brown
Handle	E	MGP3.55	coarse sand-tempered pottery	red
Handle	E	MZJ2.16	sand-tempered pottery	red-brown
Handle	E	MZJ2.17	sand-tempered pottery	red-brown
Handle	E	MZJ2.18	sand-tempered pottery	red-brown
Handle	E	PKL0.1	sand-tempered pottery	red
Handle	E	PKL0.2	sand-tempered pottery	red
Lid	A	XHS3.73	sand-tempered pottery	grey
Lid	A	XHS3.74	sand-tempered pottery	grey
Lid	A	XHS3.75	unknow	unknown
Lid	A	XHS3.76	unknow	unknown
Lid	A	XMIH1.2	sand-tempered pottery	grey-brown
Lid	Ba	DWP3.9	sand-tempered pottery	grey-brown
Lid	Bb	XMSH1.8	sand-tempered pottery	yellow-brown
Lid	Bb	XMSH2.3	sand-tempered pottery	grey
Lid	BbI	DDP2.17	sand-tempered pottery	grey-brown
Lid	BbII	XMI3.37	unknow	unknown
Lid	BbII	XMI3.38	unknow	unknown
Lid	BbII	XMI3.39	unknow	unknown
Lid	BbIII	MGP3.31	sand-tempered pottery	yellow-brown
Lid	BbIII	MGP3.31	sand-tempered pottery	yellow-brown
Lid	BbIII	MGP3.32	sand-tempered pottery	yellow-brown
Lid	BbIII	MGP3.32	sand-tempered pottery	yellow-brown
Lid	Ca	XHS3.72	sand-tempered pottery	grey
Lid	Cb	DMK4.6	sand-tempered pottery	red
Lid	Cb	DMK5.5	fine sand-tempered pottery	red-brown
Lid	Cc	DMK4.5	sand-tempered pottery	red-brown
net weight	A	XQG3.30	coarse sand-tempered pottery	red
Object stand		DWPH1.3	sand-tempered pottery	grey-brown
Object stand		DWPH2.1	sand-tempered pottery	grey-brown
wall sherd	unknown	DDP3.55	sand-tempered pottery	red-brown
wall sherd	unknown	DDPH1.14	sand-tempered pottery	red-brown
wall sherd	unknown	DDS0.13	sand-tempered pottery	red
wall sherd	unknown	HDJ4A8	sand-tempered pottery	grey-white
wall sherd	unknown	HDJH4.7	sand-tempered pottery	grey-brown
wall sherd	unknown	XHS0.16	sand-tempered pottery	red
wall sherd	unknown	XHS0.20	clay pottery	black
wall sherd	unknown	XHS0.25	sand-tempered pottery	red
wall sherd	unknown	XHS0.26	sand-tempered pottery	black
wall sherd	unknown	XHS0.27	clay pottery	brown
wall sherd	unknown	XTUM5	sand-tempered pottery	unknown
wall sherd	unknown	XYG0.5	unknow	unknown
wall sherd	unknown	XYG0.6	unknow	unknown

Table 4.18: Correlation Between Different Object Types and Settlement Sites.

	jar	handled jar	bowl	vase	spouted vessel	drinking vessel	pedestal foot	object stand	lid	ring foot	net-weight	spindle whorl
jar	0	0.033717	0.20515	-0.08807	0.068959	0.12768	0.012919	0.097657	-0.05453	0.11014	0.57301	0.81731
handled jar	0.76219	0	0.40981	0.71658	0.91789	0.56648	0.03332	0.58134	0.179	0.036402	0.84771	0.10245
bowl	0.062813	-0.09167	0	0.009318	0.48929	0.25778	0.63928	0.34575	0.9577	0.74203	0.64221	0.45177
vase	0.42852	-0.04045	0.28381	0	0.040516	0.076728	0.51867	0.89222	0.397	0.49491	0.37694	0.35821
spouted vessel	0.53562	-0.01149	0.076949	0.22536	0	0.66402	0.037482	0.80142	0.99172	0.97327	0.32936	0.8664
drinking vessel	0.25004	-0.06383	-0.12563	0.19537	-0.04838	0	0.1681	0.64652	0.13283	0.1203	0.012125	0.001619
pedestal foot	0.90772	0.2339	0.052204	-0.07184	0.22879	-0.15272	0	0.84666	0.068147	0.76921	2.58E-07	0.12221
object stand	0.37978	0.061401	-0.1048	-0.0151	-0.02803	-0.05108	-0.02155	0	0.79833	0.49718	0.76378	0.93334
lid	0.62441	-0.14894	-0.00591	-0.09419	-0.00116	0.16635	0.20121	-0.02847	0	0.10666	0.13315	0.85498
ring foot	0.32156	0.23007	0.036675	0.07596	-0.00373	0.17186	-0.03269	-0.07556	0.17838	0	0.33558	0.031956
net-weight	-0.06276	0.021401	0.051748	0.098237	0.10839	0.2742	0.52993	0.033485	-0.16621	0.10702	0	0.017107
spindle whorl	-0.02574	0.18052	0.083718	-0.10213	0.018748	0.34078	0.17099	-0.00932	-0.02037	0.23569	-0.26112	0

Table 4.19: Presence/Absence of Different Tool Types at Settlement Sites I.

	Ceramics	**Ceramic / Bone tools**			**Stone tools**					**Woodworking tools**		
	ceramics	spindle whorls	net weights	bone tools	stone tools	flaked tools	core tools	flake tools	ground tools	axes	adzes	chisel
DDP1-2	1	0	0	0	1	1	1	0	1	1	1	0
DDP3-4	1	0	0	0	1	1	1	0	1	1	1	1
DDS0	1	0	0	0	1	1	1	0	1	1	0	1
DMB0	0	0	0	0	1	0	1	0	1	1	1	1
DMK0	1	0	0	0	1	1	1	1	1	1	1	1
DWP	1	0	0	0	1	1	1	0	1	0	1	1

DWT	1	1	0	0	1	1	1	1	1	0	0	0
HDG	1	0	0	0	1	0	1	0	1	1	1	1
HDJ	1	0	0	0	1	1	1	0	1	1	1	1
HDS	1	0	0	0	1	1	1	0	1	0	0	0
HFS0	1	0	0	0	1	1	1	0	1	1	1	1
HGS0	1	0	0	0	1	1	1	0	1	1	1	0
HHW	1	0	0	0	1	1	1	0	1	1	1	1
HKP	0	0	0	0	1	0	1	0	1	1	1	1
HLT	1	0	0	0	1	1	1	0	1	1	1	0
HLW	1	0	0	0	1	0	1	0	1	0	0	0
HRJ	1	0	0	0	1	1	1	0	1	1	1	1
HSJ	1	0	0	0	1	0	0	0	0	0	0	0
HTC	1	0	0	0	1	1	1	0	1	0	0	0
HTJ	1	0	0	0	1	1	1	0	1	1	1	1
HWT	1	1	0	0	1	1	1	0	1	0	0	0
HXA	1	0	0	0	1	1	1	0	1	1	1	1
HYB	1	0	0	0	1	1	1	0	1	1	1	1
HYW	0	0	0	0	1	1	1	1	0	0	0	0
HZD0	1	0	0	0	1	1	1	0	1	1	1	0
MGP	1	1	0	0	1	0	1	0	1	0	0	0
MGW	1	0	0	0	1	1	1	0	1	0	0	0
MHB	1	0	0	0	1	0	1	0	1	1	1	0
MHJ	1	0	0	0	0	0	0	0	0	0	0	0
MLG	1	0	0	0	0	0	0	0	0	0	0	0
MMS	1	0	0	0	1	1	1	0	1	0	0	0
MST	1	0	0	0	1	1	1	0	1	1	0	0
MWG	1	0	0	0	1	0	1	0	1	1	1	1
MWJ	1	0	0	0	0	0	0	0	0	0	0	0
MYJ	1	0	0	0	1	1	1	0	0	1	0	0
NHF	1	0	0	0	1	0	1	0	1	0	0	0
NTW	1	0	0	0	1	0	1	0	1	1	0	0
PGH	1	0	0	0	1	1	0	1	0	0	0	0

PHD	0	0	0	1	1	1	1	1	0	0	0	0
PKL	1	0	0	0	1	0	1	0	1	0	0	0
PTB	1	0	0	0	1	0	1	0	1	1	0	0
PTT	1	0	0	0	1	0	1	0	1	1	0	0
PWL	1	1	0	0	1	0	1	0	1	1	1	0
PXC	1	0	0	0	1	0	1	0	1	1	1	1
PXP	0	0	0	0	1	1	1	1	1	0	0	0
PXW	1	0	0	0	1	1	1	0	1	1	0	1
PYJ	1	0	0	0	1	0	1	0	1	0	1	0
PYW	1	0	0	0	1	1	1	1	0	0	0	0
PZC	1	0	0	0	1	0	1	0	1	1	0	0
XBB	1	0	0	0	0	0	0	0	0	0	0	0
XBT	1	0	0	0	1	0	1	0	1	0	0	0
XDM	1	0	0	0	1	0	1	0	1	0	0	0
XDM	1	0	0	0	0	0	0	0	0	0	0	0
XDN	1	0	0	0	1	0	1	0	1	0	0	0
XDY	1	0	0	0	0	0	0	0	0	0	0	0
XGJ	1	0	0	0	1	0	1	0	1	1	0	0
XGS	1	0	0	0	1	0	1	0	1	1	0	0
XHS	1	0	0	0	1	1	1	0	1	1	1	1
XJB	1	0	0	0	1	0	1	0	1	0	0	0
XLZ	1	0	0	0	1	1	1	0	1	1	1	1
XMI	1	1	0	0	1	1	1	0	1	1	1	0
XMS	1	0	0	0	1	0	1	0	1	1	1	1
XQG3	1	0	1	0	1	1	1	0	1	0	1	0
XQG4	1	0	0	0	1	1	1	0	1	0	0	0
XTB	1	0	0	0	1	0	1	0	1	0	0	0
XTS	1	0	0	0	1	0	1	0	1	1	0	0
XWD	1	0	0	0	1	0	1	0	1	1	1	1
XWM	1	0	0	0	1	0	1	0	1	1	1	0
XXG	1	0	0	0	0	0	0	0	0	0	0	0
XXH	1	0	0	0	1	0	1	0	1	1	0	0

XYG	1	0	0	0	1	0	1	0	1	1	0	1
XYP	1	0	0	0	1	0	1	0	1	0	0	0
XZJ	1	0	0	0	0	0	0	0	0	0	0	0
XZS	1	0	0	0	1	0	1	0	1	0	0	0
YDZ3	1	1	0	1	1	0	1	0	1	0	1	1
YDZ4	1	1	0	1	1	0	1	0	1	1	1	1
YGH	0	0	0	0	1	0	1	0	1	0	0	0
YHC	1	0	0	0	1	0	1	0	1	1	0	0
YJD	1	0	0	0	1	1	1	0	1	1	1	1
YJY	0	0	0	1	1	0	1	0	1	1	1	1
YKJ	0	0	0	0	1	0	1	0	1	1	1	0
YLJ	1	0	0	0	1	0	1	0	1	0	0	0
YPJ	1	0	0	0	1	0	1	0	1	1	0	0
YSK	0	0	0	0	1	0	1	0	1	1	1	0
YTY	0	0	0	0	1	0	1	0	1	1	1	0
YWQ	1	0	0	0	1	0	1	0	1	1	0	0
YXF	1	0	0	0	0	0	0	0	0	0	0	0
YXL	1	0	0	0	1	1	1	0	1	1	1	0
YXL	1	0	0	0	1	1	1	0	1	1	0	0
YYW	0	0	0	0	1	0	0	0	0	0	0	0
ZHB	1	0	0	0	1	0	1	0	1	0	1	0
SUM	**81**	**8**	**1**	**4**	**83**	**37**	**80**	**7**	**76**	**50**	**38**	**26**

Table 4.20: Presence/Absence of Different Tool Types at Settlement Sites II.

	Agricultural tools					**Fishing and hunting tools**			**Processing tools**				
	other knives	perforated knife	shovel	plows	ring stones	net weights	arrow-heads	spearheads	grinding slabs	grinding roller	hand-stones	pestle	hammer-stones
DDP1-2	0	1	0	1	0	0	1	0	1	0	0	0	1
DDP3-4	1	1	0	0	0	1	0	1	1	0	0	1	0
DDS0	0	0	0	0	0	0	0	0	1	0	1	0	0
DMB0	0	0	0	0	0	0	1	0	0	0	0	0	0
DMK0	1	1	0	0	0	0	1	0	1	0	0	0	1

DWP	1	0	0	1	0	0	0	0	0	0	0	1	0
DWT	1	0	0	0	0	0	0	0	0	1	0	0	0
HDG	0	0	0	0	0	0	1	0	0	0	0	0	0
HDJ	1	1	0	0	0	0	0	0	1	0	1	1	0
HDS	0	0	0	0	0	0	0	0	0	0	0	0	0
HFS0	1	0	1	0	0	0	0	0	0	0	0	1	1
HGS0	1	1	0	0	0	0	0	0	0	0	0	0	0
HHW	1	0	0	0	0	0	1	0	0	1	1	0	0
HKP	0	1	0	0	0	0	0	0	0	0	0	0	1
HLT	0	1	0	0	0	0	0	0	0	0	1	0	0
HLW	1	0	0	0	0	0	0	0	0	0	0	0	0
HRJ	0	0	0	0	0	0	0	0	0	0	0	0	0
HSJ	0	0	0	0	0	0	0	0	0	0	0	0	0
HTC	0	0	0	0	0	0	1	0	0	0	0	0	0
HTJ	1	0	0	0	0	0	1	0	0	1	1	0	0
HWT	0	0	0	0	0	0	1	0	0	0	0	0	0
HXA	1	0	0	0	0	0	1	0	0	0	0	0	0
HYB	1	0	0	0	0	1	0	0	0	0	0	0	0
HYW	0	0	0	0	0	0	0	0	0	0	0	0	0
HZD0	0	0	0	0	0	0	0	0	1	0	0	0	0
MGP	0	0	0	0	0	0	0	0	1	0	0	0	0
MGW	0	0	0	0	0	0	0	0	0	0	0	0	0
MHB	1	1	0	0	0	0	1	0	0	0	0	0	0
MHB	1	1	0	0	0	0	1	0	0	0	0	0	0
MHJ	0	0	0	0	0	0	0	0	0	0	0	0	0
MLG	0	0	0	0	0	0	0	0	0	0	0	0	0
MMS	1	0	0	0	0	0	0	0	0	0	0	0	1
MST	1	1	0	0	0	0	0	0	0	1	1	0	1
MWG	1	0	0	0	0	0	1	0	0	0	0	0	0
MWJ	0	0	0	0	0	0	0	0	0	0	0	0	0
MYJ	0	0	0	0	0	0	0	0	0	0	0	0	0
MZJ	1	0	0	0	0	0	0	0	0	0	0	0	1

NHF	1	0	0	0	0	0	0	0	0	0	0	0	0
NTW	0	0	0	0	0	0	0	0	0	0	0	0	0
PGH	0	0	0	0	0	0	0	0	0	0	0	0	0
PHD	1	0	0	0	0	0	1	0	0	0	0	0	1
PKL	0	0	0	0	0	1	0	0	1	0	0	0	0
PTB	0	0	0	0	0	0	1	0	0	0	0	0	0
PTT	0	0	0	0	0	0	1	0	0	0	0	0	0
PWL	1	0	0	0	0	0	1	0	0	0	0	0	0
PXC	1	1	0	0	0	0	1	0	0	0	0	0	0
PXP	0	0	0	0	0	0	0	0	0	0	0	0	1
PXW	0	0	0	0	0	0	0	0	0	0	0	0	0
PYJ	0	0	0	0	0	0	1	0	0	0	0	0	0
PYW	0	0	0	0	0	0	0	0	0	0	0	0	0
PZC	0	0	0	0	0	0	0	0	0	0	0	0	0
XBB	0	0	0	0	0	0	0	0	0	0	0	0	0
XBT	0	0	0	0	0	0	0	0	0	0	0	0	0
XDM	0	0	0	0	0	0	0	0	0	0	0	0	0
XDM	0	0	0	0	0	0	0	0	0	0	0	0	0
XDN	0	0	0	0	0	0	0	0	0	0	0	0	0
XDY	0	0	0	0	0	0	0	0	0	0	0	0	0
XGJ	0	0	0	0	0	0	0	0	0	0	0	0	0
XGS	0	0	0	0	0	0	0	0	0	0	1	0	0
XHS	0	1	0	0	1	0	1	0	1	0	0	0	0
XJB	0	0	0	0	0	0	0	0	0	0	0	0	0
XLZ	0	1	0	0	1	0	0	0	1	0	1	0	0
XMI	0	1	0	0	0	0	1	0	1	0	0	0	0
XMS	0	1	0	0	0	0	1	0	0	0	0	0	0
XQG3	0	1	0	0	0	1	0	0	1	1	0	1	0
XQG4	1	0	0	0	0	0	0	0	0	0	0	0	0
XTB	0	0	0	0	0	0	0	0	0	0	0	0	0
XTS	0	0	0	0	0	0	0	0	0	0	0	0	0
XWD	1	1	0	0	0	0	1	0	0	1	0	0	0

XWM	0	0	0	0	0	0	0	0	0	1	0	0	0
XXG	0	0	0	0	0	0	0	0	0	0	0	0	0
XXH	0	0	0	0	0	0	0	0	0	0	0	0	0
XYG	0	1	0	0	0	0	0	0	0	0	0	0	1
XYP	1	0	0	0	0	1	0	0	0	0	1	1	0
XZJ	0	0	0	0	0	0	0	0	0	0	0	0	0
XZS	1	0	0	0	0	0	0	0	1	0	1	0	0
YDZ3	1	1	0	0	0	0	0	0	0	0	0	0	0
YDZ4	0	1	0	0	0	0	1	0	0	0	0	0	0
YGH	1	0	0	0	0	1	0	0	0	0	0	0	0
YHC	0	0	0	0	0	0	0	0	0	0	1	0	0
YJD	1	0	0	0	0	1	1	0	0	0	0	0	0
YJY	0	0	0	0	0	1	0	0	0	0	0	0	0
YKJ	0	0	0	0	0	1	0	0	0	0	0	0	0
YLJ	1	1	0	0	0	0	0	0	0	0	0	0	0
YPJ	1	0	0	0	0	0	0	0	0	0	0	0	0
YSK	1	0	0	0	0	0	0	0	0	0	0	0	0
YTY	0	0	0	0	0	0	0	0	0	0	0	0	0
YWQ	0	1	0	0	0	0	0	0	0	0	0	0	0
YXF	0	0	0	0	0	0	0	0	0	0	0	0	0
YXL	0	0	0	0	0	1	0	0	1	0	1	0	0
YXL	0	0	0	0	0	1	0	0	0	0	0	1	0
YYW	0	0	0	0	0	0	0	0	0	0	0	0	0
ZHB	1	0	0	0	0	0	0	0	0	0	0	0	0
SUM	**32**	**21**	**1**	**2**	**2**	**11**	**23**	**1**	**14**	**7**	**12**	**7**	**10**

Table 4.21: Presence/Absence of Different Tool Types at Settlement Sites.

	Production tools					**Coarse tools**				**Stone production fragments**			
	spindle whorls	needles	drill	halberd mold	arrowhead mold	chopper	scraper	flakes	microliths	half-products	cores	flaked fragm.	polished fragm.
DDP1-2	1	0	0	0	0	0	0	0	0	0	0	0	0

DDP3-4	1	0	0	0	0	0	0	0	0	1	0	0	0
DDS0	0	0	0	0	0	1	0	0	0	0	0	0	0
DMB0	0	0	0	0	0	0	0	0	0	0	0	0	0
DMK0	0	0	0	0	0	1	1	1	1	0	1	0	1
DWP	0	0	0	0	0	0	1	0	0	1	0	0	1
DWT	0	0	0	0	0	0	1	0	1	0	1	0	0
HDG	1	0	0	0	0	0	0	0	0	0	0	0	0
HDJ	1	0	0	0	0	0	0	0	0	1	0	1	1
HDS	0	0	0	0	0	0	0	0	0	0	0	1	0
HFS0	0	0	0	0	0	0	0	0	0	1	0	0	0
HGS0	0	0	0	0	0	1	0	0	0	1	0	0	0
HHW	0	0	1	0	0	1	1	0	0	0	0	0	0
HKP	0	0	0	0	0	0	0	0	0	0	0	0	0
HLT	0	0	0	0	0	1	0	0	0	0	0	0	0
HLW	0	0	0	0	0	0	0	0	0	0	0	0	0
HRJ	0	0	0	0	0	1	0	0	0	0	0	1	1
HSJ	0	0	0	0	0	0	0	0	0	0	0	0	0
HTC	0	0	0	0	0	1	0	0	0	0	1	0	0
HTJ	0	0	0	0	0	1	0	0	0	0	0	0	0
HWT	0	1	1	1	1	1	0	0	0	0	0	0	0
HXA	0	0	0	0	0	0	0	0	0	1	1	0	0
HYB	0	0	1	0	0	0	1	0	0	1	0	0	0
HYW	0	0	0	0	0	0	1	1	1	0	0	1	0
HZD0	0	0	0	0	0	1	1	0	0	0	0	0	0
MGP	0	0	0	0	0	0	0	0	0	1	0	0	0
MGW	0	0	0	0	0	0	0	0	0	0	0	0	0
MHB	1	0	0	0	0	0	0	0	0	0	0	0	0
MHJ	0	0	0	0	0	0	0	0	0	0	0	0	0
MLG	0	0	0	0	0	0	0	0	0	0	0	0	0
MMS	0	0	0	0	0	1	0	0	0	0	0	0	1
MST	0	0	0	0	0	1	0	0	0	1	0	0	0
MWG	0	0	0	0	0	0	0	0	0	0	0	0	0

MWJ	0	0	0	0	0	0	0	0	0	0	0	0	0
MYJ	0	0	0	0	0	0	0	0	0	0	0	0	0
MZJ	0	0	0	0	0	0	0	0	0	0	0	0	0
NHF	0	0	0	0	0	0	0	0	0	0	0	0	0
NTW	0	0	0	0	0	0	0	0	0	0	0	0	1
PGH	0	0	0	0	0	0	0	0	1	0	0	0	0
PHD	0	0	0	0	0	1	1	1	1	1	1	1	0
PKL	0	0	0	0	0	0	0	0	0	0	0	0	0
PTB	0	0	0	0	0	0	0	0	0	0	0	0	0
PTT	0	0	0	0	0	0	0	0	0	0	0	0	0
PWL	0	0	0	0	0	0	0	0	0	0	0	0	0
PXC	0	0	0	0	0	0	0	0	0	0	0	0	0
PXP	0	0	0	0	0	1	1	0	0	1	0	1	0
PXW	0	0	0	0	0	0	0	0	0	1	1	0	0
PYJ	0	0	0	0	0	0	0	0	0	0	0	0	0
PYW	0	0	0	0	0	0	0	0	0	0	0	0	0
PZC	0	0	0	0	0	0	0	0	0	0	0	0	0
XBB	0	0	0	0	0	0	0	0	0	0	0	0	0
XBT	0	0	0	0	0	0	0	0	0	0	0	0	0
XDM	0	0	0	0	0	0	0	0	0	0	0	0	1
XDM	0	0	0	0	0	0	0	0	0	0	0	0	0
XDN	0	0	0	0	0	0	0	0	0	0	0	0	0
XDY	0	0	0	0	0	0	0	0	0	0	0	0	0
XGJ	0	0	0	0	0	0	0	0	0	0	0	0	0
XGS	0	0	0	0	0	0	0	0	0	0	0	0	0
XHS	0	0	0	0	0	0	0	0	0	0	0	0	0
XJB	0	0	0	0	0	0	0	0	0	0	0	0	0
XLZ	1	0	1	0	0	1	0	0	0	1	0	0	0
XMI	0	0	0	0	0	0	0	0	0	0	0	0	0
XMS	0	0	0	0	0	0	0	0	0	0	0	0	1
XQG3	0	0	0	0	0	1	1	0	0	0	0	0	0
XQG4	0	0	0	0	0	0	1	0	0	0	0	0	0

XTB	0	0	0	0	0	0	0	0	0	0	0	0	0
XTS	0	0	0	0	0	0	0	0	0	0	0	0	0
XWD	0	0	0	0	0	0	0	0	0	0	0	0	0
XWM	0	0	0	0	0	0	0	0	0	0	0	0	0
XXG	0	0	0	0	0	0	0	0	0	0	0	0	0
XXH	0	0	0	0	0	0	0	0	0	0	0	0	0
XYG	0	0	0	0	0	0	0	0	0	0	0	0	0
XYP	0	0	0	0	0	0	0	0	0	0	0	0	0
XZJ	0	0	0	0	0	0	0	0	0	0	0	0	0
XZS	0	0	0	0	0	0	0	0	0	0	0	0	0
YDZ3	1	1	0	0	0	0	0	0	0	1	0	0	0
YDZ4	1	1	0	0	0	0	0	0	0	0	0	0	0
YGH	0	0	0	0	0	0	0	0	0	0	0	0	0
YHC	0	0	0	0	0	0	1	0	0	0	0	0	0
YJD	0	0	1	0	0	0	0	0	0	0	0	0	0
YJY	0	0	0	0	0	0	0	0	0	0	0	0	0
YKJ	0	0	0	0	0	0	0	0	0	0	0	0	0
YLJ	0	0	0	0	0	0	0	0	0	0	0	0	0
YPJ	0	0	0	0	0	0	0	0	0	0	0	0	0
YSK	1	0	0	0	0	0	0	0	0	0	0	0	0
YTY	0	0	0	0	0	0	0	0	0	0	0	0	0
YWQ	0	0	0	0	0	0	0	0	0	0	0	0	0
YXF	0	0	0	0	0	0	0	0	0	0	0	0	0
YXL	0	0	0	0	0	0	1	0	0	0	0	0	0
YXL	0	0	0	0	0	1	0	0	0	0	0	0	0
YYW	0	0	0	0	0	0	0	0	0	0	0	0	0
ZHB	0	0	0	0	0	0	0	0	0	0	0	0	0
SUM	**9**	**3**	**5**	**1**	**1**	**17**	**13**	**3**	**5**	**14**	**6**	**6**	**8**

Table 4.22: Presence/Absence of Different Decorative and Ritual Items at Settlement Sites.

	stone balls	stone-squares	pearls	bracelets
DDP1-2	1	0	0	0
HHW	0	0	0	1
HLT	0	1	0	0
HTJ	0	0	0	1
XLZ	1	0	1	0
YDZ3	0	0	0	1
YDZ4	0	0	1	1
SUM	**2**	**1**	**2**	**4**

Table 4.23: Number of Stone Tools by Type and Site I.

	Stone tools					**Woodworking tools**			**Agricultural tools**				
	number tools	flaked tools	core tools	flake tools	ground tools	axes	adzes	chisel	perforated knife	other knives	shovels	plows	ring stones
DDP1-2	30	6	30	0	24	7	9		6	0		1	
DDP3-4	83	3	83	0	80	3	24	8	9	3			
DDS0	12	7	12	0	5	3		1					
DMB0	8	0	8	0	8	2	2	2					
DMK0	250	92	192	58	158	9	25	16	12	5			
DWP	19	2	19	0	17		3	1		3		1	
DWT	23	18	12	11	5					2			
HDG	26	0	26	0	26	2	2	2					
HDJ	28	7	28	0	21	3	2	1	1	4			
HDS	4	2	4	0	2								
HFS0	56	14	56	0	42	14	12	6		1	13		
HGS0	13	9	13	0	4	1	1		1	3			
HHW	22	8	22	0	14	2	2	2		2			
HKP	8	0	8	0	8	1	1	2	3	0			
HLT	53	22	53	0	31	8	21		5	0			
HLW	2	0	2	0	2					2			
HRJ	14	6	14	0	8	4	2	2					

HSJ	0	0	0	0	0								
HTC	6	4	6	0	2								
HTJ	22	4	22	0	18	4	2	2		2			
HWT	18	3	18	0	15								
HXA	53	23	53	0	30	16	12	8		8			
HYB	23	9	23	0	14	4	4	2		4			
HYW	12	12	3	9	0								
HZD0	82	26	82	0	56	19	4						
MGP	2	0	2	0	2								
MGW	4	2	4	0	2								
MHB	10	0	10	0	10	2	2		2	2			
MHJ	0	0	0	0	0								
MLG	0	0	0	0	0								
MMS	9	3	9	0	6					2			
MST	28	7	28	0	21	7			4	10			
MWG	22	0	22	0	22	2	2	2		3			
MWJ	0	0	0	0	0								
MYJ	2	2	2	0	0	2							
MZJ	17	0	17	0	17					2			
NHF	2	0	2	0	2					2			
NTW	2	0	2	0	2	2							
PGH	4	4	0	4	0								
PHD	20	20	6	14	0					2			
PKL	3	0	3	0	3								
PTB	7	0	7	0	7	6							
PTT	6	0	6	0	6	4							
PWL	10	0	10	0	10	6	2			1			
PXC	15	0	15	0	15	4	1	2	7	7			
PXP	310	300	260	50	10								
PXW	10	1	10	0	9	3		1					
PYJ	4	0	4	0	4		2						
PYW	10	10	5	5	0								

PZC	4	0	4	0	4	4							
XBB	0	0	0	0	0								
XBT	2	0	2	0	2								
XDM	2	0	2	0	2								
XDM	0	0	0	0	0								
XDN	2	0	2	0	2								
XDY	0	0	0	0	0								
XGJ	2	0	2	0	2	2							
XGS	4	0	4	0	4	2							
XHS	55	26	55	0	29	23	11	8	4				1
XJB	2	0	2	0	2								
XLZ	97	20	97	0	77	12	3	7	23				1
XMI	18	3	18	0	15	3	6		4				
XMS	24	0	24	0	24	2	4	6	3				
XQG3	45	27	45	0	18		2		2				
XQG4	2	1	2	0	1					1			
XTB	2	0	2	0	2								
XTS	2	0	2	0	2	2							
XWD	12	0	12	0	12	4	1	2	1	1			
XWM	5	0	5	0	5	1	3						
XXG	0	0	0	0	0								
XXH	2	0	2	0	2	2							
XYG	5	0	5	0	5	1		1	1				
XYP	8	0	8	0	8					1			
XZJ	0	0	0	0	0								
XZS	4	0	4	0	4					2			
YDZ3	17	0	17	0	17		3	1	2	6			
YDZ4	50	0	50	0	50	12	8	7	7				
YGH	2	0	2	0	2					1			
YHC	22	0	22	0	22	2							
YJD	24	1	24	0	23	1	4	2		7			
YJY	15	0	15	0	15	5	3	2					

YKJ	6	0	6	0	6	2	2						
YLJ	2	0	2	0	2				1	1			
YPJ	28	0	28	0	28	2				2			
YSK	7	0	7	0	7	2	2			2			
YTY	4	0	4	0	4	2	2						
YWQ	3	0	3	0	3	1			1				
YXF	0	0	0	0	0								
YXL	12	2	12	0	10	2	2						
YXL	10	2	10	0	8	2							
YYW	0	0	0	0	0								
ZHB	3	0	3	0	3		1			2			
	1868	**708**	**1717**	**151**	**1160**	**231**	**194**	**96**	**99**	**96**	**13**	**2**	**2**

Table 4.24: Number of Stone Tools by Type and Site II.

	Fishing and hunting tools			**Processing tools**					**Production tools**				
	net weights	arrow-heads	spear-heads	grinding slabs	grinding roller	hand-stones	pestle	hammer-stones	spindle whorls	needles	drill	halberd mold	arrowhead mold
DDP1-2		1		3				1	1				
DDP3-4	4		2	3			2		4				
DDS0				2		1							
DMB0		2											
DMK0		5		1				2					
DWP							2						
DWT					3								
HDG		2							2				
HDJ				1		3	2		1				
HDS													
HFS0							4	5					
HGS0													
HHW		2			2	2					2		
HKP								1					
HLT						1							

HTC		2											
HTJ		2			2	2							
HWT		2								10	1	1	1
HXA		4											
HYB	2										2		
HYW													
HZD0				1									
MGP				1									
MGW													
MHB		2							2				
MHJ													
MLG													
MMS								2					
MST					2	2		15					
MWG		2											
MWJ													
MYJ													
MZJ								15					
NHF													
NTW													
PGH													
PHD		2						2					
PKL	2			1									
PTB		1											
PTT		2											
PWL		1											
PXC		1											
PXP								4					
PXW													
PYJ		2											
PYW													
PZC													

XBB													
XBT													
XDM													
XDM													
XDN													
XDY													
XGJ													
XGS						2							
XHS		3		1									
XJB													
XLZ				3		4			2		1		
XMI		3		2									
XMS		5											
XQG3	2			4	1		9						
XQG4													
XTB													
XTS													
XWD		1			2								
XWM					1								
XXG													
XXH													
XYG								3					
XYP	4					2	1						
XZJ													
XZS				2		2							
YDZ3									1	1			
YDZ4		2							6	2			
YGH	1												
YHC						2							
YJD	2	7									1		
YJY	5												
YKJ	2												

YSK									1				
YXL	2			2		2							
YXL	2						2						
	28	**56**	**2**	**27**	**13**	**25**	**22**	**50**	**20**	**13**	**7**	**1**	**1**

Table 4.25: Number of Stone Tools by Type and Site III.

	Coarse tools				**Stone production fragments**				**Decorative and ritual items**			
	chopper	scraper	flakes	microliths	half-products	cores	flaked fragments	polished fragment	stone balls	stone-squares	pearls	bracelets
DDP1-2									1			
DDP3-4					16							
DDS0	5											
DMB0												
DMK0	4	27	53	5		3		42				
DWP		1			3			5				
DWT		3		10		2						
HDJ					4		4	1	1			
HDS							2					
HFS0					10							
HGS0	4				6							
HHW	2	2										2
HLT	1									2		
HLW												
HRJ	2						2	2				
HSJ												
HTC	2					2						
HTJ	2											2
HWT	3											
HXA					20	4						
HYB		2			2							
HYW		2	2	2			2					
HZD0	2	1										

MGP					1							
MMS	2							2				
MST	7				2							
NTW								2				
PGH				2								
PHD	2	2	2	2	2	2	2					
PXP	2	2			2		2					
PXW					5	1						
XDM								2				
XLZ	20				2				1		2	
XMS								1				
XQG3	21	6										
XQG4		1										
YDZ3					3							5
YDZ4											2	8
YHC		20										
YXL		2										
YXL	2								2			
	83	**71**	**57**	**21**	**78**	**14**	**14**	**57**	**5**	**2**	**4**	**17**

Table 4.25: Number of Stone Tools by Type and Site III (Cont.).

Table 4.26: Number of Stone Tools by Type throughout all Sites.

Woodworking tools		**521**	**Flake tools**		**149**
axes	231		scraper	71	
adzes	194		flakes	57	
chisel	96		microliths	21	
Agricultural tools		**212**	**Percussion tools**		**155**
perforated knives	99		pestle	22	
other knives	96		hammerstones	50	
shovels	13		chopper	83	
plows	2				
ring stones	2				
Fishing and hunting tools		**86**	**Grinding tools**		**65**
net weights	28		grinding slabs	27	
arrowheads	56		grinding roller	13	
spearheads	2		handstones	25	
Clothes production tools		**40**	**Decorative items**		**28**
spindle whorls	20		stone balls	5	
needles	13		stone squares	2	
drill	7		pearls	4	
Half-products and fragments		**163**	bracelets	17	
half-products	78				
cores	14		**Bronze molds**		**2**
flaked fragments	14				
polished fragments	57		**SUM**	**1341**	**1341**

Table 4.27: Number of Stone Tools by Type throughout all Sites by Percentage.

Woodworking tools	**100.0**		**Flake tools**	**100**
axes	44.3		scraper	47.7
adzes	37.2		flakes	38.3
chisel	18.4		microliths	14.1
Agricultural tools	**100.0**		**Percussion tools**	**100.0**
perforated knives	46.7		pestle	14.2
other knives	45.3		hammerstones	32.3
shovels	6.1		chopper	53.5
plows	0.9			
ring stones	0.9			
Fishing and hunting tools	**100.0**		**Grinding tools**	**100.0**
net weights	32.6		grinding slabs	41.5
arrowheads	65.1		grinding roller	20.0
spearheads	2.3		handstones	38.5
Clothes production tools	**100.0**		**Decorative items**	**100.0**
spindle whorls	50.0		stone balls	17.9
needles	32.5		stone squares	7.1
drill	17.5		pearls	14.3
Half-products and fragments	**100.0**		bracelets	60.7
half-products	47.9		**Bronze molds**	**100**
cores	8.6			
flaked fragments	8.6			
polished fragments	35.0			

Table 4.28: Number of Stone Tools by Type Group by Absolute Number and Percentage, referring to the Number of Objects (Left) and to the Number of Sites of Occurrence (Right).

Object number	**Number**	**%**	**Site number**	**Number**	**%**
Woodworking tools	521	38.9	Woodworking tools	114	37.0
Agricultural tools	212	15.8	Agricultural tools	58	18.8
Half-products and fragments	163	12.2	Half-products and fragments	34	11.0
Percussion tools	155	11.6	Percussion tools	34	11.0
Flake tools	149	11.1	Flake tools	21	6.8
Fishing and hunting	86	6.4	Fishing and hunting	35	11.4
Grinding tools	65	4.8	Grinding tools	33	10.7
Clothes production tools	40	3.0	Clothes production	17	5.5
Decorative items	28	2.1	Decorative items	11	3.6
Bronze molds	2	0.1	Bronze molds	1	0.3
SUM	1341	100.0	SUM	308	100.0

Table 4.29: Frequency of the Occurrence of Tool Types by Number of Places of Occurrence.

Woodworking tools		**114**	**Flake tools**		**21**
axes	50		scraper	13	
adzes	38		flakes	3	
chisel	26		microliths	5	
Agricultural tools		**58**	**Percussion tools**		**34**
perforated knives	21		pestle	7	
other knives	32		hammerstones	10	
shovels	1		chopper	17	
plows	2				
ring stones	2				
Fishing and hunting tools		**35**	**Grinding tools**		**33**
net weights	11		grinding slabs	14	
arrowheads	23		grinding roller	7	
spearheads	1		handstones	12	
Clothes production tools		**17**	**Decorative items**		**11**
spindle whorls	9		stone balls	4	
needles	3		stone squares	1	
drill	5		pearls	2	
			bracelets	4	
Half-products and fragments		**34**	**Bronze molds**	**1**	**1**
half-products	14				
cores	6				
flaked fragments	6				
polished fragments	8		**SUM**		**308**

Table 4.30: Frequency of the Occurrence of Tool Types by Number of Places of Occurrence by Percentage.

Woodworking tools	**100.0**		**Flake tools**	**100.0**
axes	43.9		scraper	61.9
adzes	33.3		flakes	14.3
chisel	22.8		microliths	23.8
Agricultural tools	**100.0**		**Percussion tools**	**100.0**
perforated knives	36.2		pestle	20.6
other knives	55.2		hammerstones	29.4
shovels	1.7		chopper	50.0
plows	3.4			
ring stones	3.4			
Fishing and hunting tools	**100.0**		**Grinding tools**	**100.0**
net weights	31.4		grinding slabs	42.4
arrowheads	65.7		grinding roller	21.2
spearheads	2.9		handstones	36.4
Clothes production tools	**100.0**		**Decorative items**	**100.0**
spindle whorls	52.9		stone balls	36.4
needles	17.6		stone squares	9.1
drill	29.4		pearls	18.2
			bracelets	36.4
Half-products and fragments	**100.0**		**Bronze molds**	**100.0**
half-products	41.2			
cores	17.6			
flaked fragments	17.6			
polished fragments	23.5			

Table 4.31: Relative and Absolute Numbers of Main Stone Material Types employed.

	object number	**percentage**
igneous rock	390	48.15
sandstone	41	5.06
limestone	18	2.22
other sedimentary rock	19	2.35
obsidian	2	0.25
chert	9	1.11
serpentine	58	7.16
slate	223	27.53
quartzite	21	2.59
other metamorphic rock	3	0.37
other material	2	0.25
unclear	24	2.96
SUM	**810**	**100.00**

Table 4.32: Raw Material used for the Different Tool Types in Absolute Numbers.

	Igneous rock	sandstone	limestone	other sedimentary	obsidian	chert	serpentine	slate	quartzite	other metamorphic rock	unclear	SUM
adze	58	2	0	2	0	4	33	27	0	0	4	130
axe	118	0	1	3	0	0	9	2	0	0	9	142
chisel	25	1	2	1	0	4	7	18	0	0	4	62
knives	18	0	0	0	0	0	0	101	12	1	0	132
percussion tools	85	2	6	6	0	0	1	0	0	0	0	100
grinding tools	6	25	0	1	0	0	0	3	0	0	0	35
projectile points	2	0	0	0	0	0	2	27	0	0	2	34
net weights	7	4	1	2	0	0	0	0	0	0	1	15
flake tools	41	0	0	0	2	0	2	0	0	0	0	45
agricultural tools	5	2	7	0	0	0	1	0	0	0	0	15
production tools	8	4	1	7	0	0	0	4	9	0	1	34
production debris	22	1	0	0	0	1	3	32		2	4	66
SUM	395	41	18	22	2	9	58	214	21	3	25	810

Table 5.1: The Main Elements and Stages constituting the Burial Record (Cont.).

I. Preparation (can happen parallel to each other or in a temporarily staggered sequence)		
1. Grave ▪ choice of the location of the cemetery within the landscape o preparation of the locale ▪ choice of the location of the grave within the burial site o preparation of the location ▪ procurement and preparation of construction material ▪ choice of grave form, orientation, layout o orientation of the grave o form, depths, layout o or: modification / creation of a new grave within an existing monument / preparation of a tomb to take in further burials	2. Body ▪ Life-history of the individual o social standing and function o material wealth o health o age / sex / gender / ethnicity / individuality o individual preferences / habits of the dead person ▪ modification of the body (dismembering, burning, putting in a special position, closing body apertures) ▪ cleaning ▪ painting ▪ clothing ▪ adorning ▪ wrapping and further bedding	3. Objects ▪ grave furnishings ▪ material to be used on the corpse including means of transportation ▪ grave goods / *Beigaben* (specifically for use in the afterlife) ▪ *Mitgaben* o personal belongings o cloths o body ornaments o magical objects ▪ Traditional gifts and spontaneous "love gifts" ▪ material to be used in funerary process (enter the grave as *Nachgaben* after the actual mortuary ritual just before the grave is closed)
II. Mortuary Ritual		
1. Grave ▪ Finishing the last parts of the grave structure ▪ closing the tomb ▪ adding above-ground elements/ additional structures	2. Body ▪ transport towards the grave, possibly first going through other places and stages of the ritual process ▪ laying the corpse into the grave ▪ closing wrapping / coffin	3. Objects ▪ Transport of the objects towards the grave ▪ Altering the objects during the burial process
III. Post-burial changes		
1. Grave ▪ reopening and or removing / adding / destroying elements during post-depositional activities (later rituals such as ancestor worship or for multiple burials or grave robbery) ▪ Natural prostdepositional dislocation, shifting and other changes	2. Body ▪ exhumations for ritual or other reasons (reburial, worship, ritual, making space for new interments) ▪ disturbance due to grave robbery ▪ natural decay	3. Objects ▪ New objects entering the grave due to post-burial rituals or grave robbery ▪ Objects are changed or destroyed due to post-burial rituals or robbery ▪ Objects are removed due to post-burial rituals, making space for new interments, or robbery (can be reentered into the circle of reuse / reshaping / discard)

Table 5.2: Preparation and Burial Process.

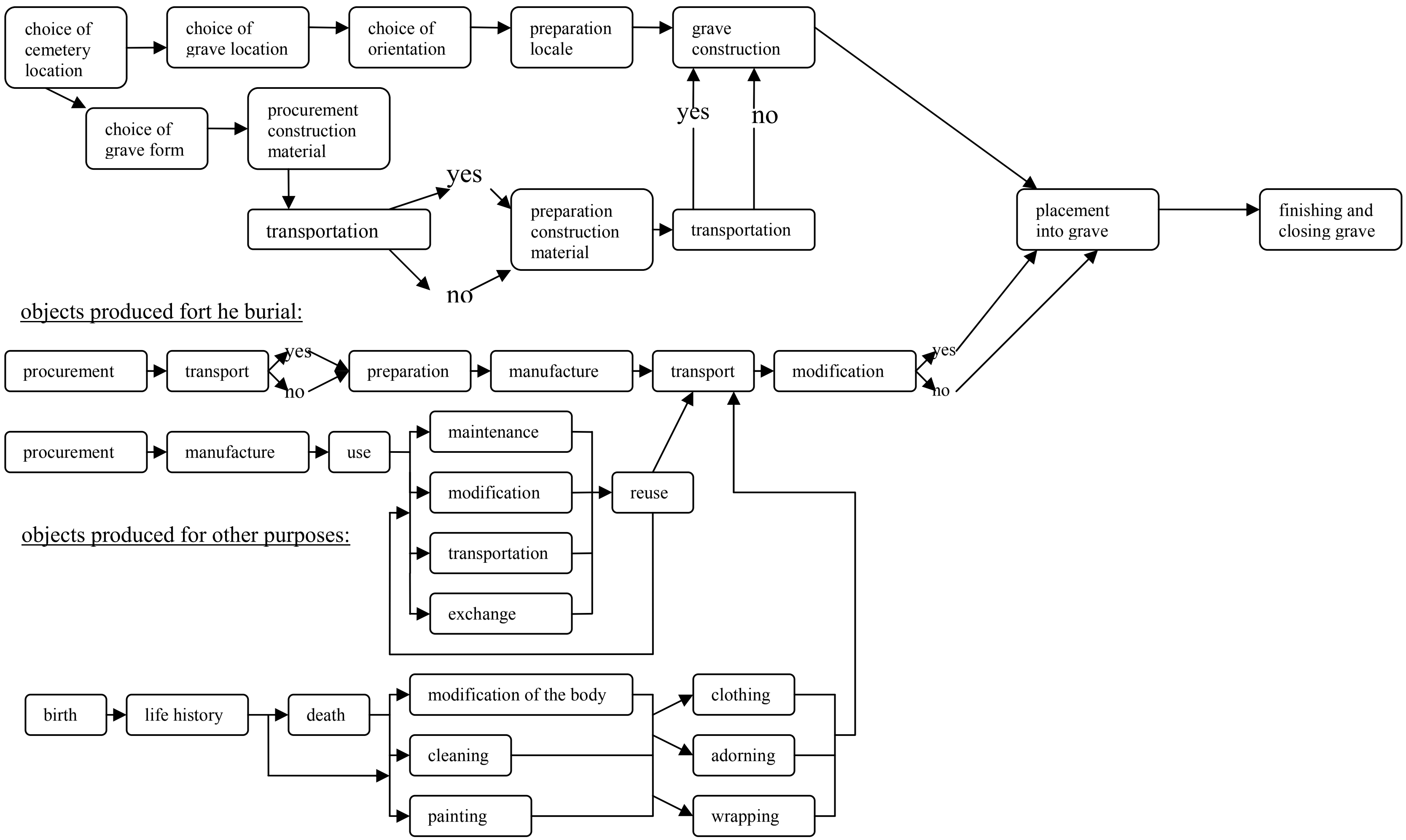


Table 5.3: Post-Burial Changes.

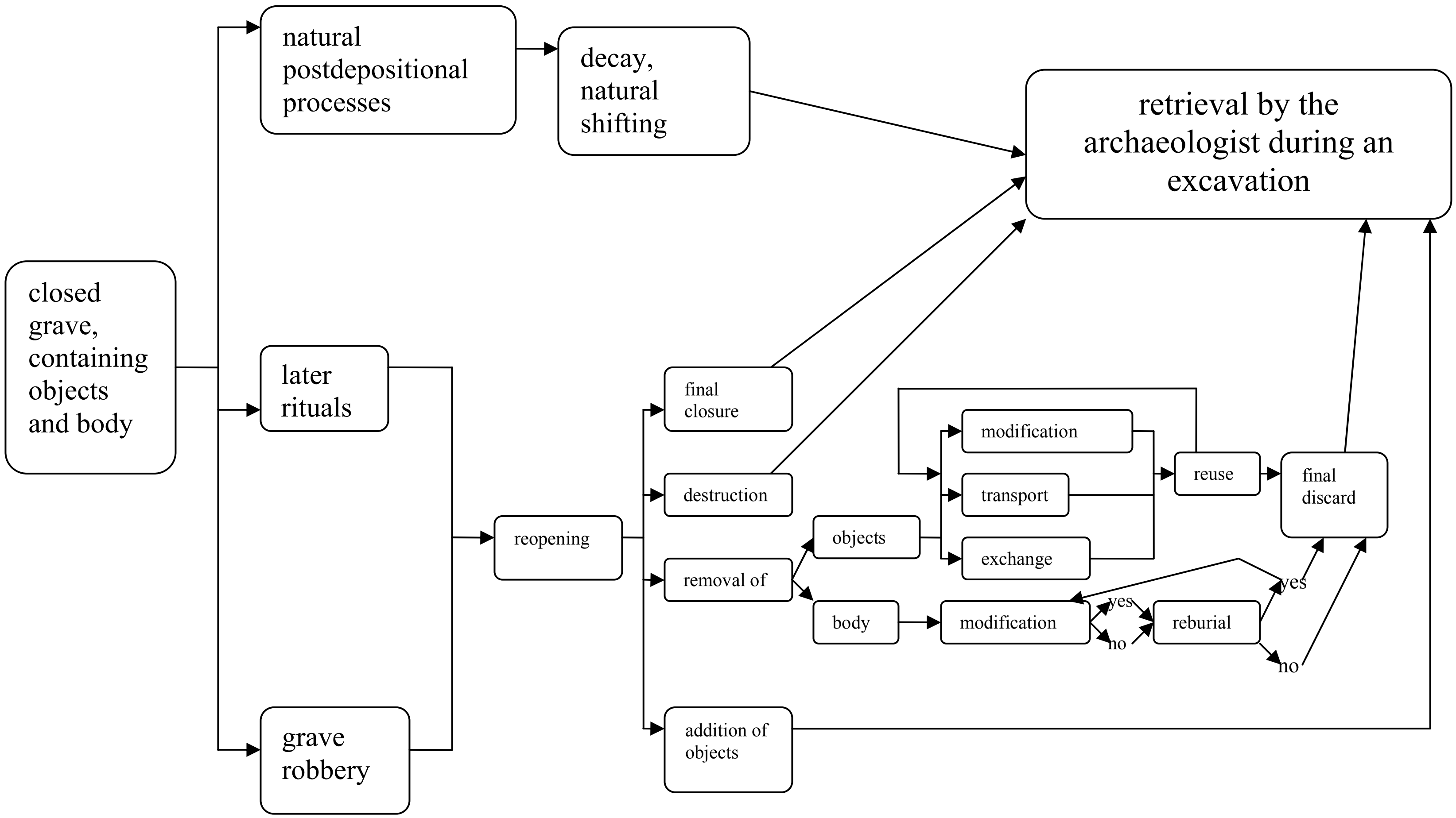


Table 5.4: Time Slots for Different Factors Forming and Influencing the grave.

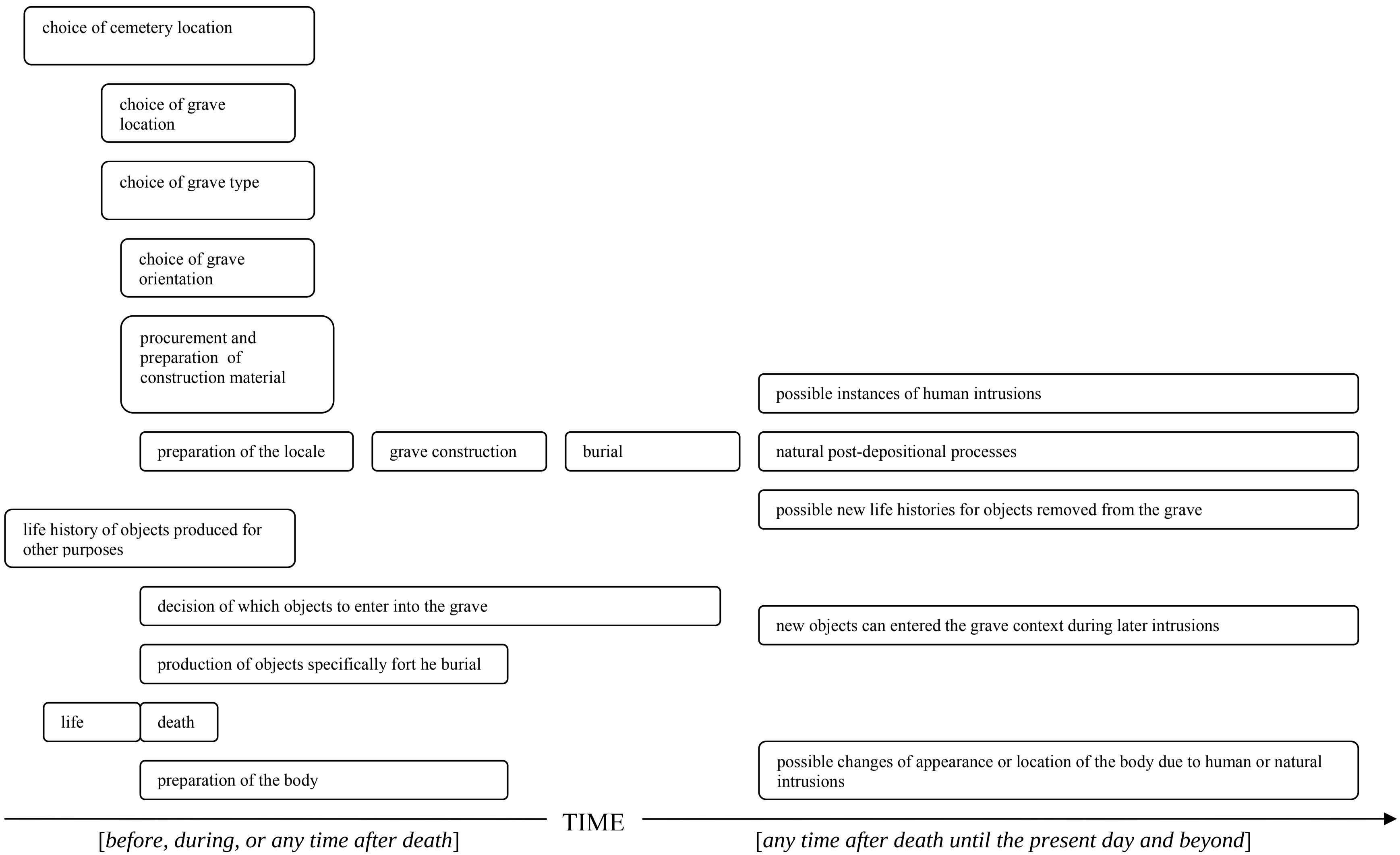


Table 5.5: State of Preservation for Excavated Graves, Unexcavated Graves, and All Graves Reported.

	Excavated Graves			**Unexcavated graves**			**All Graves**		
State	*Count*	*Perc. I*	*Perc. II*	*Count*	*Perc. I*	*Perc. II*	*Count*	*Perc. I*	*Perc. II*
Well-preserved	38	24.36%	8.58%	11	10.19%	1.79%	49	18.56%	4.53%
Disturbed	35	22.44%	7.90%	61	56.48%	9.90%	96	36.36%	9.07%
Poor	83	53.20%	18.74%	36	33.33%	5.84%	119	45.08%	11.23%
Sum 1	156	100%		108	100%		264	100%	
Unknown	287		64.78%	508		82.47%	795		75.07%
Sum 2	443		100%	616		100%	1059		100%

Table 5.6: Descriptive Statistics of Basic and Inferred Grave Measurements.

All	**Length**	**Width**	**Depth/Height**	**Proportion**	**Area**	**Volume**
Mean	4.85	1.44	1.10	3.85	10.48	17.58
Median	3.00	0.82	1.00	3.60	2.28	2.90
Mode	2.00	0.60	0.50	5.00	1.50	3.19
Standard Deviation	4.25	1.27	0.73	1.87	16.29	36.24
Range	40.55	7.10	3.90	14.73	106.60	299.21
Minimum	0.45	0.20	0.10	1.04	0.09	0.04
Maximum	41.00	7.30	4.00	15.77	106.60	299.25
Count	*641.00*	*627.00*	*524.00*	*602.00*	*603.00*	*485.00*
Graves Above Ground	**Length**	**Width**	**Depth/Height**	**Proportion**	**Area**	**Volume**
Mean	8.68	2.75	1.58	3.29	24.79	42.85
Median	8.00	2.70	1.50	3.00	22.00	30.91
Mode	11.00	3.00	2.00	3.00	24.00	3.19
Standard Deviation	4.74	1.22	0.58	1.76	19.86	49.88
Range	39.98	6.95	3.15	14.73	106.60	298.55
Minimum	1.02	0.35	0.35	1.04	0.36	0.70
Maximum	41.00	7.30	3.50	15.77	106.60	299.25
Count	*237.00*	*219.00*	*196.00*	*218.00*	*219.00*	*180.00*
Graves Below Ground	**Length**	**Width**	**Depth/Height**	**Proportion**	**Area**	**Volume**
Mean	2.60	0.74	0.82	4.17	2.32	2.67
Median	2.20	0.60	0.60	4.17	1.40	0.93
Mode	2.00	0.60	0.50	5.00	1.50	0.40
Standard Deviation	1.35	0.51	0.65	1.85	2.97	4.97
Range	11.55	3.50	3.90	8.00	21.53	41.14
Minimum	0.45	0.20	0.10	1.16	0.09	0.04
Maximum	12.00	3.70	4.00	9.17	21.62	41.18
Count	*404.00*	*408.00*	*328.00*	*384.00*	*384.00*	*305.00*
Graves with Stone Installations	**Length**	**Width**	**Depth/Height**	**Proportion**	**Area**	**Volume**
Mean	2.28	0.78	0.86	3.43	2.24	2.97
Median	2.00	0.60	0.60	3.29	1.41	0.92
Mode	2.00	0.60	0.50	5.00	1.50	0.40
Standard Deviation	1.41	0.46	0.71	1.66	3.07	4.99
Range	11.55	3.10	3.84	7.84	21.53	31.30
Minimum	0.45	0.20	0.16	1.28	0.09	0.04
Maximum	12.00	3.30	4.00	9.12	21.62	31.34
Count	*185.00*	*176.00*	*117.00*	*166.00*	*166.00*	*108.00*

Table 5.6: Descriptive Statistics of Basic and Inferred Grave Measurements (Cont.).

Graves without Stone	Length	Width	Depth/Height	Proportion	Area	Volume
Mean	2.86	0.72	0.79	4.73	2.37	2.50
Median	2.50	0.54	0.60	5.00	1.40	0.96
Mode	2.00	0.60	0.50	5.00	1.50	0.30
Standard Deviation	1.24	0.54	0.62	1.80	2.90	4.96
Range	7.50	3.40	3.15	8.00	16.05	41.12
Minimum	1.00	0.30	0.10	1.16	0.42	0.05
Maximum	8.50	3.70	3.25	9.17	16.47	41.18
Count	*219.00*	*232.00*	*211.00*	*218.00*	*218.00*	*197.00*

Table 5.7: Shape Categories.

Chamber Form Type	All	Perc.	Count Above	Perc. by Count	Perc. by Category	Count Below	Perc. by Count	Perc. by Category
Oval	19	1.79%	0	0.00%	0.00%	19	2.53%	100.00%
Trapezoidal	17	1.61%	5	1.63%	29.41%	12	1.60%	70.59%
Rectangular with rounded corners	12	1.13%	0	0.00%	0.00%	12	1.60%	100.00%
Square	31	2.93%	12	3.91%	74.19%	19	2.53%	61.29%
Rectangular	800	75.54%	247	80.46%	30.88%	553	73.54%	69.13%
Long-rectangular	164	15.49%	37	12.05%	22.56%	127	16.89%	77.44%
Long-narrow	14	1.32%	4	1.30%	28.57%	10	1.33%	71.43%
Unclear	2	0.19%	2	0.65%	100.00%	0	0.00%	0.00%
Sum	*1059*	*100.00%*	*307*	*100.00%*	*28.52%*	*752*	*100.00%*	*71.20%*
Chamber Form Type	**Below All**	**Perc. by Count**	**Below with Stone**	**Perc. by Count**	**Perc. by Category**	**Below Without Stone**	**Perc. by Count**	**Perc. by Category**
Oval	19	2.53%	2	0.52%	10.53%	17	4.59%	89.47%
Trapezoidal	12	1.60%	9	2.36%	75.00%	3	0.81%	25.00%
Rectangular with rounded corners	12	1.60%	0	0.00%	0.00%	12	3.24%	100.00%
Square	19	2.53%	10	2.62%	52.63%	9	2.43%	47.37%
Rectangular	553	73.54%	337	88.22%	60.94%	216	58.38%	39.06%
Long-rectangular	127	16.89%	20	5.24%	15.75%	107	28.92%	84.25%
Long-narrow	10	1.33%	4	1.05%	40.00%	6	1.62%	60.00%
Unclear	0	0.00%	0	0.00%	0.00%	0	0.00%	0.00%
Sum	*752*	*100.00%*	*382*	*100.00%*	*50.80%*	*370*	*100.00%*	*49.20%*

Table 5.8: Frequency of Different Stone Construction Parts.

	Stone cover	Percentage	Stone walls	Percentage	Stone floor	Percentage
Yes	445	64.59%	623	90.42%	91	13.21%
No	114	16.55%	35	5.08%	97	14.08%
Unknown	130	18.87%	31	4.50%	501	72.71%
SUM	*689*	*100.00%*	*689*	*100.00%*	*689*	*100.00%*

Table 5.9: Two-Way Combination Table of Basic Stone Construction Elements.

	Stone cover	*Stone walls*	*Stone floor*
Stone cover		435	46
Stone walls	435		79
Stone floor	46	79	

Table 5.10: Occurring Combinations of the Three Basic Stone Construction Elements.

Construction	**Count**	**Percentage I**	**Percentage II**
Stone cover, walls, and floor	46	26.14%	6.68%
Stone cover and walls	60	34.09%	8.71%
Stone cover and floor	1	0.57%	0.15%
Stone cover only	5	2.84%	0.73%
Stone walls and floor	31	17.61%	4.50%
Stone walls only	11	6.25%	1.60%
Stone floor only	11	6.25%	1.60%
Partial floor covering only	11	6.25%	1.60%
SUM 1	*176*	*100.00%*	*25.54%*
Stone cover and walls, floor unsure	340	66.28%	49.35%
Stone cover, no stone walls, bottom unsure	3	0.58%	0.44%
Stone walls, no stone cover, floor unsure	50	9.75%	7.26%
Stone walls and floor, cover unsure	2	0.39%	0.29%
Stone cover, others unsure	1	0.19%	0.15%
Stone walls, no stone floor, cover unsure	10	1.95%	1.45%
Stone walls, floor and cover unsure	84	16.37%	12.19%
All unsure	23	4.48%	3.34%
SUM 2	*513*	*100.00%*	
TOTAL	*689*		*100.00%*

Table 5.11: Types of Floor Material.

Floor Material	**Count**	**Percentage**
Stone slabs	65	36.52%
Stone slabs on rammed earth	1	0.56%
Stone slabs on soil layer	1	0.56%
Stone slabs with soil layer on top	21	11.80%
Bedrock	1	0.56%
Leveled soil	58	31.46%
Pebble layer	10	5.62%
Pebble layer on rammed earth	1	0.56%
Pebble layer with soil layer on top	1	0.56%
Pebble layer on leveled soil with soil layer on top	1	0.56%
Soil-gravel layer	17	9.55%
Soil on bedrock	1	0.56%
SUM	*178*	*100.00%*

Table 5.12: Floor Construction Elements and Their Combination.

Floor Construction Element	**All**	**On Soil Layer**	**With Soil Layer on Top**	**Both**
Stone slabs	88	2	21	0
Bedrock	2	0	1	0
Pebble layer or soil-gravel layer	30	2	2	1
Leveled soil	58	0	1	0
SUM	*178*	*3*	*25*	*1*

Table 5.13: Basic Floor Types and Additional Elements.

	All	Additional Layers	Percentage I (Basis: 178)	Percentage II (Basis: 28)	Percentage III (Basis: 178)	Percentage IV (Basis: All)
Stone slabs	88	23	49.44%	82.14%	12.92%	26.14%
Pebble layer	30	3	16.85%	10.71%	1.69%	10.00%
Natural ground	60	2	33.71%	7.14%	1.12%	3.33%
SUM	*178*	*28*	*100.00%*	*100.00%*	*15.73%*	

Note: Percentage I provides the percentage of graves in each category in relation to the overall number of graves (178). Percentage II refers to the number of graves with additional layers in each category in relation to the overall number of graves with additional soil layers (28). Percentage III is calculating the percentage of graves with additional layers in each category in relation to the overall number of graves (178), and percentage IV refers to the number of graves with additional layers in each category in relation to those that have none (88, 30, and 60).

Table 5.14: Cover Stone Size Categories.

Cover stone size categories	Count		Summary categories	Count
Large boulder	284		Boulder	287
Boulder	3		Slabs	149
Few large and many small stones	2		Large and small stones	2
Large slab(s)	18		*SUM*	*438*
Stone slab(s)	103			
Thin slab(s)	28			
SUM	*438*			

Table 5.15: Number of Cover Stones.

Cover stone number	Count	Percentage I	Percentage II
1	19	20.21%	7.28%
2	9	9.57%	3.45%
3	16	17.02%	6.13%
4	24	25.53%	9.20%
5	11	11.70%	4.21%
6	8	8.51%	3.07%
7	3	3.19%	1.15%
9	2	2.13%	0.77%
11	1	1.06%	0.38%
13	1	1.06%	0.38%
Sum 1	*94*	*100.00%*	*36.02%*
Several	167		63.98%
Sum 2	*261*		*100.00%*

Tab 5.16: Number of Stones for Walls.

Wall stones number	Count	Percentage I	Number category	Count	Percentage
Several	532	82.87%	Several	598	93.15%
Large number	25	3.89%	Large number	25	3.89%
Several large and many small	19	2.96%	Several large and many small	19	2.96%
4 stones	22	3.43%	*Sum*	*642*	*100.00%*
5-9 stones	24	3.74%			
10-12 stones	13	2.02%			
13-19	7	1.09%			
Sum	*642*	*100.00%*			

Table 5.17: Types of Wall Constructions.

	All	Percentage I	Excavated	Perc. II
Large boulders	256	39.94%	24	14.29%
Large boulders below, small stones above	9	1.40%	6	3.57%
Large boulders with small stones filling gaps	3	0.47%	3	1.79%
Large boulders at a distance, many cobbles in gaps	3	0.47%	3	1.79%
Large slabs with small stones filling gaps	3	0.47%	3	1.79%
Large slabs erected at a distance, many cobbles in gaps	4	0.62%	3	1.79%
Large slab(s)	11	1.72%	7	4.17%
Stone slab(s)	254	39.63%	42	25.00%
Thin slab(s)	72	11.23%	62	36.90%
Several layers of cobbles	13	2.03%	6	3.57%
Several layers of rectangular brick-like stones	12	1.87%	8	4.76%
Irregular cobbles and Han tiles	1	0.16%	1	0.60%
Sum	*641*	*100.00%*	*168*	*100.00%*

Table 5.18: Types of Wall Constructions by State of Excavation and Location Above / Below Ground.

	All	Above Excavated	Below Exc.	Above Unexcavated	Below Unexc.
Large boulders	256	25	0	231	0
Boulders below, small stones above	9	6	0	3	0
Large boulders, small stones filling gaps	3	3	0	0	0
Large boulders at a distance, cobbles in gap	3	3	0	0	0
Large slabs with small stones filling gaps	3	3	0	0	0
Large slabs at a distance, cobbles in gap	4	0	0	4	0
Large slab(s)	11	1	6	4	0
Stone slab(s)	254	6	36	6	206
Thin slab(s)	72	0	62	0	10
Several layers of cobbles	13	2	4	7	0
Several layers of rectangular brick-like stones	12	2	6	0	0
Irregular cobbles and Han tiles	1	1	0	0	0
Sum	*641*	*52*	*114*	*251*	*216*

Table 5.19: Percentages of Types of Wall Constructions by State of Excavation and Location Above / Below.

	All	Above	Perc. I	Perc. II	Below	Perc. I	Perc. II
Large boulders	256	256	100.00%	82.85%	0	0.00%	0.00%
Large boulders below, small above	9	9	100.00%	2.91%	0	0.00%	0.00%
Boulders, small stones filling gaps	3	3	100.00%	0.97%	0	0.00%	0.00%
Boulders at a distance, cobbles in gap	3	3	100.00%	0.97%	0	0.00%	0.00%
Large slabs, small stones filling gaps	3	3	100.00%	0.97%	0	0.00%	0.00%
Slabs at a distance, cobbles in gap	4	4	100.00%	1.29%	0	0.00%	0.00%
Large slab(s)	11	5	45.45%	1.62%	6	54.55%	1.81%
Stone slab(s)	254	12	4.72%	3.88%	242	95.28%	72.89%
Thin slab(s)	72	0	0.00%	0.00%	72	100.00%	21.69%
Several layers of cobbles	13	9	69.23%	2.91%	4	30.77%	1.20%
Several layers	12	4	33.33%	1.29%	8	66.67%	2.41%
Irregular cobbles and Han tiles	1	1	100.00%	0.32%	0	0.00%	0.00%
Sum	*641*	*309*	*48.21%*	*100.00%*	*332*	*51.79%*	*100.00%*

Table 5.20: Relative Frequency of Different Types of Wall Constructions with Reduced Categories.

	All	Perc. all	Above	Perc. I	Perc. II	Below	Perc. I	Perc. II
Large boulders	256	39.94%	256	100.00%	82.85%	0	0.00%	0.00%
Large and small stones	22	3.43%	25	100.00%	8.09%	0	0.00%	0.00%
Stone slab(s)	337	52.57%	5	1.89%	1.62%	320	93.58%	96.39%
Several layers	26	4.06%	9	69.23%	2.91%	12	30.77%	3.61%
Sum	*641*	*100.00%*	*295*	*48.21%*	*95.47%*	*332*	*51.79%*	*100.00%*

Table 5.21: Distribution of Chamber-Form Types for Graves Below Ground Using Previous Category Breaks.

Chamber-Form Type	**Excavated**	**%**	**Unexcavated**	**%**	**All**	**%**
Trapezoidal	3	1.19%	0	0.00%	3	0.79%
Oval	17	6.72%	0	0.00%	17	4.46%
Square	4	1.58%	5	3.91%	9	2.36%
Rectangular	106	41.90%	114	89.06%	220	57.74%
Rect. with rounded corners	12	4.74%	0	0.00%	12	3.15%
Long-rectangular	103	40.71%	0	0.00%	103	27.03%
Long-narrow	8	3.16%	9	7.03%	17	4.46%
Sum	*253*	*100.00%*	*128*	*100.00%*	*381*	*100.00%*

Table 5.22: Distribution of Chamber-Form Types for Graves Below Ground Using New Category Breaks.

Chamber-Form Type	**Excavated**	**%**	**Unexcavated**	**%**	**All**	**%**
Trapezoidal	3	1.19%	0	0.00%	3	0.79%
Oval	17	6.72%	0	0.00%	17	4.46%
Square	4	1.58%	5	3.91%	9	2.36%
Rectangular	63	24.90%	114	89.06%	220	57.74%
Recta. with rounded corners	12	4.74%	0	0.00%	12	3.15%
Long-rectangular	151	59.68%	0	0.00%	103	27.03%
Long-narrow	8	3.16%	9	7.03%	17	4.46%
Sum	*253*	*100.00%*	*128*	*100.00%*	*381*	*100.00%*

Table 5. 23: Descriptive Statistics for Various Segments of the Earth-Pit Graves.

All Excavated Graves	**Length**	**Width**	**Depth**	**Proportions**	**Area**	**Volume**
Mean	2.94	0.70	0.78	4.91	2.41	2.35
Median	2.60	0.54	0.60	5.00	1.40	0.96
Mode	2.50	0.60	0.60	5.00	1.50	0.30
Standard Deviation	1.26	0.55	0.58	1.76	2.98	4.84
Range	7.84	3.40	3.15	8.59	16.05	41.12
Minimum	0.66	0.30	0.10	0.57	0.42	0.05
Maximum	8.50	3.70	3.25	9.17	16.47	41.18
Count	207.00	207.00	205.00	205.00	205.00	202.00
Fenjiwan	**Length**	**Width**	**Depth**	**Proportions**	**Area**	**Volume**
Mean	2.68	0.50	0.71	5.48	1.36	1.06
Median	2.60	0.48	0.60	5.35	1.26	0.76
Mode	2.50	0.40	0.30	4.17	1.50	0.30
Standard Deviation	0.66	0.11	0.46	1.40	0.52	1.00
Range	3.84	0.83	2.77	8.59	2.64	6.56
Minimum	0.66	0.32	0.11	0.57	0.42	0.06
Maximum	4.50	1.15	2.88	9.17	3.06	6.62
Count	147.00	147.00	147.00	146.00	146.00	145.00

All Without Fenjiwan	Length	Width	Depth	Proportions	Area	Volume
Mean	3.59	1.20	0.94	3.49	5.00	5.63
Median	3.44	0.92	0.65	2.86	3.20	3.00
Mode	1.50	1.00	0.60	5.00	15.91	19.09
Standard Deviation	1.96	0.83	0.78	1.76	4.57	8.15
Minimum	1.25	0.30	0.10	1.16	0.45	0.05
Maximum	8.50	3.70	3.25	7.00	16.47	41.18
Count	60.00	60.00	58.00	59.00	59.00	57.00
Lizhou	**Length**	**Width**	**Depth**	**Proportions**	**Area**	**Volume**
Mean	5.29	1.39	0.91	4.48	7.25	8.28
Median	5.05	1.07	0.70	5.03	6.10	4.20
Mode	6.00	1.00	0.60	5.00	3.20	1.60
Standard Deviation	1.60	0.68	0.57	1.91	3.66	9.89
Minimum	1.25	0.80	0.50	1.32	1.19	0.71
Maximum	8.50	3.05	2.50	7.00	16.47	41.18
Count	26.00	26.00	25.00	26.00	26.00	25.00
All without Fenjiwan /Lizhou	**Length**	**Width**	**Depth**	**Proportions**	**Area**	**Volume**
Mean	2.26	0.90	1.01	3.09	2.62	4.12
Median	2.00	0.70	0.50	2.61	1.56	1.71
Mode	2.00	0.60	0.50	2.00	2.00	19.09
Standard Deviation	0.77	0.70	0.94	1.66	3.53	5.63
Minimum	1.38	0.30	0.10	1.16	0.45	0.05
Maximum	4.98	3.70	3.25	7.50	15.91	22.03
Count	57.00	69.00	50.00	56.00	56.00	37.00

Table 5.24: Confidence Intervals for Various Groups among the Earth-Pit Graves.

All Graves					
Variable	Obs	Mean	Std. Err.	95% Confidence	Interval]
Length	230	2.87	0.08	2.71	3.03
Width	242	0.71	0.03	0.64	0.78
Depth	222	0.80	0.04	0.72	0.88
Proportions	228	4.78	0.12	4.54	5.02
Area	228	2.34	0.19	1.97	2.71
Volume	207	2.48	0.34	1.81	3.14
Fenjiwan Only					
Variable	Obs	Mean	Std. Err.	95% Confidence	Interval]
Length	147	2.68	0.05	2.57	2.79
Width	147	0.50	0.01	0.48	0.52
Depth	147	0.71	0.04	0.64	0.79
Proportions	146	5.48	0.12	5.25	5.71
Area	146	1.36	0.04	1.28	1.45
Volume	145	1.06	0.08	0.89	1.22
All Graves Without Fenjiwan					
Variable	Obs	Mean	Std. Err.	95% Confidence	Interval]
Length	83	3.21	0.20	2.82	3.60
Width	95	1.04	0.07	0.89	1.18
Depth	75	0.98	0.10	0.79	1.17
Proportions	82	3.53	0.20	3.13	3.94
Area	82	4.09	0.46	3.17	5.00
Volume	62	5.80	0.99	3.81	7.79

Lizhou Only					
Variable	Obs	Mean	Std. Err.	95% Confidence	Interval]
Length	26	5.29	0.31	4.64	5.94
Width	26	1.39	0.13	1.11	1.67
Depth	25	0.91	0.11	0.67	1.14
Proportions	26	4.48	0.37	3.71	5.25
Area	26	7.25	0.72	5.78	8.73
Volume	25	8.28	1.98	4.20	12.36
All Graves Without Fenjiwan or Lizhou					
Variable	Obs	Mean	Std. Err.	[95% Confidence	Interval]
Length	57	2.26	0.10	2.06	2.47
Width	69	0.90	0.08	0.74	1.07
Depth	50	1.01	0.13	0.75	1.28
Proportions	56	3.09	0.22	2.65	3.54
Area	56	2.62	0.47	1.67	3.56
Volume	37	4.12	0.93	2.24	6.00

Table 5.25: Preliminary Types of Stone-Construction Graves.

Type	Description	Count	Percentage
Type I	Complete stone-cist	37	32.74%
Type II	Stone cover and walls	20	17.70%
Type III	Stone walls and floor	27	23.89%
Type IV	Stone cover and floor	1	0.88%
Type V	Stone cover	6	5.31%
Type VI	Stone walls	11	9.73%
Type VII	Stone floor	11	9.73%
	SUM	*113*	*100.00%*

Table 5.26: Frequency of Different Wall Construction Types for Graves Below Ground.

Wall construction type	Count	Percentage
Large slabs	6	1.82%
Several layers of cobbles	4	1.21%
Several layers of rectangular stones	6	1.82%
Stone slabs	242	73.33%
Thin slabs	72	21.82%
Sum	*330*	*100.00%*

Table 5.27: Frequency of Different Cover Stone Types for Graves Below Ground.

Cover stone size category	Count	Percentage
Large boulder	1	0.59%
Large slab(s)	21	12.35%
Few large and many smaller stones	2	1.18%
Stone slab(s)	113	66.47%
Thin slab(s)	33	19.41%
Sum	*170*	*100.00%*

Table 5.28: Descriptive Statistics for Stone-Construction Graves.

	Length	**Width**	**Depth**	**Proportions**	**Area**	**Volume**
Mean	2.23	0.79	0.85	3.26	2.28	3.08
Median	1.90	0.60	0.60	3.04	1.35	0.92
Mode	2.00	0.60	0.50	5.00	3.00	0.40
Standard Deviation	1.43	0.47	0.72	1.50	3.16	5.20
Range	11.55	3.10	3.84	7.12	21.53	31.30
Minimum	0.45	0.20	0.16	1.28	0.09	0.04
Maximum	12.00	3.30	4.00	8.40	21.62	31.34
Count	174.00	166.00	106.00	156.00	156.00	98.00

Table 5.29: Grave Chamber Forms for Stone-Construction Graves.

Chamber-form	**Excavated**	**Percentage**	**Unexcavated**	**Percentage**	**All**	**Percentage**
Trapezoidal	9	9.28%	0	0.00%	9	5.42%
Oval	2	2.06%	0	0.00%	2	1.20%
Square	4	4.12%	6	10.00%	19	11.45%
Rectangular	74	76.29%	45	75.00%	119	71.69%
Long-rectangular	6	6.19%	9	15.00%	15	9.04%
Long-narrow	2	2.06%	0	0.00%	2	1.20%
Sum	*97*	*100.00%*	*60*	*100.00%*	*166*	*100.00%*

Table 5.30: Stone-Construction Grave Types.

Types	**Excavated**	**Percentage**	**Unexcavated**	**Percentage**	**All**	**Percentage**
Unclear	0	0.00%	102	40.32%	102	27.49%
1	46	38.98%	99	39.13%	145	39.08%
2	44	37.29%	50	19.76%	94	25.34%
3	7	5.93%	2	0.79%	9	2.43%
4	11	9.32%	0	0.00%	11	2.96%
5	10	8.47%	0	0.00%	10	2.70%
SUM	*118*	*100.00%*	*253*	*100.00%*	*371*	*100.00%*

Table 5.31: Stone-Construction Grave Types by Sub-Types.

Subtypes	**Excavated**	**Percentage**	**Unexcavated**	**Percentage**	**All**	**Percentage**
Unclear	0	0.00%	102	40.32%	102	27.49%
1.1	8	6.78%	14	5.53%	22	5.93%
1.2	14	11.86%	81	32.02%	95	25.61%
1.3	24	20.34%	4	1.58%	28	7.55%
2.1	2	1.69%	0	0.00%	2	0.54%
2.2	11	9.32%	49	19.37%	60	16.17%
2.3	8	6.78%	1	0.40%	9	2.43%
2.4	23	19.49%	0	0.00%	23	6.20%
3.1	6	5.08%	2	0.79%	8	2.16%
3.2	1	0.85%	0	0.00%	1	0.27%
4.1	9	7.63%	0	0.00%	9	2.43%
4.2	1	0.85%	0	0.00%	1	0.27%
4.3	1	0.85%	0	0.00%	1	0.27%
5.1	9	7.63%	0	0.00%	9	2.43%
5.2	1	0.85%	0	0.00%	1	0.27%
SUM	*118*	*100.00%*	*253*	*100.00%*	*371*	*100.00%*

Table 5.32: Descriptive Statistics for All Megalithic Graves.

All	Length	Width	Height	Proportions	Area	Volume
Mean	8.68	2.67	1.58	3.32	24.08	41.20
Median	8.00	2.70	1.50	3.00	21.70	30.38
Mode	11.00	3.00	2.00	3.00	24.00	3.19
Standard Deviation	4.74	1.12	0.58	1.77	19.03	47.06
Range	39.98	4.65	3.15	15.77	106.24	298.55
Minimum	1.02	0.35	0.35	0.00	0.36	0.70
Maximum	41.00	5.00	3.50	15.77	106.60	299.25
Count	*237.00*	*214.00*	*196.00*	*214.00*	*213.00*	*177.00*

Table 5.33: Descriptive Statistics for Excavated Megalithic Graves.

Excavated	Length	Width	Height	Proportions	Area	Volume
Mean	6.09	1.70	1.67	4.06	11.57	21.49
Median	6.20	1.30	1.73	3.75	8.76	12.92
Mode	8.40	1.00	2.00	6.08	8.76	#N/A
Standard Deviation	2.82	0.94	0.58	1.99	12.53	31.26
Range	15.95	4.24	2.40	8.05	83.95	211.80
Minimum	1.05	0.76	0.40	1.05	1.05	0.70
Maximum	17.00	5.00	2.80	9.10	85.00	212.50
Count	*55.00*	*54.00*	*52.00*	*54.00*	*54.00*	*51.00*

Table 5.34: Descriptive Statistics for Unexcavated Megalithic Graves.

Unexcavated	Length	Width	Height	Proportions	Area	Volume
Mean	9.47	3.00	1.54	3.06	28.33	49.17
Median	8.60	3.00	1.40	2.90	24.30	35.53
Mode	11.00	3.00	2.00	3.33	24.00	160.00
Standard Deviation	4.92	0.99	0.58	1.62	19.01	50.05
Range	39.98	4.65	3.15	15.77	106.24	298.07
Minimum	1.02	0.35	0.35	0.00	0.36	1.18
Maximum	41.00	5.00	3.50	15.77	106.60	299.25
Count	*182.00*	*160.00*	*144.00*	*160.00*	*159.00*	*126.00*

Table 5.35: Chamber-Form Types of Megalithic Graves

Chamber Form Type	Count	Percentage
Trapezoidal	5	1.64%
Square	12	3.93%
Rectangular	247	80.98%
Long-rectangular	37	12.13%
Long-narrow	4	1.31%

Table 5.36: Relative Frequency of Megalithic Grave Types.

Types	Excavated	Percentage	Unexcavated	Percentage	All	Percentage
1	18	38.30%	243	94.19%	261	85.57%
2	18	38.30%	4	1.55%	22	7.21%
3	5	10.64%	7	2.71%	12	3.93%
4	6	12.77%	4	1.55%	10	3.28%
All	*47*	*100.00%*	*258*	*100.00%*	*305*	*100.00%*

Table 5.37: Relative Frequency of Subtypes of Megalithic Grave.

Subtypes	Excavated (n=47)	Perc.	Unexcavated (n=258)	Perc.	All (305)	Perc.
1.1	9	19.15%	62	24.03%	71	23.28%
1.2	9	19.15%	175	67.83%	184	60.33%
1.3	0	0.00%	6	2.33%	6	1.97%
2.1	13	27.66%	3	1.16%	16	5.25%
2.2	4	8.51%	1	0.39%	5	1.64%
2.3	1	2.13%	0	0.00%	1	0.33%
3.1	2	4.26%	0	0.00%	2	0.66%
3.2	2	4.26%	7	2.71%	9	2.95%
3.3	1	2.13%	0	0.00%	1	0.33%
4.1	4	8.51%	2	0.78%	6	1.97%
4.2	2	4.26%	2	0.78%	4	1.31%

Table 5.38: Frequency of Occurrence of Various Outside Stone Installations.

Outside Installation Type	Count	Percentage	Percentage of Graves Above Ground
Earth-tumulus			
Yes	95	8.97%	31.35%
None observed	964	91.03%	68.65%
Stone-mound			
Yes	7	0.66%	2.30%
None observed	1052	99.34%	97.70%
Access ramp			
Yes	35	3.31%	11.55%
None observed	1024	96.69%	88.45%
Tail			
Yes	13	1.23%	4.25%
None observed	1046	98.77%	95.75%
Other outside installations			
Yes	17	1.51%	5.60%
None observed	1042	98.49%	94.40%
Type of other outside installations			
Ba-shaped traversal arrangement of stones	8	47.06%	2.64%
Door-way of erected stones	6	35.29%	2.00%
Small stone assemblage close to door	3	17.65%	1.00%

Table 5.39: Measurements of Stone Mounds. The volume was estimated through the formula for calculating spherical cabs [$V_{KK} = 1/3\ (\pi h^2)\ (3r-h)$].

	Diameter	Height	Volume		Diameter	Height	Volume
Xichang Bahe Baozi M1	13	3	155.51	*Mean*	6.49	2.26	49.226
Xichang Bahe Baozi M2	8.2	2.6	68.67	*Stand. Error*	1.25	0.186	19.40
Xichang Bahe Baozi M3	6.5	2.62	51.25	*Median*	6	2.07	22.09
Xichang Bahe Baozi M4	3.6	1.9	13.23	*Stand. Dev.*	3.31	0.486	51.32
Xichang Bahe Baozi M5	4	1.9	15.50	*Range*	9.4	1.3	142.28
Xichang Bahe Baozi M6	4.1	2.07	18.31	*Min.*	3.6	1.7	13.23
Xichang Xijiao Gongshe M1	6	1.7	22.09	*Maxi.*	13	3	155.51
				Count	7	7	7

Table 5.40: Known Measurements for Earth-Mounds [Volume = 1/3 (πh^2) (3r-h)].

	Form	**Length**	**Width**	**Height**	**Volume**
Dechang Arong M1	oval	12	6.1	1.5	60.44
Dechang Malilang Zhannan M1	oval	11	4	2	85.87
Xichang Beishan M2	oval	16	10	2.2	186.52
Xichang Guihuacun M2	oval	11	6		
Xichang Hexi Gongshe M6	oval	12.4	8.2	1.5	69.27
Xichang Mimilang M1	oval	15	10	2.5	229.07
Xichang Mimilang M2	oval	8.5	7	1.2	33.25
Xichang Reshuitang West M1	oval	15	6	3	268.61
Xichang Shizuizi M1	oval	15	8.5	2	139.28
Xichang Tianwangshan M10	oval	21.8	16.55	5.5	1648.03
Xichang Wanao M1	oval	20	12.6	2.9	405.12
Xichang Wanao M3	oval	25	9.6	2.8	403.11
Xichang Yunduanshan M1	oval	20	11.5	2.8	364.94
Xichang Zhengjiafen M1	oval	12.4	8.2	2	121.06
Xide Lake Sihe M8	oval	11.5	1	1.16	24.79
Dechang Arong M2	round	15.5	15.5	1	47.65
Dechang Xiaoliusuo M3	round	21.7	21.7	1.6	170.23
Dechang Xiaoliusuo M4	round	40.17	40.17	2.9	1035.78
Dechang Xiaoliusuo M5	round	25.5	25.5	1.6	200.79
Dechang Xiaomiaoshan M2	round	29.45	29.45	1.3	154.06
Dechang Xiaomiaoshan M3	round	26.52	26.52	1.3	138.50
Dechang Xiaomiaoshan M4	round	23	23	1.2	102.24
Dechang Xiaomiaoshan M5	round	36	36	1.4	218.80
Mianning Sankuaishi M1	round	10	10	1	30.37
Xichang Luzuishan M1	round	11.2	10	1.5	71.39
Xichang Xijiao Gongshe M2	round	20	20	2	242.95

Table 5.41: Statistics for Earth-Mound Measurements.

	Length	**Width**	**Height**	**Volume**
Mean	18.68	14.73	1.99	258.08
Median	15.75	10.00	1.60	154.06
Mode	20.00	10.00	2.00	#N/A
Standard Deviation	8.13	10.13	0.98	355.45
Range	31.67	39.17	4.50	1623.25
Minimum	8.50	1.00	1.00	24.79
Maximum	40.17	40.17	5.50	1648.03
Count	26.00	26.00	25.00	25.00

Table 5.42: Correlation-Matrix for Presence/Absence of Various Outside Installation Features.

	Door	**Ramp**	**Tumulus**	**Stone-mound**	**Tail**	**Other Outside Installations**
Door	1					
Ramp	0.538052	1				
Tumulus	0.583308	0.163779	1			
Stone-mound	0.236674	0.245664	0.259847	1		
Tail	0.29738	0.229735	0.309811	0.651849	1	
Other Outside Inst.	0.392672	0.25357	0.35588	0.164555	0.388794	1

Table 5.43: Frequency of Occurrence of Various Inside Installation Types.

Inside Installation	Earth-pit graves	Stone-construction graves	Megalithic Graves	All
Head-compartment	9	4	0	13
Wooden coffin	8	5	0	13
Foot-compartment	0	4	0	4
Second-level ledge	2	1	0	3
Thin stone-slabs under head or pelvis	11	0	0	11
Thin stone-slab next to vessel	1	0	0	1
Middle-partitioning	0	1	0	1
Front/back-partitioning	0	0	3	0
Stairs	0	0	1	0
2 layers of stone-slabs inside	0	1	0	1
Oval niche at one end	0	1	0	1
Stone-coffin and other stone-installations	0	1	0	1
Sum	*31*	*18*	*4*	*49*

Table 5.44: Percentage of Different Kinds of Stone Material Used for Graves with Stone Elements.

Stone material	Count	Percentage	Stone material	Count	Percentage
Slate (metamorphic)	112	43.92%	Slate (metamorphic)	112	43.92%
Sedimentary rock	3	1.18%	Sedimentary rock	33	12.94%
Sandstone (sedimentary)	26	10.20%	Igneous rock	110	43.14%
Limestone (sedimentary)	4	1.57%	*Sum*	*255*	*100.00%*
Igneous rock	85	33.33%			
Granite (igneous)	25	9.80%			

Table 5.45: Stone Material Used by Grave Type, Grave Count, and Percentage.

Stone Material	igneous rock		sedimentary rock		slate		unknown
megalithic graves	101	92.66%	7	6.42%	1	0.92%	165
stone-construction graves	9	6.16%	26	17.81%	111	76.03%	247
SUM	*110*	*41.51%*	*33*	*12.45%*	*112*	*42.26%*	*412*

Table 5.46: Stone Material Used by Grave Type and Count.

Material/ Grave Type	granite	igneous rock	sandstone	sedimentary rock	limestone	unworked slates	slate	unknown
megalithic grave	25	76	5	2	0	1	0	165
stone-construction grave	0	9	20	2	4	0	111	247
SUM	*25*	*85*	*25*	*4*	*4*	*1*	*111*	*412*

Table 5.47: Stone Material Used by Region and Grave Count.

Material/ Location	granite	igneous rock	sandstone	sedimentary rock	limestone	unworked slates	slate	unkn.	SUM
Dechang	3	46	0	0	0	0	0	49	98
Huili	0	0	1	0	0	0	66	24	91
Luquan	0	0	0	0	0	0	7	1	8
Meigu	0	0	0	0	0	0	12	10	22
Mianning	0	8	0	0	0	0	0	14	22
Panzhihua	0	0	0	0	0	0	26	14	40
Puge	0	5	0	0	0	0	0	6	11
Xichang	22	4	0	0	0	1	0	99	126
Xide	0	9	0	0	0	0	0	34	43
Yanyuan	0	0	2	0	4	0	0	20	26
Yongsheng	0	2	0	1	0	0	0	13	16
Yuexi	0	7	0	0	0	0	0	2	9
Zhaojue	0	4	23	2	0	0	0	156	185
SUM	*25*	*85*	*26*	*3*	*4*	*1*	*111*	*442*	*697*

Table 5.48: Stone Material Used by Region, Grave Count, and Percentage.

Material	**igneous rock**		**sedimentary rock**		**slate**	
Dechang	49	100.00%	0	0.00%	0	0.00%
Huili	0	0.00%	1	1.49%	66	98.51%
Luquan	0	0.00%	0	0.00%	7	100.00%
Meigu	0	0.00%	0	0.00%	12	100.00%
Mianning	8	100.00%	0	0.00%	0	0.00%
Panzhihua	0	0.00%	0	0.00%	26	100.00%
Puge	5	100.00%	0	0.00%	0	0.00%
Xichang	26	96.30%	0	0.00%	1	3.70%
Xide	9	100.00%	0	0.00%	0	0.00%
Yanyuan	0	0.00%	6	100.00%	0	0.00%
Yongsheng	2	66.67%	1	33.33%	0	0.00%
Yuexi	7	100.00%	0	0.00%	0	0.00%
Zhaojue	4	13.79%	25	86.21%	0	0.00%
SUM	*110*	*43.14%*	*33*	*12.94%*	*112*	*43.92%*

Table 5.49: Descriptive Statistics for Slope and Aspect at Grave Sites vs. Non-Site Sample of 600 Points.

	All Sites	*Non-Sites*	*Earth-Pit*	*Megalith*	*Stone*	*All Sites*	*Non-Sites*	*Earth*	*Megalith*	*Stone*
	Slope					Aspect				
Mean	8.95	21.37	5.79	8.44	11.68	181.92	181.38	206.22	168.87	187.96
St. Error	0.54	0.42	0.79	0.80	0.98	6.66	3.91	13.76	9.59	12.00
Median	6.26	20.93	4.37	5.32	9.48	187.94	180.76	217.73	162.53	213.84
Mode	0.82	#N/A	0.82	3.22	4.82	270.00	#N/A	#N/A	270.00	107.24
St. Dev.	8.13	10.19	5.24	8.36	8.43	100.15	95.86	91.28	100.12	103.21
Kurtosis	1.18	0.38	2.65	1.56	0.13	-1.20	-1.24	-1.04	-1.17	-1.22
Skew.	1.32	0.52	1.55	1.46	0.94	-0.06	0.03	-0.20	0.14	-0.25
Range	33.89	61.67	22.95	33.89	32.78	356.93	347.80	321.32	356.93	351.73
Min.	0.16	0.97	0.36	0.16	0.68	0.00	2.05	27.90	0.00	1.08
Max.	34.05	62.64	23.31	34.05	33.47	356.93	349.85	349.22	356.93	352.81
Count	226	600	44	109	74	226	600	44	109	74

Table 5.50: Descriptive Statistics for Elevation and Distance to River at Grave Sites vs. Non-Site Sample.

	All Sites	*Non-Sites*	*Earth*	*Megalith*	*Stone*	*All Sites*	*Non-Sites*	*Earth*	*Megalith*	*Stone*
	Elevation					Distance to River				
Mean	1797.80	2492.74	2032.00	1599.26	1960.57	1.84	4.39	1.52	1.60	2.37
St. Err.	26.05	33.01	69.20	20.60	47.38	0.13	0.12	0.25	0.17	0.26
Median	1779.50	2412.50	2154.50	1556.00	2079.50	0.96	3.70	0.78	0.93	1.50
Mode	2341.00	2016.00	2378.00	1567.00	1907.00	0.00	#N/A	#N/A	#N/A	#N/A
St. Dev.	391.57	808.57	459.02	215.03	407.59	1.95	3.02	1.69	1.74	2.28
Kurtosis	-0.37	0.20	-0.56	3.53	0.71	0.80	-0.15	1.54	2.29	-0.50
Skew.	0.31	0.42	-0.46	1.16	-0.92	1.33	0.70	1.49	1.73	0.83
Range	1866.00	4351.00	1826.00	1453.00	1852.00	8.64	14.28	6.48	8.21	8.64
Min.	933.00	578.00	973.00	1151.00	933.00	0.00	0.01	0.00	0.00	0.00
Max.	2799.00	4929.00	2799.00	2604.00	2785.00	8.64	14.29	6.48	8.21	8.64
Count	226	600	44	109	74	226	600	44	109	74

Table 5.51: Slope at Grave Sites by Grave Type.

Slope (degrees)	**20.01-32**	**10-20**	**4-9.9**	**1-3**	**<1**
megalithic grave	2	55	130	46	34
stone-construction grave	39	80	125	36	3
earth-pit graves	0	23	177	41	0

Table 5.52: Visibility by Construction and Location.

	visibility by location			
visibility category by construction	low	medium	high	SUM
5	8	11	27	46
	17.39%	23.91%	58.70%	100.00%
4.5	6	28	61	95
	6.32%	29.47%	64.21%	100.00%
	62	65	37	164
3	37.80%	39.63%	22.56%	100.00%
	137	83	20	240
2	57.08%	34.58%	8.33%	100.00%
	101	26	4	131
1	77.10%	19.85%	3.05%	100.00%
	260	91	38	389
0	66.84%	23.39%	9.77%	100.00%

Table 5.53: Aspect at Grave Sites by Grave Type

Aspect	megalithic graves		stone-construction		earth-pit graves		random points		all graves	
N	10	9.17%	8	10.81%	3	6.82%	36	5.99%	21	10.19%
NE	17	15.60%	8	10.81%	3	6.82%	71	11.81%	28	13.59%
E	20	18.35%	10	13.51%	6	13.64%	100	16.64%	36	17.48%
SE	11	10.09%	7	9.46%	7	15.91%	76	12.65%	25	12.14%
S	12	11.01%	6	8.11%	4	9.09%	75	12.48%	22	10.68%
SW	14	12.84%	9	12.16%	7	15.91%	74	12.31%	30	14.56%
W	16	14.68%	17	22.97%	7	15.91%	89	14.81%	40	19.42%
NW	9	8.26%	9	12.16%	7	15.91%	80	13.31%	25	12.14%
SUM	*99*	*90.83%*	*66*	*89.19%*	*41*	*93.18%*	*565*	*94.01%*	*206*	*100.00%*

Table 5.54: Grave Orientation by Grave Type.

Orientation	**megalithic graves**		**stone-construction**		**earth-pit graves**		**all graves**	
E	85	30.69%	37	13.07%	46	19.09%	168	20.97%
W	47	16.97%	33	11.66%	21	8.71%	101	12.61%
N	68	24.55%	73	25.80%	23	9.54%	164	20.47%
S	21	7.58%	34	12.01%	80	33.20%	135	16.85%
NE	12	4.33%	75	26.50%	0	0.00%	87	10.86%
SW	9	3.25%	30	10.60%	9	3.73%	48	5.99%
NW	20	7.22%	1	0.35%	37	15.35%	58	7.24%
SE	15	5.42%	0	0.00%	25	10.37%	40	4.99%
SUM	*277*	*100.00%*	*283*	*100.00%*	*241*	*100.00%*	*801*	*100.00%*

Table 5.55: Grave Orientation by Grave Type (Modified).

	megalithic graves		**stone-construction**		**earth-pit graves**	
E or W	132	47.65%	70	24.73%	67	27.80%
N or S	89	32.13%	107	37.81%	113	46.89%
NE or SW	21	7.58%	105	37.10%	9	3.73%
NW or SE	35	12.64%	1	0.35%	62	25.73%

Table 5.56: Correlation between Aspect and Grave Orientation.

	megalithic graves		**stone-construction graves**		**earth-pit graves**		**All graves**	
right angle	60	21.66%	49	17.31%	21	8.71%	130	16.23%
angle	96	34.66%	162	57.24%	147	61.00%	405	50.56%
same	121	43.68%	72	25.44%	73	30.29%	266	33.21%
SUM	*277*	*100.00%*	*283*	*100.00%*	*241*	*100.00%*	*801*	*100.00%*

Table 5.57: Test of Correlation for Aspect and Grave Orientation for All Graves.

			OrientationNum	Aspect
OrientationNum	Pearson Correlation		1	.129**
	Sig. (2-tailed)			.000
	N		801	801
Aspect	Pearson Correlation		.129**	1
	Sig. (2-tailed)		.000	
	N		801	801
Kendall's tau_b	OrientationNum	Correlation Coefficient	1.000	.139**
		Sig. (2-tailed)	.	.000
		N	801	801
	Aspect	Correlation Coefficient	.139**	1.000
		Sig. (2-tailed)	.000	.
		N	801	801
Spearman's rho	OrientationNum	Correlation Coefficient	1.000	.174**
		Sig. (2-tailed)	.	.000
		N	801	801
	Aspect	Correlation Coefficient	.174**	1.000
		Sig. (2-tailed)	.000	.
		N	801	801

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5.58: Cross-tabulation and Tests of Significance for Aspect and Orientation for All Graves.

		AspectWord									Total
			E	N	NE	NW	S	SE	SW	W	
Orientation grave		7	0	0	0	0	0	0	0	0	7
	E	0	45	6	21	21	10	35	7	23	168
	N	0	15	31	37	12	20	18	4	27	164
	NE	0	25	10	4	16	8	0	5	19	87
	NW	0	0	1	1	13	1	32	9	1	58
	S	0	6	9	2	1	9	76	1	31	135
	SE	0	4	6	1	3	0	23	3	0	40
	SW	0	0	0	1	1	1	2	6	37	48
	W	0	19	6	1	14	14	32	8	7	101
Total		7	114	69	68	81	63	218	43	145	808

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	1.266			.000
	Cramer's V	.448			.000
	Contingency Coefficient	.785			.000
Ordinal by Ordinal	Kendall's tau-b	.201	.028	7.255	.000
	Kendall's tau-c	.191	.026	7.255	.000
	Gamma	.234	.032	7.255	.000
Measure of Agreement	Kappa	.073	.015	5.936	.000
N of Valid Cases		808			

Table 5.59: Test of Correlation for Aspect and Grave Orientation for Megalithic Graves.

			OrientationNum	Aspect
OrientationNum	Pearson Correlation		1	.151*
	Sig. (2-tailed)			.010
	N		288	288
Aspect	Pearson Correlation		.151*	1
	Sig. (2-tailed)		.010	
	N		288	288
Kendall's tau_b	OrientationNum	Correlation Coefficient	1.000	.087*
		Sig. (2-tailed)	.	.045
		N	288	288
	Aspect	Correlation Coefficient	.087*	1.000
		Sig. (2-tailed)	.045	.
		N	288	288
Spearman's rho	OrientationNum	Correlation Coefficient	1.000	.122*
		Sig. (2-tailed)	.	.038
		N	288	288
	Aspect	Correlation Coefficient	.122*	1.000
		Sig. (2-tailed)	.038	.
		N	288	288

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5.60: Cross-tabulation and Tests of Significance for Aspect and Orientation for Megalithic Graves.

		AspectWord								Total
		E	N	NE	NW	S	SE	SW	W	
OrientationWord	E	31	6	15	9	3	10	4	8	86
	N	2	10	16	3	10	2	1	24	68
	NE	1	0	4	1	1	0	4	11	22
	NW	0	0	1	8	1	0	9	1	20
	S	2	7	2	1	5	1	1	2	21
	SE	2	6	1	1	0	2	3	0	15
	SW	0	0	1	1	1	0	6	0	9
	W	16	1	1	11	8	2	5	3	47
Total		54	30	41	35	29	17	33	49	288

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.888			.000
	Cramer's V	.336			.000
	Contingency Coefficient	.664			.000
Ordinal by Ordinal	Kendall's tau-b	.066	.048	1.396	.163
	Kendall's tau-c	.063	.045	1.396	.163
	Gamma	.078	.056	1.396	.163
N of Valid Cases		288			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Correlation statistics are available for numeric data only.

Table 5.61: Test of Correlation for Aspect and Grave Orientation for Earth-Pit Graves.

			OrientationNum	Aspect
OrientationNum	Pearson Correlation		1	.110
	Sig. (2-tailed)			.087
	N		241	241
Aspect	Pearson Correlation		.110	1
	Sig. (2-tailed)		.087	
	N		241	241
Kendall's tau_b	OrientationNum	Correlation Coefficient	1.000	.281**
		Sig. (2-tailed)	.	.000
		N	241	241
	Aspect	Correlation Coefficient	.281**	1.000
		Sig. (2-tailed)	.000	.
		N	241	241
Spearman's rho	OrientationNum	Correlation Coefficient	1.000	.341**
		Sig. (2-tailed)	.	.000
		N	241	241
	Aspect	Correlation Coefficient	.341**	1.000
		Sig. (2-tailed)	.000	.
		N	241	241

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5.62: Cross-tabulation and Tests of Significance for Aspect and Orientation for Earth-Pit Graves.

		AspectWord						Total
		E	NW	S	SE	SW	W	
OrientationWord	E	4	0	7	24	2	9	46
	N	7	0	0	16	0	0	23
	NW	0	5	0	32	0	0	37
	S	0	0	0	75	0	5	80
	SE	2	2	0	21	0	0	25
	SW	0	0	0	2	0	7	9
	W	0	0	0	19	0	2	21
Total		13	7	7	189	2	23	241

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.827			.000
	Cramer's V	.370			.000
	Contingency Coefficient	.637			.000
Ordinal by Ordinal	Kendall's tau-b	.154	.066	2.268	.023
	Kendall's tau-c	.101	.044	2.268	.023
	Gamma	.262	.111	2.268	.023
N of Valid Cases		241			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Correlation statistics are available for numeric data only.

Table 5.63: Test of Correlation for Aspect and Grave Orientation for Stone-Construction Graves.

			OrientationNum	Aspect
OrientationNum	Pearson Correlation		1	.258**
	Sig. (2-tailed)			.000
	N		272	272
Aspect	Pearson Correlation		.258**	1
	Sig. (2-tailed)		.000	
	N		272	272
Kendall's tau_b	OrientationNum	Correlation Coefficient	1.000	.182**
		Sig. (2-tailed)	.	.000
		N	272	272
	Aspect	Correlation Coefficient	.182**	1.000
		Sig. (2-tailed)	.000	.
		N	272	272
Spearman's rho	OrientationNum	Correlation Coefficient	1.000	.282**
		Sig. (2-tailed)	.	.000
		N	272	272
	Aspect	Correlation Coefficient	.282**	1.000
		Sig. (2-tailed)	.000	.
		N	272	272

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5.64: Cross-Table and Tests of Significance for Aspect and Orientation for Stone-Construction Graves.

		AspectWord								Total
		E	N	NE	NW	S	SE	SW	W	
OrientationWord	E	10	0	6	12	0	1	1	6	36
	N	6	21	21	9	10	0	3	3	73
	NE	24	10	0	15	7	0	1	8	65
	NW	0	1	0	0	0	0	0	0	1
	S	4	2	0	0	4	0	0	24	34
	SW	0	0	0	0	0	0	0	30	30
	W	3	5	0	3	6	11	3	2	33
Total		47	39	27	39	27	12	8	73	272

		Value	Asymp. Std. Er.[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	1.085			.000
	Cramer's V	.443			.000
	Contingency Coefficient	.735			.000
Ordinal by Ordinal	Kendall's tau-b	.272	.042	6.485	.000
	Kendall's tau-c	.261	.040	6.485	.000
	Gamma	.318	.049	6.485	.000
N of Valid Cases		272			

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.
c. Correlation statistics are available for numeric data only.

Table 5.65: Grave orientation by County.

County	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**SUM**
Dechang	15	1	19	4	6	4	34	9	92
Xichang	33	7	51	6	5	5	13	4	124
Mianning	2		27		1				30
Yuexi	1		6		7		1		15
Puge	1	3			2			1	7
Xide	16		12	6				5	39
Meigu	7						13		20
Zhaojue	30	32	12		34	30	15		153
Huili	39	19	21	21	75	2	19	35	231
Luquan	2	2		2				2	8
Ninglang					4	7			11
Panzhihua	3	23	1				2	2	30
Yanyuan	7		9		1		2		19
Yongsheng	8		10				2		20
SUM	*164*	*87*	*168*	*39*	*135*	*48*	*101*	*58*	*800*

Table 5.66: Aspect at Grave Sites by County.

County	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**SUM**
Dechang	3	4	28	7	15	9	8	18	92
Xichang	5	10	21	13	13	19	28	15	124
Mianning		1	4	22	1		2		30
Yuexi	8		4	1		2			15
Puge		5	2						7
Xide	14	19	1		1	5			40
Meigu	5				11	3	1		20
Zhaojue	20	5	16	10	16	2	81	3	153
Huili		21	31	164	6	3	2	4	231
Luquan								8	8
Ninglang							11		11
Panzhihua	14	2		1				14	31
Yanyuan			7				12		19
Yongsheng		1						19	20
SUM	*69*	*68*	*114*	*218*	*63*	*43*	*145*	*81*	*801*

Table 5.67: Graves and Grave Groups.

ID	*Num.*	*Orientation*	*Relative orientation*	*Spacing*	*Grave type*	*Sub-type*
DAR	5	SW, SE, S	roughly same	13-60 m	megalithic	1.1, 2.1, 2.2
DAX	2	S, S	same	8 m	megalithic	1.1
DAU	2	S, E	different		megalithic	1.1
DCZ	1	S			megalithic	1.1
DDB	4	E, E, N, S	different		megalithic	1.1
DCB	1	NW			megalithic	1.1
DDG	1	N			megalithic	1.1
DDM	4				megalithic	1.1
DFJ	2	E	same	300 m	megalithic	1.1
DGH	1	SW			megalithic	1.1
DGD	2	NW	same		megalithic	1.2
DGY	9	N, NE, S	different		megalithic	1.1, 1.2
DHF	1	N			megalithic	1.2
DHS	1	E			megalithic	1.3
DHM	3	E	same		megalithic	1.2
DHC	1	W			megalithic	1.2
DHJ	1	E			megalithic	1.2
DLS	1	SE			megalithic	1.2
DLJ	3	W	same		megalithic	1.2
DMA	1	SE			megalithic	1.2
DML	1	W			megalithic	1.2
DMN	1	N			megalithic	1.2
DMZ	3	S, W, W	different		megalithic	1.2
DNB	1	N			megalithic	1.2
DNH	1	E			megalithic	1.2
DSB	1	E			megalithic	1.1
DSR	1	E			megalithic	1.2
DSL	1	N			megalithic	1.2
DSJ	2	W	same		megalithic	1.1
DSC	12	W	same	50 m	megalithic	1.1

ID	*Num.*	*Orientation*	*Relative orientation*	*Spacing*	*Grave type*	*Sub-type*
DWS	40	E	same		megalithic	1.1
DWJ	1	W			megalithic	1.3
DXG	2				megalithic	1.2
DXL	8	NW, W	roughly same	< 50 m	megalithic	1.2
DXM	7	NW, W	roughly same		megalithic	1.2
DXW	1	E			megalithic	1.2
DYZ	2	E	same	4 m	megalithic	1.2
DYX	2	NW, W	roughly same		megalithic	1.2
DYJ	1	W			megalithic	1.2
DZJ	1	N			megalithic	1.2
HFJ	156	N, NW, SE	roughly same	dense	earth-pit, stone	1.3
HGS	1				stone	
HGJ	10	NW	same		earth-pit, stone	
HHT	2	E			stone	1.1
HZD	4	N	same		earth-pit, stone	1.3
HLS	1				stone	
HML	1	N			earth-pit, stone	1.1
HPL	3	N	same		stone	1.1
HTJ	1	E			stone	2.2
HTP	1	E			earth-pit	
HWT	30	NW, W	roughly same	regular	earth-pit, stone	
HWH	10			dense	earth-pit, stone	
HXT	100	E	same		earth-pit, stone	
HXP	200	N, NE	roughly same	dense	earth-pit, stone	
HXC	2	E	same		stone	2.2
HYP	10	E	same		stone	2.2
HYS	19	N	same		stone	1.2, 1.3
LYB	8	N, NE, SE	different	0.5 m	stone	1.2, 1.3, 2.3
MAB	5	N,W	different		stone	1.2, 2.2
MJJ	10	N, W	different		stone	1.2
MSW	2				stone	1.1
MWC	1	W	same		stone	
MWB	2	W	same	5 m	stone	2.2
MWD	1	W			stone	2.2
MWT	1	W			stone	2.2
MBB	1	N			megalithic	1.1
MCG	1				megalithic	1.2
MMW	1	E			megalithic	1.1
MRS	4	E	same		megalithic	1.1
MSK	1	S			megalithic	1.2
MSL	1	E			megalithic	1.3
MXS	1	N			megalithic	1.2
MXG	21	E	same	0.5-1 m	megalithic	4.1
MSJ	5	E	same		megalithic	1.2
MTB	3	N, NE	roughly same		megalithic	1.3, 1.2
MWQ	2	N, NW	roughly same	1000 m	megalithic	1.2
NDX	11	S, SW	roughly same		earth-pit	
PAM	2		exactly same	40 m	megalithic	
PHP	1				megalithic	
PWL	7				megalithic, earth-pit	

PXC	40		different		megalithic	
RBH	12		roughly same	2-4 m	stone	
RBG	10		roughly same	2-3 m	stone	
XBB	10		roughly same	40-150 m	megalithic	
XBJ	5		exactly same		megalithic	
XBS	150		different		megalithic, urns	
XCC	2		exactly same	14 m	megalithic	
XCY	2		different		megalithic	
XDA	1				megalithic	
XDB	4		exactly same		megalithic	
XDC	9				megalithic	
XDS	1				megalithic	
XDY	11	E, NE	roughly same		megalithic, earth-pit	
XGS	1				megalithic	
XGH	5		same	30 m	megalithic	
XHG	7		slightly different		megalithic	
XHQ	1				megalithic	
XHT	3		different		megalithic	
XJX	1				megalithic	
XLG	1				megalithic	
XLJ	6		exactly the same		megalithic	
XLZ	28	N, NW, E			megalithic, earth-pit	
XLS	1	N			megalithic	1.2
XMS	1	E			earth-pit	
XML	4	E	same		megalithic	1.2, 2.2
XMM	3	S	same	5 m	megalithic	1.2
XMI	2	E, NE	same		megalithic	1.1
XQG	4	N, N, E			earth-pit	
XRS	1				megalithic	1.2
XSJ	1				megalithic	1.2
XSX	1	N			megalithic	1.2
XSB	1	E			megalithic	1.2
XSZ	1	SW			megalithic	1.2
XSG	2	N	same		megalithic	1.2
XTC	1	W			megalithic	1.2
XTH	15	N			megalithic, earth-pit	4.2
XTU	6	E, SE	roughly same	0.3-0.5 m	megalithic	1.2
XWN	5	E, N, SW	different	25-160 m	megalithic	1.1, 1.2, 2.1
XNG	4	N, S	same		megalithic	1.2
XXH	2	W			megalithic	1.1
XXJ	3	SW			megalithic	1.2, 2.1
XXS	2				megalithic	3.2
XXC	6				megalithic	1.2
XXY	2	N	same	100 m	megalithic	1.2
XXX	1	N			megalithic	1.2
XYG	3				earth-pit	
XYJ	3	S, SE, SW	slightly different	3 m	megalithic	1.1
XYZ	4	E	same		megalithic	1.2
XYP	2	E			earth-pit	
XYU	3	W		30	megalithic	1.1
XYD	1				megalithic	1.2

XZF	1				megalithic	1.2
XGQ	6	E, N	slightly different		megalithic	1.2
XGY	2				megalithic	1.2
XLK	10	N	same	7-20 m	megalithic	1.2, 2.1, 2.2
XLF	3	E	same	15 m	megalithic	1.2
XLN	1	N			megalithic	1.2
XQL	1				megalithic	1.2
XWJ	1	E			megalithic	1.2
XWH	14	E, SE	roughly same	dense	megalithic	1.2
YHM	1				stone	
YPC	1				stone	
YXD	1				stone	
PYX	1				stone	
YYW	4	N, NW, W	slightly different		stone	1.3
YBG	1				earth-pit	
YBS	1				earth-pit	
YCJ	4				earth-pit, stone	1.2
YGS	3				earth-pit	
YHT	1				earth-pit	
YJD	1				earth-pit	
YBI	1	N	same		earth-pit	
YLL	13	E, S, W		0.2-0.3 m	earth-pit	1.2, 3.1
YLW	1				earth-pit	
YMB	4				earth-pit	1.1, 1.2
YMY	1		roughly same		earth-pit	
YNH	1				earth-pit	
YTL	1				earth-pit	
YTS	20			2 m	earth-pit	
YWM	20				earth-pit	
YWS	3	N	same	1-3 m	earth-pit	
YBIII	3	N	roughly same	1-3 m	earth-pit	
YXG	1				stone	
YXH	2				earth-pit	
YYN	10				earth-pit	2.2
YYS	1				earth-pit	2.2
YZS	1				earth-pit	
YDZ	140	N, E, W	roughly same		earth-pit	1, 3.1, 5.1
YQD	1	N			earth-pit	1.1
YYH	2	E	roughly same	2 m	earth-pit	
YLS	4	E	roughly same		earth-pit	
YQS	8	S, one N	same		megalithic	1.1, 1.2, 1.3
YWJ	1	W			stone	1.2
ZAB	6	N	same		stone	2.2
ZBE	1				stone	
ZBK	1				stone	
ZCB	10	E, NE	roughly same		stone	1.2, 5.1
ZDG	100		slightly different		stone	
ZDZ	1				stone	
ZDD	1				stone	
ZDQ	2		roughly same		stone	
ZDC	12	W	same		stone	1.2

ZJE	4	NE	same slope		stone	2.2, 5.2
ZEK	12	N, NE	roughly same	3-6 m	stone	2.2, 2.4, 1.2
ZEZ	1				stone	
ZEW	2	W	same		stone	1.2, 2.2
ZFC	3	N, NE	roughly same	3-6 m	stone	2.2, 2.4
ZGY	1				stone	
ZHQ	1				stone	
ZHY	1				stone	
ZHL	1				stone	
ZLY	32	SW, S	same		stone	2.4
ZJN	1				stone	4.2
ZKW	3	S	same		stone	2.2
ZKE	1				stone	
ZME	3	E	same		stone	1.2
ZMC	56	E, N	different		stone	1.2
ZMK	1	S			stone	2.2
ZMJ	3	S	same		stone	1.2
ZNT	4	S	same		stone	1.2, 2.2
ZNP	1				stone	
ZPB	27	N, NE	roughly same	3-4 m	stone	2.3, 2.4
ZQJ	12	NE, E	roughly same		stone	1.1, 1.3, 3, 4
ZSE	8	N	same		stone	2.2
ZTL	1				stone	
ZTW	3	E	same		stone	2.2
ZWG	3	E, E, W	roughly same		stone	2.2, 1.2
ZWT	20	S	same		stone	
ZWS	5	N, NE	roughly same	3-6 m	stone	2.2, 2.4, 1.2
ZYB	1				stone	
ZYG	2	S	same		stone	2.2

Table 5.68: Number of Interments per Grave and Frequency of Occurrence of Different Interment Types.

Number interred	**Count**	**Percentage**		**Interment type**	**Count**	**Percent**
Single	86	64.18%		Primary	49	36.57%
Double	4	2.99%		Secondary	31	23.13%
Multiple (3-6 skeletons)	11	8.21%		Primary and secondary	1	0.75%
Group-burial (9-20 skeletons)	10	7.46%		Inhumation + cremation	3	2.24%
Mass-grave (48-125)	7	5.22%		Cremation	27	20.15%
Several interments	16	11.94%		Unknown	23	17.16%
Sum	*134*	*100.00%*		*Sum*	*134*	*100.00%*

Table 5.69: Skeleton Positions and Types of Body Treatment.

Skeleton Position	**Count**	**Perc.**		**Body treatment**	**C.**	**Perc.**
Extended supine	51	38.06%		Wrapping	1	0.75%
In urn	28	20.90%		Application of red substance	1	0.75%
Irregular placement	31	23.13%		Detachment of skull	1	0.75%
Mostly piled in rear, some scattered	4	2.99%		Skull placed on stomach	4	2.99%
Stacked in layers throughout grave	6	4.48%		Rearranging	24	17.91%
Unclear	14	10.45%		Stacking of bones	9	6.72%
Sum	*134*	*100.00%*		Bones by type in piles	1	0.75%
				Sum	*41*	*30.60%*

Table 5.70: Correlation Table of Skeleton Number Types and Skeleton Positions.

	All	Primary	Primary disarranged	Secondary	Primary + sec.	Inhum + cremation	Cremation	Un-known
Single	86	45	0	8	0	0	26	7
Double	4	3	0	0	1	0	0	0
Multiple	11	1	2	5	0	1	0	2
Group	10	0	6	1	0	1	0	2
Mass	7	0	4	0	0	1	0	2
Several	16	0	1	5	0	0	0	10
Sum	*134*	*49*	*13*	*19*	*1*	*3*	*26*	*23*

Table 5.71: Correlation Table of Interment Types and Skeleton Positions.

	All	Primary	Primary disarranged	Secon-dary	Primary + sec.	Inhum + crem.	Cremation	Un-known
Extended sup.	51	49	1	0	1	0	0	0
In urn	28	0	0	1	0	0	27	0
Irregular	31	0	8	8	0	1	0	14
Piled in rear	4	0	3	0	0	1	0	0
Stacked	6	0	1	4	0	1	0	0
Unclear	14	0	0	6	0	0	0	8
Sum	*134*	*49*	*13*	*19*	*1*	*3*	*27*	*22*

Table 5.72: Correlation Table of Skeleton Number Types and Skeleton Positions.

	All	Single	Double	Multiple	Group	Mass	Several
Extended supine	51	45	4	1	1	0	0
In urn	28	28	0	0	0	0	0
Irregular Placement	31	1	0	6	6	4	14
Piled in rear	4	0	0	1	1	1	1
Stacked	6	0	0	3	2	1	0
Unclear	14	13	0	0	0	1	0
Sum	*134*	*87*	*4*	*11*	*10*	*7*	*15*

Table 5.73: Degree of Likelihood of Reopening of the Graves.

Degree of likelihood of reopening	Count	Percentage
High	188	17.72%
Medium	111	10.46%
Low	555	52.31%
None	204	19.23%
Unclear	3	0.28%
Total	*1061*	*100%*

Table 5.100: Main Object Categories and their Placement within the Grave.

Personal ornaments and clothing applications			
Between or on bones and around head	364	63.86%	28.79%
Middle	74	12.98%	6.06%
On one side	4	0.70%	0.33%
On one end	51	8.95%	4.17%
In front chamber	4	0.70%	0.33%
On second-level ledge	1	0.18%	0.08%
Outside coffin	43	7.54%	3.52%

Outside grave	29	2.38%	2.37%
SUM 1	*570*	*100%*	
Unclear	652		53.36%
SUM 2	*1222*		*100%*
Other ornaments			
Unclear	40		100%
Cowry shells			
Middle	1		25%
Placement unclear	3		75%
SUM	*4*		*100%*
Weapons and Tools			
Between bones	59	34.91%	5.09%
Middle	27	15.98%	2.33%
On right side	5	2.96%	0.43%
On left side	4	2.37%	0.35%
Above head	31	18.34%	2.67%
On one end	3	1.78%	0.26%
Foot compartment	21	12.42%	1.81%
On second-level ledge	2	1.18%	0.17%
On divider	2	1.18%	0.17%
Outside coffin	5	2.96%	0.43%
Outside grave	10	5.92%	0.86%
SUM 1	*169*	*100%*	
Unclear	989		85.41%
SUM 2	*1158*		*100%*
Armor			
On body	11	84.62%	40.74%
On one end	1	7.69%	3.70%
On second-level ledge	1	7.69%	3.70%
SUM 1	*13*	*100%*	
Unclear	14		51.85%
SUM 2	*27*		*100%*
Ceramic Vessels			
On one end	377	54.64%	21.04
Above head	140	20.29%	7.81%
At Feet	29	4.20%	1.61%
Head compartment	19	2.75%	1.06%
Foot compartment	7	1.01%	0.39%
Between bones	36	5.22%	2.00%
Middle	65	9.42%	3.63%
On left side	5	0.72%	0.28%
On right side	2	0.28%	0.11%
Outside grave	10	1.44%	0.56%
SUM 1	*690*	*100%*	
Unclear	1102		61.50%
SUM 2	*1792*		*100%*
Metal vessels			
Foot compartment	2	100%	4.35%
SUM 1	*2*	*100%*	
Unclear	44		95.65%
SUM 2	*46*		*100%*

Drums			
Foot compartment	1	50%	8.33%
On second-level ledge	1	50%	8.33%
SUM 1	*2*	*100%*	
Unclear	10		83.33%
SUM 2	*12*		*100%*
***Bianzhong* bells**			
Foot compartment	1		14.29%
In object pit	6		85.71%
SUM	*12*		*100%*
***Ling* bells**			
Between bones	6		50.00%
In middle	4		33.34%
On second-level ledge	1		8.33%
Staffheads			
Unclear	9		100%
Stands			
Unclear	8		100%
Mirror			
Unclear	1		100%
Horse equipment			
At horse head	5	27.78%	10.42%
Unclear	10	55.56%	20.83%
Foot compartment	3	16.67%	6.25%
SUM 1	*18*	*100%*	
Unclear	30		62.50%
SUM 2	*48*		*100%*
Seal			
Unclear	1		100%
Coins			
Between bones	11	78.57%	18.97%
On left side	3	21.43%	5.17%
SUM 1	*14*	*100%*	
Unclear	44		75.86%
SUM 2	*58*		*100%*
Smooth flat oval cobbles			
At head	34	85.00%	62.96%
At feet	1	2.50%	1.85%
Middle	5	12.5%	12.50%
On top of ceramic vessel	3	7.50%	5.56%
SUM 1	*40*	*100%*	
Unclear	14		25.93%
SUM 2	*54*		*100%*
Stone balls			
Legs	3	50%	42.86%
Feet	3	50%	42.86%
SUM 1	*6*	*100%*	
Unclear	1		14.28%
SUM 2	*7*		*100%*
Carbonized Ropes			
In burial chamber	6		100%

Table 5.75: Ceramics at Grave Sites (n=420).

Object Type	**Count**	**Percentage**	**Object Type**	**Count**	**Percentage**
jar	413	25.34%	spindle whorl	83	5.09%
single-handled jar	109	6.69%	pendant	2	0.12%
double-handled jar	227	13.93%	ram's head	1	0.06%
four-handled jar	2	0.12%	flat bottom	27	1.66%
jar with handles	7	0.43%	ring foot	13	0.80%
double-jar	3	0.18%	pedestal base	28	1.72%
urn	47	2.88%	handle	7	0.43%
vat	32	1.96%	wall sherds	27	1.66%
cup	51	3.13%	bo bowl	59	3.62%
beaker	73	4.48%	wan bowl	103	6.32%
goblet	106	6.50%	dou bowl	16	0.98%
ewer	50	3.07%	fu cauldron	6	0.37%
vase	126	7.73%	lid	1	0.06%
basin	10	0.61%	net weight	1	0.06%
			SUM	*1630*	*100.00%*

Table 5.76: Ceramic Quality of Ceramic Vessels from Different Types of Sites.

	Graves		**Art market**		**Ceramic pits I**		**Ceramic pits II**	
Firing temp.	*Count*	*Percentage*	*Count*	*Percentage*	*Count*	*Percentage*	*Count*	*Perc.*
high	332	42.46%	76	95.00%	0	0.00%	155	80.73%
medium	3	0.38%	0	0.00%	1	1.27%	0	0.00%
low	447	57.16%	4	5.00%	21	26.58%	0	0.00%
unknown	0	0.00%	0	0.00%	57	72.15%	37	19.27%
SUM	*782*	*100.00%*	*80*	*100.00%*	*79*	*100.00%*	*192*	*100.00%*
Technique	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
hand-thrown	454	58.06%	4	5.00%	72	91.14%	171	89.06%
fast wheel	186	23.79%	0	0.00%	0	0.00%	0	0.00%
slow wheel	8	1.02%	0	0.00%	1	1.27%	0	0.00%
coil-built	7	0.90%	0	0.00%	0	0.00%	21	10.94%
molded	1	0.13%	0	0.00%	0	0.00%	0	0.00%
unknown	126	16.11%	76	95.00%	6	7.59%	0	0.00%
SUM	*782*	*100.00%*	*80*	*100.00%*	*79*	*100.00%*	*192*	*100.00%*
Color	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
red	284	21.95%	2	2.50%	2	2.53%	8	4.17%
red-yellow	34	2.63%	0	0.00%	0	0.00%	0	0.00%
red-brown	345	26.66%	0	0.00%	19	24.05%	0	0.00%
brown	87	6.72%	8	10.00%	50	63.29%	16	8.33%
yellow-brown	41	3.17%	0	0.00%	0	0.00%	2	1.04%
yellow	54	4.17%	0	0.00%	0	0.00%	0	0.00%
grey	157	12.13%	2	2.50%	0	0.00%	13	6.77%
grey-brown	168	12.98%	0	0.00%	3	3.80%	5	2.60%
black	86	6.65%	68	85.00%	3	3.80%	4	2.08%
black-grey	24	1.85%	0	0.00%	0	0.00%	0	0.00%
black-brown	14	1.08%	0	0.00%	0	0.00%	5	2.60%
unknown	0	0.00%	0	0.00%	2	2.53%	139	72.40%
SUM	*1294*	*100.00%*	*80*	*100.00%*	*79*	*100.00%*	*192*	*100.00%*
Quality	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*

fine clay	34	2.45%	0	0.00%	0	0.00%	0	0.00%
clay	229	16.51%	26	32.50%	0	0.00%	23	99.00%
coarse clay	1	0.07%	0	0.00%	0	0.00%	0	0.00%
fine sand	41	2.96%	53	66.25%	0	0.00%	5	0.00%
sand	987	71.16%	1	1.25%	79	100.00%	28	1.00%
coarse sand	95	6.85%	0	0.00%	0	0.00%	0	0.00%
unknown	0	0.00%	0	0.00%	0	0.00%	136	0.00%
SUM	*1387*	*100.00%*	*80*	*100.00%*	*79*	*100.00%*	*192*	*100.00%*
Surface	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
burnished	35	26.52%	0	0.00%	6	12.50%	72	96.00%
red/white color	0	0.00%	0	0.00%	0	0.00%	1	1.33%
black slip	89	67.42%	9	100.00%	42	87.50%	2	2.67%
red slip	5	3.79%	0	0.00%	0	0.00%	0	0.00%
white slip	2	1.52%	0	0.00%	0	0.00%	0	0.00%
glazed	1	0.76%	0	0.00%	0	0.00%	0	0.00%
SUM	*132*	*100.00%*	*9*	*100.00%*	*48*	*100.00%*	*75*	*100.00%*

Table 5.77: Ceramic Decoration on Ceramic Vessels from Different Types of Sites.

	Graves		**Art market**		**Ceramic pits I**		**Ceramic pits II**	
Decoration	Count	%	Count	%	Count	%	Count	%
decorated	416	26.18%	80	100.00%	17	21.52%	11	5.73%
undecorated	1173	73.82%	0	0.00%	62	78.48%	181	94.27%
	1589	100.00%	80	100.00%	79	100.00%	192	100.00%
Technique	Count	%	Count	%	Count	%	Count	%
appliqué	97	17.73%	30	35.71%	1	10.00%	0	0.00%
impressed	195	35.65%	17	20.24%	0	0.00%	6	54.55%
incision	152	27.79%	28	33.33%	6	60.00%	3	27.27%
cutting	7	1.28%	0	0.00%	1	10.00%	0	0.00%
appliqué/incision	62	11.33%	9	10.71%	0	0.00%	0	0.00%
appliqué/impressed	6	1.10%	0	0.00%	2	20.00%	0	0.00%
incision/impressed	3	0.55%	0	0.00%	0	0.00%	2	18.18%
cutting/incision	25	4.57%	0	0.00%	0	0.00%	0	0.00%
	547	100.00%	84	100.00%	10	100.00%	11	100.00%
Decoration Type	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
finger-tip impressed clay strip	3	0.38%	0	0.00%	2	20.00%	0	0.00%
impressed leaf-vein	132	16.60%	0	0.00%	0	0.00%	6	33.33%
horizontal appliqué	73	9.18%	7	11.11%	0	0.00%	0	0.00%
vertical strip	5	0.63%	7	11.11%	0	0.00%	0	0.00%
inc. horizontal lines	113	14.21%	10	15.87%	3	30.00%	2	11.11%
zigzag of points	7	0.88%	3	4.76%	0	0.00%	3	16.67%
horizontal point lines	40	5.03%	4	6.35%	0	0.00%	3	16.67%
corded pattern	2	0.25%	0	0.00%	0	0.00%	0	0.00%
incised net pattern	14	1.76%	0	0.00%	2	20.00%	1	5.56%
water-ripple patter	110	13.84%	4	6.35%	2	20.00%	1	5.56%
Decoration Type	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
water-ripple + appl.	59	7.42%	6	9.52%	0	0.00%	0	0.00%
horizontal lines of pairs of points	0	0.00%	0	0.00%	0	0.00%	0	0.00%

cut-out triangles	32	4.03%	10	15.87%	1	10.00%	1	5.56%
incised traversal lines	85	10.69%	2	3.17%	0	0.00%	0	0.00%
lying S application	10	1.26%	2	3.17%	0	0.00%	0	0.00%
other appliqué	5	0.63%	0	0.00%	0	0.00%	0	0.00%
incised horizontal lines with vertical application band	1	0.13%	0	0.00%	0	0.00%	0	0.00%
large double-spirals	2	0.25%	7	11.11%	0	0.00%	0	0.00%
fish-bone pattern	13	1.64%	1	1.59%	0	0.00%	1	5.56%
rows of triangles	10	1.26%	0	0.00%	0	0.00%	0	0.00%
multiple complex patterns	76	9.56%	0	0.00%	0	0.00%	0	0.00%
horizontal band of two points on top	2	0.25%	0	0.00%	0	0.00%	0	0.00%
two points	1	0.13%	0	0.00%	0	0.00%	0	0.00%
SUM	*795*	*100.00%*	*63*	*100.00%*	*10*	*100.00%*	*18*	*100.00%*
Deco. Placement	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
inside vessel	0	0.00%	0	0.00%	0	0.00%	0	0.00%
lip	4	0.56%	0	0.00%	0	0.00%	0	0.00%
below rim	20	2.82%	0	0.00%	0	0.00%	1	5.56%
neck	20	2.82%	6	5.61%	0	0.00%	0	0.00%
shoulder	230	32.39%	38	35.51%	8	80.00%	5	27.78%
body	108	15.21%	13	12.15%	1	10.00%	5	27.78%
handle	86	12.11%	41	38.32%	0	0.00%	1	5.56%
foot	90	12.68%	0	0.00%	1	10.00%	0	0.00%
bottom	152	21.41%	9	8.41%	0	0.00%	6	33.33%
SUM	*710*	*100.00%*	*107*	*100.00%*	*10*	*100.00%*	*18*	*100.00%*

Table 5.78: Frequency of Different Functional Vessel Types in Different Kinds of Graves.

Form type	**All (n=307)**		**Multiple/Reopened (n=38)**		**Unopened (n=269)**		**Reliable (n=172)**	
jar	559	1.82	212	5.58	323	1.2	265	1.54
single-handled	149	0.49	76	2	70	0.26	69	0.4
double-handled	249	0.81	121	3.18	126	0.47	35	0.2
four-handled	2	0.01	2	0.05	0	0	0	0
double jar	3	0.01	0	0	3	0.01	3	0.02
urn	52	0.17	5	0.13	47	0.17	35	0.2
vat	32	0.1	0	0	32	0.12	32	0.19
fu	6	0.02	3	0.08	3	0.01	3	0.02
cup	52	0.17	23	0.61	29	0.11	29	0.17
beaker	73	0.24	53	1.39	20	0.07	2	0.01
goblet	132	0.43	14	0.37	104	0.39	115	0.67
ewer	50	0.16	31	0.82	19	0.07	19	0.11
vase	125	0.41	16	0.42	109	0.41	95	0.55
basin	10	0.03	1	0.03	9	0.03	9	0.05
bo	59	0.19	11	0.29	48	0.18	29	0.17
wan	103	0.34	0	0	103	0.38	98	0.57
dou	16	0.05	1	0.03	15	0.06	13	0.08
lid	1	0	0	0	1	0	1	0.01
SUM	*1673*	*5.45*	*569*	*14.98*	*1061*	*3.94*	*852*	*4.96*

Table 5.79: Frequency of Different Functional Vessel Types in Graves with Multiple Interments.

Grave	jar	1-handled jar	2-handel jar	4-handled jar	urn	fu	cup/ beaker	goblet	ewer	vase	basin	bo	dou
DARM1	70	26	30	0	0	0	4	0	0	0	0	0	0
DARM3	1	3	1	0	0	0	3	0	1	3	0	0	0
DARM4	5	0	3	1	0	0	0	0	1	3	1	0	0
MBBM1	1	0	0	0	0	0	0	0	0	0	0	0	0
MSLM1	1	0	0	0	0	0	0	0	0	0	0	0	0
MWQM1	0	10	25	0	0	0	33	0	2	6	0	0	0
MWQM2	0	6	57	0	0	0	11	1	17	1	0	0	1
PXAM1	0	0	0	0	0	0	0	0	1	0	0	0	0
PXBM1	0	3	0	0	0	0	0	0	0	0	0	0	0
PXBM2	0	1	1	0	0	0	0	0	0	0	0	0	0
XBBM4	0	0	0	0	0	0	0	4	1	0	0	1	0
XBBM6	0	0	0	0	0	0	0	1	1	0	0	0	0
XDYDM2	0	0	0	0	5	0	0	0	0	0	0	0	0
XGQM1	2	3	0	0	0	0	0	0	0	0	0	0	0
XGQM2	0	1	0	0	0	0	0	0	0	0	0	0	0
XGSM1	2	0	0	0	0	0	0	0	0	1	0	0	0
XHGM1	1	0	0	0	0	0	0	0	0	0	0	0	0
XHGM2	2	0	0	0	0	0	0	0	0	0	0	0	0
XHGM3	0	0	0	1	0	0	0	1	0	0	0	0	0
XHGM4	1	0	0	0	0	0	0	0	0	0	0	0	0
XHTM1	1	2	0	0	0	0	0	0	0	0	0	0	0
XLKM1	1	0	0	0	0	3	0	1	0	0	0	0	0
XLKM6	0	0	2	0	0	0	5	0	2	0	0	0	0
XLKM8	0	14	1	0	0	0	0	0	0	0	0	0	0
XTHM10	9	0	0	0	0	0	0	3	0	1	0	0	0
XTUM5	1	0	0	0	0	0	0	0	0	0	0	0	0
XWNM1	82	1	0	0	0	0	16	0	0	0	0	9	0
XWNM2	16	0	0	0	0	0	1	0	0	0	0	1	0
XXCM1	2	0	0	0	0	0	0	0	0	0	0	0	0
XXHM1	0	0	0	0	0	0	1	0	0	0	0	0	0
XXJM1	0	6	1	0	0	0	0	0	5	0	0	0	0
XXJM6	0	0	0	0	0	0	2	2	0	0	0	0	0

XYJM1	4	0	0	0	0	0	0	0	0	1	0	0	0
XYJM2	4	0	0	0	0	0	0	0	0	0	0	0	0
XYJM3	0	0	0	0	0	0	0	1	0	0	0	0	0
XYUM1	3	0	0	0	0	0	0	0	0	0	0	0	0
XYUM5	2	0	0	0	0	0	0	0	0	0	0	0	0
ZQJM6	1	0	0	0	0	0	0	0	0	0	0	0	0
SUM	212	76	121	2	5	3	86	14	31	16	1	11	1

Table 5.80: Pearson's Correlation Coefficient calculated for Graves with Multiple Consecutive Interments.

		jar	single	double	four	urn	fu	cup	beaker	goblet	ewer	vase	basin	bo
jar	Pearson	1	.469**	0.208	-0.043	-0.054	-0.045	-0.019	.467**	-0.089	-0.092	-0.075	-0.006	.743**
single	Pearson	.469**	1	.571**	-0.095	-0.067	-0.067	0.229	.352*	-0.135	0.176	0.197	-0.067	-0.048
double	Pearson	0.208	.571**	1	-0.037	-0.049	-0.049	0.308	.624**	0.035	.809**	.354*	-0.003	-0.059
four	Pearson	-0.043	-0.095	-0.037	1	-0.039	-0.039	-0.058	-0.081	0.036	-0.026	0.219	.697**	-0.047
urn	Pearson	-0.054	-0.067	-0.049	-0.039	1	-0.027	-0.041	-0.057	-0.07	-0.048	-0.06	-0.027	-0.033
fu	Pearson	-0.045	-0.067	-0.049	-0.039	-0.027	1	-0.041	-0.057	0.119	-0.048	-0.06	-0.027	-0.033
cup	Pearson	-0.019	0.229	0.308	-0.058	-0.041	-0.041	1	.687**	-0.055	0.066	.744**	-0.041	0.025
beaker	Pearson	.467**	.352*	.624**	-0.081	-0.057	-0.057	.687**	1	-0.064	.430**	.590**	-0.057	.536**
goblet	Pearson	-0.089	-0.135	0.035	0.036	-0.07	0.119	-0.055	-0.064	1	0.113	-0.049	-0.07	-0.001
ewer	Pearson	-0.092	0.176	.809**	-0.026	-0.048	-0.048	0.066	.430**	0.113	1	0.176	0.011	-0.051
vase	Pearson	-0.075	0.197	.354*	0.219	-0.06	-0.06	.744**	.590**	-0.049	0.176	1	.365*	-0.072
basin	Pearson	-0.006	-0.067	-0.003	.697**	-0.027	-0.027	-0.041	-0.057	-0.07	0.011	.365*	1	-0.033
bo	Pearson	.743**	-0.048	-0.059	-0.047	-0.033	-0.033	0.025	.536**	-0.001	-0.051	-0.072	-0.033	1

Table 5.81: Ceramics Assemblages of Undisturbed and Well-Reported Burials with no Signs of Re-Opening.

Grave	jar	single-handled	double-handled	urn	vat	double jar	fu	cup	beaker	goblet	ewer	vase	basin	bo	wan	dou	lid
HFJM10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM100	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM101	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM102	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0
HFJM103	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM105	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
HFJM106	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM108	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM109	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HFJM112	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM113	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM116	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM118	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM120	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM121	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM122	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM123	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM124	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM125	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM126	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM127	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
HFJM128	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM130	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM133	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM134	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM135	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM137	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM138	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
HFJM139	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM140	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
HFJM141	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
HFJM142	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
HFJM143	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM144	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM145	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM146	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM148	2	2	0	1	0	0	0	0	0	2	2	1	0	0	2	0	0
HFJM2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM26	2	1	0	1	0	0	0	0	0	1	1	0	0	1	0	0	0
HFJM28	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM29	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
HFJM3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM30	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM32	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
HFJM33	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0
HFJM34	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HFJM35	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM36	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM37	3	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0
HFJM38	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM39	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM4	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0
HFJM44	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
HFJM47	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM48	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM49	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM50	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM51	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM52	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM53	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
HFJM54	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM55	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM56	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM57	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM59	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM6	2	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
HFJM60	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM62	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM64	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM66	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM68	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM69	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM70	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM71	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM72	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM73	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM74	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM75	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM76	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM77	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM78	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HFJM79	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM80	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM82	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM83	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM84	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM85	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM88	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
HFJM93	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
HFJM94	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0
HFJM95	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HGJM1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HLJM1	0	34	0	0	0	1	0	0	0	60	0	7	0	0	0	0	0
HWTM1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
HWTM2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
HWTM3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HWTM4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HXPM14	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
HXPM20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
HXPM21	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
HXPM5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
HXPM6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
LYBMAM1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
LYBMAM2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LYBMAM3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LYBMAM8	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
MSKM1	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
NDXM1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
NDXM10	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NDXM11	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NDXM2	1	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NDXM3	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NDXM4	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NDXM5	1	9	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0
NDXM6	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NDXM7	1	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
NDXM9	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0

XDYM1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
XDYM2	2	0	1	3	0	0	0	0	1	0	0	0	0	2	0	0	0
XDYM3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
XDYM4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
XDYM8	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
XDYM9	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
XLAM1	0	0	0	0	3	0	0	0	0	0	0	3	0	0	2	1	0
XLAM10	8	0	0	0	1	0	0	0	0	0	3	4	0	2	2	0	0
XLAM11	25	0	0	0	11	0	0	0	0	0	0	2	2	2	8	0	0
XLAM12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0
XLAM13	2	0	0	0	3	0	0	0	0	0	0	0	0	0	1	1	0
XLAM2	8	0	0	0	0	0	0	0	0	0	1	2	0	1	1	1	0
XLAM3	3	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
XLAM4	0	0	0	0	4	0	0	2	0	0	0	4	0	0	6	0	0
XLAM5	5	0	0	0	0	0	0	1	0	0	0	2	0	0	4	1	0
XLAM6	2	0	0	0	1	0	0	8	0	0	0	1	0	2	1	0	0
XLAM7	1	0	0	0	4	0	0	0	0	0	0	1	0	0	4	0	0
XLAM8	3	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
XLAM9	2	0	0	0	2	0	0	1	0	0	0	4	0	1	0	2	0
XLBM1	3	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0
XLBM2	1	0	0	0	1	0	0	0	0	0	0	2	3	0	0	0	0
XLBM3	3	0	5	0	0	2	0	5	0	0	0	8	0	7	19	0	0
XLBM4	5	0	0	0	0	0	0	0	0	0	11	14	0	0	0	0	1
XLBM5	2	0	0	0	0	0	0	1	0	0	0	8	4	4	9	0	0
XLBM6	3	0	0	0	0	0	0	0	0	0	0	1	0	0	5	0	0
XLBM7	5	0	0	0	0	0	0	7	0	0	0	7	0	4	10	0	0
XLBM8	11	0	0	0	0	0	0	0	0	0	0	1	0	2	2	1	0
XMSM1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0
XQGM1	14	1	0	1	0	0	0	0	0	18	1	0	0	0	0	0	0
XQGM2	3	0	0	0	0	0	0	0	0	19	0	2	0	0	0	0	0
XYGM1	2	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0
XYGM3	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
XYPM1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
YLLM11	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YLLM7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YMBM2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YYWM1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

YYWM3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
YYWM4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
ZCBM1	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
ZCBM6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
ZEKM1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZEKM12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZEKM3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZFQM1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
ZFQM3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZPBM11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZPBM2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
ZPBM4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
ZPBM8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZPBM9	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
SUM	248	69	35	34	32	3	3	29	2	115	19	95	9	29	98	13	1

Table 5.82: Assemblages of Weapon and Tools from Graves.

	sword	yue	ge	metal knife	spear	arrowhead	stone knife	metal axe	spindle whorl	wood working	grinding rod	other tools	SUM
DARM1	0	0	0	0	2	0	0	0	0	0	0	0	2
DARM3	0	0	0	1	0	0	0	0	0	0	0	0	1
DARM4	0	0	0	0	0	0	0	0	0	0	1	0	1
DGYM2	0	0	0	1	0	1	0	0	0	0	0	0	2
HFJM103	0	0	0	0	0	0	0	0	1	0	0	0	1
HFJM12	0	1	0	0	0	0	0	0	0	0	0	0	1
HFJM129	0	0	0	0	0	0	0	0	0	1	0	0	1
HFJM139	0	0	0	0	0	0	0	0	1	0	0	0	1
HFJM144	0	0	0	0	0	0	0	0	1	0	0	0	1
HFJM148	0	0	0	0	0	0	0	0	0	0	0	0	0
HFJM26	0	1	0	0	0	1	0	0	0	0	0	3	5
HFJM3	0	0	0	0	1	0	0	0	0	0	0	0	1
HFJM32	0	0	0	0	0	0	0	0	1	0	0	0	1
HFJM37	0	0	0	0	0	0	0	0	2	0	0	0	2
HFJM38	1	0	0	0	0	0	0	0	0	0	0	0	1
HFJM4	0	1	0	0	0	0	0	0	0	0	0	0	1
HFJM42	0	0	0	0	0	0	0	0	1	0	0	0	1

HFJM59	0	0	0	0	0	0	0	0	0	1	0	0	1
HFJM6	0	0	0	0	0	0	0	0	1	0	0	0	1
HFJM91	0	0	0	0	0	0	0	0	1	0	0	0	1
HFJM98	0	0	0	0	0	0	0	0	1	0	0	0	1
HGJM2	0	0	0	0	0	0	0	0	1	0	0	0	1
HGJM29	0	1	0	0	0	0	0	0	0	0	0	0	1
HLJM1	0	0	0	0	0	13	0	0	22	1	5	18	59
HMLM1	0	0	0	0	0	0	0	0	1	0	2	0	3
HWTM1	0	0	0	0	0	0	0	0	0	0	0	1	1
HWTM2	0	0	0	0	0	0	0	0	1	0	0	0	1
HWTM3	0	0	0	0	0	0	0	0	3	0	0	0	3
HWTM4	0	0	0	0	0	0	0	0	4	0	0	0	4
HWTM5	0	0	0	0	0	0	0	0	4	0	0	0	4
HXPM6	0	0	0	0	0	0	0	0	0	1	0	0	1
MABM1	0	0	0	0	0	0	0	0	0	1	0	0	1
MBBM1	0	0	0	0	0	9	0	0	0	0	0	0	9
MSKM1	0	0	0	2	0	2	0	0	0	0	0	0	4
MTBM1	0	0	0	0	0	0	0	0	0	1	0	0	1
MWQM1	1	0	0	0	0	2	0	0	0	1	0	0	4
MWQM2	0	0	0	0	0	1	0	0	0	0	0	0	1
NDXM2	0	1	0	1	2	0	0	0	0	0	0	0	4
NDXM4	0	1	0	0	0	0	0	0	0	0	0	0	1
NDXM5	0	0	0	1	0	2	0	0	0	0	0	0	3
NDXM8	1	0	0	0	1	0	0	0	0	0	0	0	2
NDXM9	0	0	0	0	0	0	0	0	1	0	0	0	1
NDZM4	1	0	0	0	0	0	0	0	0	0	0	0	1
PAMM1	0	0	0	0	0	1	0	0	0	0	0	0	1
PWLM3	0	0	0	0	0	6	0	0	0	0	0	0	6
PXAM1	0	0	0	3	0	4	0	0	0	0	0	0	7
PXAM2	0	0	0	1	0	1	0	0	0	0	0	0	2
PXBM1	1	0	0	0	0	1	0	0	0	0	6	0	8
XBBM1	0	0	0	1	0	2	0	0	1	0	0	0	4
XBBM4	0	0	0	0	0	0	0	0	1	0	0	0	1
XDYM2	0	0	0	0	0	0	0	0	0	1	0	1	2
XDYM3	1	0	0	0	0	1	0	0	0	1	0	0	3

XGQM1	0	0	0	5	0	0	0	0	0	0	1	0	6
XHGM1	1	0	0	1	0	0	0	0	0	0	1	0	3
XHGM2	0	0	0	4	0	0	0	0	0	0	3	0	7
XHGM4	0	0	0	0	0	0	0	0	4	0	3	0	7
XHGM5	0	0	0	1	0	0	0	0	0	0	0	0	1
XHGM6	0	0	0	0	0	0	0	0	2	0	0	0	2
XHTM1	0	0	0	2	0	0	0	0	0	0	1	0	3
XLKM1	0	0	0	0	0	1	0	0	0	0	0	0	1
XLKM5	0	0	0	0	0	1	0	0	0	0	0	0	1
XLKM6	0	0	0	1	0	0	0	0	2	0	0	0	3
XLKM7	0	0	0	1	0	0	0	0	0	0	0	0	1
XLKM8	0	0	0	2	0	0	0	0	1	1	0	0	4
XQGM1	0	0	0	2	0	0	1	0	0	0	0	0	3
XQGM2	0	0	0	0	0	0	1	0	0	0	0	4	5
XQGM3	0	0	0	0	0	0	0	0	0	0	0	5	5
XWNM1	0	0	0	2	0	0	0	0	0	0	1	0	3
XWNM2	0	0	0	0	0	0	0	0	0	0	1	0	1
XXCM1	0	0	0	2	2	2	0	0	2	0	0	0	8
XXHM1	0	0	0	2	0	2	2	1	0	0	0	1	8
XXJM1	1	0	0	1	1	2	2	0	2	0	0	1	10
XYGM1	0	0	0	1	0	0	0	0	0	0	0	0	1
XYJM1	0	0	0	0	0	1	0	0	0	0	0	1	2
XYJM2	0	0	0	0	0	2	0	0	0	1	0	0	3
XYJM3	0	0	0	0	0	1	0	0	0	0	0	0	1
XYPM1	0	0	0	0	0	0	0	0	0	2	0	0	2
XYUM1	0	0	0	0	0	1	0	0	5	0	0	0	6
XYUM2	0	0	0	0	0	0	0	0	7	0	0	0	7
XYUM3	0	0	0	0	0	0	0	0	2	0	0	0	2
YBIM1	0	0	0	1	1	1	0	0	0	0	0	0	3
YBSM1	1	1	0	1	1	0	0	0	0	0	0	0	4
YCJM4	0	0	0	1	0	0	0	0	0	0	0	0	1
YDZM1	0	0	0	0	0	0	0	0	2	0	0	0	2
YDZM106	0	0	0	1	1	2	0	0	1	0	0	0	5
YDZM11	0	0	0	0	0	0	0	0	0	0	0	1	1
YDZM13	0	0	0	0	0	1	0	0	0	0	0	0	1

YDZM139	0	0	0	0	1	1	0	0	0	0	0	0	2
YDZM19	0	0	0	0	0	1	0	0	0	0	0	0	1
YDZM2	0	0	0	0	0	2	0	0	0	2	0	0	4
YDZM34	0	0	0	0	0	0	2	0	0	2	0	0	4
YDZM48	0	0	0	0	0	0	0	0	0	0	0	0	0
YDZM66	0	0	0	0	0	0	0	0	0	2	0	0	2
YDZM77	1	0	0	3	2	3	0	0	0	0	0	0	9
YDZM80	0	0	0	0	0	0	0	0	1	0	0	0	1
YDZM88	0	0	0	0	0	0	0	0	0	1	0	0	1
YDZM9	0	0	0	0	0	1	0	0	0	0	0	0	1
YDZM91	0	0	0	1	0	2	0	0	0	0	0	0	3
YDZM93	0	0	0	0	0	0	1	0	0	0	0	0	1
YDZM94	0	0	0	0	0	2	0	0	0	0	0	0	2
YGSM1	2	0	0	0	1	0	0	1	0	0	0	0	4
YHTM1	1	0	0	0	0	0	0	0	0	0	0	0	1
YLLM10	0	2	0	0	0	0	0	0	0	0	0	0	2
YLLM11	1	1	2	1	2	17	2	1	0	0	1	2	30
YLLM4	1	0	1	1	1	0	0	0	0	0	0	0	4
YLLM6	1	0	1	0	0	23	0	0	0	0	1	2	28
YLLM7	1	0	0	0	0	0	0	0	0	0	0	0	1
YLLM9	1	0	3	0	0	10	0	0	0	0	0	0	14
YLSM1	3	0	0	6	0	0	0	0	0	0	0	0	9
YMBM1	1	0	0	0	0	1	0	0	0	0	0	0	2
YMBM2	1	1	1	0	2	0	0	0	0	0	0	0	5
YQDM1	0	0	0	0	0	3	0	0	0	0	0	0	3
YQSM1	0	0	0	0	0	0	0	0	0	1	0	0	1
YXHM1	6	5	0	0	0	0	0	0	0	0	0	0	11
YZSM1	0	0	0	0	0	0	0	1	0	0	0	0	1
ZCBM1	0	0	0	1	0	0	0	0	0	0	0	0	1
ZCBM5	0	0	0	0	0	0	0	0	1	0	0	0	1
ZCBM6	0	0	0	0	0	0	0	0	1	0	0	0	1
ZEKM12	0	0	0	0	0	1	0	0	0	0	0	0	1
ZEKM3	0	0	0	0	0	1	0	0	0	0	0	0	1
ZEKM4	0	0	0	0	0	8	0	0	0	1	0	0	9
ZEKM5	0	0	0	0	0	1	0	0	0	0	0	0	1

ZFQM2	0	0	0	0	0	0	0	0	0	1	0	0	1
ZJEM1	0	0	0	0	0	1	0	0	0	0	0	0	1
ZJEM3	0	1	0	0	0	0	0	0	0	0	0	0	1
ZLYM2	0	0	0	0	0	0	0	0	0	2	0	0	2
ZWSM1	0	0	0	0	0	1	0	0	0	0	0	0	1
SUM	29	17	8	55	21	143	11	4	82	25	27	40	462

Table 5.83: Stone Weapons and Tools at Settlement and Grave Sites.

Woodworking tools	graves, object number	graves, number of graves	settlements, object number	settlements, number of sites
adze	6	6	194	38
axe	15	14	231	50
chisel	4	4	96	26
Agricultural tools				
knife, perforated	10	6	99	21
knife, unperforated	1	1	96	32
shovel	0	0	13	1
plow	0	0	2	2
ring stone	0	0	2	2
Fishing and hunting tools / weapons				
net weight	0	0	28	11
net weight, ceramic	0	0	2	1
arrowhead, bone	3	1	0	0
arrowhead, stone	64	24	56	23
arrowhead, wood	2	1	0	0
Clothes production				
spindle whorl, ceramic	83	35	8	8
spindle whorl, stone	2	1	20	8
needle, bone	0	0	4	4
needle, stone	2	2	13	3
awl	3	1	0	0
drill	0	0	7	5
cutter	1	1	0	0
Percussion tools				
pestle	6	4	22	7
chopper	10	1	83	17
hammerstone	0	0	50	10
Grinding tools				
grinding rod	27	14	13	7
handstone	14	2	25	12
grinding slab	0	0	27	14
Flake tools	graves, object number	graves, number of graves	settlements, object number	settlements, number of sites
scraper	0	0	71	13
flake	1	1	57	3
microlith	1	1	21	5
Half products				
half-product	0	0	78	14
cores	0	0	14	6
flaked fragments	0	0	14	6
polished fragments	6	1	57	8
Other				
bronze mold	0	0	2	1

Table 5.84: Materials used for Personal Ornaments and Clothing Applications found in Graves.

Material	**Number**
Metal	744
Stone	226
Bone/Tooth	200
Shell/Snail	65
Frit	25
Ceramic	3
Wood	2
SUM	*1261*

Table 5.85: Personal Ornaments and Clothing Applications found in Graves by Number of Objects, Number of Graves, and Function Categories.

	Number of graves	**Number of objects**
Ring	56	320
Chain/Pendants/Beads	55	456
Clothing applications	24	267
Hair ornaments	23	106
Other ornaments	12	112
SUM	*170*	*1261*

Table 5.86: Personal Ornaments and Clothing Applications by Type and Site I.

	RINGS						CLOTHING				
	SUM	Arm-ring	Finger-ring	Ear-ring	Ring-segment	Flat ring	SUM	Belt	Button	Applic.	Armor
DARM1	0	0	0	0	0	0	0	0	0	0	0
DARM3	0	0	0	0	0	0	0	0	0	0	0
DARM4	2	2	0	0	0	0	0	0	0	0	0
DGYM2	3	3	0	0	0	0	0	0	0	0	0
HFJM13	5	4	1	0	0	0	1	0	0	1	0
HFJM149	1	1	0	0	0	0	0	0	0	0	0
HFJM3	2	1	0	0	0	1	0	0	0	0	0
HFJM53	0	0	0	0	0	0	0	0	0	0	0
HFJM60	1	1	0	0	0	0	0	0	0	0	0
HGJ	15	15	0	0	0	0	62	1	10	51	0
HGJM2	2	2	0	0	0	0	0	0	0	0	0
HWT	0	0	0	0	0	0	0	0	0	0	0
HXSM21	0	0	0	0	0	0	0	0	0	0	0
MBBM1	11	11	0	0	0	0	2	0	2	0	0
MSKM1	4	4	0	0	0	0	2	0	2	0	0
MTBM2	1	1	0	0	0	0	0	0	0	0	0
MWQM1	6	6	0	0	0	0	0	0	0	0	0
NDXM5	0	0	0	0	0	0	0	0	0	0	0
NDXM9	0	0	0	0	0	0	1	0	0	1	0
PAM	1	1	0	0	0	0	0	0	0	0	0
PAMM1	4	4	0	0	0	0	0	0	0	0	0
PAMM2	10	10	0	0	0	0	0	0	0	0	0
PWLM1	0	0	0	0	0	0	0	0	0	0	0
PWLM2	0	0	0	0	0	0	0	0	0	0	0
PXBM1	36	33	2	0	0	1	0	0	0	0	0

PXBM2	6	0	0	5	0	1	0	0	0	0	0
PXBM4	10	8	0	0	0	2	0	0	0	0	0
XBBM1	20	10	3	3	4	0	0	0	0	0	0
XBBM2	1	1	0	0	0	0	0	0	0	0	0
XBBM3	1	1	0	0	0	0	0	0	0	0	0
XBBM4	2	2	0	0	0	0	0	0	0	0	0
XBSM1	7	3	1	3	0	0	0	0	0	0	0
XDYM1	0	0	0	0	0	0	0	0	0	0	0
XGQM1	28	8	3	11	6	0	11	0	11	0	0
XHGM1	1	0	0	1	0	0	0	0	0	0	0
XHGM2	1	1	0	0	0	0	0	0	0	0	0
XHGM4	6	3	0	2	0	1	0	0	0	0	0
XLK	50	35	2	6	7	0	6	0	6	0	0
XLKM1	0	0	0	0	0	0	0	0	0	0	0
XLKM6	3	2	0	0	1	0	1	0	1	0	0
XLKM7	2	2	0	0	0	0	0	0	0	0	0
XLKM8	6	2	2	1	1	0	3	0	3	0	0
XQGM1	1	1	0	0	0	0	0	0	0	0	0
XWNM1	0	0	0	0	0	0	1	0	1	0	0
XWNM2	1	0	0	1	0	0	0	0	0	0	0
XXCM1	2	2	0	0	0	0	7	0	0	0	7
XXHM1	4	0	0	0	4	0	8	0	8	0	0
XXJM1	31	10	0	12	9	0	31	1	17	13	0
XYGM1	1	1	0	0	0	0	0	0	0	0	0
XYGM2	0	0	0	0	0	0	0	0	0	0	0
YDZM10	1	1	0	0	0	0	0	0	0	0	0
YDZM100	0	0	0	0	0	0	0	0	0	0	0
YDZM101	1	1	0	0	0	0	0	0	0	0	0
YDZM11	0	0	0	0	0	0	0	0	0	0	0
YDZM13	0	0	0	0	0	0	0	0	0	0	0
YDZM14	1	0	0	0	0	1	0	0	0	0	0
YDZM15	0	0	0	0	0	0	0	0	0	0	0
YDZM15	2	2	0	0	0	0	0	0	0	0	0
YDZM16	0	0	0	0	0	0	0	0	0	0	0
YDZM18	0	0	0	0	0	0	0	0	0	0	0
YDZM19	0	0	0	0	0	0	0	0	0	0	0
YDZM2	1	1	0	0	0	0	0	0	0	0	0
YDZM34	0	0	0	0	0	0	0	0	0	0	0
YDZM57	1	1	0	0	0	0	0	0	0	0	0
YDZM61	0	0	0	0	0	0	0	0	0	0	0
YDZM62	5	3	2	0	0	0	0	0	0	0	0
YDZM70	0	0	0	0	0	0	0	0	0	0	0
YDZM71	0	0	0	0	0	0	0	0	0	0	0
YDZM77	0	0	0	0	0	0	0	0	0	0	0
YDZM77	1	1	0	0	0	0	1	0	0	1	0
YDZM85	0	0	0	0	0	0	0	0	0	0	0
YDZM91	3	2	1	0	0	0	0	0	0	0	0
YDZM94	0	0	0	0	0	0	0	0	0	0	0
YDZM98	0	0	0	0	0	0	1	0	1	0	0

YGSM1	0	0	0	0	0	0	1	0	1	0	0
YLLM11	2	1	0	1	0	0	17	0	0	17	0
YLLM4	1	0	0	1	0	0	44	0	3	38	3
YLLM5	0	0	0	0	0	0	3	0	0	0	3
YLLM6	0	0	0	0	0	0	26	1	25	0	0
YLLM9	0	0	0	0	0	0	32	16	16	0	0
YLS	0	0	0	0	0	0	0	0	0	0	0
YLXM1	1	1	0	0	0	0	3	0	3	0	0
YLY	1	1	0	0	0	0	0	0	0	0	0
YMBM2	0	0	0	0	0	0	2	0	0	0	2
YQDM1	0	0	0	0	0	0	0	0	0	0	0
YYJ	0	0	0	0	0	0	0	0	0	0	0
ZCBM1	0	0	0	0	0	0	0	0	0	0	0
ZCBM3	1	0	1	0	0	0	0	0	0	0	0
ZCBM5	1	0	1	0	0	0	0	0	0	0	0
ZCBM6	1	0	1	0	0	0	0	0	0	0	0
ZEKM11	1	0	0	1	0	0	0	0	0	0	0
ZEKM3	0	0	0	0	0	0	0	0	0	0	0
ZEKM9	0	0	0	0	0	0	0	0	0	0	0
ZJEM1	2	0	0	0	2	0	1	0	0	0	1
ZJEM2	0	0	0	0	0	0	0	0	0	0	0
ZJEM3	0	0	0	0	0	0	0	0	0	0	0
ZPBM3	5	5	0	0	0	0	0	0	0	0	0
ZPBM4	0	0	0	0	0	0	0	0	0	0	0
SUM	320	211	20	48	34	7	267	19	110	122	16

Table 5.87: Personal Ornaments and Clothing Applications by Type and Site II.

	PENDANT						HAIR	UNCLEAR	SUM
	SUM	Bead	Pendant	Chain	Shell/ Snail	Tusk	Hair ornament	SUM	SUM
DARM1	0	0	0	0	0	0	2	0	2
DARM3	2	2	0	0	0	0	0	0	2
DARM4	1	1	0	0	0	0	0	0	3
DGYM2	3	3	0	0	0	0	0	0	6
HFJM13	0	0	0	0	0	0	0	0	6
HFJM149	0	0	0	0	0	0	0	0	1
HFJM3	0	0	0	0	0	0	0	0	2
HFJM53	1	0	1	0	0	0	0	0	1
HFJM60	0	0	0	0	0	0	0	0	1
HGJ	1	1	0	0	0	0	0	1	79
HGJM2	44	44	0	0	0	0	0	0	46
HWT	1	1	0	0	0	0	0	0	1
HXSM21	3	0	0	2	1	0	0	0	3
MBBM1	2	2	0	0	0	0	0	0	15
MSKM1	4	4	0	0	0	0	0	0	10
MTBM2	0	0	0	0	0	0	0	0	1
MWQM1	2	2	0	0	0	0	0	0	8
NDXM5	1	1	0	0	0	0	0	0	1
NDXM9	0	0	0	0	0	0	0	0	1
PAM	0	0	0	0	0	0	0	0	1

PAMM1	0	0	0	0	0	0	0	0	4
PAMM2	0	0	0	0	0	0	0	0	10
PWLM1	1	0	0	1	0	0	0	0	1
PWLM2	1	0	0	1	0	0	0	0	1
PXBM1	12	1	0	0	0	11	0	0	48
PXBM2	22	3	0	0	0	19	3	0	31
PXBM4	21	4	0	0	0	17	4	0	35
XBBM1	6	6	0	0	0	0	6	0	32
XBBM2	1	1	0	0	0	0	0	0	2
XBBM3	2	2	0	0	0	0	0	0	3
XBBM4	0	0	0	0	0	0	0	0	2
XBSM1	0	0	0	0	0	0	3	0	10
XDYM1	3	3	0	0	0	0	0	0	3
XGQM1	9	9	0	0	0	0	1	0	49
XHGM1	0	0	0	0	0	0	0	0	1
XHGM2	1	1	0	0	0	0	0	0	2
XHGM4	0	0	0	0	0	0	0	0	6
XLK	3	3	0	0	0	0	17	54	130
XLKM1	0	0	0	0	0	0	2	0	2
XLKM6	2	2	0	0	0	0	1	0	7
XLKM7	0	0	0	0	0	0	0	0	2
XLKM8	1	1	0	0	0	0	1	0	11
XQGM1	0	0	0	0	0	0	0	0	1
XWNM1	0	0	0	0	0	0	0	0	1
XWNM2	35	35	0	0	0	0	0	0	36
XXCM1	0	0	0	0	0	0	0	0	9
XXHM1	1	1	0	0	0	0	6	8	27
XXJM1	39	38	0	0	0	1	44	31	176
XYGM1	1	1	0	0	0	0	0	0	2
XYGM2	2	0	2	0	0	0	0	1	3
YDZM10	0	0	0	0	0	0	3	0	4
YDZM100	18	18	0	0	0	0	0	0	18
YDZM101	0	0	0	0	0	0	0	0	1
YDZM11	5	0	0	0	5	0	0	0	5
YDZM13	8	8	0	0	0	0	0	0	8
YDZM14	0	0	0	0	0	0	0	0	1
YDZM15	3	3	0	0	0	0	0	0	3
YDZM15	8	0	0	0	8	0	0	1	11
YDZM16	12	12	0	0	0	0	0	0	12
YDZM18	13	0	0	0	13	0	0	0	13
YDZM19	11	1	0	0	10	0	0	0	11
YDZM2	0	0	0	0	0	0	1	0	2
YDZM34	1	0	1	0	0	0	0	0	1
YDZM57	0	0	0	0	0	0	0	0	1
YDZM61	0	0	0	0	0	0	1	0	1
YDZM62	0	0	0	0	0	0	3	0	8
YDZM70	0	0	0	0	0	0	2	0	2
YDZM71	0	0	0	0	0	0	1	0	1
YDZM77	6	6	0	0	0	0	0	0	6

YDZM77	6	2	0	0	4	0	1	0	9
YDZM85	11	0	0	0	11	0	0	0	11
YDZM91	6	0	0	0	6	0	0	0	9
YDZM94	16	10	0	0	6	0	0	0	16
YDZM98	0	0	0	0	0	0	0	0	1
YGSM1	0	0	0	0	0	0	0	0	1
YLLM11	41	41	0	0	0	0	1	0	61
YLLM4	33	33	0	0	0	0	0	6	84
YLLM5	0	0	0	0	0	0	0	0	3
YLLM6	9	9	0	0	0	0	1	3	39
YLLM9	10	10	0	0	0	0	0	2	44
YLS	0	0	0	0	0	0	0	2	2
YLXM1	0	0	0	0	0	0	0	0	4
YLY	0	0	0	0	0	0	0	0	1
YMBM2	0	0	0	0	0	0	0	0	2
YQDM1	0	0	0	0	0	0	1	0	1
YYJ	0	0	0	0	0	0	0	2	2
ZCBM1	3	2	0	1	0	0	0	0	3
ZCBM3	0	0	0	0	0	0	0	0	1
ZCBM5	0	0	0	0	0	0	0	0	1
ZCBM6	0	0	0	0	0	0	0	0	1
ZEKM11	1	0	0	0	1	0	0	0	2
ZEKM3	4	4	0	0	0	0	0	0	4
ZEKM9	0	0	0	0	0	0	0	1	1
ZJEM1	1	1	0	0	0	0	0	0	4
ZJEM2	1	0	1	0	0	0	0	0	1
ZJEM3	0	0	0	0	0	0	1	0	1
ZPBM3	0	0	0	0	0	0	0	0	5
ZPBM4	1	1	0	0	0	0	0	0	1
	456	333	5	5	65	48	106	112	1261

Table 5.88: Usage of Different Material Types by Object Categories.

	bronze	iron	composite	gilded	gold	silver	stone	precious stone	bone	organic	ceramic	snail/ shell	tooth	cowry	SUM
weapon	204	21	8	0	0	0	64	0	3	2	0	0	0	0	302
tool	14	1	0	0	0	0	115	0	0		82	0	0	0	212
container	20	0	0	0	0	0	0	0	0	5	1679	0	0	0	1704
ritual	35	0	0	0	0	0	50	0	0	0	1	0	0	0	86
horse gear and armor	25	0	0	0	0	0	0	0	0	0	0	0	0	0	25
clothing	176	0	0	5	1	0	0	1	0	0	0	0	0	0	183
hair	66	0	0	0	0	0	0	0	12	0	0	0	0	0	78
ornament	258	0	0	3	0	7	9	213	107	3	27	34	49	32	742
other	39	0	0	0	0	0	0	0	0	0	0	0	0	0	39
SUM	*837*	*22*	*8*	*8*	*1*	*7*	*238*	*214*	*122*	*10*	*1789*	*34*	*49*	*32*	*3371*

Table 5.89: Usage of Different Material Types used for Personal Ornaments.

Ornaments	bronze	gilded	silver	stone	precious stone	bone	organic	ceramic	snail/shell	tooth	cowry	SUM
ring	179	3	7	2	6	34	2	0	0	0	0	233
bead	0	0	0	6	203	73	1	25	0	0	0	308
pendant	0	0	0	1	2	0	0	2	34	49	32	120
other	79	0	0	0	2	0	0	0	0	0	0	81
SUM	*258*	*3*	*7*	*9*	*213*	*107*	*3*	*27*	*34*	*49*	*32*	*742*

Table 5.90: Usage of Different Material Types for Beads.

Beads	Objects	Graves
bead agate	84	15
bead turquoise	115	19
bead nephrite	4	2
bead other stone	6	2
bead bone	73	12
bead frit	25	1
bead organic	1	1
bead bronze	10	1
SUM	*318*	*55*

Table 5.91: Occurrence of Metal and Ceramic Objects by Grave Type (by Number of Graves).

	metal	no metal	ceramic	no ceramic
earth-pit grave	36	213	211	38
megalithic grave	36	19	42	13
stone-construction grave	27	60	65	22
unclear	3	1	1	3
SUM	*102*	*293*	*319*	*76*

Table 5.92: Occurrence of Different Material Categories by Grave Type (by Number of Graves).

	number graves	only ceramics	ceramic and other objects, but no metal	ceramic and metal	no ceramics, no metal, but other objects	metal, but no ceramics
earth-pit grave	249	151	41	19	21	17
megalithic grave	55	12	5	25	2	11
stone-construction grave	87	41	8	16	11	11
unclear	4	1	0	0	0	3
SUM	*395*	*205*	*54*	*60*	*34*	*42*

Table 5.93: Occurrence of Different Material Categories by Grave Type (by Number of Objects).

	Ceramic	Bronze	Iron	Comp.	Silver/ Gold	Stone	Agate	Turquoise	Nephrite	Bone/ Tooth/ Shell	Frit	Organic	Number graves	Average number of objects
earth-pit	973	120	7	0	2	124	4	72	5	64	0	14	253	5.47
stone-cist	147	299	12	2	2	63	58	27	6	58	0	26	87	8.05
megalithic	532	401	21	1	12	48	22	16	3	131	25	0	55	22.04

Table 5.94: Occurrence of Different Material Categories by Grave Type (by Number of Objects).

	Ceramics	Metal	Stone	Bone/Tooth/Shell	Other	SUM
earth-pit	973	129	205	64	14	1385
stone-cist	147	315	154	58	26	700
megalithic	532	435	89	131	25	1212
SUM	*1652*	*879*	*448*	*253*	*65*	*3297*

Table 5.95: Regional Distribution of Different Material Groups (by Number of Graves).

	Number Graves	Ceramics	Bronze	Iron	Comp.	Silver/ Gold	Stone	Agate	Turquoise	Nephrite	Bone/ Tooth	Shell	Organic	Frit
Dechang	4	3	4	2	0	0	1	1	2	0	1	0	0	0
H. Fenjiwan	81	69	8	0	0	0	41	0	0	1	0	0	0	0
Huili other	17	15	2	0	0	0	3	1	1	1	1	1	0	0
Luquan	5	5	0	0	0	0	0	0	0	0	0	0	0	0
Meigu	1	1	0	0	0	0	1	0	0	0	0	0	0	0
Mianning	16	14	6	0	0	1	3	1	1	0	1	0	0	0
Miyi	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ninglang	11	10	6	0	1	0	0	0	1	0	0	0	1	0
Puge	10	4	8	0	0	0	3	2	1	0	6	0	0	0
Xichang	62	57	18	9	0	2	22	5	4	2	8	0	0	1
Xide	4	3	4	2	0	0	3	0	0	1	2	0	0	0
Yanyuan	59	48	21	7	1	1	6	3	2	2	1	0	0	0
Yongsheng	59	41	13	3	1	0	9	0	7	4	6	8	0	0
Zhaojue	31	16	9	1	0	2	9	2	0	2	2	1	5	0

Table 5.96: Regional Distribution of Different Material Groups in Graves (by Number of Objects).

	Ceramics	Bronze	Iron	Comp.	Silver/ Gold	Stone	Agate	Turquoise	Nephrite	Bone	Shell	Frit	Organic
Dechang	131	12	2	0	0	1	1	4	0	1	0	0	0
H. Fenjiwan	167	14	0	0	0	57	0	0	1	0	0	0	0
Huili other	146	3	0	0	0	42	2	41	1	2	1	0	0
Luquan	6	0	0	0	0	0	0	0	0	0	0	0	0
Meigu	1	0	0	0	0	1	0	0	0	0	0	0	0
Mianning	185	37	0	0	4	4	2	2	0	2	0	0	0
Miyi	0	3	0	0	0	1	0	0	0	0	0	0	0
Ninglang	53	10	0	1	0	0	0	1	0	0	0	0	14
Puge	9	77	0	0	0	10	4	4	0	61	0	0	0
Xichang	635	270	19	0	8	42	17	6	2	72	0	25	0
Xide	32	28	2	0	0	3	0	0	1	3	0	0	0
Yanyuan	79	290	12	1	1	34	56	6	2	21	0	0	0
Yongsheng	174	51	4	1	1	18	0	51	4	26	58	0	0
Zhaojue	40	25	1	0	2	22	2	0	3	5	1	0	16
SUM	*1658*	*820*	*40*	*3*	*16*	*235*	*84*	*115*	*14*	*193*	*60*	*25*	*30*

Table 5.97: Correlation between Tool/Weapon Types and Raw Material in Graves.

Graves	serpentinite	nephrite	metamorphic rock	quartzite	igneous rock	sedimentary rock	shale/ slate	stone, unclear	Stone, SUM	coarse clay	fine clay	bone	wood
adze	0	1	0	0	2	1	0	1	5	0	0	0	0
axe	0	1	1	1	6	0	0	4	13	0	0	0	0
chisel	0	0	1	0	2	0	0	1	4	0	0	0	0
arrowhead	0	4	1	0	2	1	80	14	102	0	0	3	2
knife	0	0	0	0	6	0	2	1	9	0	0	0	0
grinding roller	0	0	0	0	1	16	18	5	40	0	0	0	0
spindle whorl	0	0	0	0	0	0	0	2	2	59	25	0	0
production tools	0	0	0	0	1	1	1	0	3	0	0	0	0
grinding tools	0	0	2	0	0	1	0	16	19	0	0	0	0
coarse tools	0	0	0	0	8	0	0	0	8	0	0	0	0
ritual objects	0	0	0	0	1	6	0	6	13	0	0	0	0
SUM	*0*	*6*	*5*	*1*	*29*	*26*	*101*	*50*	*218*	*59*	*25*	*3*	*2*

Table 5.98: Correlation between Tool/Weapon Types and Raw Material at Settlement Sites.

Settlements	serpentinite	nephrite	metamorphic	quartzite	igneous rock	sedimentary rock	shale/ slate	stone, unclear	Stone, SUM	coarse clay	fine clay	bone	wood
adze	34	0	4	0	59	2	1	5	105	0	0	0	0
axe	10	0	1	0	117	5	0	10	143	0	0	0	0
chisel	7	0	4	0	25	0	1	4	41	0	0	0	0
arrowhead	0	1	0	0	1	4	1	7	14	0	0	0	0
spear-head	2	0	0	0	0	0	0	0	2	0	0	0	0
knife	0	0	1	0	13	0	106	0	120	0	0	0	0
grinding roller	0	0	0	0	4	0	0	0	4	0	0	0	0
spindle whorl	0	0	0	0	1	4	0	0	5	6	4	0	0
coarse tools	2	0	2	13	131	0	0	0	148	0	0	0	0
grinding tools	1	0	0	0	28	5	3	0	37	0	0	0	0
production tools	0	0	0	0	6	8	0	0	14	0	0	0	0
fragments	2	0	0	3	16	0	0	4	25	0	0	0	0
net-weight	0	0	0	0	1	3	0	1	5	0	0	0	0
agric. tools	1	0	0	0	5	0	0	0	6	0	0	0	0
SUM	*59*	*1*	*12*	*16*	*407*	*31*	*112*	*31*	*669*	*6*	*4*	*0*	*0*

Table 5.99: Correlation between Location and Raw Material used for Tools/Weapons found in Graves.

Graves	serpentinite	nephrite	metamorphic	quartzite	igneous rock	sedimentary rock	shale/ slate	stone, unclear	Stone, SUM	coarse clay	fine clay	bone	wood
Dechang	0	0	0	0	0	1	0	0	1	0	0	0	0
Huili Fenjiwan	0	0	0	0	0	48	1	1	50	9	0	0	0
Huili other	0	0	0	0	1	0	0	21	22	26	20	0	0
Miyi	0	0	0	0	0	0	0	1	1	0	0	0	0
Mianning	0	0	0	0	0	0	0	2	2	0	0	0	0
Ninglang	0	0	0	0	0	0	0	0	0	1	0	0	0
Puge	0	0	0	0	2	7	0	1	10	0	1	3	0
Xichang	0	0	4	0	12	8	0	11	35	22	5	0	0
Xide	0	0	1	0	0	0	0	6	7	0	0	0	0
Yanyuan	0	3	0	0	8	0	0	3	14	0	0	0	0
Yongsheng	0	0	0	0	4	1	28	3	36	0	0	0	0
Zhaojue	0	0	0	1	2	2	0	2	7	2	0	0	0
SUM	*0*	*3*	*5*	*1*	*29*	*67*	*29*	*51*	*185*	*60*	*26*	*3*	*0*

Table 5.100: Correlation between Location and Raw Material used for Tools/Weapons found at Settlement Sites.

Settlements	serpentinite	nephrite	metamorphic	quartzite	igneous rock	sedimentary rock	shale/ slate	stone, unclear	Stone, SUM	coarse clay	fine clay	bone	wood
Dechang	43	0	3	12	86	8	23	2	177	3	0	0	0
Huili	6	0	4	2	109	4	13	10	148	0	0	0	0
Miyi	0	0	0	0	0	0	0	0	0	0	0	0	0
Mianning	0	0	0	0	14	4	7	0	25	6	0	0	0
Puge	0	0	0	0	31	0	7	0	38	0	1	0	0
Xichang	9	0	0	1	116	8	33	8	175	0	3	0	0
Xide	0	0	0	0	0	0	0	0	0	0	0	0	0
Yanyuan	0	0	0	0	4	4	9	0	17	0	0	0	0
Yongsheng	0	1	4	0	21	3	14	4	47	0	0	1	0
Zhaojue	1	0	0	0	0	0	0	0	1	0	0	0	0
SUM	*59*	*1*	*11*	*15*	*381*	*31*	*106*	*24*	*628*	*9*	*4*	*1*	*0*

Table 5.101: Correlation between Location and Raw Material used for Tools/Weapons found at Settlement Sites and Graves

MATERIAL	**serpentinite**		**nephrite**		**metamorphic rock**		**igneous rock**		**sedimentary rock**		**shale/slate**		**stone, unclear**		**SUM**	**SUM**
LOCATION	*Graves*	*Settlement*	*G*	*S*	*G*	*S*	*G.*	*S.*	*G*	*S*	*G*	*S*	*G*	*S*	*G*	*S*
Dechang	0	43	0	0	0	15	0	86	1	8	0	23	0	2	1	177
Huili	0	6	0	0	0	6	1	109	48	4	0	13	22	10	71	148
Mianning	0	0	0	0	0	0	0	14	0	4	0	7	2	0	2	25
Miyi	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Ninglang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Puge	0	0	0	0	0	0	2	31	7	0	0	7	1	0	10	38
Xichang	0	9	0	0	4	1	12	116	8	8	0	33	11	8	35	175
Xide	0	0	0	0	1	0	0	0	0	0	0	0	6	0	7	0
Yanyuan	0	0	3	0	0	0	8	4	0	4	0	9	3	0	14	17
Yongsheng	0	0	0	1	0	4	4	21	1	3	28	14	3	4	36	47
Zhaojue	0	1	0	0	1	0	2	0	2	0	0	0	2	0	7	1
SUM	*0*	*59*	*3*	*1*	*5*	*11*	*29*	*381*	*67*	*31*	*28*	*106*	*51*	*24*	*184*	*628*

Table 5.102: Content of Selected Megalithic Graves Separate by Layers.

	skeletons	layer description	ceramics	ornament	weapons/tools	other
DARM1.1	several	layer 1	0	0	0	0
DARM1.2	several	layer 2	0	0	0	0
DARM1.3	several	layer 3	10	0	0	0
DARM1.4a	several	close to door	56	0	1	0
DARM1.4b	several	throughout grave	55	2	1	0
DARM3.1	several	layer 1	0	0	0	0
DARM3.2a	several	layer 2, eastern short side	0	0	1	0
DARM3.2b	several	layer 2, close to bottom, long-side	12	4	0	0
DARM4a.1	several	front, layer 1	1	0	0	0
DARM4a.2	several	front, layer 2	0	0	0	0
DARM4a.3	several	front, layer 3	4	2	1	0
DARM4b.1	several	back, layer 1	0	0	1	4
DARM4b.2	several	back, layer 2	0	0	0	0
DARM4b.3	several	back, layer 3	0	0	0	0
DARM4b.4	several	back, layer 4	3	0	0	0
DARM4b.5	several	back, layer 5	6	3	1	0

Table 5.102: Content of Selected Megalithic Graves Separate by Layers (Cont.).

	skeletons	layer description	ceramics	ornament	weapons/tools	other
XGQM1.1	several	layer 1	0	0	0	0
XGQM1.2a	several	layer 2, upper part	5	38	5	0
XGQM1.2b	several	layer 2, lower part	0	11	0	1
XHGM2.1	several	layer 1	2	2	7	5
XHGM2.2	several	layer 2	0	0	0	0
XHGM3.1	several	layer 1	0	0	0	0
XHGM3.2	several	layer 2	2	0	2	2
XWNM1.1	none	layer 1	0	0	0	0
XWNM1.2	none	layer 2	0	0	0	0
XWNM1.3	none	layer 3	0	0	0	0
XWNM1.4	none	layer 4	4	0	0	0
XWNM1.5	several	layer 5	0	0	0	0
XWNM1.6	several	layer 6	11	1	3	0
XWNM1.7	several	layer 7	0	0	0	0
XWNM1a	several	close to collapsed door, inside	39	0	2	0
XWNM1b	none	outside grave chamber	54	0	0	0
XWNM2.1	none	layer 1	10	0	0	0
XWNM2.2	none	layer 2	0	0	0	0
XWNM2.3	none	layer 3	0	0	0	0
XWNM2.4	none	layer 4	8	0	0	1
XWNM2.5	several	layer 5	0	36	2	0

Table 5.103: Object Assemblages in Megalithic Graves by Object Group.

	Interred	Ornament	Weapon	Spindle whorl	Tool	Other metal	Ceramic vessel
DARM1	several	2	2	0	0	0	131
DARM3	several	2	1	0	0	0	12
DARM4	several	3	0	0	2	0	14
DGYM2	several	6	2	0	0	0	0
MBBM1	several	15	9	0	0	0	1
MSLM1	several	0	0	0	0	0	1
MTBM1	several	0	0	0	1	1	0
MTBM2	several	1	0	0	0	1	0
MWQM1	5	8	3	0	1	0	76
MWQM2	several	0	1	0	0	0	94
NDZM4	several	0	1	0	0	0	0
PAMM1	several	4	1	0	0	0	0
PWLM3	10	0	6	0	0	0	0
PXAM1	4	0	7	1	0	0	1
PXAM2	82	0	2	0	1	0	0
PXBM1	48	50	2	0	6	0	3
PXBM2	several	33	0	0	0	0	2
PXBM4	125	35	0	0	0	0	0
XBBM1	95	34	3	1	1	0	0
XBBM2	17	2	0	0	0	0	0
XBBM3	6	3	0	0	0	0	0
XBBM4	several	2	0	1	0	0	6
XBBM6	55	0	0	0	0	0	2

XYJM1	several	0	1	0	1	0	5
XYJM2	several	0	2	0	1	0	4
XYJM3	several	0	1	0	0	0	1
XYUM1	several	0	1	5	0	0	3
XYUM2	several	0	0	7	0	0	0
XYUM3	several	0	0	2	0	0	0
XYUM5	several	0	0	0	0	0	2
ZQJM1	several	0	0	0	0	0	1
SUM		530	81	28	36	18	565
Average		9.64	1.47	0.51	0.65	0.33	10.27

Table 5.104: Correspondence Table for Objects in Megalithic Graves I.

	bracelet	finger ring	earring	bead	tusk	other ring	other ornament	ling
arrow	0.23874	-0.00344	0.004683	0.063821	-0.07218	0.040648	0.132637	-0.0151
knife	0.037466	.404**	.384**	0.088801	-0.12293	.532**	0.100995	.524**
sword	.483**	0.094186	0.261607	.327*	0.132557	0.199228	.408**	0.114531
weapon	-0.01606	-0.09827	0.138232	0.129028	-0.06897	0.068659	0.211947	0.02213
tool	0.069425	0.049612	.284*	.354**	-0.08301	.417**	.627**	0.239401
grinding rod	.672**	.311*	0.050014	0.04215	0.253023	0.07736	-0.05494	0.224991
spindle	-0.03155	-0.01231	0.097339	0.069342	-0.08486	0.073022	0.136386	0.051296
armor	-0.00375	-0.04053	-0.04222	-0.03919	-0.0326	-0.04345	-0.02266	-0.04107
coin	-0.0899	0.008656	-0.06843	-0.0717	-0.06265	-0.05593	-0.04355	0.017543
seal	-0.00375	.365**	0.01732	-0.02222	-0.0326	0.085734	-0.02266	.411**
slag	-0.05538	-0.04053	0.01732	.555**	-0.0326	-0.04345	-0.02266	-0.04107
clothing applic.	0.234068	0.156009	.806**	.766**	-0.01955	.783**	.945**	.439**
hair	0.241339	0.092332	.711**	.773**	0.124044	.631**	.960**	.449**
bracelet	1	.552**	.274*	0.221303	.441**	.340*	0.183288	0.151962
finger ring	.552**	1	.464**	0.086452	0.092151	.599**	-0.0496	.390**
earring	.274*	.464**	1	.676**	0.159298	.886**	.643**	.426**
bead	0.221303	0.086452	.676**	1	0.088482	.548**	.765**	.355**
tusk	.441**	0.092151	0.159298	0.088482	1	0.096429	-0.00356	-0.05573
other ring	.340*	.599**	.886**	.548**	0.096429	1	.577**	.410**
other ornament	0.183288	-0.0496	.643**	.765**	-0.00356	.577**	1	.389**
ling	0.151962	.390**	.426**	.355**	-0.05573	.410**	.389**	1

Table 5.105: Correspondence Table for Objects in Megalithic Graves II.

	jar	single-h	double-h	cup	beaker	goblet	ewer	vase	bo	basin	fu
jar	1	0.009227	0.000154	-0.04167	.401**	-0.05075	-0.05725	-0.04286	.546**	0.000762	-0.02716
single-handled	0.009227	1	.469**	.458**	.454**	-0.05739	.388**	.446**	-0.05551	-0.04578	-0.04578
double-handled	0.000154	.469**	1	.369**	.655**	0.097311	.910**	.429**	-0.0182	0.021012	-0.02852
cup	-0.04167	.458**	.369**	1	.658**	-0.01907	0.08822	.753**	-0.02488	-0.02655	-0.02655
beaker	.401**	.454**	.655**	.658**	1	-0.01774	.447**	.606**	.544**	-0.03821	-0.03821
goblet	-0.05075	-0.05739	0.097311	-0.01907	-0.01774	1	0.145363	-0.0018	0.024198	-0.04656	0.136367
ewer	-0.05725	.388**	.910**	0.08822	.447**	0.145363	1	0.202195	-0.03288	0.025031	-0.03233
vase	-0.04286	.446**	.429**	.753**	.606**	-0.0018	0.202195	1	-0.04874	.374**	-0.0402
bo	.546**	-0.05551	-0.0182	-0.02488	.544**	0.024198	-0.03288	-0.04874	1	-0.02245	-0.02245
basin	0.000762	-0.04578	0.021012	-0.02655	-0.03821	-0.04656	0.025031	.374**	-0.02245	1	-0.01852
fu	-0.02716	-0.04578	-0.02852	-0.02655	-0.03821	0.136367	-0.03233	-0.0402	-0.02245	-0.01852	1
arrow	-0.0998	0.013469	0.053473	0.087835	0.025195	-0.1154	0.057863	0.024296	-0.0781	-0.06441	0.021993
knife	0.035611	0.199714	-0.09498	-0.06204	0.02568	-0.18235	-0.0469	-0.10505	0.167356	-0.07252	-0.07252
sword	-0.06636	.292*	0.133228	.401**	0.242898	-0.10821	0.111488	.292*	-0.05218	-0.04303	-0.04303
weapon	.387**	0.033329	-0.03801	-0.06437	-0.00719	-0.01434	-0.00112	-0.09746	-0.05445	-0.0449	-0.0449
tool	-0.08672	0.249374	0.002624	0.160166	0.004538	-0.08259	0.078788	0.1151	-0.07068	0.119815	-0.05829
grinding rod	0.044163	-0.07492	-0.06025	-0.05543	-0.01253	-0.1129	-0.07067	-0.04163	0.096792	0.092297	-0.0449
spindle	-0.08338	0.011245	-0.06915	-0.03495	-0.09227	-0.05793	0.001267	-0.11397	-0.0523	-0.05251	-0.05251
armor	-0.02018	-0.04578	-0.02852	-0.02655	-0.03821	-0.04656	-0.03233	-0.0402	-0.02245	-0.01852	-0.01852
coin	-0.05966	0.072187	-0.05128	-0.05103	-0.07343	0.144903	-0.06214	-0.07726	-0.04316	-0.03559	.834**
slag	0.077553	-0.04578	-0.02852	0.039824	-0.03821	-0.04656	-0.03233	-0.0402	0.089819	-0.01852	-0.01852
clothing application	-0.03587	.338*	-0.02939	-0.02367	-0.04472	-0.07775	0.217138	-0.06712	-0.0089	-0.03092	-0.03092
hair	-0.00841	0.258851	-0.03173	-0.03109	-0.0596	-0.07641	0.218554	-0.07609	-0.04251	-0.03506	0.030303
bracelet	-0.07503	0.096619	-0.01331	0.077036	-0.00373	-0.10216	0.002167	0.026867	-0.06146	-0.00375	-0.05538
finger	-0.05806	.294*	-0.05584	-0.05811	-0.08362	-0.10191	-0.07076	-0.08798	-0.04915	-0.04053	-0.04053
earring	-0.05907	.268*	-0.04764	-0.05664	-0.0871	-0.10615	0.127479	-0.09164	-0.04463	-0.04222	-0.04222
bead	-0.00234	0.225403	-0.02981	0.016812	-0.05311	-0.09854	0.172461	-0.03672	0.017961	-0.02222	-0.03919
tusk	-0.04679	-0.0688	-0.03809	-0.04673	-0.06725	-0.08196	-0.04639	-0.07075	-0.03952	-0.0326	-0.0326
other ring	-0.06728	.294*	-0.05226	-0.03283	-0.08462	-0.10926	0.095116	-0.09432	-0.05269	-0.04345	-0.04345
other	-0.04178	0.25664	-0.01884	-0.01583	-0.04675	-0.05698	0.239408	-0.04919	-0.02748	-0.02266	-0.02266
ling	-0.06334	.398**	-0.0486	-0.05888	-0.08474	-0.10327	0.055517	-0.08915	-0.0498	-0.04107	-0.04107

Table 5.106: Correspondence Table for Objects in Megalithic Graves III.

	arrow	knife	sword	weapon	tool	grinding rod	spindle whorl	armor	coin	seal	clothing application	hair
arrow	1	0.031553	0.051107	-0.01651	0.190092	-0.08634	-0.05138	0.108394	-0.04999	-0.06441	0.136984	0.116483
knife	0.031553	1	-0.04892	0.032142	0.199213	0.205455	-0.07533	0.184806	-0.08443	0.184806	.290*	0.093897
sword	0.051107	-0.04892	1	0.150715	0.195649	.342*	-0.02615	-0.04303	-0.08271	-0.04303	.370**	.374**
weapon	-0.01651	0.032142	0.150715	1	0.194546	0.038978	0.039406	.504**	0.148099	-0.0449	0.181302	0.214341
tool	0.190092	0.199213	0.195649	0.194546	1	-0.11734	-0.02099	.298*	-0.03596	0.119815	.578**	.581**
grinding rod	-0.08634	0.205455	.342*	0.038978	-0.11734	1	0.039406	-0.0449	-0.0863	-0.0449	-0.02838	-0.0806
spindle	-0.05138	-0.07533	-0.02615	0.039406	-0.02099	0.039406	1	-0.05251	-0.0789	0.050632	0.119576	0.128941
armor	0.108394	0.184806	-0.04303	.504**	.298*	-0.0449	-0.05251	1	-0.03559	-0.01852	-0.03092	-0.03506
coin	-0.04999	-0.08443	-0.08271	0.148099	-0.03596	-0.0863	-0.0789	-0.03559	1	0.181922	-0.04097	-0.00457
seal	-0.06441	0.184806	-0.04303	-0.0449	0.119815	-0.0449	0.050632	-0.01852	0.181922	1	0.055556	-0.00238
slag	-0.06441	-0.07252	-0.04303	-0.0449	-0.05829	0.092297	-0.05251	-0.01852	-0.03559	-0.01852	-0.03092	-0.03506
clothing-applic.	0.136984	.290*	.370**	0.181302	.578**	-0.02838	0.119576	-0.03092	-0.04097	0.055556	1	.915**
hair	0.116483	0.093897	.374**	0.214341	.581**	-0.0806	0.128941	-0.03506	-0.00457	-0.00238	.915**	1
bracelet	0.23874	0.037466	.483**	-0.01606	0.069425	.672**	-0.03155	-0.00375	-0.0899	-0.00375	0.234068	0.241339
finger ring	-0.00344	.404**	0.094186	-0.09827	0.049612	.311*	-0.01231	-0.04053	0.008656	.365**	0.156009	0.092332
ear ring	0.004683	.384**	0.261607	0.138232	.284*	0.050014	0.097339	-0.04222	-0.06843	0.01732	.806**	.711**
bead	0.063821	0.088801	.327*	0.129028	.354**	0.04215	0.069342	-0.03919	-0.0717	-0.02222	.766**	.773**
tusk	-0.07218	-0.12293	0.132557	-0.06897	-0.08301	0.253023	-0.08486	-0.0326	-0.06265	-0.0326	-0.01955	0.124044
other ring	0.040648	.532**	0.199228	0.068659	.417**	0.07736	0.073022	-0.04345	-0.05593	0.085734	.783**	.631**
other ornament	0.132637	0.100995	.408**	0.211947	.627**	-0.05494	0.136386	-0.02266	-0.04355	-0.02266	.945**	.960**
ling	-0.0151	.524**	0.114531	0.02213	0.239401	0.224991	0.051296	-0.04107	0.017543	.411**	.439**	.449**

Table 5.107: Assemblages at Graves in Yanyuan and Yongsheng.

	location	special ritual	inter.	ceramic vessel	metal weapon/ tool	stone weapon/ tool	orn.	*ling* bell	body armor	horse gear	metal vessel	drum	bell	staff	ball
YLLM4a	second-level ledge North		1	1	1	0	1	0	1	2	0	0	0	0	3
YLLM4b	second-level ledge South	1 horse skull, 2 horse long-bones	0	0	1	0	2	0	0	0	0	0	0	0	0
YLLM4c	foot compartment	cinnabar	0	4	1	0	1	2	0	3	2	1	1	0	0
YLLM4d	main grave-pit, East		1	1	0	0	32	0	0	0	0	0	0	0	0
YLLM4e	main grave-pit		0	1	0	0	30	0	0	0	0	0	0	0	0
YLLM4f	main grave-pit, West		0	0	2	0	13	0	0	0	0	0	0	0	0
YLLM4g	main grave-pit, SW		0	0	0	0	0	0	2	3	0	0	0	1	0
YLLM4h	main grave-pit, NW	horse skull	0	0	0	0	0	0	0	0	0	0	0	0	1
SUM M4			*2*	*7*	*5*	*0*	*79*	*0*	*3*	*8*	*2*	*1*	*1*	*0*	*4*
YLLM6.1	skeleton 1	rouge-red soil	1	1	0	1	3	0	0	0	0	0	0	0	0
YLLM6.2	skeleton 2		1	1	0	0	0	2	0	0	0	0	0	0	0
YLLM6.3	skeleton 3	rouge-red soil, animal bones	1	2	3	0	16	0	0	0	0	0	0	0	0
YLLM6.4	skeleton 4		1	0	0	0	19	0	0	0	0	0	0	0	0
YLLM6a	on divider		0	0	5	14	0	0	0	0	0	0	0	0	0
YLLM6b	foot compartment	3 horse long bones	0	0	0	10	1	0	0	0	0	0	0	0	0
YLLM6c	south of coffin	1 horse skull, 3 horse long bones	0	0	0	0	0	0	0	0	0	0	0	0	0
SUM M6			*4*	*4*	*10*	*25*	*39*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
YLLM5			1	0	0	0	0	0	3	0	0	0	0	0	0
YLLM7		calcinated animal remains	1	1	9	0	30	0	0	0	0	0	0	0	0
YLLM10			1	0	2	0	0	0	0	0	0	0	0	0	0

YLLM11			1	1	10	4	49	0	0	0	0	0	0	0	0
YLLM9a	stone cist	pig skeleton	1	0	1	0	4	0	0	0	0	0	0	0	0
YLLM9b	west of stone cist		0	0	1	0	30	0	0	0	0	0	0	0	0
YLLM9c	main chamber, middle		1	0	0	0	0	0	0	0	0	0	0	0	0
YLLM9d	main chamber, east		1	0	0	0	0	0	0	0	0	0	2	0	0
YLLM9e	main chamber, west	burning of human and animal bones	1	1	12	3	10	2	0	0	0	0	0	0	0
SUM M9			*4*	*1*	*14*	*3*	*44*	*2*	*0*	*0*	*0*	*0*	*2*	*0*	*0*
YMBM1			1	0	2	0	0	0	0	0	0	2	0	0	0
YMBM2			1	3	5	0	0	0	2	1	0	1	0	0	0

Table 5.108: Minimal Assemblage of Stone-Construction Graves with Multiple Secondary Interments at Yongsheng Duizi.

	double-handled jar	bronze arrow	metal knife	sword	other metal weapon	spindle whorl	bronze bracelet	bronze finger-ring	bead	cowry	snail	hairpin, bone	ling
YDZM77	2	3	3	1	2		1		8	3	1	1	
YDZM91	5	2	1				2	1		3	3		2
YDZM106	0	2	1		1	1							
YDZM139	0	1			1								
YDZM94	0	2								3	3		

Table 5.109: Assemblages of Graves at Xichang Lizhou, arranged by Number of Vessels

	jar	**vat**	**bo**	**basin**	**ewer**	**vase**	**wan**	**dou**	**cup**	**double-handled**	**double jar**	**lid**	**SUM**
XLAM11	25	11	2	2		2	8						50
XLBM3	3		7			8	19		5	5	2		49
XLBM7	5		4			7	10		7				33
XLBM4	5				11	14						1	31
XLBM5	2		4	4		8	9		1				28
XLAM10	8	1	2		3	4	2						20

XLBM8	11		2			1	2	1					17
XLAM4		4				4	6		2				16
XLAM6	2	1	2			1	1		8				15
XLAM2	8		1		1	2	1	1					14
XLAM5	5					2	4	1	1				13
XLAM9	2	2	1			4		2	1				12
XLAM7	1	4				1	4						10
XLBM6	3					1	5						9
XLAM1		3				3	2	1					9
XLBM1	3					1	3						7
XLBM2	1	1		3		2							7
XLAM13	2	3					1	1					7
XLAM12							6						6
XLAM8	3	2					1						6
XLAM3	3					2							5

Table 5.110: Correlation Table for Artifacts occurring in more than one Grave at Xichang Lizhou.

	jar	vat	cup	ewer	vase	bo	wan	basin	dou
jar	1	.875**	0.090564	-0.98198	-0.09454	-0.28483	0.08266	-0.84702	-0.5145
vat	.875**	1	-0.66285	.^{a}	-0.16031	0.240239	.867**	-1.000**	-1.000**
cup	0.090564	-0.66285	1	.^{a}	-0.04655	0.15861	0.020681	.^{a}	.^{a}
ewer	-0.98198	.^{a}	.^{a}	1	.999*	1.000**	1.000**	.^{a}	.^{a}
vase	-0.09454	-0.16031	-0.04655	.999*	1	.792*	.771**	0.866025	0.784465
bo	-0.28483	0.240239	0.15861	1.000**	.792*	1	.941**	1.000**	-0.5
wan	0.08266	.867**	0.020681	1.000**	.771**	.941**	1	1.000**	.^{a}
basin	-0.84702	-1.000**	.^{a}	.^{a}	0.866025	1.000**	1.000**	1	.^{a}
dou	-0.5145	-1.000**	.^{a}	.^{a}	0.784465	-0.5	.^{a}	.^{a}	1

Table 5.111: Sereation Table for Artifacts in Graves at Xichang Lizhou.

	lid	ewer	vat	basin	jar	vase	wan bowl	dou bowl	bo bowl	cup	double-handled jar	double jar
XLBM4	1	1	0	0	1	1	0	0	0	0	0	0
XLBM2	0	0	1	1	1	1	0	0	0	0	0	0
XLAM8	0	0	1	0	1	0	1	0	0	0	0	0
XLAM7	0	0	1	0	1	1	1	0	0	0	0	0
XLAM10	0	1	1	0	1	1	1	0	1	0	0	0

XYGM3	0	0	0	0	1	1	0	0	0	0	0	0
XLAM3	0	0	0	0	1	1	0	0	0	0	0	0
XLAM11	0	0	1	1	1	1	1	0	1	0	0	0
XLAM13	0	0	1	0	1	0	1	1	0	0	0	0
XLAM1	0	0	1	0	0	1	1	1	0	0	0	0
XLBM1	0	0	0	0	1	1	1	0	0	0	0	0
XLBM6	0	0	0	0	1	1	1	0	0	0	0	0
XYGM1	0	0	0	0	1	1	1	0	0	0	0	0
XLAM2	0	1	0	0	1	1	1	1	1	0	0	0
XLAM4	0	0	1	0	0	1	1	0	0	1	0	0
XLAM6	0	0	1	0	1	1	1	0	1	1	0	0
XLBM5	0	0	0	1	1	1	1	0	1	1	0	0
XLAM9	0	0	1	0	1	1	0	1	1	1	0	0
XLBM8	0	0	0	0	1	1	1	1	1	0	0	0
XLAM12	0	0	0	0	0	0	1	0	0	0	0	0
XLAM5	0	0	0	0	1	1	1	1	0	1	0	0
XLBM7	0	0	0	0	1	1	1	0	1	1	0	0
XLBM3	0	0	0	0	1	1	1	0	1	1	1	1

Table 5.112: Assemblages in other Earth-Pit Graves in Xichang.

	double-handled	single-handled	goblet	jar	ewer	vase	bo	dou	fu	urn	sword	arrow	axe/adze	grinding rod	knife	chopper	bronze bracelet
XDYM2	1			2			1						1	1	1		
XDYM3	1							1			1	1		1	1		
XDYM9	2	2															
XDYM4			1														
XDYM8			1	1				1									
XQGM1			10	25	1												1
XQGM2			11	16		1											
XYPM1							1						2				

Table 5.113: Assemblages from Graves at Huili Fenjiwan and Washitian.

	jar / urn	single-handled	double-handled	cup	goblet	vase/ ewer	bowl	stone	spindle	sword	yue	stone tool	arrow	axe	deco.	SUM
HFJM10	1															1
HFJM100	1							2								3

HFJM101	1															1
HFJM102	2						1									3
HFJM103	1								1							2
HFJM105					2											2
HFJM106	1							1								2
HFJM108	1															1
HFJM109	1							1								2
HFJM112	1							1								2
HFJM113	1															1
HFJM116	1															1
HFJM118	1															1
HFJM12											1					1
HFJM120	2							1								3
HFJM121	1							2								3
HFJM122	1							1								2
HFJM123	1															1
HFJM124	1							1								2
HFJM125	1															1
HFJM126	1															1
HFJM127	1				1											2
HFJM128	1															1
HFJM129														1		1
HFJM13															6	6
HFJM130	1															1
HFJM131								1								1
HFJM132								1								1
HFJM133	1							1								2
HFJM134	1															1
HFJM135	1															1
HFJM137	2															2
HFJM138	2					1		3								6
HFJM139	2								1							3
HFJM140	1			1												2
HFJM141	3						1									4
HFJM142	2						1									3

HFJM143	3															3
HFJM144	3	1							1							5
HFJM145	1															1
HFJM146	2															2
HFJM148	3	2			2	3	2	1				1				14
HFJM149															1	1
HFJM15								1								1
HFJM17								1								1
HFJM2	1															1
HFJM20								1								1
HFJM26	3	1			1	1	1	1			1	3	1			13
HFJM28	1															1
HFJM29	1				2			2								5
HFJM3		1						1			1				2	5
HFJM30	1															1
HFJM32	3				1			1	1							6
HFJM33	1		2				1	2								6
HFJM34	1															1
HFJM35	1															1
HFJM36	1							1								2
HFJM37	3						1	2	2							8
HFJM38	1									1						2
HFJM39	1															1
HFJM4	1				1		1	4			1					8
HFJM40								1								1
HFJM42									1							1
HFJM44	2															2
HFJM45	1						1	1								3
HFJM47	1							1								2
HFJM48	1															1
HFJM49	1															1
HFJM5	1															1
HFJM50	1							1								2
HFJM51	1															1
HFJM52	1							1								2

HFJM53					1										1	2
HFJM54	1							1								2
HFJM55	1															1
HFJM56	1							1								2
HFJM57	1															1
HFJM59	1							1						1		3
HFJM6	2		1			1			1							5
HFJM60	1							1							1	3
HFJM62	1															1
HFJM64	1															1
HFJM65								1								1
HFJM66	1															1
HFJM68	1															1
HFJM69	1															1
HFJM70	3															3
HFJM71	1															1
HFJM72	1															1
HFJM73	1															1
HFJM74	1															1
HFJM75	1															1
HFJM76	1							1								2
HFJM77	1															1
HFJM78	1							1								2
HFJM79	1															1
HFJM8								1								1
HFJM80	2															2
HFJM82	1							1								2
HFJM83	1															1
HFJM84	1															1
HFJM85	1															1
HFJM88	1							1								2
HFJM91							1		1							2
HFJM93	1						1									2
HFJM94	1				1		1									3
HFJM95	1															1

HFJM98									1							1
HWTM1	8	3					2					1				14
HWTM2									1							1
HWTM3									3							3
HWTM4									4							4
HWTM5									4							4
SUM	124	8	3	1	12	6	15	49	22	1	4	5	1	2	11	264

Table 5.114: Assemblages from Graves and Surface Finds at other Grave Sites in Huili and Luquan.

	jar	handled	goblet	vase	chain	stone	metal weapon	stone arrow	grindin g rod	stone tool	spindle whorl	clothing	hair	orn.	horse gear
HWT0							2	1		11				1	
HGJM1		2													
HGJM2											1			45	
HGJM29							1								
HGJ0	2	9					64				1	182	67	17	1
HLJM1	21	24	50	7		1	13	13	5	19	22				
HML0	1								3						
HMLM1	2								2		1				
HYSM1	1														
HXSM21				1	2										
HXPM13				1											
HXPM14	1														
HXPM20				1											
HXPM5			1												
HXPM6										1					
LYBMAM1				1											
LYBMAM2	1														
LYBMAM3	2														
LYBMAM8				2											
SUM	30	35	51	13	2	1	67	14	10	31	25	182	67	63	1

Table 5.115: Assemblage from Stone-Construction Graves in Zhaojue and Meigu.

	jar	vase	other ceramic	metal weapon	stone weapon/ tool	spindle whorl	ring	hair	bead	chain	pendant	shell	coin	metal vessel	ropes
ZCBM1	2		1	1					2	1			3		
ZCBM3							1						9		
ZCBM4													1		
ZCBM5						1	1								
ZCBM6			1			1	1						4		
ZJEM1					1		2		1					2	
ZJEM2											1				
ZJEM3				1				1							
ZEKM1	1														
ZEKM11							1					1			
ZEKM12	1				1										
ZEKM2															1
ZEKM3	5				1				4						
ZEKM4					9									1	1
ZEKM5					1										
ZEKM9											1				
ZFCM1	4		2												
ZFCM2					1										
ZFCM3	6														
ZLYM2					2										
ZMCM1	1														
ZPBM1							1								
ZPBM11	1														
ZPBM2	1	1													
ZPBM3		3					5								
ZPBM4		2							1						1
ZPBM8	4														
ZPBM9	1	1													
ZWSM1					1										2
ZWSM5															
MABM1	1														
SUM	*28*	*7*	*4*	*2*	*17*	*2*	*12*	*1*	*8*	*1*	*2*	*1*	*17*	*3*	*5*

Table 5.116: Assemblages from Earth-Pit and Stone-Construction Graves in Puge, Xide, and Yuexi.

	jar	wan	arrow, bronze	arrow, wood	sword	iron knife	stone axe	grinding rod	button	bronze bracelet	chain	shell	metal vessel	iron tray	seal	SUM
PWLM1											1					1
PWLM2											1					1
PWLM3				3								1				4
XWDM1	1	1														2
XWDM2	1	1														2
YQSM1	1	1					1	1								4
YYHM1					1								10	1	1	13
YLSM1					3	6			3	2			4			18
SUM	*3*	*3*	*0*	*3*	*4*	*6*	*1*	*1*	*3*	*2*	*2*	*1*	*14*	*1*	*1*	*45*

Table 5.117: Assemblages from Graves with Single Interments in Ninglang, Yanbian, and Yanyuan excluding Laolongtou.

	jar	single-handled	double-handled	beaker	arrow	knife metal	sword	yue axe	tool metal	spindle whorl	applic.	bead	wood cont.	stone	ling	coin
NDXM1				3												
NDXM10		1	3													
NDXM11		1														
NDXM2	1	3	2			1		3								
NDXM3	1	3	1													
NDXM4		2	2					1								
NDXM5	2	9	5		2	1						1	5			
NDXM6		4														
NDXM7	2	2	1						1							
NDXM8							1	1								
NDXM9	1	1	2							1	1					
YYWM1	1															
YYWM3	2															
YYWM4				1												
Surface finds																
YBI0	1				1	1		1								
YGS0			1				3	1	1		1					
YYN0	4														3	
YCJ0			1		4	4	4	4	3		4	3				

YXHM0			30				6	5									
Robbed																	
YBSM1			30			1	1	2									
YCJM4						1											8
YHTM1							1								1		
YJDM1			1														
YWSM1			2														
YZSM1									1								
SUM	*15*	*26*	*81*	*4*	*7*	*9*	*16*	*18*	*6*	*1*	*6*	*4*		*5*	*1*	*3*	*8*

Fig. 5.118: Minimal Assemblages from Insufficiently Reported Single Graves in Yongsheng by Type of Interment.

	jar	doubleh	urn	beaker	vase	bowl	arrow	tool	spindle	button	hair	bracelet	ring	bead	shell	drum	ling
cremation																	
YDZM102	1		2														
YDZM119			1														
YDZM124	1	1	2														
YDZM127		2												1			
YDZM134	1			1		1											
YDZM140	1			1													
YDZM23	2																
YDZM32	2												1				
YDZM37	1																
YDZM39	1		1														
YDZM40		1															
YDZM47	1		2											1			
YDZM48								1									
YDZM66	3		1					2									
YDZM80			1						1								
YDZM96	4																
YDZM97		1	1														
primary interment																	
YDZM11	1	3						1							5		
YDZM131		1				1											
YDZM15	1	2		1									2		8		2
YDZM15														3			

YDZM16														12			
YDZM2	2				2	2	2	2			1	1					
YDZM55	7				1	2											
YDZM57						3							1				
YDZM58	2				1												
YDZM59	9				1	1											
YDZM61												1					
YDZM62	1				1	1					3	3	2				
YDZM82		1															
YDZM85	8				4	10									5		
primary and secondary																	
YDZM12	2																
YDZM1	2								2								
YDZM10	2				1	3					3	1					
unclear																	
YQDM1							3				1						
YYJM1																2	
YDZM100														18			
YDZM101												1					
YDZM114	1																
YDZM13							1							8			
YDZM135	1																
YDZM14													1				
YDZM17	6																
YDZM18															9		
YDZM19							1	3						1			
YDZM3	1					1											
YDZM34								4						1			
YDZM70																	
YDZM71		1										1					
YDZM88								1									
YDZM9							1										
YDZM93								1									
YDZM98										1							
SUM	*64*	*13*	*11*	*3*	*11*	*25*	*8*	*15*	*3*	*1*	*8*	*8*	*6*	*43*	*27*	*2*	*2*

Table 6.1: Content of Ceramic Object Pits.

	Ceramics	jar	double-handled jar	urn	cup	beaker	goblet	ewer	vase	basin	bo	wan	dou	lid	spindle whirl	stone net weight
XDYKa1	2															
XDYKa2	2	2														
XDYKa3	8	2		2						3	1					
XDYKa4	1	1														
XDYKa5	1	1														
XDYKa6	1	1														
XDYKa7	1	1														
XDYKa8	2	2														
XDYKa9	1	1														
XDYKa10	2	2														
XDYKa11	2	2														
XDYKa12	2	1		1												
XDYKa13	4	1	1		1								1			
XDYKa14	2	2														
XDYKa15	2	1		1												
XDYKa16	2	2														
XDYKa17	2	1		1												
XDYKa18	2	2														
XDYKa19	2			2												
XDYKa20	2	1														
XDYKa21	2	1		1												
XDYKa22	2	2														
XDYKa23	2			2												
XDYKa24	2	1														
XQGW1	2	1		1												
XYPW1	1			1												
XYPW2	2			2												
XYPW3	1			1												
XYPW4	1			1												
XYPW5	2			2												
XYPW6	2		1	1												

XYPW7	2			2												
XYPW8	2			2												
XYPW9	1			1												
XYPW10	1			1												
XYPW11	5	1		2												
XYPW12	1			1												1
XYPW13	5			2								1		1		
XDYH1	14	12			2											
XDYH2	8	6					1						1			
PWLH1	150+	4+			1+				1+		1+				2+	
XMLH1	20	2				7		10					1			

Table 6.2: Objects from the Art Market in Huili.

Type	**Subtype**	**Number**	**Figure 6.27**
knife	AbII	1	2b
	CaI	1	1b
sword	Aa	1	1a
	F	1	2a
	unknown	1	
dagger-axe	AaIII	1	3a
spear-head	C	1	3b
arm-ring	BbII	1	4a
staff-head	Cf	1	4b
SUM		9	

Table 7.1: Descriptive Statistics for Slope and Aspect at Different Types of Sites.

	Slope				**Aspect**			
	Settlements	*Graves*	*Object Pits*	*Non-Sites*	*Settlements*	*Graves*	*Object Pits*	*Non-Sites*
Mean	8.73	8.95	8.33	21.37	174.93	181.92	154.36	181.38
St. Error	0.81	0.54	2.43	0.42	8.48	6.66	25.03	3.91
Median	5.70	6.26	8.12	20.93	173.19	187.94	143.08	180.76
Mode	#N/A	0.82	#N/A	#N/A	#N/A	270.00	#N/A	#N/A
St. Dev.	8.43	8.13	6.87	10.19	88.15	100.15	70.81	95.86
Kurtosis	1.37	1.18	1.88	0.38	-0.99	-1.20	-0.90	-1.24
Skew.	1.35	1.32	1.16	0.52	-0.11	-0.06	0.36	0.03
Range	39.10	33.89	21.88	61.67	345.08	356.93	200.65	347.80
Min.	0.34	0.16	0.46	0.97	2.98	0.00	59.49	2.05
Max.	39.44	34.05	22.35	62.64	348.06	356.93	260.13	349.85
Count	108	226	8.00	600	108	226	8	600

Table 7.2: Descriptive Statistics for Elevation and Distance to River at Different Types of Sites.

	Elevation				**Distance to River**			
	Settlements	*Graves*	*Object Pits*	*Non-Sites*	*Settlements*	*Graves*	*Object Pits*	*Non-Sites*
Mean	1693.36	1797.80	1677.50	2492.74	1.96	1.83	1.40	4.39
St. Err.	42.80	26.05	53.09	33.01	0.22	0.13	0.66	0.12
Median	1620.00	1779.50	1669.00	2412.50	1.16	0.96	0.85	3.70
Mode	1809.00	2341.00	#N/A	2016.00	#N/A	3.41	#N/A	#N/A
St. Dev.	444.78	391.57	150.15	808.57	2.32	1.94	1.87	3.02
Kurtosis	4.71	-0.37	-2.36	0.20	5.67	0.93	6.39	-0.15
Skew.	1.61	0.31	0.03	0.42	2.25	1.37	2.45	0.70
Range	2793.00	1866.00	370.00	4351.00	11.77	8.64	5.86	14.28
Min.	982.00	933.00	1494.00	578.00	0.00	0.00	0.01	0.01
Max.	3775.00	2799.00	1864.00	4929.00	11.78	8.64	5.87	14.29
Count	108	226	8	600	108	226	8.00	600

Table 7.3: Aspect (i.e., Slope Direction) at Settlement Sites, Grave Sites, and Non-Sites.

Aspect	**Settlements**		**Graves**		**Non-Sites**	
N	5	4.63%	21	10.19%	36	6.37%
NE	9	8.33%	28	13.59%	71	12.57%
E	16	14.81%	36	17.48%	100	17.70%
SE	18	16.67%	25	12.14%	76	13.45%
S	17	15.74%	22	10.68%	75	13.27%
SW	15	13.89%	30	14.56%	74	13.10%
W	19	17.59%	40	19.42%	89	15.75%
NW	9	8.33%	25	12.14%	80	14.16%
SUM	108	100.00%	206	100.00%	565	100.00%

Table 7.4: Slope, Aspect, Elevation, and Distance to River for Object Pits and Urn Burials.

Name	Pit type	Slope	Aspect	Aspect	Elevation	Distance River
Huili Guoyuan (drum)	Bronze deposit	3.37	158.88	E	1825	1.01
Huili Luoluochong (drum)	Bronze deposit	2.59	260.13	W	1796	0.32
Huili Zhuanchangba (bells)	Bronze deposit	10.93	243.20	SW	1864	5.87
Puge Wadaluo	Ceramic pit	22.35	85.31	E	1773	0.93
Xichang Maliucun	Ceramic pit	7.00	59.49	NE	1556	0.77
Xichang Qimugou	Ceramic pit	9.23	123.30	SE	1565	1.68
Xichang Yingpanshan	Ceramic pit	10.71	127.27	SE	1547	0.01
Mianning Xiaogoudi	Ceramic pit	1.13	129.29	SE	1725	1.47
Xichang Dayangdui	Ceramic pit	0.46	177.32	NW	1494	0.67

Table 7.5: Distance between Graves and Nearest Settlement Site (< 2 km).

Distance (km)	Grave Site	Settlement Site
0.81	Dechang Hejia Fenshan	Dechang Hezui
0.85	Dechang Ma'anzi	Dechang Hezui
0.59	Dechang Yuejin	Dechang Hezui
0.41	Dechang Liangshanpo	Dechang Wangjiaping
0.37	Huili Yunshancun	Huili Fenjiwan
0.28	Huili Leijiashan	Huili Dazhaizi
0.26	Huili Miaozi Laobao	Huili Guojiabao
0.51	Huili Yingpanshan	Huili Houzidong
0.98	Huili Hedongtian	Huili Washitian
0.45	Meigu Wagujue Cunnan	Meigu Wagujue
0.27	Meigu Wagujue Dongbei	Meigu Wagujue
0.14	Meigu Wagujue Dongnan I	Meigu Wagujue
0.99	Meigu Wagujue Dongnan II	Meigu Wagujue
0.13	Mianning Xiaogoudi	Mianning Gaopo Wanwan
0.56	Mianning Beishanba	Mianning Sanfentun
0.57	Miyi Tianba	Miyi Heijiaba
0.83	Xichang Dabaobao	Xichang Dongyuemiao
0.78	Xichang Huangshuitang	Xichang Dongyuemiao
0.59	Xichang Lijiagou cun	Xichang Qimugou
0.01	Xichang Yangjiashan	Xichang Yangjiashan
1.00	Xichang Maliucun	Xichang Zhongjia Shanzui
0.49	Xide Lanfenba	Xide Wadegu
0.41	Xide Wenjiaba	Xide Wadegu
0.76	Xide Guoyuancun	Xide Wamu
0.10	Yanyuan Bei Ganhaixiang	Yanyuan Jiaodingshan
0.25	Yanyuan Tangshidi	Yanyuan Wuqiu
0.59	Yanyuan Caojiawan	Yanyuan Xiaoguan Liangzi
0.78	Yanyuan Bei Ganhaixiang	Yanyuan Yingpanshan South
0.80	Yongsheng Qiaodiping	Yongsheng Lujiajie
0.61	Yongsheng Yanjiaqing	Yongsheng Lujiajie
0.95	Zhaojue Watuo	Zhaojue Hebo
0.54	Zhaojue Geze Yanpeng	Zhaojue Juntun
1.45	Dechang Wangsuo	Dechang Dashipai
1.65	Dechang Guoyuan	Dechang Maojiakan
1.71	Dechang Dachangba	Dechang Maojiakan

1.26	Huili Tangjiapo	Huili Guantianshan
1.23	Huili Puling	Huili Tianbacun
1.76	Huili Xicaodi	Huili Tianbacun
1.45	Huili Xiaoyingpan	Huili Washitian
1.38	Mianning Chengguan	Mianning Sanfentun
1.54	Xichang Xixingcun	Xichang Bahe Baozi
1.36	Xichang Luzuishan	Xichang Dongyuemiao
1.16	Xichang Jianxin	Xichang Henglanshan
1.54	Xichang Yangjiashan	Xichang Qujia Laokan
1.72	Xichang Hexi Gongshe	Xichang Shantou
1.44	Xichang Yunduanshan	Xichang Shaojia Gaokan
1.08	Xichang Chenyuancun	Xichang Tanshan
1.55	Xichang Beishan	Xichang Tu'ershan
1.55	Xichang Yingpanshan	Xichang Zhongjia Shanzui
1.35	Xide Laoniuchang	Xide Wadegu
1.40	Xide Wuhe	Xide Wadegu
1.50	Yanyuan Wuming Baobao	Yanyuan Wuqiu
1.61	Yanyuan Haimatang	Yanyuan Xiaoguan Liangzi
1.10	Yanyuan Tangshidi	Yanyuan Yingpanshan
1.17	Yanyuan Tangguan Liandi	Yanyuan Yingpanshan
1.36	Zhajue Waluo Geci	Zhaojue Hebo
1.10	Zhaojue Sikaixiang	Zhaojue Juntun
1.67	Zhaojue Ada Bobu	Zhaojue Juntun

Table 7.6: Frequency of Occurrence of Main Ceramic Types at Different Types of Sites.

	Settlement		Grave		Ceramic Pit Type I		Ceramic Pit Type II	
Object Type	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
jar	81	39.71%	413	28.66%	32	44.44%	25	47.17%
single-handled jar	6	2.94%	116	8.05%	0	0.00%	0	0.00%
double-handled jar	6	2.94%	227	15.75%	2	2.78%	0	0.00%
four-handled jar	0	0.00%	2	0.14%	0	0.00%	0	0.00%
double-jar	0	0.00%	3	0.21%	0	0.00%	0	0.00%
urn	12	5.88%	47	3.26%	30	41.67%	0	0.00%
vat	0	0.00%	32	2.22%	0	0.00%	0	0.00%
cup	13	6.37%	51	3.54%	1	1.39%	4	7.55%
beaker	3	1.47%	73	5.07%	0	0.00%	7	13.21%
goblet	3	1.47%	106	7.36%	0	0.00%	1	1.89%
ewer	6	2.94%	50	3.47%	0	0.00%	10	18.87%
vase	15	7.35%	126	8.74%	0	0.00%	2	3.77%
basin	3	1.47%	10	0.69%	3	4.17%	0	0.00%
bo bowl	26	12.75%	59	4.09%	1	1.39%	2	3.77%
wan bowl	13	6.37%	103	7.15%	1	1.39%	0	0.00%
dou bowl	3	1.47%	16	1.11%	1	1.39%	2	3.77%
lid	11	5.39%	1	0.07%	1	1.39%	0	0.00%
object stand	3	1.47%	0	0.00%	0	0.00%	0	0.00%
fu cauldron	0	0.00%	6	0.42%	0	0.00%	0	0.00%
SUM	204	100.00%	1441	100.00%	72	100.00%	53	100.00%

Table 7.7: Sites with Ceramics with Leaf-Vein Impression on the Bottom.

Site Number	**ID**	**Name**	**Site Type**
1	DAR	Dechang Arong	Grave site
10	DDP	Dechang Dongjiapo	Settlement site
27	DMK	Dechang Maojiakan	Settlement site
36	DWP	Dechang Wangjiaping	Settlement site
37	DWT	Dechang Wangjiatian	Settlement site
38	DWS	Dechang Wangsuo	Grave site
52	HDJ	Huili Dongzui	Settlement site
54	HFS	Huili Fenjiwan	Settlement and grave site
102	MGP	Mianning Gaopo	Settlement site
103	MGW	Mianning Gaopo Wanwan	Settlement site
108	MST	Mianning Sanfentun	Settlement site
109	MSK	Mianning Sankuaishi	Grave site
114	MZJ	Mianning Zhaojiawan	Settlement site
119	MWQ	Miyi Wanqiu	Grave site
123	NJY	Ninglang Daxingzhen	Grave site
132	PTB	Puge Tianba	Settlement site
134	PWL	Puge Wadaluo	Settlement, graves, object pits
135	PXC	Puge Xiaoxingchang	Settlement and grave site
144	XBB	Xichang Bahe Baozi	Settlement and grave site
156	XDY	Xichang Dayangdui	Settlement, graves, object pits
170	XLZ	Xichang Lizhou	Settlement and grave site
172	XMS	Xichang Ma'anshan	Settlement and grave site
177	XMI	Xichang Mimilang	Settlement and grave site
179	XQG	Xichang Qimugou	Settlement, graves, object pits
196	XWN	Xichang Wanao	Grave site
218	XLK	Xide Lake Sihe	Grave site
222	XWD	Xide Wadegu	Settlement and grave site
240	YJD	Yanyuan Jiaodingshan	Settlement and grave site
242	YLL	Yanyuan Laolongtou	Grave site
260	YDZ	Yongsheng Duizi	Settlement and grave site
304	ZJP	Zhaojue Pusu Bohuang	Grave site

Table 7.8: Megalithic Graves, Their Date, and Major Ceramic Form Types.

	remarks	ceramic quality	urn	double-handled	vase	ewer	beaker	goblet
Phase I								
XDYDM2	not reopened	sand, red-brown-grey	AaII				A	
XTHM10	not reopened	fine, red			Ac			EcIa, EcIb
XGSM1	probably not reopened	fine/sand			Ga			
Phase IIa								
XQGM1		fine, black, high	x			BbI		CaIa, CaII, DaII
XQGM2		fine, black, high			Bb			CaIa, CaII, CaIII, Cb, CcI, CcII, Db
XMLH1		sand/fine, black-brown				BbII	CaII	CaI, DaII, EbII
XYJM5		sand/fine, black-brown						
XYJM3		sand/fine, black-brown						
XYUM1		sand/fine, black-brown						
XYUM2		sand/fine, black-brown						
XBBM4		sand, black						
XBBM6		sand/fine, black-grey						CaIb, DaI
XBBM3		no ceramics						
Phase IIb								
XBBM1		sand, black						
XBBM2		no ceramics						
DGYM2		no ceramics						
PXAM1	might have started earlier	fine, black-brown-grey				BbI		
PXAM2	82 skeletons, possibly long use-life	fine, black-brown-grey						
XLKM6	some later forms as well, longer use-life	fine/sand, grey-black		G		BbII	Ca	
XLKM7		no ceramics						
XLKM5		no ceramics						
XLKM1		fine/sand, grey-black				BbII		EbII
XLSM1	continuing until phase IV	sand, grey		DcIa				EbI
XYJM1		sand/fine, black-brown			x			
XYJM2		sand/fine, black-brown						DaI
Phase IIIa								
XQG3		sand, red-brown-grey	AaII, Bb	Cb, Da, Dc		x		B/C
DWT3		sand, red-brown-grey		Da, Db, Dc, E?			Ca	
DWTH1		sand, red-brown-grey		CcII				
DWTH2		sand, red-brown-grey	Aa	Db				
DWTH3		no ceramics						

MST5		sand, grey-brown						
MST6		sand, grey-brown						
MST7		sand, grey-brown						
MWQM1	some variability in material, many ceramics, probably used over long time	sand		CaI, CaII, CaIII, CbII, CcI, CdI, DaIII, DaIV, DcIa, DcII, De	FaI, FaII	A	Ba, BaI, BaII, Bb, Ca, CbI, CbII, DcI, DcII	
MWQM2	some variability in material, many ceramics, probably used over long time	sand, red-brown-grey		CaI, CaII, CaIII, CbI, CbII, CcI, CdII, DaII, DaIII, DaIV, DcIa, DcII, DdI, De, Df	FaII		BaI, BaII, Bb, Ca, DcII, DcIII	EdII
PXBM1	48 skeletons, possibly long use-life	fine, black-brown-grey						
PXBM2	many skeletons, probably continues until phase IV	fine, black-brown-grey		DaII				
Phase IIIb								
PXBM3		fine, black-brown-grey						
PXBM4	125 skeletons, earlier and later comb types, continues until phase IV	no ceramics						
XXHM1	much variety in objects, long use life	sand, black						
MSKM1		sand						
XHGM1		sand, red-brown-grey						
XHGM2	continues until phase IV	sand, red-brown-grey						
XHGM5		no ceramics						
XHGM6		fine, black						
XHGM8		fine sand, black						
DARM1	much ritual activity, possibly long use time	sand, red-brown-grey					Ca	
DARM3	some variety in material, possibly longer use life	sand, grey-brown		DcIa	FaII, Ha	BaII		
DARM4	very large	sand, grey-brown		Db, DcIa	Ab, FaII	BaII		
Phase IV								
XXJM1	earlier and later needles	sand, grey-red		F		BaI		

	present, ceramics later							
XHGM3		sand, red-brown-grey						
XHGM4		sand, red-brown-grey						
XHGM8		fine, black-grey, high		DcIa				
XHSM4		sand, red-brown-grey						
XGQM1	large, many ornaments, long use life	fine, red, high-fired						
XGQM2	20 skeletons	fine, red, high-fired						
XWNM1	much ritual activity inside, possibly over longer time	sand, red-brown-grey					Bb, Ca	
XWNM2	much ritual activity inside, possibly over longer time	sand, red-brown-grey						
XBSM1		no ceramics						
XQYM1		no ceramics						
Unclear date								
MTBM1		no ceramics						
MTBM2		no ceramics						
MBSM1	probably not reopened	sand						
MSLM1	probably not reopened	sand						
XCYM1		sand, red-brown-grey						
XXCM1	large grave	no ceramics						

Table 7.9: Megalithic Graves, Their Date, and Secondary Ceramic Form Types.

	cup	jar	single-handled	four-handled	handle	jar with handles	wan	bo	dou	fu	spindle whorl
Phase I											
XTHM10		BaII									
XGSM1		x									
Phase IIa											
XQGM1		GaIII			C						
XYJM5											Ab, Ba
XYUM1		EbIIa									Aa, Ab, Bb, Bb
XYUM2											Aa, Ab, Ba
XBBM4											Aa
XBBM6	CaII										

Phase IIb											
XBBM1											Aa
PXAM1		x									Bc
PXAM2		x									
XLKM6	CaI, CbI										
XLHM1		Ec									
XLSM1		GbII								A, B	
XYJM1		C, Gc			BaI						
XYJM2					BaI						
Phase IIIa											
XQG3	A	Ha			Aa, Bb, BcI	x		AaI			
DWT3		Ha			Aa, BaII, BcI, Bd, D						Ab, Ad
DWTH2		Ha									
MST5					Aa						
MST6					Bb, BcI						
MWQM1	BaIa, BaIII, BbI, CaII, CbI, CbII, CcI, CcIIa		CaI, CbI, DaI, DbIa, Ea, Fb								
MWQM2	A, BaI, Ba, Cb, Cc		CaI, Ea, Fb, Ja						AbII		
PXBM1		x									
Phase IIIb											
XXHM1	CdIII										
MSKM1	CdII	x									
XHGM1		x									
XHGM2		x									
XHGM6											Ab, Ba
XHGM8											Ab
DARM1		Hb, Hc			Bd	AaI, AaII, Ab, Ac					
DARM3		Hb	Ea, Ha		Ac			Fc			
DARM4		AaII, EbII		B							
Phase IV											
XXJM1			CaI, DaI, Ka								x

XHGM3				A							
XHGM4		x									Ab, Da
XHGM8			Ka, Kb, Kc								
XHSM4		x	CaI, Ka								
XGQM1		x	CaI, Ka								
XGQM2			Kb								
XWNM1		Ea, Ha				AaII		E, EaIc			
XWNM2	CdI	Ea, Hb, Hc						D			
Unclear											
MBSM1		x									
MSLM1		AbII									
XCYM1	x										
XXCM1		x									x

Table 7.10: Stone Tools connected with Megalithic Graves.

	arrowhead	axe	chisel	adze	grinding rod	chopper	grinding slab	pestle	scraper	microlith
Phase IIa										
XQGM2						AI, AII				
XYJM3	IIBbI									
XYUM1	IIBaI									
XBBM6	IIB					AI				
Phase IIb										
XLKM5	IICbII									
XLSM1	IID									
XYJM1	IIBaII							C		
XYJM2	IIBaI, IIBbI			Aa						
Phase IIIa										
XQG3		B, Ba		Ca, Cb		AI, AII, BI	D	Aa, Ab, B		
DWT3					BaII				D	scraper
DWTH2										scraper
MST5		Ca				AII, BIII				
MST6						AII, B		B		
PXBM1					BaI					
PXBM2										
Phase IIIb										
PXBM4					AaI, Bai					

XHGM1					BaI					
XHGM2					BaI, BaII					
DARM4					BaI					
Phase IV										
XHGM4					BaII					
XHGM8			Ab							
XHSM4					BaII					
XGQM1					AcI					
XWNM1					Bb					

Table 7.11: Metal Weapons, Tools, and Other Metal Objects connected with Megalithic Graves.

	arrow bronze	spear bronze	spear iron	sword bronze	sword iron	knife iron	knife bronze	knife, stone	axe, bronze	sickle	spade	coins	seal
Phase IIa													
XQGM1								AI					
XQGM2								AI					
Phase IIb													
XBBM1							Fb						
DGYM2	x						Fc						
PXAM1	IC						Fa, Fd						
PXAM2	IC						Fc						
XLKM6							Fd						
XLKM7							Fa						
XLSM1												Aa	
Phase IIIa													
XQG3								DIII					
DWT3								FII					
DWTH3								FII					
MST6								FII					
MWQM1	IE			x									
MWQM2	IE												
PXBM1	IGb						x						
Phase III													
XXHM1	IGa					AhII		AII, Cib	D	x			
MSKM1	x						x						
XHGM1				G			Fa						
XHGM2						AhII	CaI, Fa						
XHGM5						x							

DARM1		C											
DARM3						AhI							
Phase IV													
XXJM1	IGb, IE	C	C		x			AII			x		
XHGM3												Aa	
XHGM4						x							
XHGM8							Fb, Fb					Ac	x
XHSM4						AhI							
XGQM1						AhI, H						Aa, Ab	
XWNM1						Ha, Hb							
XQYM1						Ha	x						
MTBM1												x	
MTBM2												x	
Unclear													
MBSM1	x												
XXCM1	x						x						

Table 7.12: Personal Ornaments of Metal in Megalithic Graves.

	bracelet	finger ring	earring	*huan*	*ling*	button	belt hook	geometric ornament	needle	hair comb	head ornament	hair needle	conical object	bead
Phase IIa														
XQGM1	C													
XBBM4	BbII													
XBBM3	BbIb													
Phase IIb														
XBBM1	AcII, Ba, Bb	Aa, Ab		C	Da					A		A		
XBBM2	AcII													
DGYM2	C													
PXAM1	AaI													
PXAM2	AaIIc													
XLKM6	AcIIIa, BcI					Ba						C		E
XLKM7	AbIII, AcV													
XLSM1										A, C				
Phase IIIa														
MWQM1	AaIIa													
PXBM1	Aa, Ac,	Aa												

	Ba, BbI													
PXBM2										Bb				
Phase IIIb														
PXBM4	BaIIa									A, Bb				
XXHM1				Ba, Bb		Db, E				A, C			Db, Dc	
MSKM1	C					x								
XHGM2	BaIV				Aa									
DARM4	AaIIa													
Phase IV														
XXJM1	AcII, BbIb		F	Bb	Ac	Ba, Bb, Ca	B	A	x	Ba, C, D, E	x		Db, Dc,	E
XHGM4	AcI, C													
XHGM8	AcV, BcII	Aa, Ab		Ba	Ab	Ca, Cb, E				A				
XGQM1	AaII, Ab, Ac, BaIV	A, Ba, Bb	A, B		Da	Bb, Ca, Da								
XWNM1						Ad								
XBSM1	BcI, C		B		Ac									
XQYM1	C													
MTBM2	C													
Unclear														
MBSM1	BcI, C					x								
XXCM1	C													

Table 7.13: Personal Ornaments of Bone and Stone in Megalithic Graves.

	bracelet	earring	*huan*	*huang*	tusk	pendant	turquoise beads	agate beads	other beads
Phase IIa									
XBBM3							Ba, F		
Phase IIb									
XBBM1		Aa, Ab		B			Dc	Ba	Ba, F
XBBM2							Db		
DGYM2							Bb, Da, Db		
XLKM6				C					
Phase IIIa									
PXBM1	Bb		Aa		Ca, Cd, Ce			C	
PXBM2	Ba	Aa, Ab	Ab		Ca, Cb, Cc, Cd, Ce			Bc	
Phase IIIb									
PXBM4					Ca, Cb		Aa, Ba, Da		
XXHM1								Ba	

XHGM1		Ab							
XHGM2									Bb
DARM3							Db, Dc		
DARM4								Bb	
Phase IV									
XXJM1		Aa, Ab	A		Cd	x		Ab, Ac	Ab, Ac, Bb, Bc
XHGM4	Ab	Aa, Ab	Ab						
XHGM8		Aa							Bb
XGQM1							Da	Ba, Bc, Da	
XWNM2		Ab				Ac			Bb, Bc
XBSM1		Aa, Ab							
Unclear									
XCYM1									Bb

Table 7.14a: Chronological Table (Neolithic to Early Bronze Age).

Date	Dechang	Xichang	Mianning	Northeast	Southeast	South and Southwest
Late Paleolithic					Huili Yangjia Wuji	Renhe Huilongwa, Xicaoping
Neolithic					Huili Houzidong	Xiqu Yanwan Renhe Gonghe
	Maojiakan				Huili Hewanwan, Liantang, Tangjiaba, Tianbacun	Renhe Yangjiashan?
	Wangjiaping (2470-2270 BC)	Henglanshan 4 (2575-2480 BC)			Huili Guantianshan/ Yingpanshan	
		Henglanshan 3 (2150-2030 BC)				
		Ma'anshan Qimugou I Lower Yingpanshan		Zhaojue Pusu Bohuang M3-4, M8-9, M11	Huili Xiaoyingpan, Xiaotuanshan, Luquan Yingpanbao	Yongsheng Duizi I
		Early Lizhou		Puge Tianba Puge Zhongcun	Huili Dongzui I	Yongsheng Jiaodingshan?
Early Bronze Age /Shang (1600-1046 BC)		Early Dayangdui Middle Lizhou graves Xichang Yangjiashan	Gaopo (1410-1050 BC)	Puge Xiaoxingchang settlement	Huili Dongzui II	Yongsheng Duizi II?

Table 7.14b: Chronological Table (Western Zhou to Eastern Han).

Date	Dechang	Xichang	Mianning	Northeast	Southeast	South and Southwest
Western Zhou (1046-771 BC)	Early Dongjiapo	Late Lizhou	Zhaojiawan (1390-840 BC)			Yongsheng Duizi III?
	Late Dongjiapo	Middle Dayangdui Mimilang		Puge Wadaluo Zhaojue Fuchengqu M1-3		Yumen Wanxiao?
Spring and Autumn (771-476 BC)		Megalithic Graves I Late Dayangdui				
		Megalithic Graves IIa Upper Yingpanshan Qimugou M1 and M2 Maliucun H1		Puge Xiaoxingchang AM1-2 (520-450 BC), Xide Lake Sihe, Zhaojue Erba Keku M2, M4, and M9	Huili Fenjiwan I	
Warring States (475-222 BC)	Dechang Guoyuan M2	Megalithic Graves IIb		Puge Xiaoxingchang BM1-3 (520-450 BC)	Huili Fenjiwan II	
	Dechang Wangjiatian	Megalithic Graves IIIa Qimugou Layer 3	Mianning Sanfentun		Huili Washitian Huili Fenjiwan III	
					Huili Leijiashan M1 Huili Miaozi Laobao	Ninglang Daxingzhen
Qin (221-206 BC)	Dechang Arong M1, M3, M4	Megalithic Graves IIIb			Huili Guojiabao	
Western Han (206 BC - AD 9)		Megalithic Graves IV Qimugou M3 and W1			Huili Guoyuan and Luoluochong	Yanyuan Laolongtou M6 and M9 Maojiaba M1
					Huili Zhuanchangba	Yongsheng Duizi Phase IV Yanyuan Caojiawan Yanyuan M4 Maojiaba M2
				Yuexi Liaojiashan Yuexi Huayang		Yanyuan Laolongtou M7 and M11
Wang Mang (AD 9-23)		Megalithic Graves IV		Zhaojue Eba Buji M1-2 Eba Buji M3?		
Eastern Han (AD 24-220)		Megalithic Graves IV		Zhaojue Pusu Bohuang M1, Zhaojue Chike Boxixian M1-6		

Figures

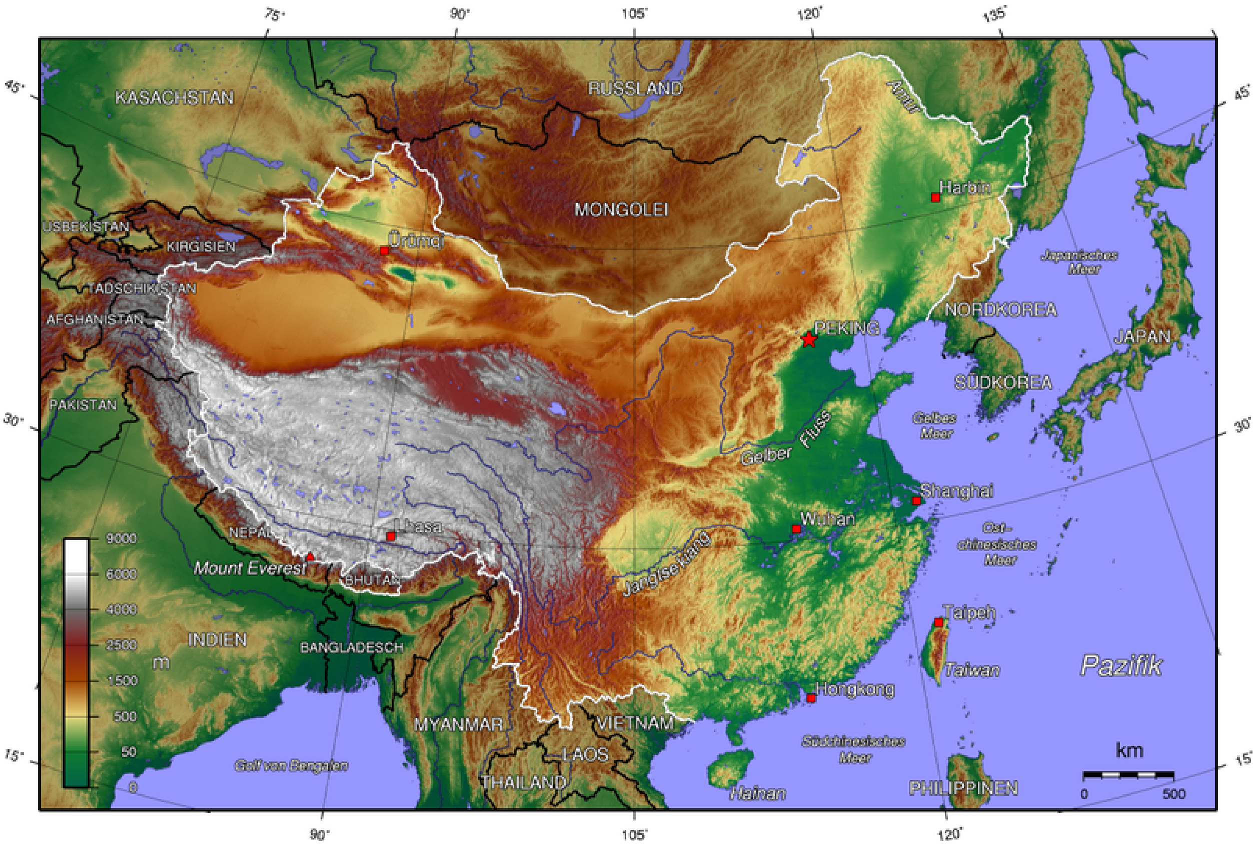


Figure 1.1: Topographical map of China (Wikimedia Commons 2005 [2013]).

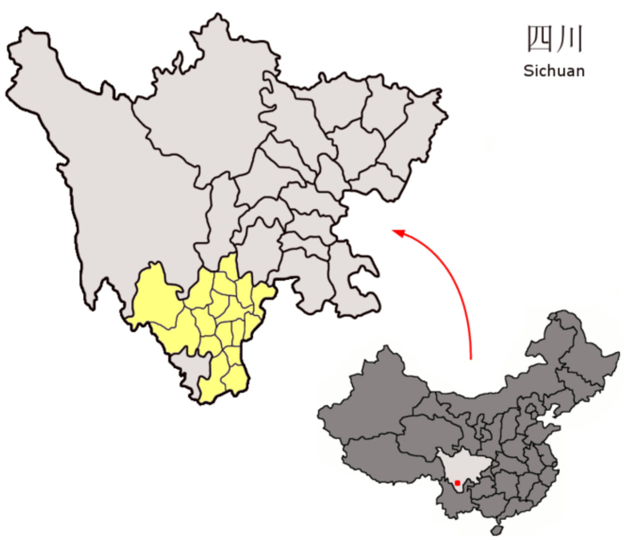
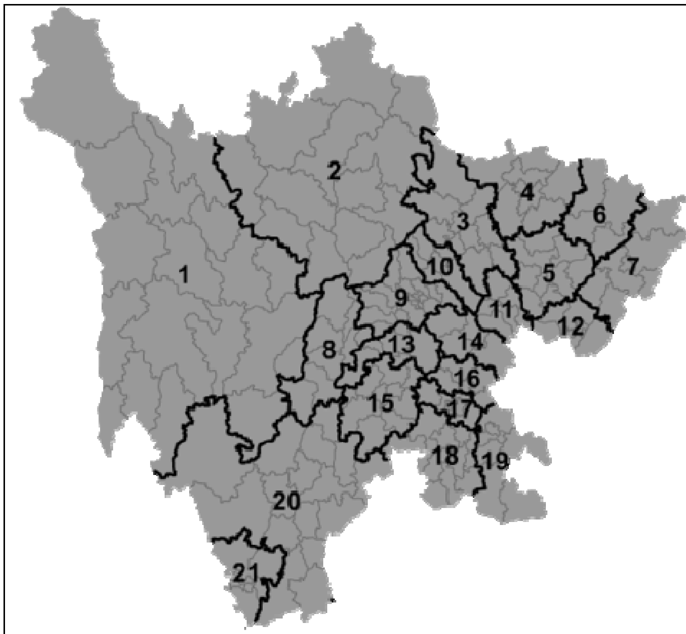
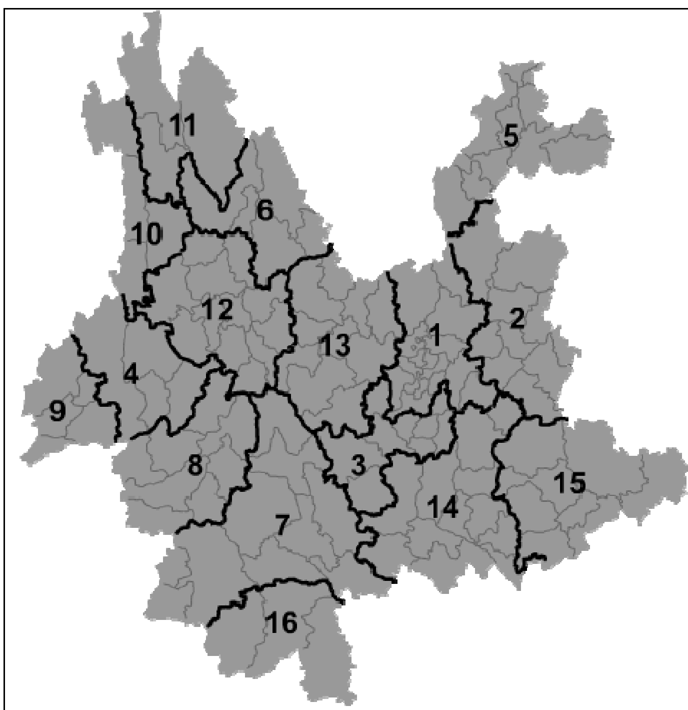


Figure 1.2: Location of Liangshan Yi Autonomous Prefecture in Sichuan and China (Wikimedia Commons 2007 [2011]).



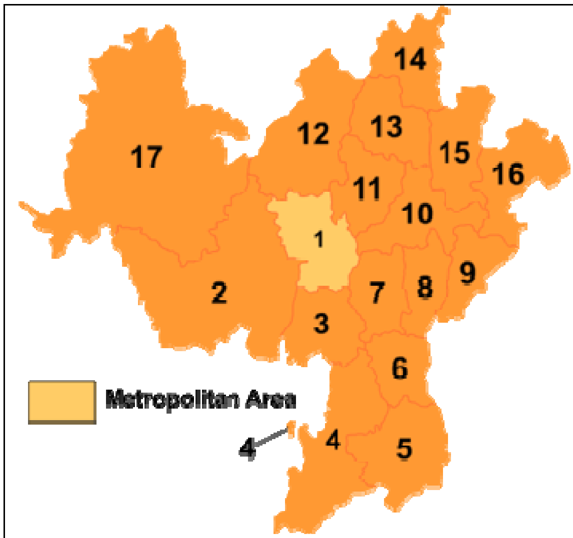
1	Garzê (Tibetan)	甘孜藏族自治州
2	Ngawa (Tibetan & Qiang)	阿坝藏族羌族自治州
3	Mianyang	绵阳市
4	Guangyuan	广元市
5	Nanchong	南充市
6	Bazhong	巴中市
7	Dazhou	达州市
8	Ya'an	雅安市
9	Chengdu	成都市
10	Deyang	德阳市
11	Suining	遂宁市
12	Guang'an	广安市
13	Meishan	眉山市
14	Ziyang	资阳市
15	Leshan	乐山市
16	Neijiang	内江市
17	Zigong	自贡市
18	Yibin	宜宾市
19	Luzhou	泸州市
20	Liangshan (Yi)	凉山彝族自治州
21	Panzhihua	攀枝花市

Figure 1.3: Map of Prefectures of Sichuan Province (Wikimedia Commons 2010a [2011]).



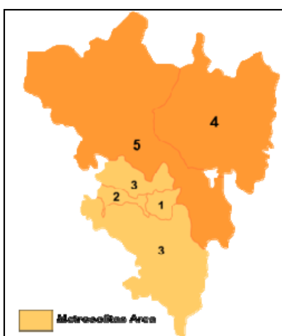
1	Kunming	昆明市
2	Qujing	曲靖市
3	Yuxi	玉溪市
4	Baoshan	保山市
5	Zhaotong	昭通市
6	Lijiang	丽江市
7	Pu'er	普洱市
8	Lincang	临沧市
9	Dehong (Dai & Jingpo)	德宏傣族景颇族自治州
10	Nujiang (Lisu)	怒江傈僳族自治州
11	Diqing (Tibetan)	迪庆藏族自治州
12	Dali (Bai)	大理白族自治州
13	Chuxiong (Yi)	楚雄彝族自治州
14	Honghe (Hani & Yi)	红河哈尼族彝族自治州
15	Wenshan (Zhuang & Miao)	文山壮族苗族自治州
16	Xishuangbanna (Dai)	西双版纳傣族自治州

Figure 1.4: Map of Prefectures of Yunnan Province (Wikimedia Commons 2010b [2011]).

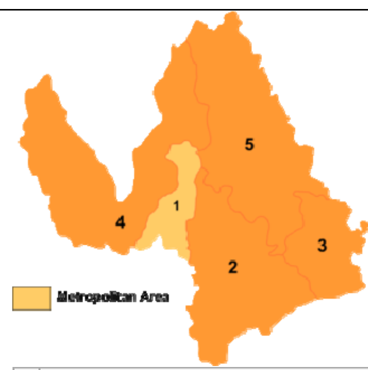


#	Name	Hanzi
1	Xichang City	西昌市
2	Yanyuan County	盐源县
3	Dechang County	德昌县
4	Huili County	会理县
5	Huidong County	会东县
6	Ningnan County	宁南县
7	Puge County	普格县
8	Butuo County	布拖县
9	Jinyang County	金阳县
10	Zhaojue County	昭觉县
11	Xide County	喜德县
12	Mianning County	冕宁县
13	Yuexi County	越西县
14	Ganluo County	甘洛县
15	Meigu County	美姑县
16	Leibo County	雷波县
17	Muli Tibetan Autonomous County	木里藏族自治县

Figure 1.4: Map of Liangshan Prefecture (Wikimedia Commons 2010c [2011]).



#	Name	Hanzi
1	Dong District	东区
2	Xi District	西区
3	Renhe District	仁和区
4	Miyi County	米易县
5	Yanbian County	盐边县



#	Name	Hanzi
1	Gucheng District	古城区
2	Yongsheng County	永胜县
3	Huaping County	华坪县
4	Yulong Nakhi Autonomous County	玉龙纳西族自治县
5	Ninglang Yi Autonomous County	宁蒗彝族自治县

Figure 1.5: Maps of Panzhihua and Lijiang (Wikimedia Commons 2010d and 2010e [2011]).

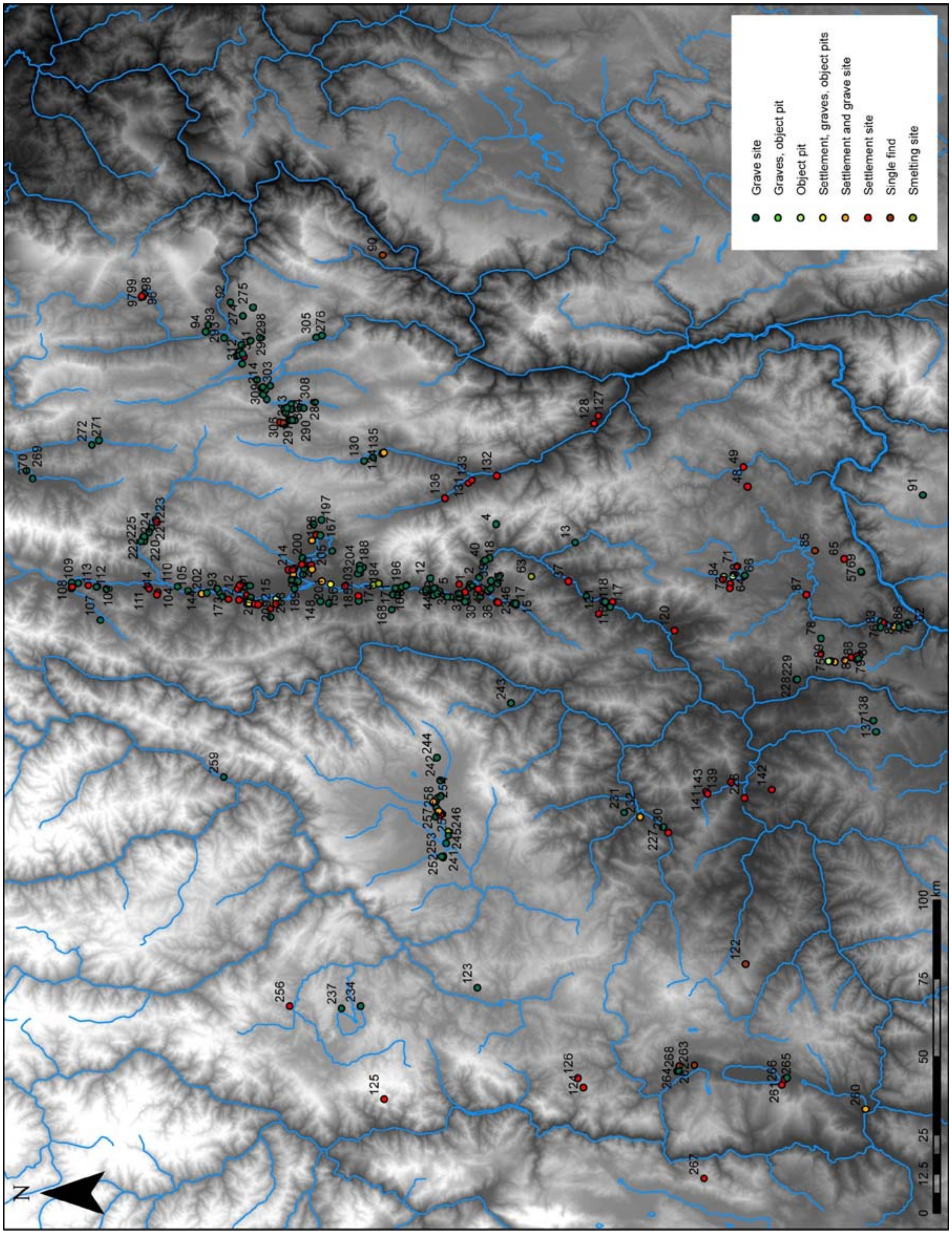


Figure 1.6: Map of All Sites by Site Number Color Coded by Site Type.

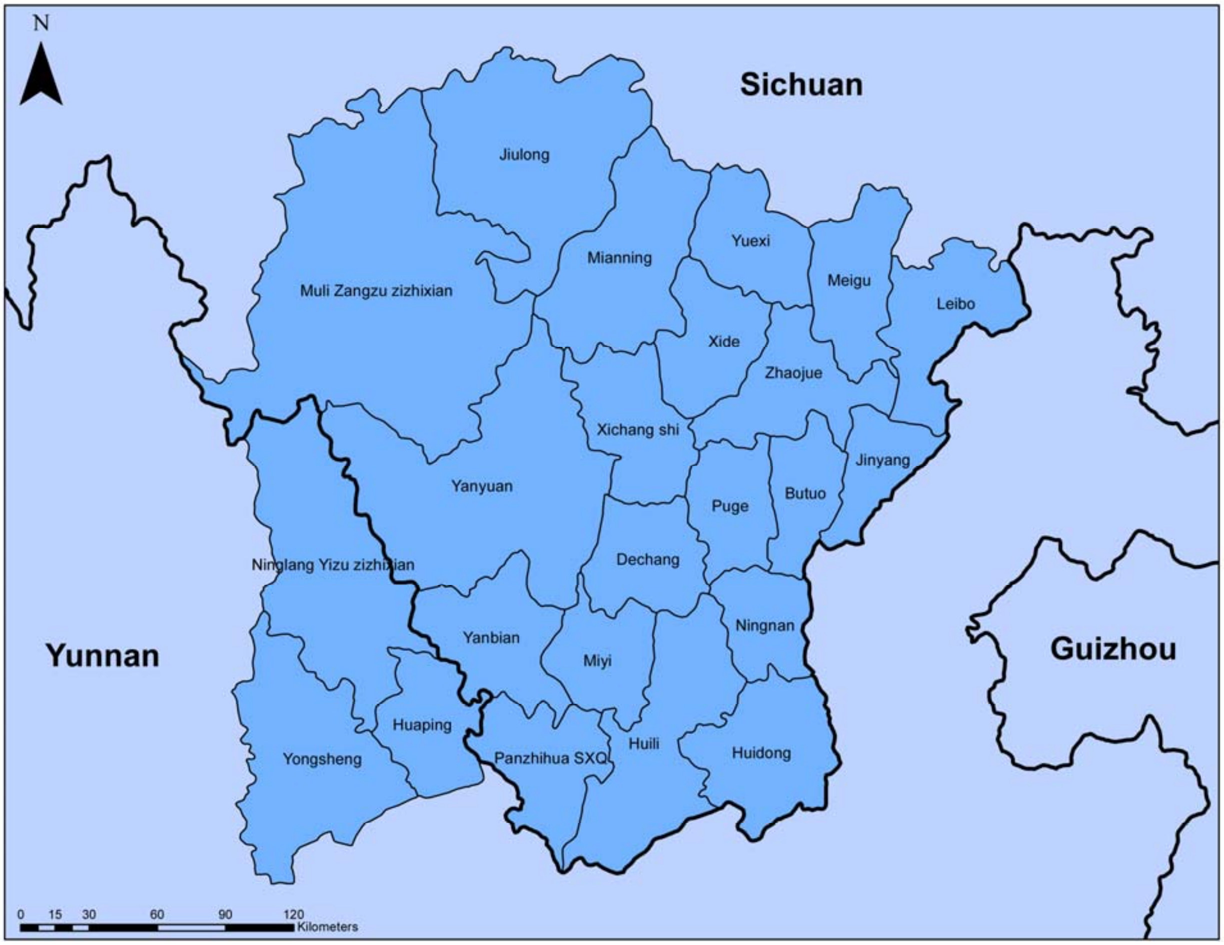


Figure 1.7: Map of Administrative Units included in the Research Area.

Figure 2.1: Macro areas in Chinese History (Wikimedia Commons [2008] 2012).

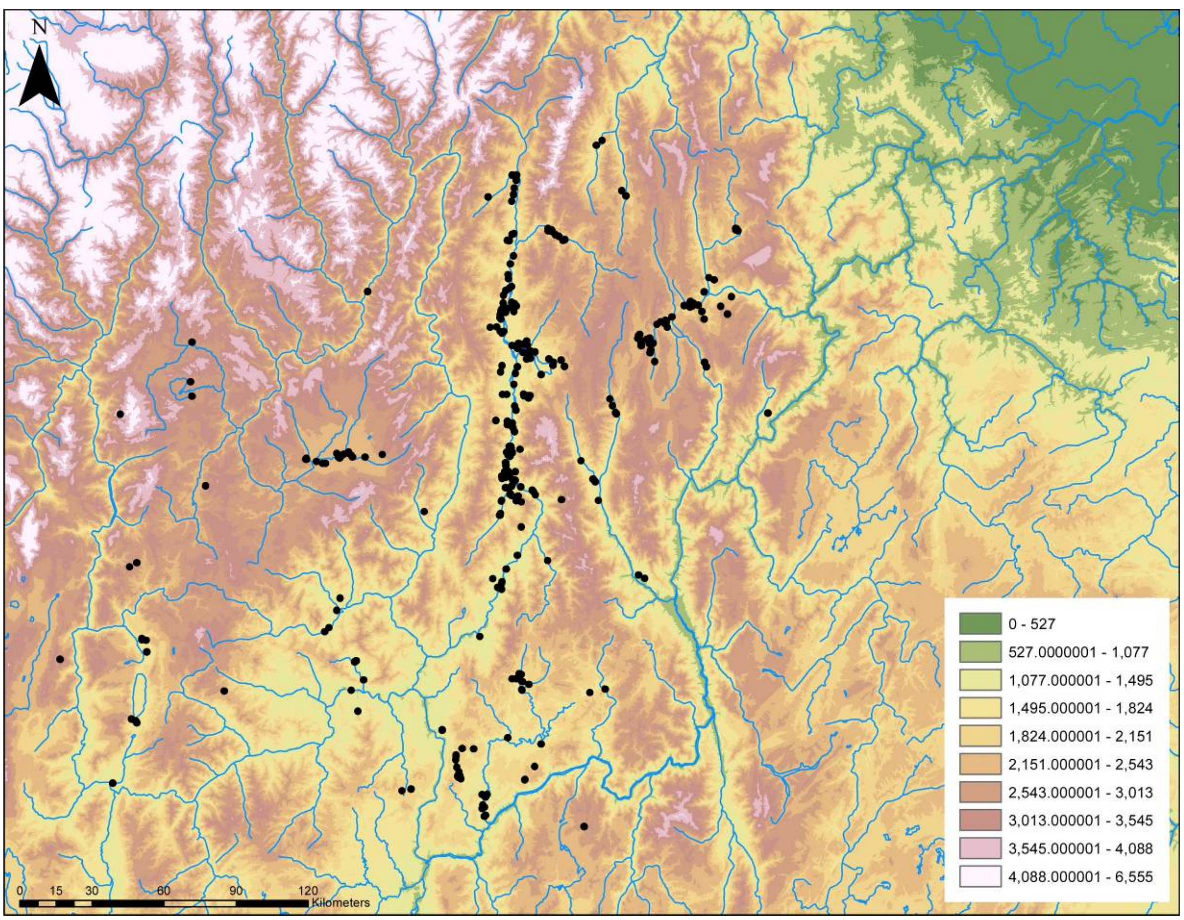


Figure 2.2: Geomorphology of the Research Area with Sites for Reference.

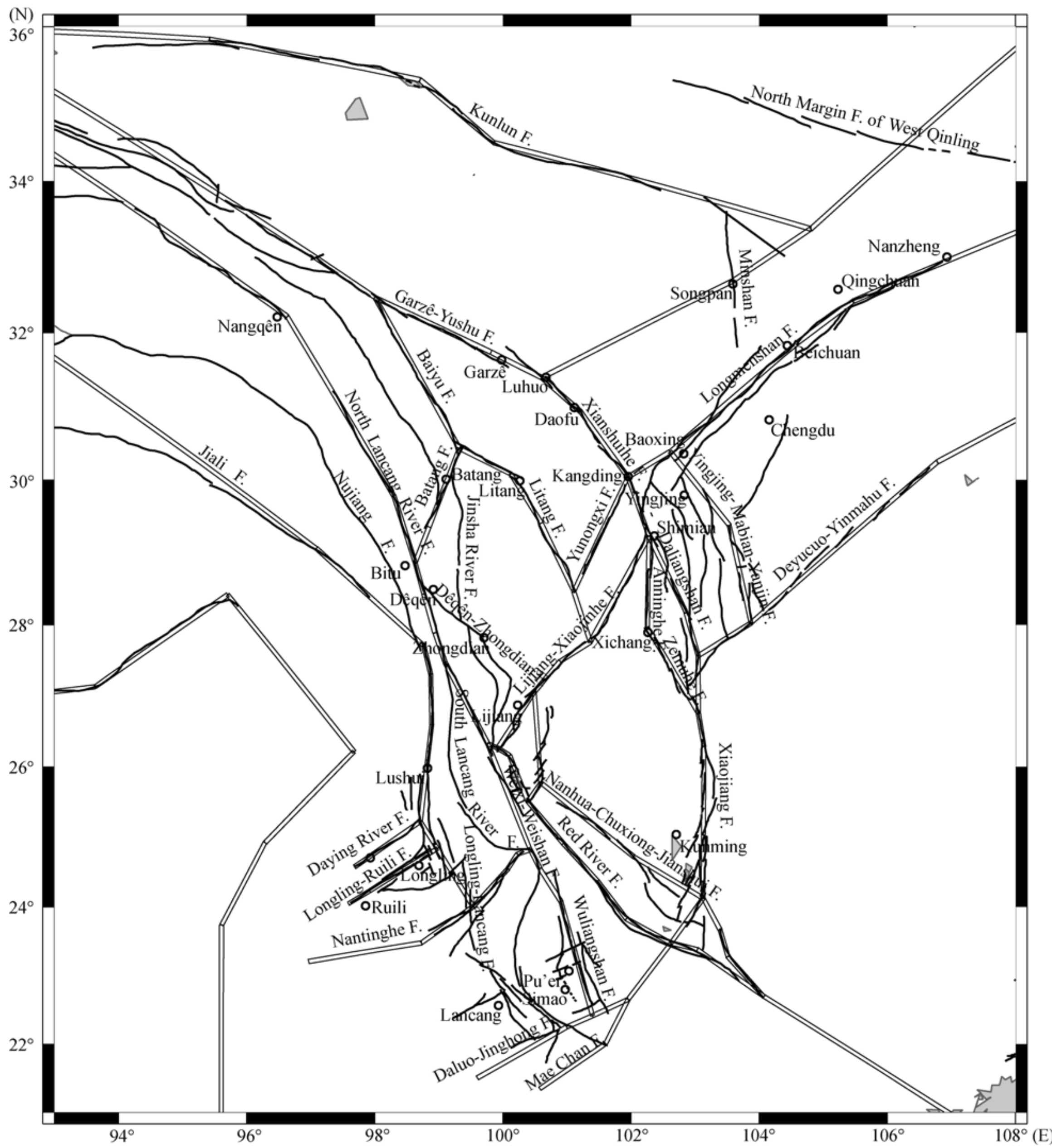


Figure 2.3: Tectonic Map and Fault Model of the Sichuan Region (F = Fault) (Wang et al. 2008: Figure 1).

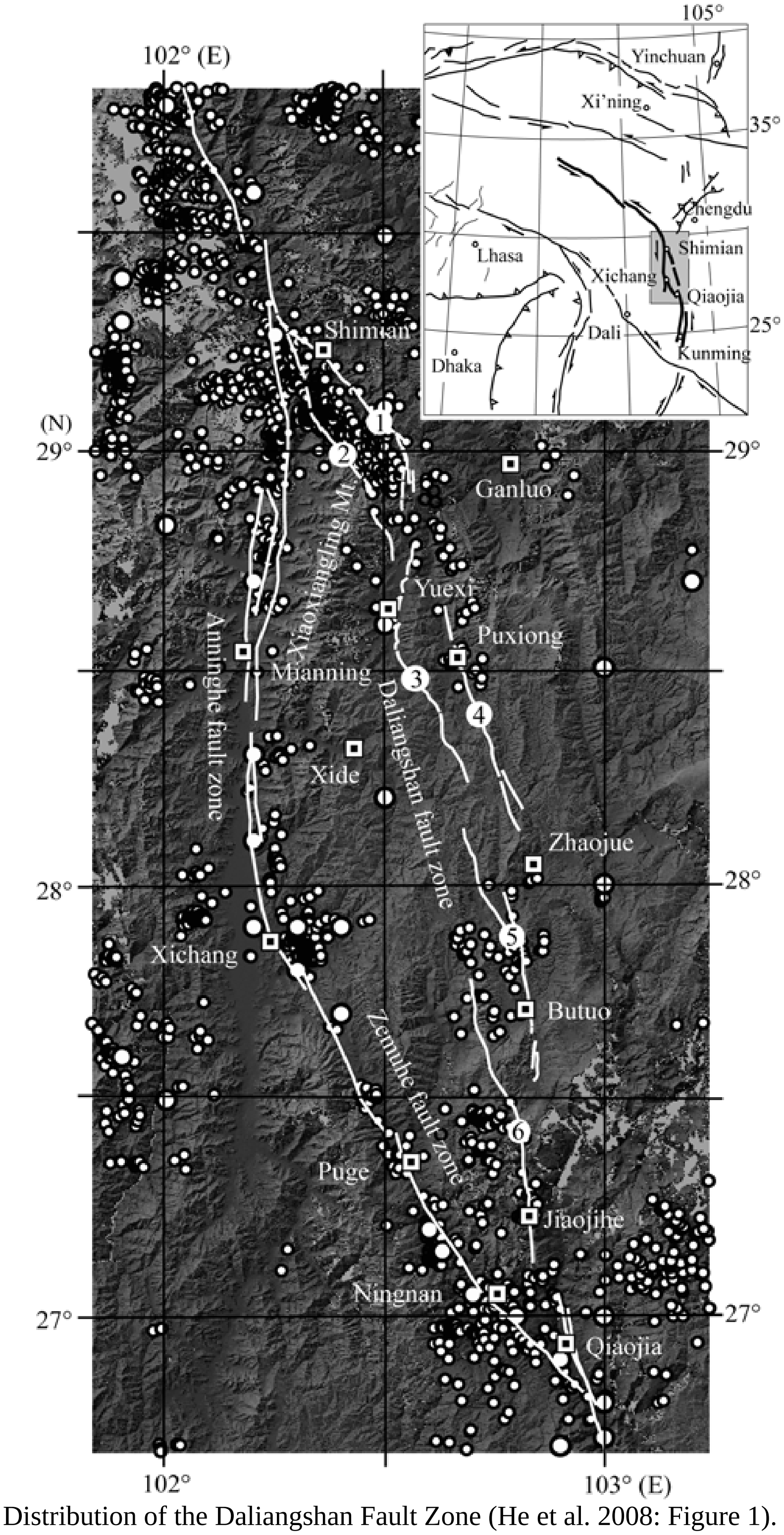


Figure 2.4: Spatial Distribution of the Daliangshan Fault Zone (He et al. 2008: Figure 1).

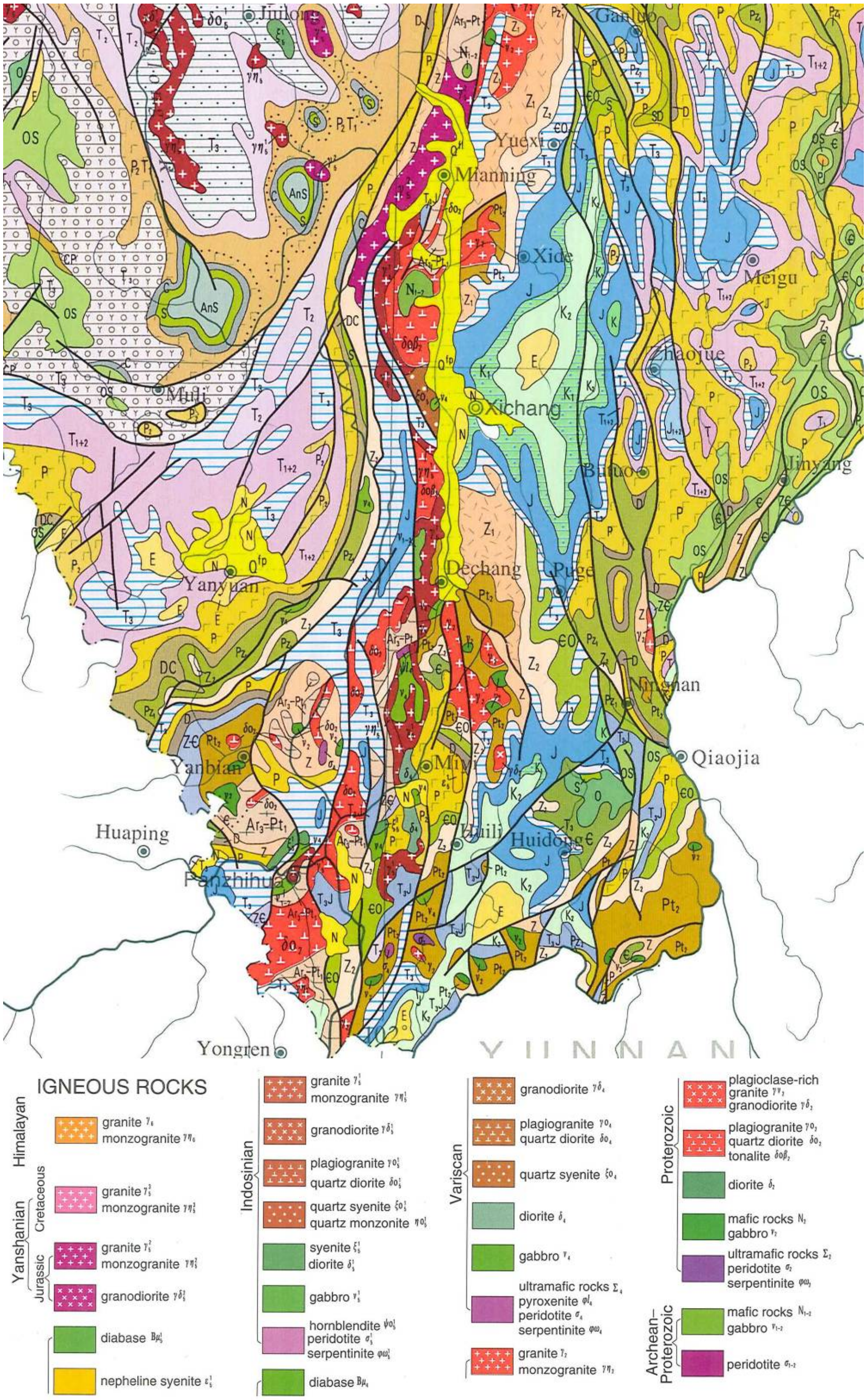


Figure 2.5: Geology of Southwest Sichuan and Northwest Yunnan (Ma, Qiao, and Liu 2002:278f. and 297f.).

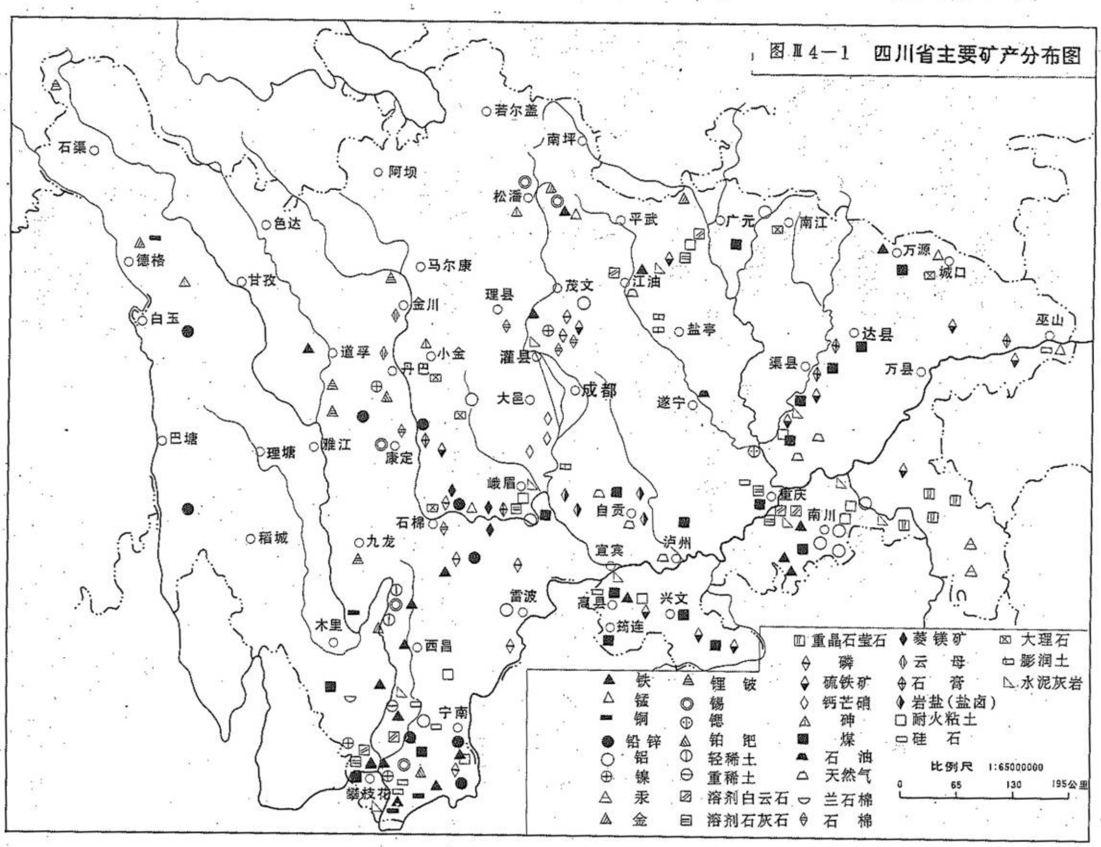


Figure 2.7: Distribution of Natural Resources in Sichuan Province (Sichuansheng Difangzhi 1992: Figure II4-1).

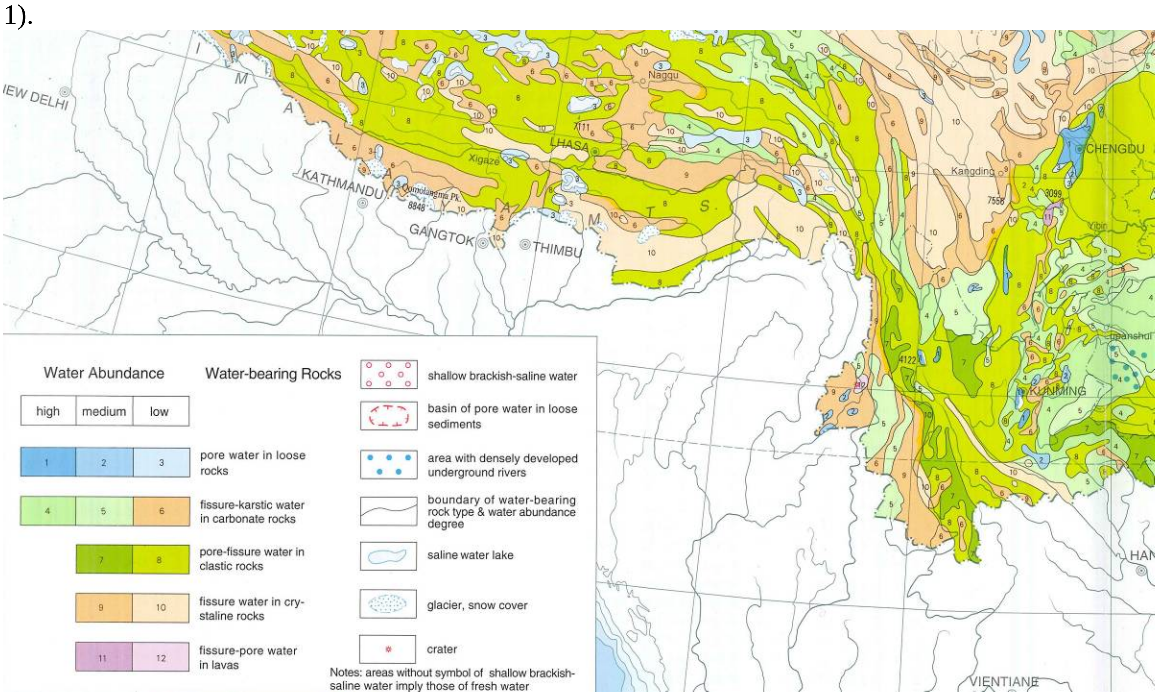


Figure 2.8: Hydrogeological Map of China (Ma, Qiao, and Liu 2002:74-5).

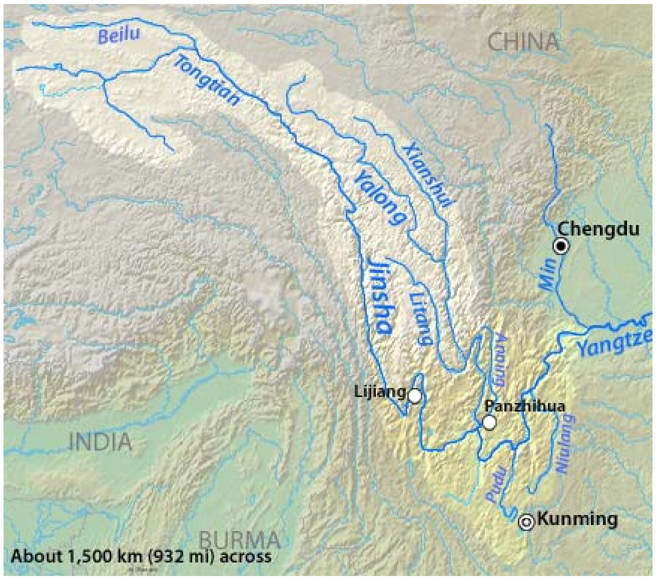


Figure 2.9: Map of the Jinsha River Drainage Basin in Southwest China (Wikimedia Commons 210 [2013]).

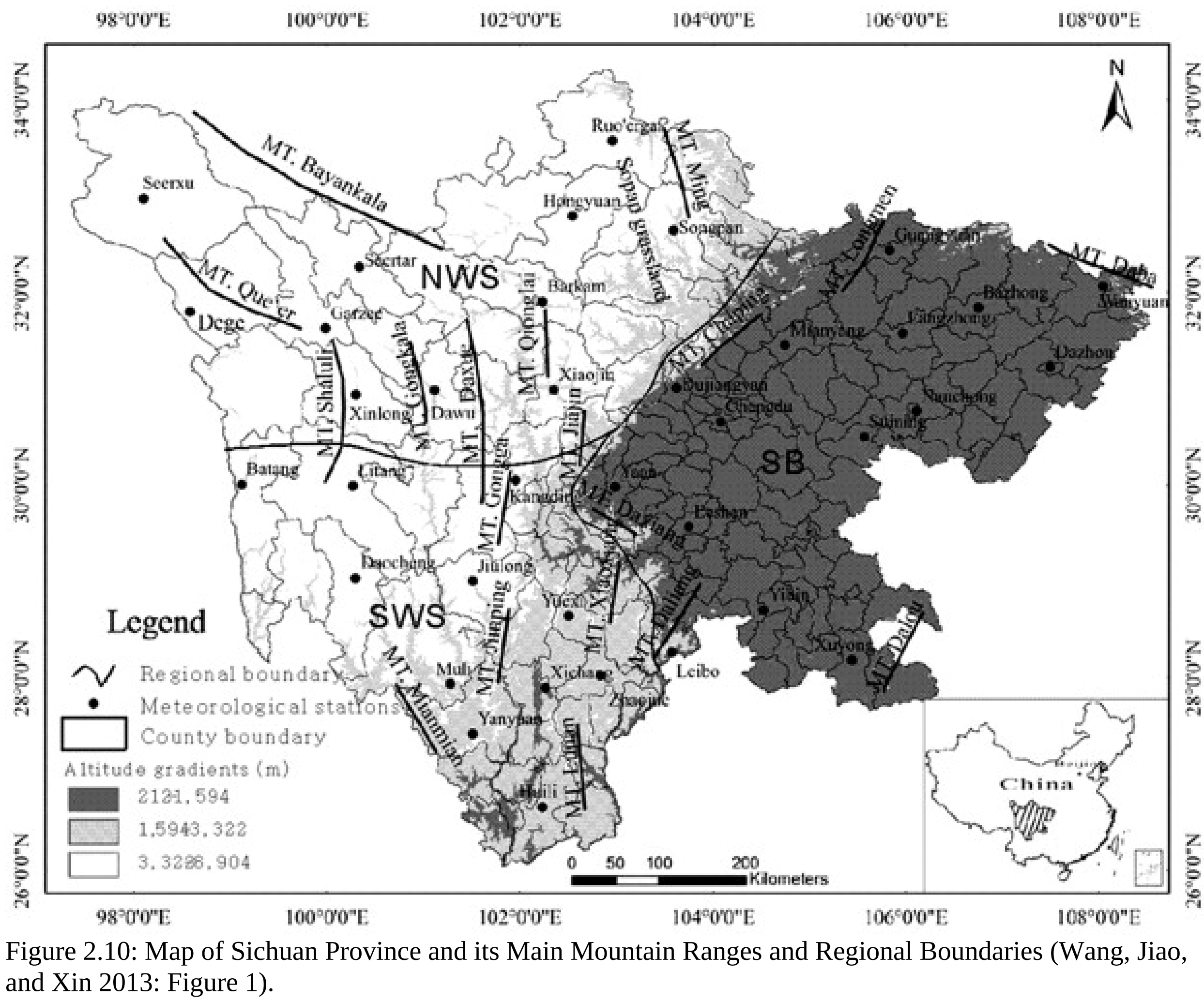


Figure 2.10: Map of Sichuan Province and its Main Mountain Ranges and Regional Boundaries (Wang, Jiao, and Xin 2013: Figure 1).

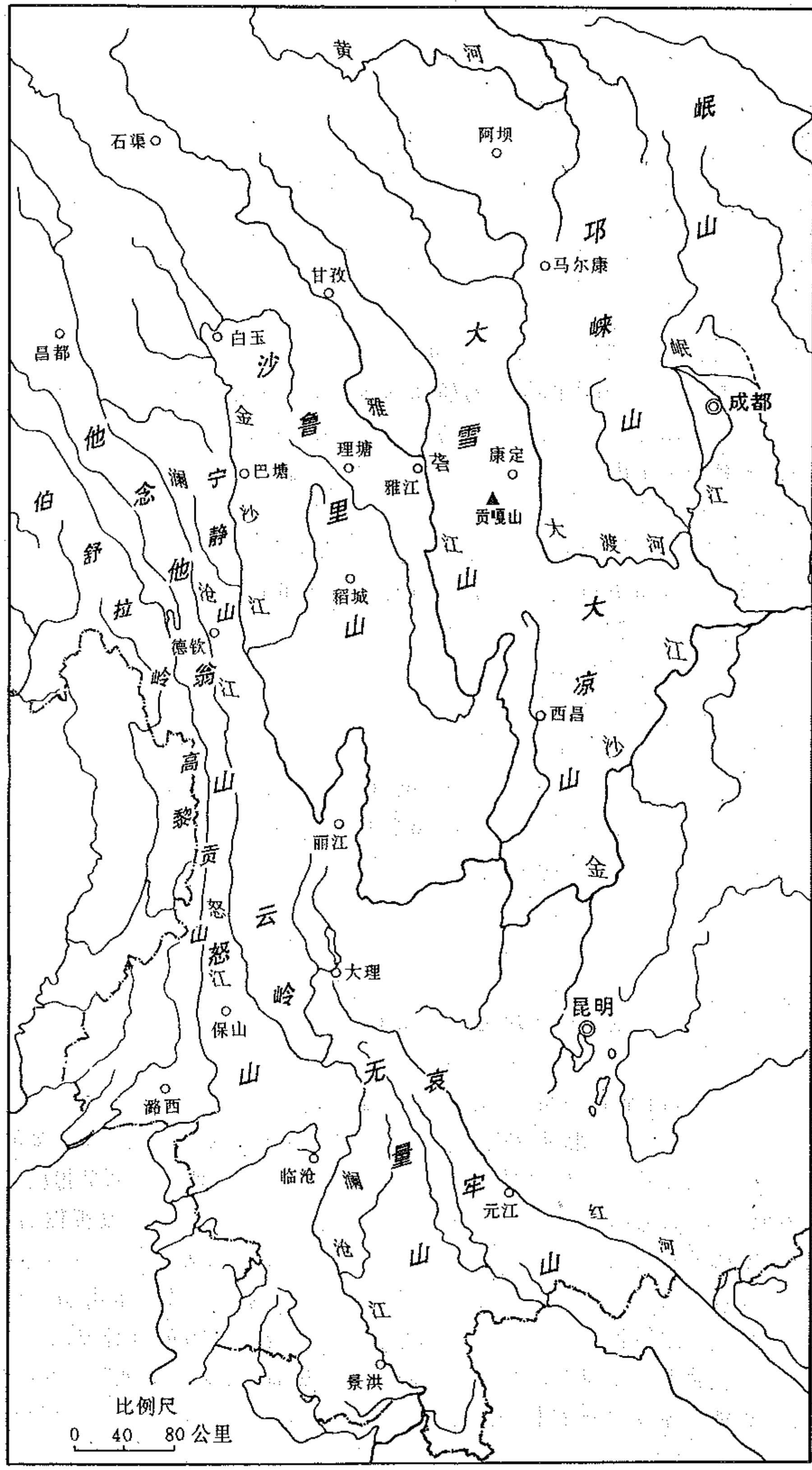


Figure 2.11: The Hengduan Mountain Ranges (Zhang Rongzu 1997: Figure 2-1).

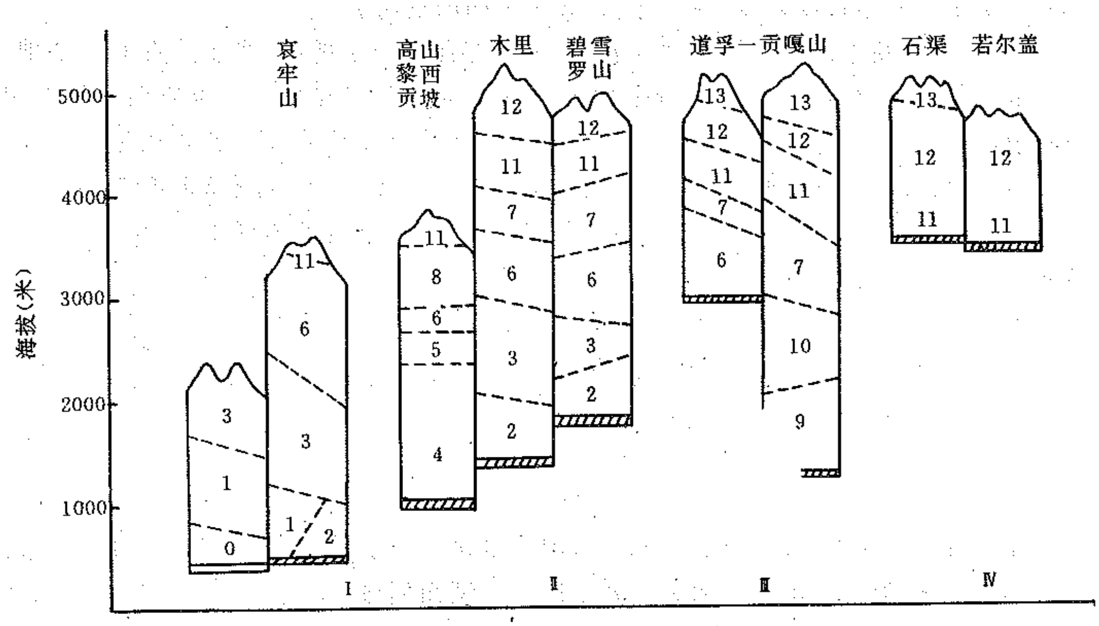


Figure 2.12: Vertical Zonation of Soil Types in the Hengduan Mountains. 1. purple soil (lateritic red soil), 2. drab red soil, 3. red soil, 4. yellow soil, 5. yellow-brown soil, 6. brown soil, 7. dark brown soil, 8. dark grey soil, 9. mountain cinnamon soil, 10. mountain grey cinnamon soil, 11. subalpine meadow soil, 12. alpine meadow soil, 13. alpine cold desert soil (Zhang Rongzu 1997: Figure 8-4).

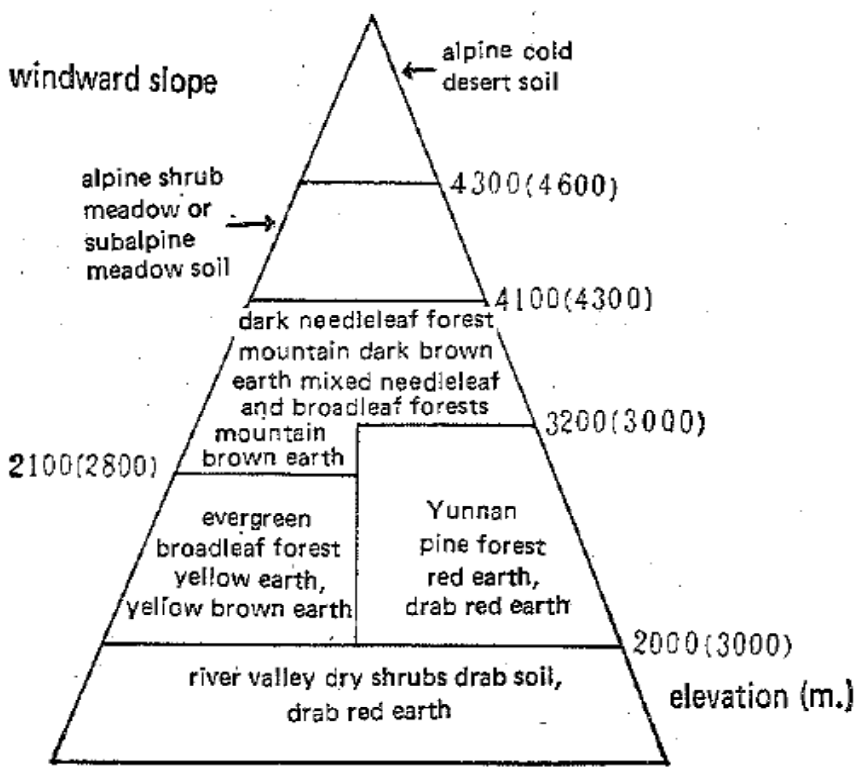


Figure 2.13: Model of Mountain Vertical Spectrum in Western Sichuan and Northern Yunnan (Ren, Yang, and Bao 1985:Figure 27).

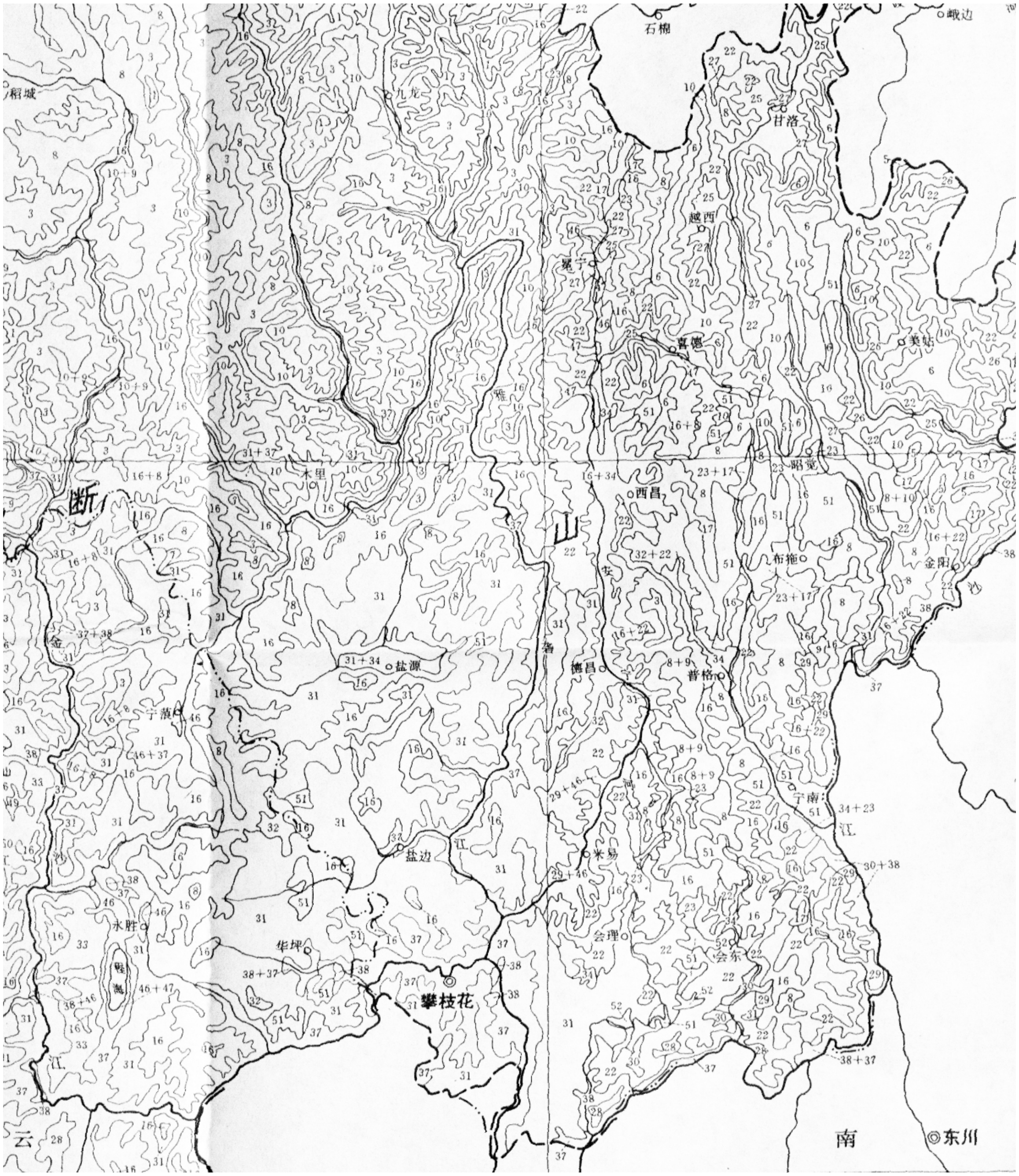


Figure 2.14: Soils of the Hengduan Mountains: 1.-2. Leptisols; 3.-4. Cyro-sod soils; 5.-6. Humus brownified soils; 7. Podzols; 8.-11. Grey-brown soils; 12.-15. Grey-cinnamon soils; 16.-17. Brown soils; 18.-21. Cinnamon soils; 22.-23. Yellow-brown soils; 24. Yellow-cinnamon soils; 25.-27. Yellow soils; 28.-30. Red soils; 31.-34 Para-red soils; 35.-36. Latored soils; 37.-38. Red-cinnamon soils; 39.-41 Meadow soils; 42.-43. Gley soils; 44.-45. Peat soils; 46.-48. Paddy soils; 49.-50. Rendzinas; 51.-52. Purple soils; G. Glacier and snow; R. Rock and original soils (Gao and Li 2000).

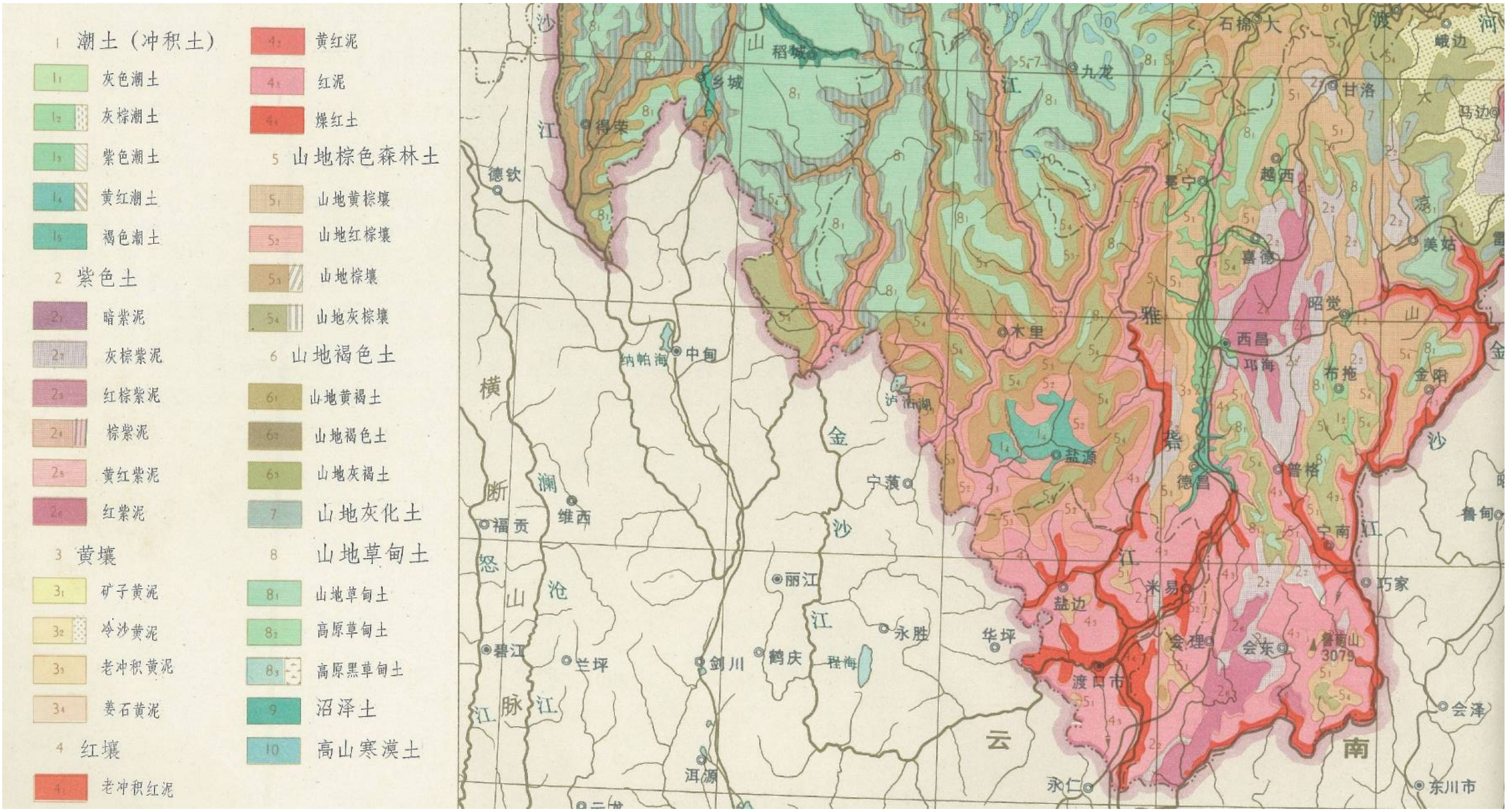


Figure 2.15: Soil Map of Southwest Sichuan (Sichuansheng Cehuiju 1981:29-30).

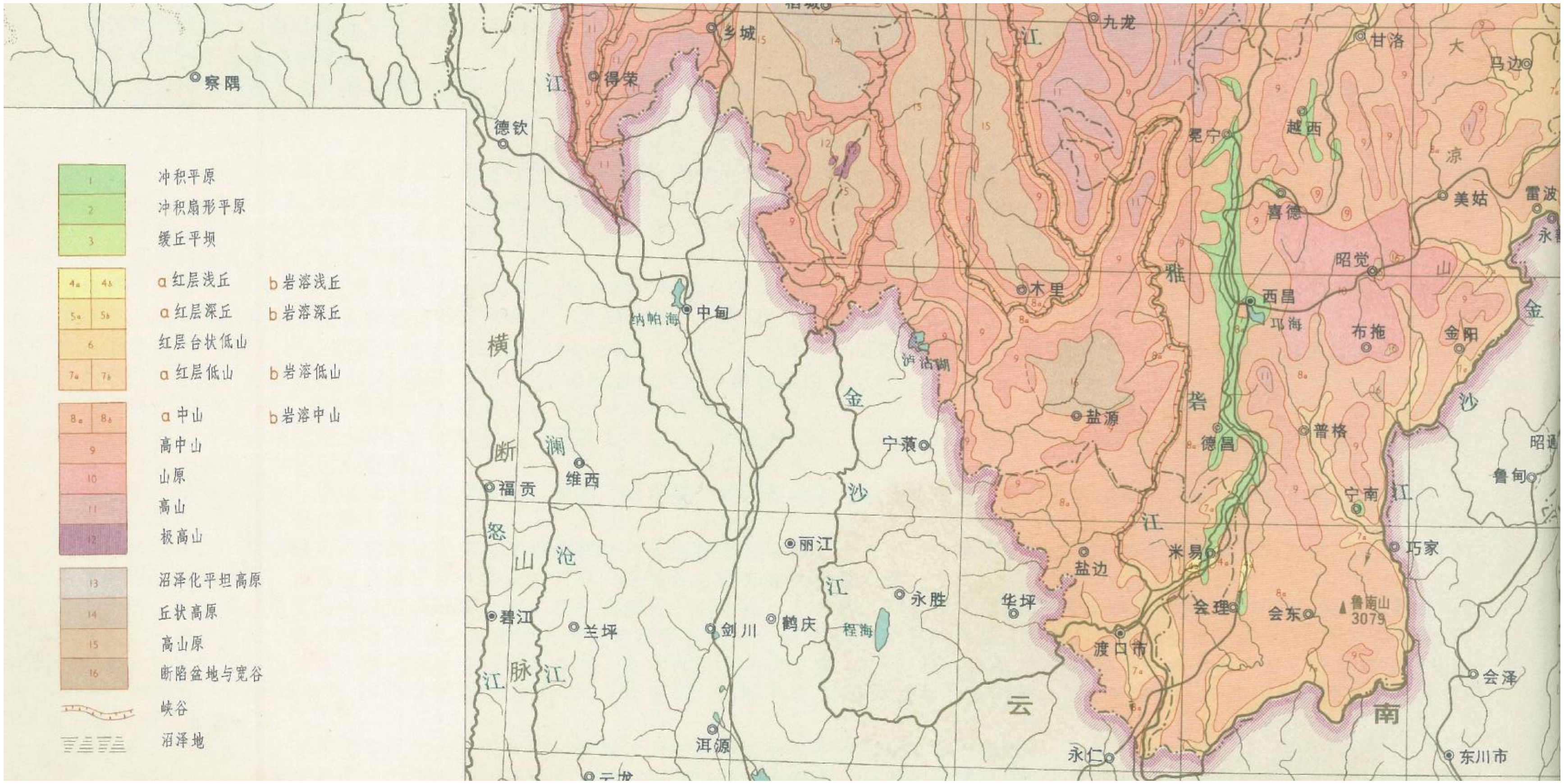


Figure 2.16: Map of Landforms of Southwest Sichuan (Sichuansheng Cehuiju 1981:17-18).

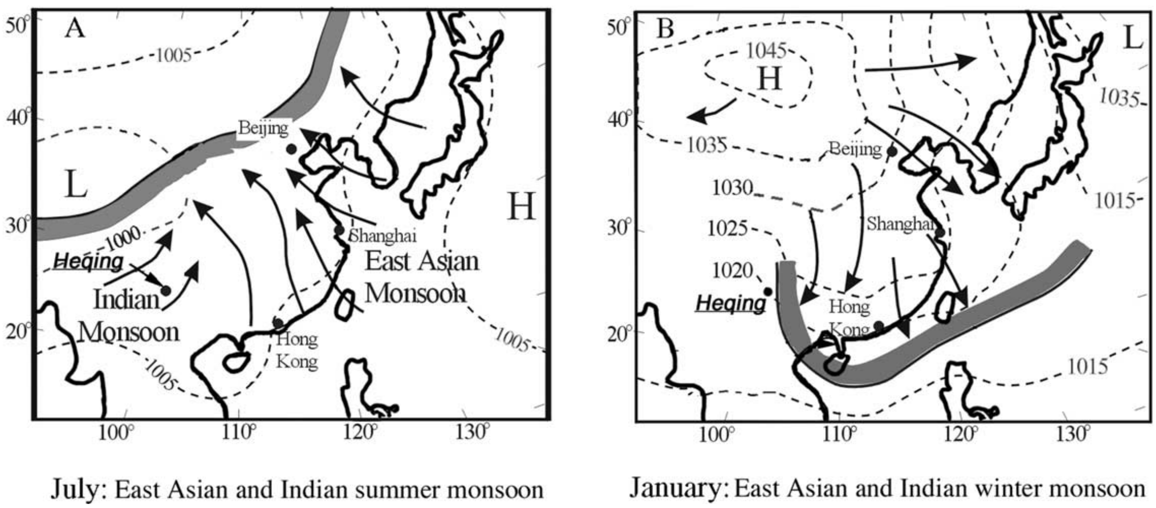


Figure 2.17: Maps for the Present-day Summer (A) and Winter (B) Monsoon Seasons in China. (Zhang et al. 2004: Figure 1).

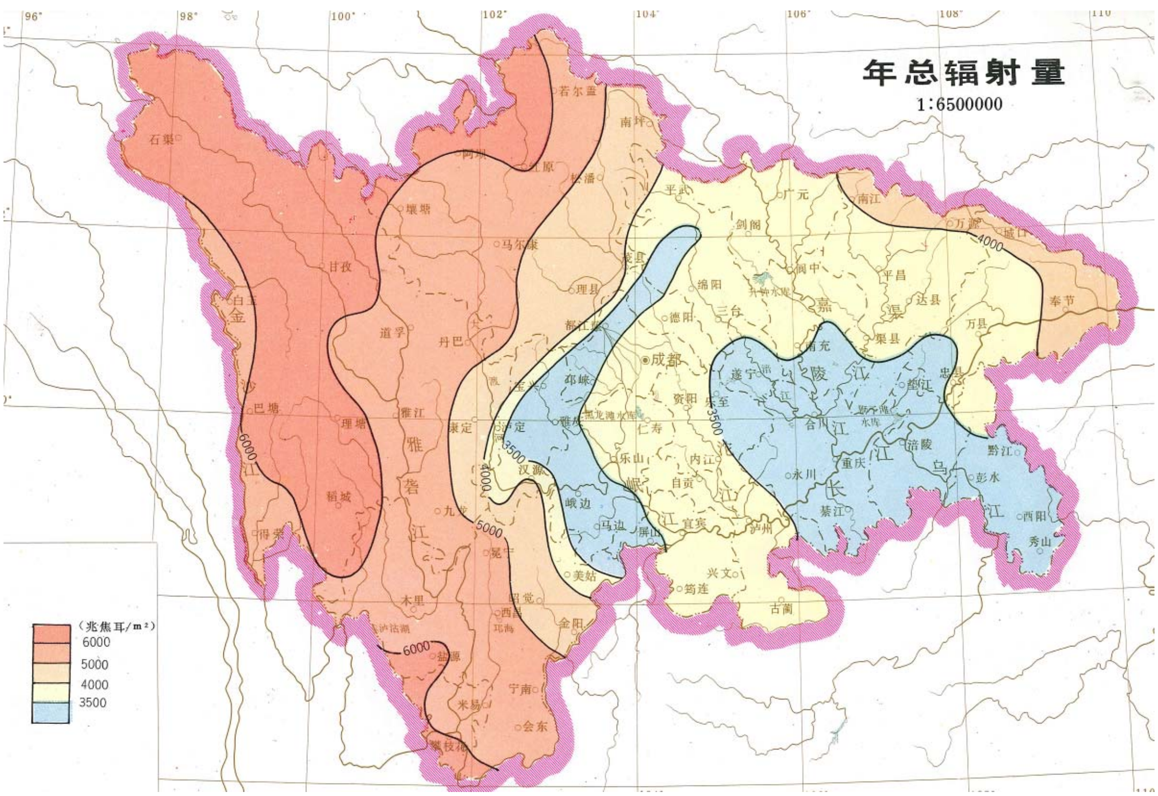


Figure 2.18: Annual Radiation in Sichuan (Sichuansheng Difanghzi 1992:Pl. 33).

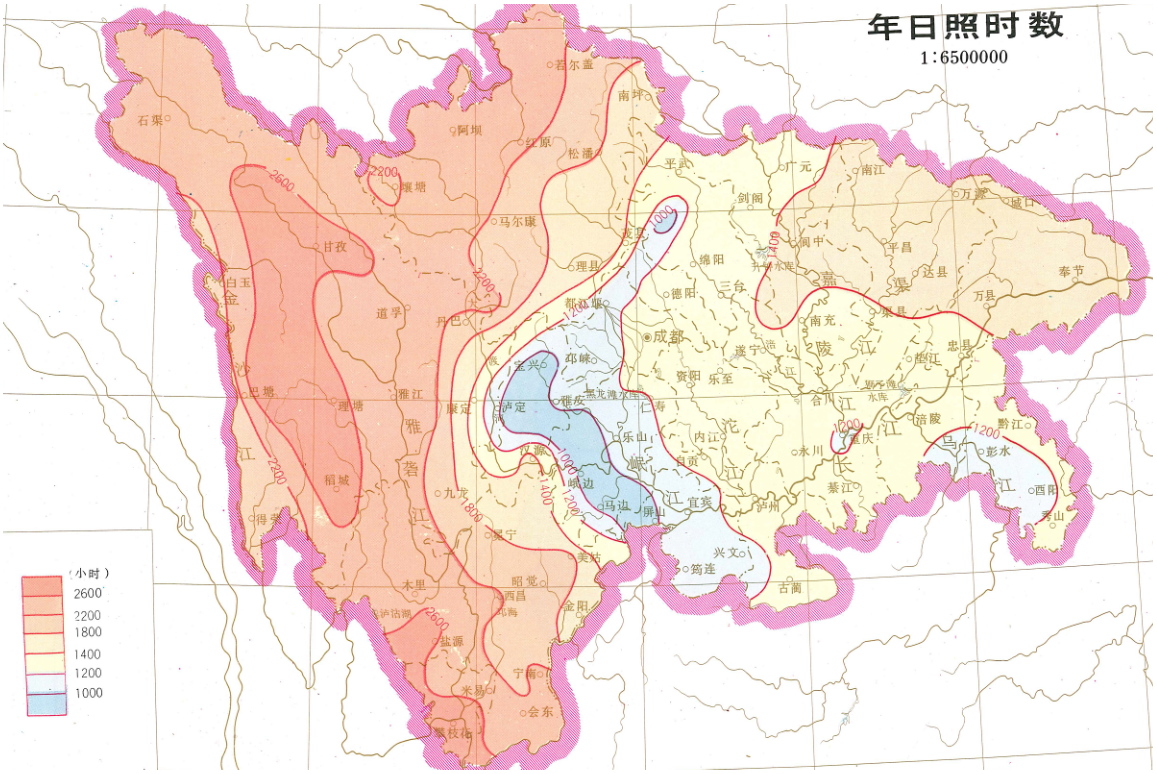


Figure 2.19: Number of Annual Sunshine Days in Sichuan (Sichuansheng Difanghzi 1992:Pl. 34).

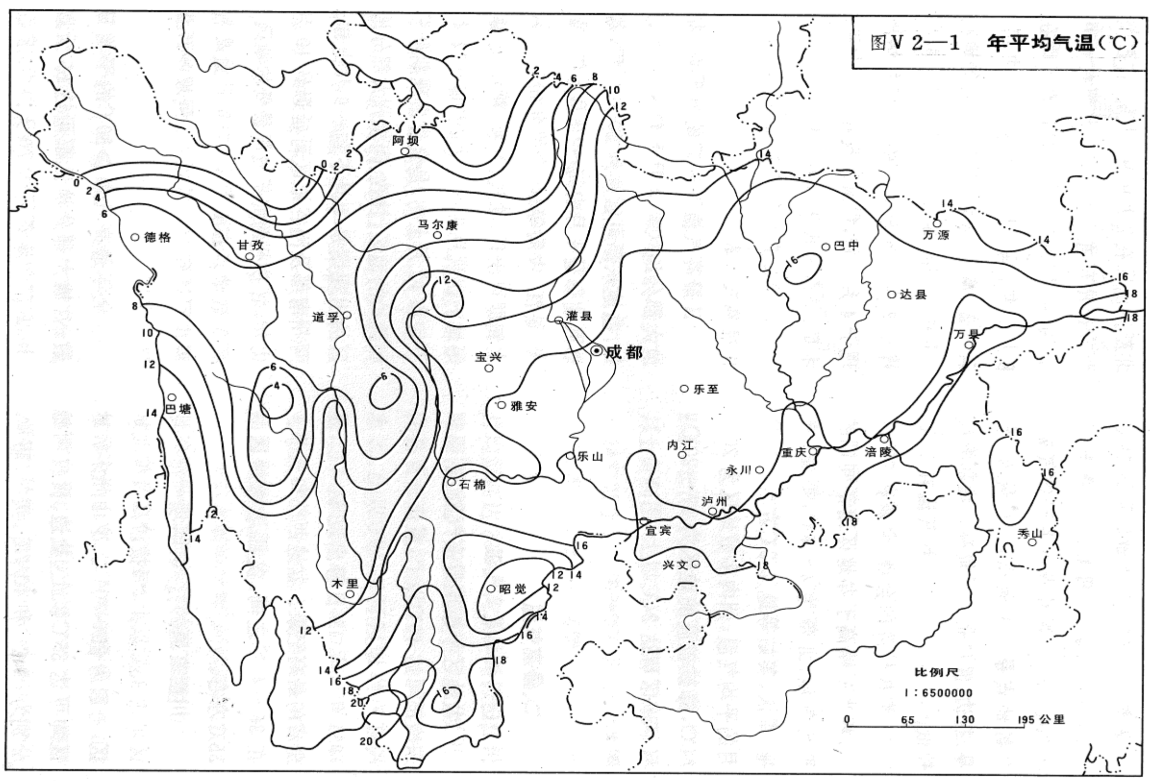


Figure 2.20: Average Temperaturen in Sichuan (Sichuansheng Difanghzi 1992:8).

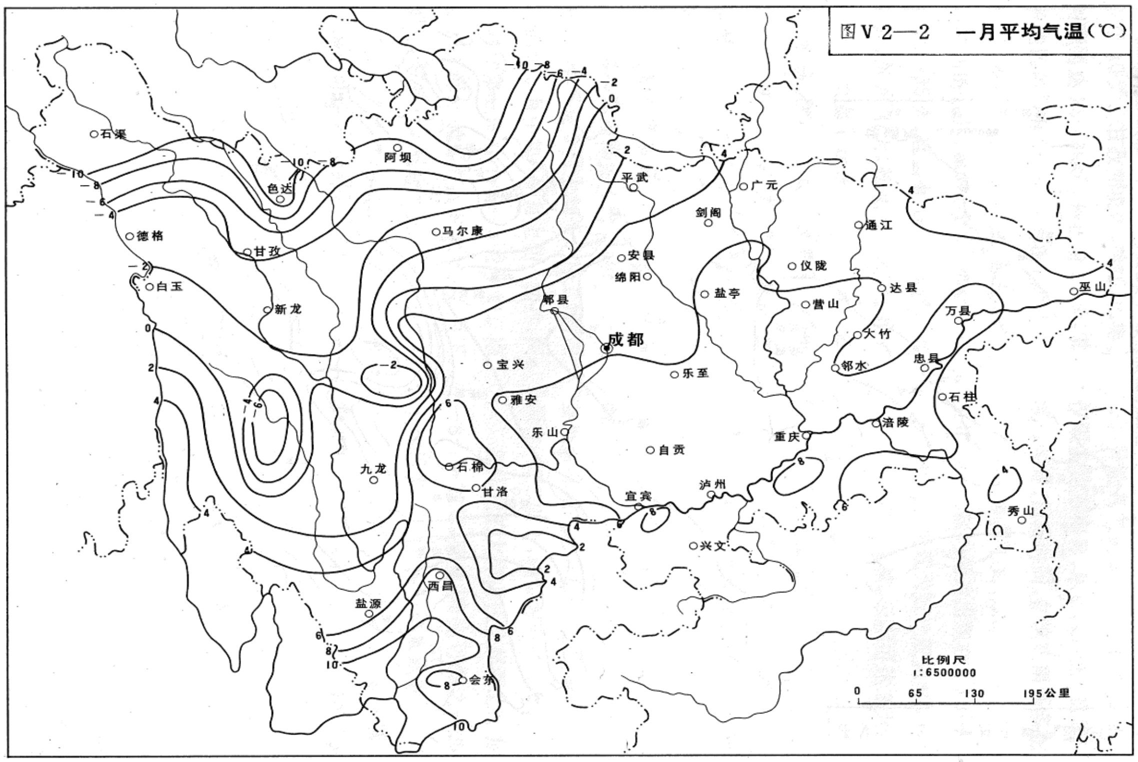


Figure 2.21: Average Temperatures in January (Sichuansheng Difanghzi 1992:9).

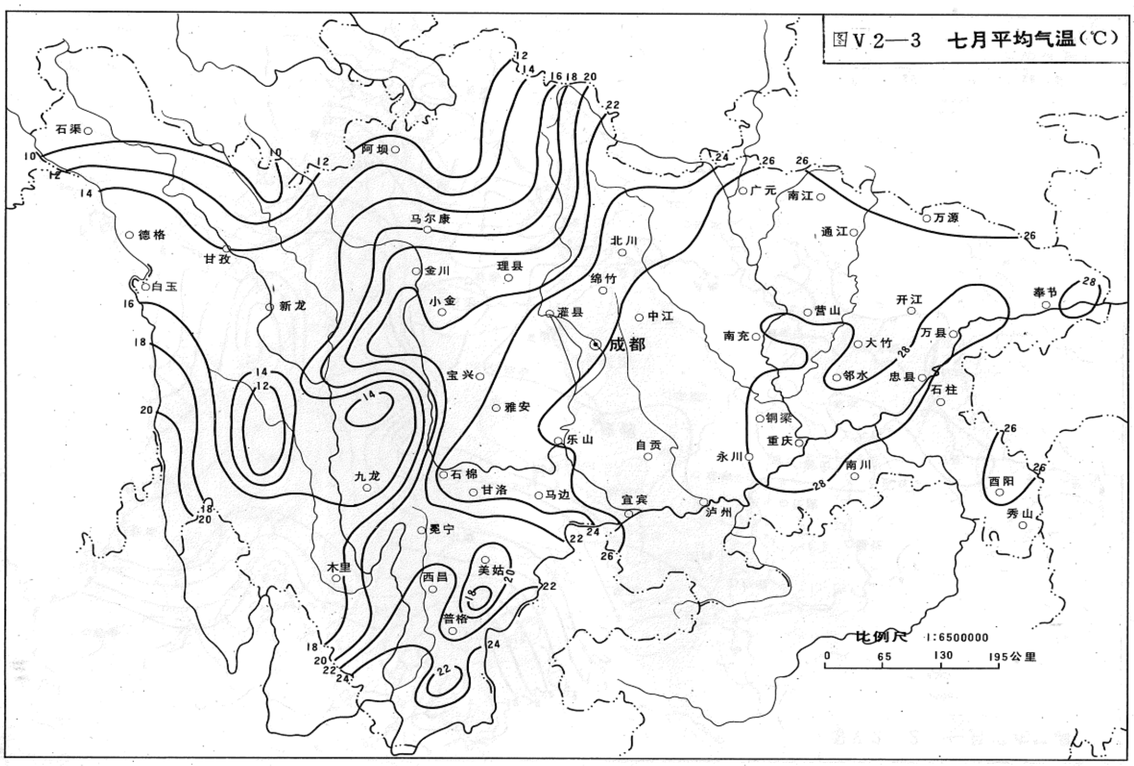


Figure 2.22: Average Temperatures in July (Sichuansheng Difanghzi 1992:10).

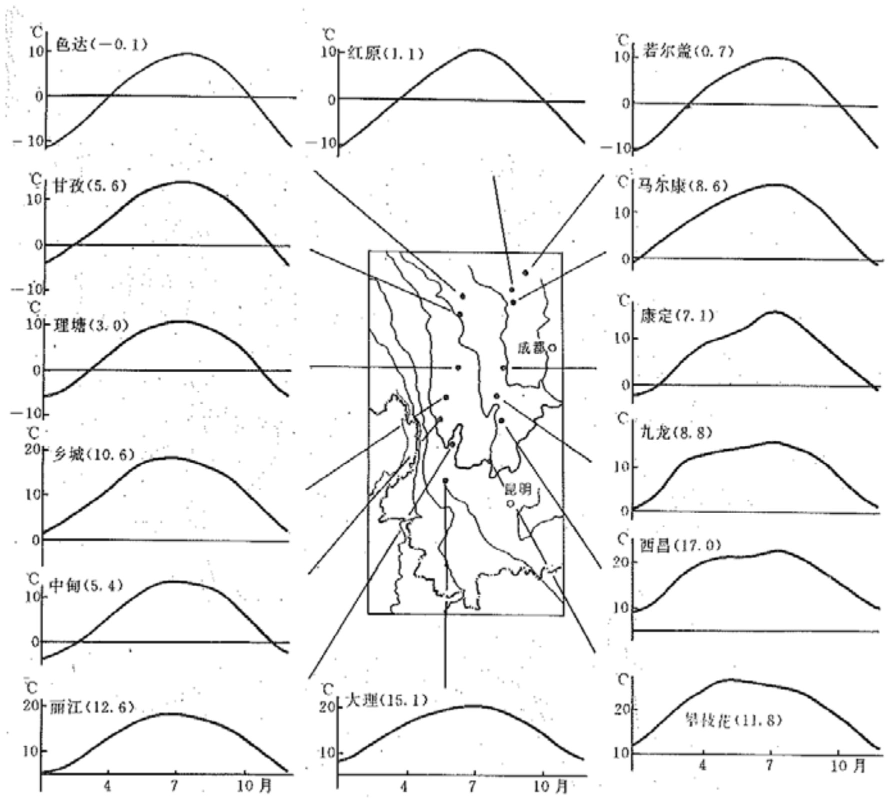


Figure 2.23: Temperature Fluctuations throughout the Year and Average Temperature for Various Locations in the Hengduan Mountains (Zhang Rongzu 1997:4-5).

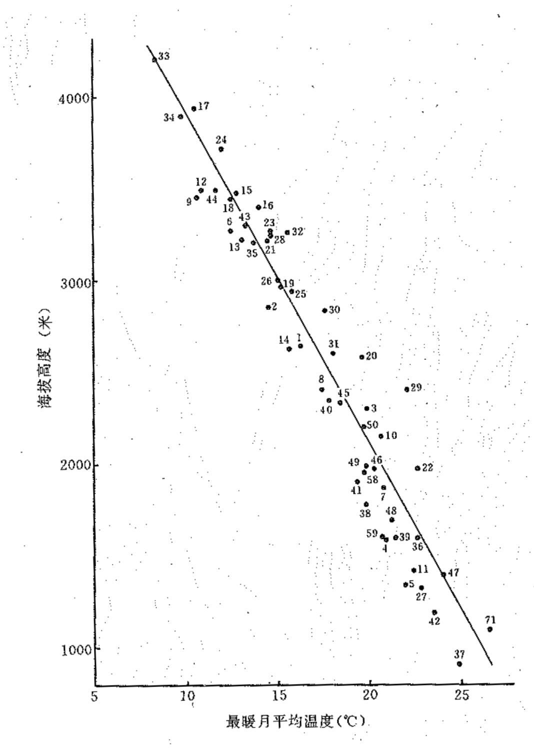


Figure 2.24: Correlation between Highest Temperature and Elevation in the Hengduan Mountain Range (Zhang Rongzu 1997:4-5).

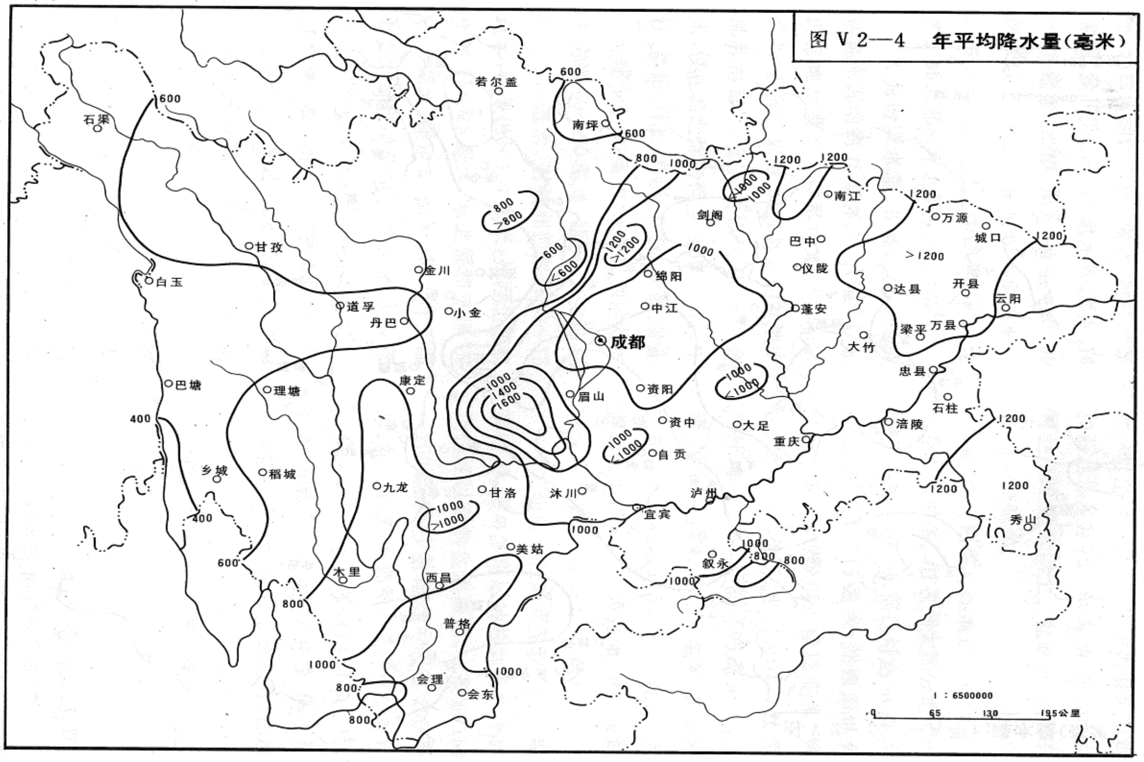


Figure 2.25: Average Annual Precipitation (Sichuansheng Difanghzi 1992:19).

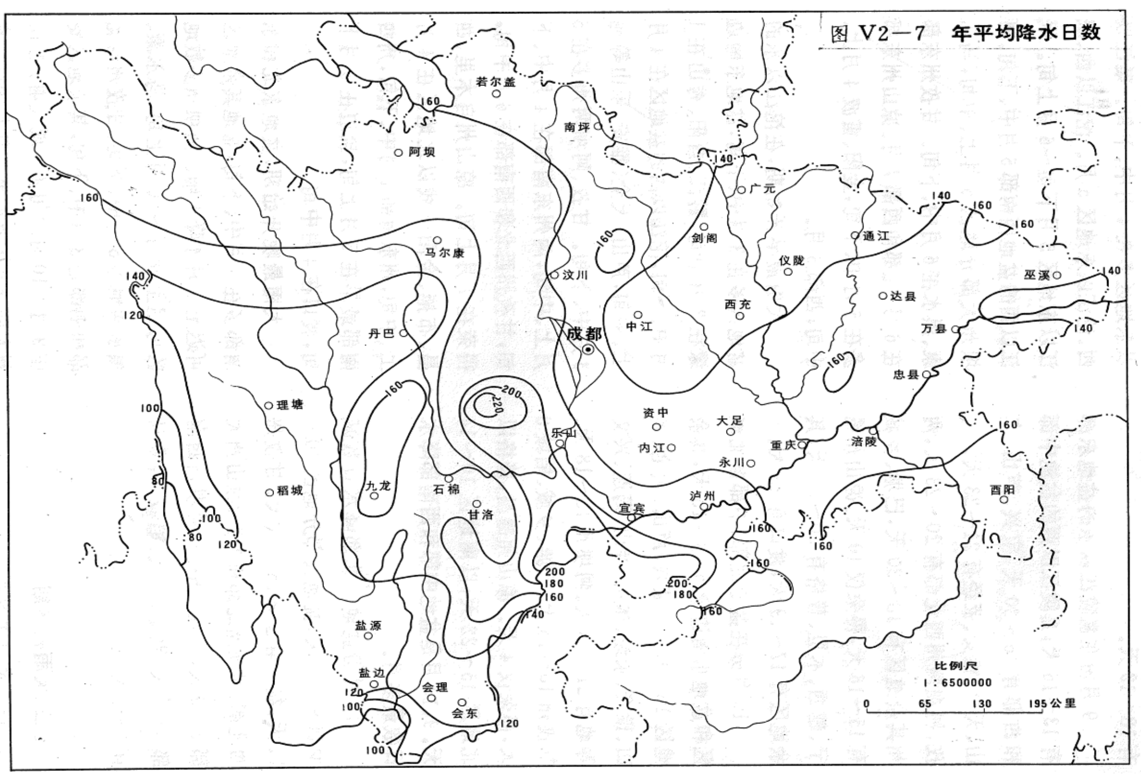


Figure 2.26: Annual Number of Rain Days (Sichuansheng Difanghzi 1992:27).

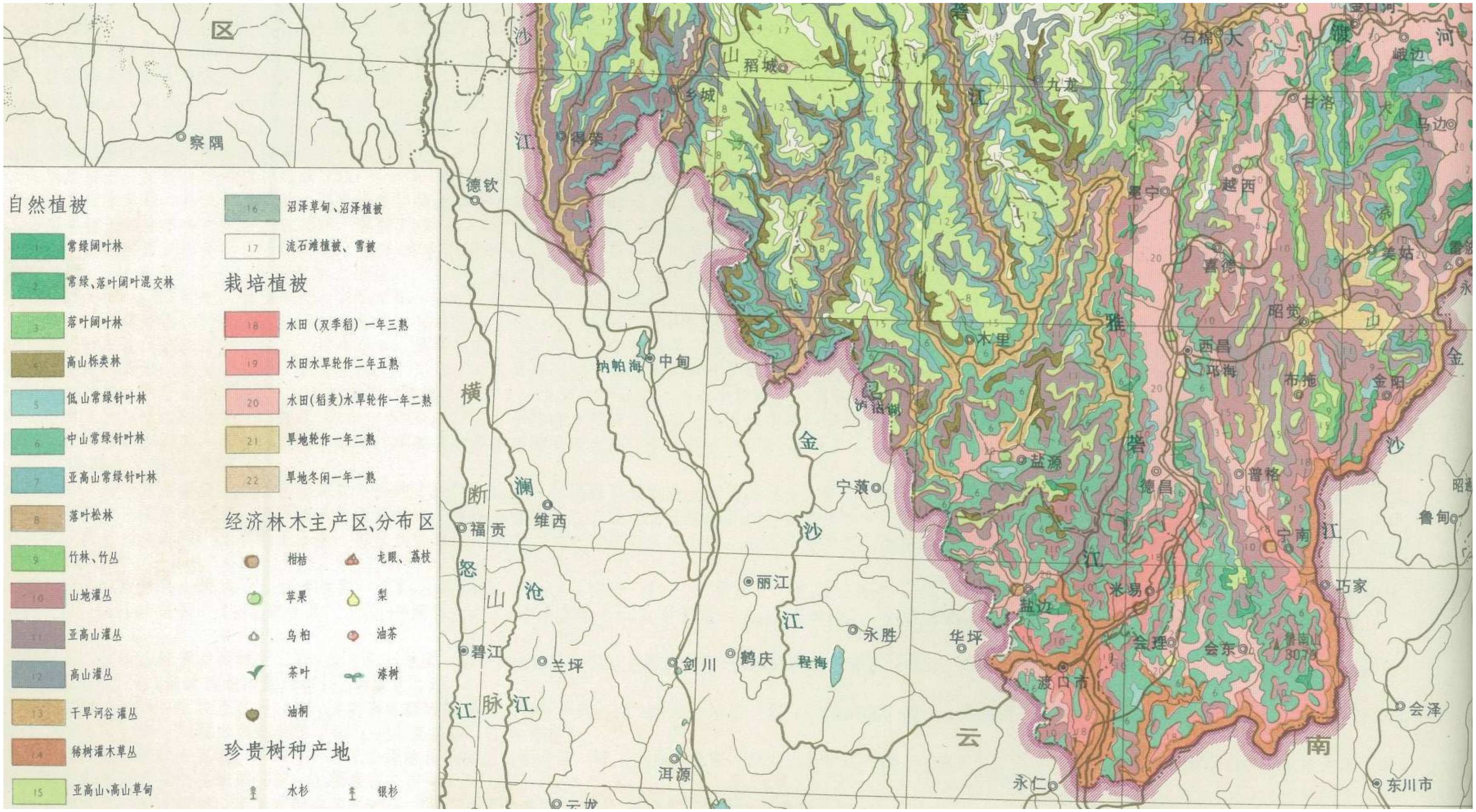


Figure 2.27: Map of Vegetation Cover in Southwest Sichuan (Sichuansheng Cehuiju 1981:31-32).

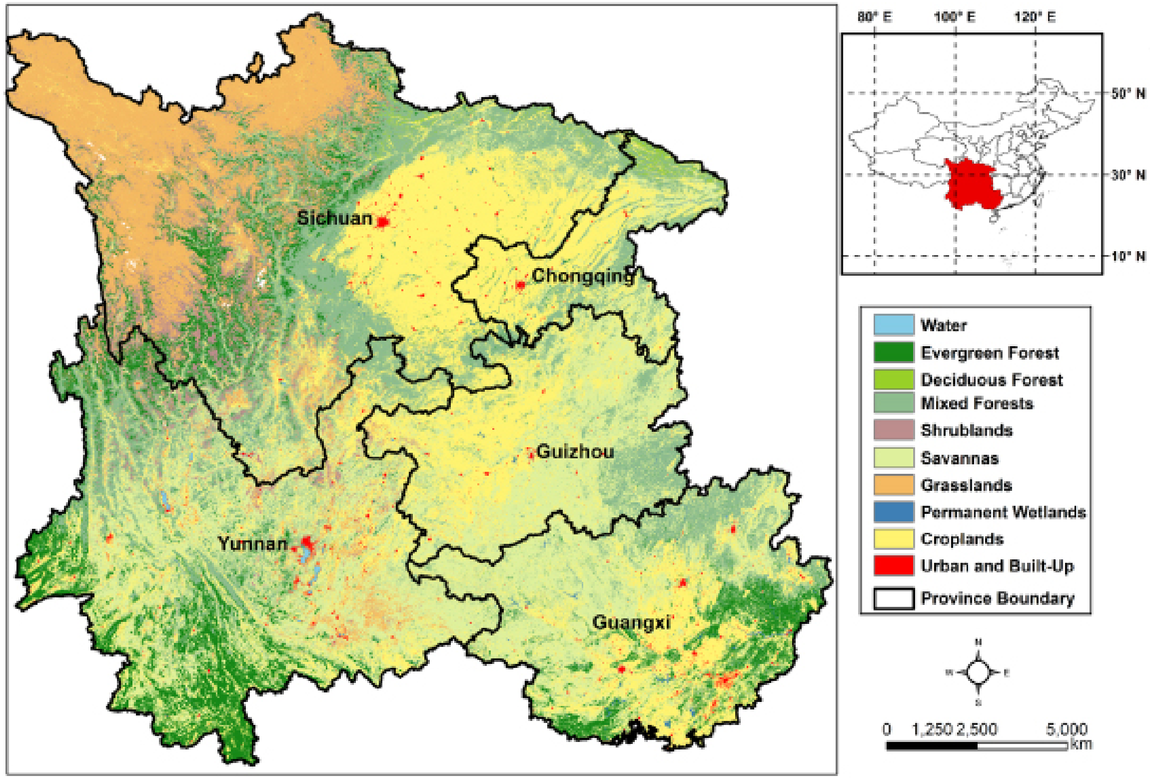


Figure 2.28: Surface Cover of Southwest China (Zhang et al. 2012: Figure 1).

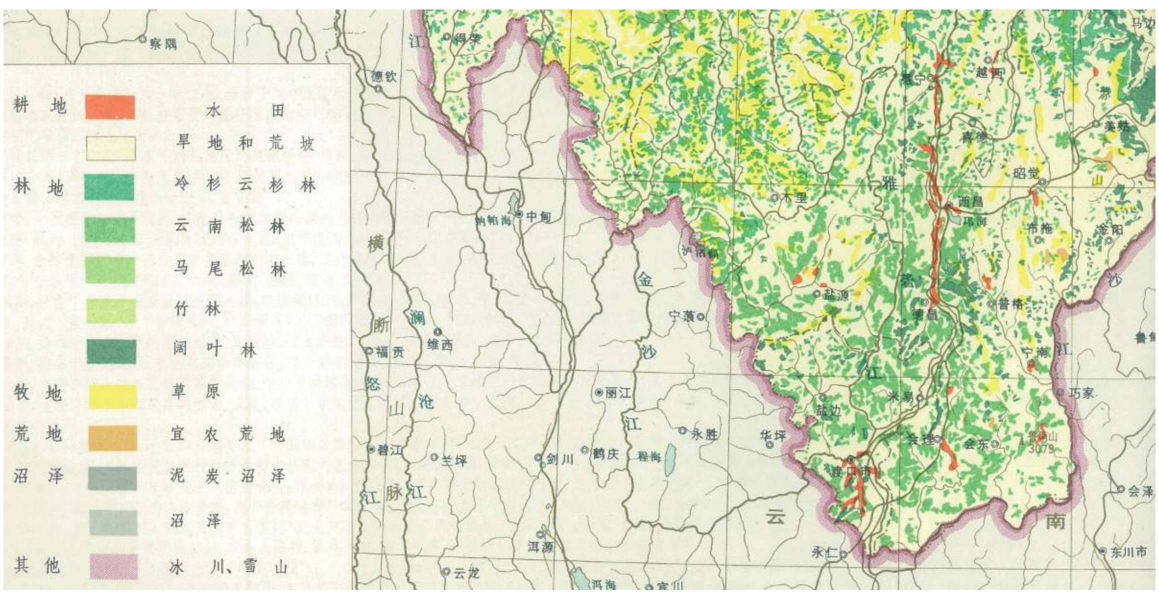


Figure 2.29: Map of Land Utilization Southwest Sichuan (Sichuansheng Cehuiju 1981:33-34).

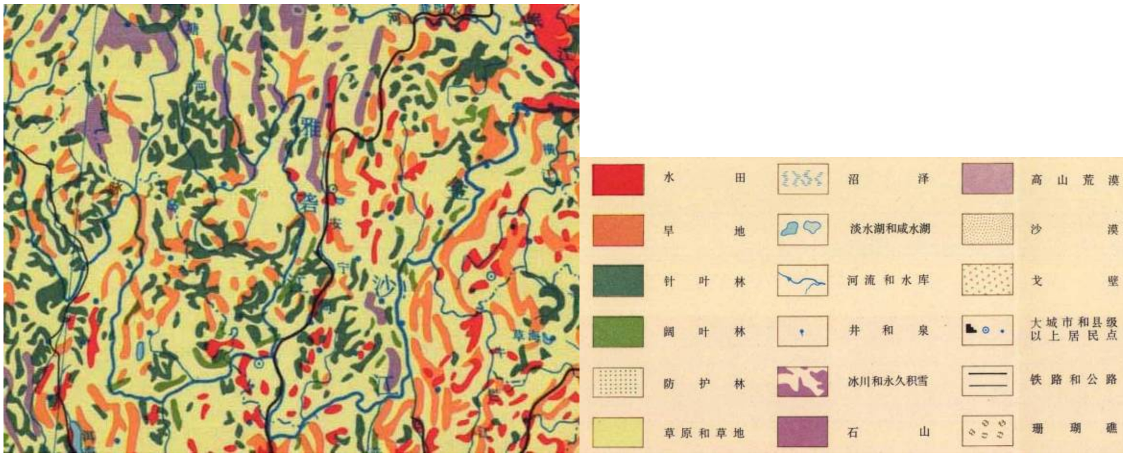


Figure 2.30: Map of Land Utilization Southwest China (Zhongguo Kexueyuan 1979).

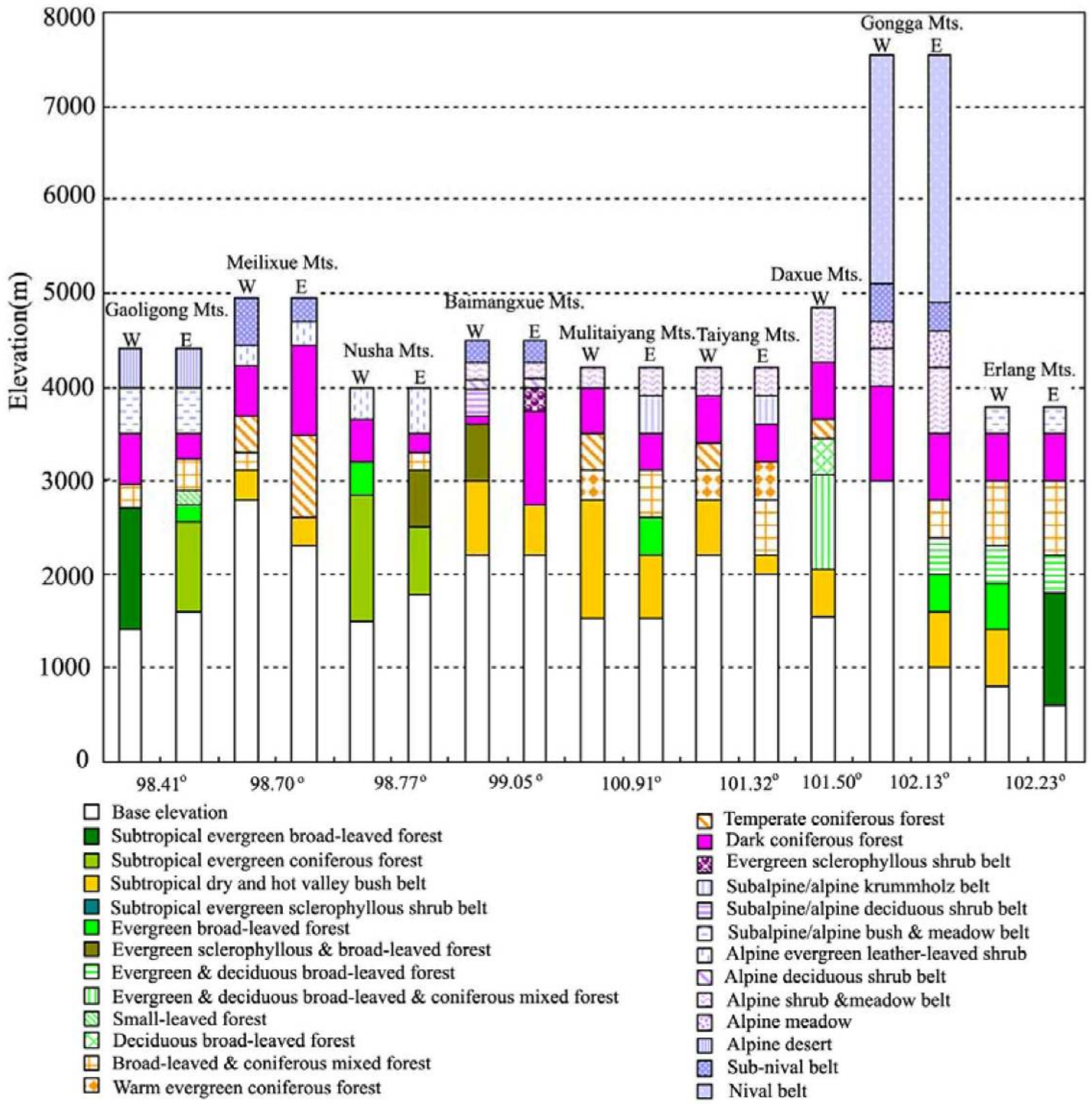


Figure 2.31: Comparison of Altitudinal Belts between the East Slope (E) and West Slope (W) of the Hengduan Mountains (Yao Yonghui et al. 2010:Figure 7).

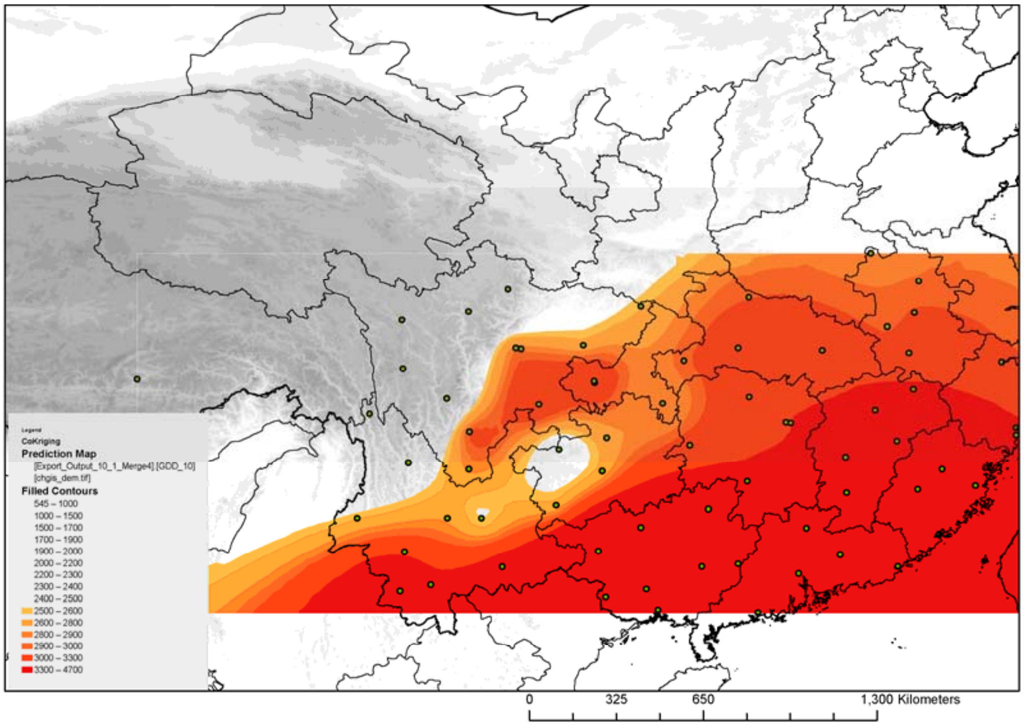


Figure 2.32: Growing Degree Days of Temperate *O. Japonica* (d'Alpoim Guedes 2013).

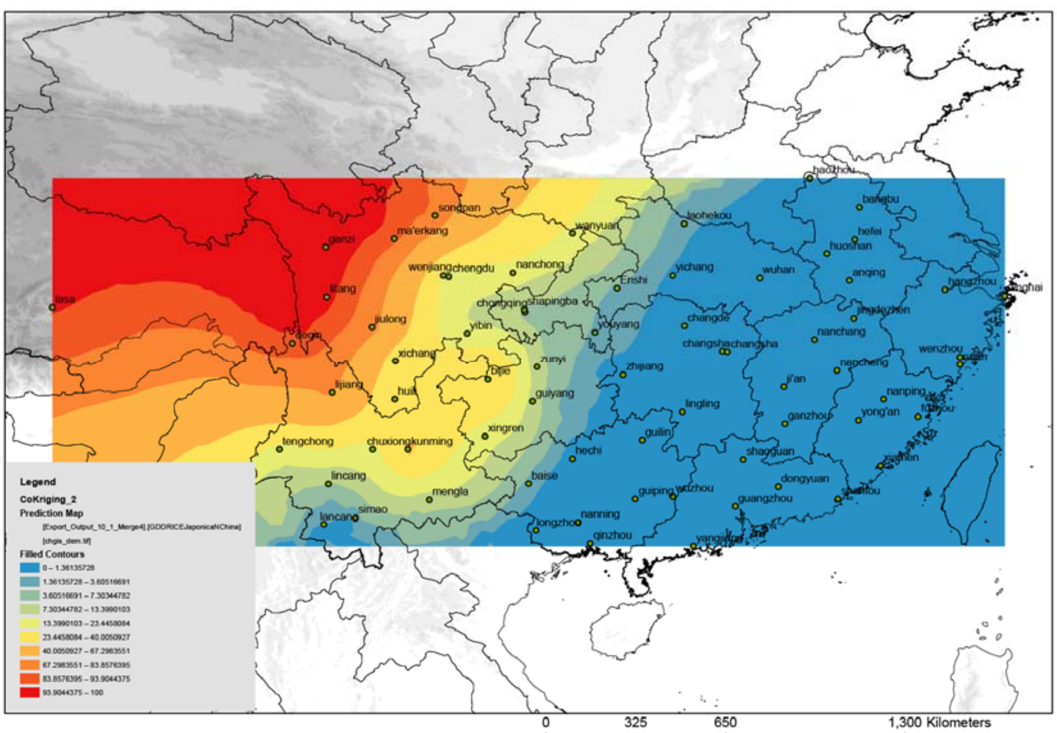


Figure 2.33: Risk Associated with Planting *O. Japonica*. The Numbers Represent the Total Percentage of Years where Failure Occurred (d'Alpoim Guedes 2013).

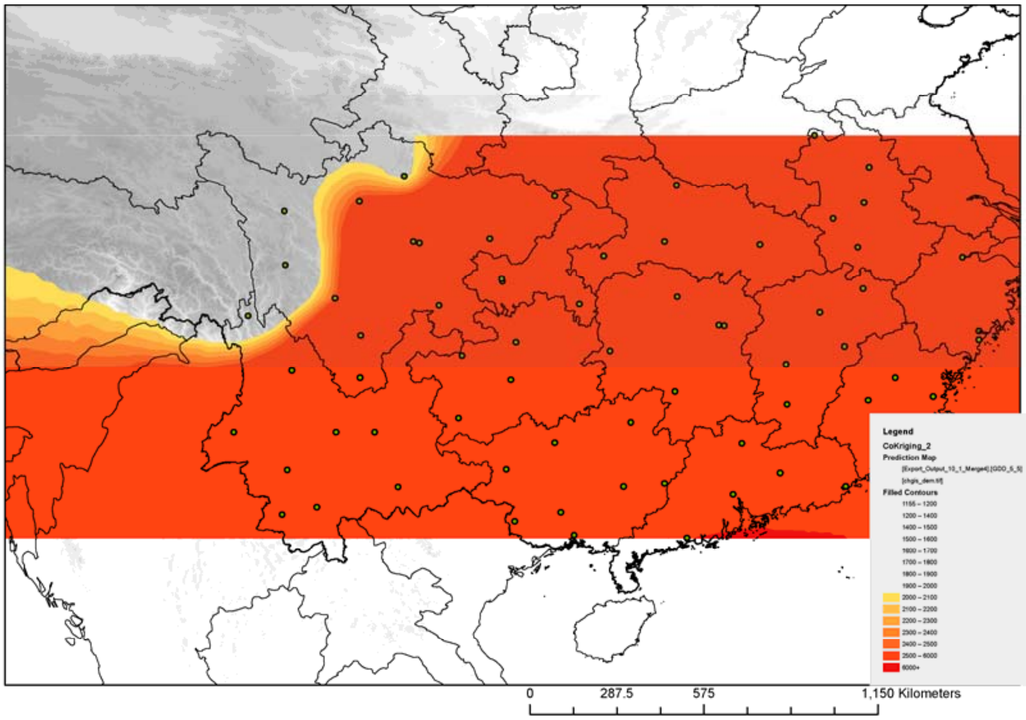


Figure 2.34: Potential Niche of Foxtail Millet in Southwest China (d'Alpoim Guedes).

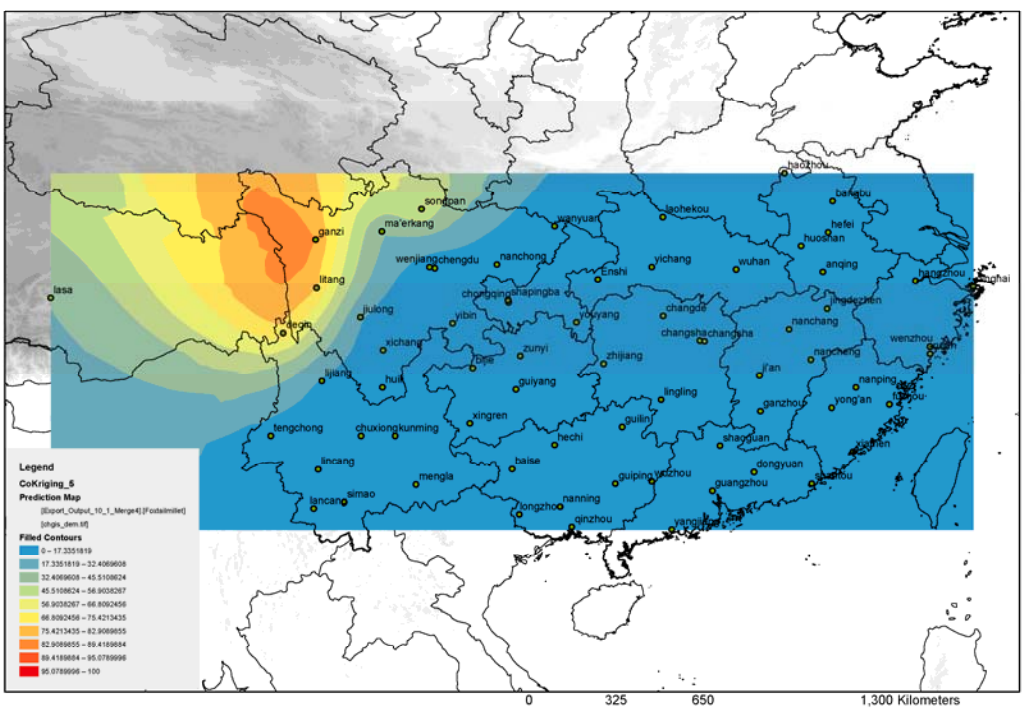


Figure 2.35: Risk Associated with Growing Foxtail Millet (d'Alpoim Guedes).

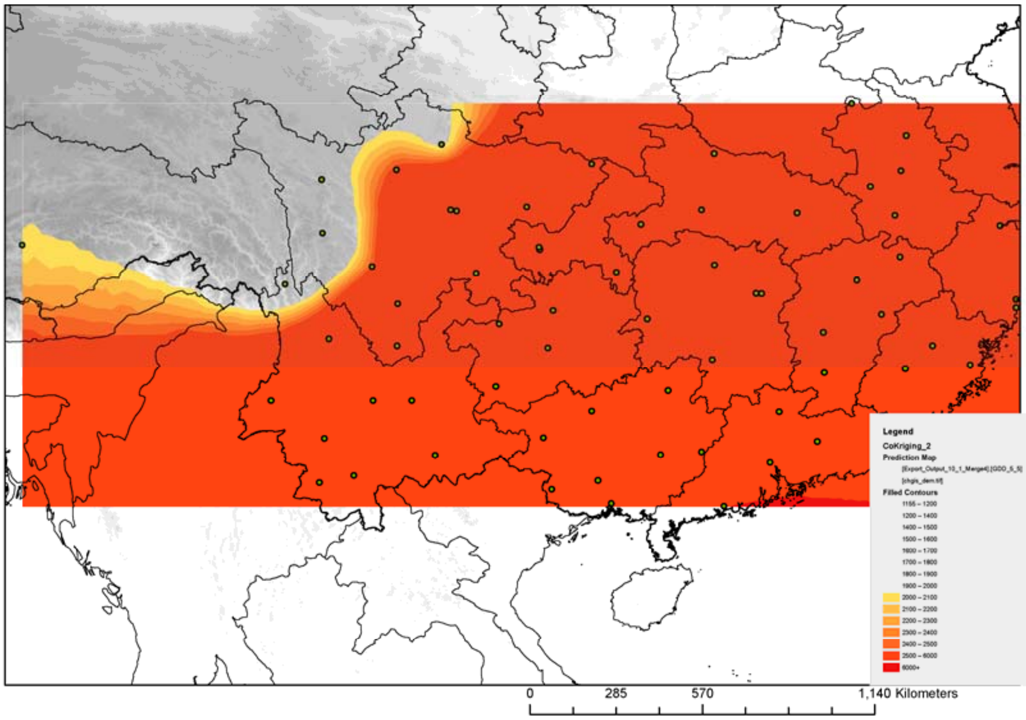


Figure 2.36: Potential Distribution of Spring Varieties of Barley (d'Alpoim Guedes).

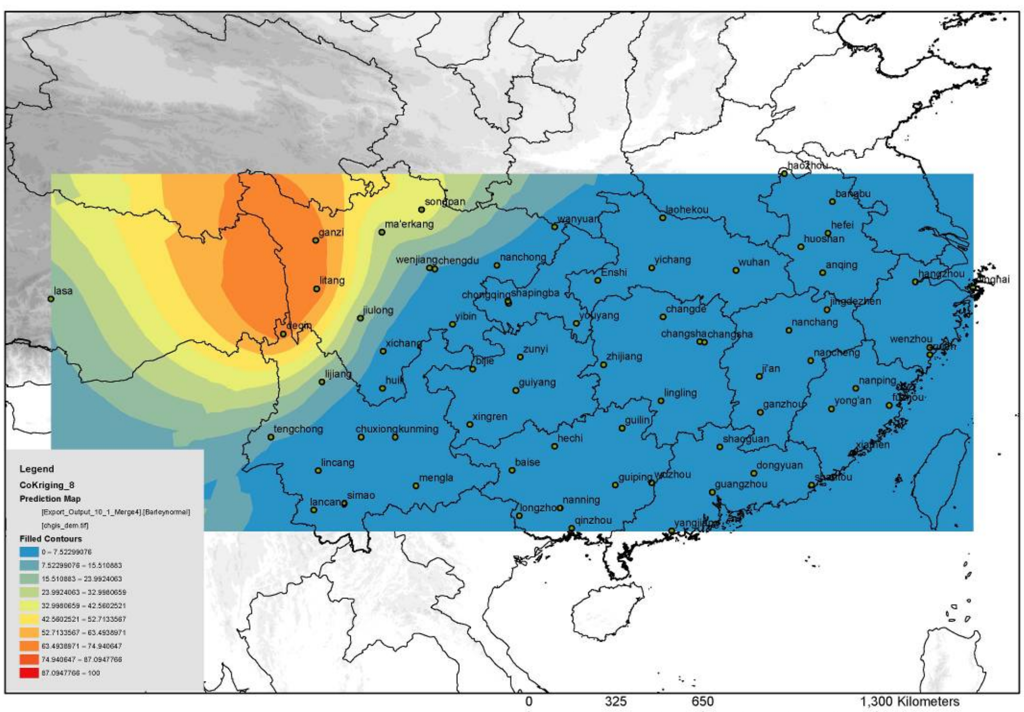


Figure 2.37: Risk Associated with Practicing Barley Cultivation (d'Alpoim Guedes).

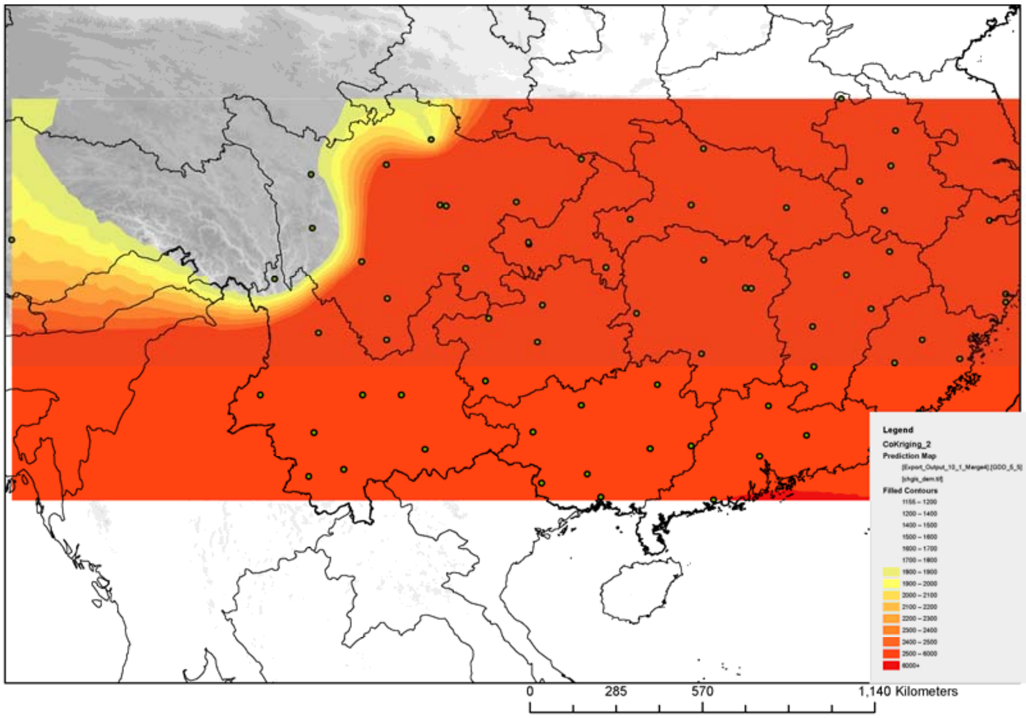


Figure 2.37: The Potential Distribution of Spring Varieties of Wheat (d'Alpoim Guedes).

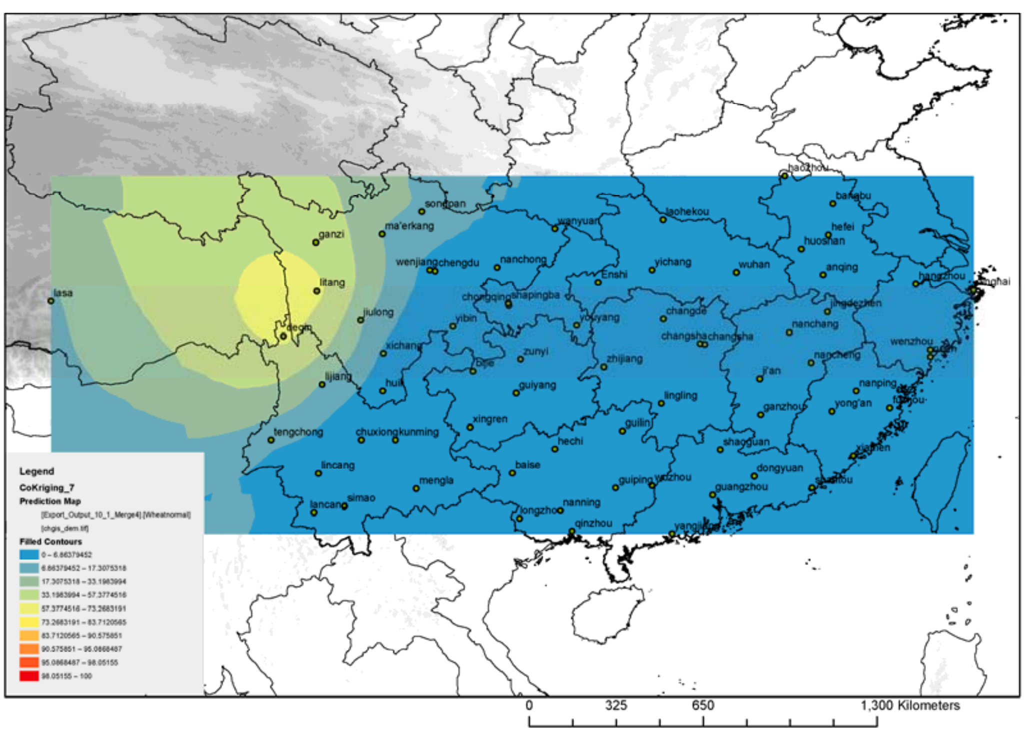


Figure 2.38: Risk Map of Spring Wheat (d'Alpoim Guedes).

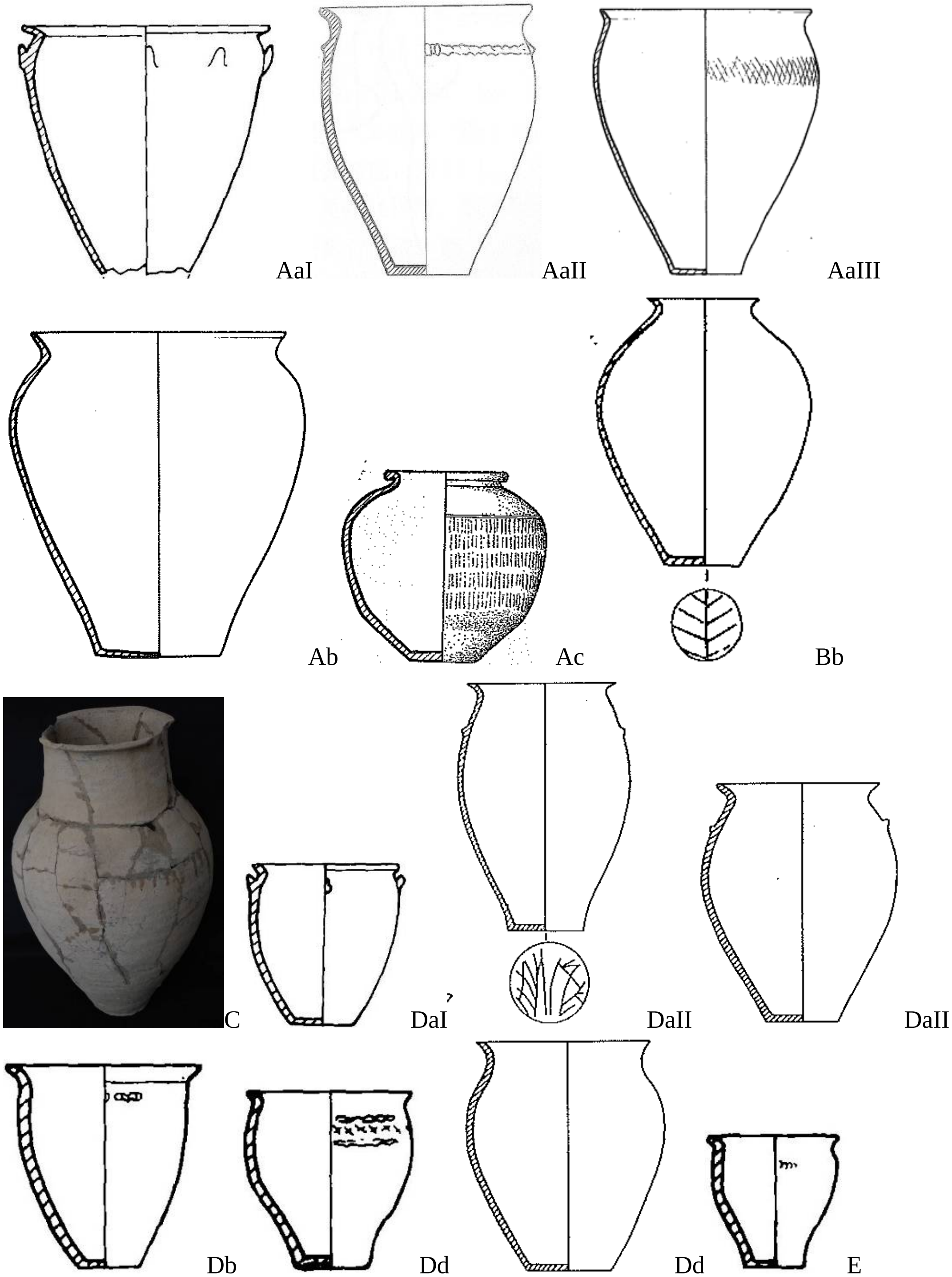


Figure 3.1: *Guan* Urn Types: First Row: XDYKa23.1 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 18.2), XDYDM2.1 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 58.1), XYPW3.1 (Chengdu, Liangshan, and Xichangshi 2007: Figure 8.3); Second Row: XYPW9.1 (Chengdu, Liangshan, and Xichangshi 2007: Figure 14.2), XLZHM1.42 (Figure 7.5), , HFJM26.7 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 12.4); Third Row: YDZM134.1 (Yunnansheng, Lijiangshi, and Lijiangshi 2010), XDYKa12.2 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 18.4), HFJM28.1 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 11.12); Last Row: XDYKa3.2, XDYKa21.2, XDYKa15.1 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 18.6, 18.9, 18.11).

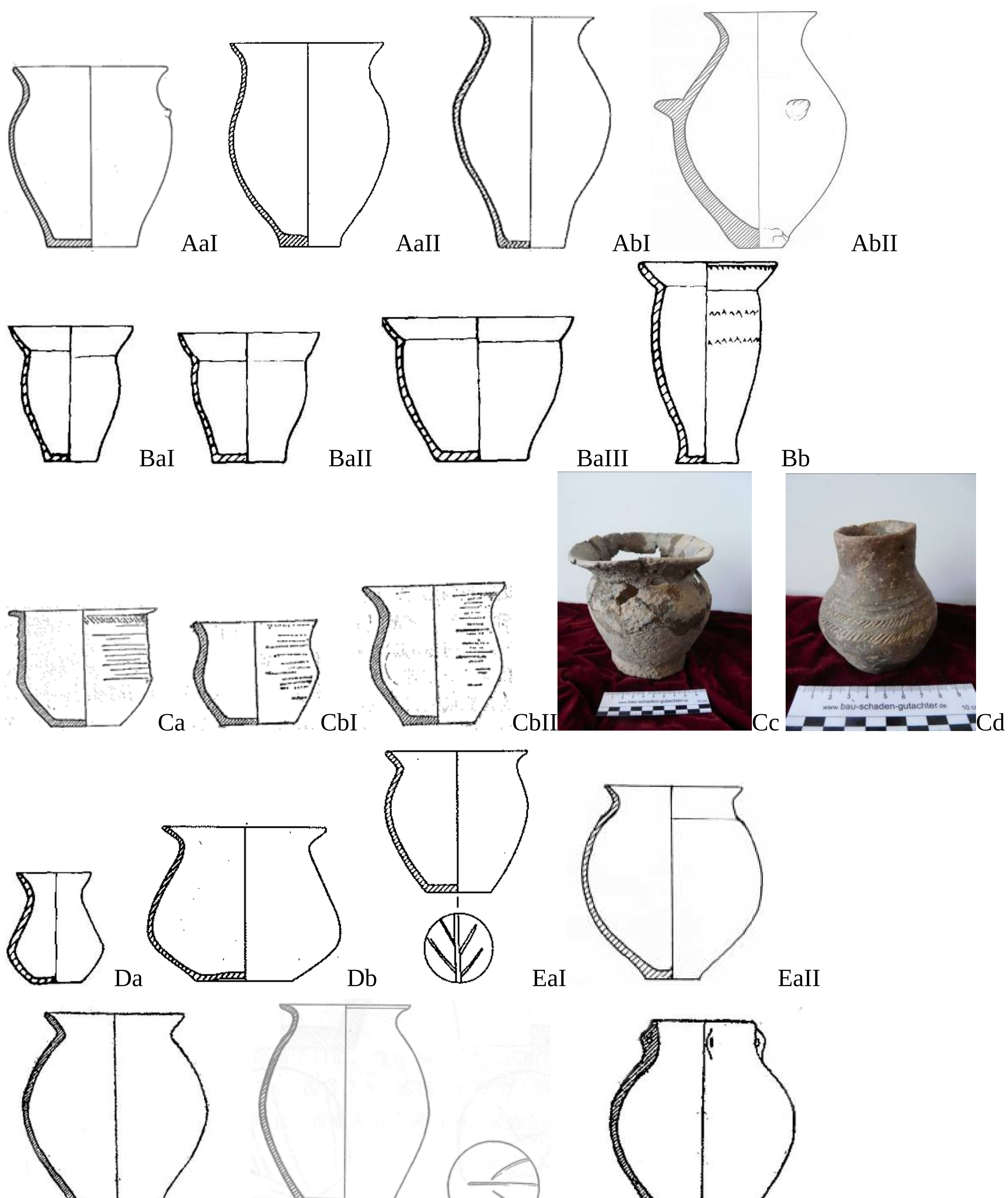


Figure 3.2: *Guan* Jar Types I: Top Row: HFJ76, HFJM144.2 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 4.3, 11.10), LYZM3.2 (Kunmingshi et al. 2007: Figure 8.4), DARM4.10 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 58.8); Second Row: XDYH1.5, H2.2, H1.1, H2.3 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 25.12, 25.11, 25.1, 25.4); Third Row: XYGM3.7, M3.3, M1.1 (Liu Shixu 1981: Figure 1.6-8), YDZM3.1, YDZM10.3 (Photos Taken by the Author); Fourth Row: XDYM8.3 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7.7), ZCBM1.7 (Liangshan Yizu 1981: Figure 7.4), HFJM2.1 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 11.11), XQGW1.2 (Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 19.2); Last Row: ZFQM3.1 (Liangshan Yizu 1981: Figure 7.6), DARM4.11 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 60.8), ZEKM3.10 (Liangshan Yizu 1981: Figure 7.5).

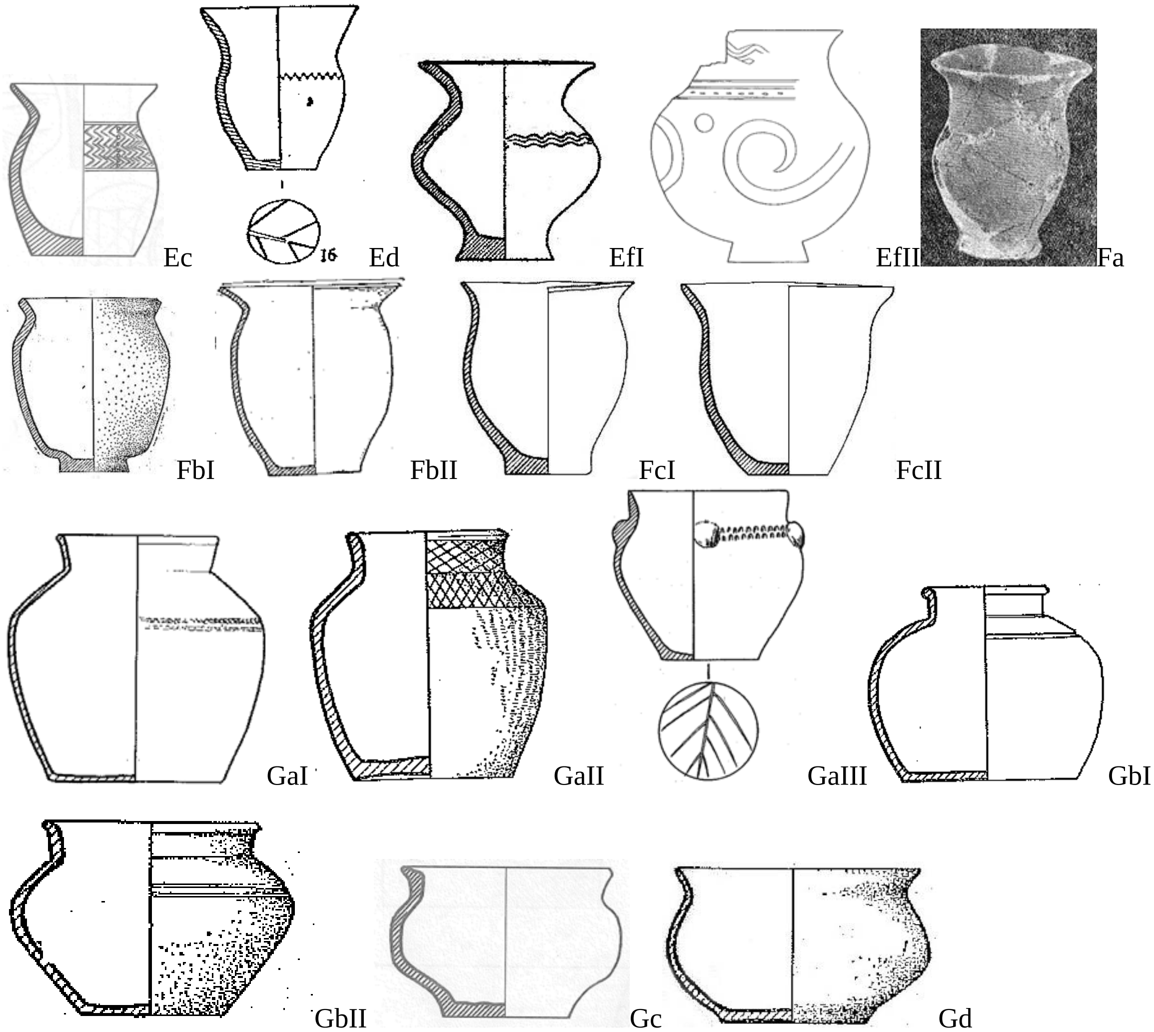


Figure 3.3: *Guan* Jar Types II: Top Row: XLHC3 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 63.4), NDXM2.7 (Yunnansheng Bowuguan 1983: Figure 6.16), ZEKM3.14 (Liangshan Yizu 1981: Figure 7.4), YGJC549 (Liangshan and Chengdu 2009: Figure 39.5), XYM1.2 (Liu Shixu 1981: Figure 2); Second Row: XLZBM5.8, M5.9 (Lizhou Yizhi 1980a: Figure 10.14-15), ZJPM8.2, M11.1 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 11.2, 1); Third Row: XMSM1.1 (Chengdu, Liangshan, and Xichangshi 2007: Figure 6.1), XLZHM3.1 (Lizhou Yizhi 1980b: Figure 6.1), XQGM1.2 (Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 6.11), XLZHM1.37 (Lizhou Yizhi 1980b: Figure 6.3); Last Row: XLZHM2.16 (Lizhou Yizhi 1980b: Figure 6.7), XYJM1.2 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 63.5), XLZHM1:30 (Lizhou Yizhi 1980b: Figure 8.3).

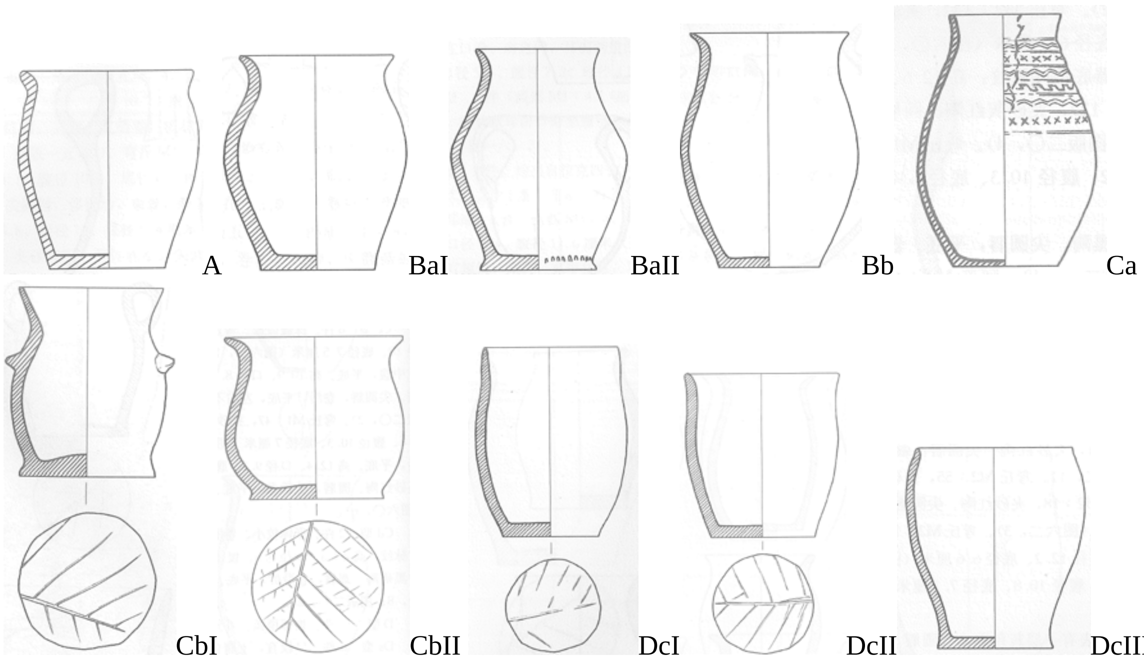


Figure 3.4: *Guan* Beaker Types: Top Row: XDYDM2.4, MWQM1.36, M2.111, M2.1, XLKM6.5; Bottom Row: MWQM1.99, M1.28, M2.18, M2.90, M2.101 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 58.2-4, 58.9, 59.3, 63.1-2, 62.3-5).

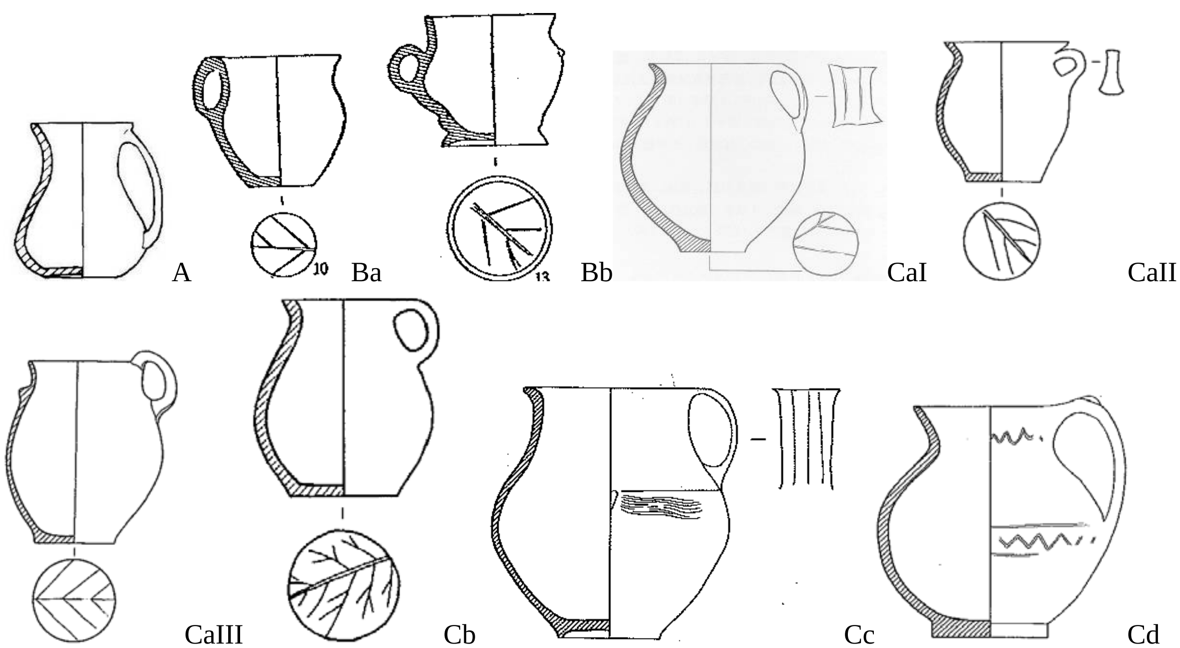


Figure 3.5: Single-Handled *Guan* Jars I: Top Row: XDYM9.3 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7.9), NDXM5.12, M5.23 (Yunnansheng Bowuguan 1983: Figure 6.10, 6.13), MWQM1.57 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 36.5), HFJM26.5 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 11.8); Bottom Row: HLJM1.42 (Chengdu, Liangshan, and Huilixian 2009: Figure 5.6), HJM148.13 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 11.17), YGJC218, YGJC357 (Liangshan and Chengdu 2009: Figure 39.3-4).

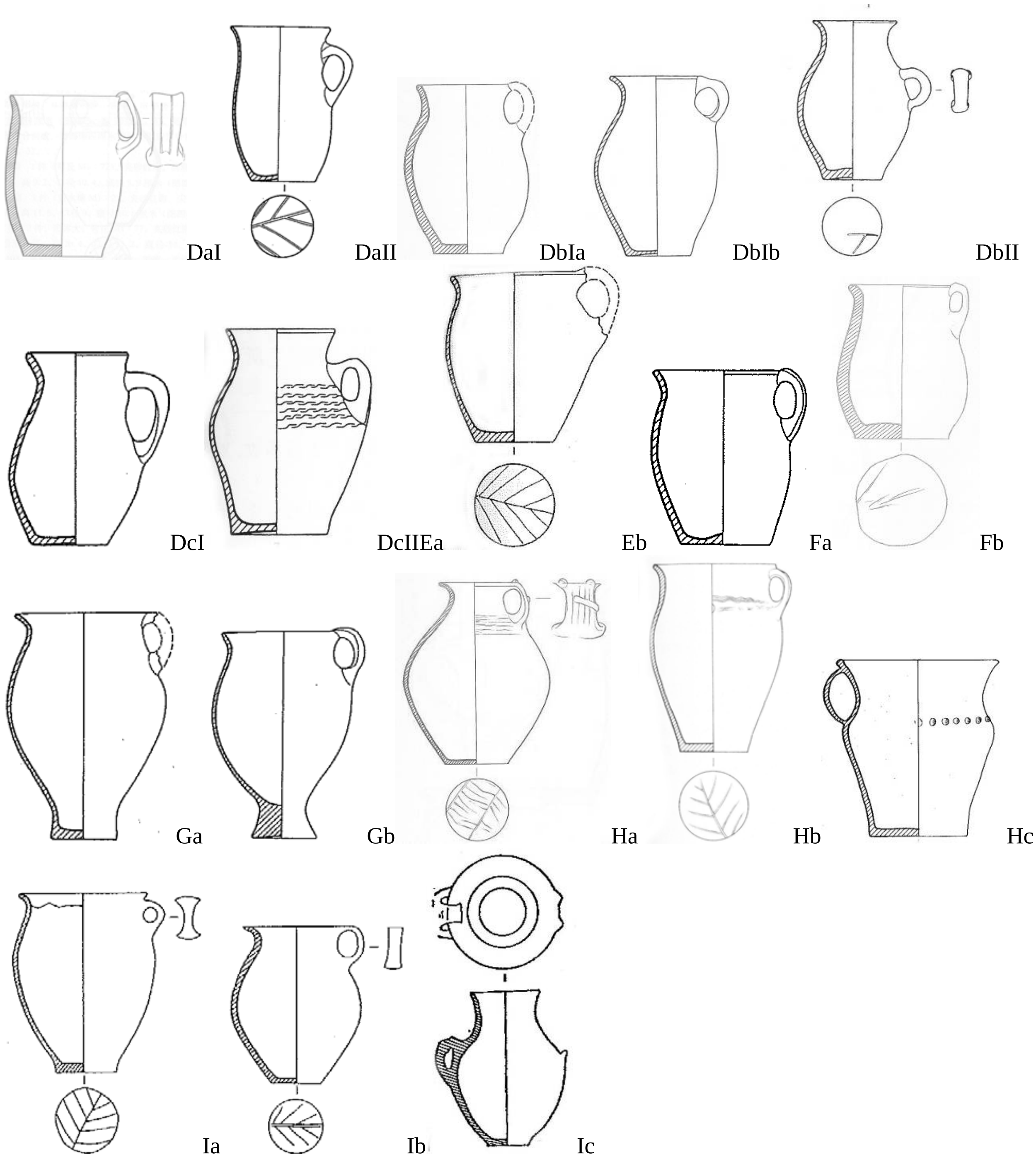


Figure 3.6: Single-Handled *Guan* Jars II: Top: MWQM1.31 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 39.1), HLJM1.125 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 3.6), MWQM1.77 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 40.6), HLJM1.43, M1.52 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 5.1, 6.4); Second Row: HLM1.14, M1.44, M1.11, M1.126 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 3.2, 3.7, 4.5, 4.3); Third Row: HLJM1.92 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 4.4), MWQM1.44 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 39.4), HLJM1.7, M1.62 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 5.2-3), DARM3.8 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 40.2), HGJM1.2 (Chengdu Wenwu et al. 2010: Figure 4.1); Bottom: HGJM1., HGJ742 (Chengdu Wenwu et al. 2010: Figure 4.1, 4.4), HFJM3.1, M144.3 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 11.9, 11.8), NDXM4.1 (Yunnansheng Bowuguan 1983: Figure 6.8).

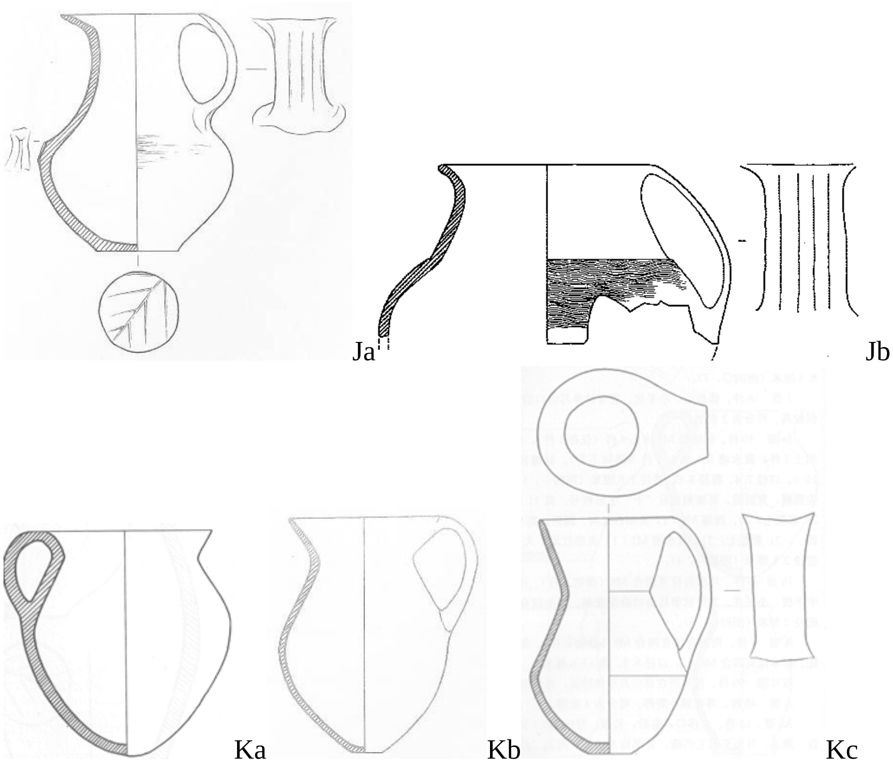


Figure 3.7: Single-Handled *Guan* Jars III: Top Row: MWQM2.49 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 40.2), YLLM4.14 (Liangshan and Chengdu 2009: Figure 4.4); Bottom Row: XHTM1.2, XQGM2.26, XLKM8.4 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 40.5, 4.1, 41.5).

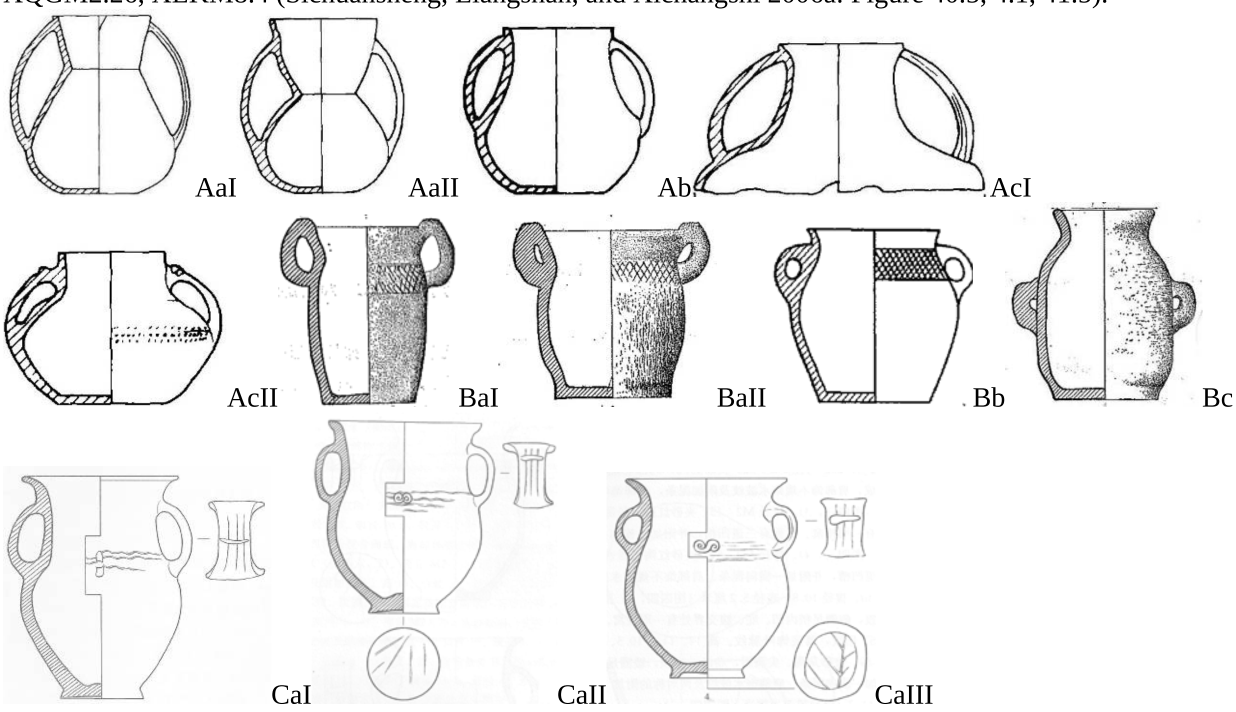


Figure 3.8: Double-Handled *Guan* Jars I: Top: XDQM9.2, M9.1, Ka 13.5, M2.1 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7.1, 7.5, 8.3, 7.2); Second Row: XDQM3.1 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7.8), XLZBM2.25, M2.6 (Lizhou Yizhi 1980a: Figure 10.2-3), HFJM33.2 (Huilixian and Sichuansheng 2004: Figure 11.1), XLZBM2.6 (Lizhou Yizhi 1980a: Figure 10.4); Bottom: MWQM1.30, M1.66, M2.96 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 42.4, 42.6, 42.4).

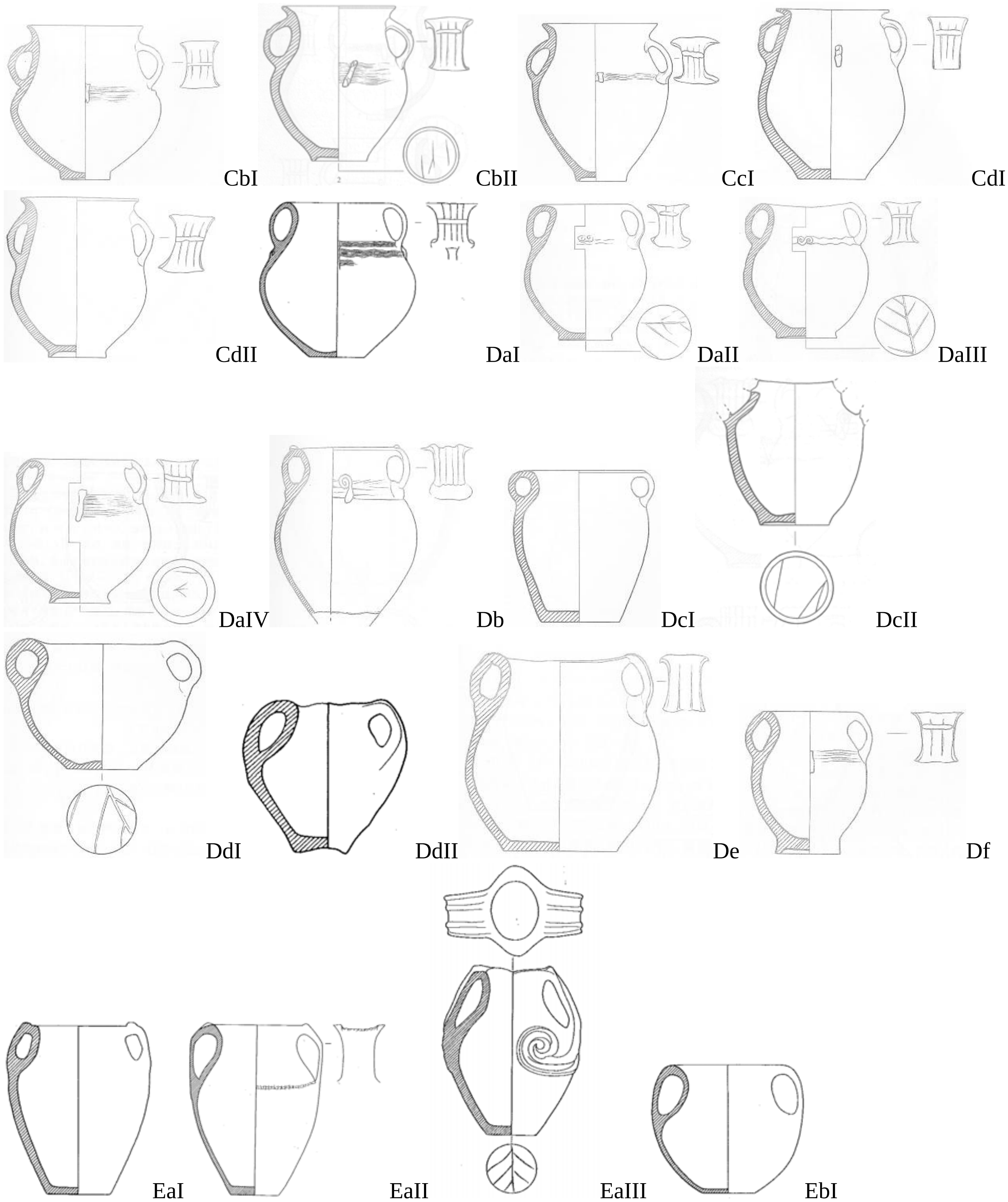


Figure 3.9: Double-Handled *Guan* Jars II: Top Row: MWQM2.35, M2:104, M1.51, M1.16; Second Row: MWQM2.70 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 47.1-2, 48.4, 49.2, 49.1), YGJC257 (Liangshan and Chengdu 2009: Figure 33.1), MWQM1.52, M1.8; Third Row: MWQM2.60, M1.7, M2.20, M2.121; Fourth Row: MWQM2.92 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 50.6, 50.1, 51.1, 54.1, 55.3-4, 56.3), YGJC720 (Liangshan and Chengdu 2009: Figure 127.1), MWQM1.34, M2.126 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 57.1, 57.3); Bottom Row: YGJC741, YGJC250, YGJC247, YGJC250 (Liangshan and Chengdu 2009: Figure 29.6, 29.1, 29.9, 30.10)

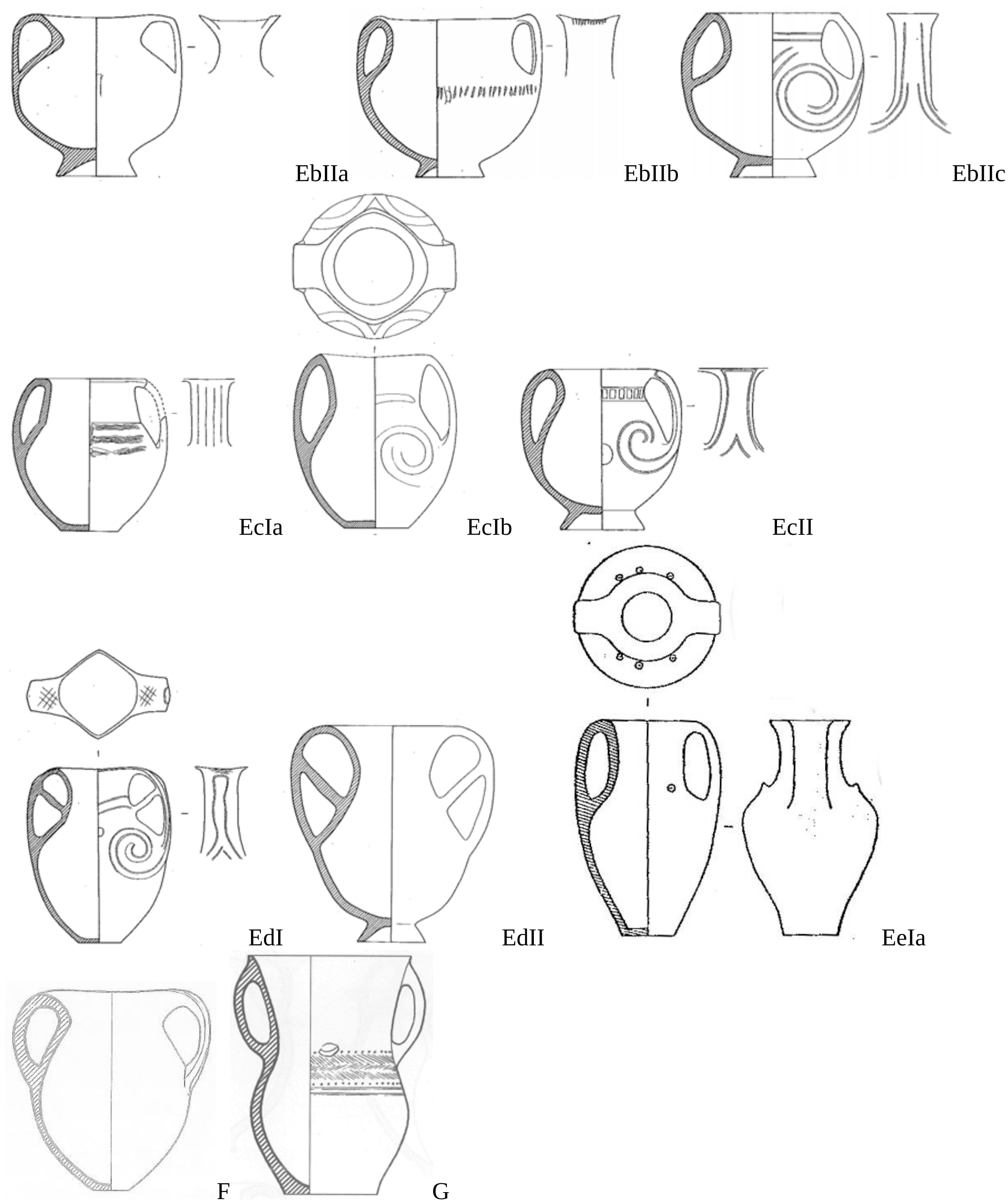


Figure 3.10: Double-Handled *Guan* Jars III: Top Row: YGJC252, YGJC338, YGJC278; Second Row: YGJC210, YBJC221, YGJC354; Third Row: YLLM4.28, YGJC243 (Liangshan and Chengdu 2009: Figure 37.1, 38.3, 37.6, 31.4, 31.3, 37.5, 4.1, 39.1), NDXM2.6 (Yunnansheng Bowuguan 1983: Figure 6.3); Bottom Row: XXJM1.4, XLKM6.4 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 57.4, 49.3).

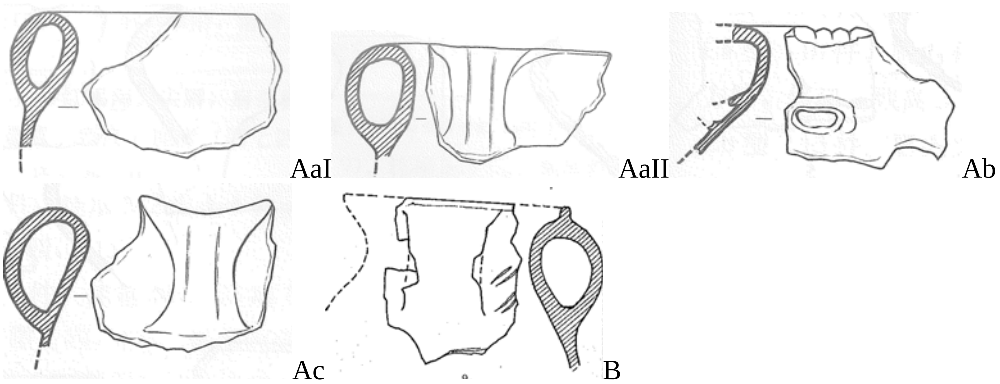


Figure 3.11: Handled Jars: DARM1.20, 21, 23, 28 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 73.2-73.4, 73.6), HDJH2.10 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 7.9).

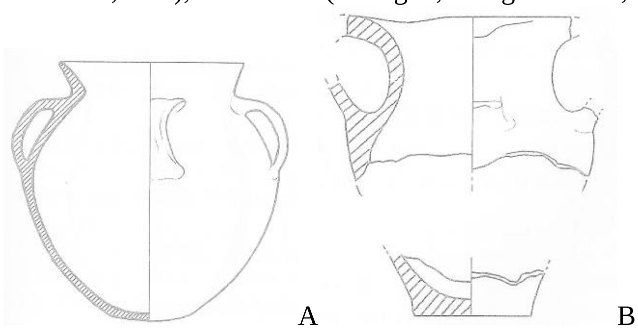


Figure 3.12: Four-Handled Jar: XHGM3.4, DARM4.3 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 57.5-6).

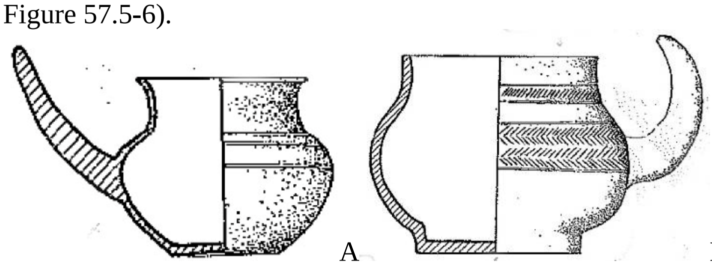


Figure 3.13: Jars with Horn-Shaped Handle: XLZHM4.26 (Lizhou Yizhi 1980a: Figure 6.5), XLZBM3.1 (Lizhou Yizhi 1980b: Figure 8.6).

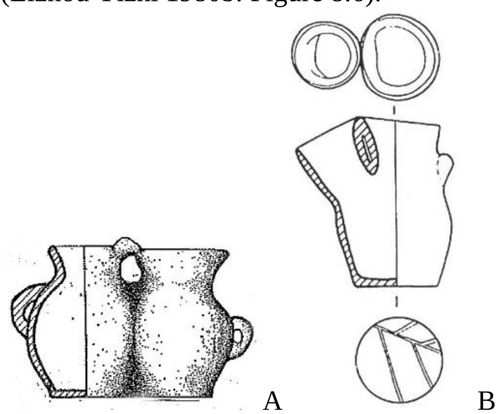


Figure 3.14: Double-Jars: XLZBM3.13 (Lizhou Yizhi 1980a: Figure 10.10), HLJM1.114 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 5.8).

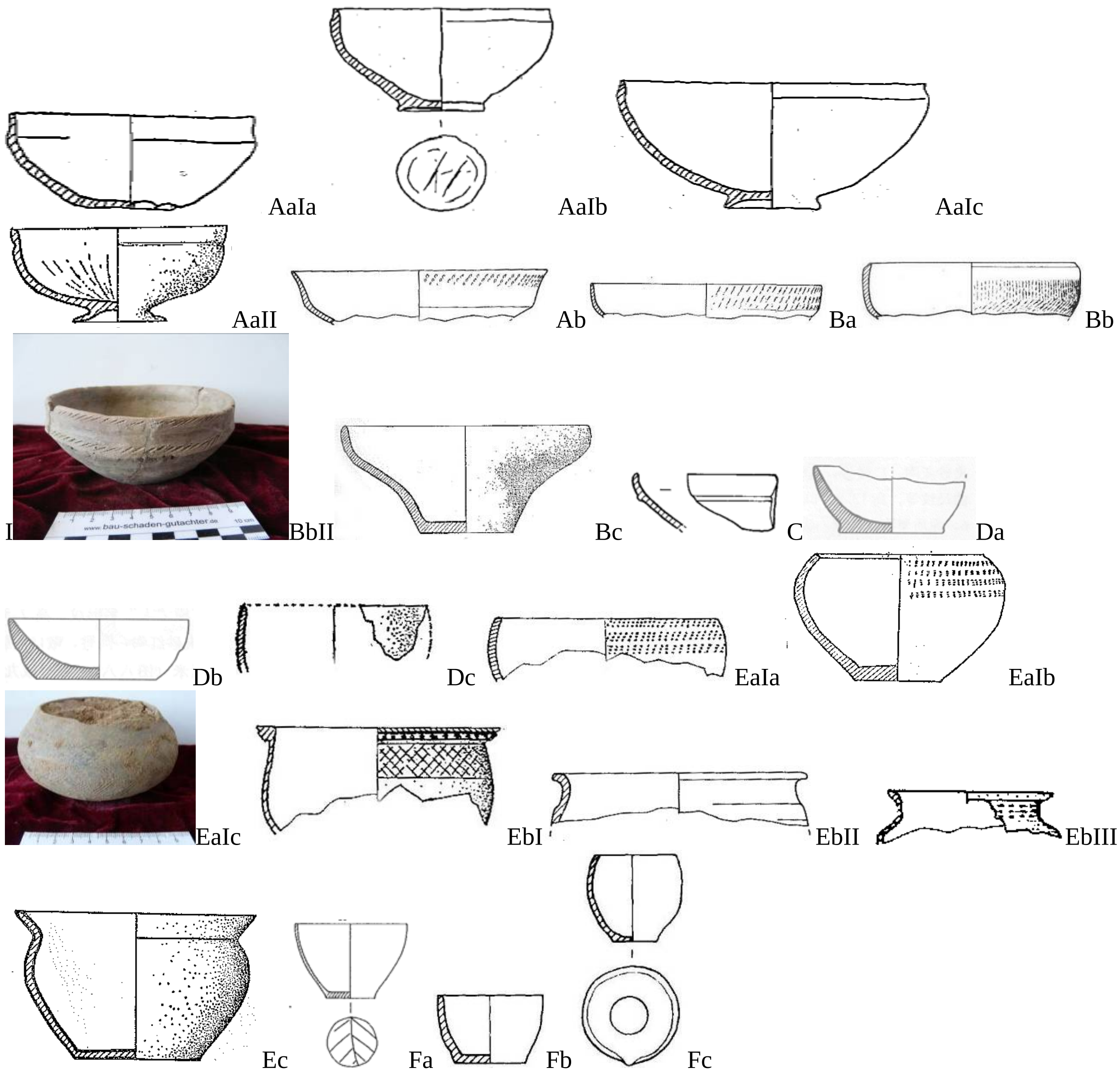


Figure 3.15: *Bo* Bowl Types: Top Row: MGP3.3, MGP3.9, MGP3.6 (Drawings by Author), XLZGM3.20 (Lizhou Yizhi 1980b: Figure 6.8), XMS8.4, XMSH1.7 (Chengdu, Liangshan, and Xichangshi 2007: Figure 17.9, 22.8), XYPH2.2 (Chengdu, Liangshan, and Xichangshi 2007: Figure 24.1), YDZM55.3 (Photo by Author), XLZBM8.17 (Lizhou Yizhi 1980a: 8.7), XMSH3.2 (Chengdu, Liangshan, and Xichangshi 2007: Figure 24.2), XBBM4.16, XWNM2.10 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 65.8-9), PXC0.5 (Liangshan, Pugexian, and Pugexian 1982: Figure 4.3), XHS0.9 (Xichangshi Wenwu 1998: Figure 4.4), XLZAM10.97 (Lizhou Yizhi 1980a: Figure 9.1), YDZM85.30 (Photo by Author), XHS0.10 (Xichangshi Wenwu 1998: Figure 4.3), XHS3.68 (Chengdu, Liangshan, and Xichangshi 2006: Figure 15.2), XHS0.8 (Xichangshi Wenwu 1998: Figure 4.9)XLZBM8.2 (Lizhou Yizhi 1980a: Figure 9.4), HJFM26.4 (Huilixian, Liangshan, and Sichuansheng: Figure 12.13), XDYKa3.4, XDYM2.3 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 18.8, 7.11).

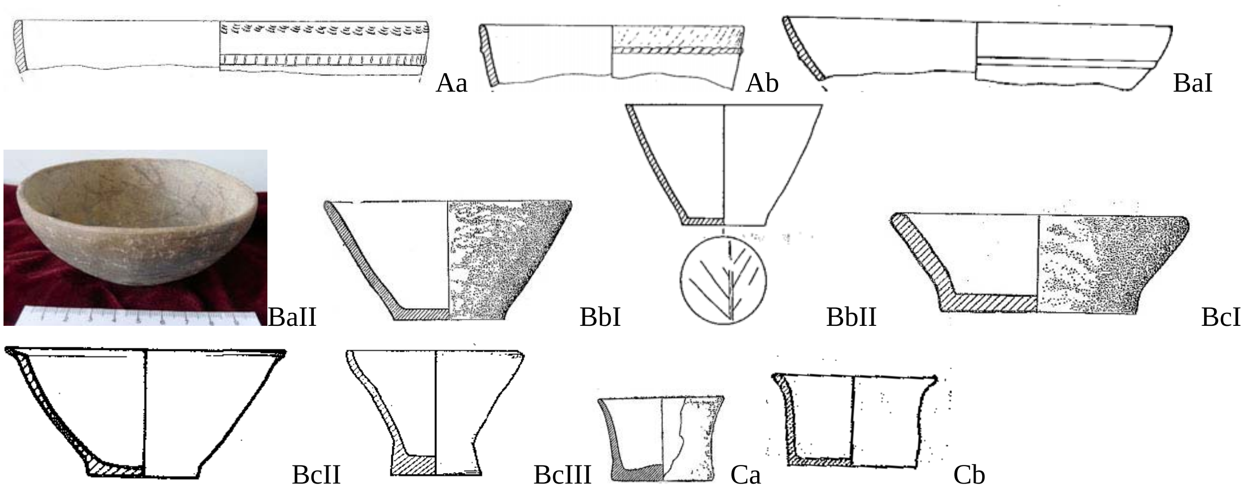


Figure 3.16: *Wan* Bowl Types: Top Row: XHS4.24, XHS4.25, XHS3.69 (Chengdu, Liangshan, and Xichangshi 2006: Figure 9.8, 9.5, 15.7); Second Row: YDZM10.1 (Photo by Author), XLZBM3.11 (Lizhou Yizhi 1980a: Figure 8.5), HFJM93.2 (Huilixian, Liangshan, and Sichuansheng: Figure 12.12), XLZBM1.1 (Lizhou Yizhi 1980a: Figure 9.3); Bottom Row: XYPW13.2 (Chengdu, Liangshan, and Xichangshi 2007: Figure 18.4), XLZAM1.9 (Lizhou Yizhi 1980a: Figure 9.6), PXC0.8 (Liangshan and Pugexian 1982: Figure 4.10), XYGM1.5 (Liu Shixu 1981: Figure 1.10).

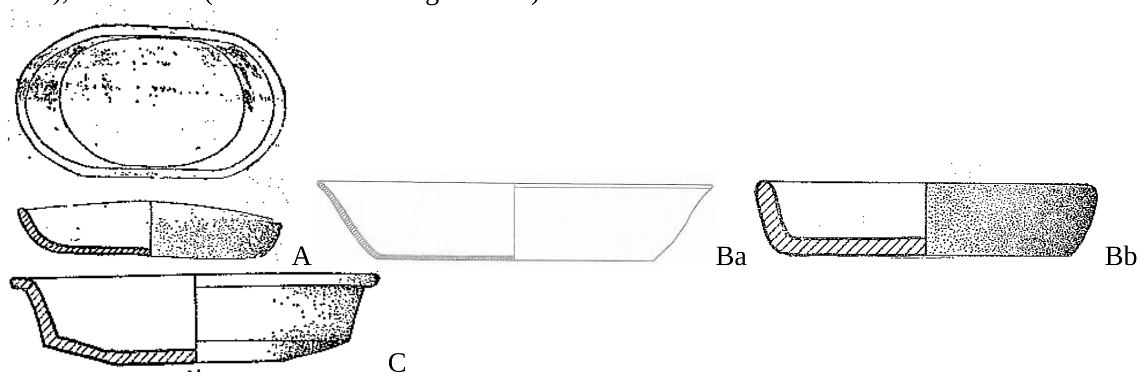


Figure 3.17: Basin Types: XLZBM2.4 (Lizhou Yizhi 1980a: Figure 10.13), DARM4.6 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 70.7), XLZBM2.3 (Lizhou Yizhi 1980a: Figure 9.2), XLZHM1.14 (Lizhou Yizhi 1980b: Figure 6.11).

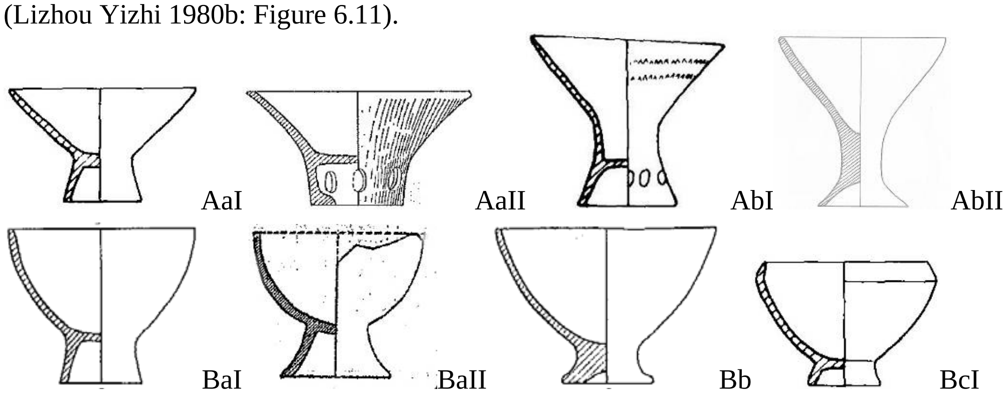


Figure 3.18: *Dou* Bowl Types: Top Row: XDYM8.2 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7.3), XLZAM9.70 (Lizhou Yizhi 1980a: Figure 9.7), XDYH2.1 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 25.3), MWQM2.118 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 70.5); Bottom Row: HFJM45.1 (Huilixian, Liangshan, and Sichuansheng: Figure 11.3), ZFQM1.5 (Liangshan Yizu 1981: Figure 7.2), HFJM4.5 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 11.5), XDYM3.2 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7.12).

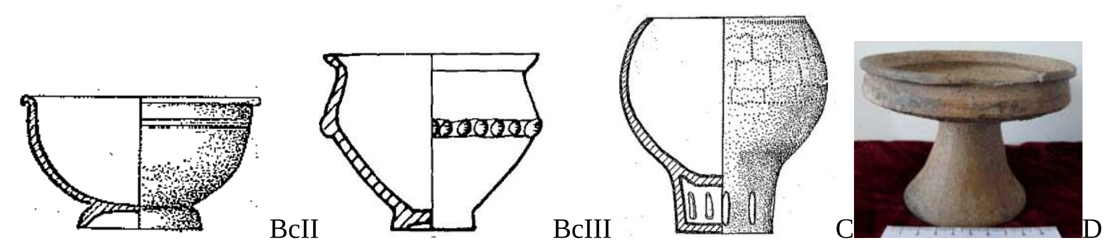


Figure 3.19: *Dou* Bowl Types II: XLZHM1.30 (Lizhou Yizhi 1980b: Figure 8.6), XDYKa13.1 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 18.5), XLZBM8.3 (Lizhou Yizhi 1980a: Figure 9.8), YDZM131.1 (Photo by Author).

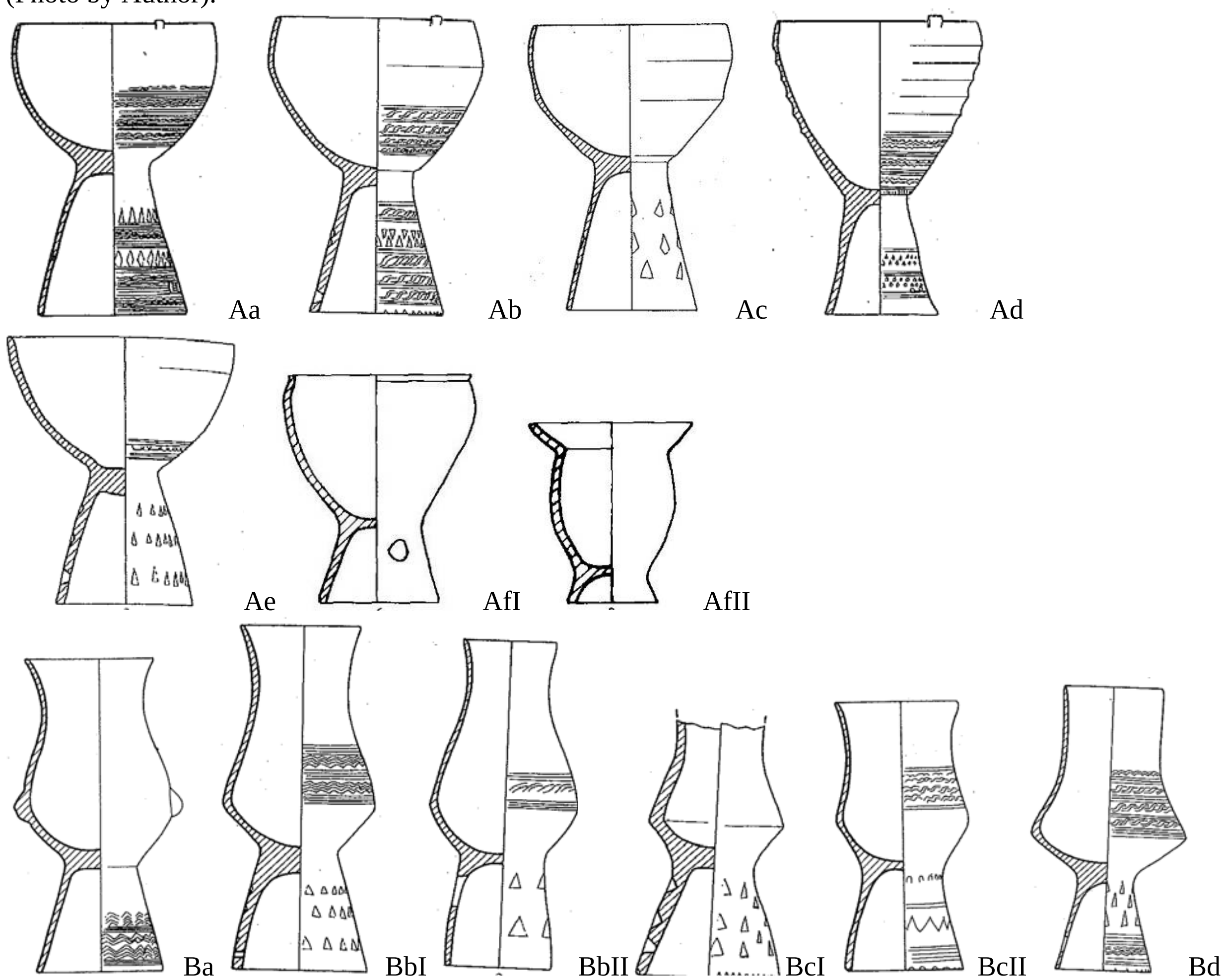


Figure 3.20: Goblet Types I: Top Row: HLJM1.131, 103, 5, 133; Second Row: HLJM1.127 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 10.4, 11.4, 12.5, 13.1, 13.3), XDYM4.1, XDYH2.6 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7.10, Figure 25.2); Bottom Row: HLJM1.123, 67, 45, 18, 64, 98 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 7.2, 8.2, 9.2, 5.7, 7.3, 9.3).

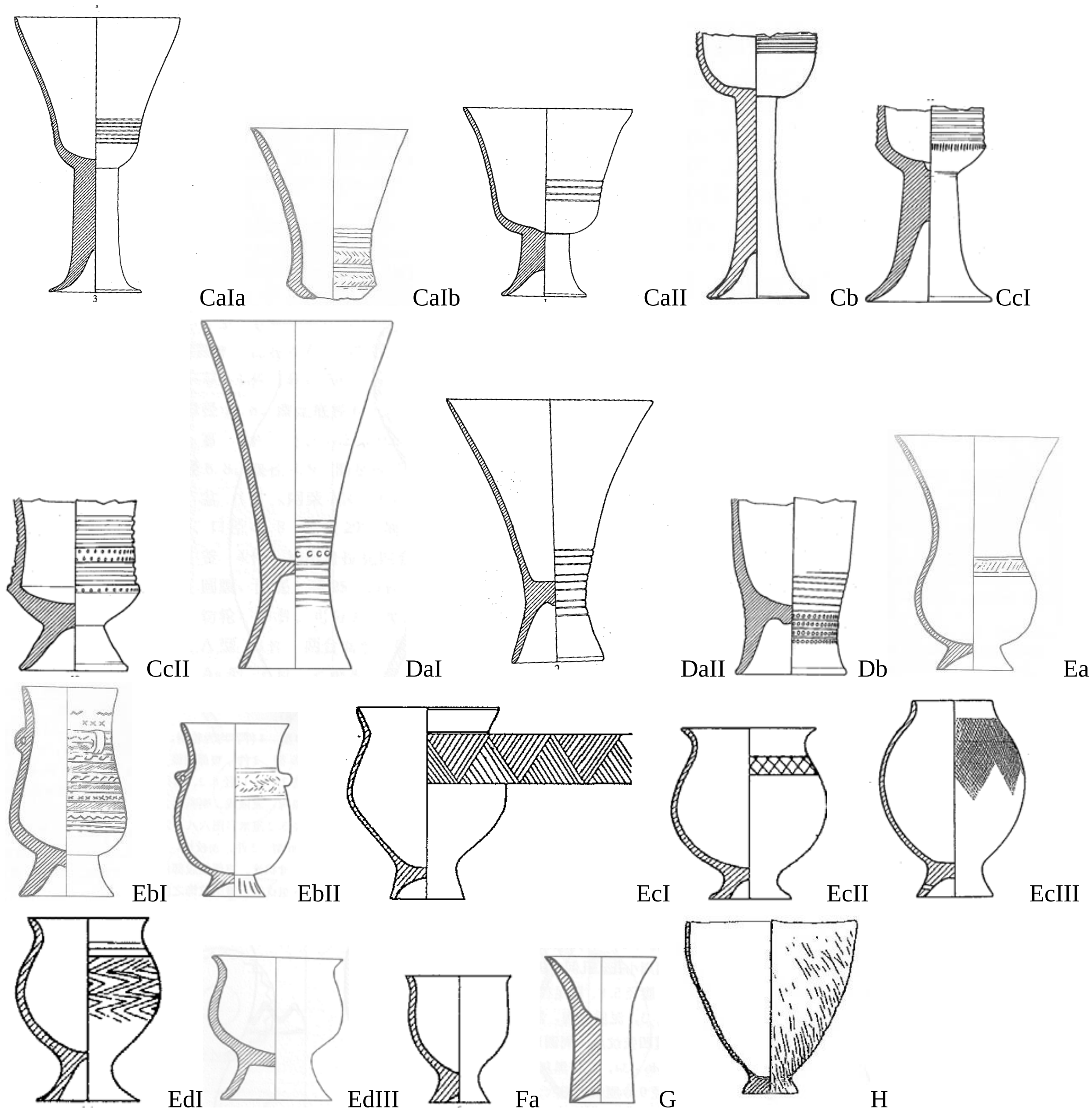


Figure 3.21: Goblet Types II: Top Row: XQGM1.5 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 5.3), XBBM6.33 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 66.6), XQGM1.9, M2.3; Second Row: XQGM2.4 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 5.1, 9.15, 9.10), XYJM3.2 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 69.1), XQGM1.7, M2.8 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 5.2, 9.11), XBBM4.2; Third Row: XLKM1.2, XHGM3.6 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 66.1-2, 66.5), HFJM148.4; Bottom Row: HFJM4.3 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 12.7, 12.6), HLJM1.53 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 13.10), XLZHM1.30 (Lizhou Yizhi 1980b: Figure 8.6), HFJM127.2 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 12.6), HXPM5.1 (Kunmingshi et al. 2007: Figure 18.2).

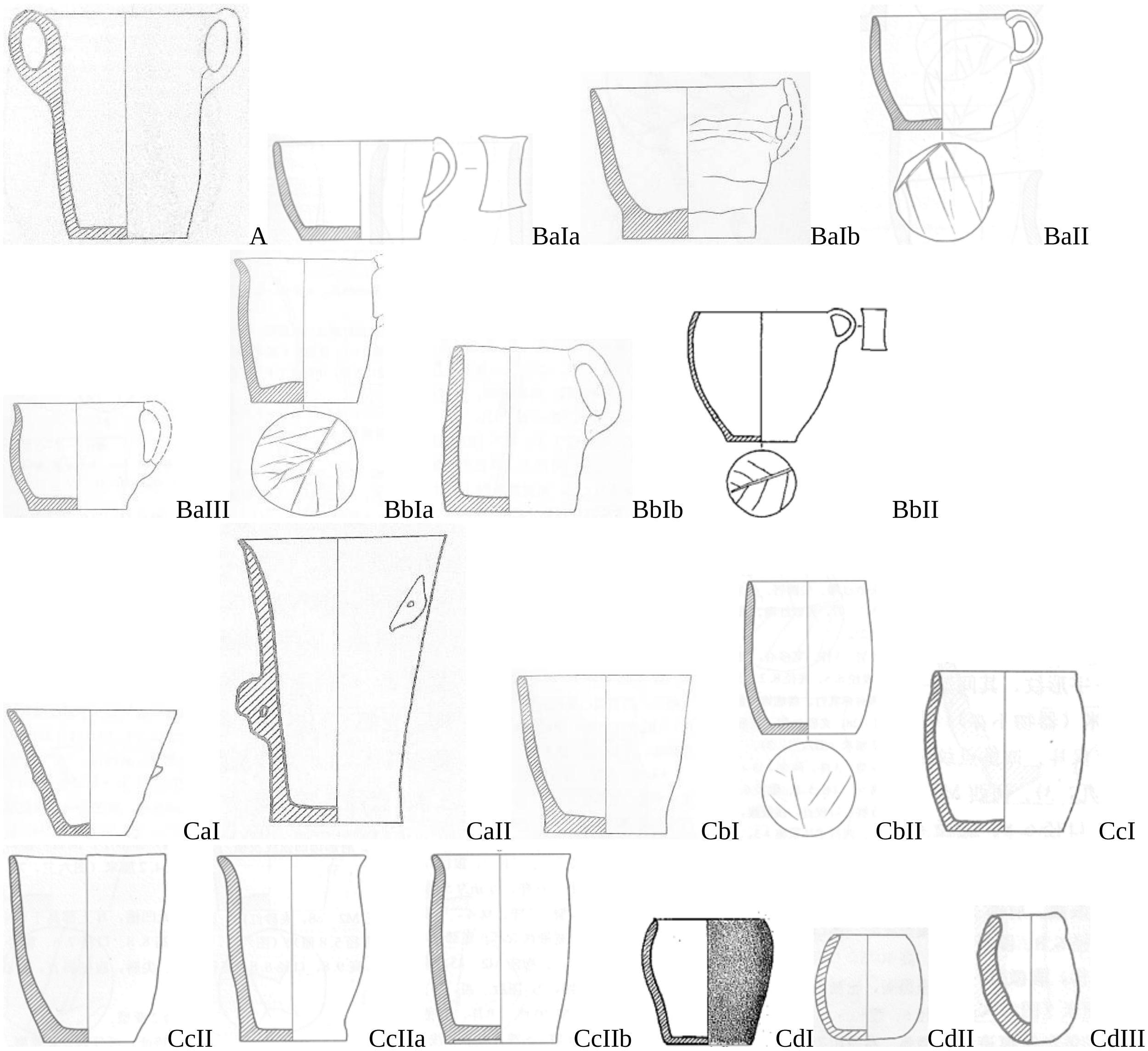


Figure 3.22: *Bei* Cup Types: Top Row: MWQM2.43, M2.129, M2.108, M2.44; Second Row: MWQM2.65, M1.69, M1.108 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 64.2-5, 64.9, 65.1-2), HFJM140.2 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 12.10); Third Row: XLKM6.8, XXM6.37, MWQM2.5, MWQM2.120; Bottom Row: MWQM1.60, M1.97, M2.70 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 65.4, 65.7, 65.3, 65.10, 62.9, 63.2, 62.10), XLZBM5.7 (Lizhou Yizhi 1980a: Figure 8.3), MSKM1.1, XXHM1.1 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 65.12, 65.11).

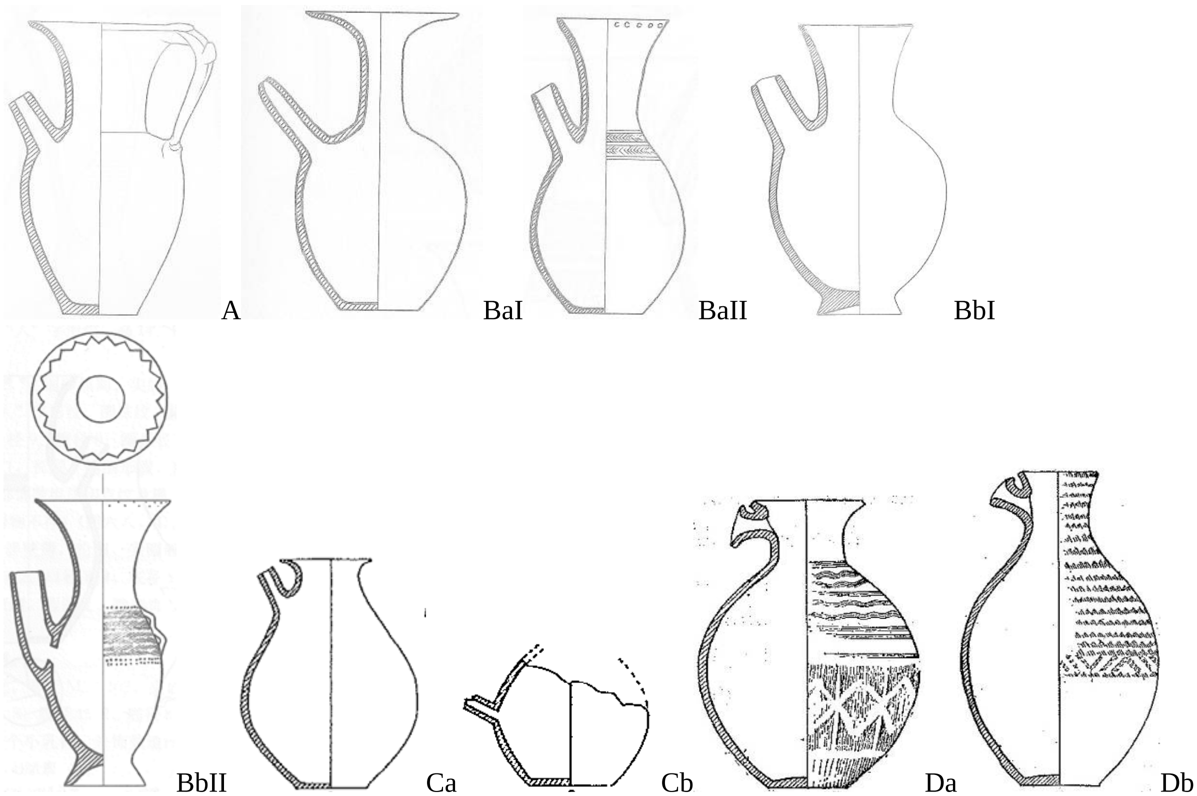


Figure 3.23: *Hu* Ewer Types: Top Row: MWQM1.61, XXJM1.5, XBBM6.27; Bottom Row: PXAM1.9,XLKM6.2 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 67.2, 67.4, 67.6, 68.1, 68.4), HFJM148.2, M26.2 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 12.2, 12.5), XLZAM10.107, M10.103 (Lizhou Yizhi 1980a: Figure 10.11-12).

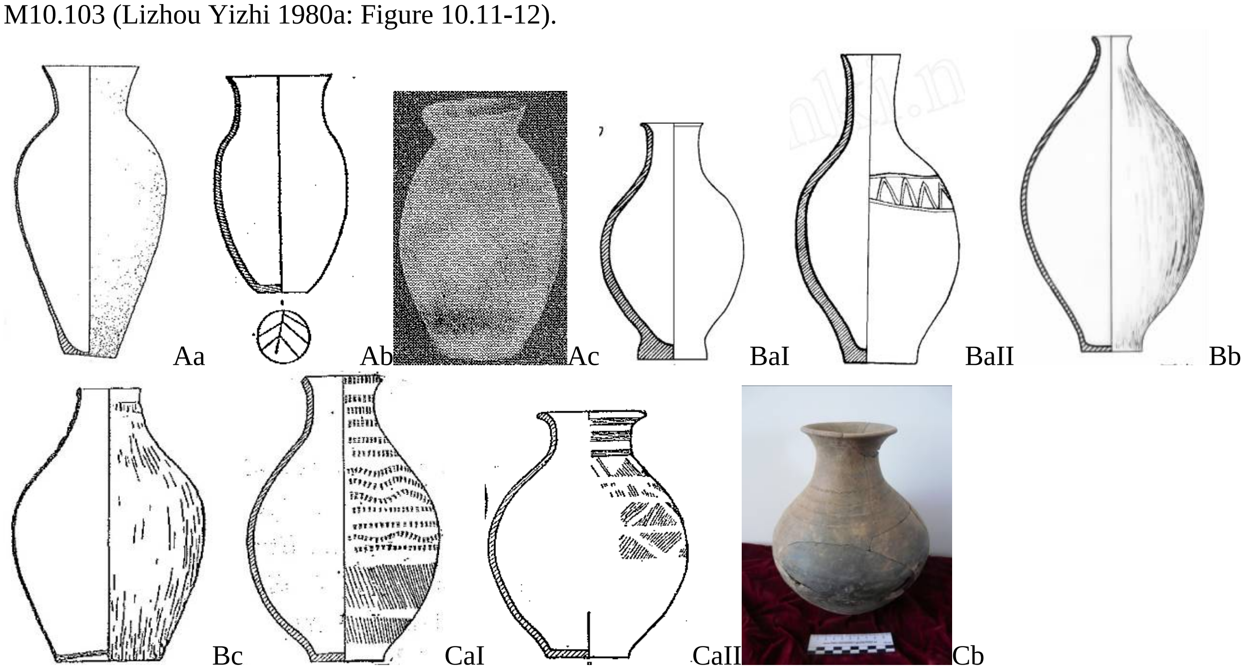


Figure 3.24: *Ping* Vase Types I: Top Row: HXPM13.1 (Kunmingshi et al. 2007: Figure 18.4), NDXM5.19 (Yunnansheng Bowuguan 1983: Figure 6.15), XHTM10.2 (Liangshan Yizu 1984: Figure 4.7), ZJPM3.2, M4.2 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 11.5, 11.7), HXSM21.1 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 7); Bottom Row: HXPM20.1 (Kunmingshi et al. 2007: Figure 18.3), XLZAM10.99, M10.102 (Lizhou Yizhi 1980a: Figure 10.6, 10.8), YDZM85.1 (Photo by Author).

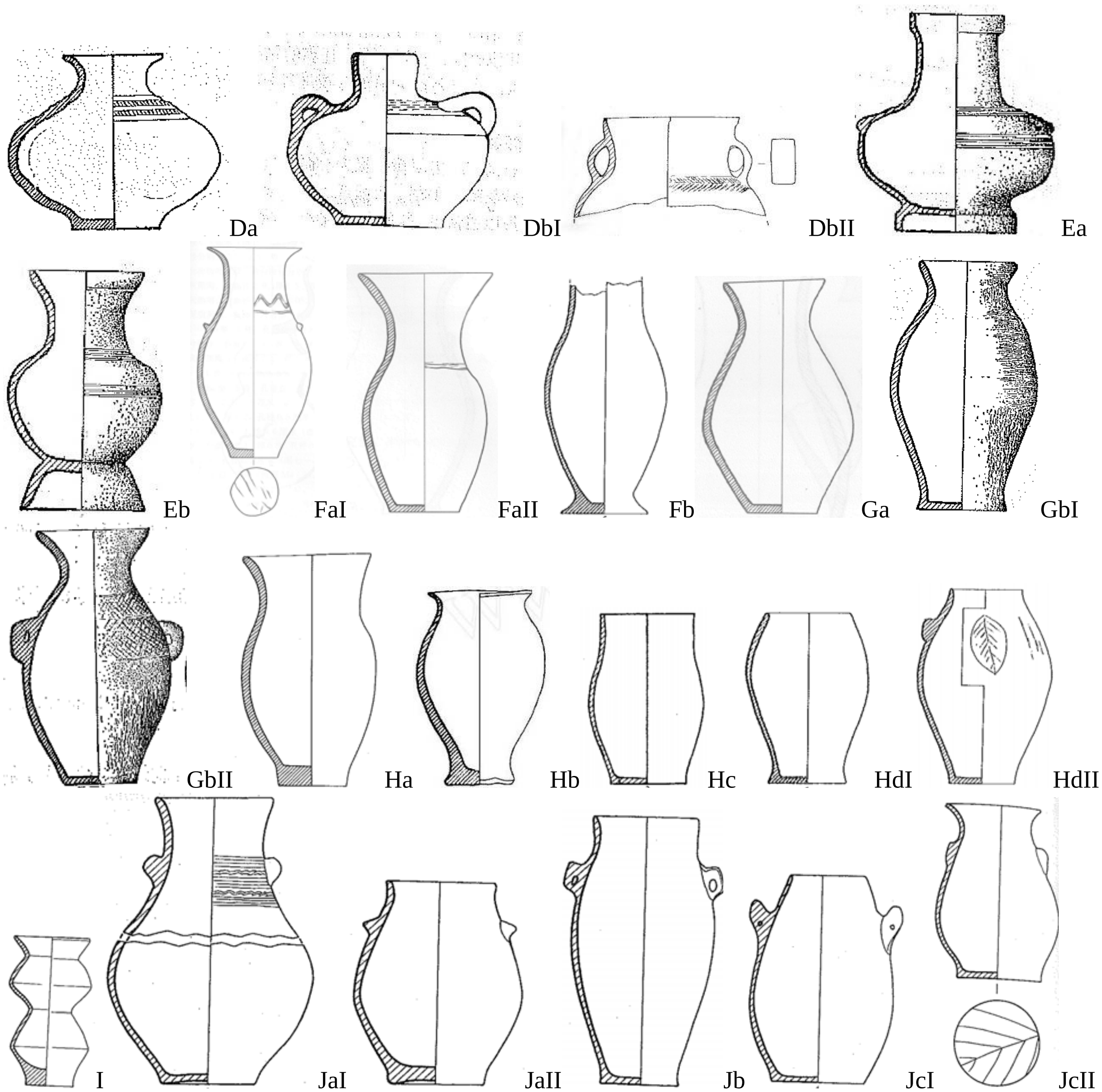


Figure 3.25: *Ping* Vase Types II: Top Row: XYGM1.4 (Liu Shixu 1981: Figure 1.5), XYWM1.1 (Dukoushi Wenwu 1986: Figure 3), XMI4.15 (Liangshan, Chengdu, and Xichang 2005: Figure 9.1), XLZHM2.4; Second Row: XLZHM3.5 (Lizhou Yizhi 1980b: Figure 7.6, 7.4), MWQM1.6, M2.103 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure Figure 68.4, 68.3), LYAM1.1 (Kunmingshi et al. 2007: Figure 8.5), XGSM1.3 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 70.4), XLZBM5.5; Third Row: XLZBM2.23 (Lizhou Yizhi 1980a: Figure 8.9, 10.1), YGJC541 (Liangshan and Chengdu 2009: Figure 39.6), ZJPM2.1 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 11.3), HFJM138.1 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 12.3); Fourth Row: LYAM1.1, AM8.1 (Kunmingshi et al. 2007: Figure 8.1-2); Bottom Row: HLJM1.14, M1.10, M1.82, M1.1, M1.36, M1.97 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure Figure 9.9, 6.1, 6.5, 6.2, 6.4, 6.3).

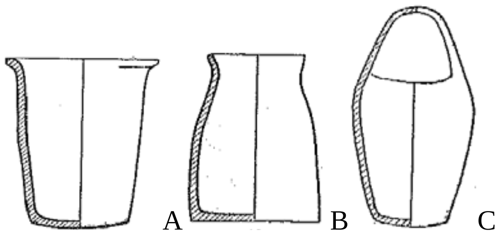


Figure 3.26: *Zun* Vat Types: XLZAM7.51, AM11.170, AM11.25 (Lizhou Yizhi 1980a: Figure 9.9, 9.10, 9.12).

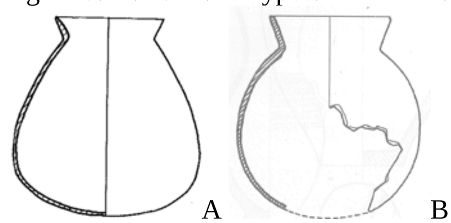


Figure 3.27: *Fu* Pot Types: XMSM1.3 (Chengdu, Liangshan, and Xichangshi 2007: Figure 6.3), XLKM1.5 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 70.8).

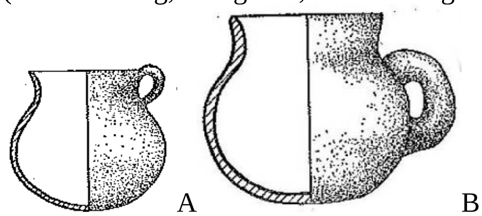


Figure 3.28: *Mou* Cauldron Types: XLZHM3.8, M1.57 (Lizhou Yizhi 1980b: Figure 6.4, 6.6)

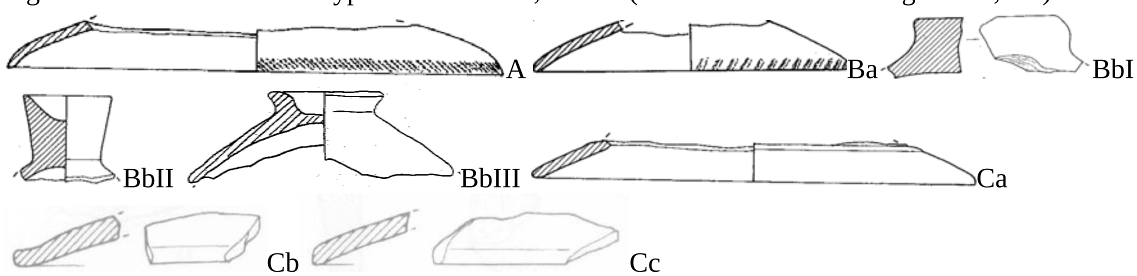


Figure 3.29: Lid Types: Top Row: XHS3.73 (Chengdu, Liangshan, and Xichangshi 2006: Figure 15.9), DWP3.9 (Chengdushi, Liangshanzhou, and Dechangxian 2009: Figure 10.8); Second Row: DDP2.17 (Chengdu, Liangshanzhou, and Dechangxian 2011: Figure 22.5), XMI3.38 (Liangshan, Chengdu, and Xichangshi 2006: Figure 10.6), MGP3.31 (Drawing by Author), XHS3.72 (Chengdu, Liangshan, and Xichangshi 2006: Figure 15.12), DMK4.6, DMK4.5 (Sichuansheng and Liangshan 2007: Figure 9.4-5).

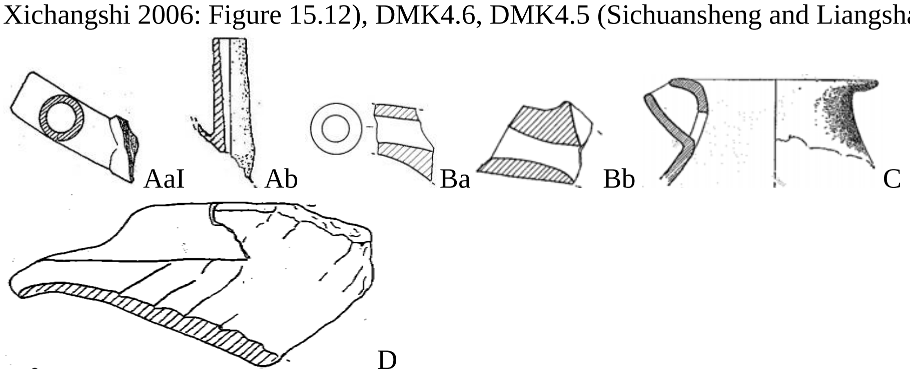


Figure 3.30: Spout Types: XQG3.31 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 14.10), XHS0.15 (Xichangshi Wenwu 1998: Figure 4.7), XMS5.3 (Chengdu, Liangshan, and Xichangshi 2007: Figure 21.3), XHS4.32 (Chengdu, Liangshan, and Xichangshi 2006: Figure 9.3), XLZ1.1 (Lizhou Yizhi 1980a: Figure 8.8), MGP3.57, 59, 60, 61 (Drawing by Author).

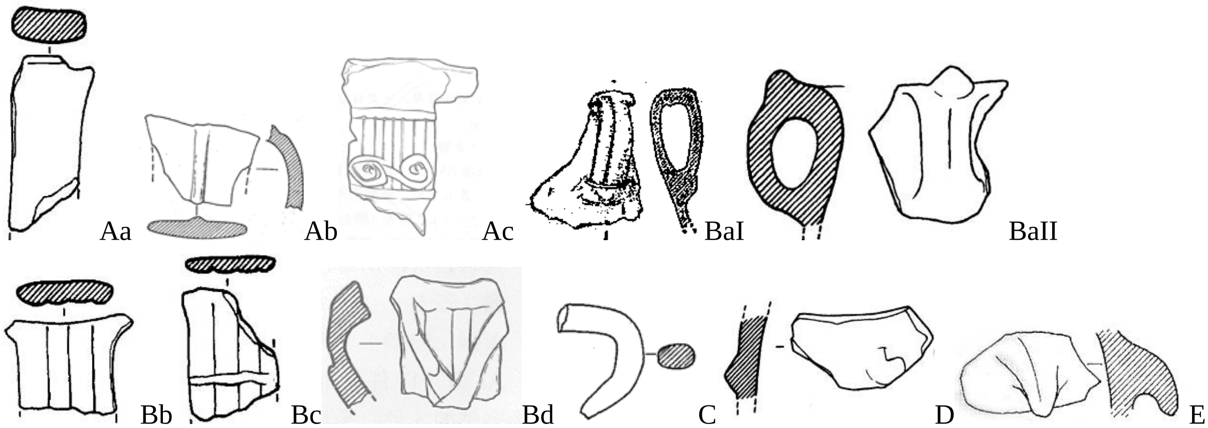


Figure 3.31: Handle Types: Top Row: MST5.3 (Liangshan and Mianningxian 2006: Figure 4.4), HDJH2.9 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 7.8), DARM3.11 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure76.19), XYJM2.16 (Liangshan Yizu 1983: Figure 3.5), DWT3.6 (Sichuansheng and Liangshan 2006: Figure 8.1); Second Row: MST6.2, MST6.1 (Liangshan and Mianningxian 2006: Figure 4.6, 4.5), DARM1.29 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 76.21), XQGM1.27 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 7.9), DWT3.31 (Sichuansheng and Liangshan 2006: Figure 9.6), HDJ5.14 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 13.18).

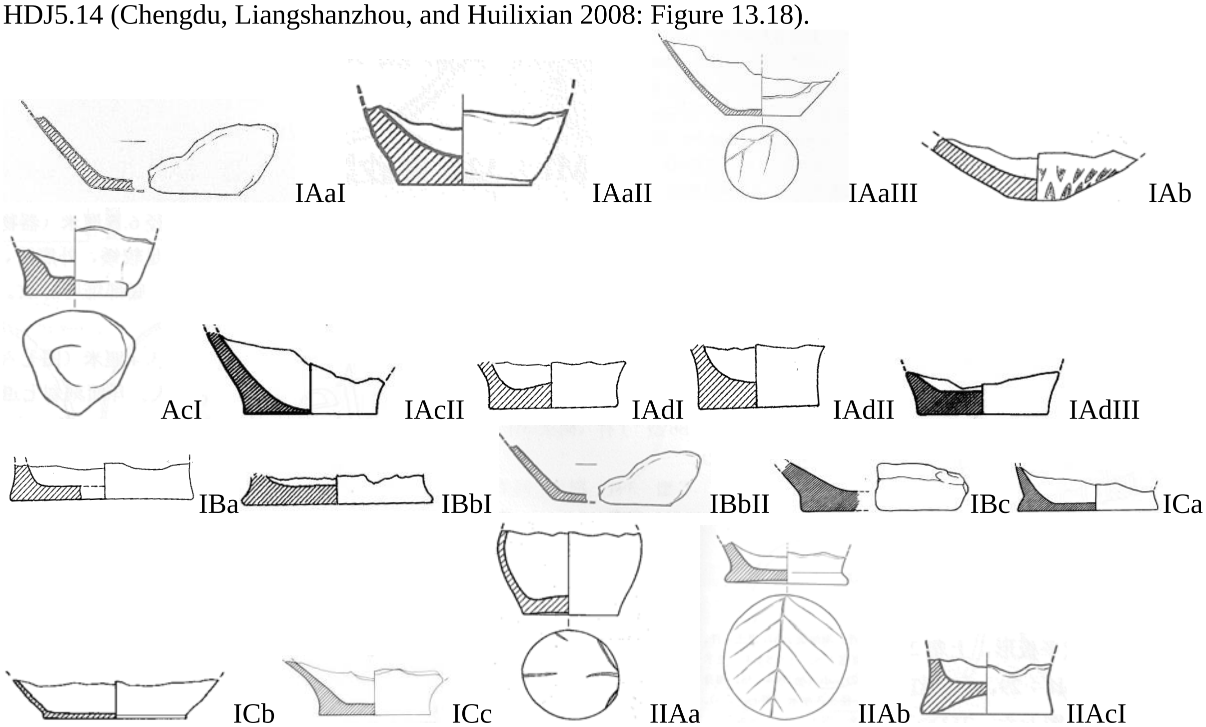


Figure 3.32: Vessel Bottom Types I: Top Row: XWNM1.23, XWNM1.7, DARM1.26 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 76.6, 76.5, 76.10), DWP3.19 (Chengdushi, Liangshanzhou, and Dechangxian 2009: Figure 11.10): Second Row: DARM3.12 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 76.7), DWTH2.3 (Sichuansheng and Liangshan 2006: Figure 10.6), HDJH2.4, H2.5 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 7.4-5), DWTH2.2 (Sichuansheng and Liangshan 2006: Figure 11.2); Third Row: DWP3.16 (Sichuansheng and Liangshan 2006: Figure 11.7), XQG3.40 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 14.9), XWNM1.9 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 76.16), DWTH2.1, DWT3.57 (Sichuansheng and Liangshan 2006: Figure 10.7-8); Bottom Row: XHSH3.17 (Chengdu, Liangshan, and Xichangshi 2006: Figure 13.5), HZD0.12 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 5.10), XQGM1.21 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 6.10), DARM3.17, DARM4.24 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 76.18, 76.11).

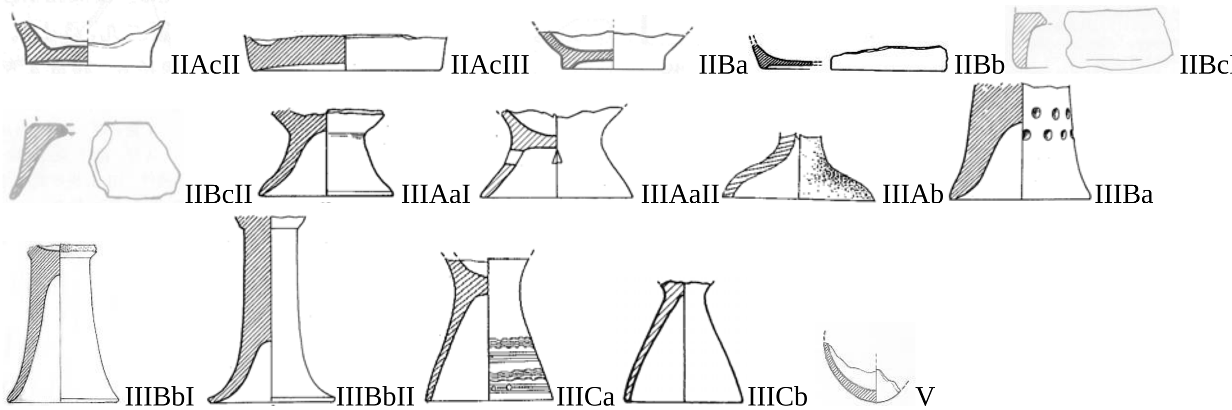


Figure 3.33: Vessel Bottom Types II: Top: DARM1.31 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 76.12), HDJ5.16 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 13.14), XYUM1.5 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 76.14), DWT3.20 (Sichuansheng and Liangshan 2006: Figure 10.4), DMK4.3; Second Row: DMK4.2 (Chengdu, Liangshan, and Xichangshi 2007: Figure 10.20, 10.11), XQGM2.2 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 9.13), XYPW11.2 (Chengdu, Liangshan, and Xichangshi 2007: Figure 16.3), XHS0.17 (Xichangshi Wenwu 1998: Figure 4.13), XQGM1.17; Bottom: XQGM1.16, M1.22 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 7.6, 7.4, 7.7), HLJM1.69 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 13.5), XYPW5.1 (Chengdu, Liangshan, and Xichangshi 2007: 10.3), XWNM1.22 (Sichuansheng, Liangshan, and Xichangshi 2006a: 76.17).

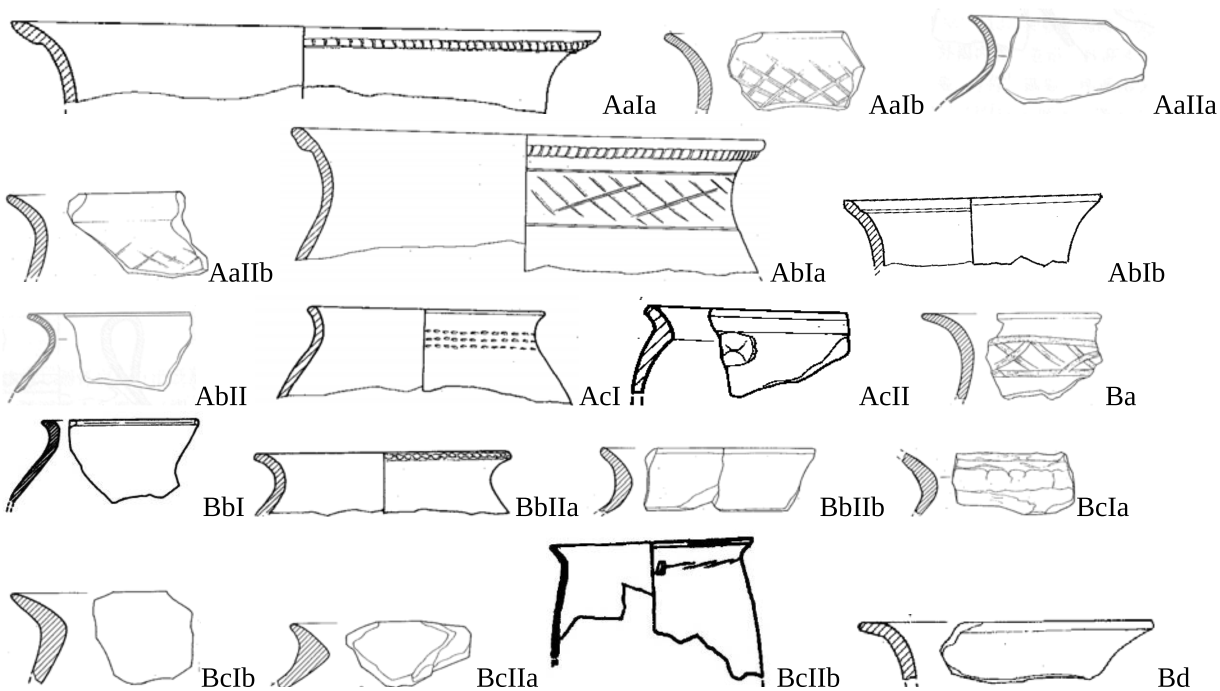


Figure 3.34: Rim Types I: Top: XHS4.1 (Xichangshi Wenwu 1998: Figure 8.5), DDP2.7 (Zhou Zhiqing 2011: Figure 22.6), DARM1.16 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 73.11); Second Row: DDP2.5 (Zhou Zhiqing 2011: Figure 22.1), XHS3.30 (Chengdu, Liangshan, and Xichangshi 2006: Figure 14.14), HDJM2.1 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 7.1); Third Row: DARM1.15 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 74.3), XHS1.16 (Xichangshi Wenwu 1998: Figure 17.8), MZJ2.10 (CKF 2009: 4.3), DDP3.20 (Zhou Zhiqing 2011: Figure 16.6); Fourth Row: DWT3.12 (Sichuansheng and Liangshan 2006: 9.1), HDJ5.2 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 13.7), DDP3.10, DDPH4.5; Bottom: DDPH3.4, DDP2.14 (Zhou Zhiqing 2011: 15.3, 14.2, 13.6, 22.8), XQG3A22 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 6.4), DDP3.12 (Zhou Zhiqing 2011: Figure 16.3).

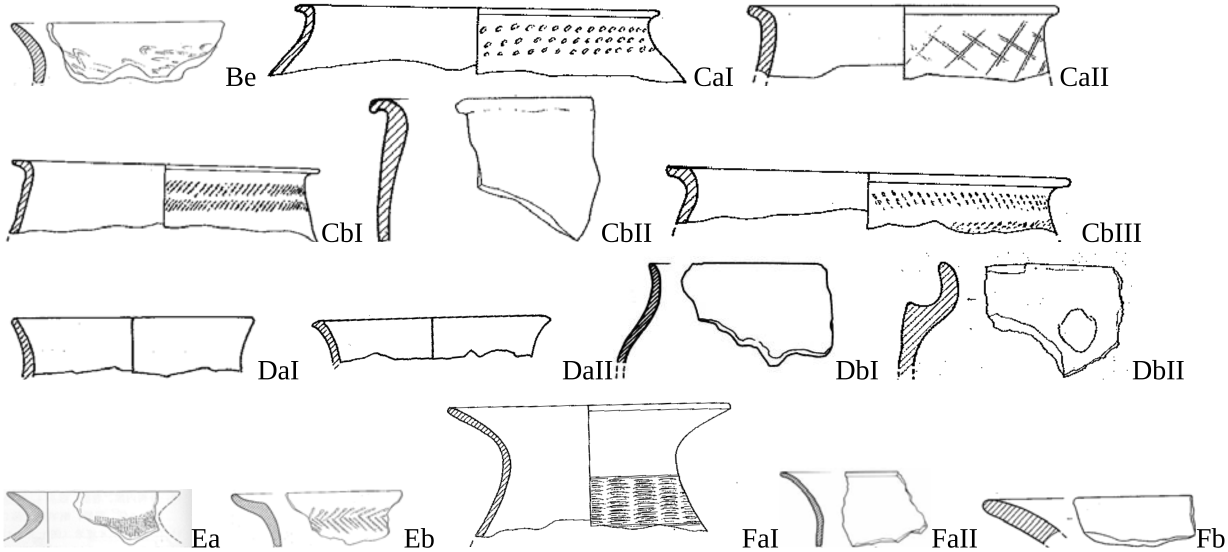


Figure 3.35: Rim Types II: Top Row: XHS3.54, XHS3.42 (Chengdu, Liangshan, and Xichangshi 2006: Figure 15.3, 15.4), DWPH1.1 (Chengdushi, Liangshanzhou, and Dechangxian 2009: Figure 5.1); Second Row: XHS3.59 (Chengdu, Liangshan, and Xichangshi 2006: Figure 15.4), DDP1.2 (Zhou Zhiqing 2011: Figure 24.5), XHS3.60 (Chengdu, Liangshan, and Xichangshi 2006: Figure 15.6); Third Row: HDJH5.6, HDJM3.2 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 13.3, 8.4), DWT3.13 (Sichuansheng and Liangshan 2006: Figure 9.2), XWD0.7 (Wang Hengjie 1979: Figure 2.8); Bottom Row: XGSM1.16 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 75.9), DDP1.3 (Zhou Zhiqing 2011: Figure 24.1), XHSH3.10 (Chengdu, Liangshan, and Xichangshi 2006: Figure 12.5), HZD0.1 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 5.1), DWP3.3 (Chengdushi, Liangshanzhou, and Dechangxian 2009: Figure 10.6).

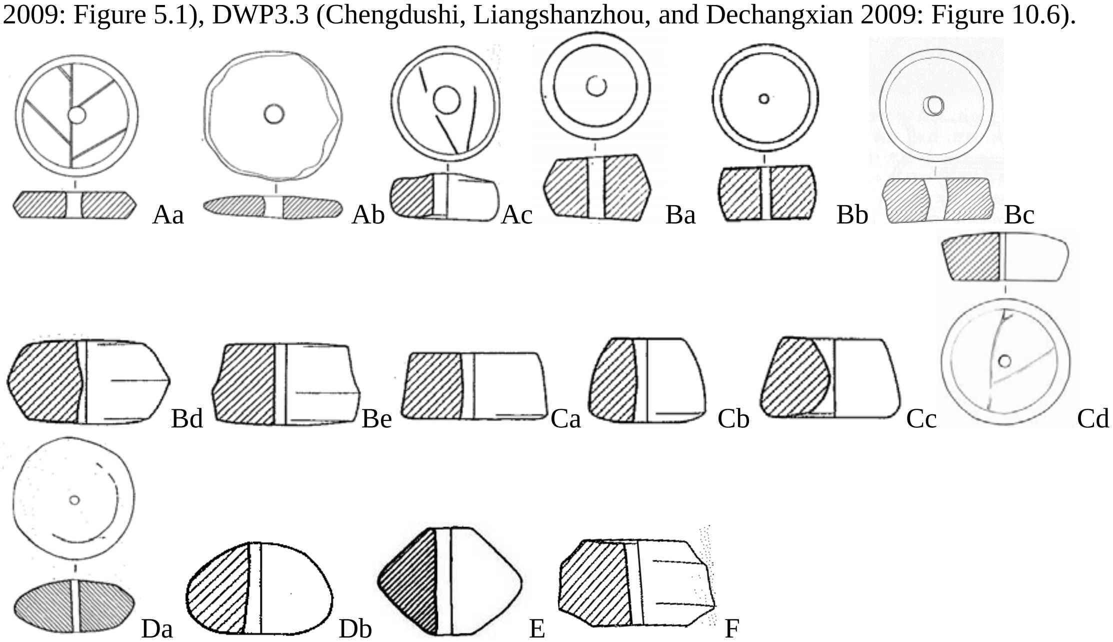


Figure 3.36: Spindle Whorl Types: Top Row: XMI5.13, XMI3.30 (Liangshan Yizu et al. 2006: Figure 8.6, 10.16), HLJM1.28 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 15.14), HFJM42.3, M37.7 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 13.14, 13.11), MST0.9 (Liangshan, and Xichangshi 2006a: Figure 72.2); Second Row: HLJM1.108, M1:33, M1;73, M1.117, M1.49 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 15.1, 15.7, 15.20-15.22), HWTM4.5 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 11.1); Bottom Row: XHGM4.8 (Xichang Diqu 1978: Figure 6.6), HLJM1.26 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 15.19), MST0.2 (Liangshan and Mianningxian 20062006: Figure 6.2), HLJM1.91 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 15.8).

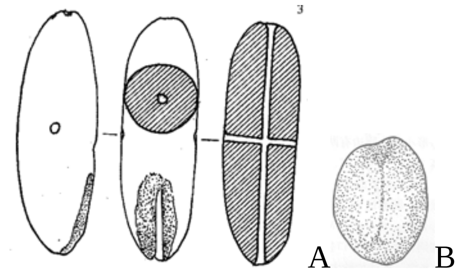


Figure 3.37: Ceramic Net Weight Types: XQG3.30 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 14.5), XBBM6.8 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 66.9).

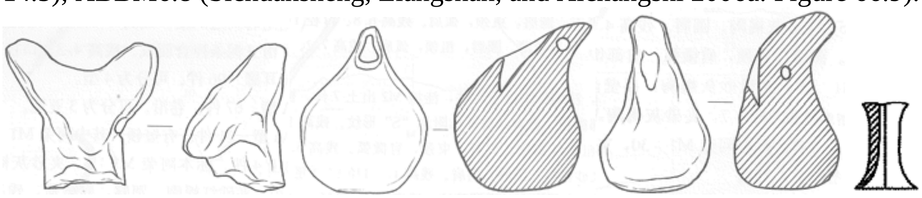


Figure 3.38: Ram's-Head Shaped Object (XYGM2.8), Drop-Shaped Pendants (XYGM2.5, 4) (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 72.3-5), Glazed Ear Pendant (ZCBM6.2) (Liangshan, Sichuan, and Zhaojuexian 2011: Figure 8.3).

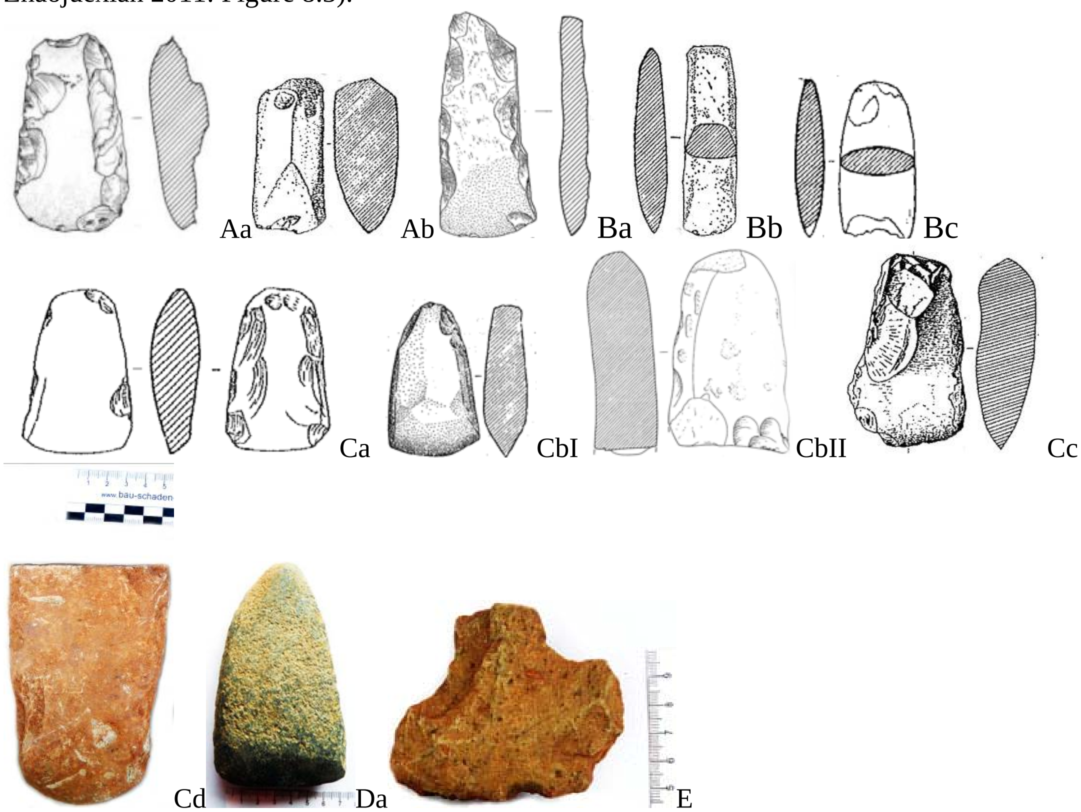


Figure 3.39: Axe Types: Top Row: HDZ0.25 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 3.2), PWL0.6 (Liangshan and Pugexian 1983: Figure 2.3), DDP0.5 (Zhou Zhiqing 2011: Figure 27.3), PTB0.4 (Liangshan and Pugexian 1982: Figure 5.3), XWD0.12 (Wang Hengjie 1979: Figure 1.5); Second Row: HXPM6.1 (Kunmingshi et al. 2007: Figure 2.3), ZEKM4.3 (Liangshan Yizu 1981: Figure 6.4), HLJM1.47 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 16.2), XHS0.32 (Xichangshi Wenwu 1998: Figure 2.4); Bottom Row: HFJ0.38 (Photo by Author), PTB0.7 (Photo by Author), HLT0.20 (Photo by Author).

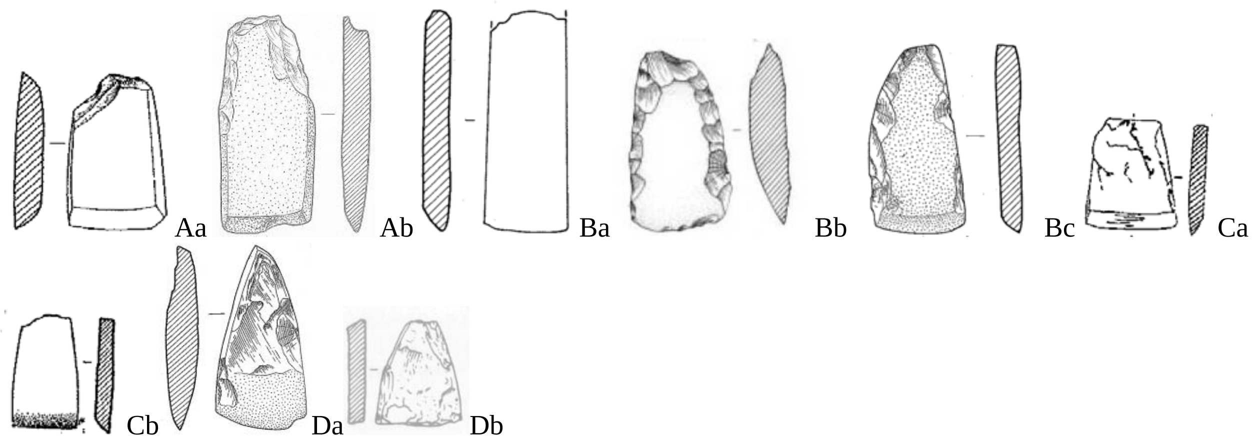


Figure 3.40: Adze Types: Top Row: XHS4.33 (Chengdu, Liangshan, and Xichangshi 2006: Figure 10.1), MWQM1.116 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 93.12),XMSH3.4 (Chengdu, Liangshan, and Xichangshi 2007: Figure 24.4), HZD0.34 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 3.4), DDP3.63 (Zhou Zhiqing 2011: Figure 24.4); Bottom Row: XHS0.38 (Xichangshi Wenwu 1998: Figure 3.3),ZFQM2.1 (Liangshan Yizu 1981: Figure 6.3), DWP3.21 (Chengdushi, Liangshanzhou, and Dechangxian 2009: Figure 13.2), DMK1.7 (Sichuansheng and Liangshan 2007: Figure 8.7).

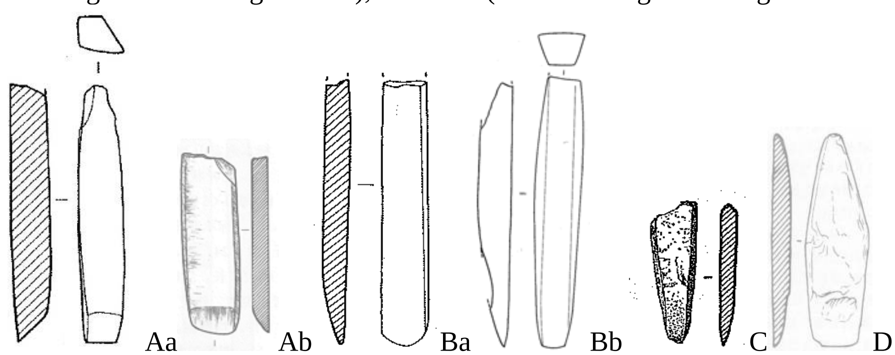


Figure 3.41: Chisel Types: XMS8.13 (Chengdu, Liangshan, and Xichangshi 2007: Figure 18.2), XLKM8.75 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 93.13), XHS4.36 (Chengdu, Liangshan, and Xichangshi 2006b: Figure 10.5), XMS7.20 (Chengdu, Liangshan, and Xichangshi 2007: Figure 20.1), XLZ1.68 (Lizhou Yizhi 1980a: Figure 7.8), DMK4.13 (Sichuansheng and Liangshan 2007: Figure 7.11).

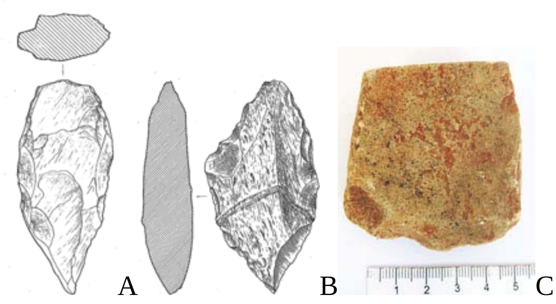


Figure 3.42: Plow Types: DDP1.11 (Zhou Zhiqing 2011: Figure 25.2), DWP3.20 (Chengdushi, Liangshanzhou, and Dechangxian 2009: Figure 12); Potential Shovel (HJ0.6, Photo by Author).

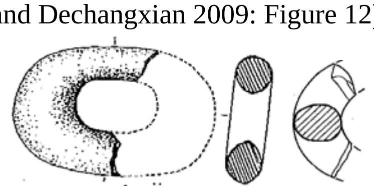


Figure 3.43: Ring Stone (XHS0.40, Xichangshi Wenwu 1998: Figure 2.1), Potential Ring Stone (XLZ1.73, Lizhou Yizhi 1980a: Figure 7.10).

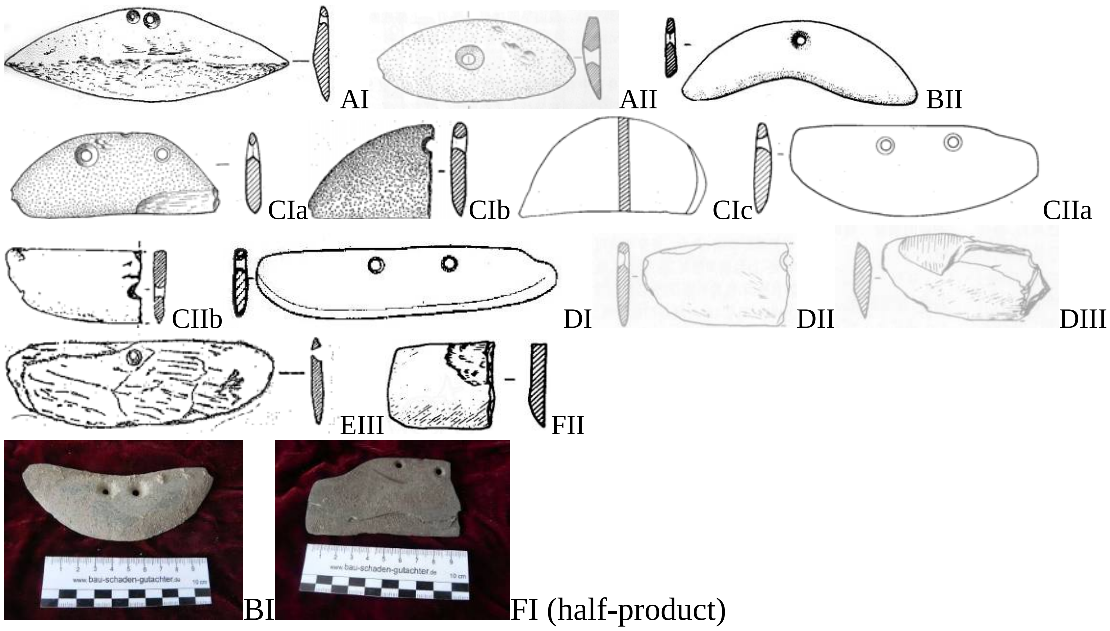


Figure 3.44: Stone Knife Types: Top Row: XQGM2.1 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 9.14), XXHM1.22 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 93.1), MST0.6 (Liangshan and Mianningxian 2006: Figure 6.6), Second Row: DDP3.58 (Zhou Zhiqing 2011: Figure 7), XLZ1.21 (Lizhou Yizhi 1980a: Figure 7.3), YLM11.10 (Liangshan and Chengdu 2009: Figure 23), XMSH3.4 (Chengdu, Liangshan, and Xichangshi 2007: Figure 24.5); Third Row: XHS0.36 (Xichangshi Wenwu 1998: Figure 3.6), XYP5.14 (Chengdu, Liangshan, and Xichangshi 2007: Figure 6.6), DMK0.14, DMK0.15 (Sichuansheng and Liangshan 2007: Figure 7.12, 7.15); Fourth Row: XYG0.7 (Liu Shixu 1981: Figure 1.4), DWTH3.1 (Sichuansheng and Liangshan 2006: Figure 12.4); Bottom Row: YDZ3.16, YDZ2.6 (Photos by Author).

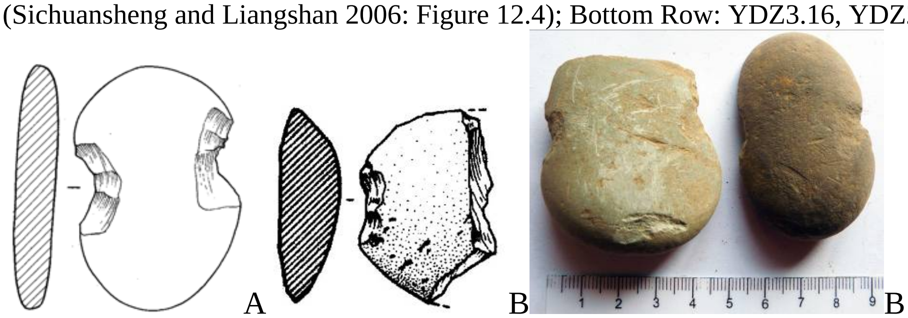


Figure 3.45: Net Weight Types: XYPW12 (Chengdu, Liangshan, and Xichang 2007: Figure 17), XQG0.1 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 9.1), PLK0.4-5 (Photo by Author).

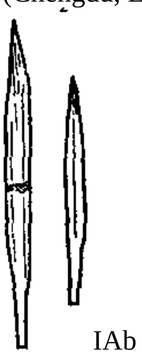


Figure 3.46: Arrowhead Types II (Wood): NDXM5.7.1-2 (Yunnansheng Bowuguan 1983: Figure 4.4),

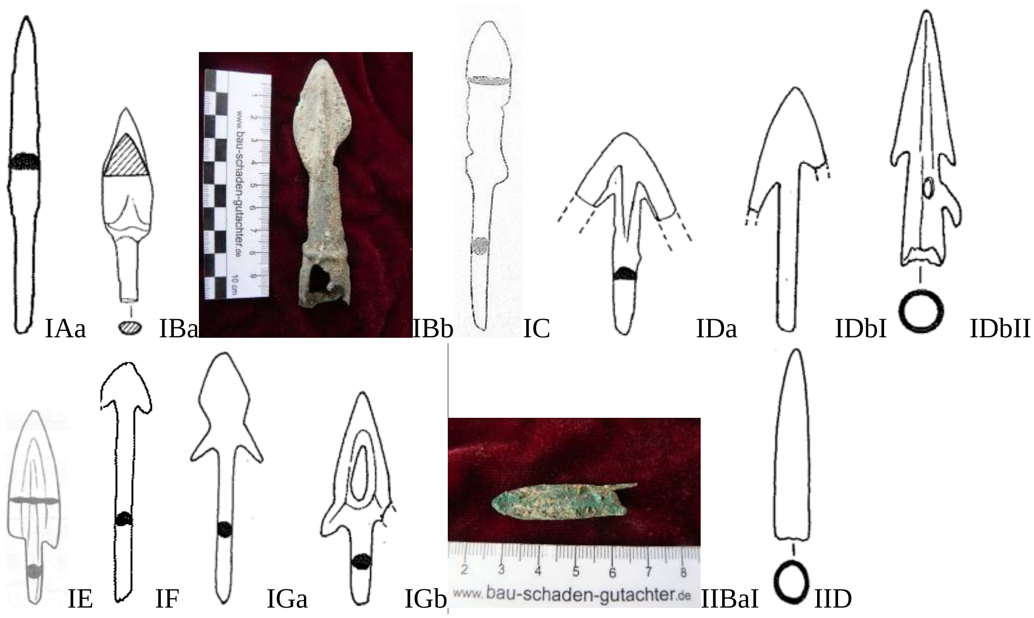


Figure 3.47: Arrowhead Types I (Metal): Top Row: YLLM6.52 (Liangshan and Chengdu 2009: Figure 16.5), HGJC48 (Chengdu Wenwu et al. 2010: Figure 11.5), YDZM77.12 (Photo by Author), PXAM1.5 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 88.2), YLLM6.42, YLLM9.23-2, YGJC637 (Liangshan and Chengdu 2009: Figure 16.1, 19.2, 80.8); Bottom Row: MWQM1.23 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 88.6), YGJC634b, YGJC633 (Liangshan and Chengdu 2009: Figure 80.14, 80.13), YDZM13.2 (Photo by Author), YGJC626 (Liangshan and Chengdu 2009: Figure 80.1).

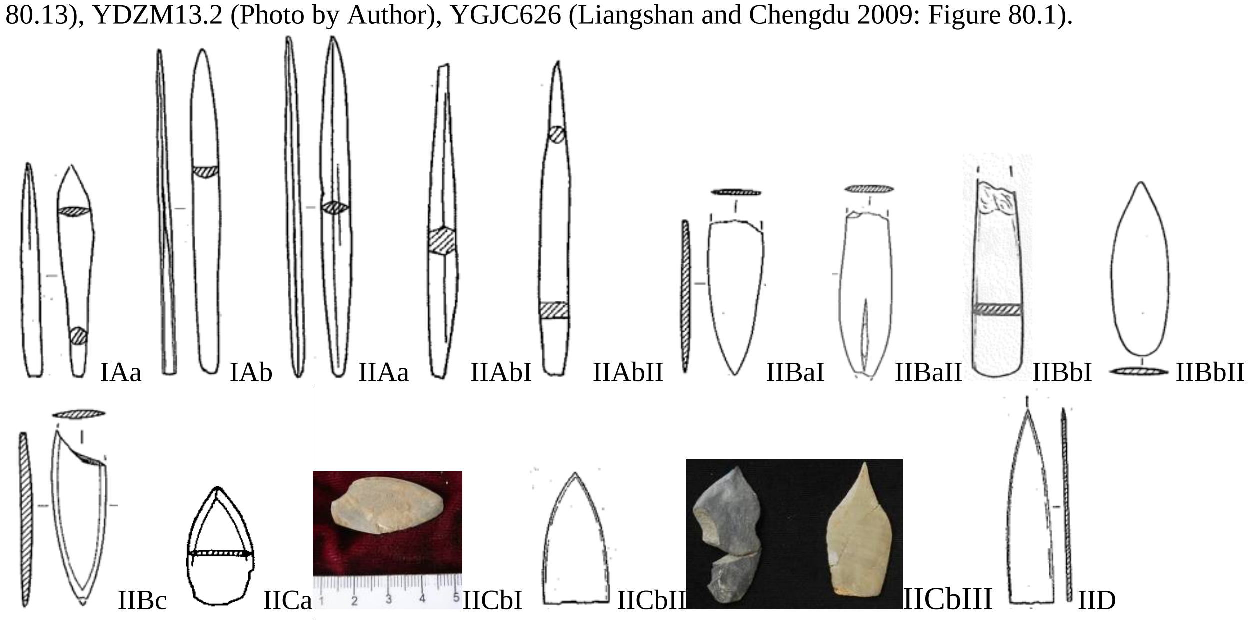


Figure 3.48: Arrowhead Types III (Stone): Top Row: YGJC714, C710, C712, YLLM6.55-15, M6.55-1 (Liangshan and Chengdu 2009: Figure 124.5-6, 124.4, 11.3, 11.2), XMI4.23, XMI3.40 (Liangshan, Chengdu, and Xichangshi 2006: Figure 11.9, 11.8), XYJM3.1 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 93.3), XMSH4.7 (Chengdu, Liangshan, and Xichangshi 2007: Figure 25.7); Second Row: XHS3.78 (Chengdu, Liangshan, and Xichangshi 2006: Figure 16.5), HFJM26.10 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 13.8), YDZM9.1 (Photo by Author), XLKM5.4 (Liangshan Diqu 1978: Figure 5.2), YDZM2.1-2 (Photo by Author), XLKMM1.24 (Liangshan Diqu 1978: Figure 5.1).

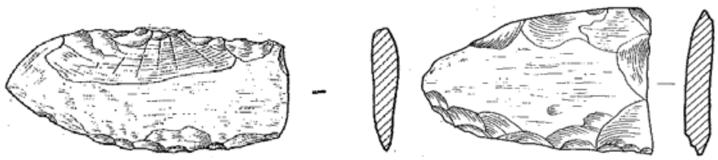


Figure 3.49: Spearheads: DDP4.24, DDP4.25 (Zhou Zhiqing 2011: Figure 7.6-7.7).

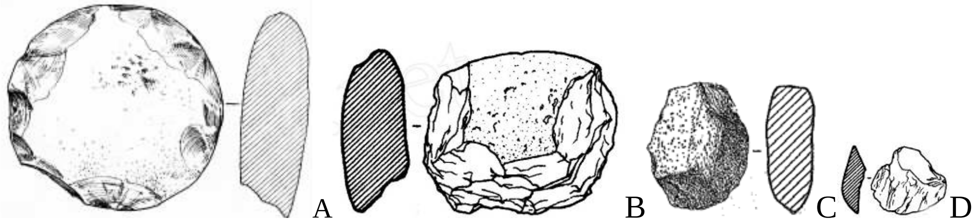


Figure 3.50: Chopper Types: XQG3.6 (Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 17.2), XQG3A108 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 8.7), XLZ1.37 (Lizhou Yizhi 1980a: Figure 7.5), XQG0.2 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 9.2).

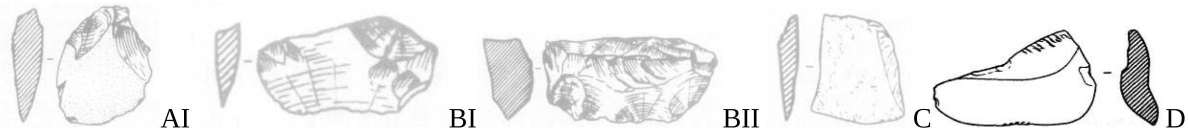


Figure 3.51: Scraper Types: DMK1.1, DMK4.9, DMK0.7, DMK5.15 (Sichuansheng and Liangshan 2007: Figure 6.1, 6.7, 6.9, 6.4), DWT3.3 (Sichuansheng and Liangshan 2006: Figure 12.3).

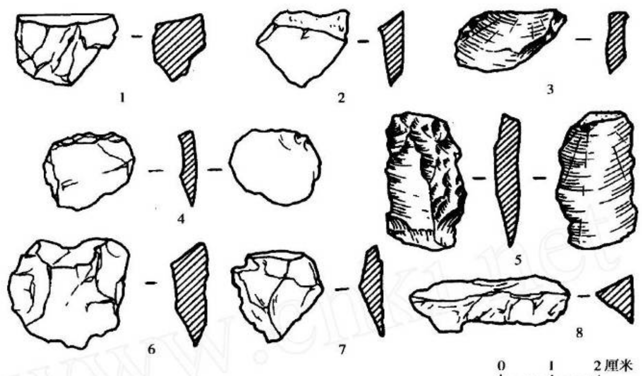


Figure 3.52: Microliths I: DWT3.103-110, Microlithic Core (1-2), Scrapers (3-8) (Sichuansheng and Liangshan 2006: Figure 13).

Figure 3.53: Microliths II: 1. DMK1.3 (Core), 2. DMK3.1 (Scraper), 3. DMK4.8 (Core), 4. DMK0.5 (Scraper) (Sichuansheng and Liangshan 2007: Figure 5); Photo: DWT3 (Photo by Author).

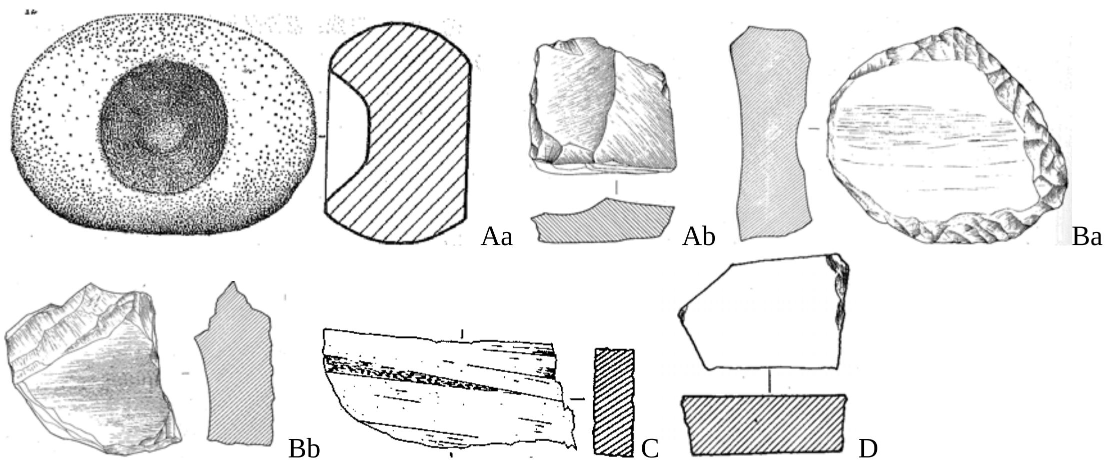


Figure 3.54: Grinding Slab Types I: Top Row: XLZ1.83 (Lizhou Yizhi 1980a: Figure 7.17), DDP0.2 (Zhou Zhiqing 2011: Figure 27.2), XMIH1.4 (Liangshan, Chengdu, and Xichangshi 2006: Figure 6.1); Bottom Row: DDP1.10 (Zhou Zhiqing 2011: Figure 25.1), XHS0.41 (Xichangshi Wenwu 1998: Figure 2.5), HDJ4.6 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 15.6).

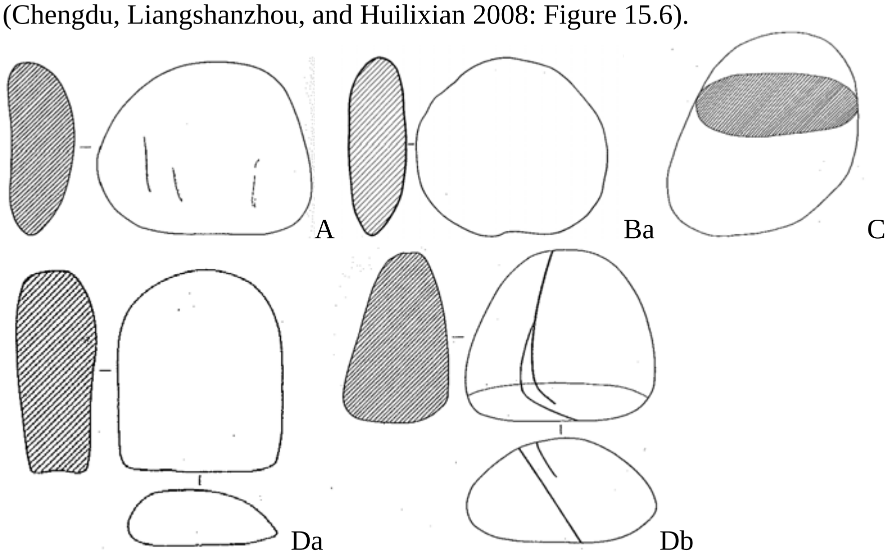


Figure 3.55: Handstone Types: HLJM1.32 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 16.4), XYP5.19 (Chengdu, Liangshan, and Xichangshi 2007: Figure 6.2), YLLM11.22 (Liangshan and Chengdu 2009: Figure 23.7), HLJM1.76, M1.14 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 16.5, 16.1).

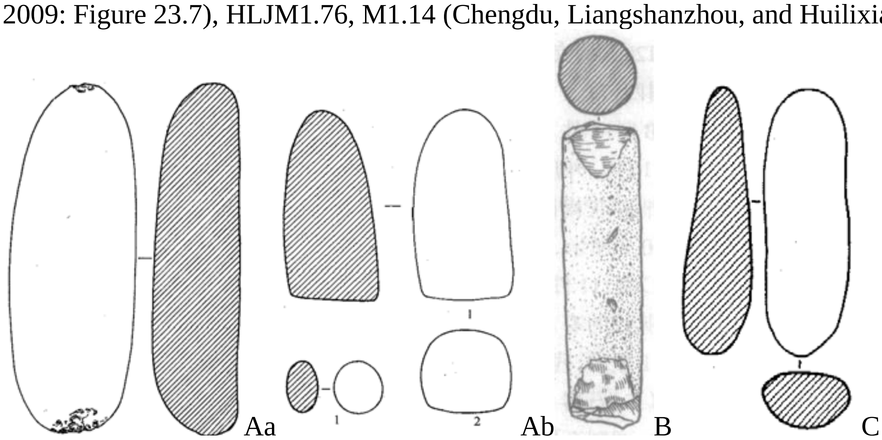


Figure 3.56: Pestle Types: XQG3.46 (Chengdu, Liangshanzhou, and Xichangshi 2008: Figure 15.5), HLJM1.23 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 17.2), MST6.8 (Liangshan and Mianningxian 2006: Figure 5.3), XYP6.15 (Chengdu, Liangshan, and Xichangshi 2007: Figure 4.9).

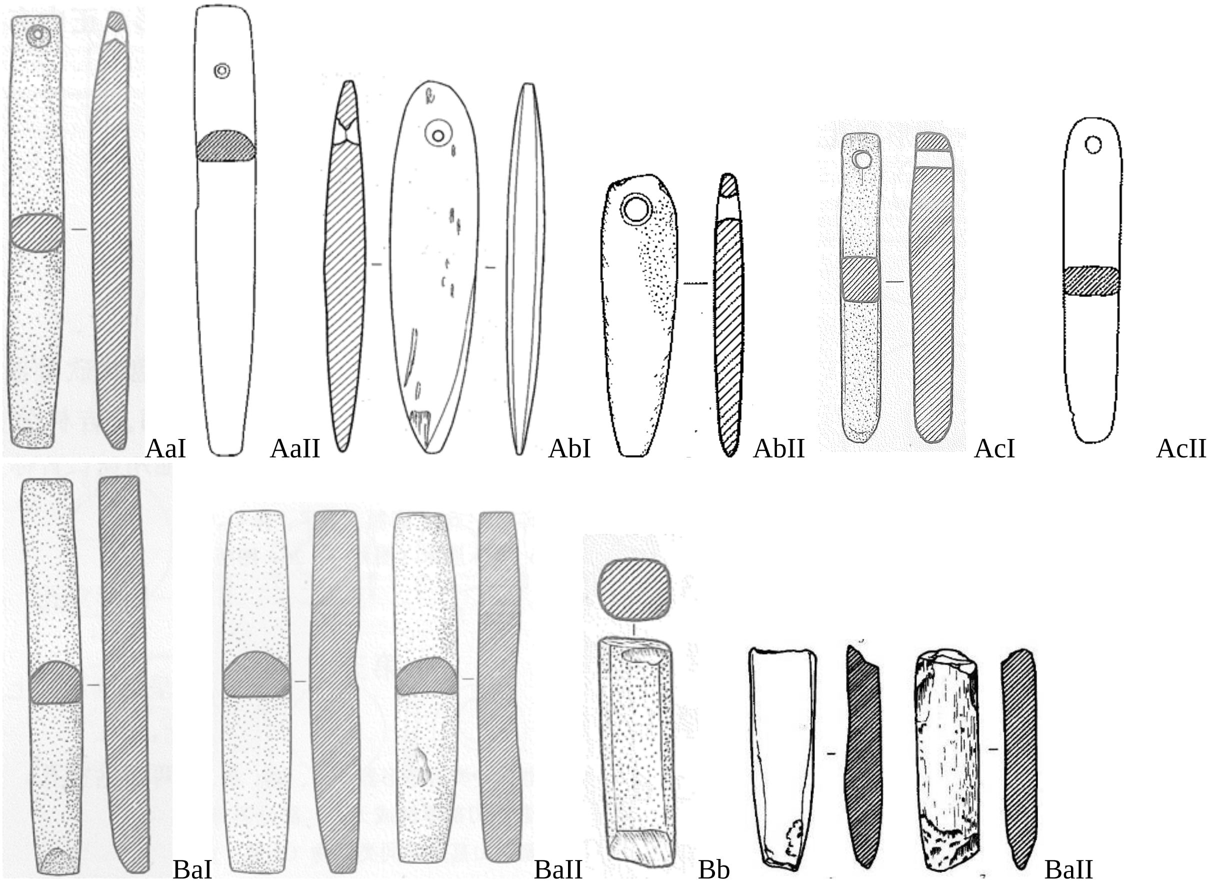


Figure 3.57: Grinding Roller Types: Top Row: PXCBM4.48 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 92.2), YGJC0.342 (Liangshan and Chengdu 2009: Figure 125.1), HLJM1.38 (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 19.1), HML0.3 (Chengdu, Huilixian, and Sichuan 2010: Figure 12.2), XGQM1.27 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 92.4), YGJ0.286 (Liangshan and Chengdu 2009: Figure 126.5); Bottom Row: XHGM2.6, XHGM4.7, M2.21 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 92.7, 92.4-5), DWT3.112-113 (Sichuansheng and Liangshan 2006: Figure 6-7).

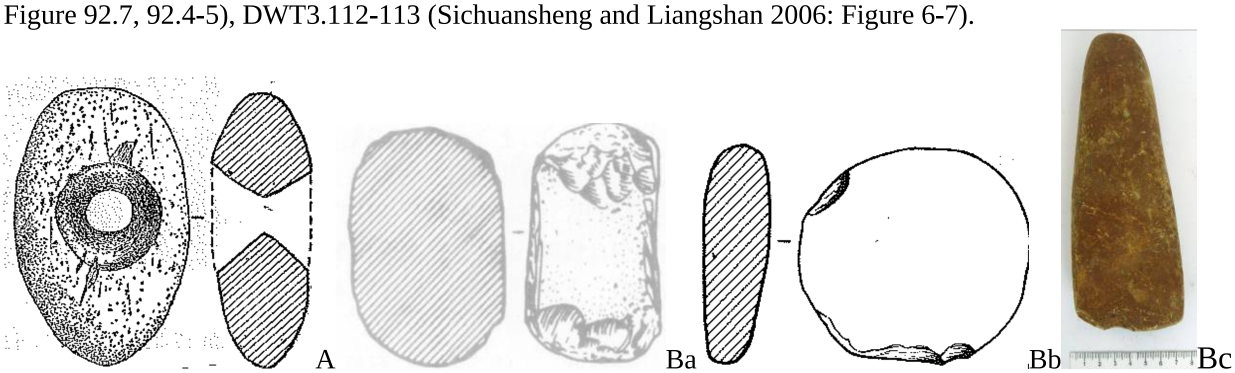


Figure 3.58: Hammer Stone Types: XYG0.10 (Liu Shixu 1981: Figure 1.3), DMK0.9 (Sichuansheng and Liangshan 2007: Figure 6.15), XYP6.16 (Chengdu, Liangshan, and Xichangshi 2007: Figure 4.10), HFJ0.26 (Photo by Author).

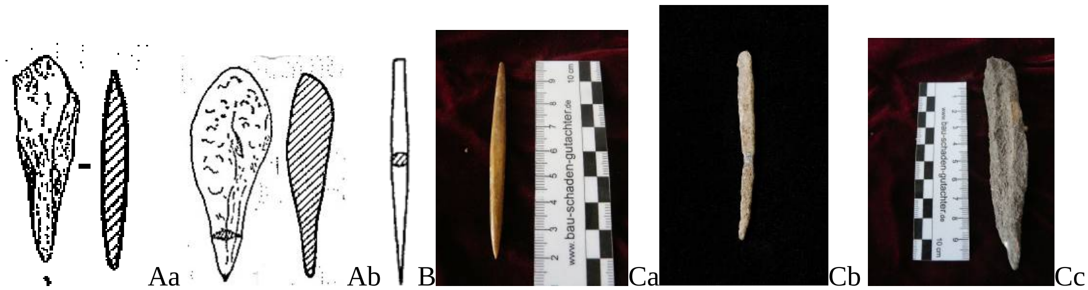


Figure 3.59: Perforation Tool Types: XLZ1.65 (Lizhou Yizhi 1980a: Figure 7.13), YJD0.18 (Sichuan and Sichuan 1984: Figure 1.10), HFJM26.9 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 13.7), YDZ4.1, YDZM11.1, YDZ2.4 (Photos by Author).

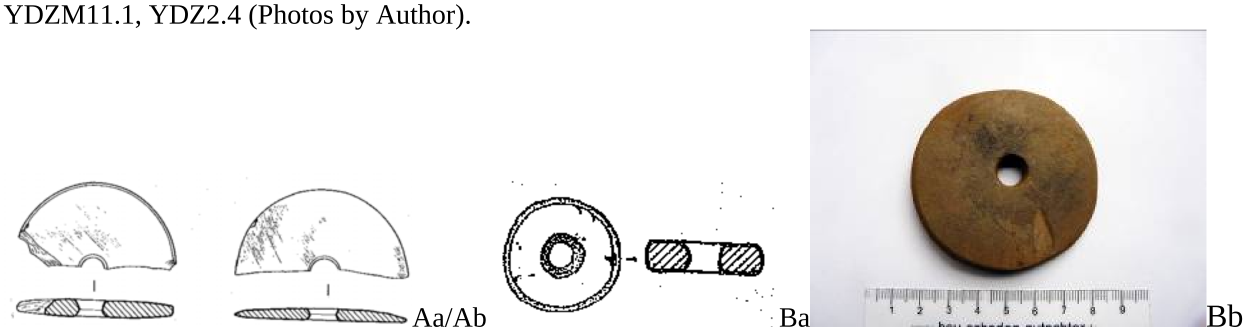


Figure 3.60: Stone Spinde Whorls Types: DDP3.66, DDP3.67 (Zhou Zhiqing 2011: Figure 20.2-20.3), XLZ1.74 (Lizhou Yizhi 1980a: Figure 7.14), DDP3.74 (Photo by Author).

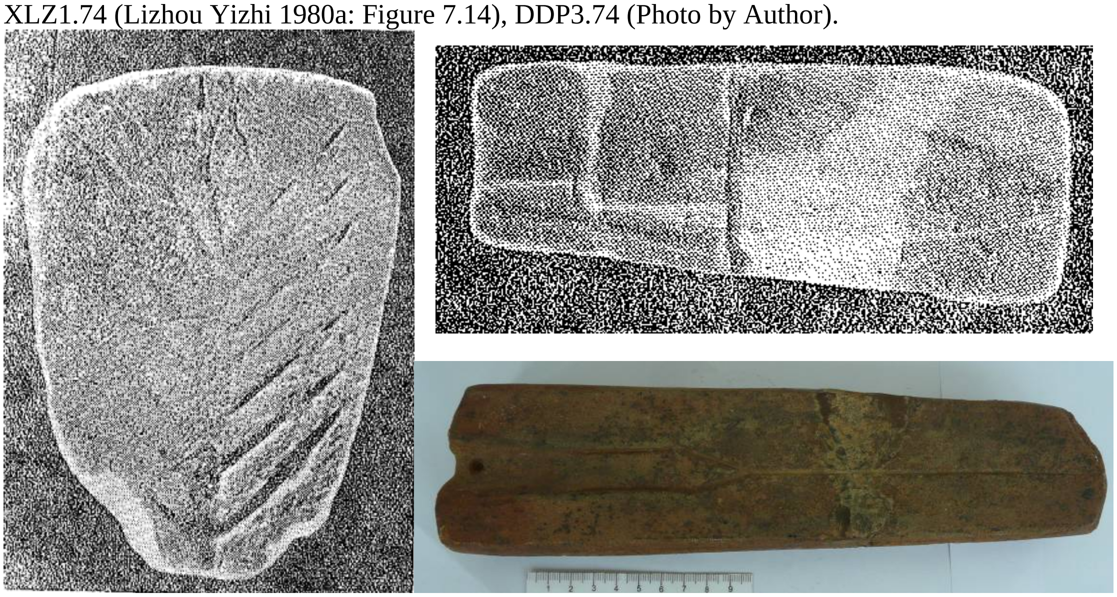


Figure 3.62: Molds for the Production of Metal objects: 14 Arrowheads, *Ge* Dagger-Axe, Dagger (HWT0.4-6) [Tao and Zhaodian 1981, Figure 4-5 and Photo by Author].

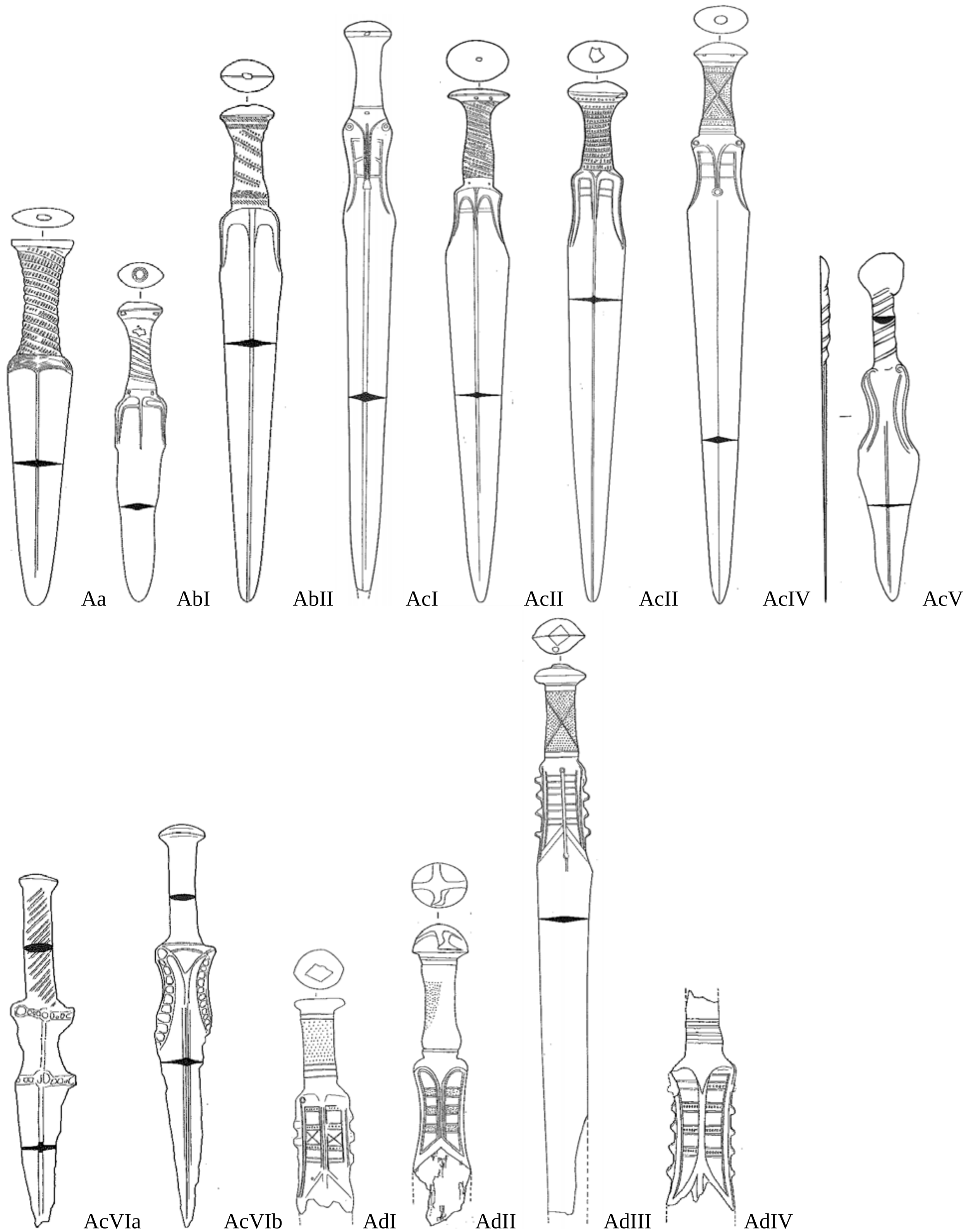


Figure 3.63: Sword Types I: Top Row: YGJC513, YGJC136, YGJC288, YGJC490, YGJC121, YGJC548, YGJC545, YGJC60; Bottom Row: YGJC200, YGJC201, YGJC491, YBJC57, YGJC694, YGJC960 (Liangshan and Chengdu 2009: Figure 40.3, 40.5, 40.11, 42.1, 42.5, 42.4, 42.8, 129.5, 129.6, 129.4, 119.4, 121.2, 119.3, 120.1).

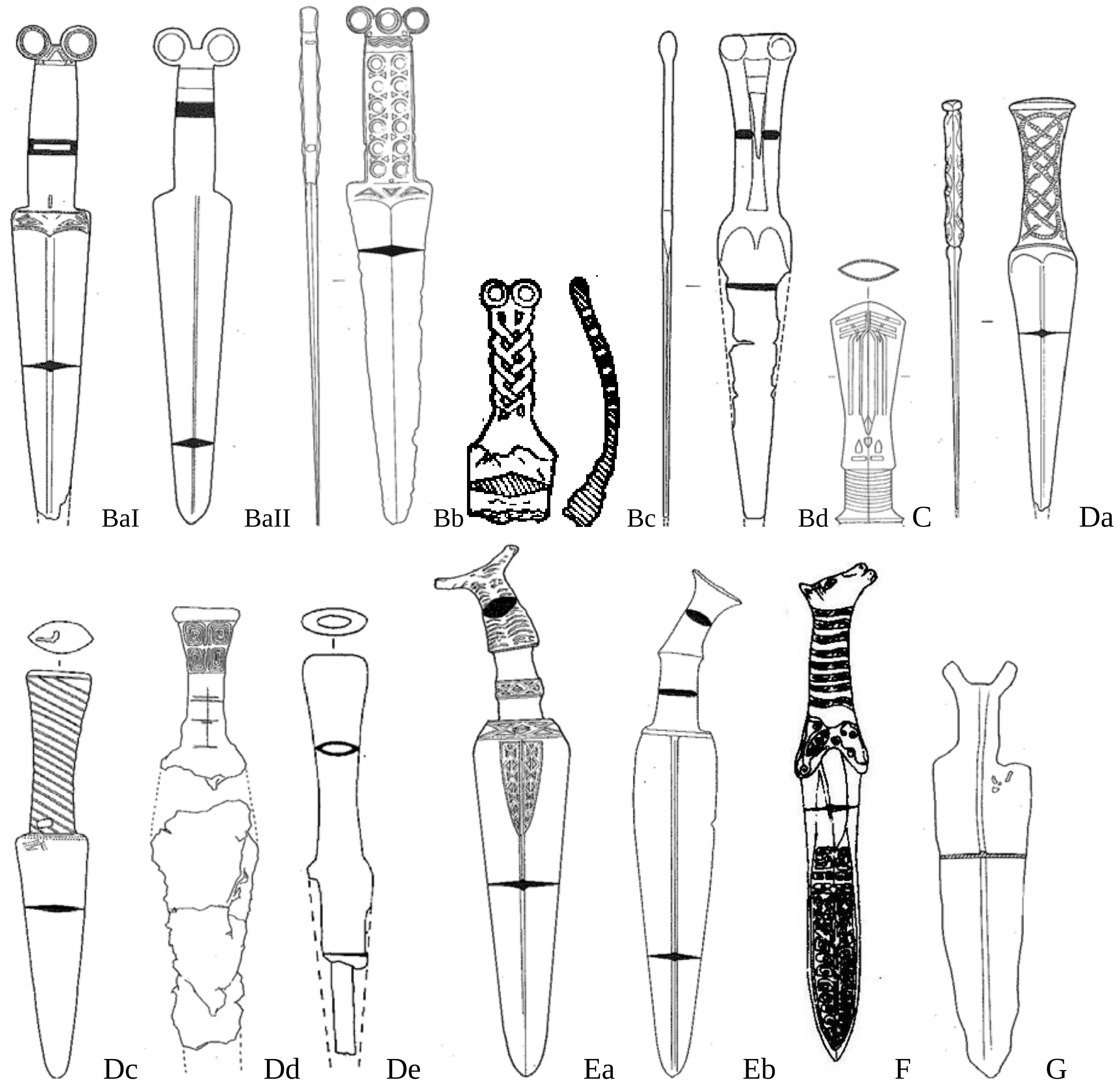


Figure 3.64: Sword Types II: Top Row: YGJC345, YGJC194, YGJC227 (Liangshan and Chengdu 2009: Figure 44.1-2, 133.2), NDXC1 (Yunnansheng Bowuguan 1983: Figure 5.4), YGJC227 (Liangshan and Chengdu 2009: Figure 44.8), HGJC60 (Chengdu Wenwu et al. 2010: Figure 7.5), YGJC447; Bottom Row: YGJC469, YLLM9.5 (Liangshan and Chengdu 2009: Figure 43.7, 40.7, 19.13), HGUC4 (Huilixian, Lianghsn, and Sichuansheng 2004: Figure 13.1), YLLM11.24, YLLM7.1 (Liangshan and Chengdu 2009: Figure 24.7, 27.1), HGUC4 (Tang Xiang 1996: Figure 1.2), HGJC28 (Chengdu Wenwu et al. 2010: Figure 7.4).

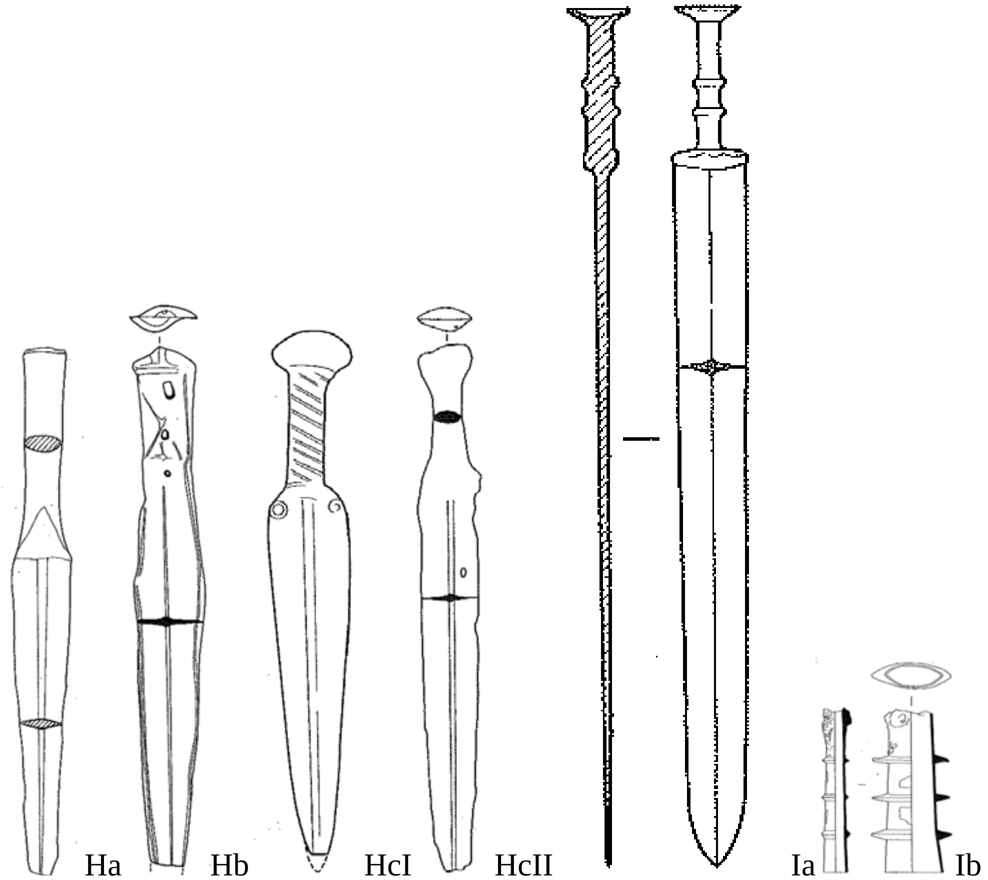


Figure 3.65: Sword Types III: HGJC62 (Chengdu Wenwu et al. 2010: Figure 7.2); YGJC156, YGJC9, YGJC72 (Liangshan and Chengdu 2009: Figure 129.1, 129.3, 129.12), HGJC66 (Chengdu Wenwu et al. 2010: Figure 7.6), YLLM6.51 (Liangshan and Chengdu 2009: Figure 16.3)

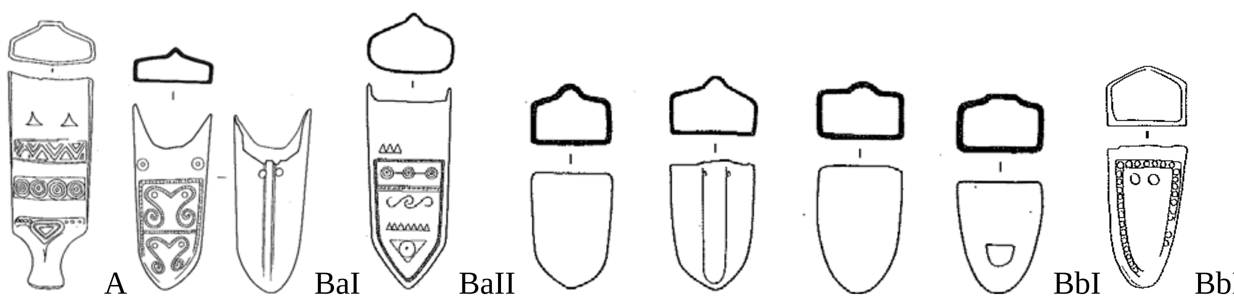


Figure 3.66: Scabbard Tip Types: YGJC178, YGJC107, YGJC458, YGJC302, YGJC289, YGJC491, YGJC455 (Liangshan and Chengdu 2009: Figure 66.10, 66.3, 66.11, 65.9-11, 66.5).

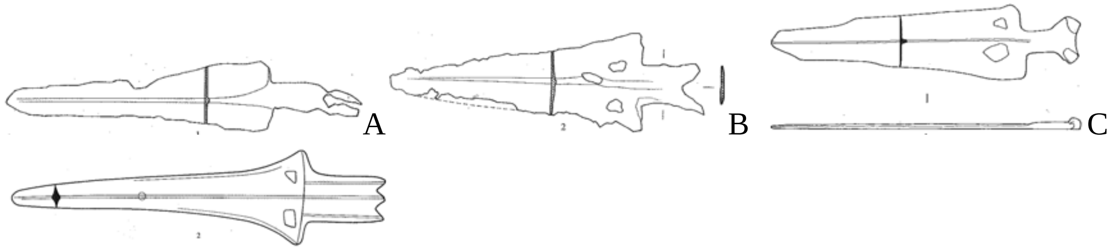


Figure 3.67: *Mingqi Ge* Dagger-Axe Types: HGJC24, HGJC25 (Chengdu Wenwu et al. 2010: Figure 5.1-2), YJGC583, YGJC436 (Liangshan and Chengdu 2009: Figure 128.1, 47.2).

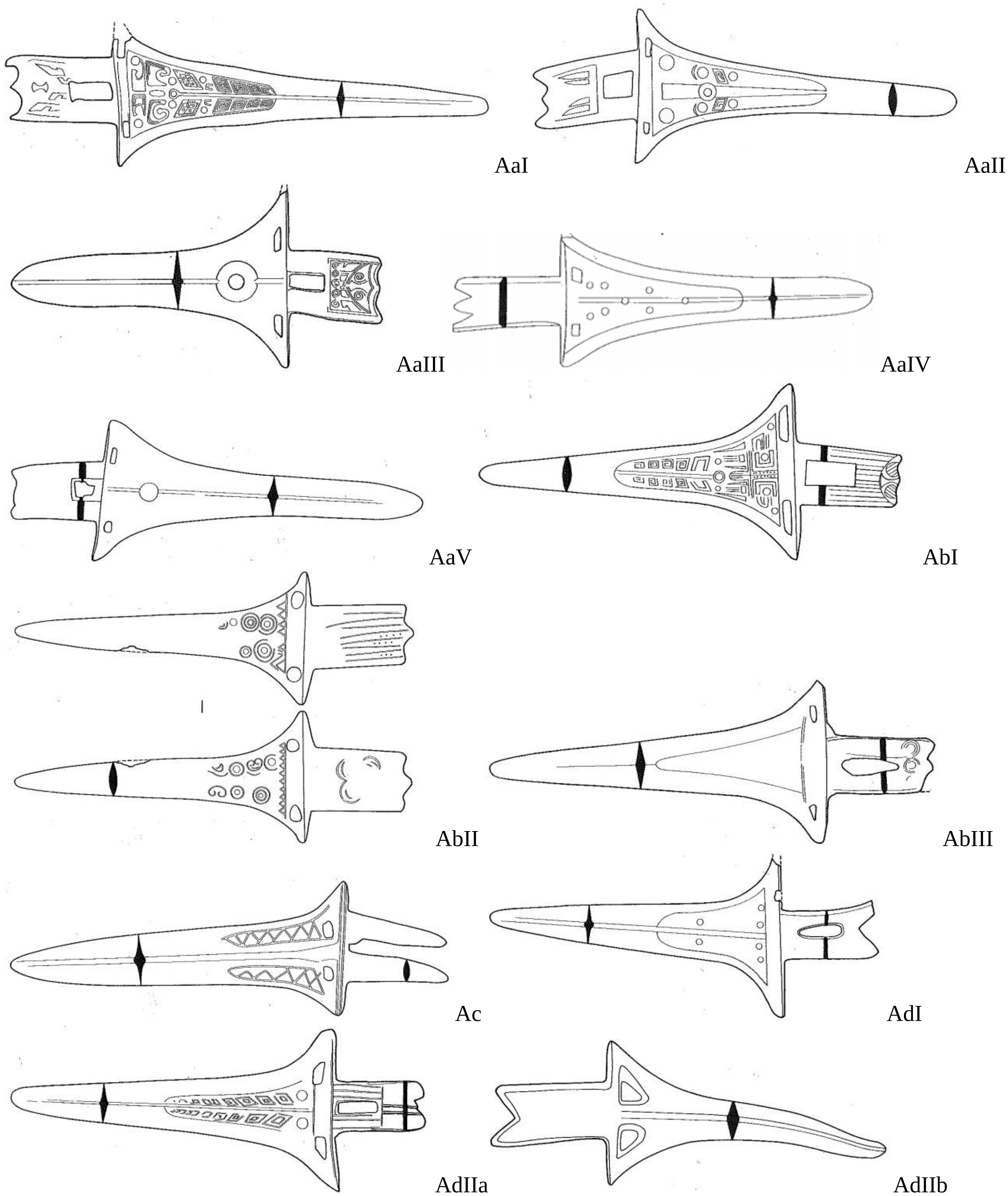


Figure 3.68: *Ge* Dagger-Axe Types I: YGJC68, YGJC522, YGJC58, YLLM11.7, YGJC34, YGJC556, YGJC219, YGJC60, YGJC294, YGJC442, YGJC14, YGJC555 (Liangshan and Chengdu 2009: Figure 47.1, 45.1, 45.3, 6.1, 47.3, 56.1-3, 60.1, 51.3-4, 53.3).

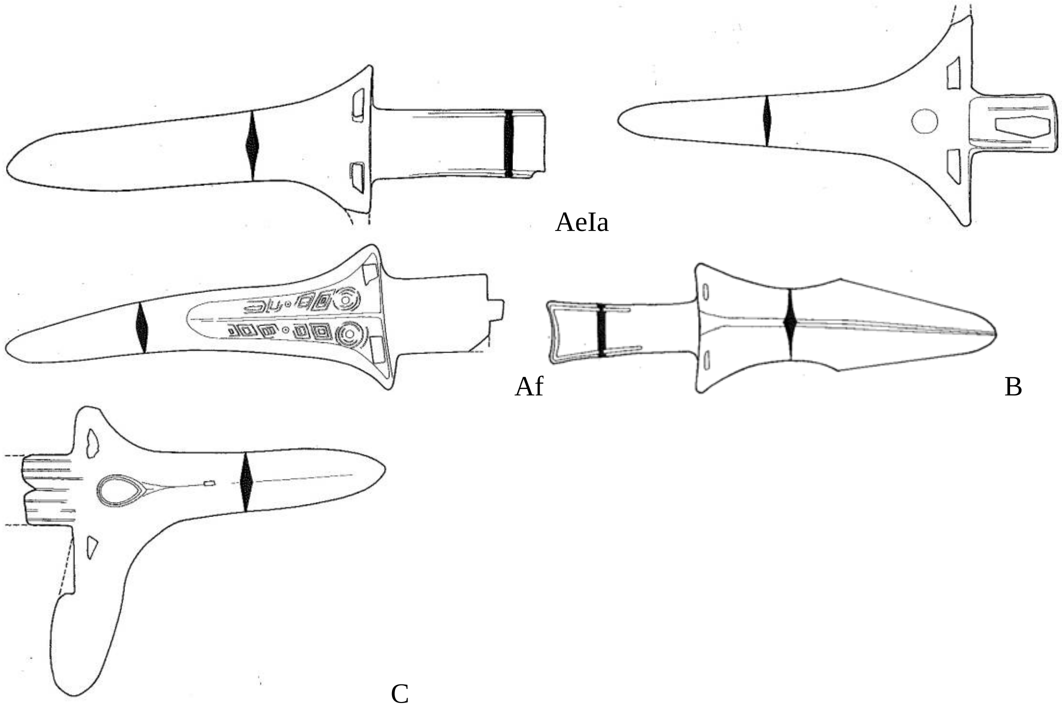


Figure 3.69: *Ge* Dagger-Axe Types I: YGJC433, YGJC346, YGJC320, YLLM11.1, YGJC523 (Liangshan and Chengdu 2009: Figure 58.3, 58.1, 60.3, 23.3, 59.4).

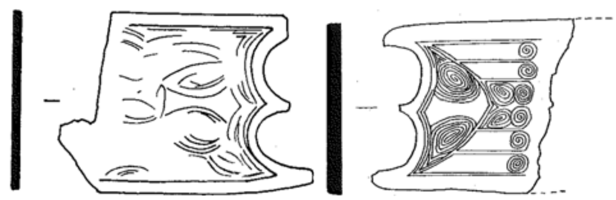


Figure 3.70: *Ge* Butt: YLLM6.50, YLLM9.22 (Liangshan and Chengdu 2009: Figure 12.1, 18.2)

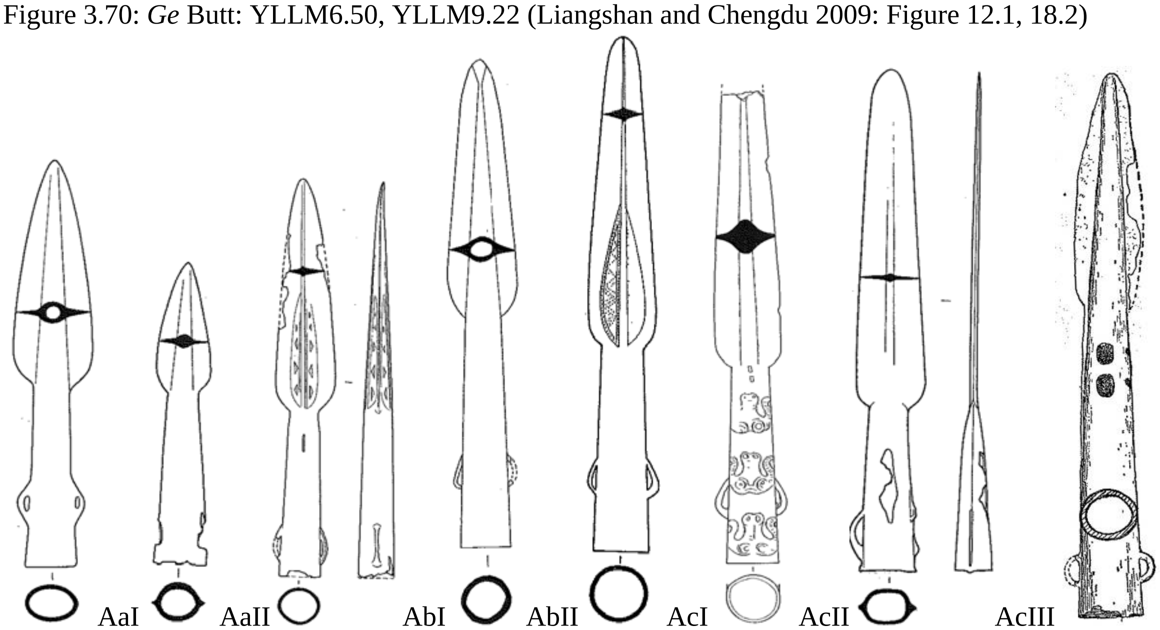


Figure 3.71: *Mao* Spearhead Types I: YGJC337, YGJC157, YGJC734, YLLM11.2, YGJC514, YGJC38 (Liangshan and Chengdu 2009: Figure 67.2, 67.5, 67.7, 24.1, 68.2, 133.3, 68.1), YGSM1.13 (Huang Zhengzong 1983: Figure 4.3).

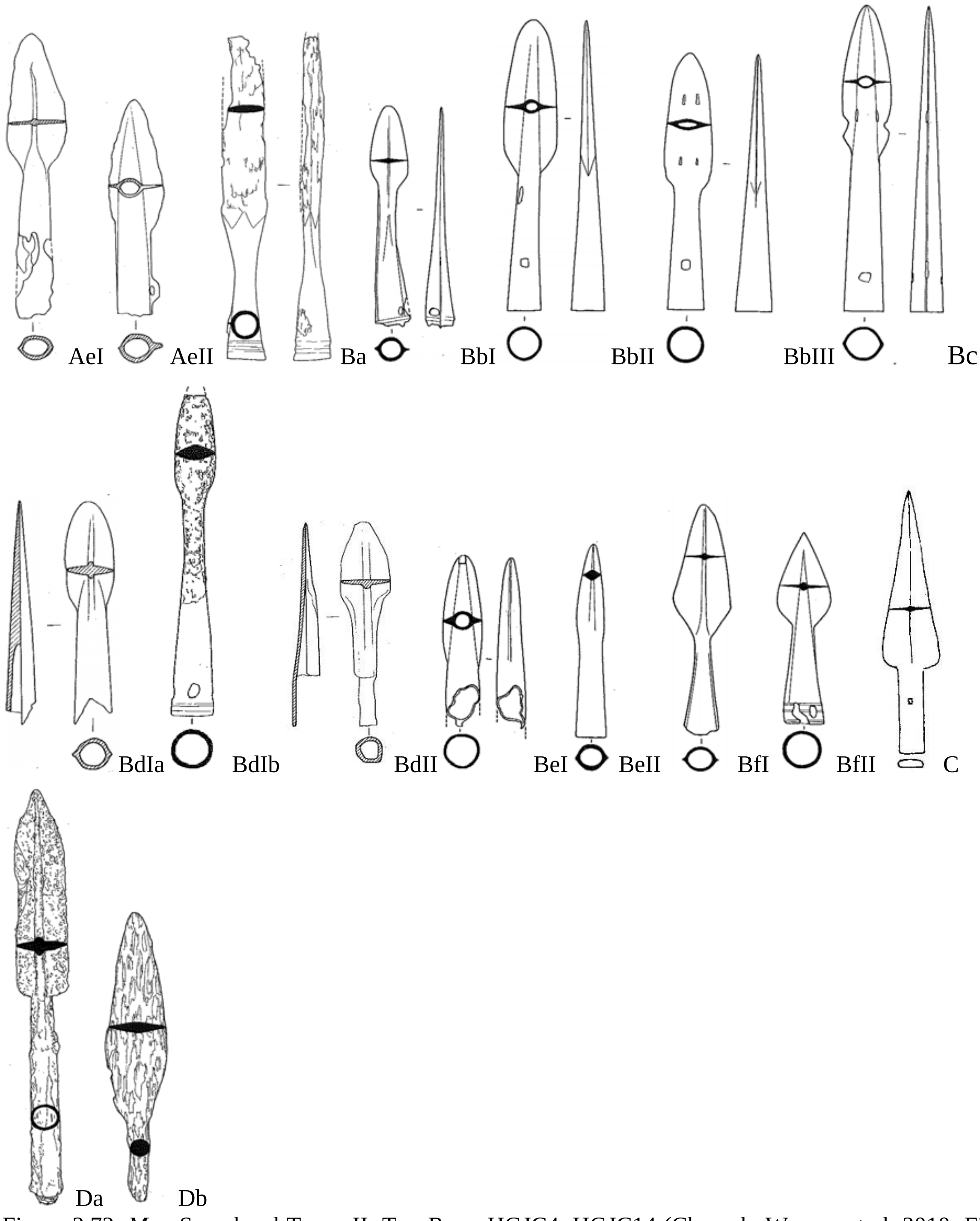


Figure 3.72: *Mao* Spearhead Types II: Top Row: HGJC4, HGJC14 (Chengdu Wenwu et al. 2010: Figure 6.2, 6.8), YGJC174, YGJC190, YGJC1043, YGJC528, YGJC40 (Liangshan and Chengdu 2009: Figure 122.1, Figure 68.7, 68.3-4, 67.1); Second Row: HGJC8 (Chengdu Wenwu et al. 2010: Figure 6.4), YGJC322 (Liangshan and Chengdu 2009: Figure 122.2), HGJC6 (Chengdu Wenwu et al. 2010: Figure 6.7), YGJC1168, YGJC610, YGJC329, YGJC432 (Liangshan and Chengdu 2009: Figure 67.8, 68.9), HGUC55 (Tang Xiang 1996: Figure 2.3); Bottom Row: YLLM11.6, M4.20 (Liangshan and Chengdu 2009: Figure 24.6, 8.13).

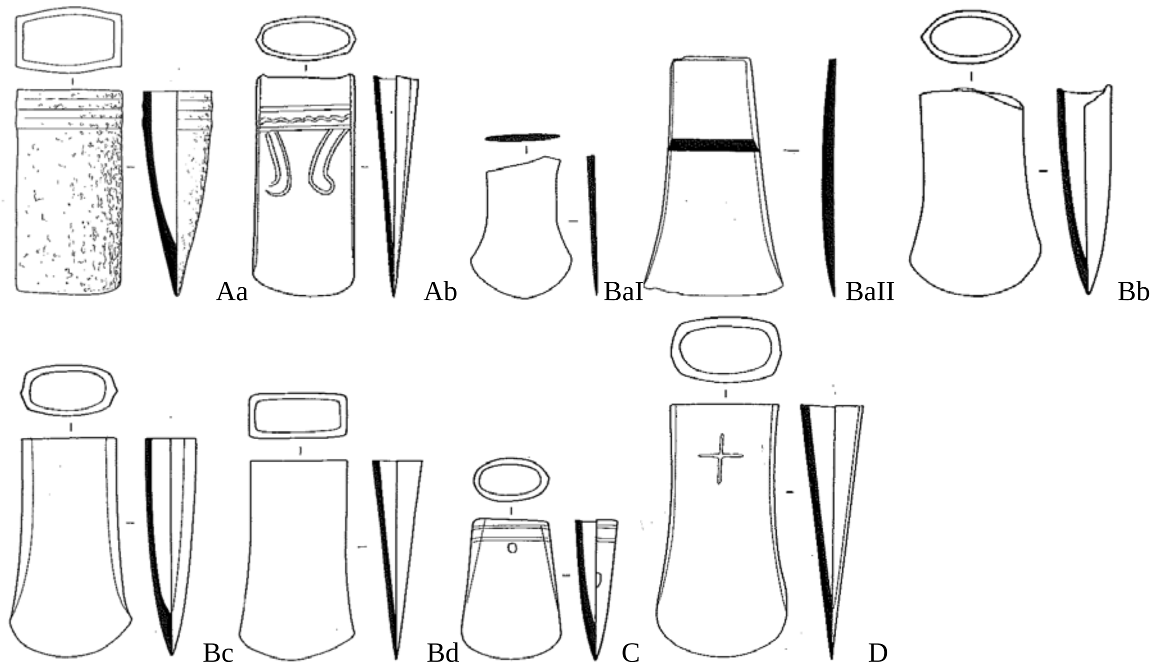


Figure 3.73: *Fu* Axe Types: Top Row: YGJC701, YGJC668, YGJC126, YLLM11.3, YGJC126; Bottom Row: YGJC310, YGJC167, YGJC667, YGJC669 (Liangshan and Chengdu 2009: Figure 122.5, 102.6, 101.10, 23.10, 101.8, 101.1, 101.7, 102.5, 102.3).

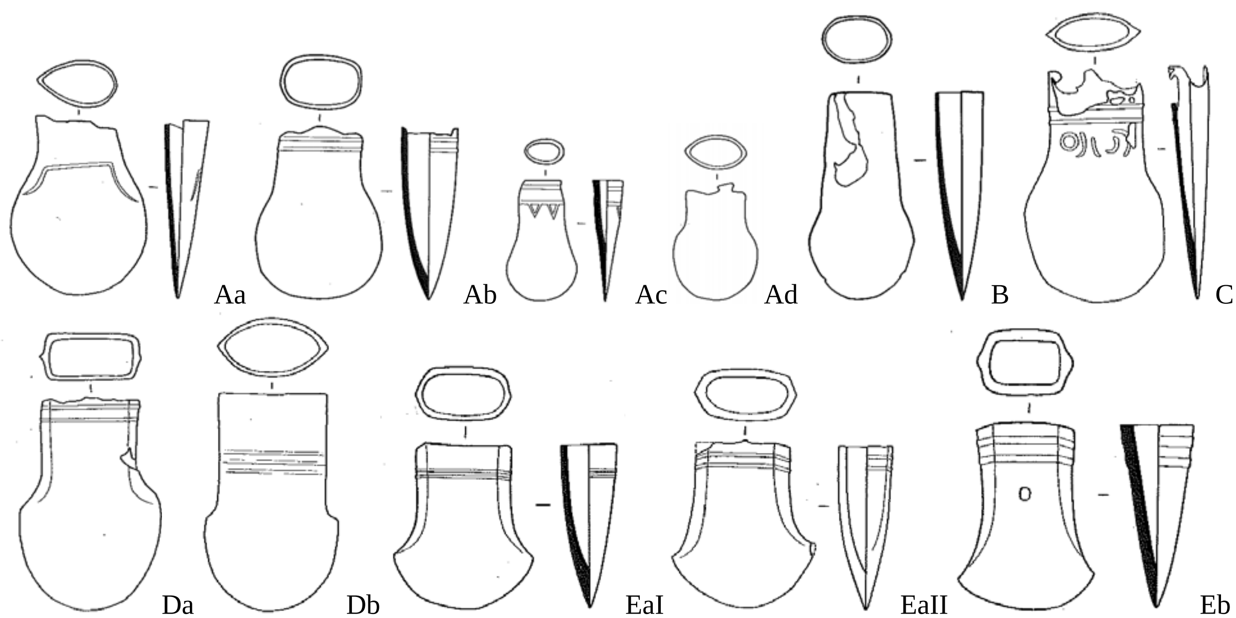


Figure 3.74: *Yue* Axe Types I: Top Row: YGJC63, YGJC47, YGJC488, YGJC287, YGJC62, YGJC557; Bottom Row: YGJC418, YGJC71, YGJC7, YGJC489, YGJC485 (Liangshan and Chengdu 2009: Figure 61.1-2, 61.9, 61.8, 130.1, 62.3, 63.1, 61.11, 63.5, 64.5, 64.9).

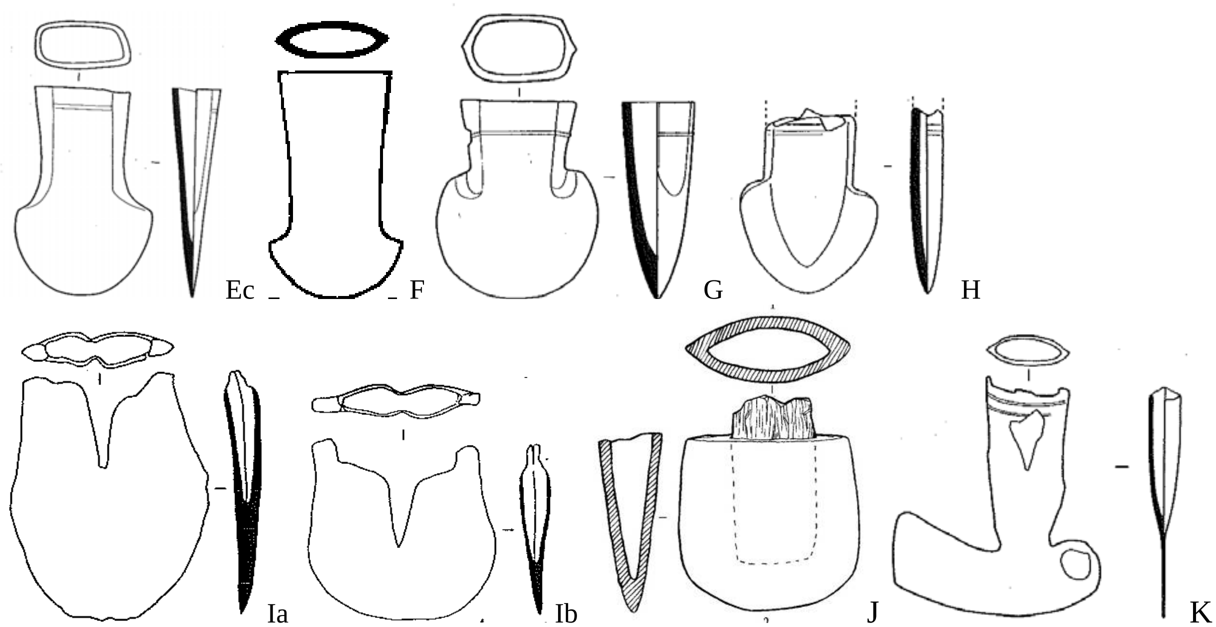


Figure 3.75: *Yue* Axe Types II: Top Row: YGJC737 (Liangshan and Chengdu 2009: Figure 66.1), NDXM2.4 (Yunnansheng Bowuguan 1983: Figure 5.5), YGJC349, YGJC607 (Liangshan and Chengdu 2009: Figure 65.6, 65.8), HGJM4.2, M29.7 (Chengdu Wenwu et al. 2010: Figure 13.2, 13.4), ZJEM3.2 (Liangshan, Sichuan, and Zhaojuexin 2009: Figure 12.2), YGJC1167 (Liangshan and Chengdu 2009: Figure 65.4).

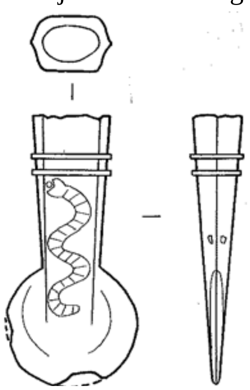


Figure 3.76: *Qi* Axe: YLLM9.20 (Liangshan and Chengdu 2009: Figure 19.1).

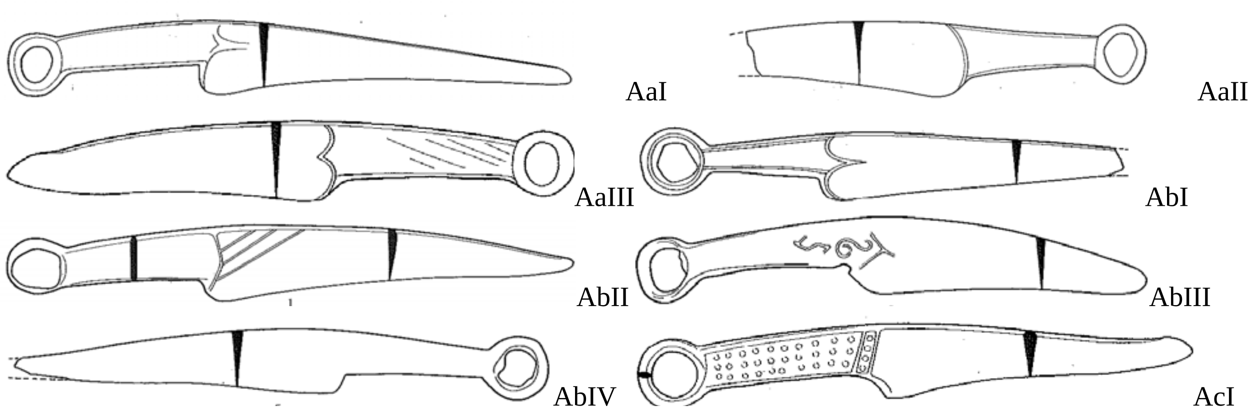


Figure 3.77: Knife Types I: YGJC315, YGJC372, YGJC373, YGJC316, YGJC36, YGJC477, YGJC424, YGJC97 (Liangshan and Chengdu 2009: Figure 72.1, 73.1, 73.3, 72.2, 74.1-2, 74.5, 74.4).

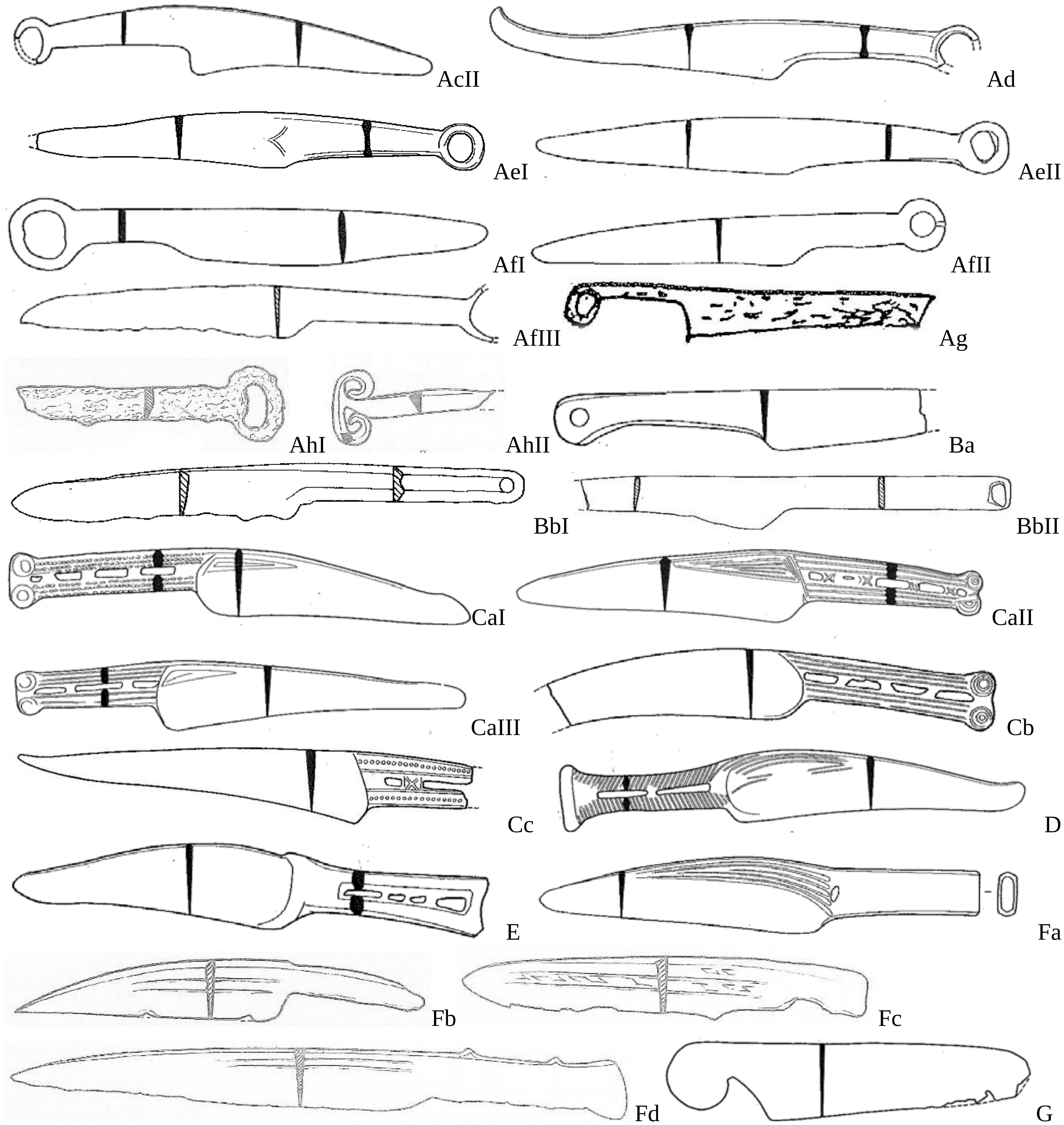


Figure 3.78: Knife Types II: YGJC41, YGJC276, YGJC102, YGJC620, YGJC585, YGJC100 (Liangshan and Chengdu 2009: Figure 75.2, 76.5, 75.6-7, 76.1, 76.4), HGJC29 (Chengdu Wenwu et al. 2010: Figure 8.3), YLSM1.54 (Mao and Zou 1991: Figure 1.9), XGQM1.9, XXHM1.21 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 90.7-8), YGJC106 (Liangshan and Chengdu 2009: Figure 76.3), HGJC91, HGJC58 (Chengdu Wenwu et al. 2010: Figure 8.1, 8.4), YGJC35, YGJC609, YGJC42, YGJC298, YGJC614, YGJC151, YGJC92, YLLM11.4 (Figure 69.4, 69.1, 71.2, 70.2, 70.5, 70.3, 71.3, 23.4), XBBM1.52, DGYM2.1, PXAM1.3 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 88.9-10, 88.13), YGJC617 (Liangshan and Chengdu 2009: Figure 71.4).

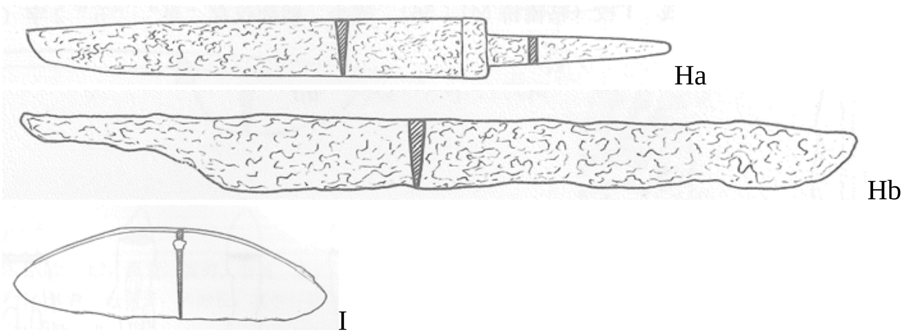


Figure 3.79: Knife Types III: XGQM1.3, M1.2, XXHM1.13 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 90.2-3, 87.2).

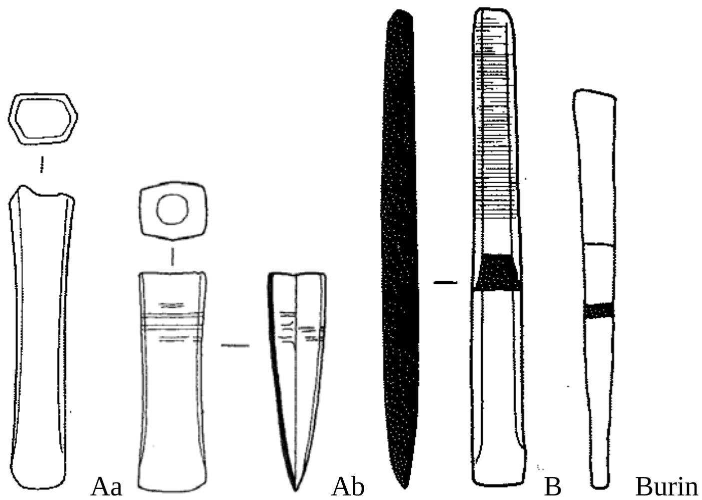


Figure 3.80: Chisel Types: YGJC597, YLLM6.29, YLLM11.13, Burin: YLLM6.51 (Liangshan and Chengdu 2009: Figure 103.1, 12.4, 24.5, 12.5).

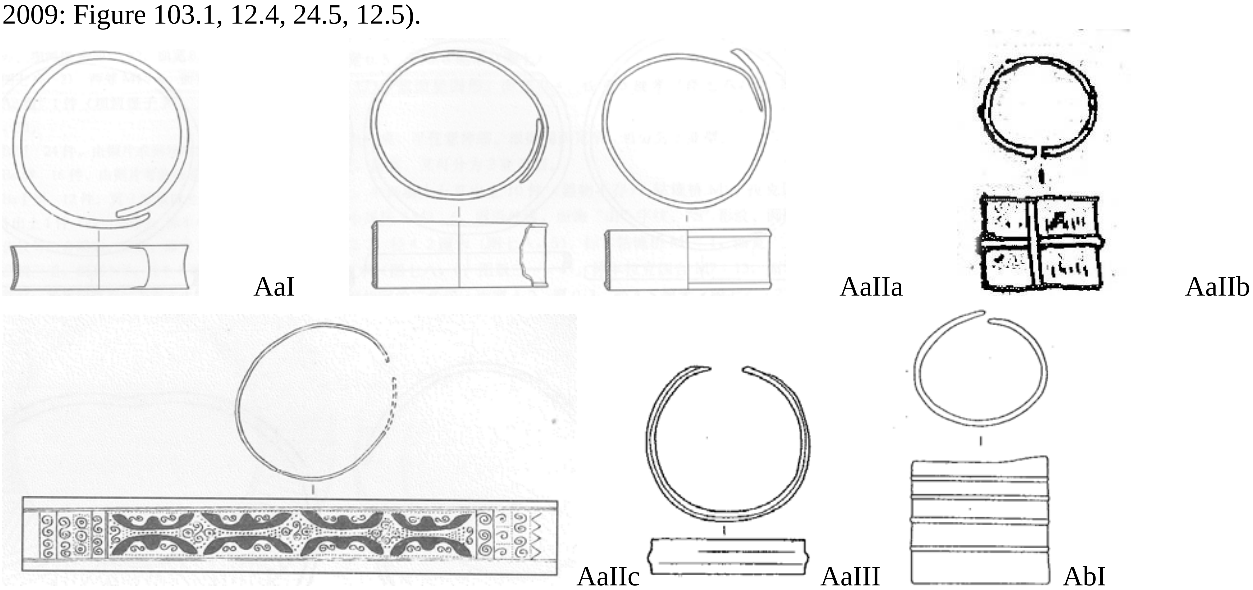


Figure 3.81: Bracelet Types I: Top Row: PXAM1.1, DARM4.8, M4.7 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 79.1-3), YLXM1.1 (Mao and Zou 1991: Figure 1.6); Bottom Row: PXAM2.6 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 78.5), YGJC677, YGJC91 (Liangshan and Chengdu 2009: Figure 107.8, 107.1).

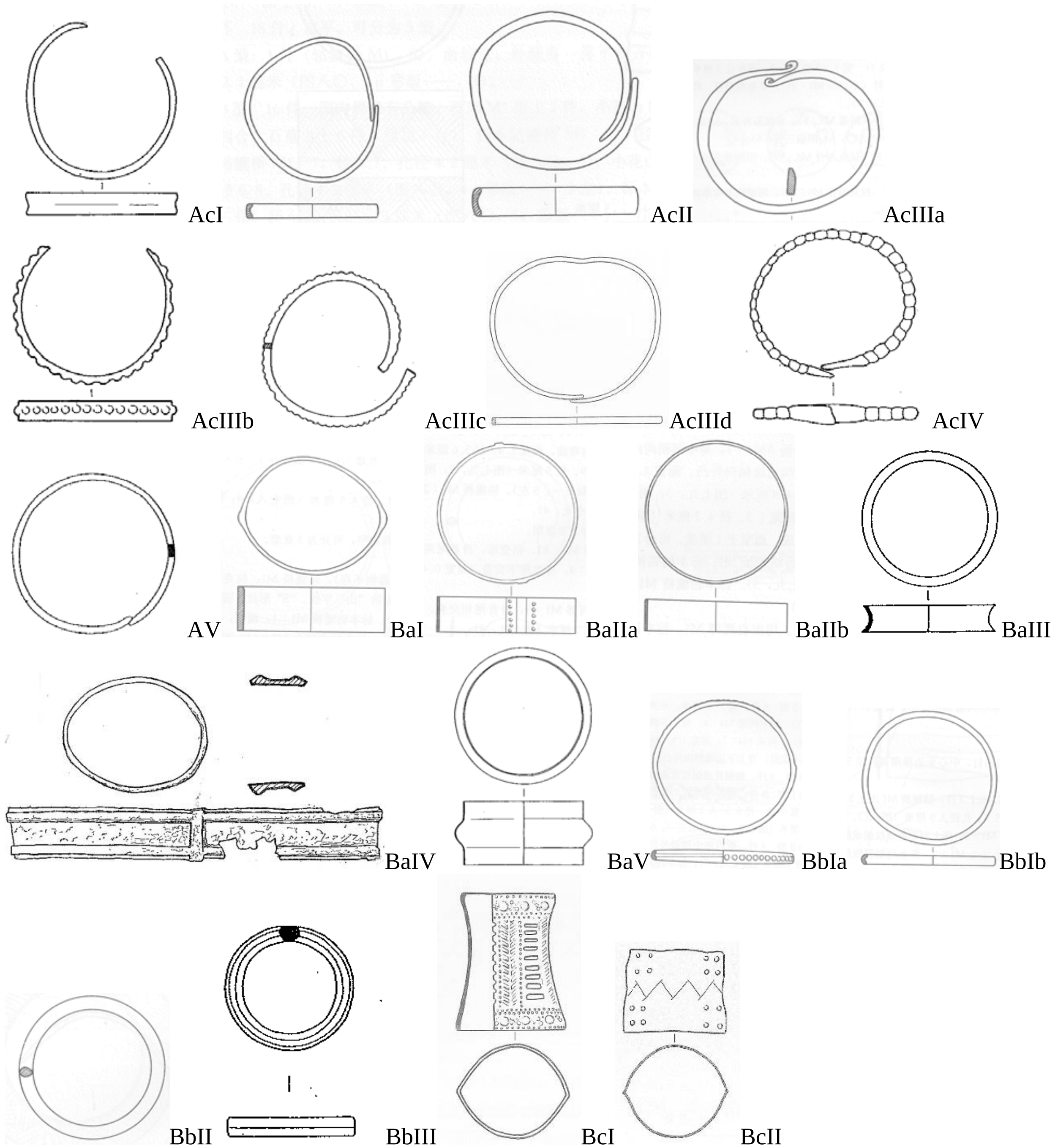


Figure 3.82: Bracelet Types II:Top Row: YGJC55 (Liangshan and Chengdu 2009: Figure 108.4), XXJM1.9, XGQM1.4, XLKM6.29 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 79.7-8, 90.10); Second Row: YGJC204 (Liangshan and Chengdu 2009: Figure 107.9), HGJC30 (Chengdu Wenwu et al. 2010: Figure 9.4), XGQM1.67 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 79.5), HGJC14 (Chengdu Wenwu et al. 2010: Figure 9.3); Third Row: YGJC153 (Liangshan and Chengdu 2009: Figure 109.8), PXBM1.51, PXBM4.36, PXBM1.52 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 77.1, 77.4-5), HFJM149.2 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 13.5); Fourth Row: XHGM2.16 (Sichuansheng and Anninghe 1976: Figure 2.13, YGJC94 (Liangshan and Chengdu 2009: Figure 107.3), PXBM1.54-55; Fifth Row: PXAM2.6 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 77.6-7, 78.4), YGJC82 (Liangshan and Chengdu 2009: Figure 110.12), XLKM6.31, MBBM1.4 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 84.6-7).

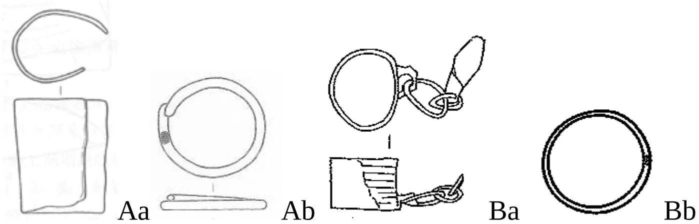


Figure 3.83: Fingering Types: PXBM1.41, XBBM1.84 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 79.9, 81.7), YGJC679 (Liangshan and Chengdu 2009: Figure 110.8), ZCBM6.3 (Liangshan, Sichuan, and Zhaojuexian 2011: Figure 8.6).

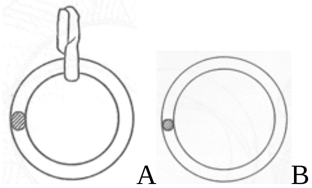


Figure 3.84: Decorative Ring Types: XQGM1.11, M1.69 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 81.4, 81.1).

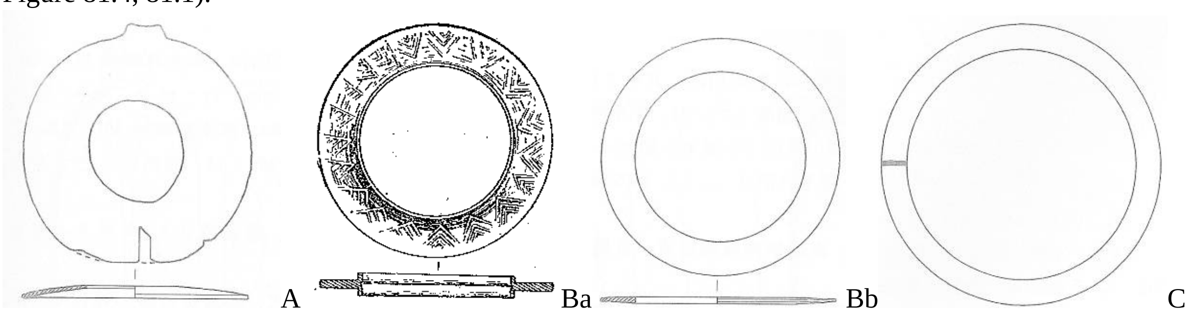


Figure 3.85: Flat Ring Types: XGQM1.5 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 80.1), XLKM8.28 (Liangshan Diqu 1978: Figure 6.4), XGQM1.68, BBM1.83 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 80.2. 80.9).

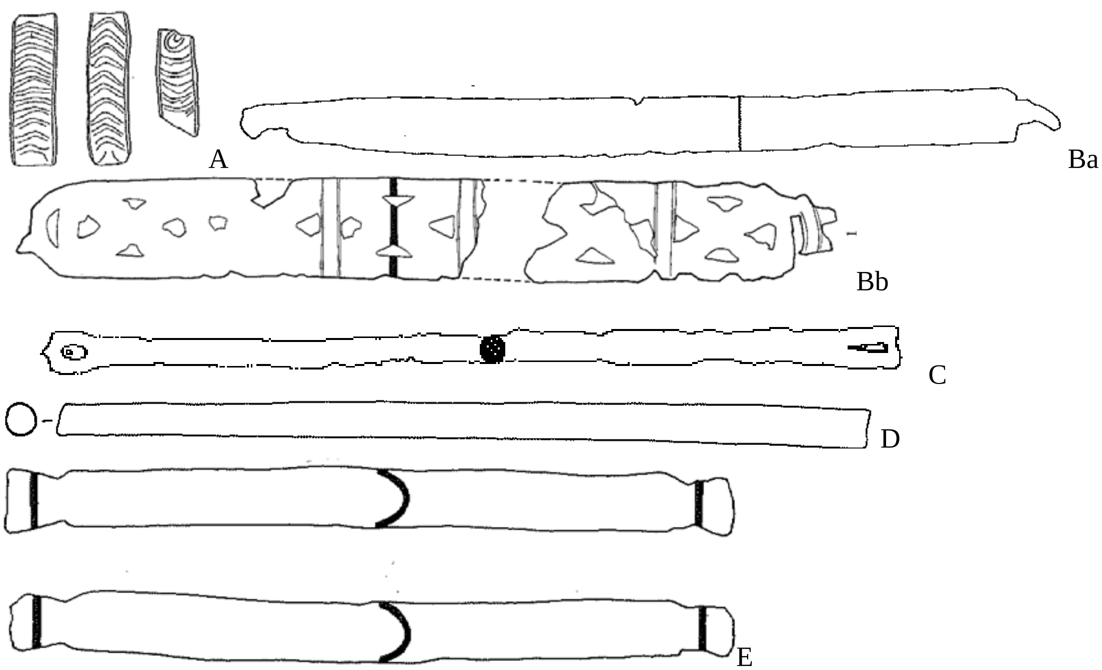


Figure 3.86: Band Types: YGJC703, YLLM4.24, YGJC689, YLLM4.2, YGJC685-2, YGJC413 (Liangshan and Chengdu 2009: Figure 124.1, 6.2, 117.1, 6.6, 117.2, 117.7).

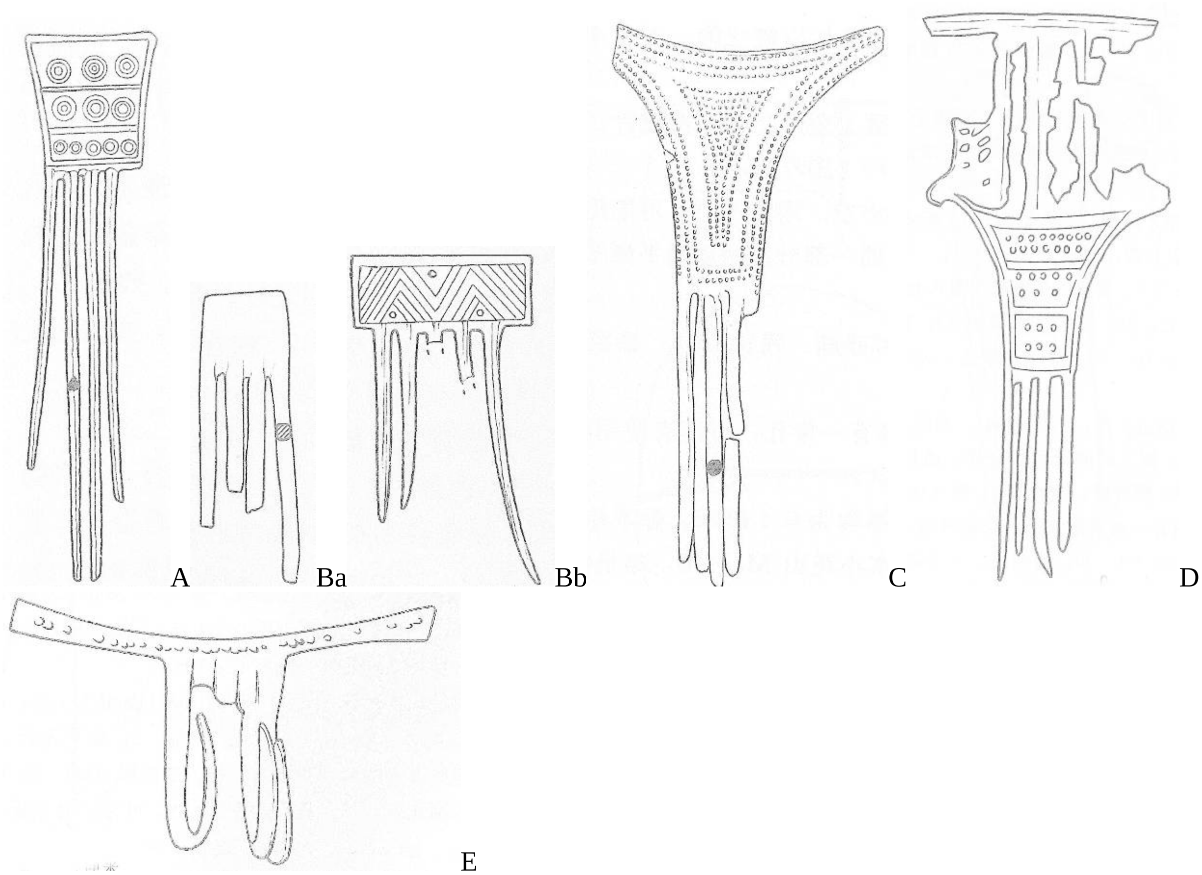


Figure 3.87: Hair Comb Types: PXBM4.15, XXJM1.22, PXBM4.9, XXJM1.23, M1.26, M1.27 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 85.1, 85.12, 85.9, 86.1, 86.8, 86.9).

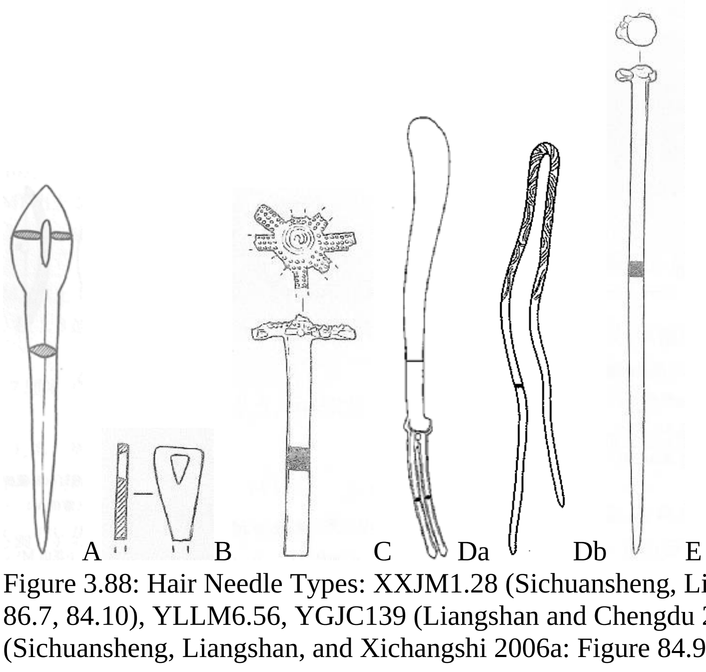


Figure 3.88: Hair Needle Types: XXJM1.28 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 84.11, 86.7, 84.10), YLLM6.56, YGJC139 (Liangshan and Chengdu 2009: Figure 13.2, 106.3), XBBM1.21 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 84.9).

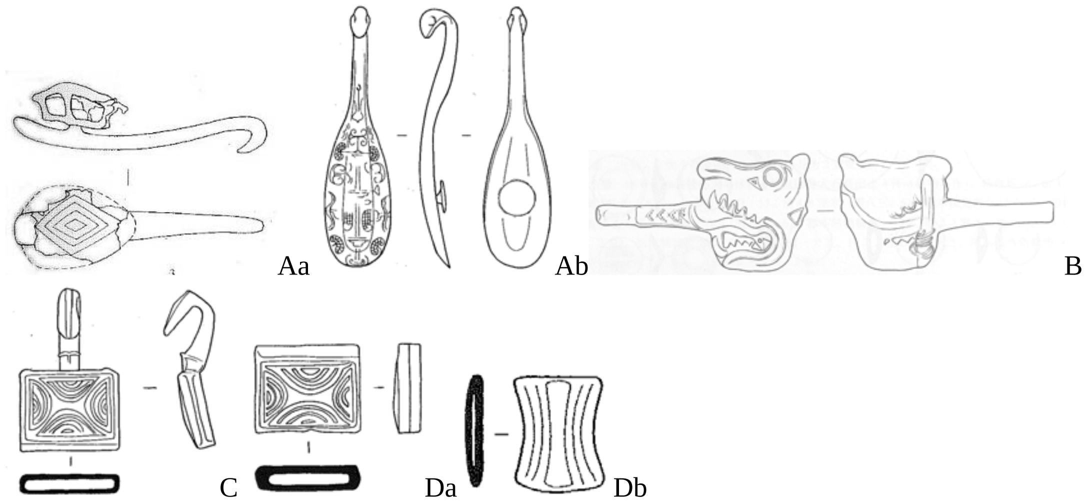


Figure 3.89: Belt Parts: HGJC63 (Chengdu Wenwu et al. 2010: Figure 11.3), YGJC670 (Liangshan and Chengdu 2009: Figure 104), XXJM1.63 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 84.5), YGJC130, YGJC131, YLLM9.14 (Liangshan and Chengdu 2009: Figure 105.1, 105.2, 19.10).

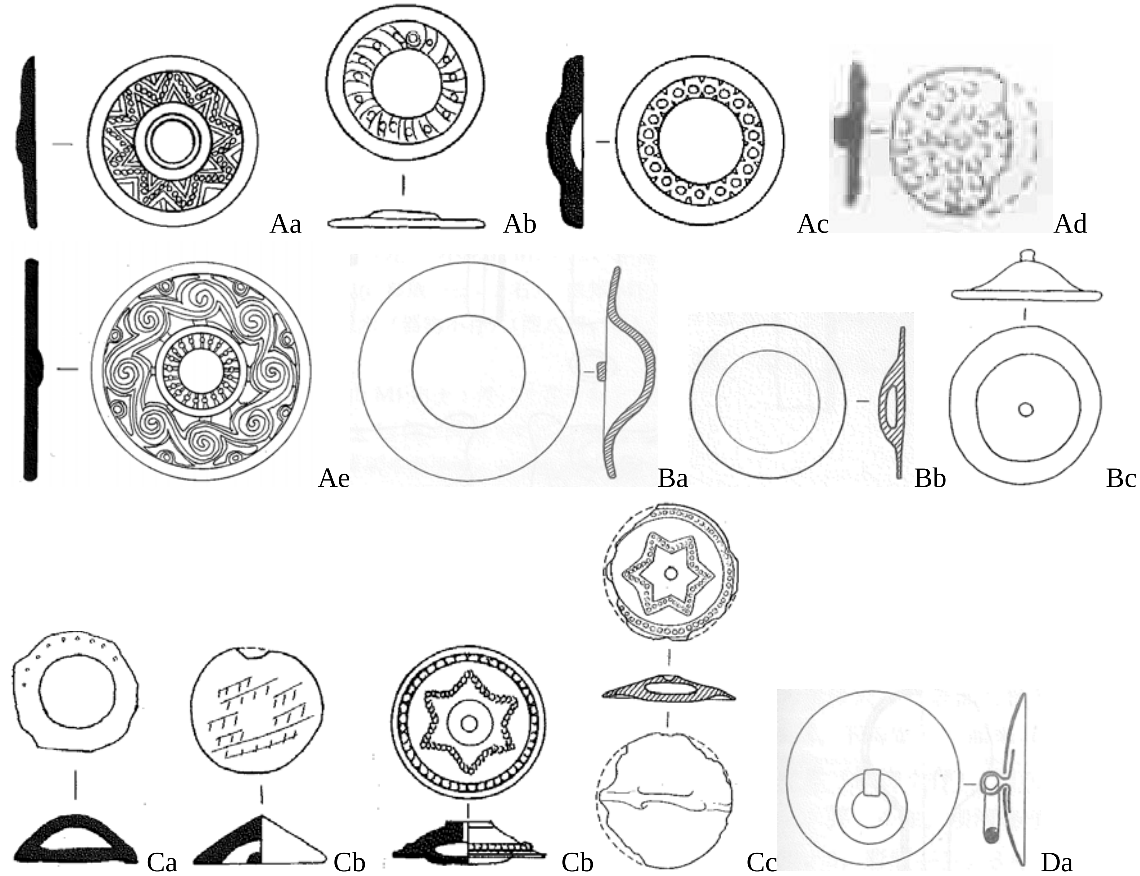


Figure 3.90: Button-Shaped Application Types I: Top Row: YLLM6.4-7, YGJC671-1, YLLM9.16 (Liangshan and Chengdu: Figure 14.7, 106.2, 20.1), XWNM1.19 (Sichuansheng, Liangshanzhou, and Xichangshi 2006: Figure 14.11); Second Row: YLLM6.39 (Liangshan and Chengdu: Figure 12.6), XXLKM6.26, XGQM1.71 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 83.6, 83.8), YLLM6.45; Bottom Row: YLLM4.6, YLLM4.5, YGJC755 (Liangshan and Chengdu 2009: Figure 13.4, 8.3, 8.14, 112.1), HGJC18 (Chengdu Wenwu et al. 2010: Figure 10.3), XGQM1.70 (Sichuansheng, Liangshanzhou, and Xichangshi 2006: Figure 83.1).

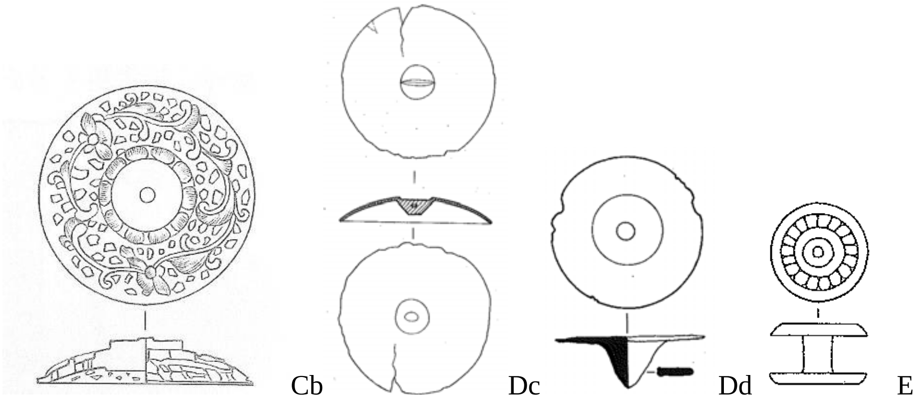


Figure 3.91: Button-Shaped Application Types II: Top Row: XXHM1.25 (Sichuansheng, Liangshanzhou, and Xichangshi 2006: Figure 83.19), HGJC16 (Chengdu Wenwu et al. 2010: Figure 10.1), YGJC682, YGJC732 (Liangshan and Chengdu 2009: Figure 112.7, 110.6).

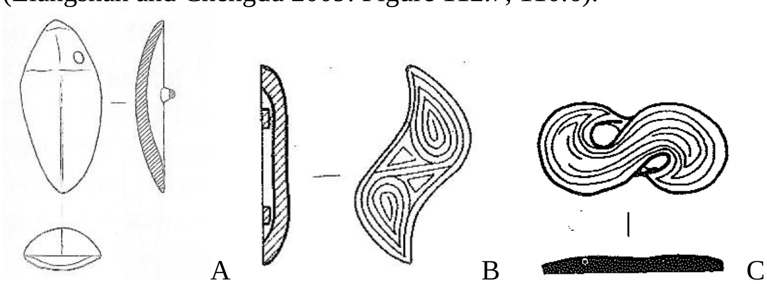


Figure 3.92: Geometric Application Types: XXJM1.17 (Sichuansheng, Liangshanzhou, and Xichangshi 2006: Figure 83.15), HGJC49-1 (Chengdu Wenwu et al. 2010: Figure 11.7), YGJC79 (Liangshan and Chengdu 2009: Figure 111.5).

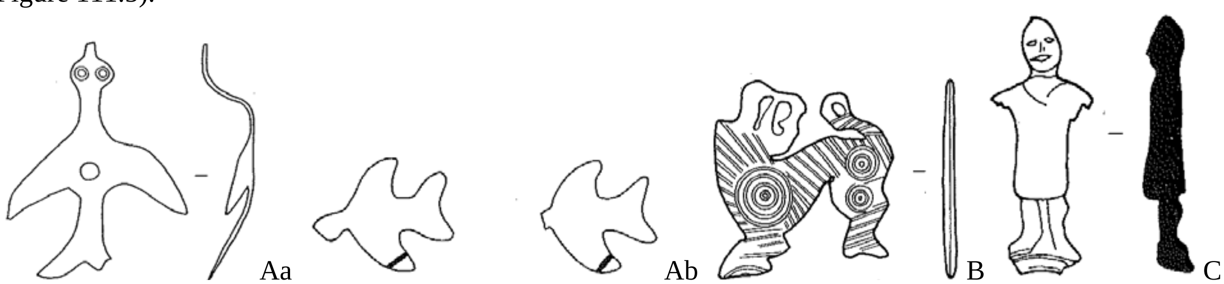


Figure 3.93: Zoomorphic and Anthropomorphic Decoration Elements: YGJC380, YGJC1169, YGJC568, YGJC304, YGJC414 (Liangshan and Chengdu 2009: Figure 16.3, 116.7-8, 111.2, 111.3).

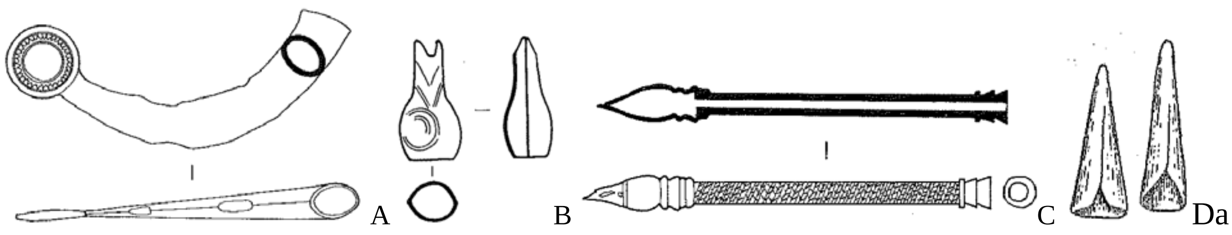


Figure 3.94: Other Ornament Types I: YGJC465, YGJC686,YGJC413 (Liangshan and Chengdu 2009: Figure 105.5, 118.1, 117.8), XLKM6.26 (Liangshan Diqu 1978: Figure 8.8)

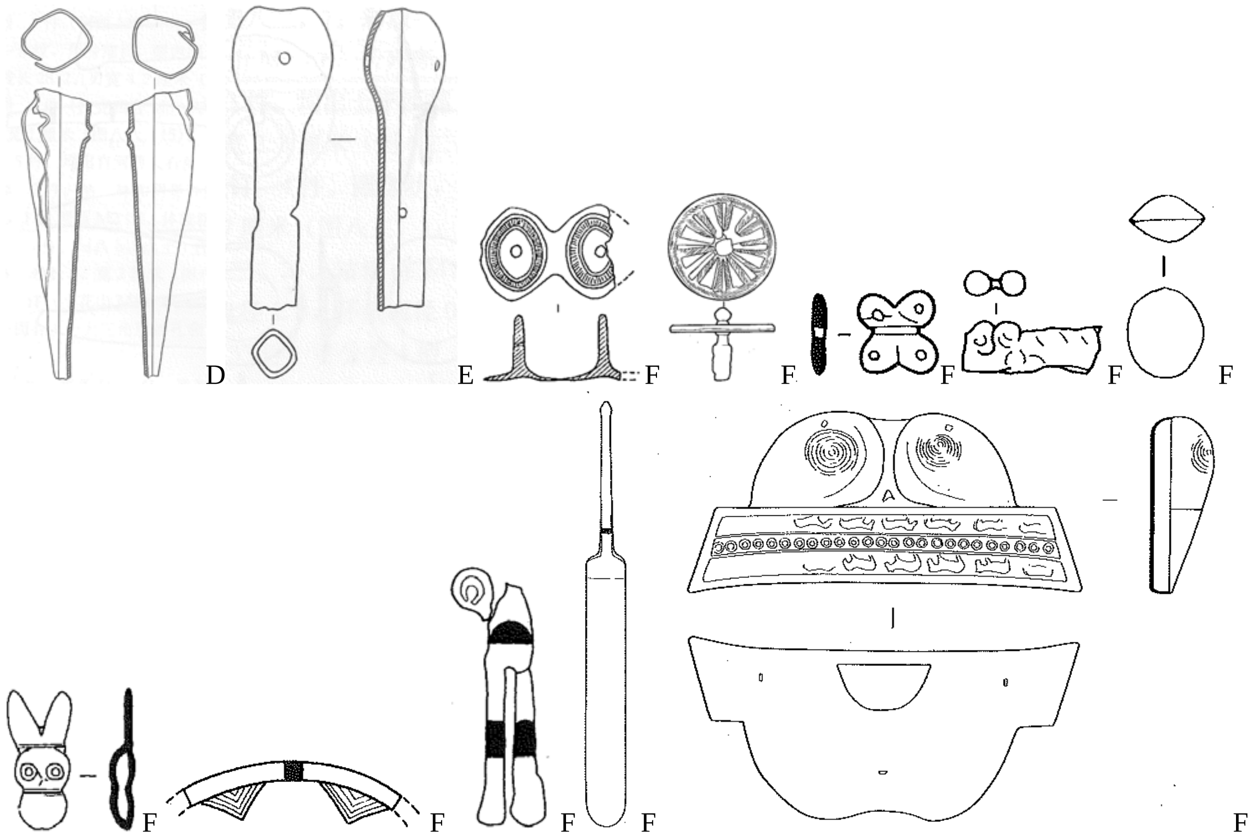


Figure 3.95: Other Ornament Types II: Top Row: XXHM1.18-19, XXJM1.18 (Sichuansheng, Liangshanzhou, and Xichangshi 2006: Figure 87.7-8, 84.1), HGJM13.2 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 13.12), YGJC690, YLLM6.53, M11.25, M4.26-1; Bottom Row: YLLM9.14, M9.9, M11.15, M6.23, M6.5 (Liangshan and Chengdu 2009: Figure 118.4, 16.9, 25.4, 8.11, 19.9, 19.12, 25.1, 16.4, 13.1).

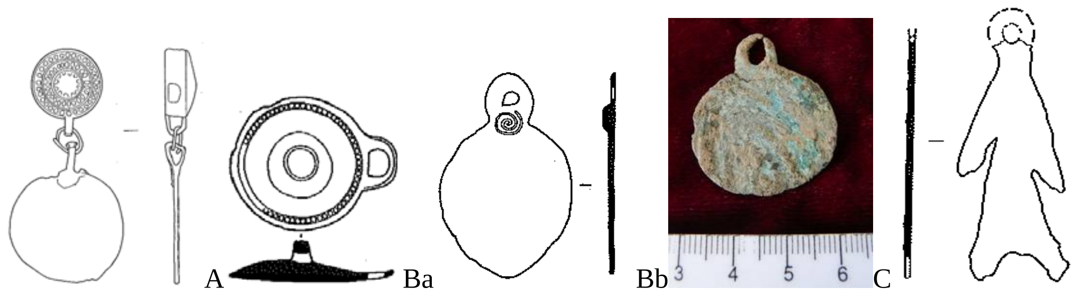


Figure 3.96: Pendant Types: YGJC1011, YGJC147, YGJC148 (Liangshan and Chengdu 2009: Figure 139.1, 110.3-4), YDZM77.1 (Photo by Author), YGJC1023-1 (Liangshan and Chengdu 2009: Figure 138.2).

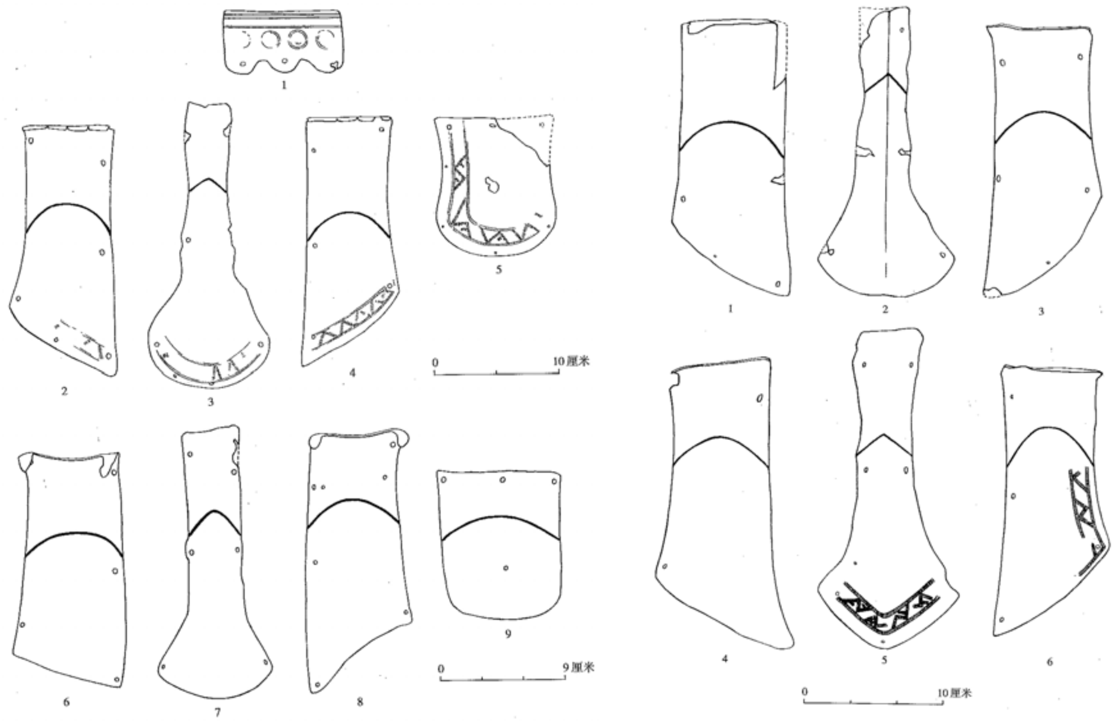


Figure 3.97: Arm Guard Type A (Left) and Type B (Right) (Liangshan and Chengdu 2009: Figure 77-78).

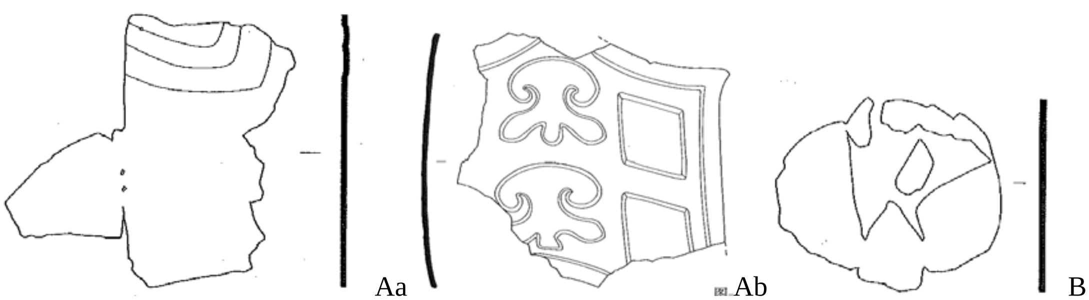


Figure 3.98: Body Armor Types: YLLM5.2, M5.1, YGJC1017 (Liangshan and Chengdu 2009: Figure 28.1-2, 138.1).

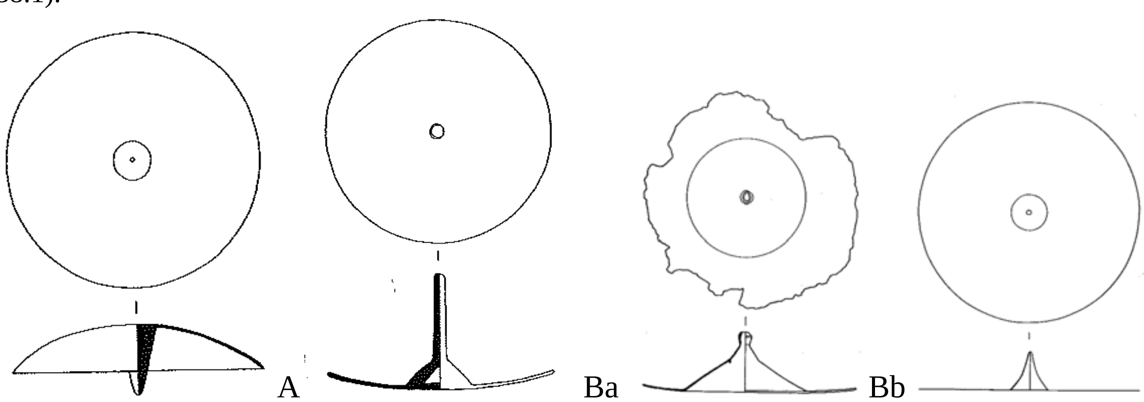


Figure 3.99: Round Ornaments with Thorn: YLLM4.19, YGJC731, YGJC164; Shield Boss: YGJC415 (Liangshan and Chengdu 2009: Figure 6.7, 100.5, 100.2, 81.2).

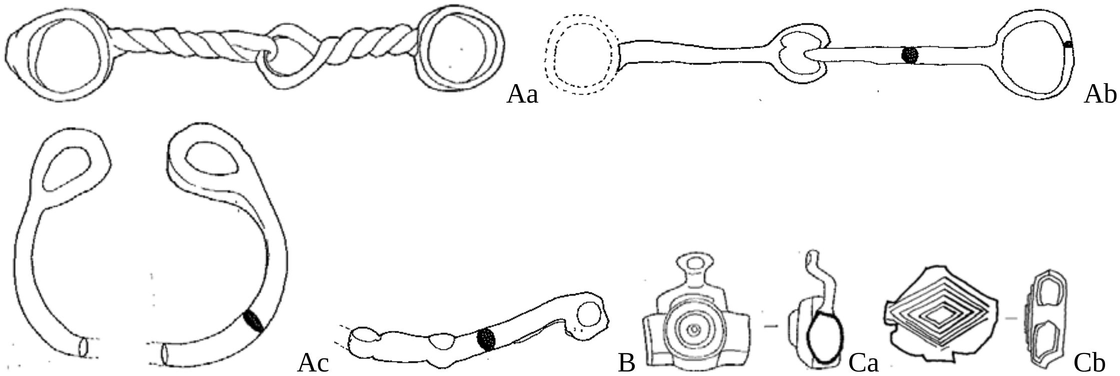


Figure 3.100: Horse Harness Types: YGJC475, YGJC74, YGJC267, YGJC265, YLLM4.23-4, YGJC784 (Liangshan and Chengdu 2009: Figure 99.1-3, 99.5, 7.9, 100.6).

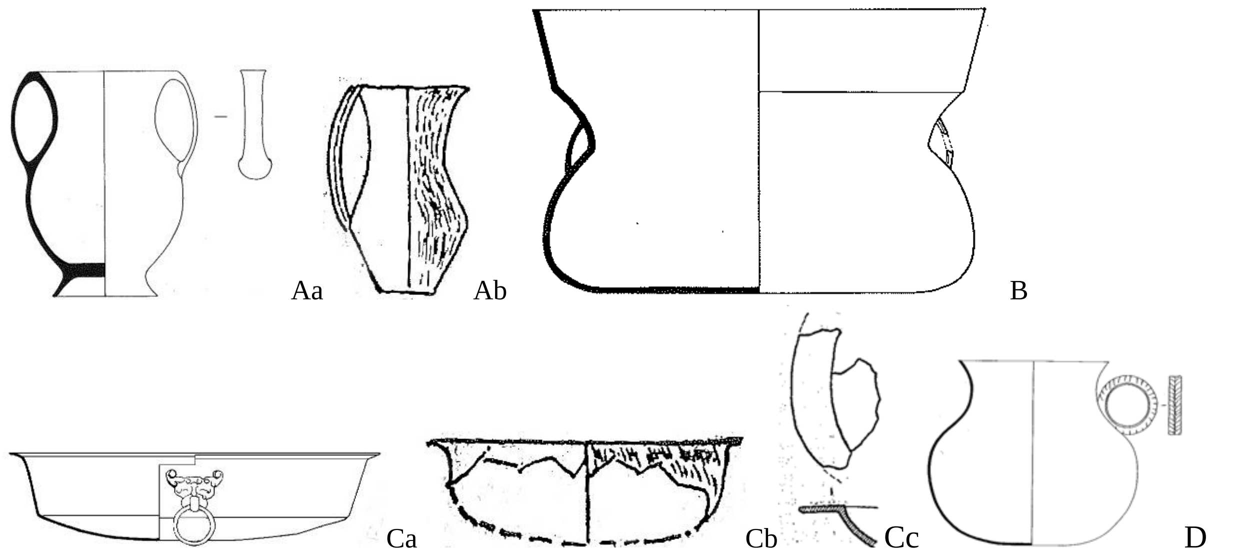


Figure 3.101: Metal Vessel Types: Top Row: YGJC1016 (Liangshan and Chengdu 2009: Figure 137), YLSM1.4 (Mao and Zou 1991: Figure 1.5), YLLM4.10 (Liangshan and Chengdu 2009: Figure 4.6); ZJEM1.1 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 12.1), YLXM1.5 (Mao and Zou 1991: Figure 1.4), ZEKM4.1 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 8.2), YGJC665 (Liangshan and Chengdu 2009: Figure 100.3).

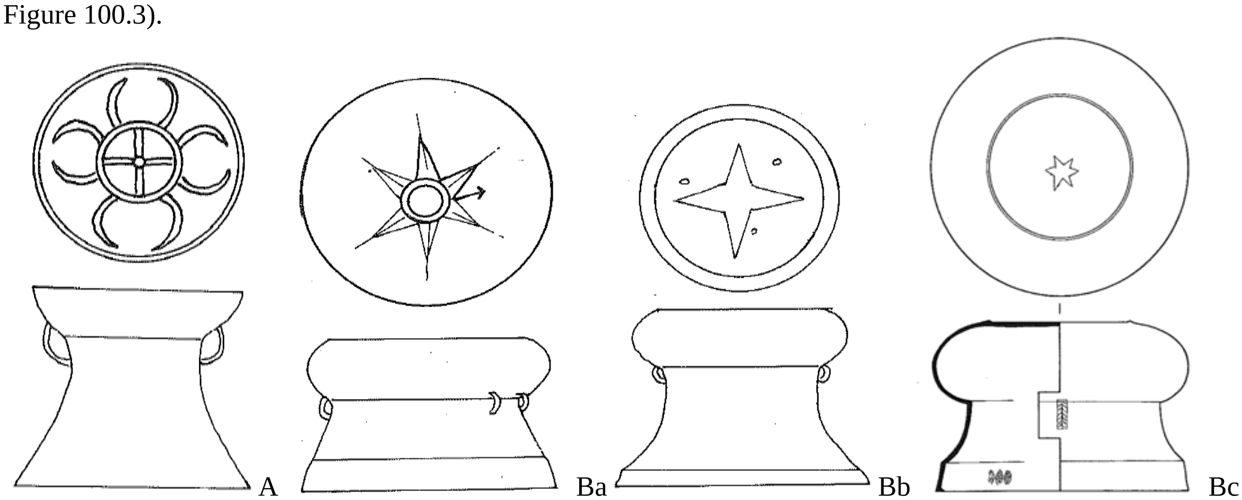


Figure 3.102: Drum Types I: YMBM2.2, YMBM1.19, M1.20 (Liu Shixu 1991), YGJC1025 (Liangshan and Chengdu 2009: Figure 131.2).

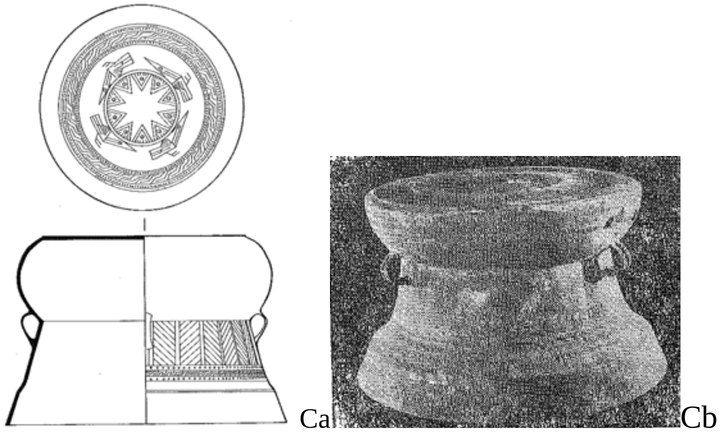


Figure 3.103: Drum Types II: YLLM4.11 (Liangshan and Chengdu 2009: Figure 4.5), HLLC1 (Huilixian Wenhuaguan 1977: Figure 1).

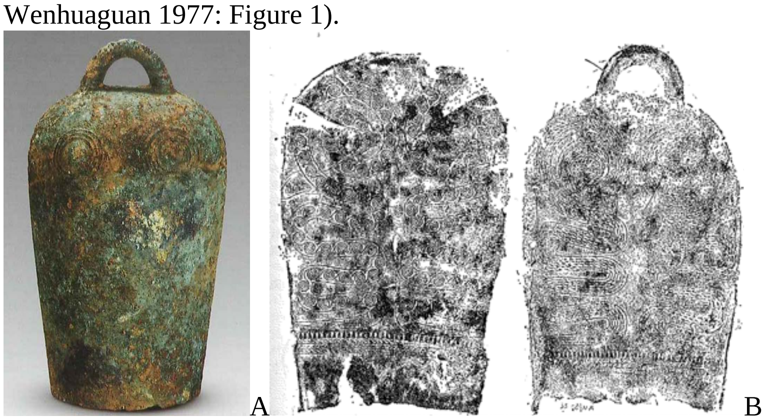


Figure 3.104: *Bianzhong* Bell Types: YLLM4.12 9Liangshan and Chengdu 2009: Color Plate 7.1), HZC (Tao Mingkuan 1982: Figure 2).

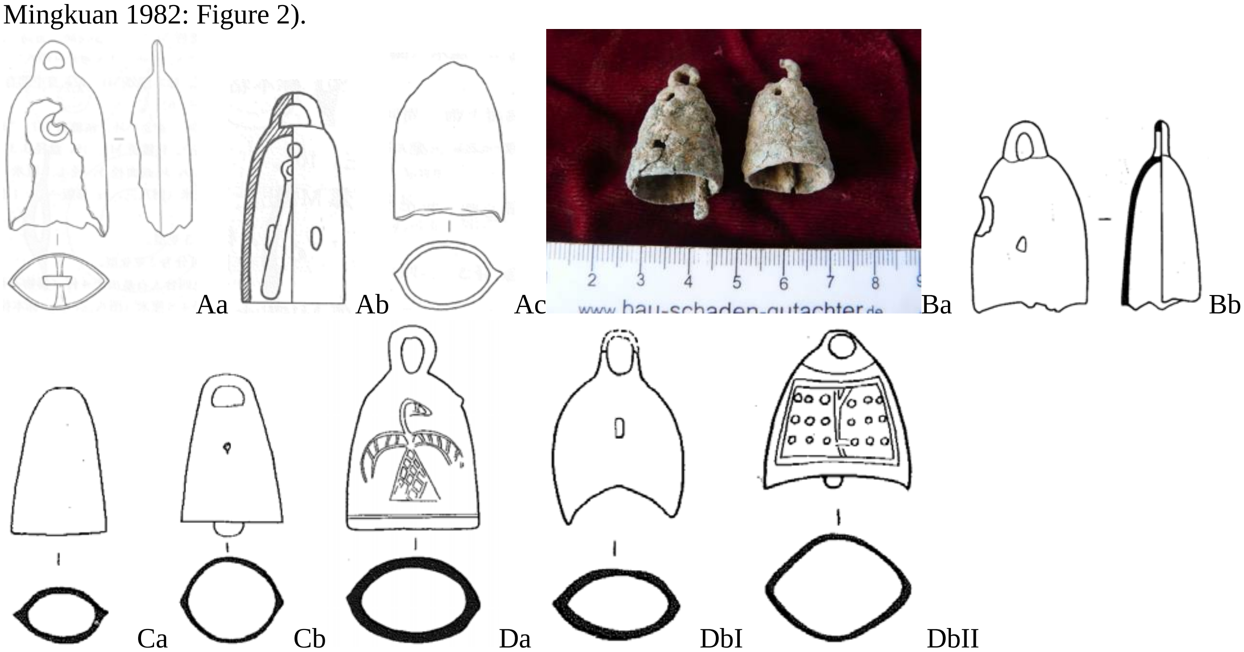
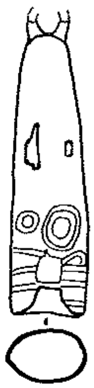
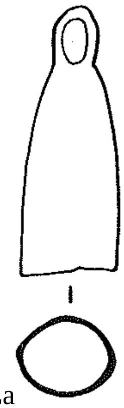
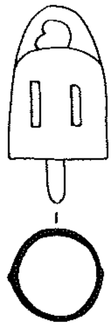


Figure 3.105: *Ling* Bell Types I: Top Row: XHGM2.4, XLKM8.80, XXJM1.12 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 82.2, 82.5, 82.8), YDZM15.1-2 (Photo by Author), YLLM6.15-2; Bottom Row: YGJC268, YGJC442, YGJC5, YGJC113, YGJC152 (Liangshan and Chengdu 2009: Figure 12.3, 82.4-5, 82.2, 83.4-5).


Ea

Eb

Fa

Fb

Figure 3.106: *Ling* Bell Types II: Top Row: YGJC89, YGJC183, YGJC570-1, YGJC597 (Liangshan and Chengdu 2009: Figure 84.1, 83.6, 84.2. 84.4).

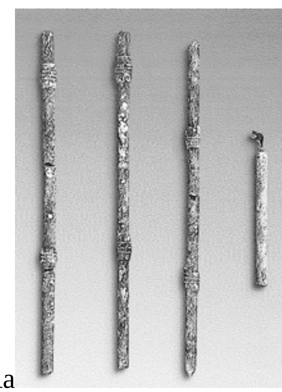
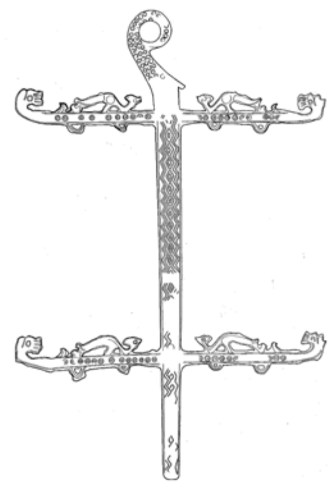

Aa

Ab

B

Figure 3.107: Staff Types: YGJC8, YGJC1013, YGJC419 (Liangshan and Chengdu 2009: Color Plate 30.2, Plate 23.3, Figure 91).

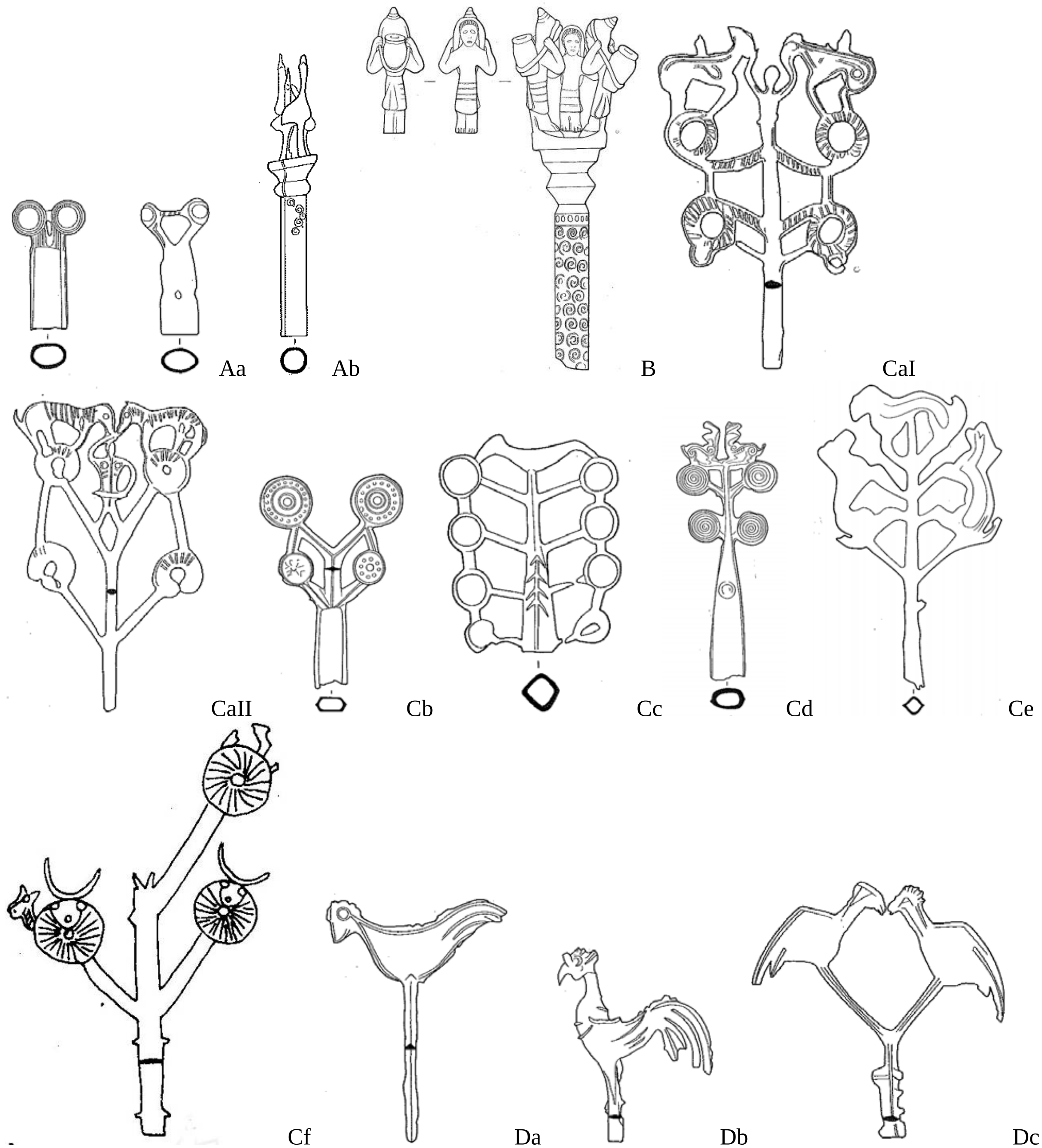
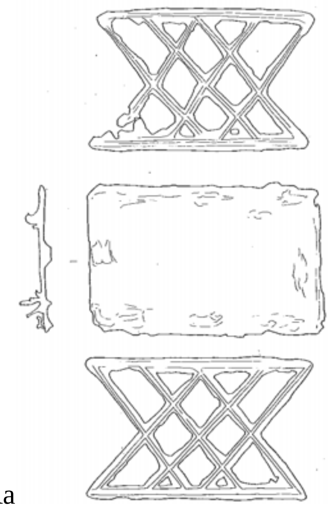


Figure 3.108: Staff Head types: Top Row: YGJC343, YGJC645, YGJC643, YGJC651; Second Row: YGJC657, YGJC28, YGJC27, YGJC328, YGJC502 (Liangshan and Chengdu 2009: Figure 94.2-3, 94.5, 93, 95.1, 97.6, 95.3, 95.4, 94.6-7); Bottom Row: HGYC80 (Tang Xiang 1996: Figure 2.4), YGJC396, YGJC735, YGJC482 (Liangshan and Chengdu 2009: Figure 113.1, 114.2, 114.8)

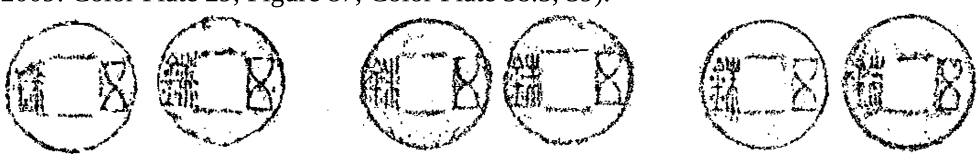

Aa

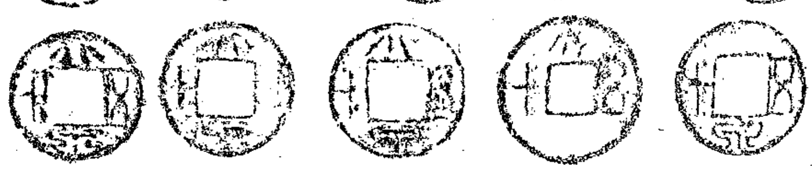

Ab


B


C

Figure 3.109: Bronze Stand Types: YGJC642, YGJC375, YGJC1012, YGJC1014 (Liangshan and Chengdu 2009: Color Plate 29, Figure 87, Color Plate 38.5, 39).


Aa


Ab


B

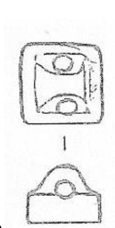

Seal

Figure 3.110: Bronze Coin Types: Top Row: ZCBM3.7, M1.4-1-3; Second Row: ZCBM3.2, M6.4-1-4 (Liangshan, Sichuan, and Zhaojuexian 2011: Figure 9.1-11); Bottom Row: YGJC1029 (Liangshan and Chengdu 2009: Figure 239.2), Seal: XLKM8.24 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 94.4).

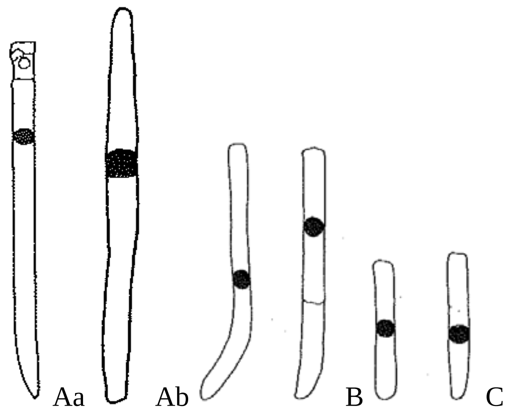


Figure 3.111: Nail Types: YLLM4.4, M6.43, M7.9, M7.6, M7.2, M7.4 (Liangshan and Chengdu 2009: Figure 7.3, 16.6, 27.5-8).

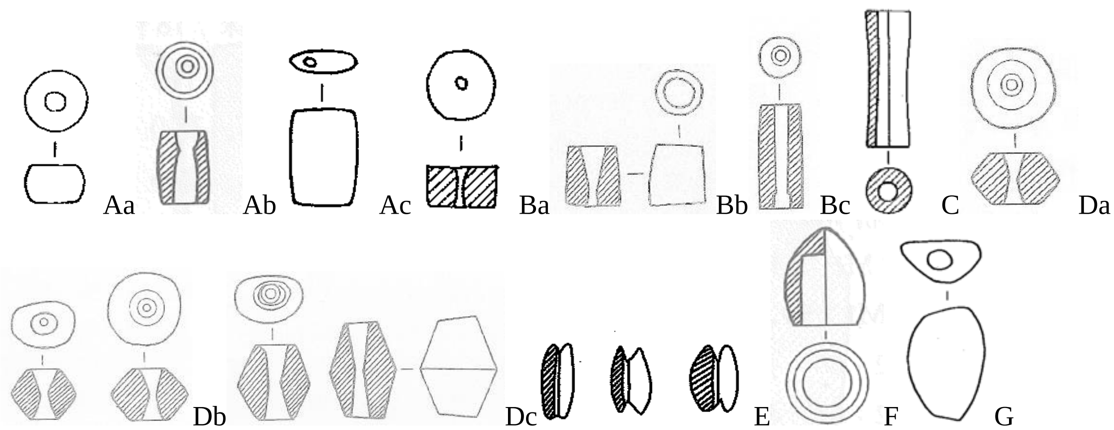


Figure 3.112: Bead Types: Top Row: YLLM4.34 (Liangshan and Chengdu 2009: Figure 8.9), XXJM1.44 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 94), YLLM4.34-1, M6.54 (Liangshan and Chengdu 2009: Figure 8.10, 16.10), DARM4.6, XWNM2.1 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 94.20, 91.23), HGJM2.3 (Chengdu, Sichuan, and Liangshan 2010: Figure 11.2), DGYM2.3; Bottom Row: MWQM1.84, DGYM2.2, BBM1.76, DARM3.3 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 94.26, 94.24-25, 94.21-22), ZCBM1.5 (Liangshan, Sichuan, and Zhaojuexian 2011: Figure 8.5), BBM1.90 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 94.34), YLLM11.21 (Liangshan and Chengdu 2009: Figure 25.2).

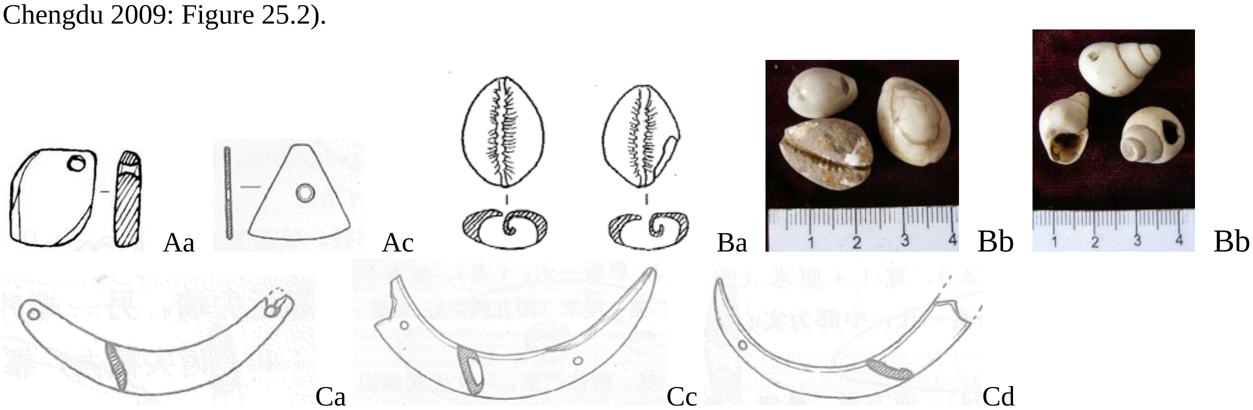


Figure 3.113: Pendant Types: ZJEM2.1 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 13.4)k, XWNM2.5 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 91.26), YGJC37038 (Liangshan and Chengdu 2006: Figure 124.2-3), YDZM77.1-3, YDZM94.7-9 (Photo by Author), PXBM4.40, M2.28, M1.58 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 94.3, 94.1-2).

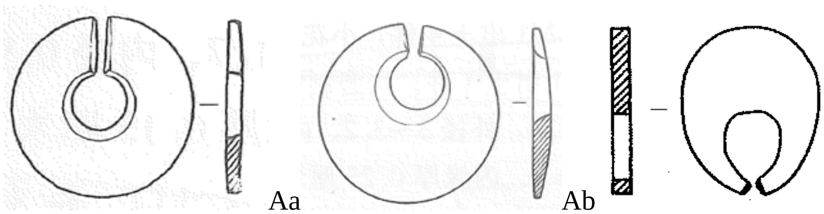


Figure 3.114: Slit-Ring Types: XBBM1.86, XXJM1.36 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 10, 91.1), YLLM11.17 (Liangshan and Chengdu 2009: Figure 25.5).

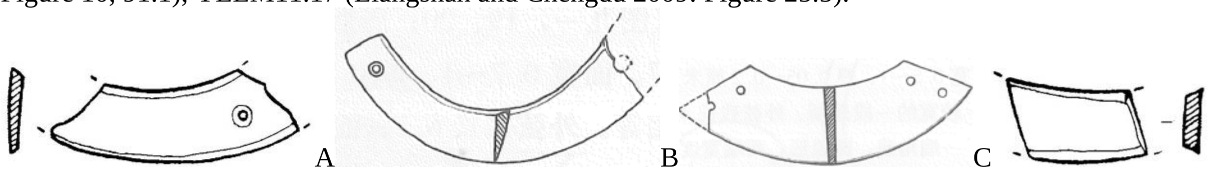


Figure 3.115: Ring-Segment Types: ZJEM1.4 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 13.2), XBBM1.87, XLKM6.18 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 91.21, 91.22), ZJEM1.5 (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 13.3).

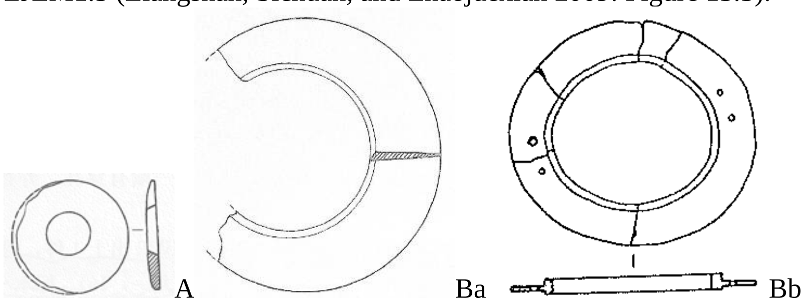


Figure 3.116: Closed Ring Types: XHGM4.13, PXBM1.29 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 91.17, 91.16), HFJM3.3 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 13.9).

Figure 3.117: Hair Needle Types: YDZM10.1 (Yunnansheng, Lijiangshi, and Lijiangshi 2010), YDZM62.4 (Photo by Author), XLKM6.19 (Sichuansheng, Liangshanzhou, and Xichangshi 2006a: Figure 91.29).

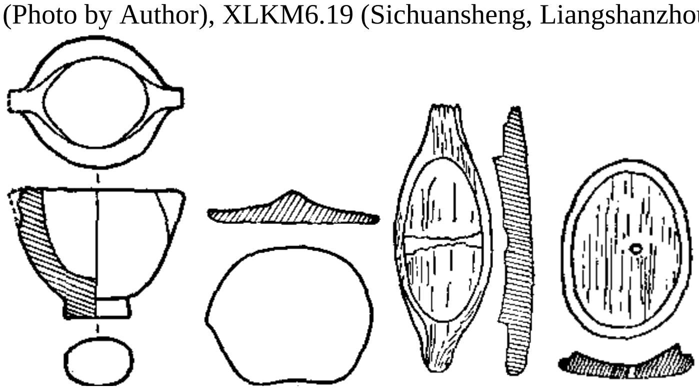


Figure 3.118: Wooden Bowl, Lid, Oval Object, and Quiver Bottom (NDXM5.11, M5.2, M5.5, M5.3 (Yunnansheng Bowuguan 1983: Figure 7.2, 7.5, 7.3, 7.7).

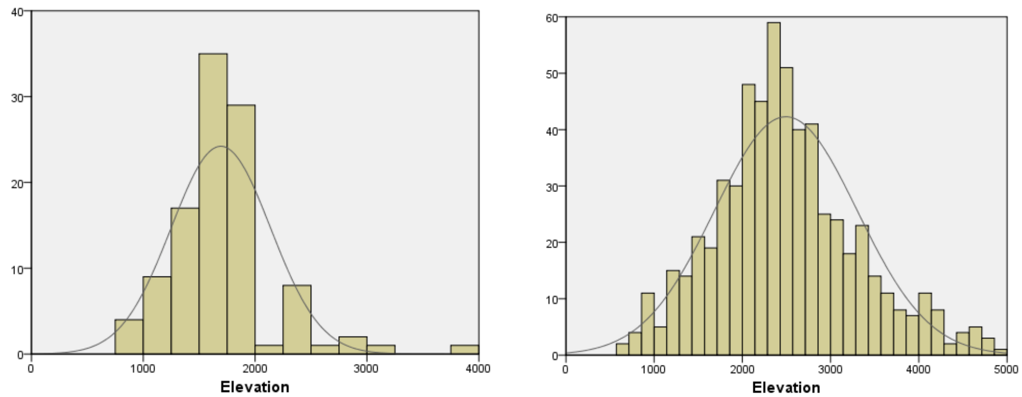


Figure 4.1: Comparison of Elevation at Settlement Sites (Left) vs. Random Points (Right).

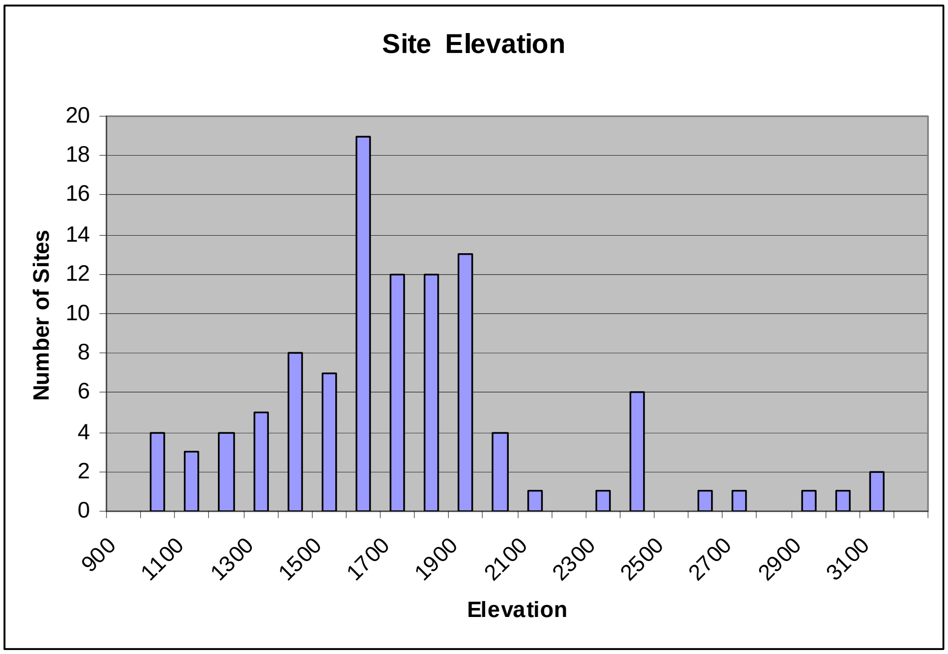


Figure 4.2: Elevation at Settlement Sites in the Research Area.

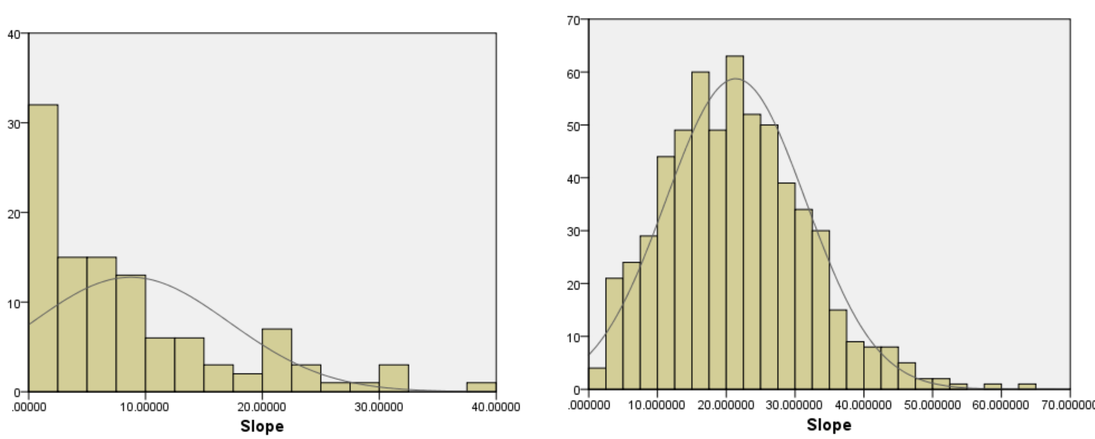


Figure 4.3: Slope at Settlement Sites (Left) vs. Non-Sites (Right).

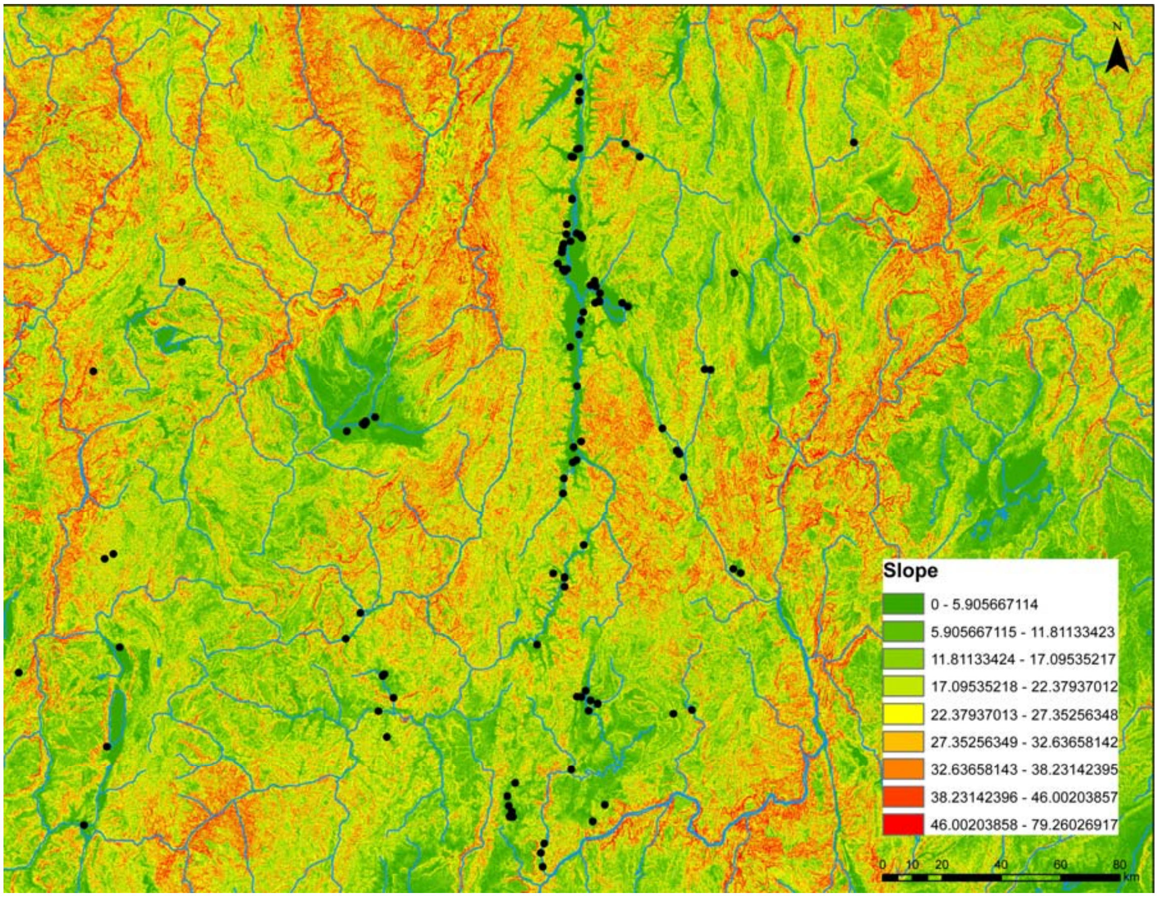


Figure 4.4: Settlement Sites in Relation to Slope.

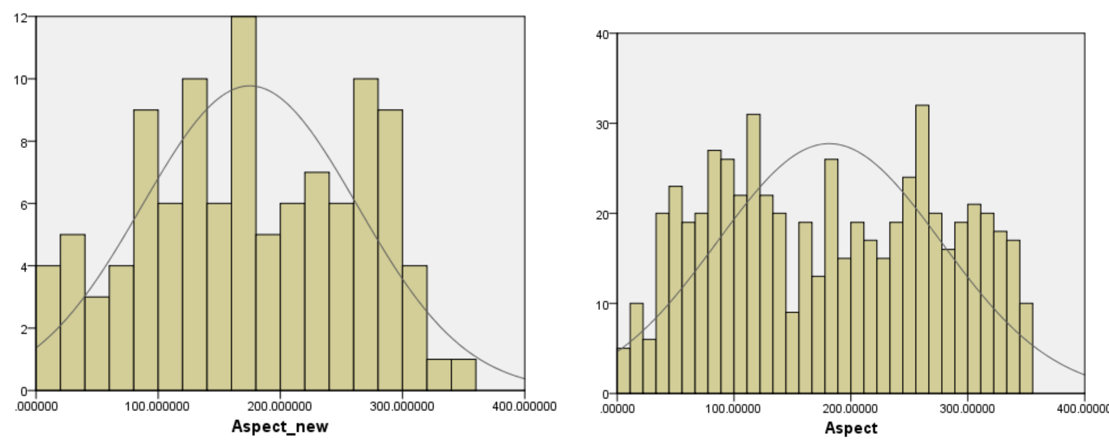


Figure 4.5: Aspect at Settlement Sites (Left) vs. Non-Sites (Right).

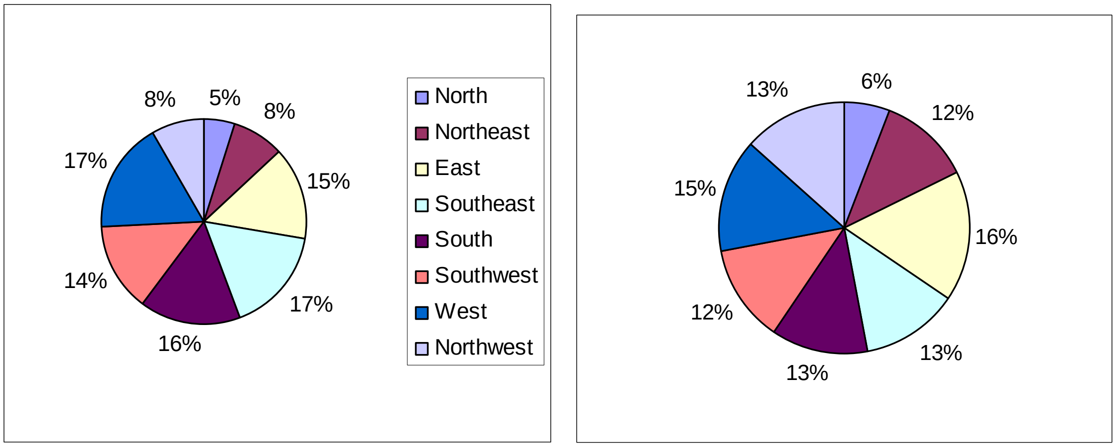


Figure 4.6: Distribution of Sites by Slope Orientation (Aspect) for Settlement Sites (Left) and Random Points (Right).

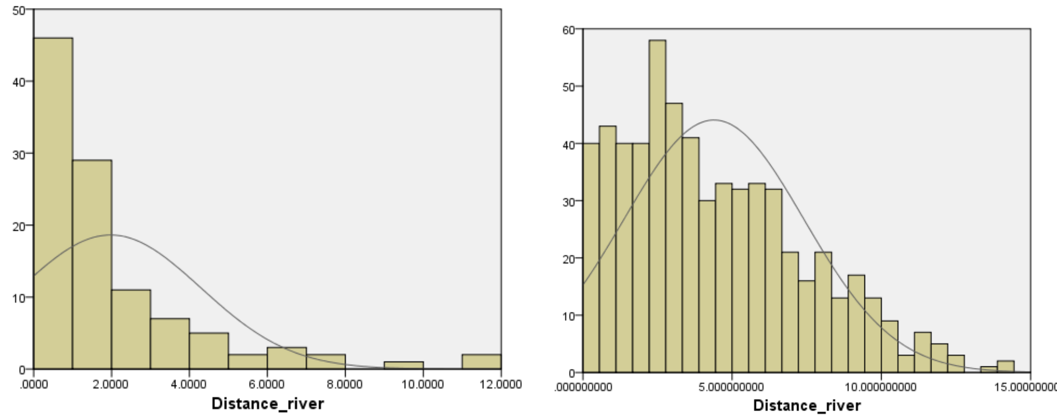


Figure 4.7: Distance to Rivers for Settlement Sites vs. Non-Sites.

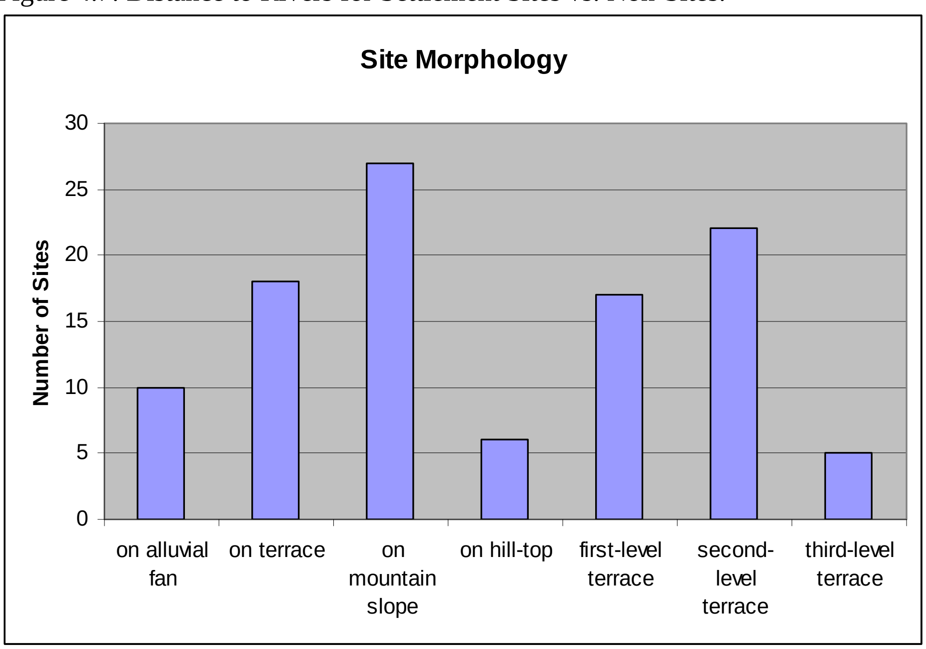


Figure 4.8: Site morphology by Type and Frequency.

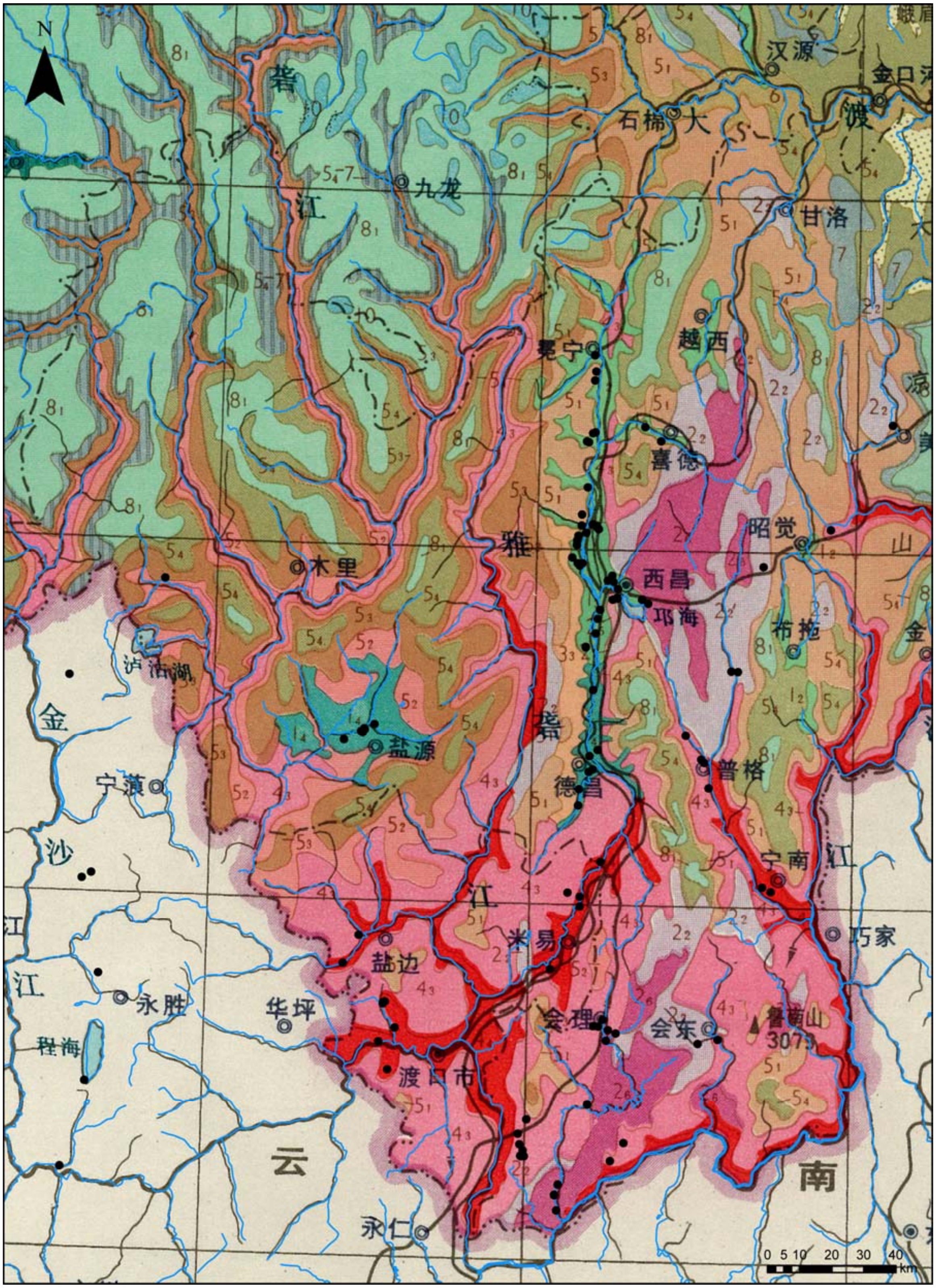


Figure 4.9: Distribution of Settlement Sites in Relation to Soil Quality (1_4 yellow-red alluvial soil; 2_2 grey-brown clay soil; 2_6 red-purple clay soil; 4_3 yellow-red soil; 4_4 drab red earth; 5_1 yellow-brown mountain soil; 5_2 red-brown mountain soil; 53 brown mountain soil beneath tree cover: 8_1 mountain meadow; after Sichuansheng Cehuiju 1981:29-30).

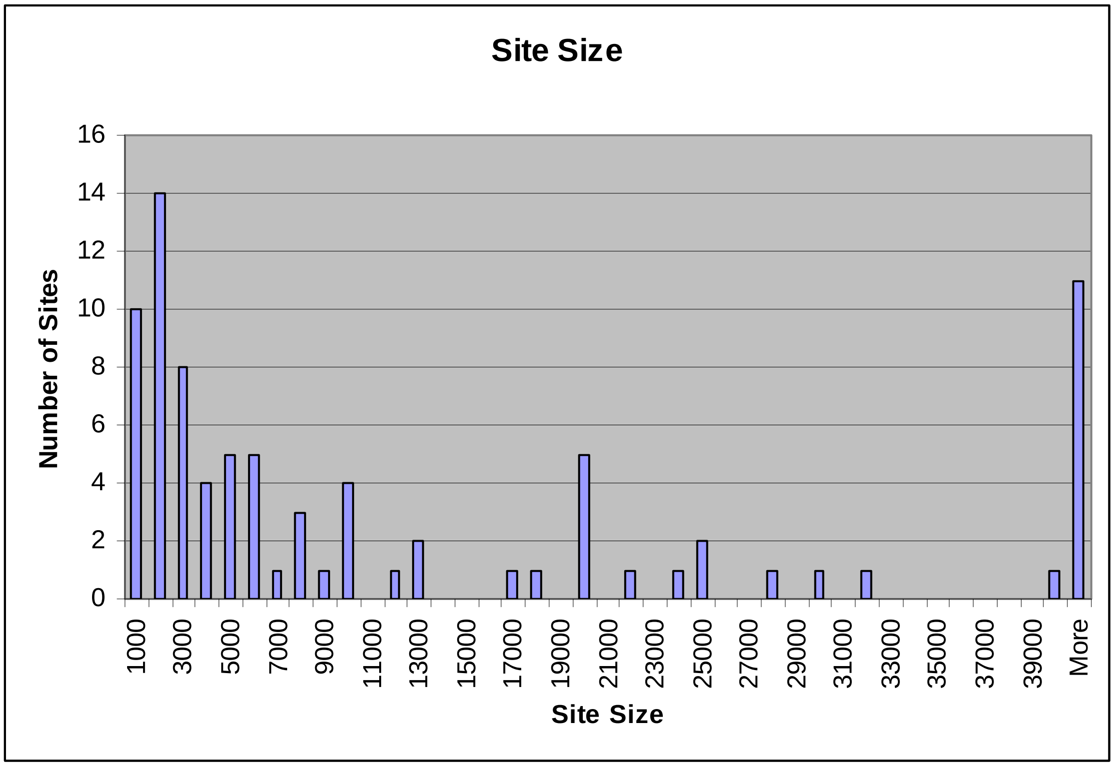


Figure 4.10: Overall Site Size Distribution.

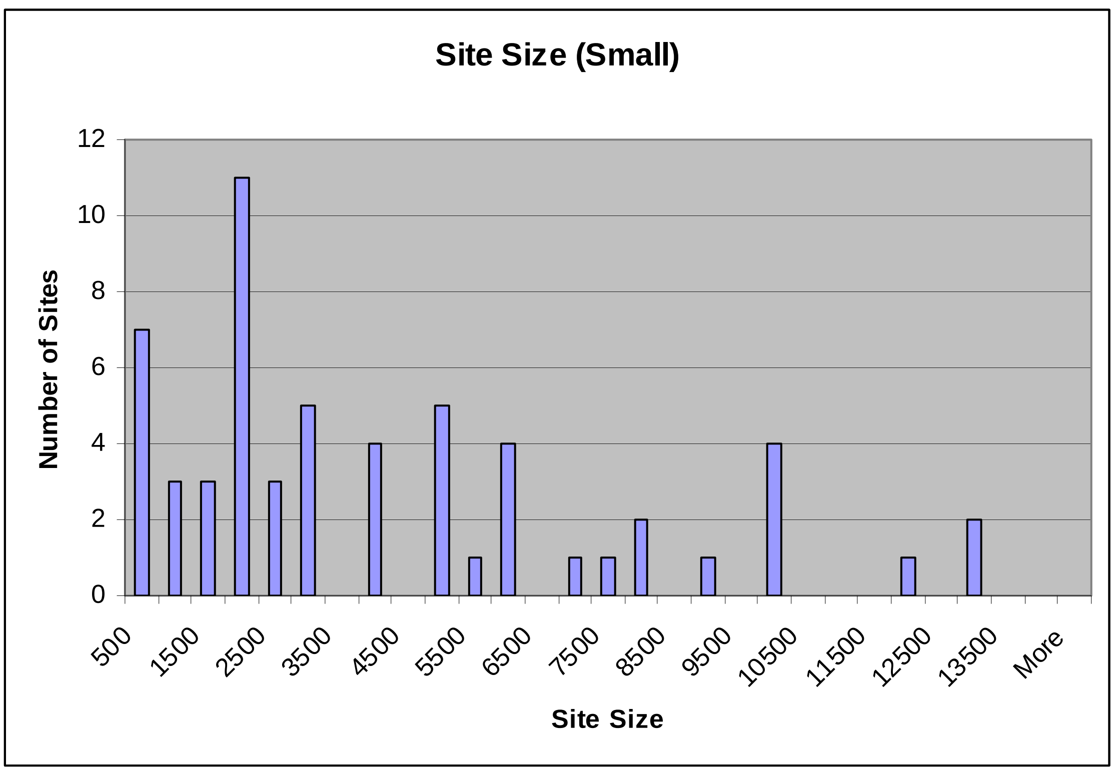


Figure 4.11: Site Size Distribution for Small Sites (< 15,000 m^2).

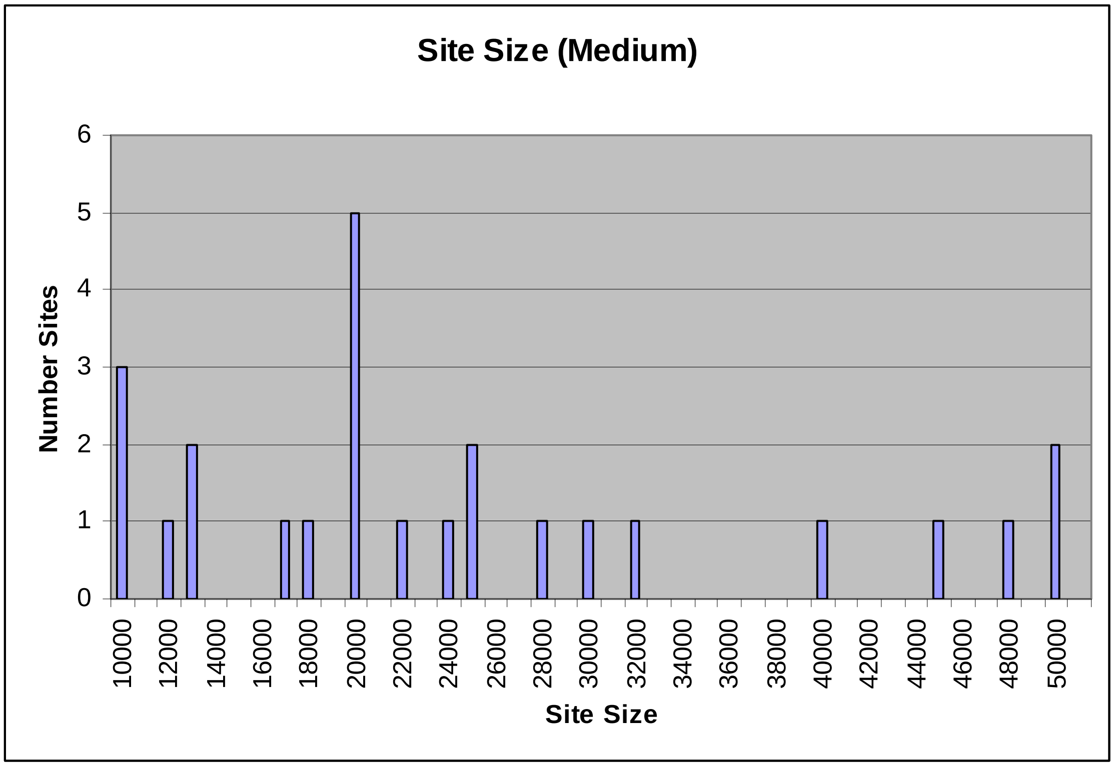


Figure 4.12: Site Size Distribution for Medium- to Large-Size Sites (10,000-500,000 m^2).

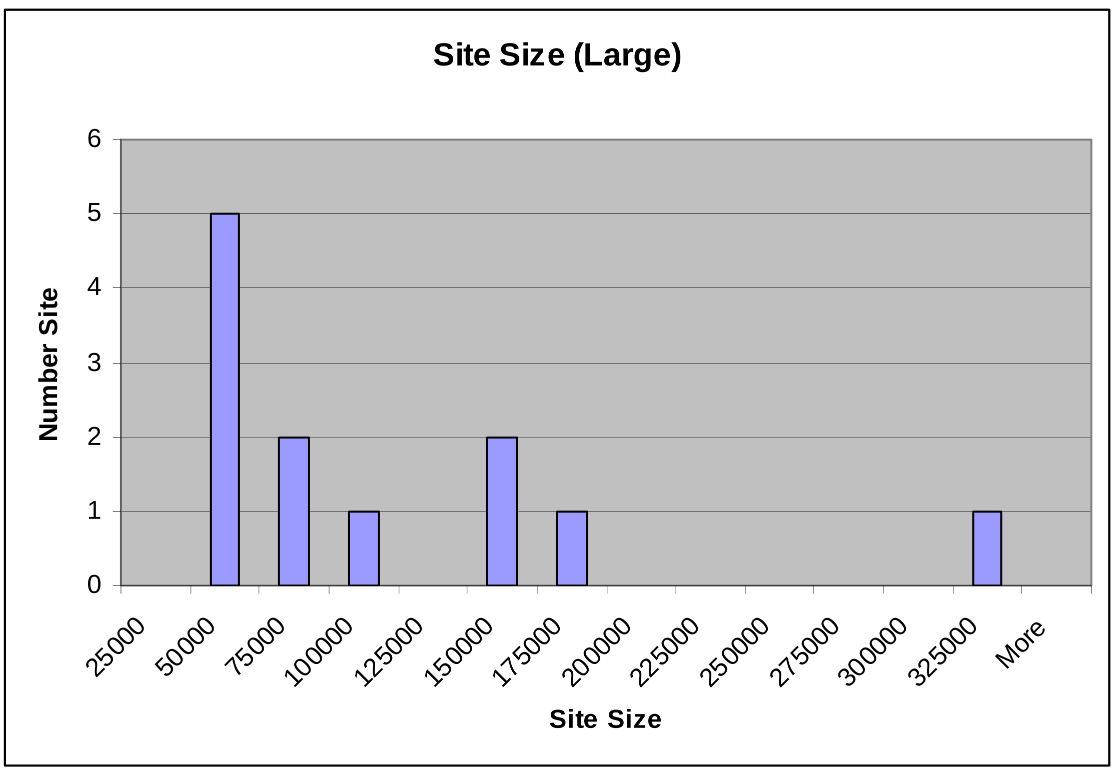


Figure 4.13: Site Size Distribution for Large and very Large Sites (250,000-325,000 m^2).

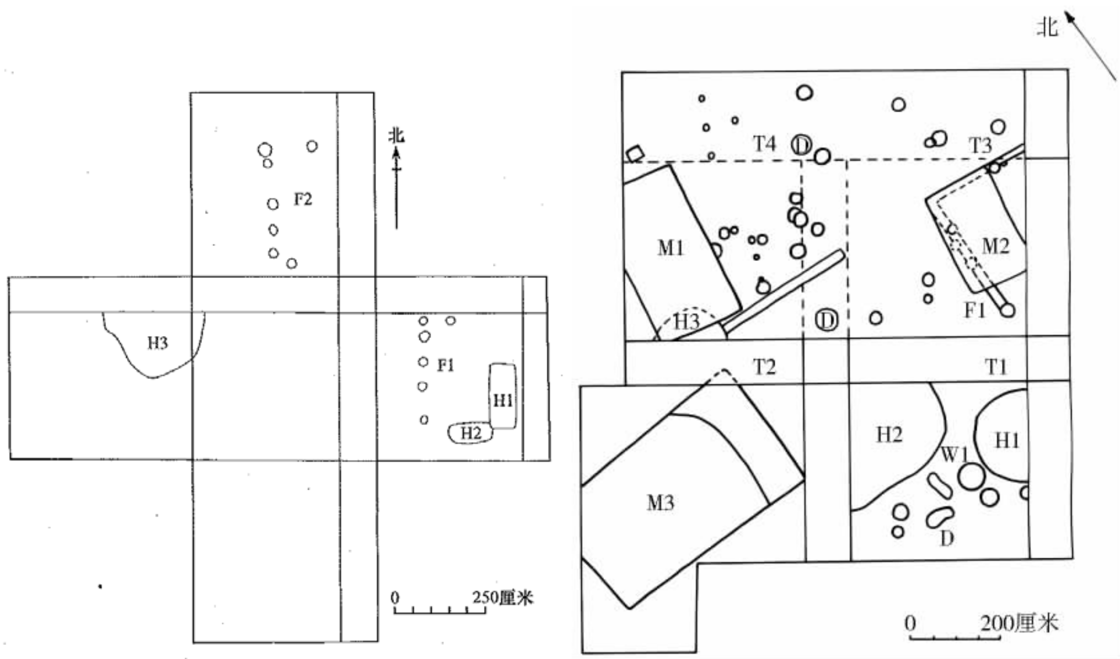


Figure 4.14: Plan of the Settlement Features discovered in the 2004 Henglanshan Excavation (Chengdu Kaogu Faxian 2004:21-22, Figure 3) and at Xichang Qimugou (Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 2).

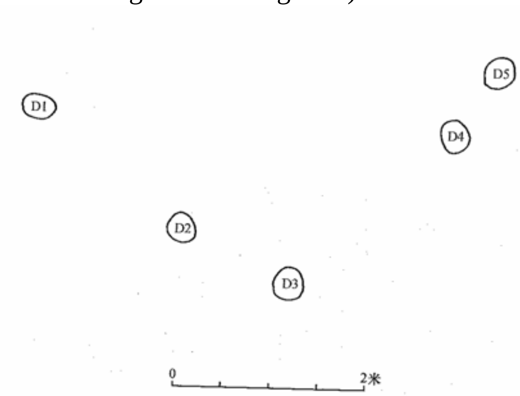


Figure 4.15: Xichang Ma'anshan F1 (Chengdu, Liangshan, and Xichang 2007: Figure 7-9).

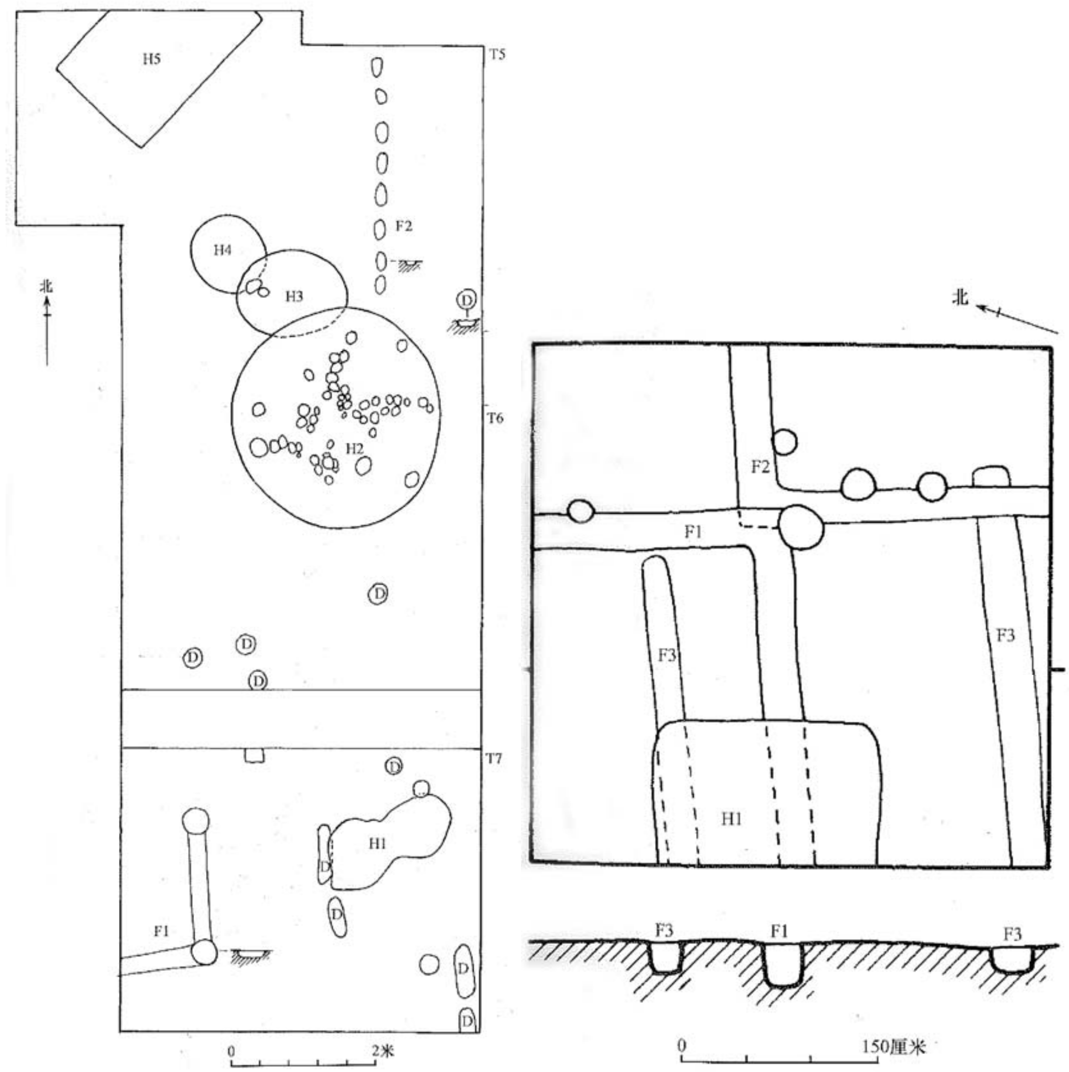


Figure 4.16: Site plan of T5-7 at Huili Dongzui (Chengdu Wenwu et al. 2008: Figure 3) and Xichang Mimilang below layer 5 (Liangshan, Chengdu, and Xichang 2006: Figure 5).


Figure 4.17: Yongsheng Duizi F1 and F8 (photographs by Yongsheng Wenguansuo).

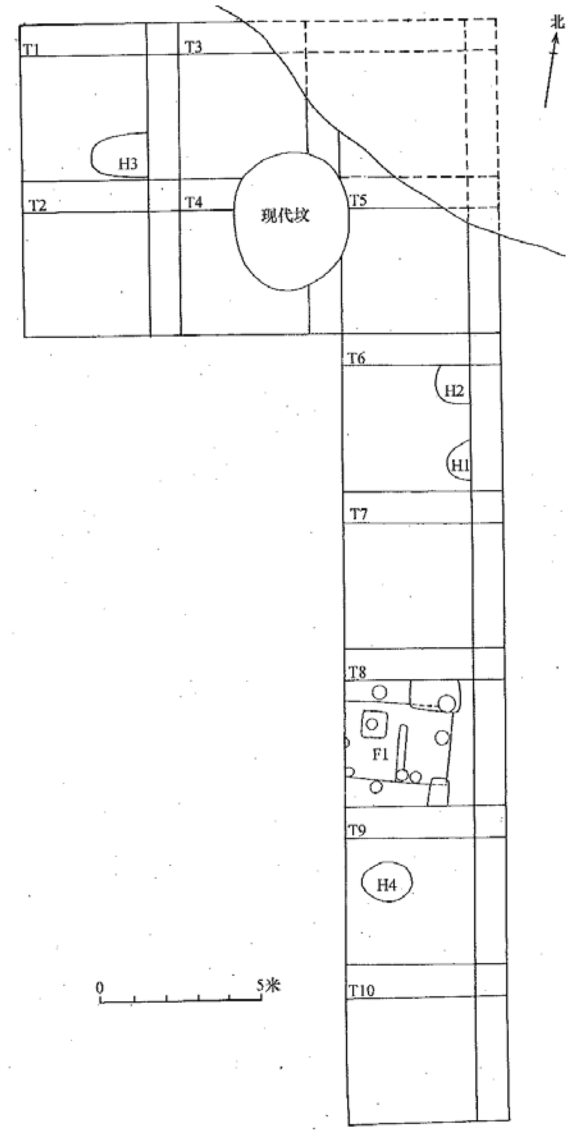


Figure 4.18: Dechang Dongjiapo Layer 3 (Zhou Zhiqing 2011: Figure 2).

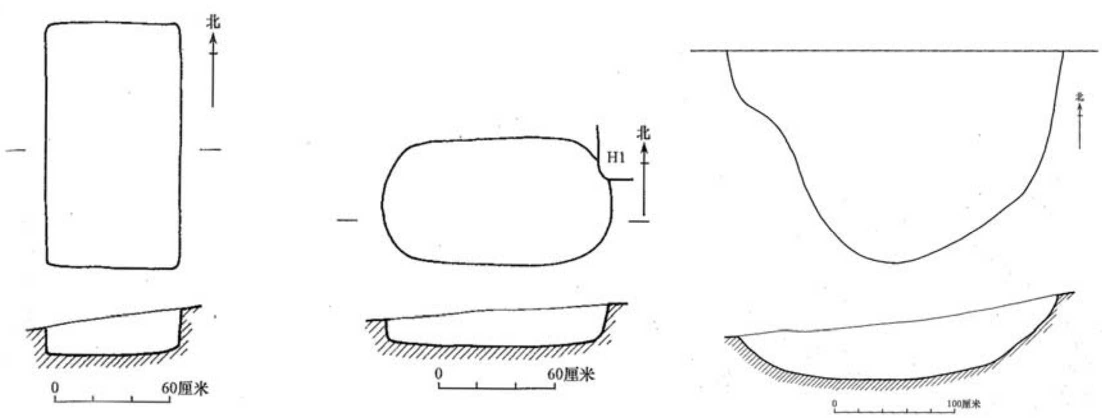


Figure 4.19: Plan of pit H1, H2, and H3 at Xichang Henglanshan (Chengdu Kaogu Faxian 2004:23-24, Figure 4, 5, and 6).

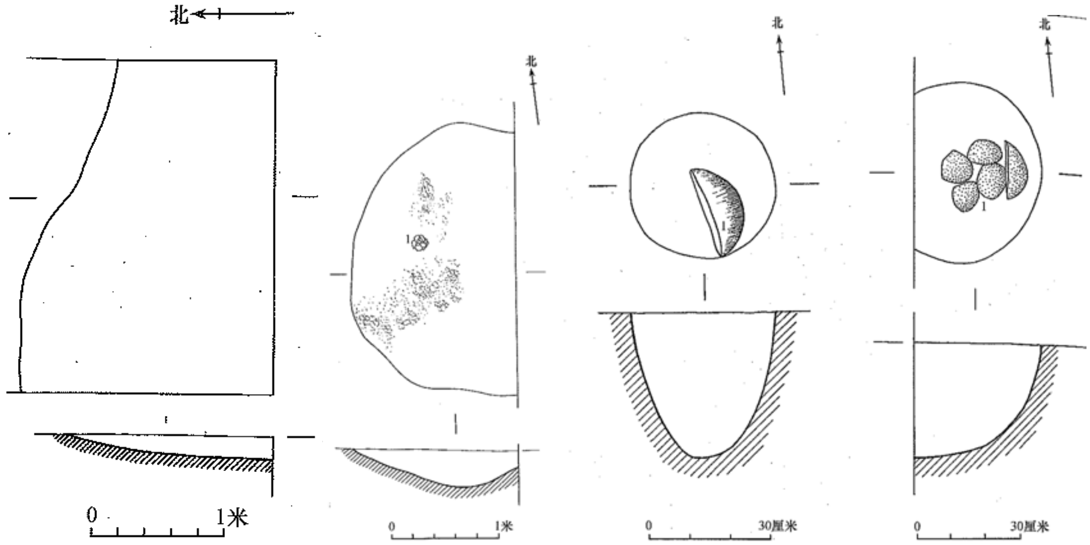


Figure 4.20: Plan of Dechang Wangjiaping H1-2, D1 and D2 (Chengdu Wenwu et al. 2009: Figure 4, 6, and 8).

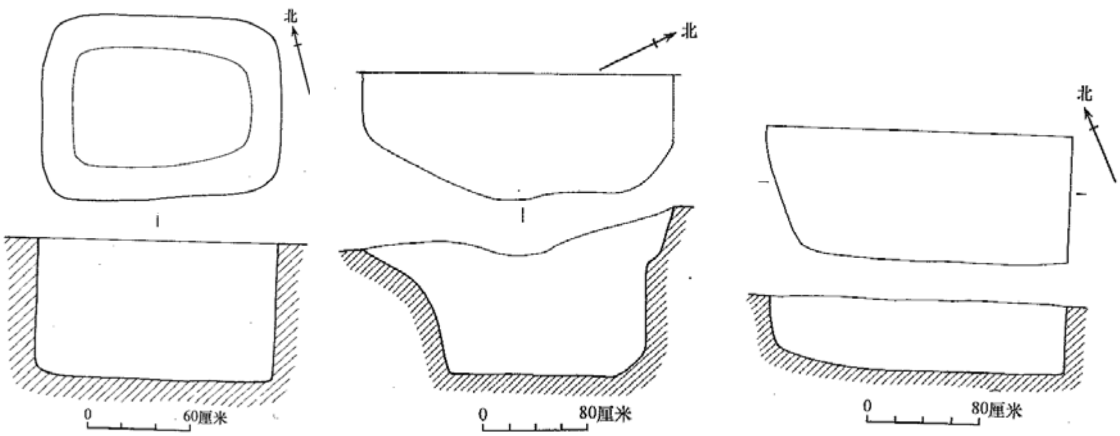


Figure 4.21: Xichang Ma'anshan H1, H4, and H5 (Chengdu, Liangshan, and Xichang 2007: Figure 10, 13, and 15).

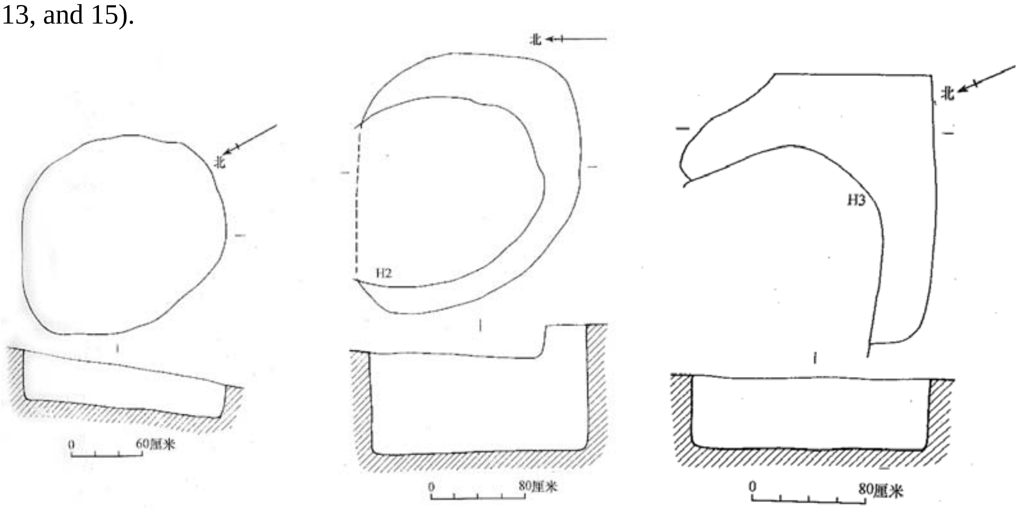


Figure 4.22: Xichang Ma'anshan H2, H5, and H6 (Chengdu, Liangshan, and Xichang 2007: Figure 11-12 and 14).

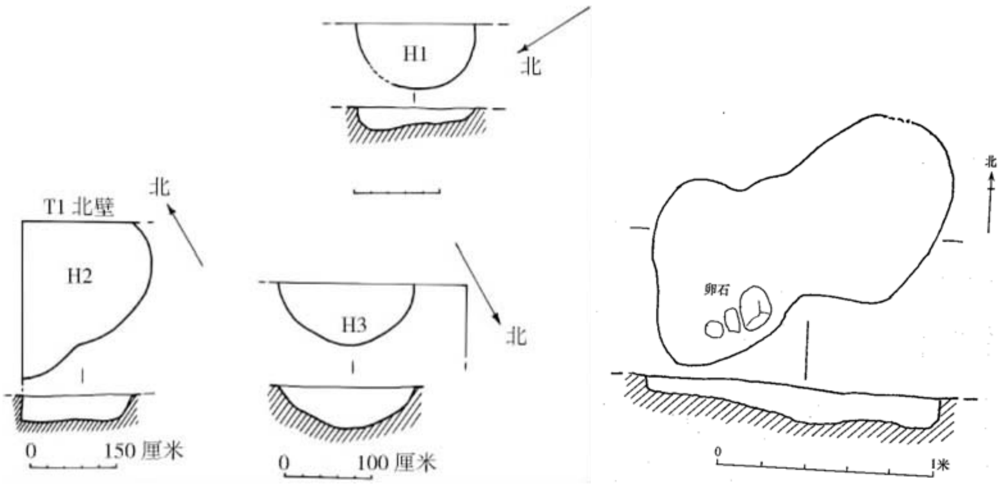


Figure 4.23: Xichang Qimugou H1-3 and F1 (Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 10-11) and Huili Dongzui H1 (Chengdu Wenwu et al. 2008: Figure 4).

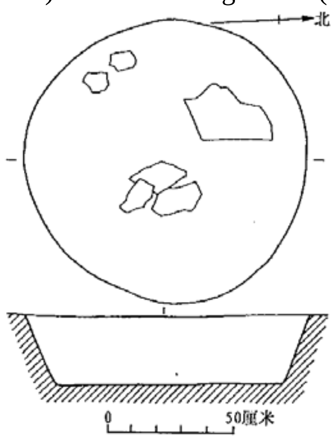


Figure 4.24: Huili Fenjiwan K2 (Huilixian Wenwu et al. 2004: Figure 10).

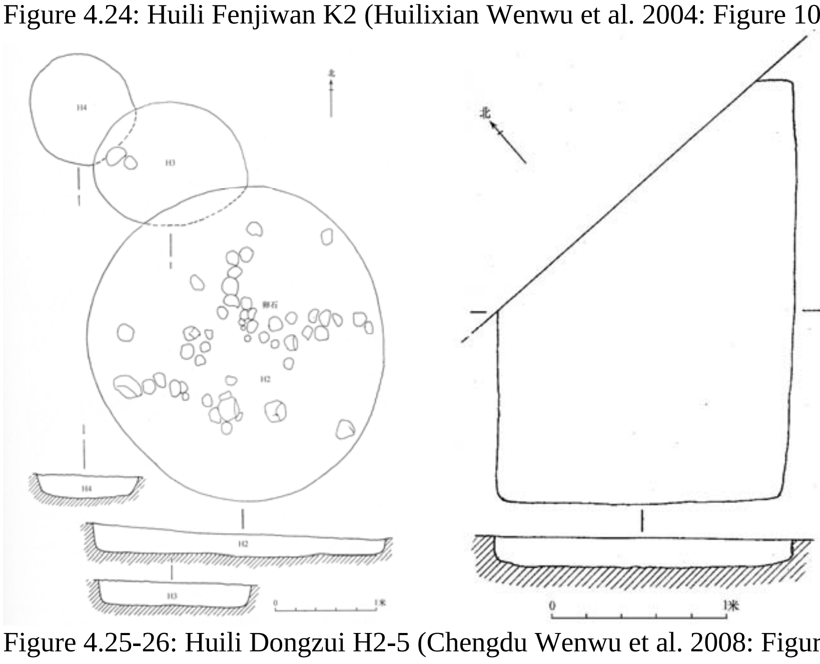


Figure 4.25-26: Huili Dongzui H2-5 (Chengdu Wenwu et al. 2008: Figure 6 and 10).

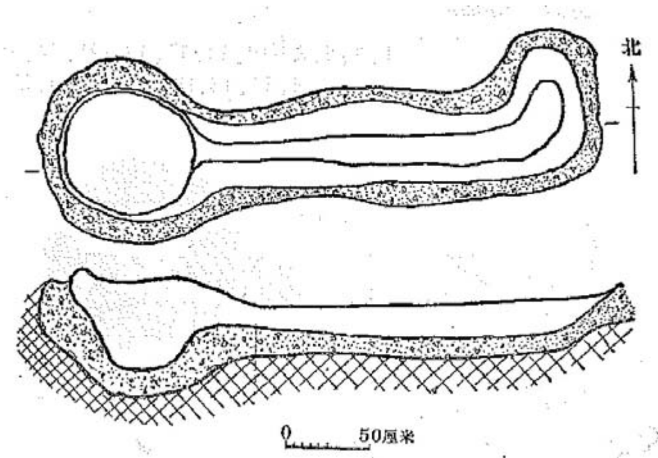


Figure 4.27: Kiln BY1 at Xichang Lizhou (Lizhou 1980: Figure 4).

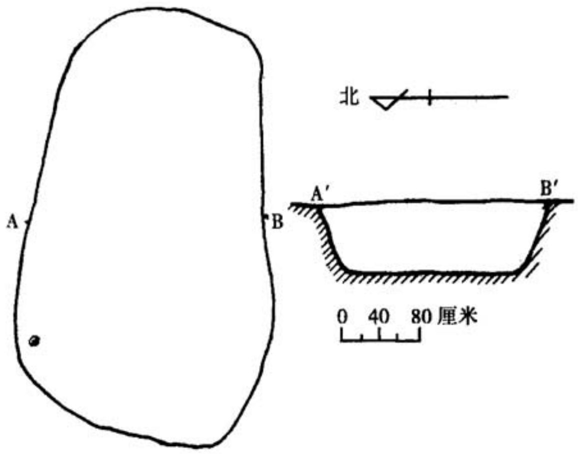


Figure 4.28: Xichang Maliucun H1 (Sichuansheng, Liangshan, and Xichangshi 2006b: Figure 1).

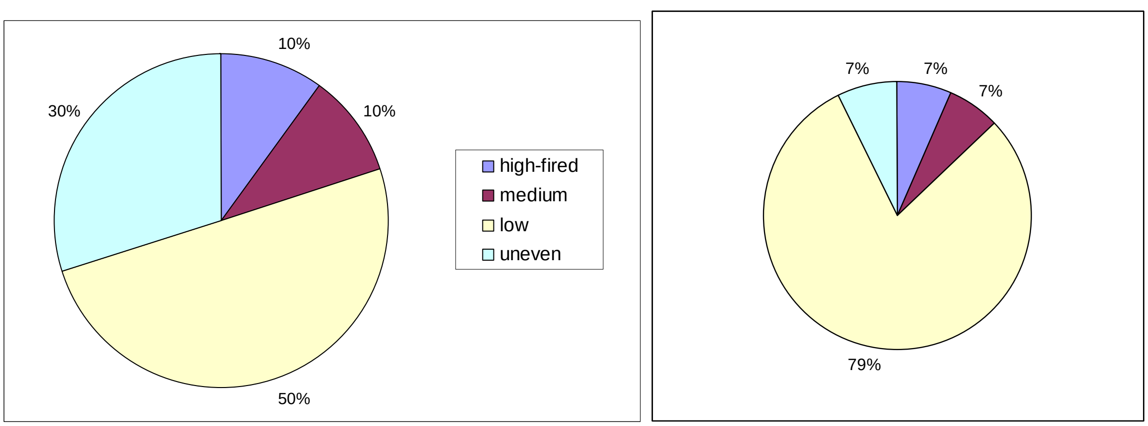
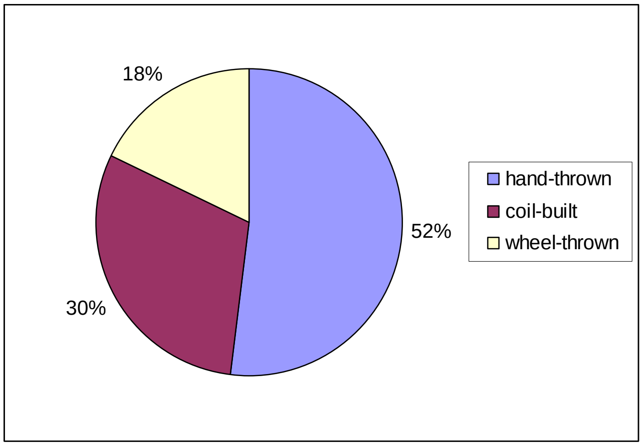


Figure 4.29: Relative Frequency of different Firing Temperatures by Presence/Absence by Site (Left) and Number of Vessels over all Settlement Sites (Right).



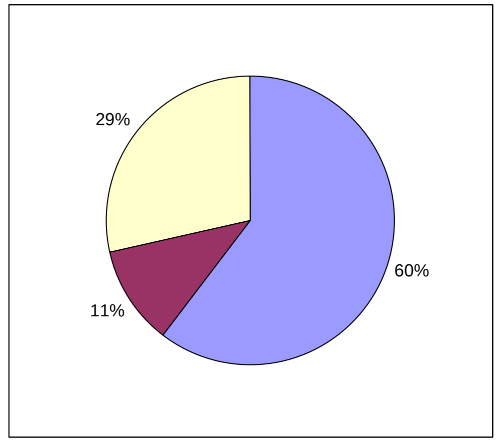
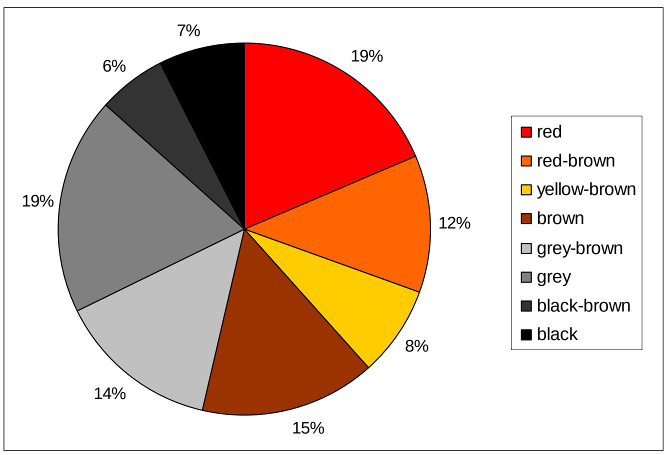


Figure 4.30: Frequency of Different Forming Techniques for Ceramics at Settlement Sites, both by general Presence/Absence (Left) and Number of Vessels (Right).



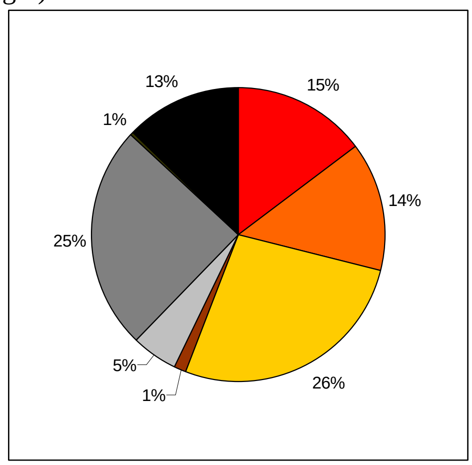


Figure 4.31: Frequency of Different Colors for Ceramics at Settlement Sites, both by Presence/Absence (Left) and Number of Vessels (Right).

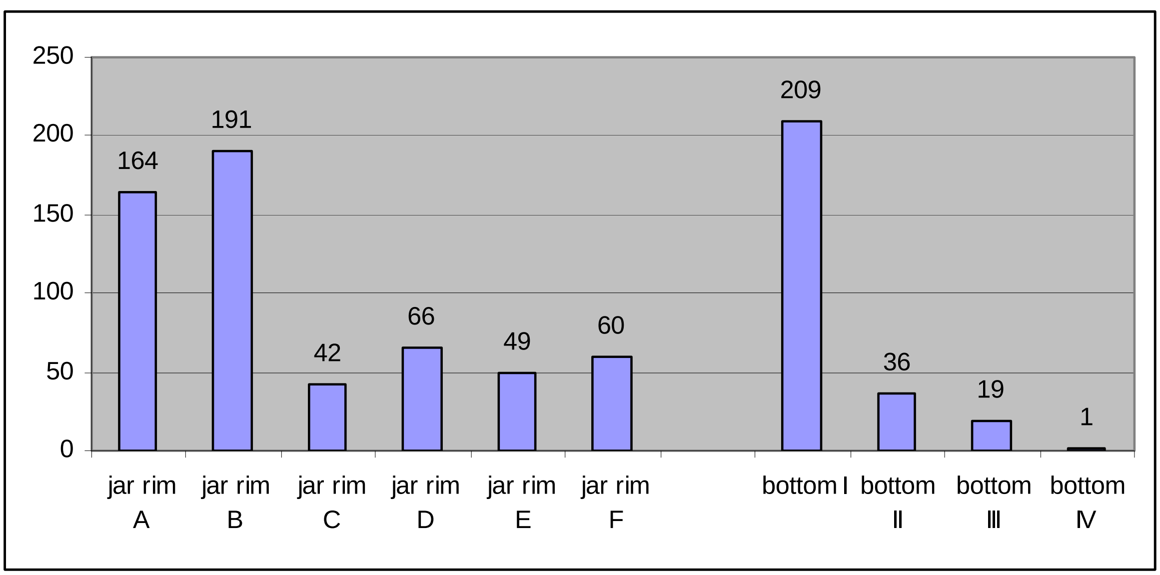


Figure 4.32 Frequency of Different Rim and Bottom Forms at Settlement Sites.

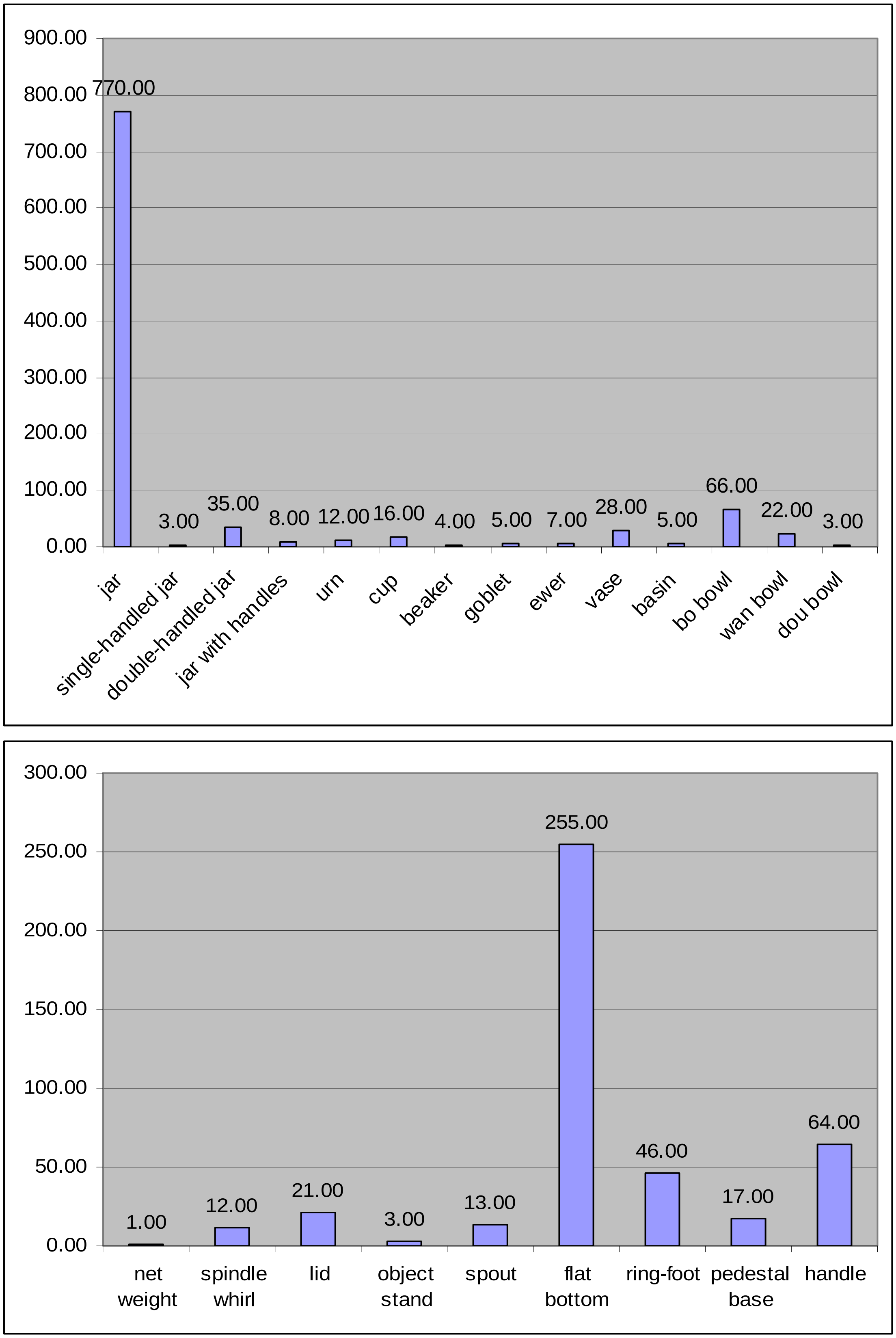
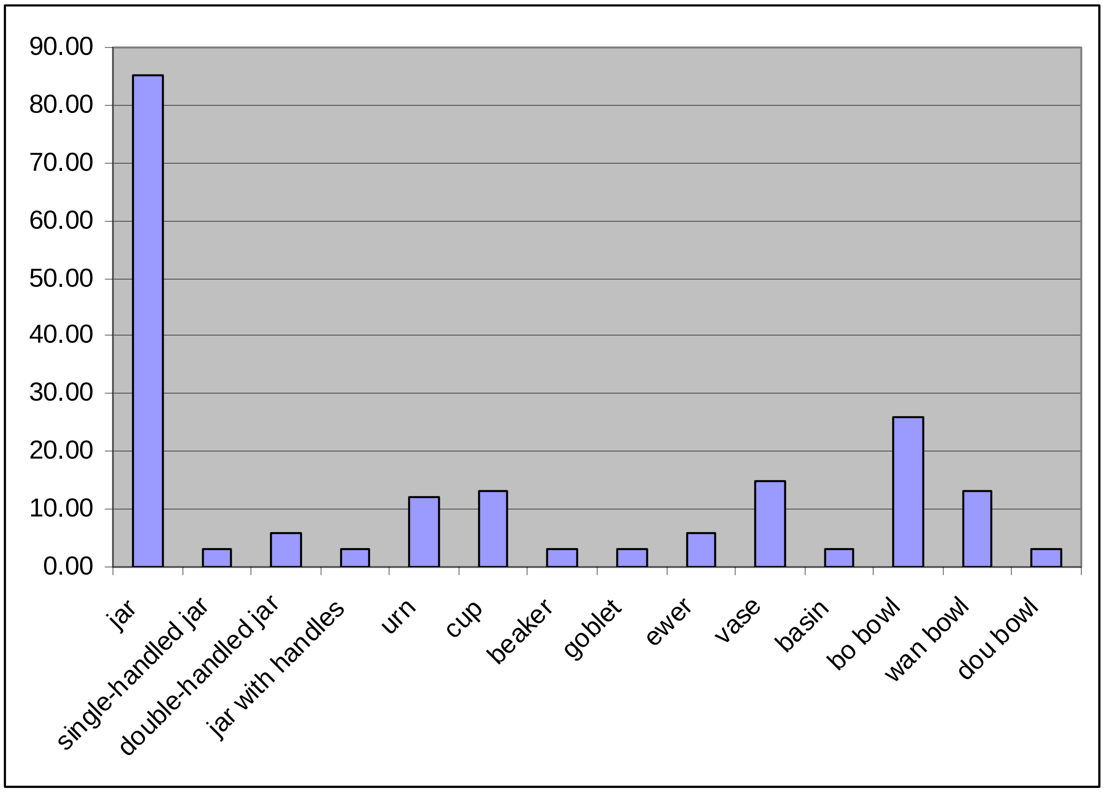


Figure 4.33: Number of Different Kinds of Ceramic Objects found at Settlement Sites.



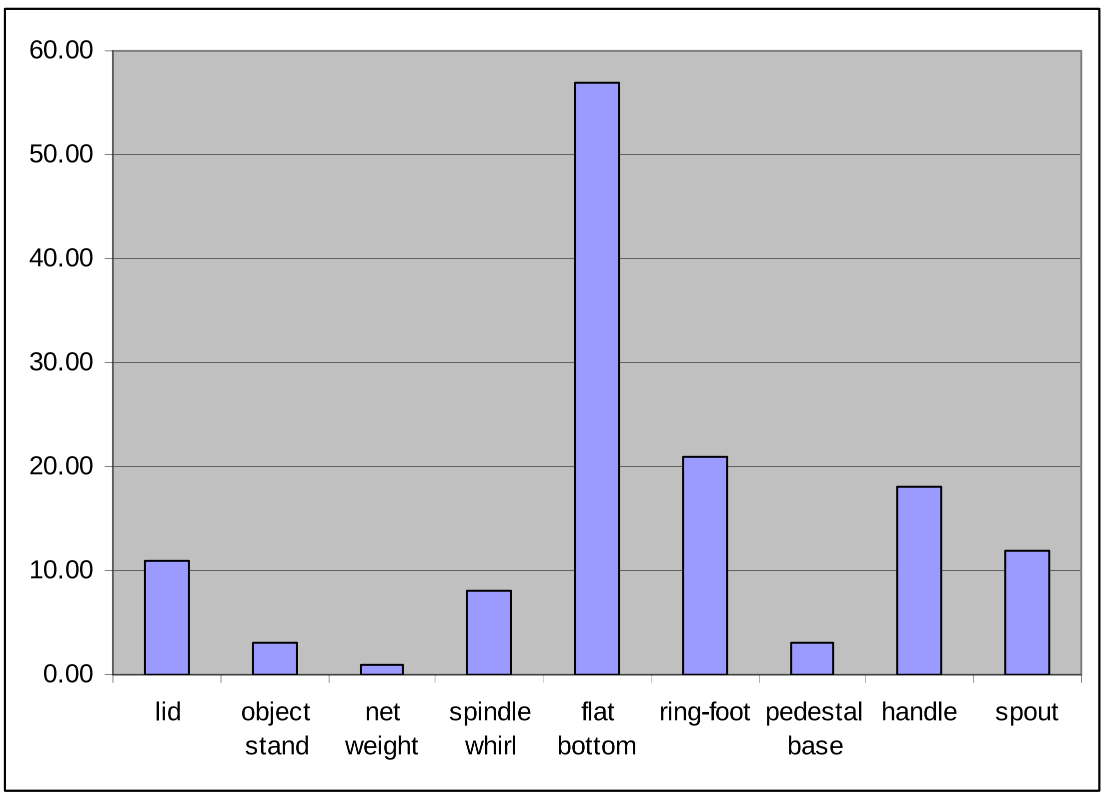


Figure 4.34: Frequency of Different Kinds of Ceramic Objects at Settlement Sites (by Presence/Absence.

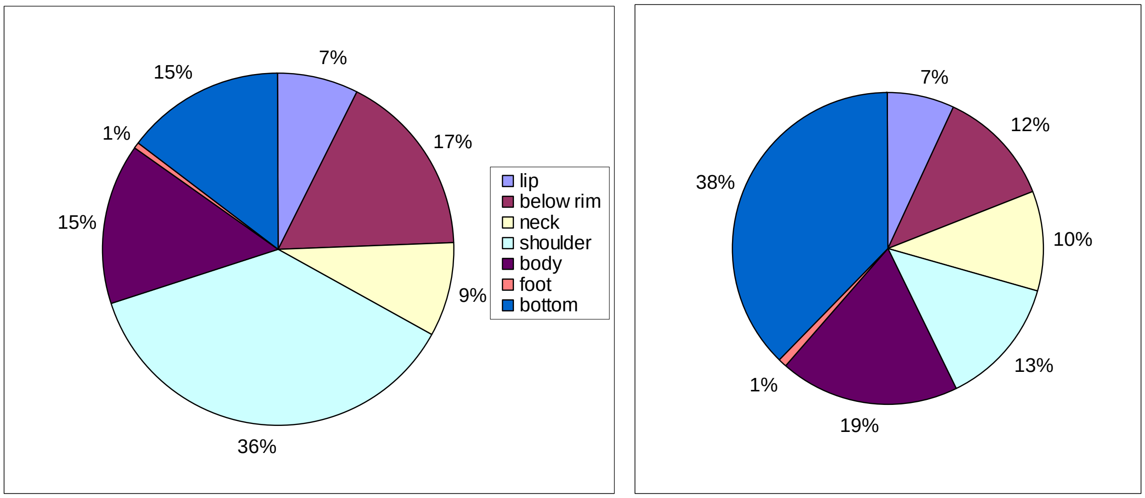


Figure 4.35: Frequency of Decoration Placement by Presence/Absence (Left) and Absolute Number of Vessels as reported (Right).

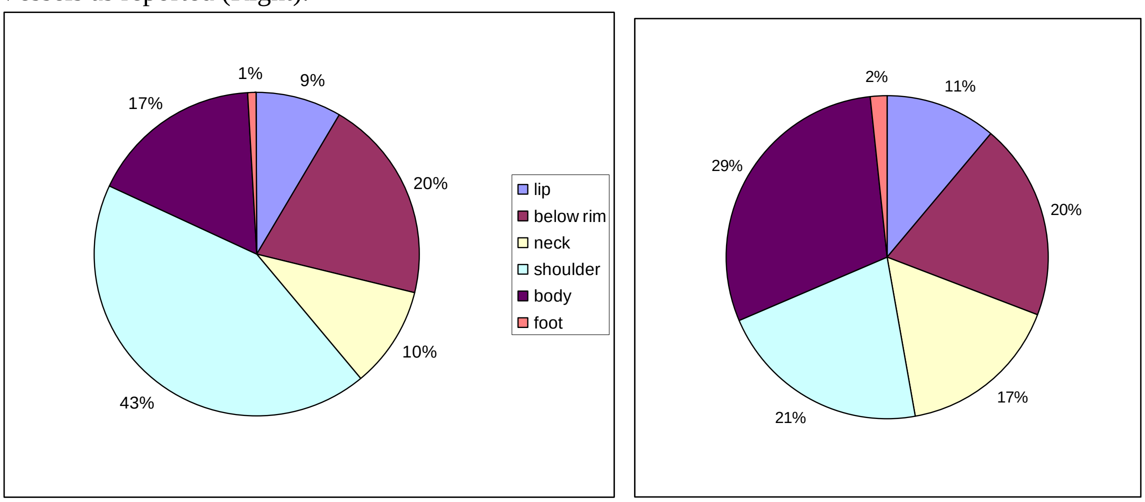


Figure 4.36: Frequency of Decoration Placement by Presence/Absence (Left) and Absolute Number of Vessels as reported (Right) under exclusion of Bottom Decoration.

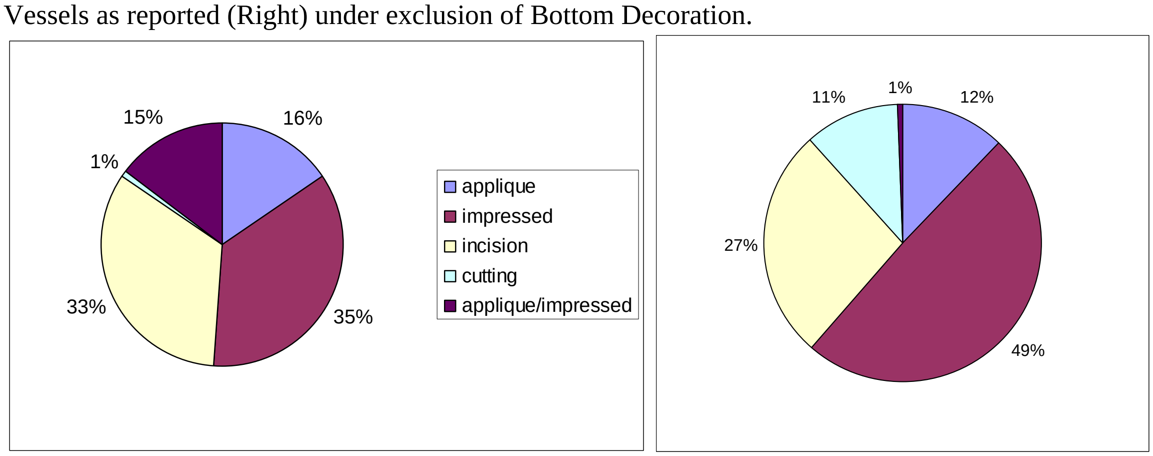


Figure 4.37: Frequency of Decoration Techniques by Presence/Absence (Left) and Absolute Number of Vessels as reported (Right).

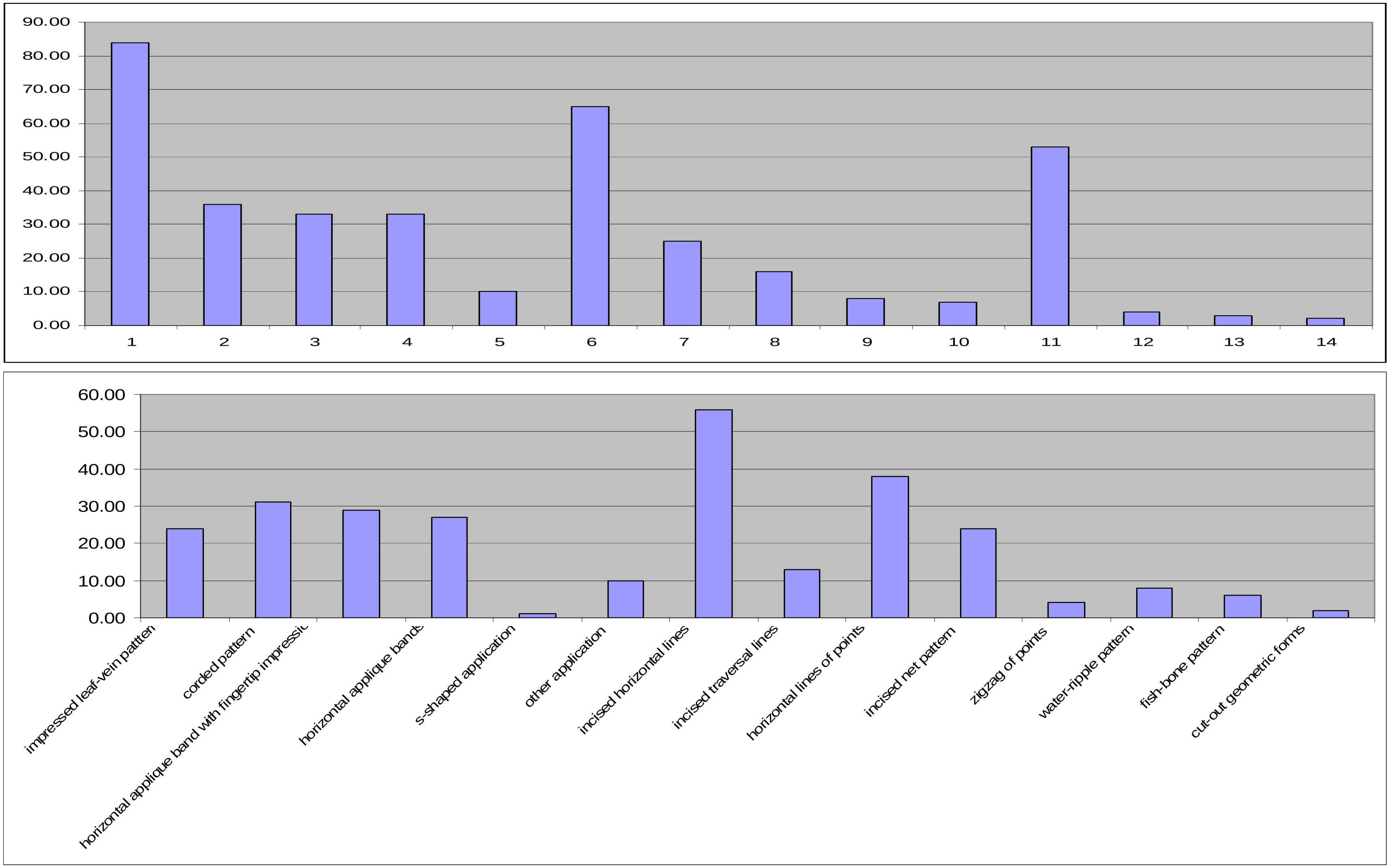
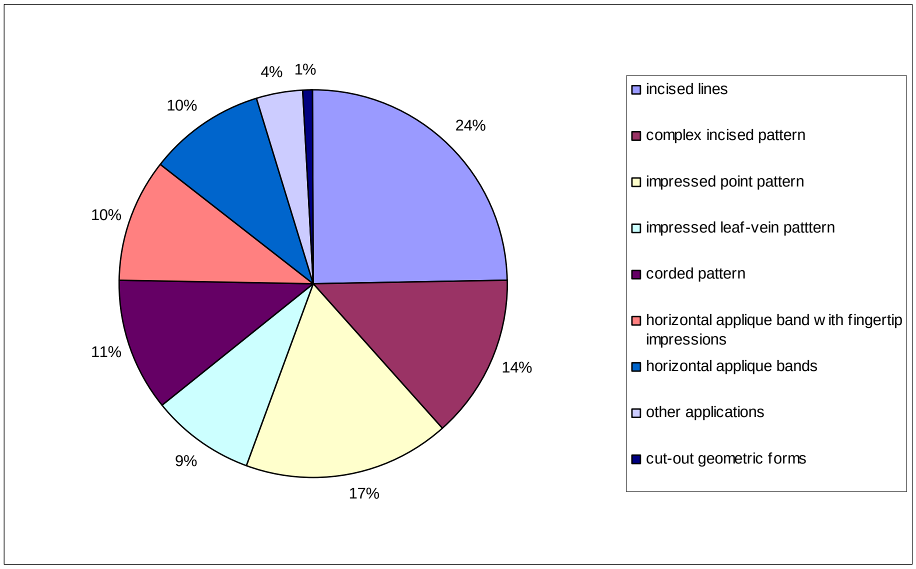


Fig. 4.38: Frequency of Decorative Programs by Absolute Number of Vessels as reported (Top) and by Presence/Absence (Bottom).



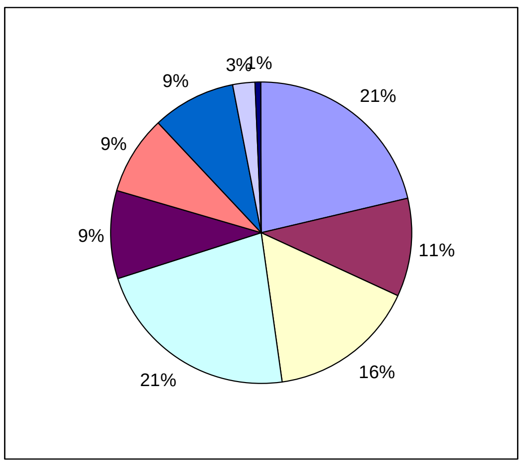


Figure 4.39: Frequency of Decorative Programs by Presence/Absence (Left) and Absolute Number of Vessels as reported (Right), reduced to Nine Main Types.

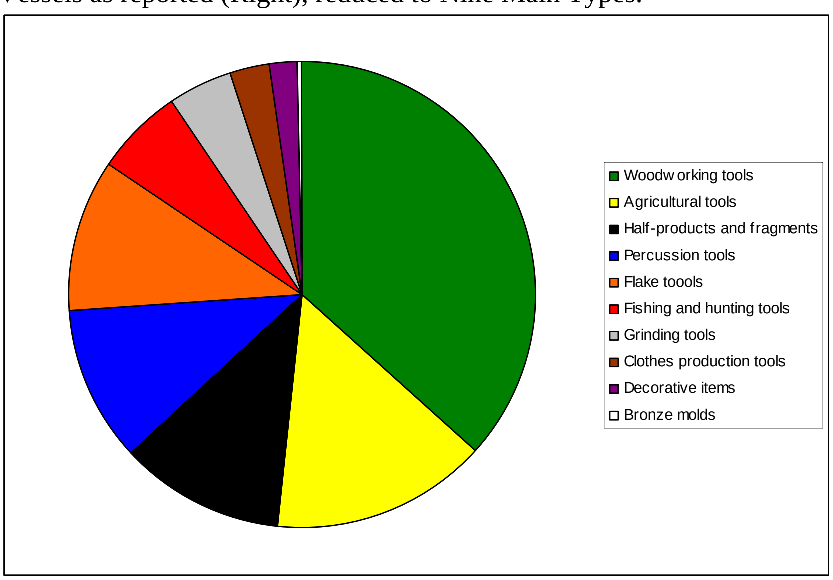


Figure 4.40: Number of Stone Tools by Type throughout all Sites.

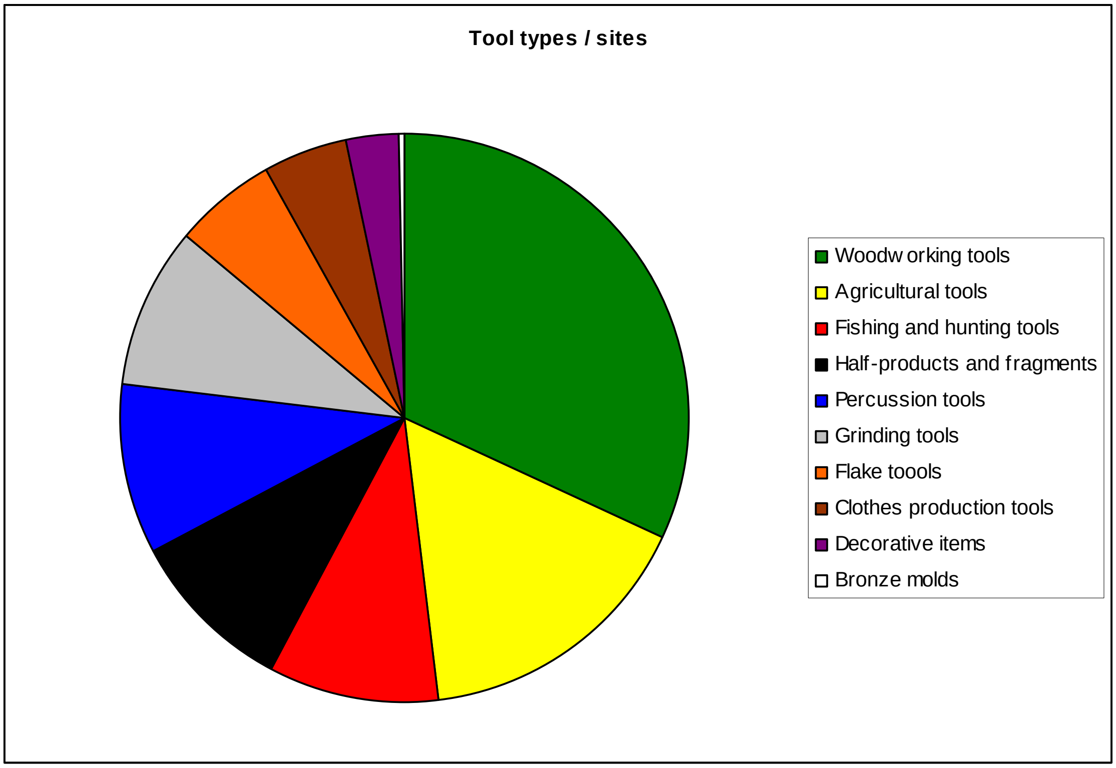
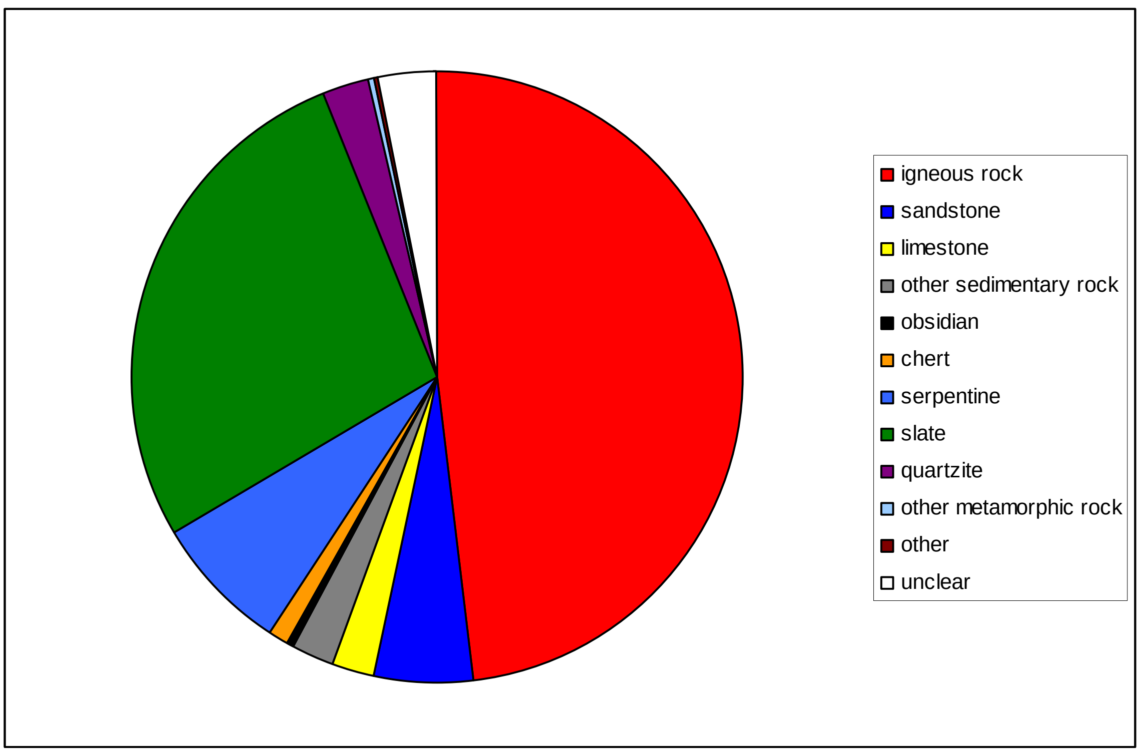


Figure 4.41: Frequency of the Occurrence of Tool Types by Number of Places of Occurrence.



Tab. 4.42: Most commonly employed Stone Material Types.

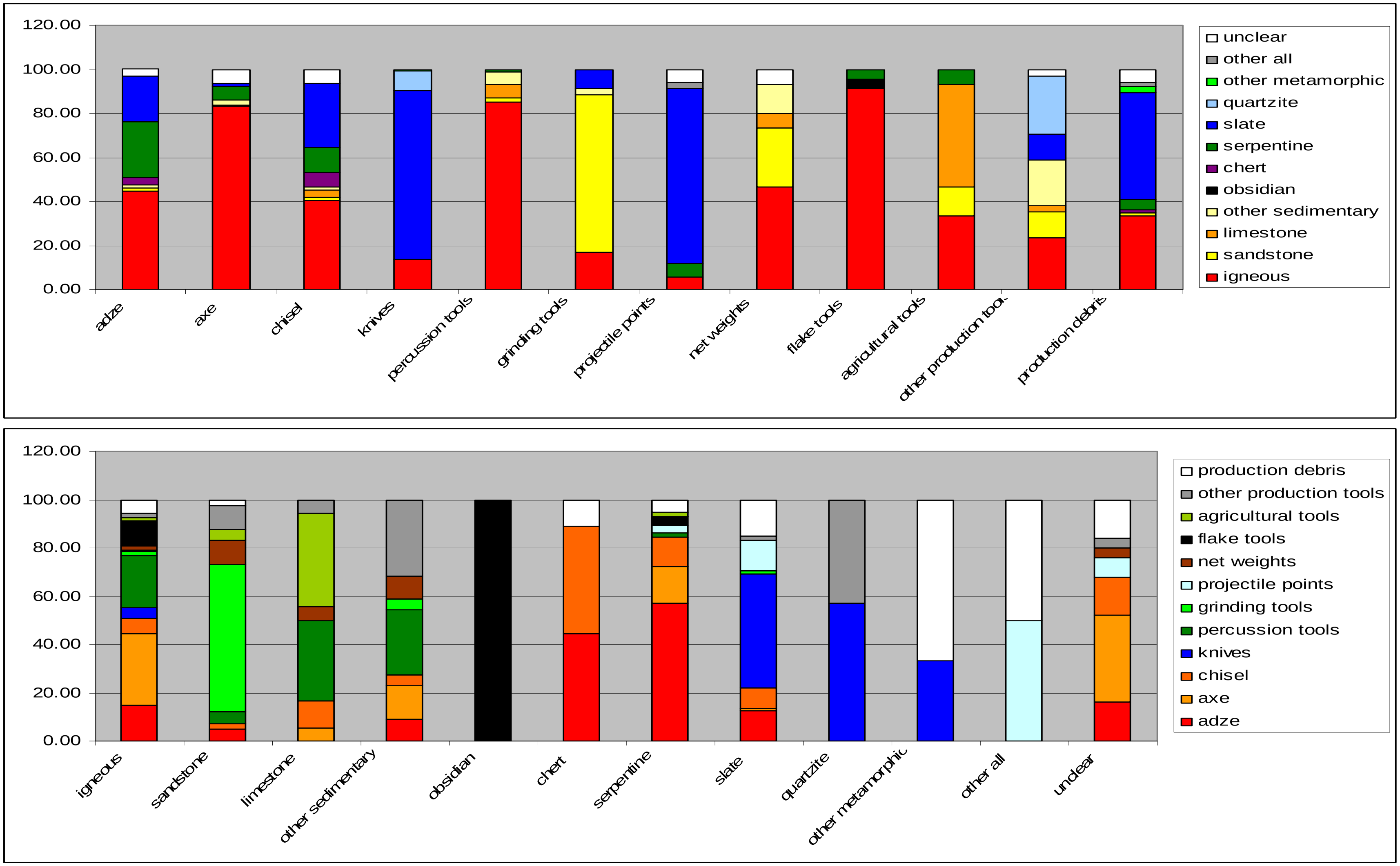


Fig. 4.43: Raw Material used for the Different Tool Types in Percentages.

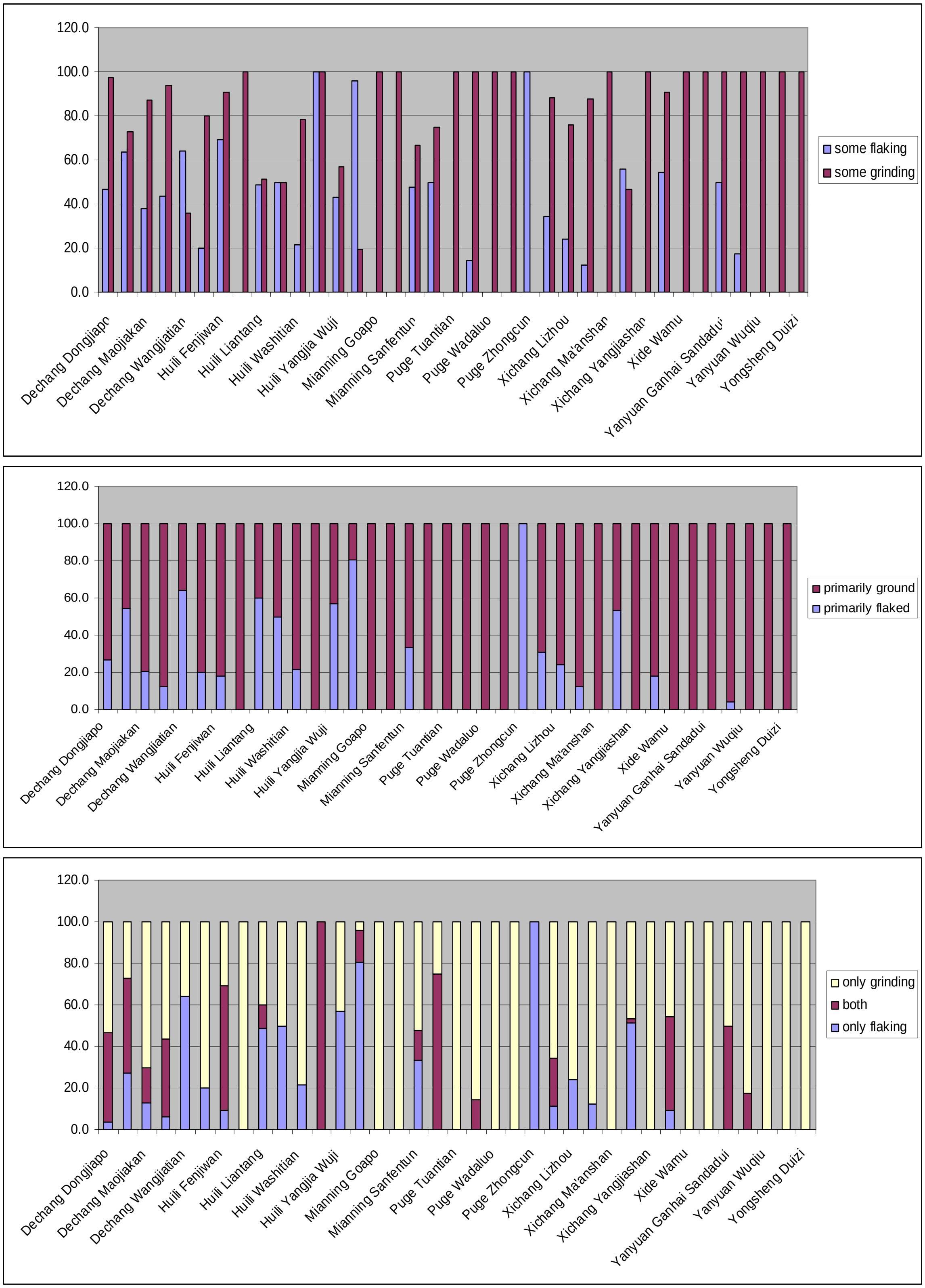


Figure 4.44: Main Production Techniques by Site.

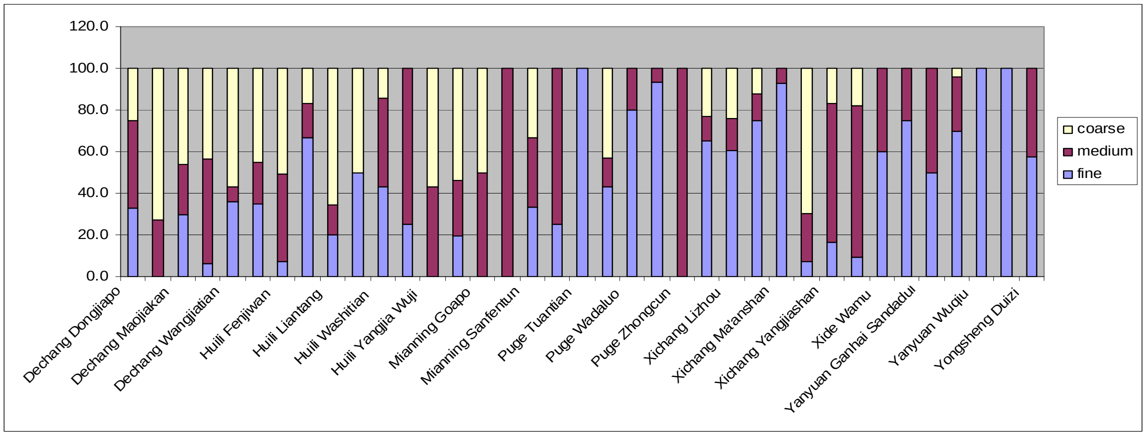


Figure 4.45: Degree of Refinement in Tool Production by Site.

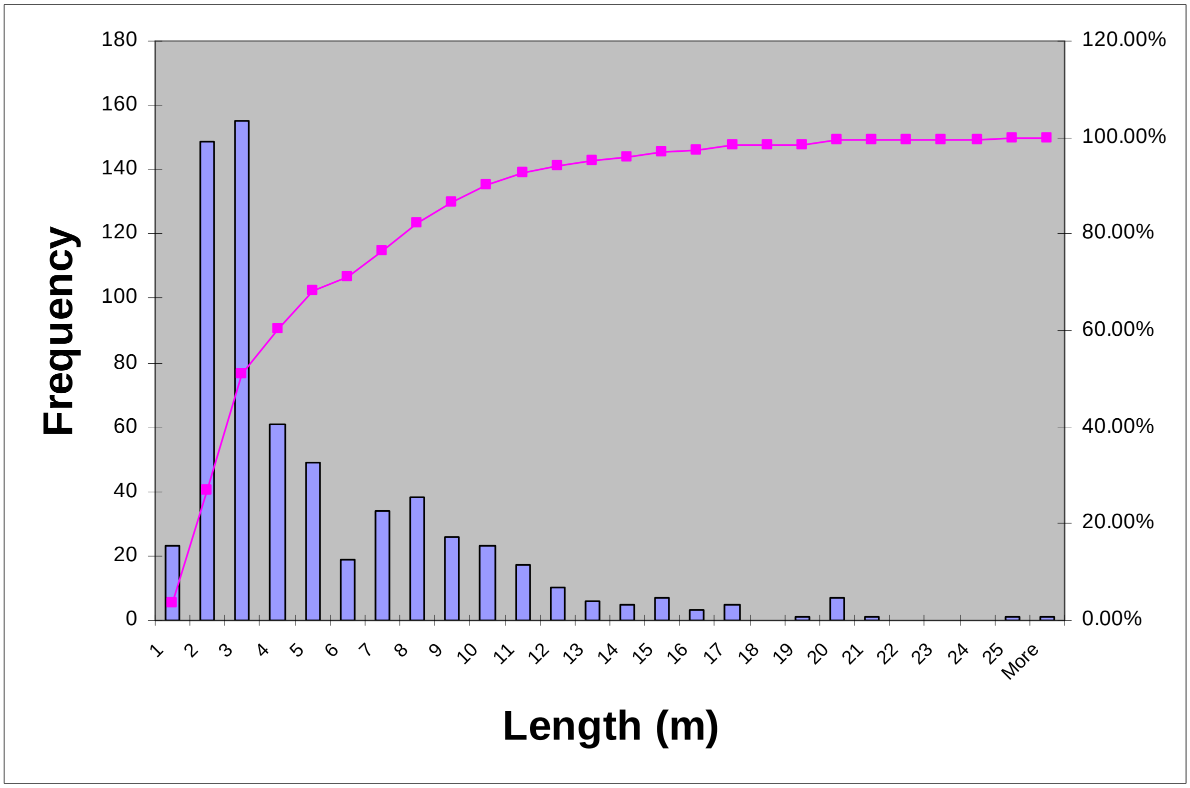


Figure 5.1: Histogram and Cumulative Frequency for Grave Length.

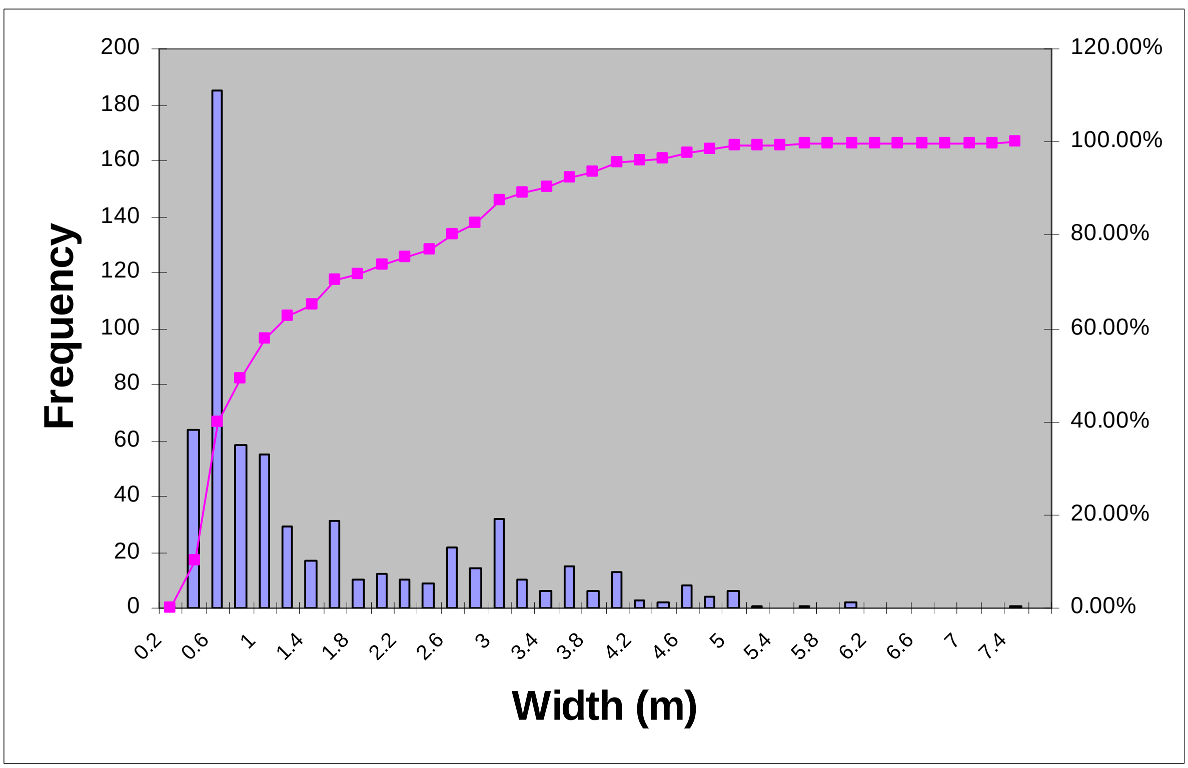


Figure 5.2: Histogram and Cumulative Frequency for Grave Width.

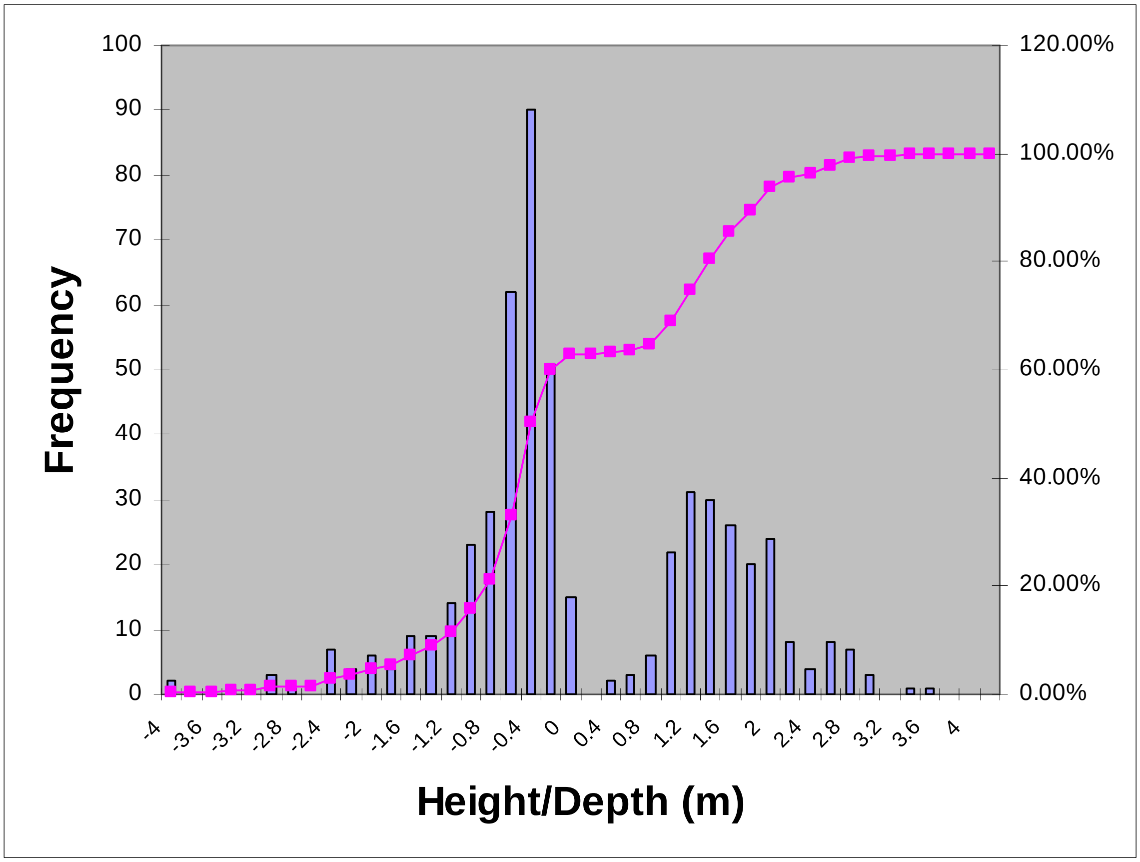


Figure 5.3: Histogram and Cumulative Frequency for Grave Depth/Height.

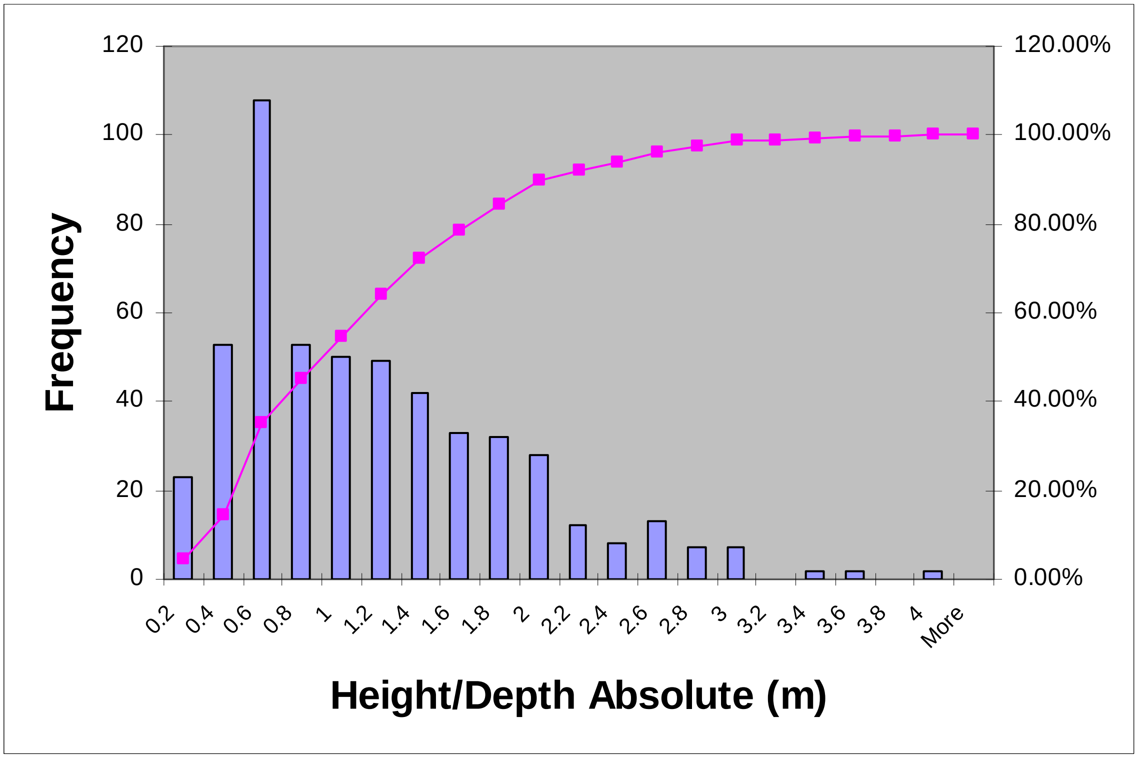


Figure 5.4: Histogram and Cumulative Frequency for Grave Depth/Height (Absolute Values).

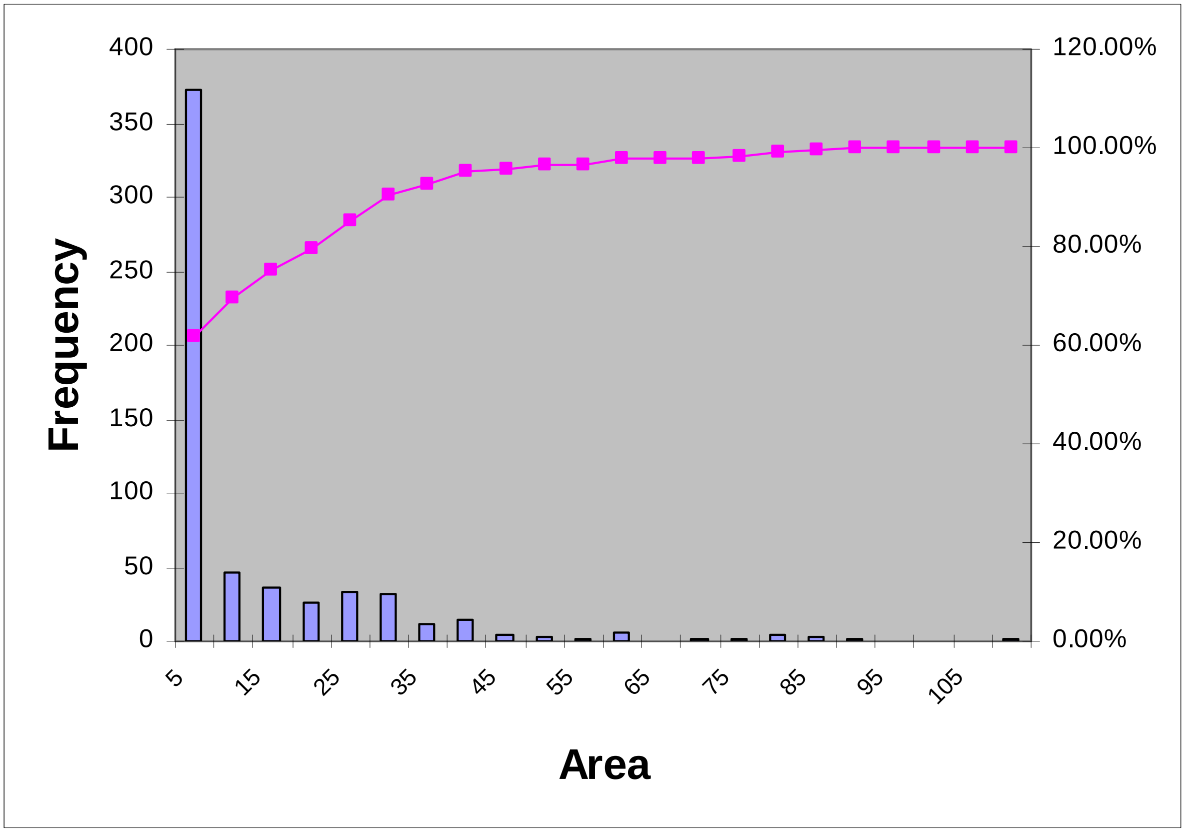


Figure 5.5: Histogram and Cumulative Frequency for Grave Area (Length x Width).

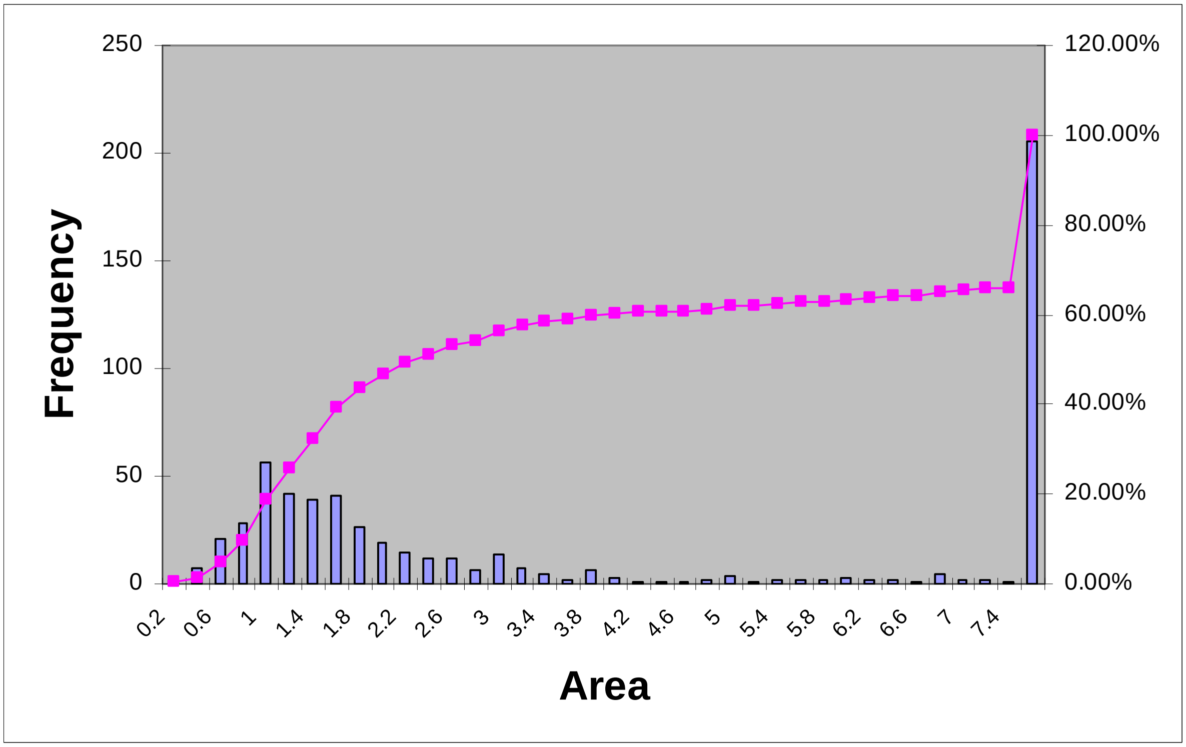


Figure 5.6: Histogram and Cumulative Frequency for Grave Area Rescaled for Low Values.

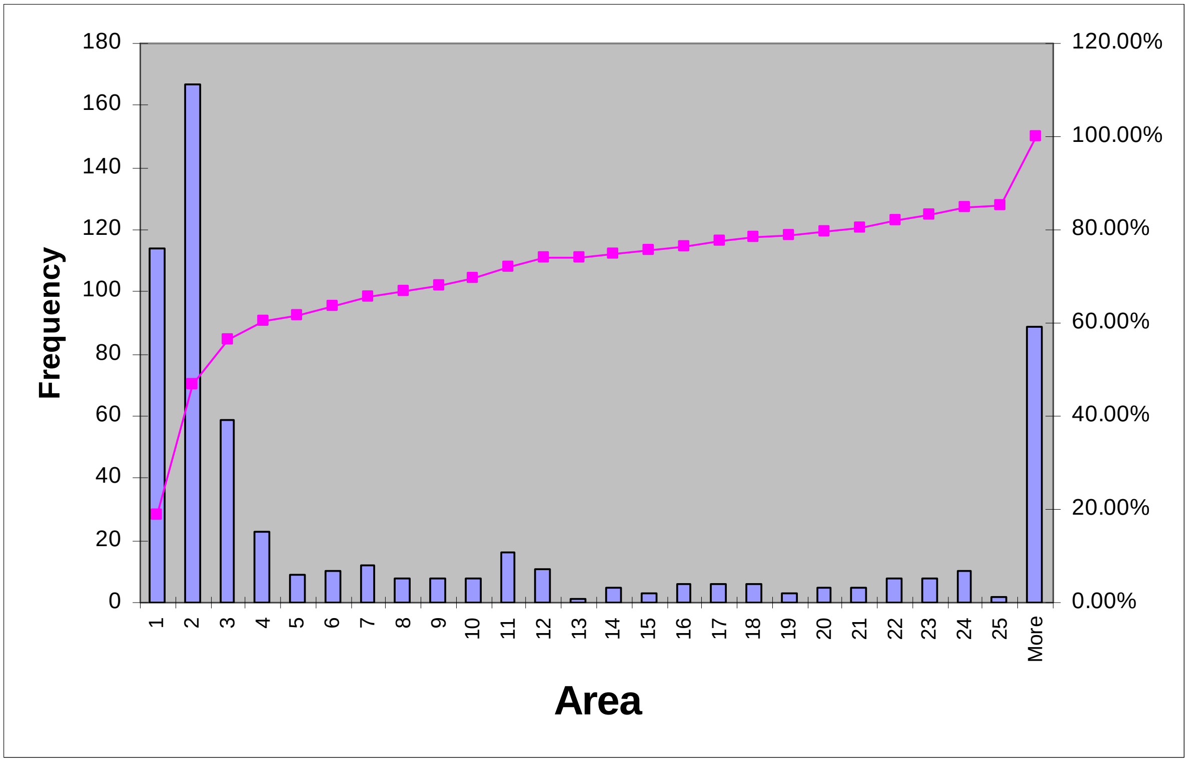


Figure 5.7: Histogram and Cumulative Frequency for Grave Area Highlighting Medium Values.

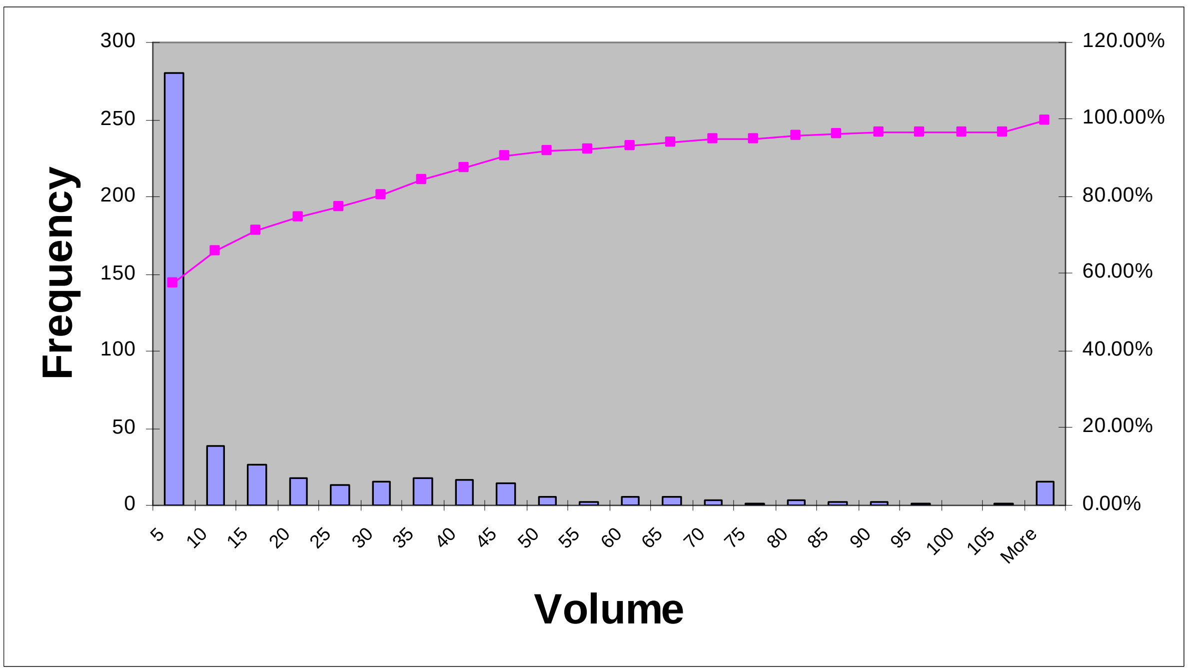


Figure 5.8: Histogram and Cumulative Frequency for Volume (Length x Width x Height) of All Graves.

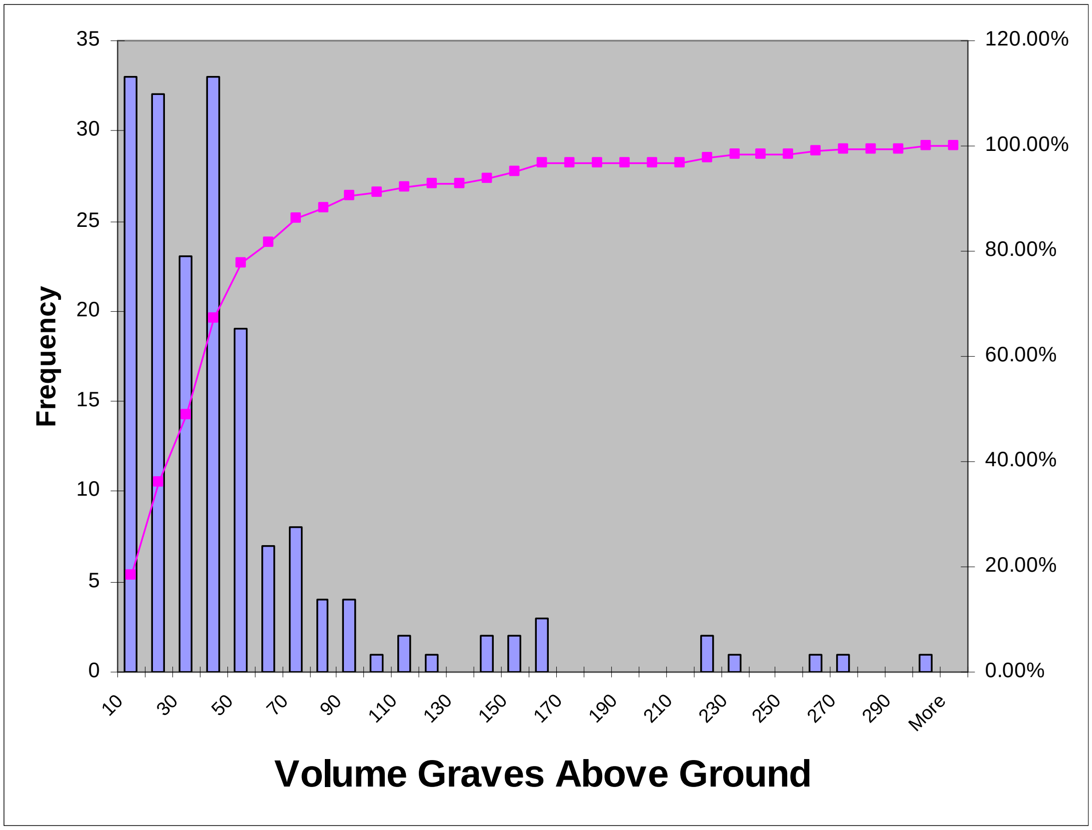


Figure 5.9: Histogram and Cumulative Frequency for Volume of Graves Above Ground.

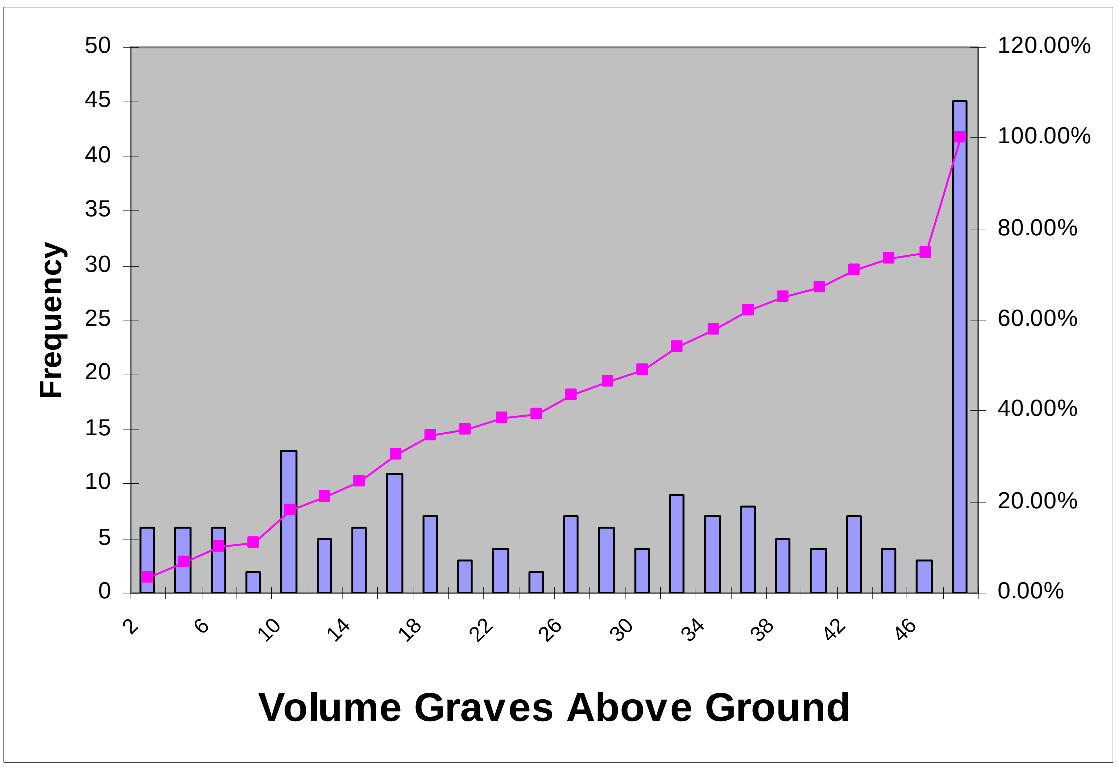


Figure 5.10: Histogram and Cumulative Frequency for Volume of Graves Above Ground .Highlighting Low Values.

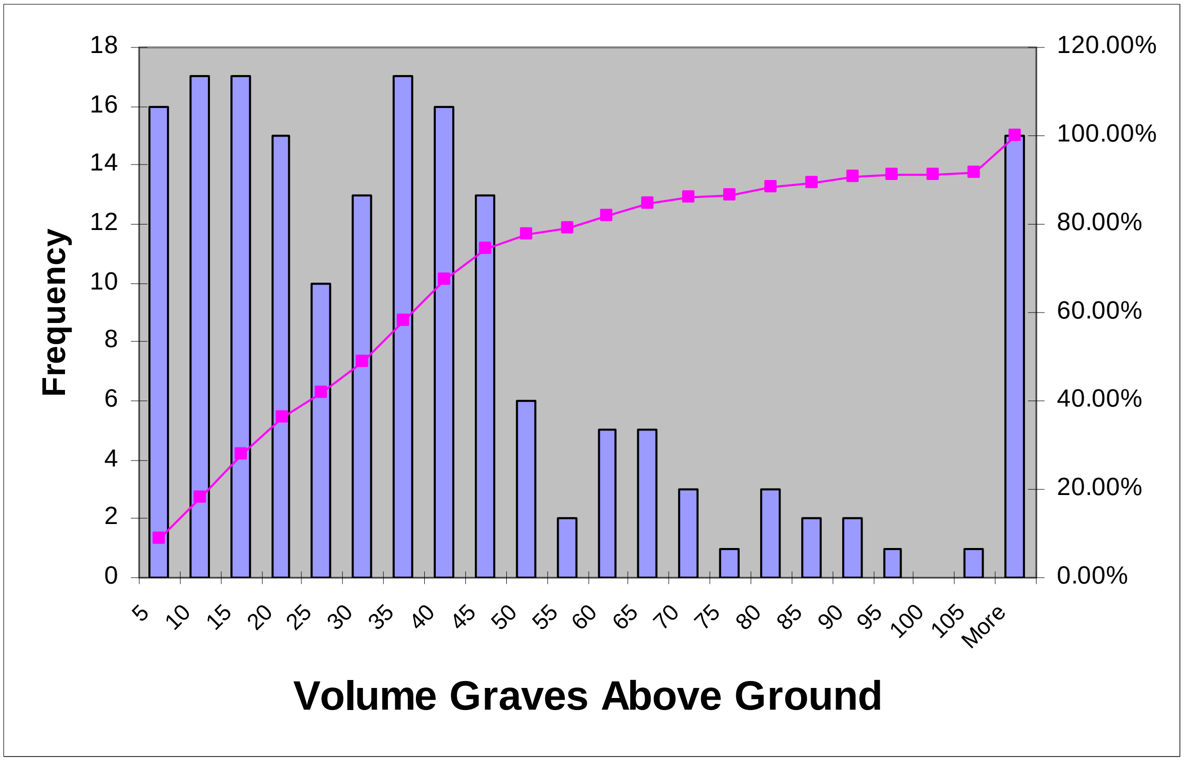


Figure 5.11: Histogram and Cumulative Frequency for Volume of Graves Above Ground Highlighting Medium Values.

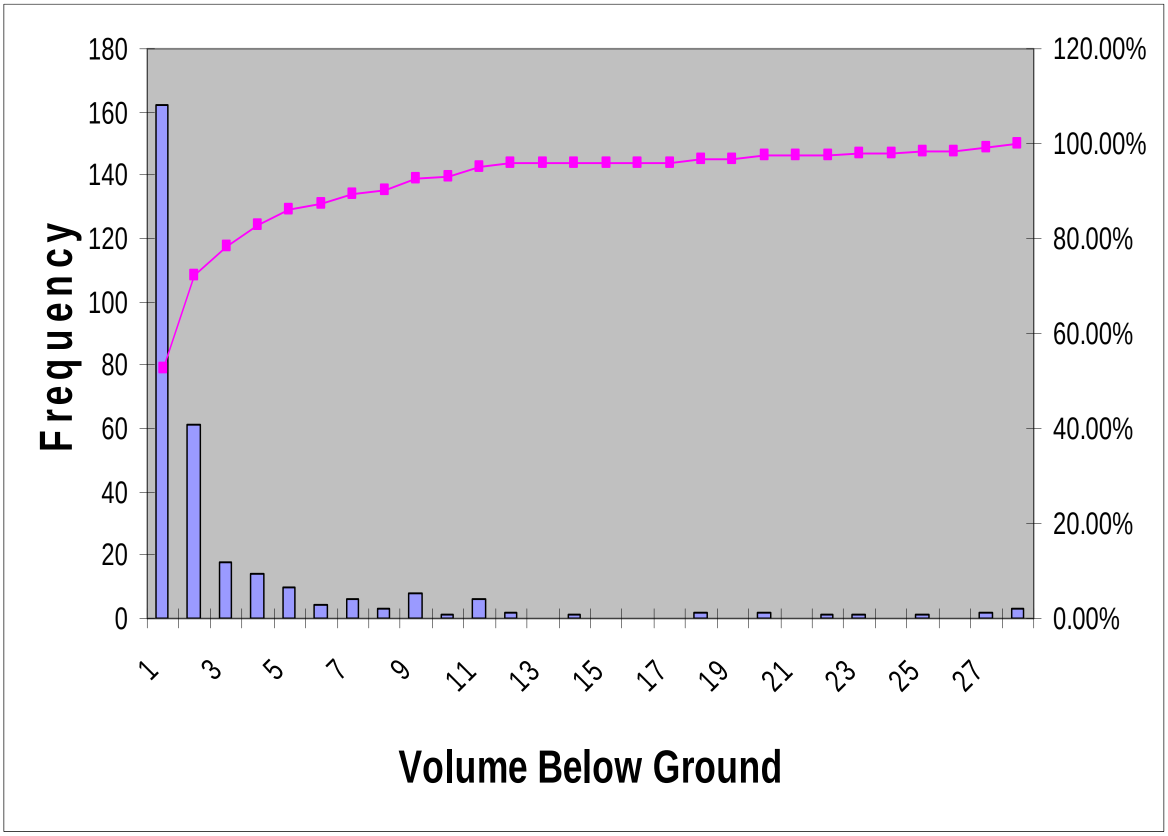


Figure 5.12: Histogram and Cumulative Frequency for Volume of Graves Below Ground.

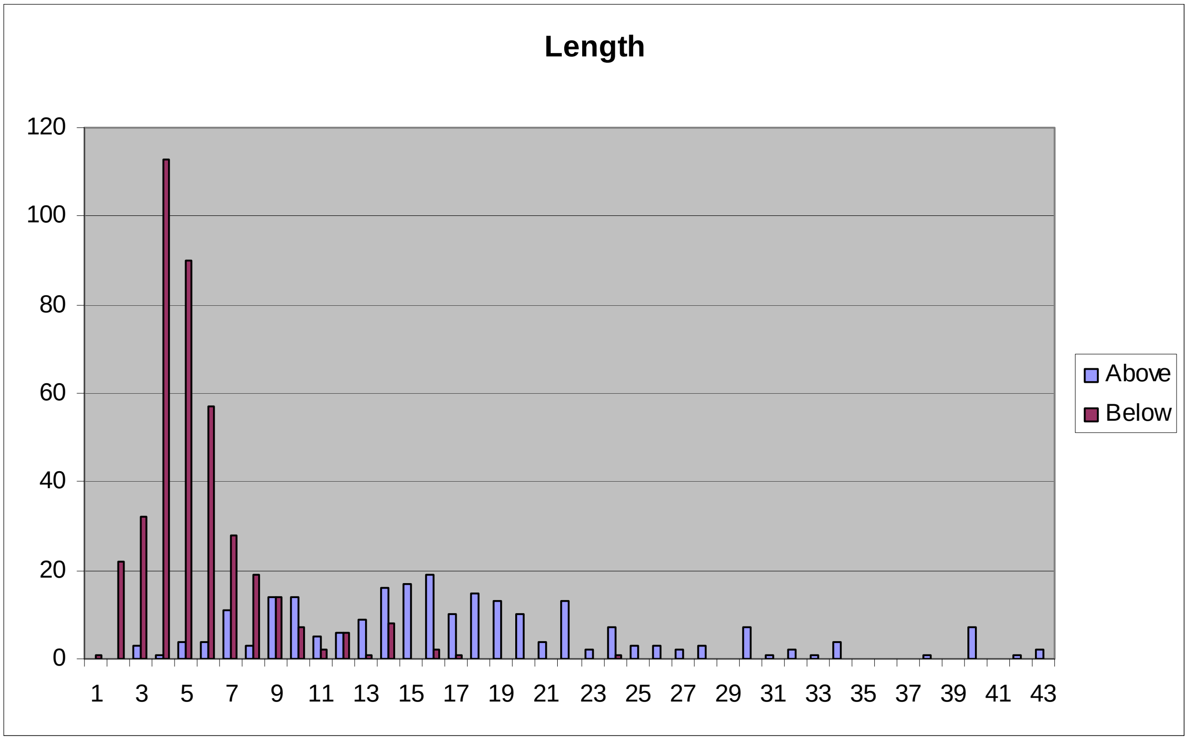


Figure 5.13: Histogram for Grave Length.

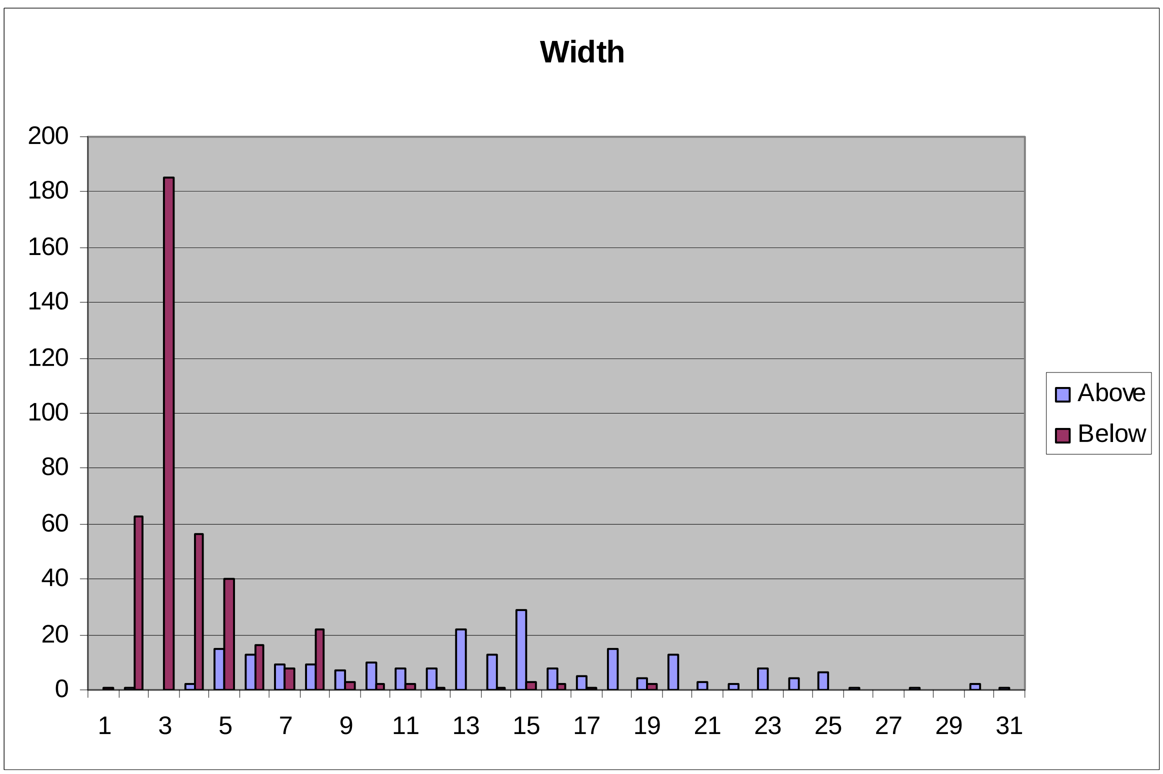


Figure 5.14: Histogram for Grave Width.

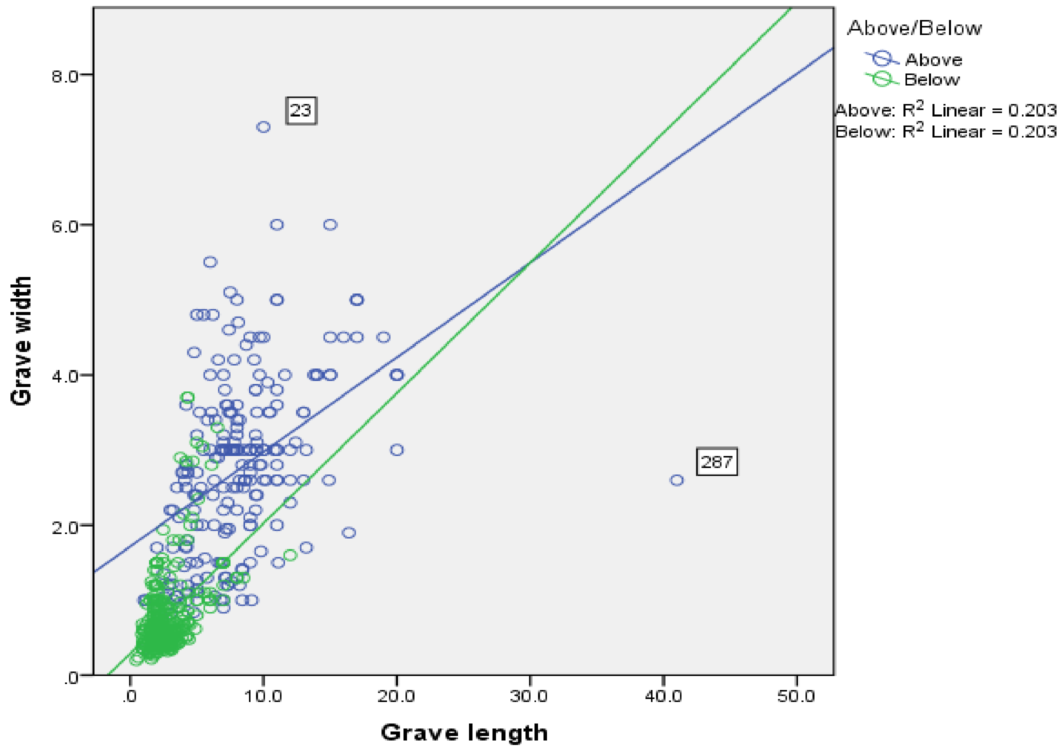


Figure 5.15: Scattergram Plotting Length Against Width.

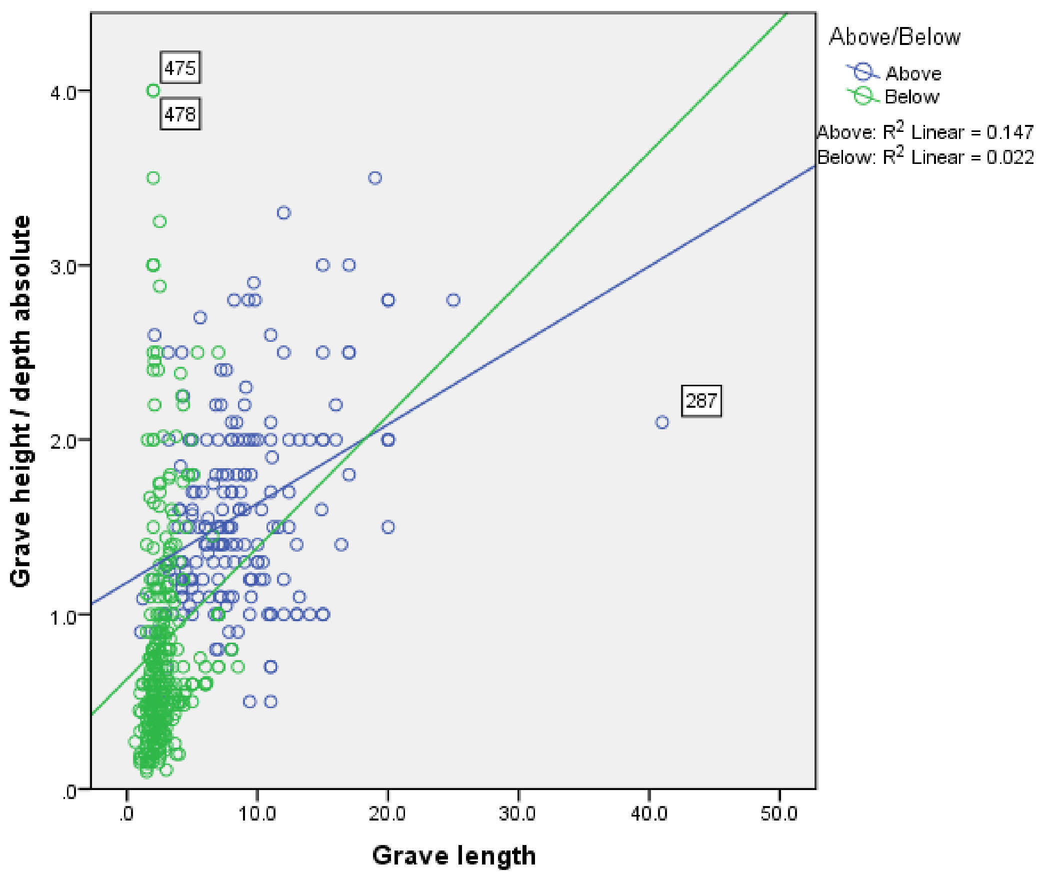


Figure 5.16: Scattergram Plotting Length against Height/Depth (Absolute Values).

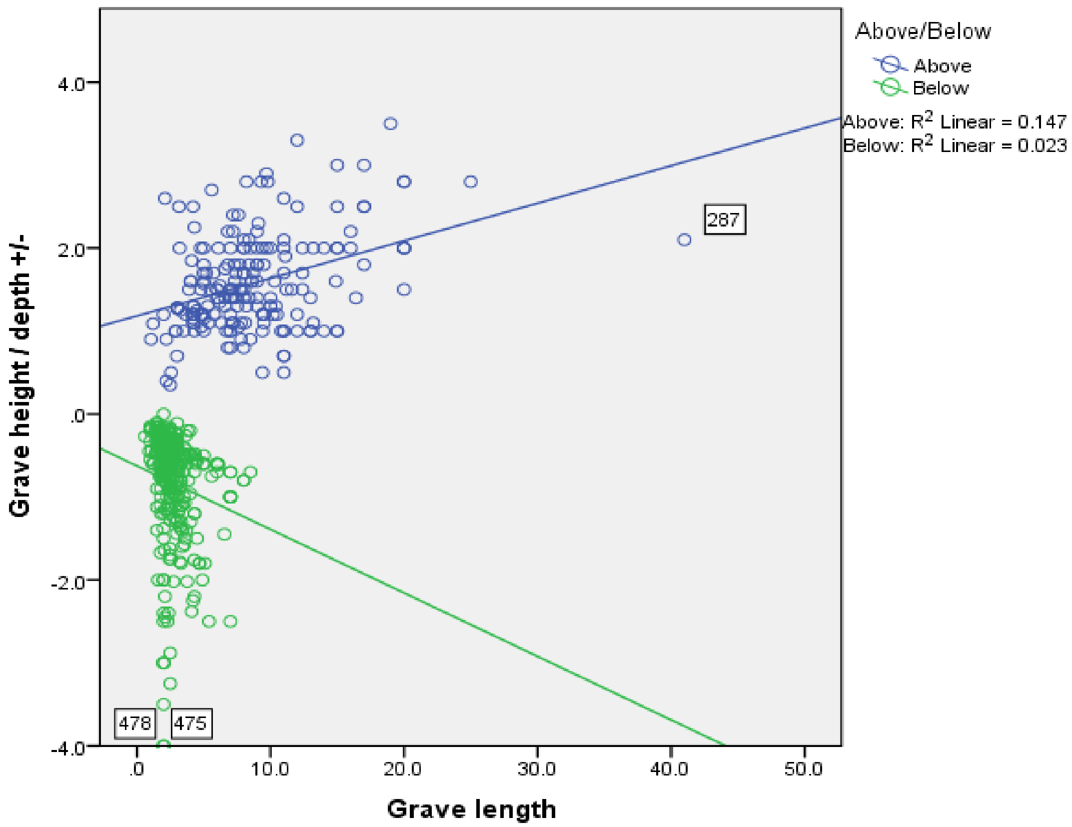


Figure 5.17: Scatterplot for Grave Width and Grave Height/Depth.

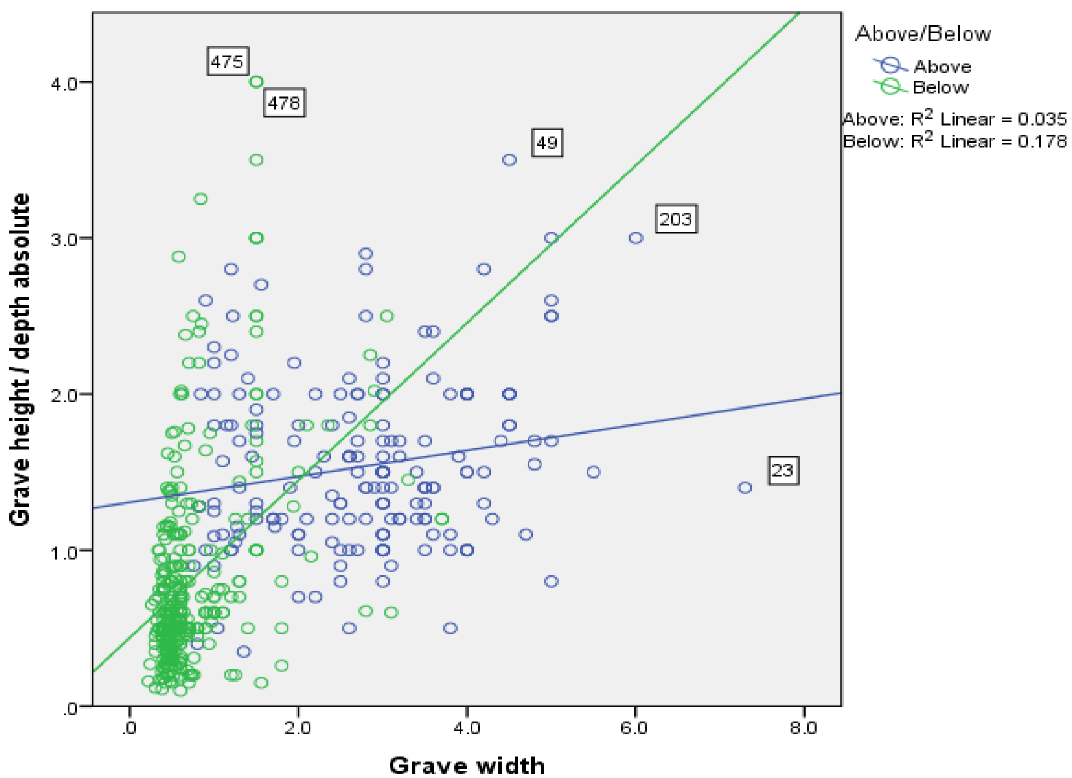


Figure 5.18: Scatterplot for Grave Width and Height/Depth (Absolute Values).

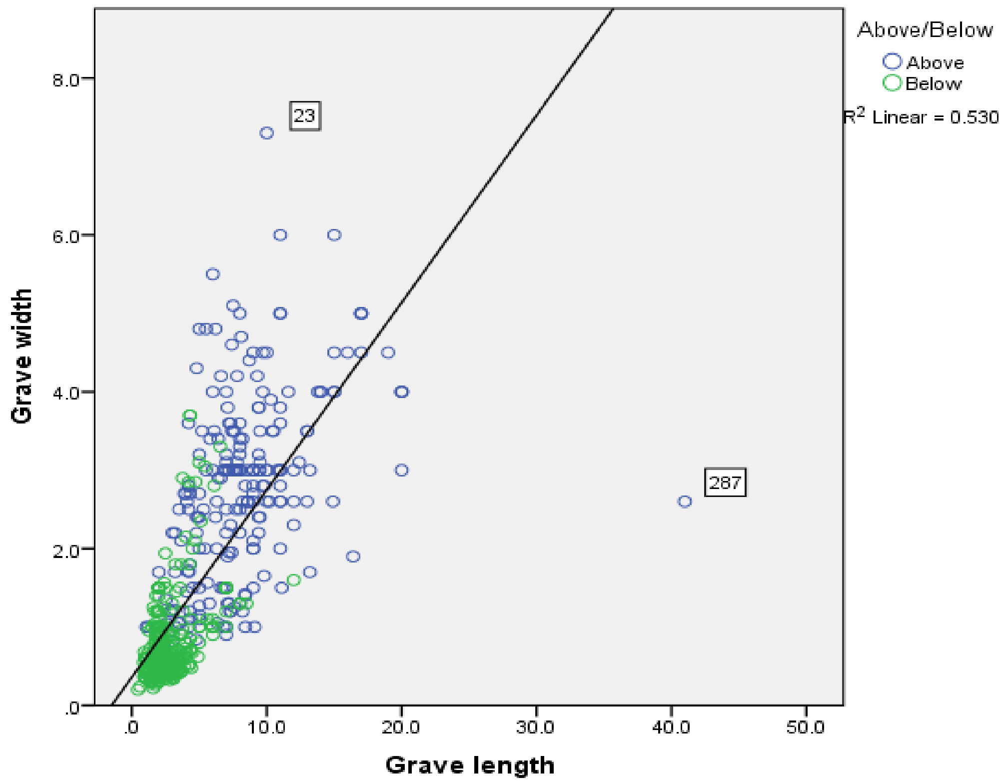


Figure 5.19: Scatterplot for Grave Length/Width with Common Regression Line.

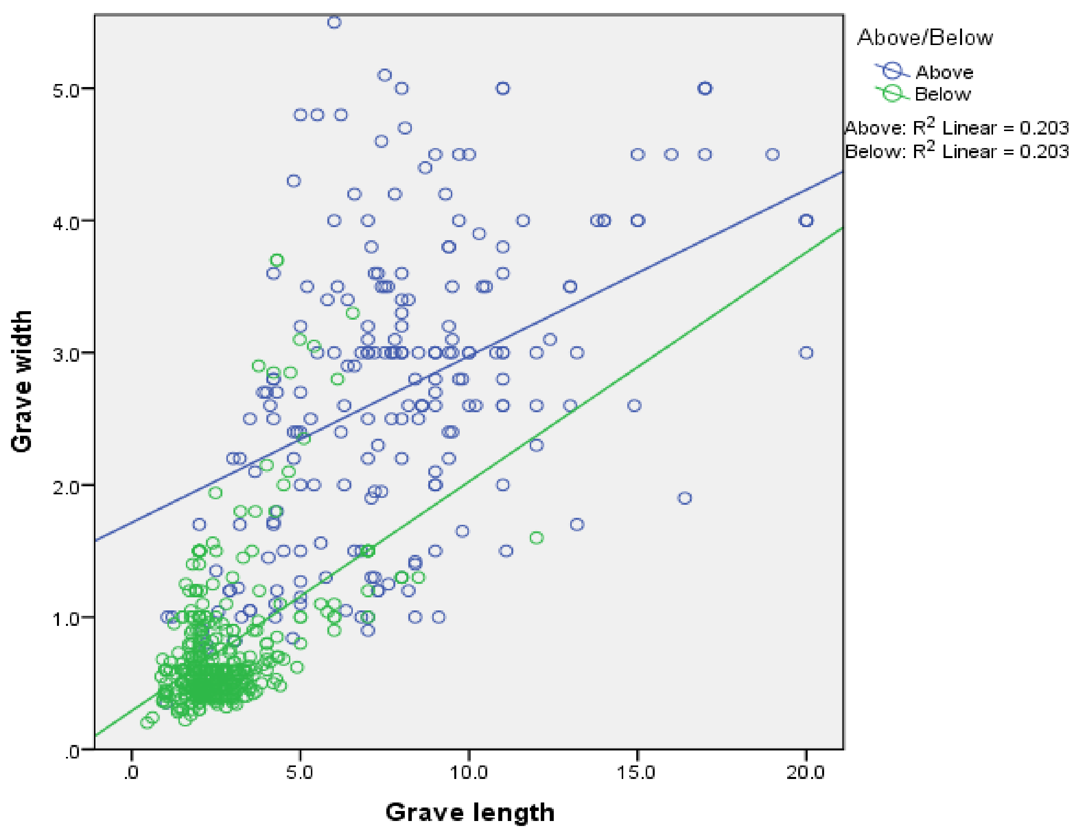


Figure 5.20: Close-up View of Dense Cloud in Scatterplot for Grave Length and Width.

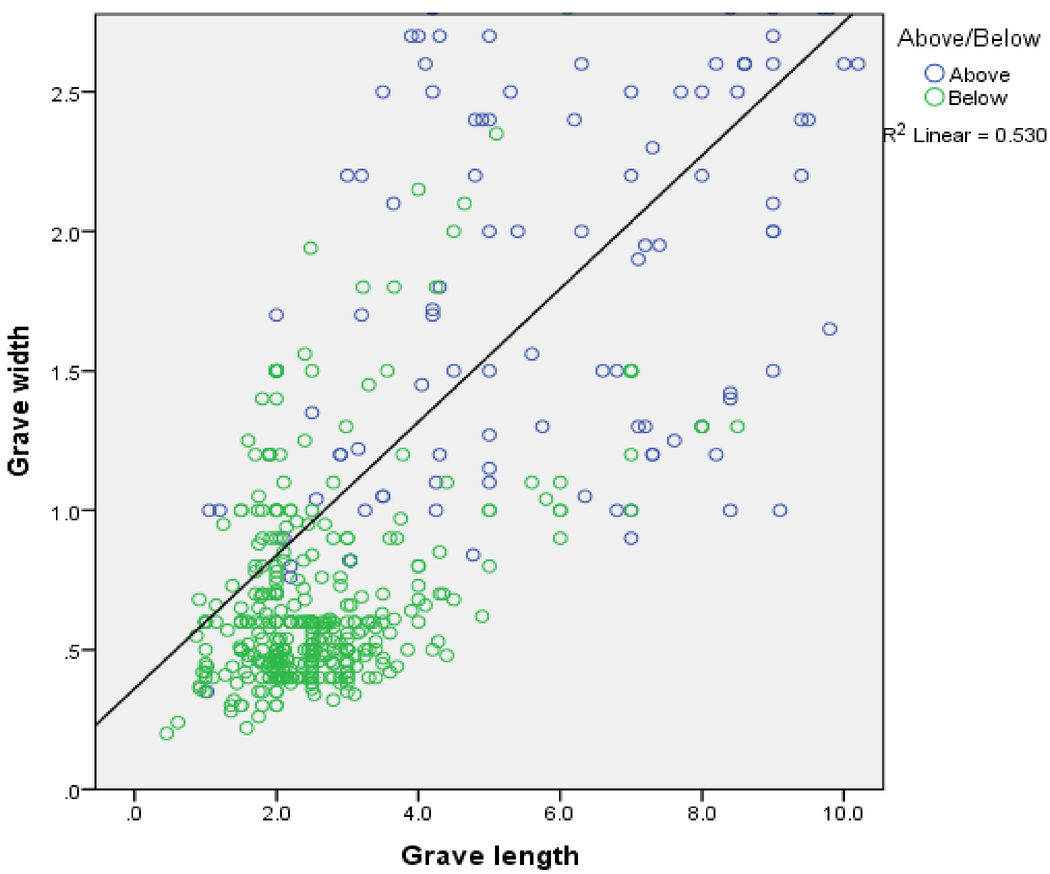


Figure 5.21: Close-up View of Dense Cloud in Scatterplot for Grave Length and Width.

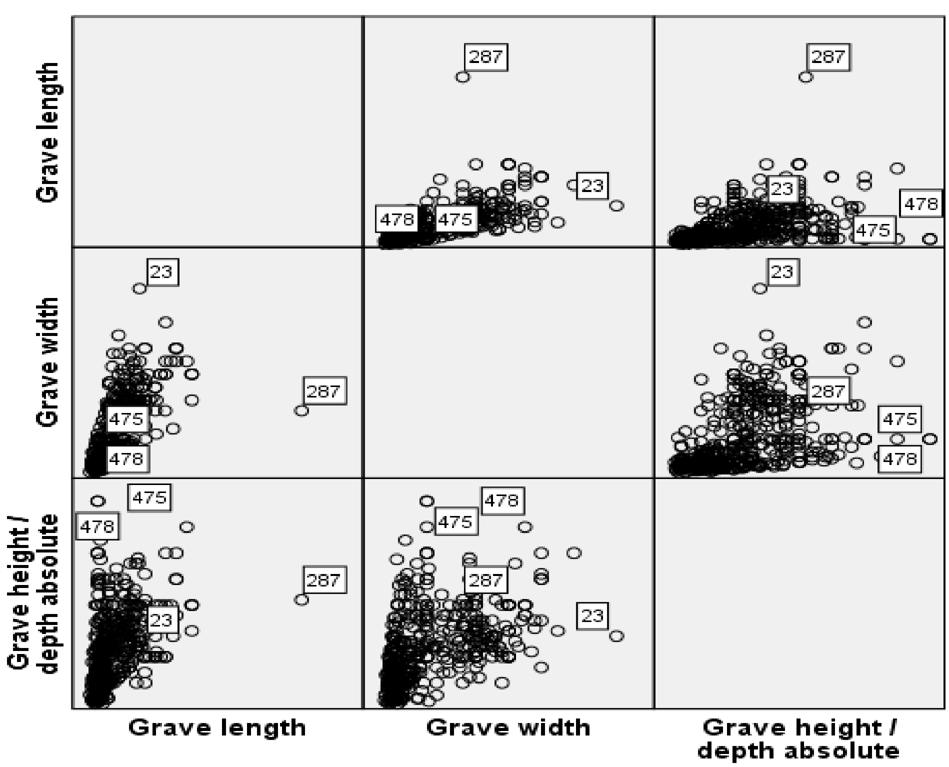


Figure 5.22: Three-Way Scatterplot for Length, Width, and Height/Depth (Absolute Values).

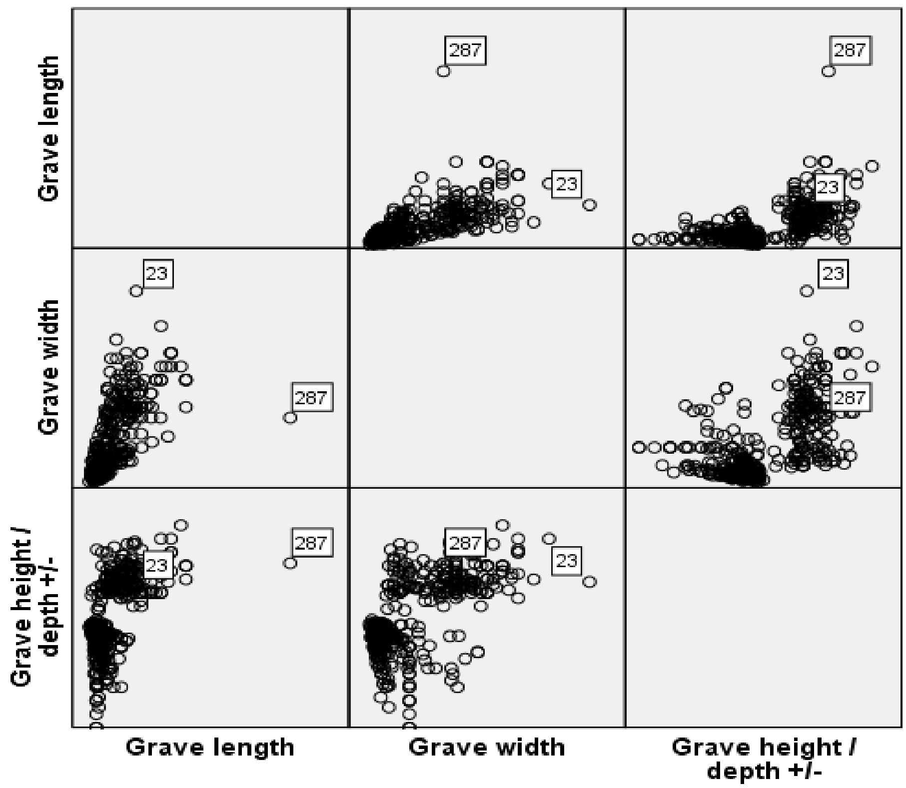


Figure 5.23: Three-Way Scatterplot for Length, Width, and Height/Depth.

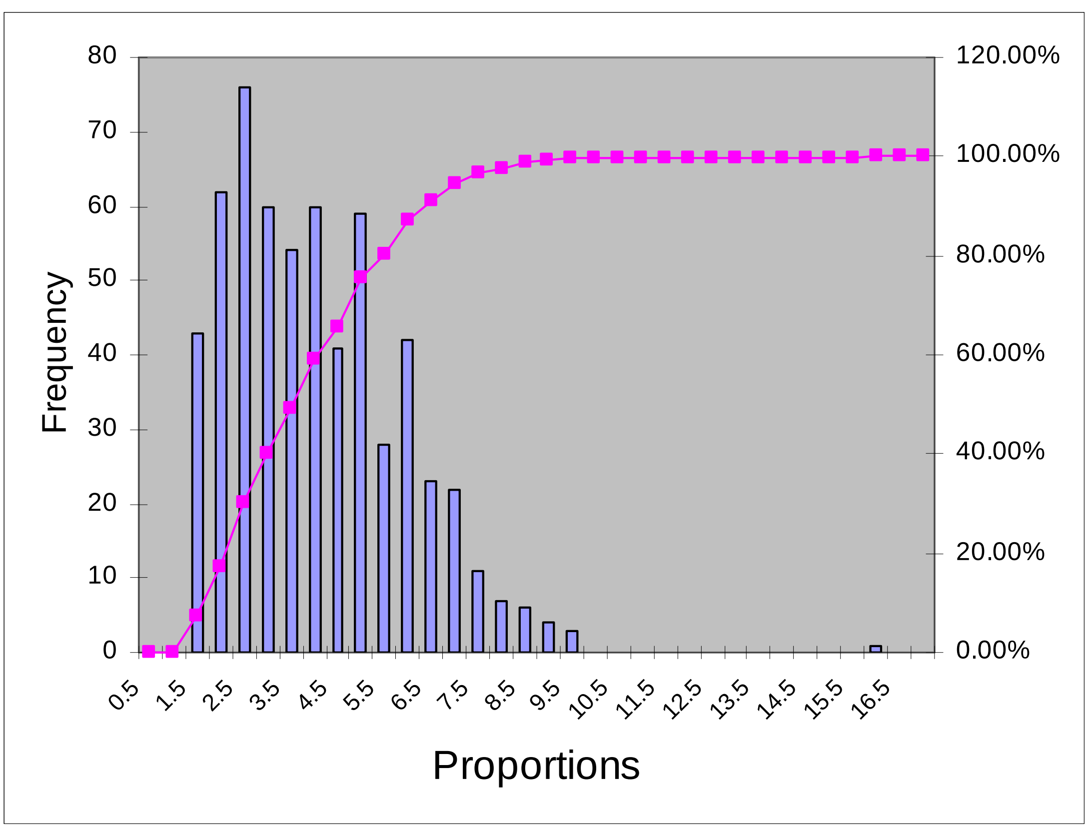


Figure 5.24: Histogram and Cumulative Frequency for Grave Proportions (Length/Width).

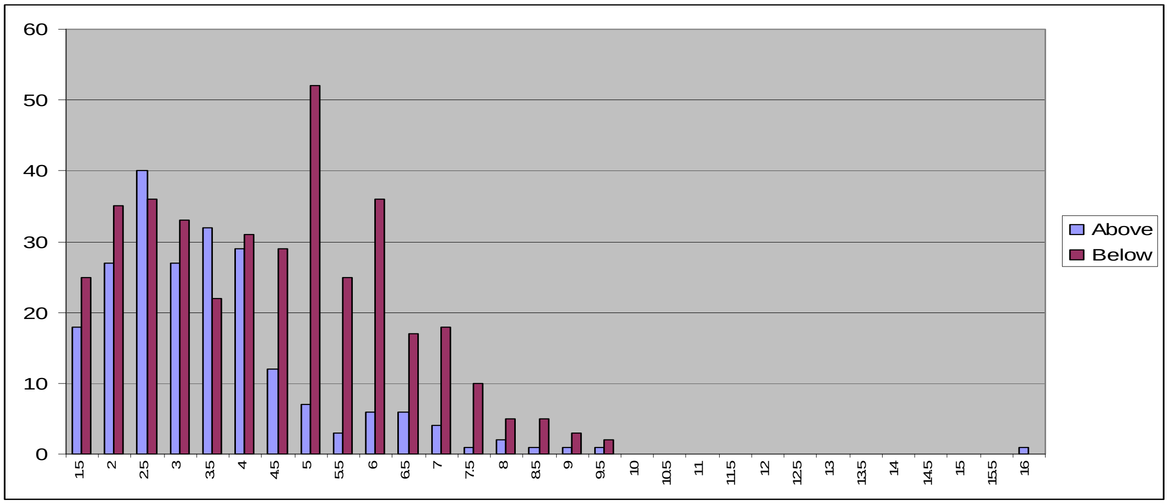


Figure 5.25: Histogram for Grave Proportions.

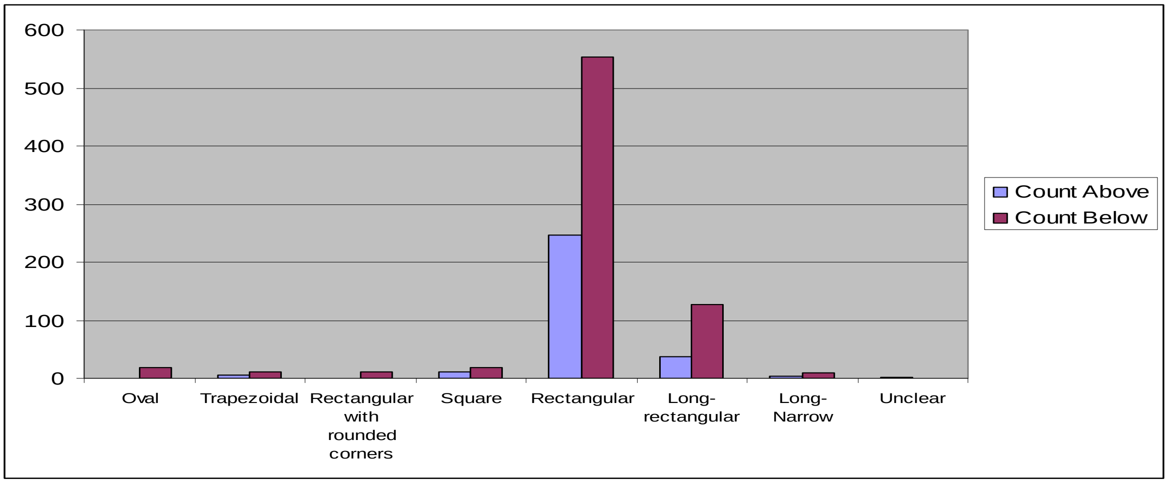


Figure 5.27: Histogram for Different Types of Grave Chamber Forms in Absolute Numbers Separate by Graves Above and Below Ground.

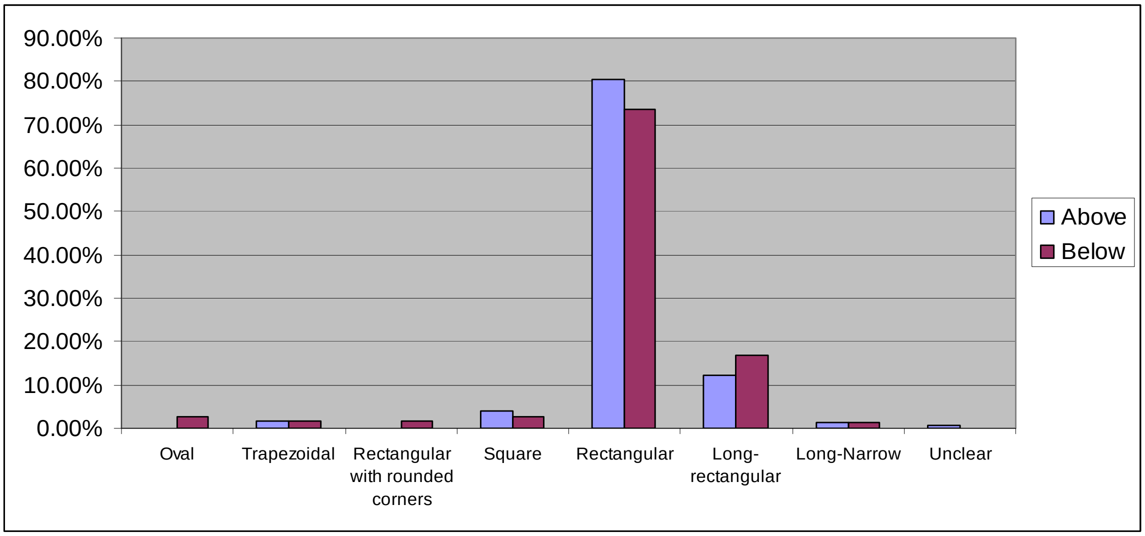


Figure 5.27: Histogram for Different Types of Grave Chamber Forms Expressed in Percentage Separate by Graves Above and Below Ground.

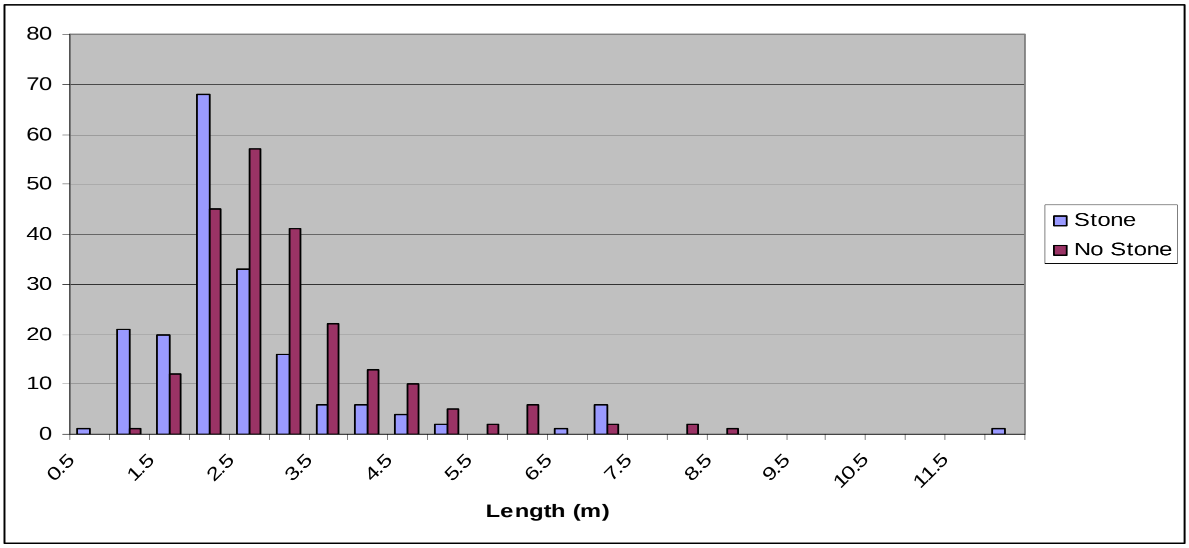


Figure 5.28: Length Measurements for Graves Below Ground.

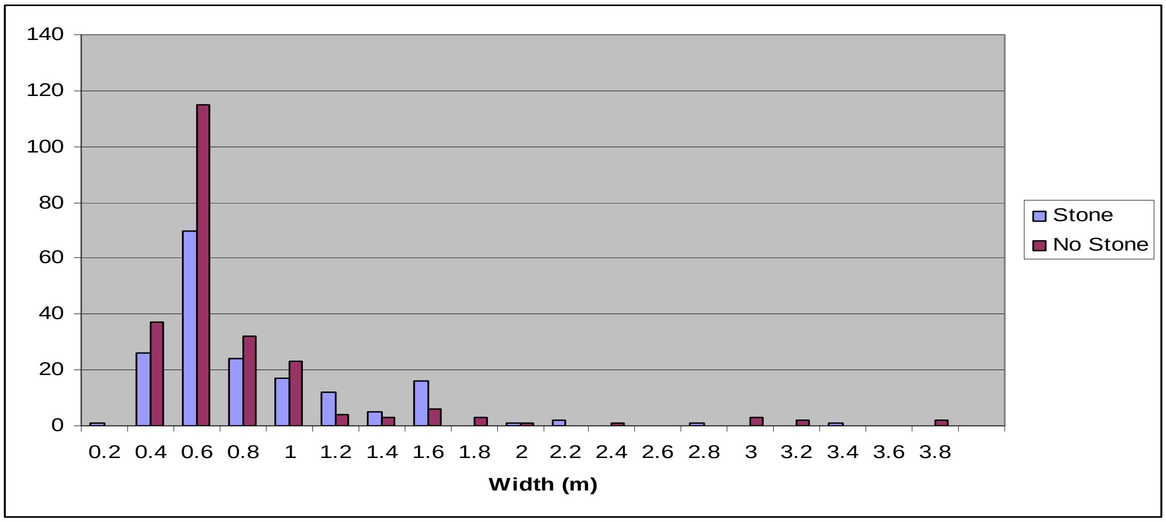


Figure 5.29: Width Measurements for Graves below Ground.

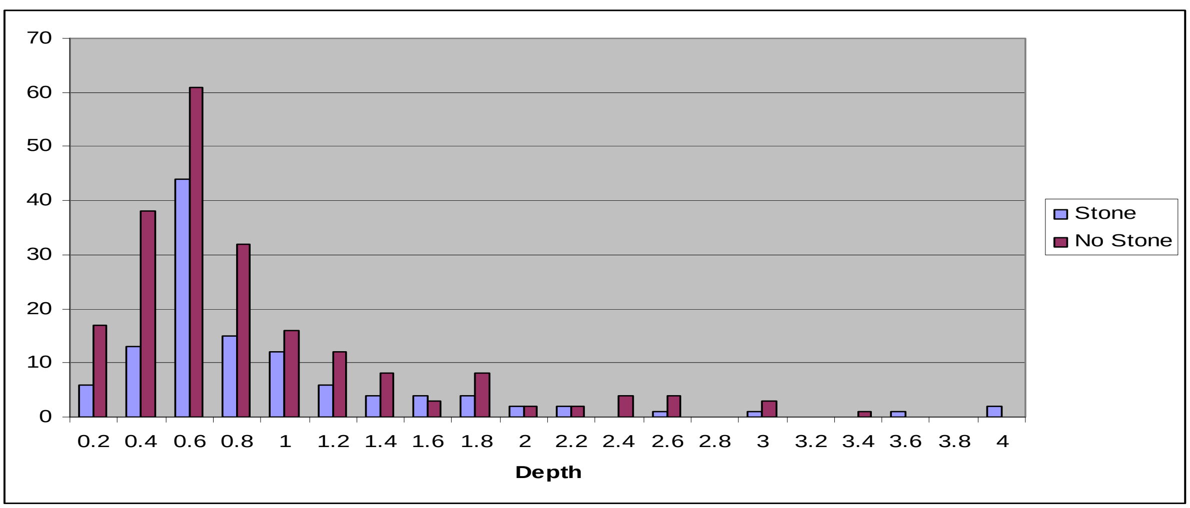


Figure 5.30: Depth Measurements for Graves Below Ground.

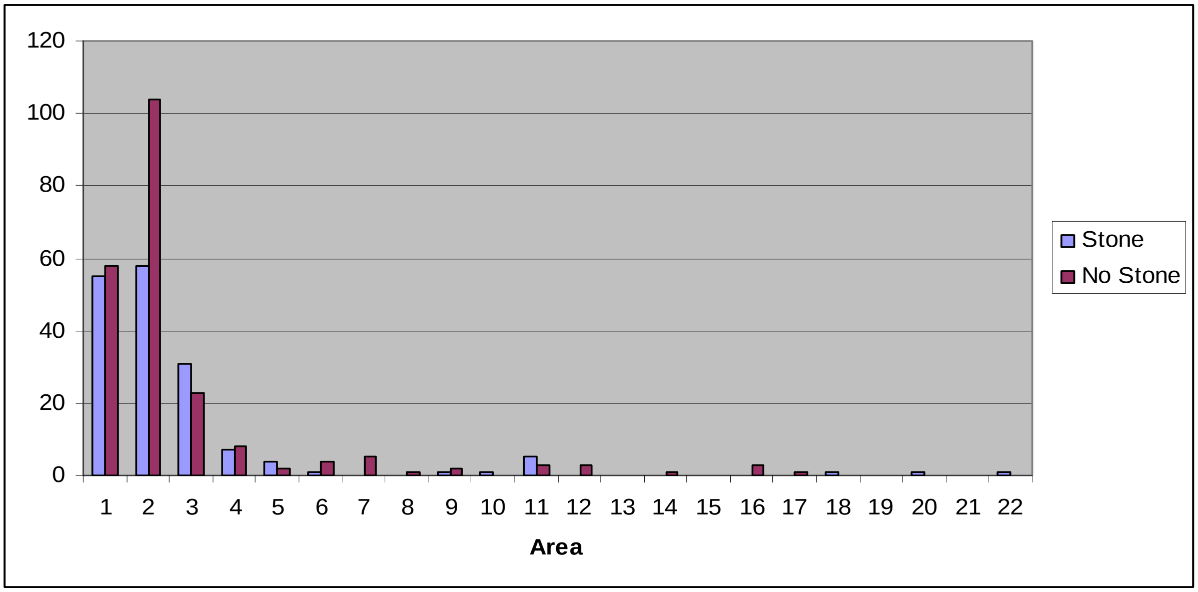


Figure 5.31: Area for Graves Below Ground.

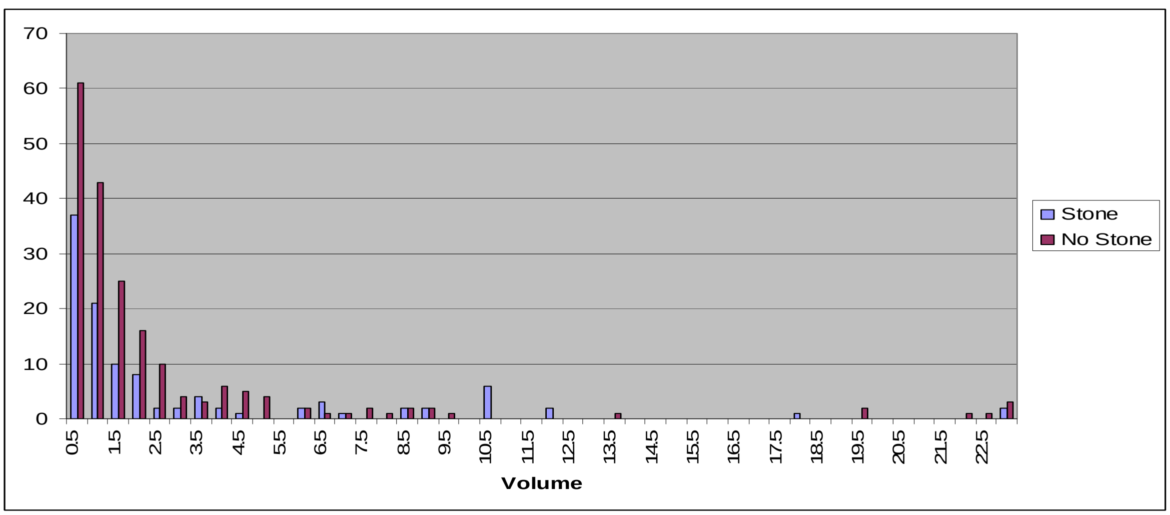


Figure 5.32: Volume for Graves Below Ground.

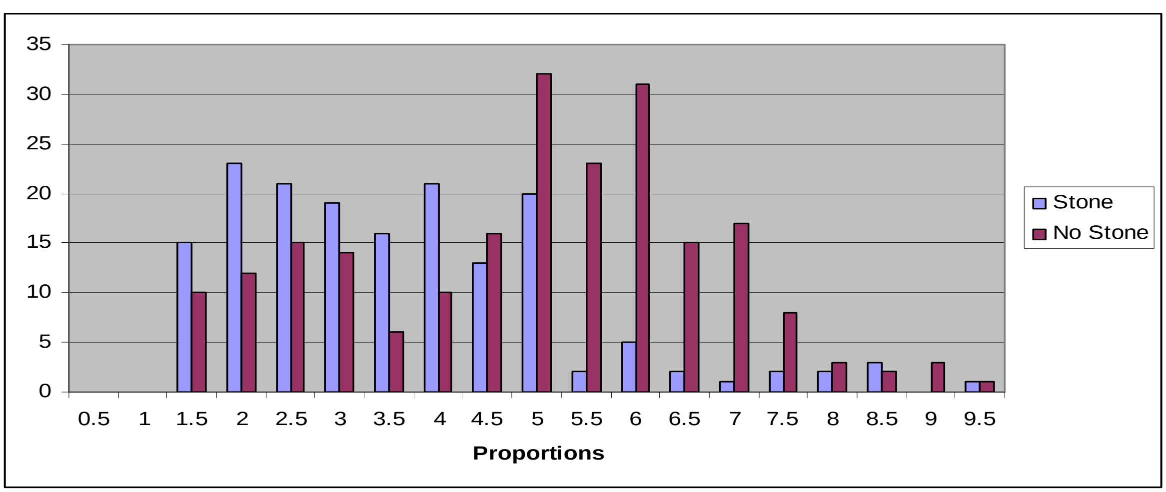


Figure 5.33: Proportions for Graves Below Ground.

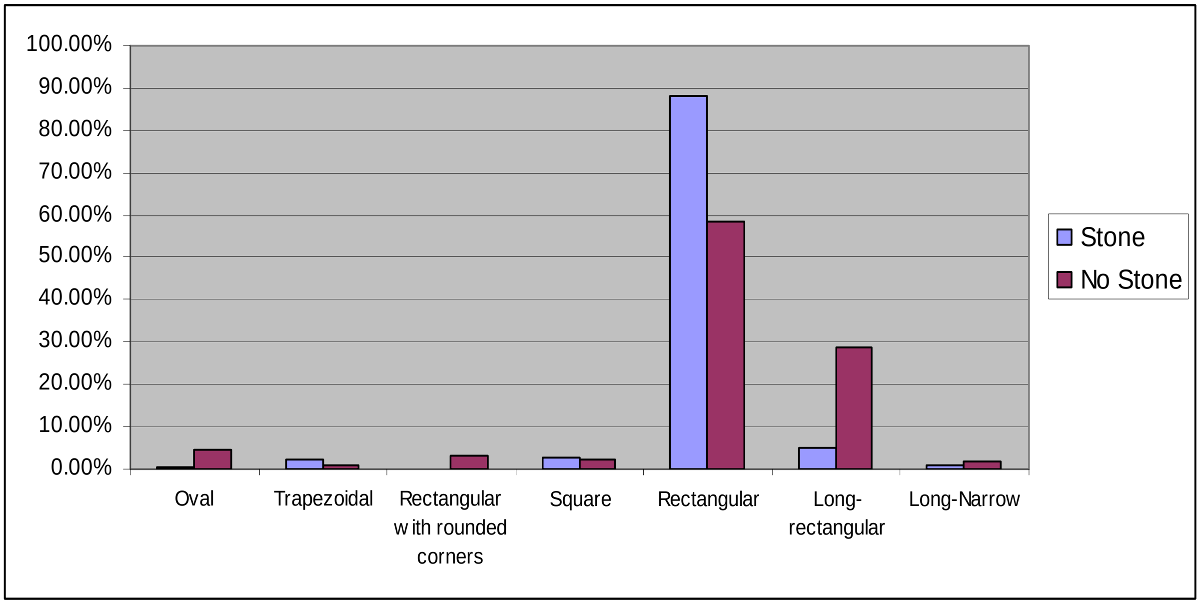


Figure 5.34: Form-Types for Graves Below Ground.

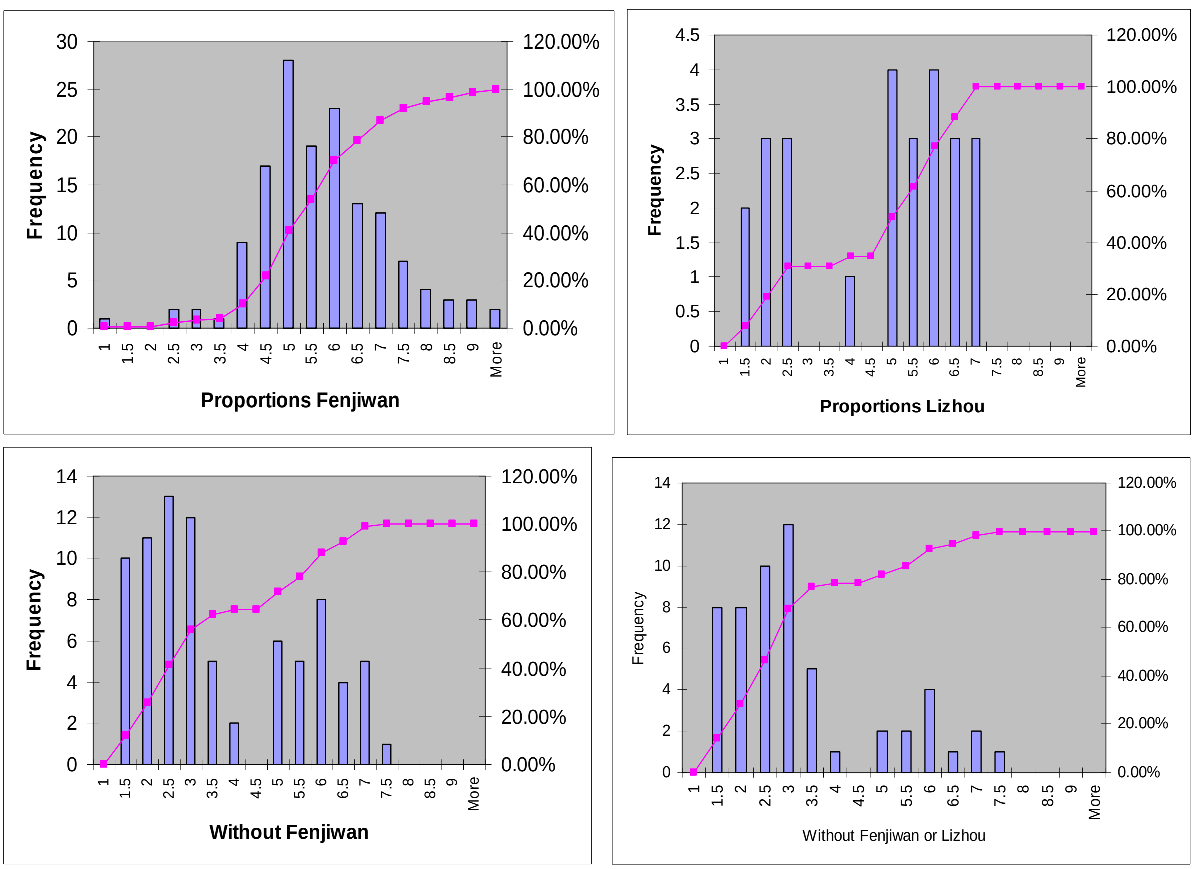


Figure 5.35: Histograms for the Proportions of Earth-Pit Graves Comparing Lizhou, Fenjiwan, and Other Sites.

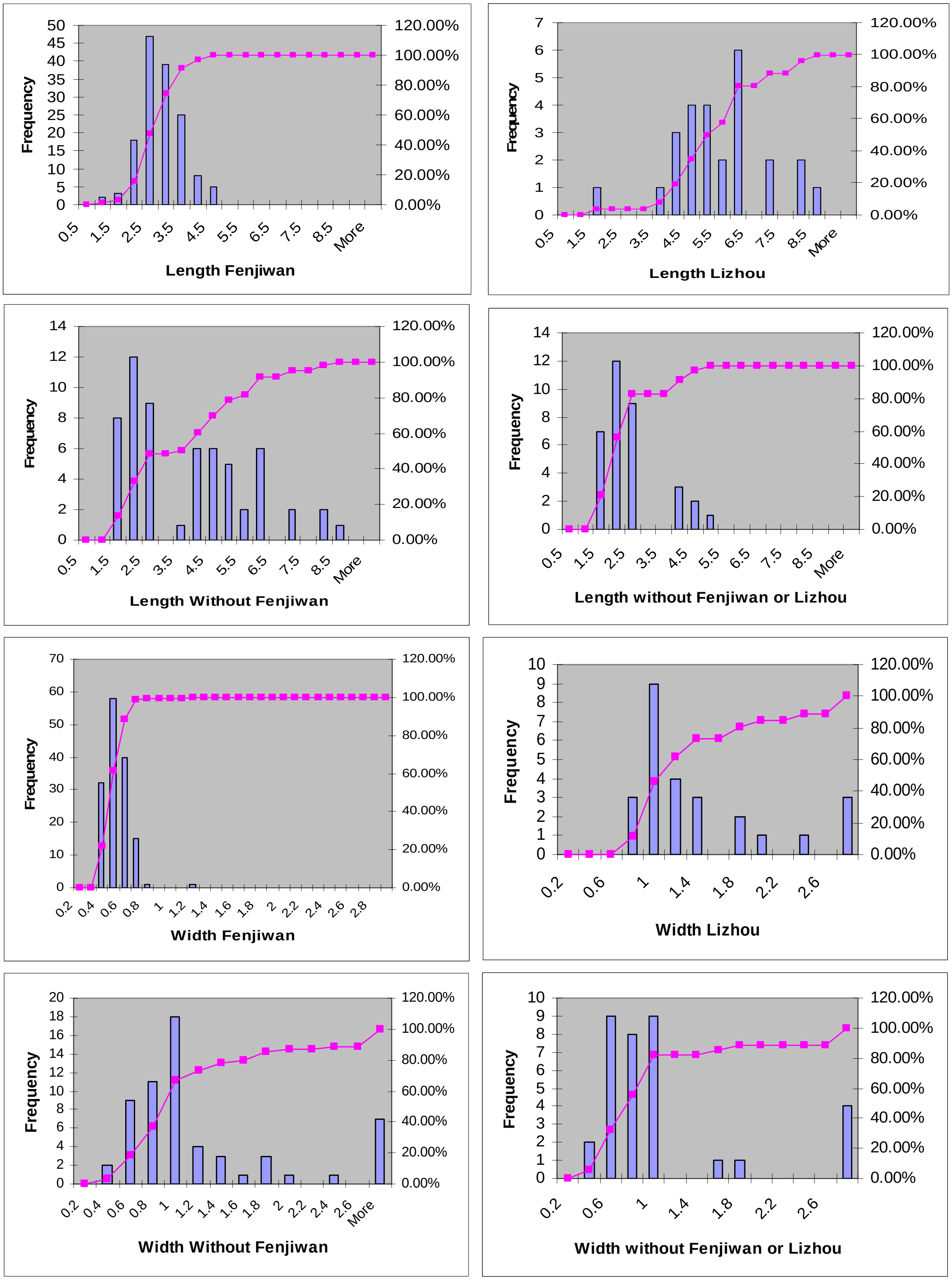


Figure 5.35: Histograms for Length and Width of Earth-Pit Graves Comparing Lizhou, Fenjiwan, and Other Sites (Cont.).

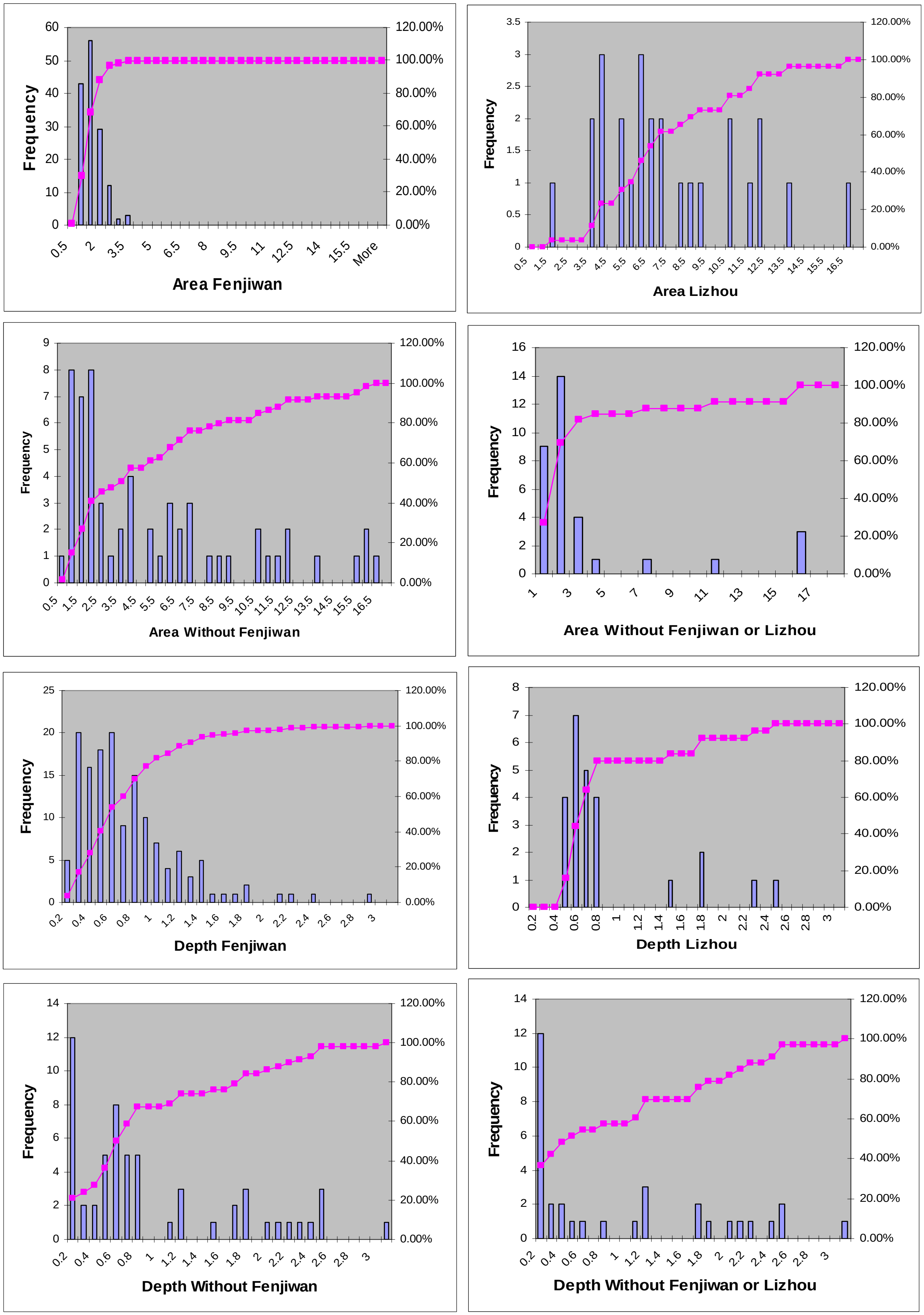


Figure 5.35: Histograms for Area and Depth of Earth-Pit Graves Comparing Lizhou, Fenjiwan, and Other Sites.

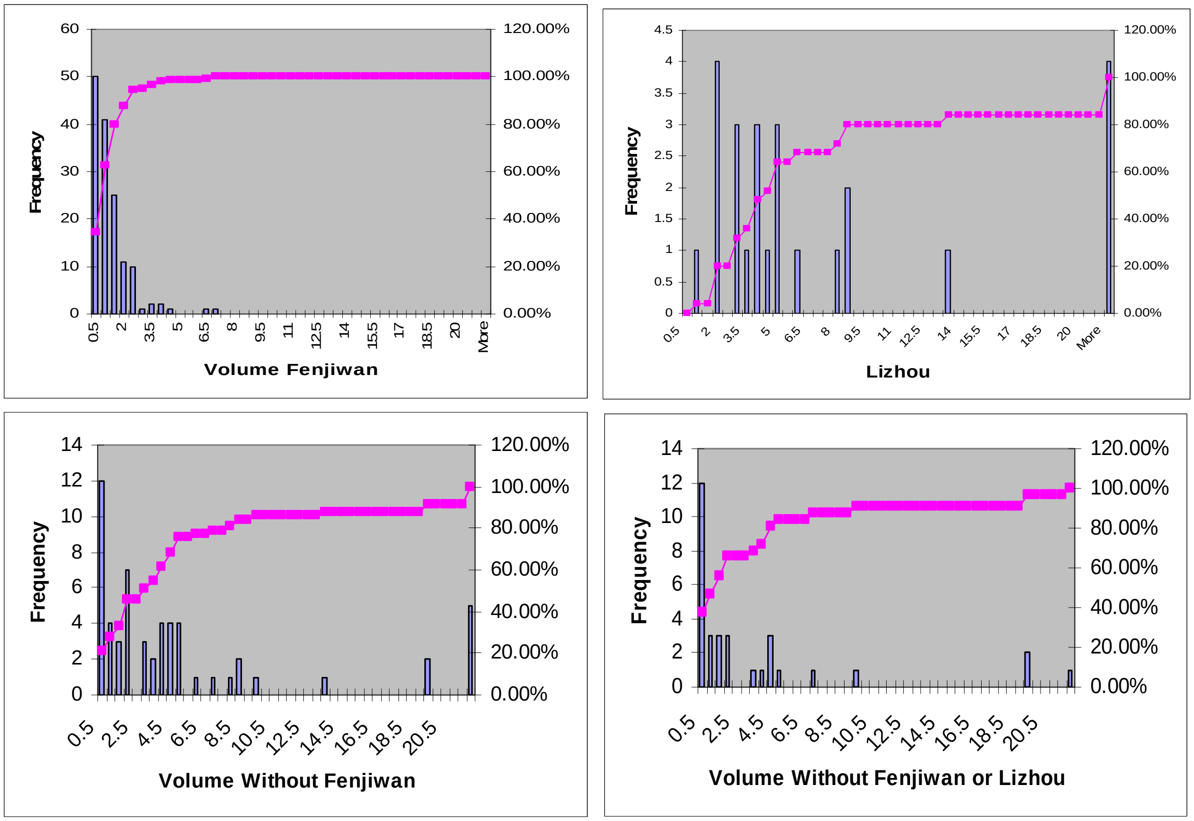


Figure 5.35: Histograms for the Volume of Earth-Pit Graves Comparing Lizhou, Fenjiwan, and Other Sites (Cont.)

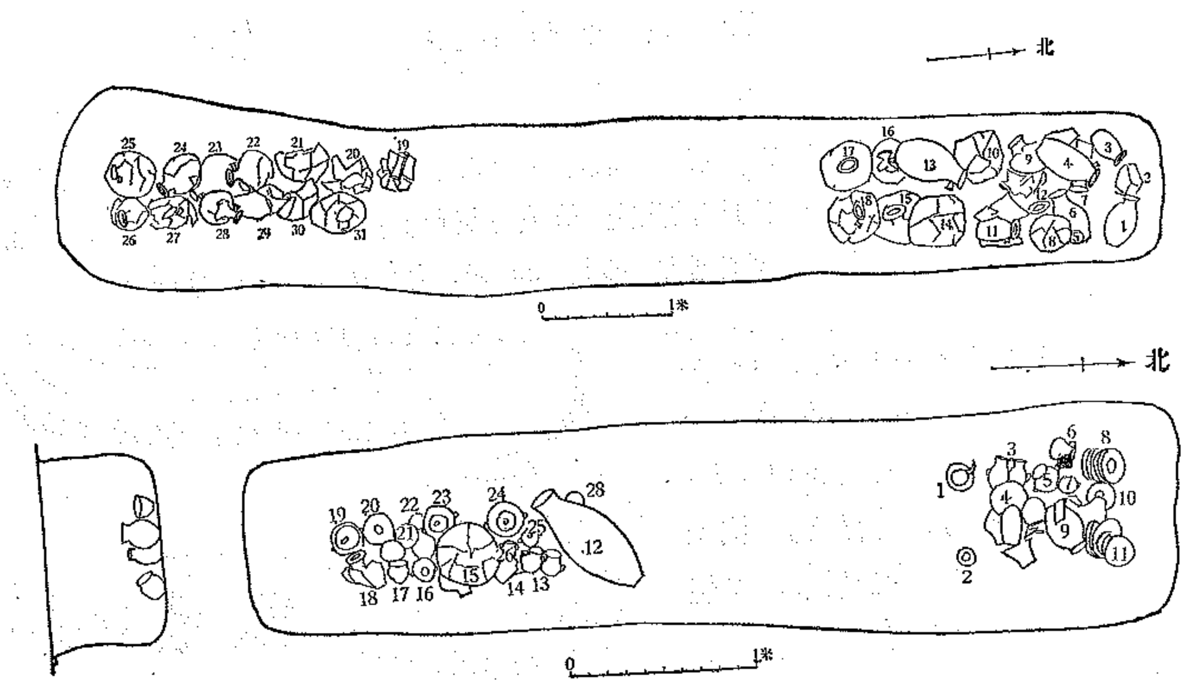


Figure 5.36: Xichang Lizhou BM4 and BM3 (Lizhou Yizhi 1980: Figure 5-6).

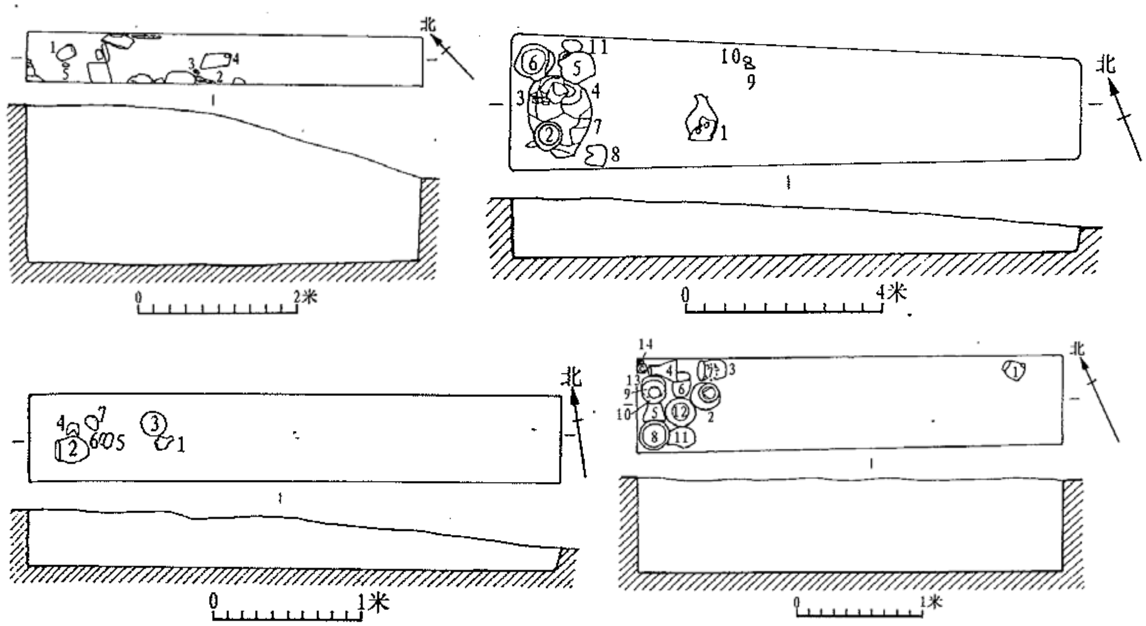


Figure 5.37: Huili Fenjiwan M3, M26, M29, and M148 (Huilixian, Liangshan, and Sichuansheng 2004: Figure 3, 4, 5, and 7).

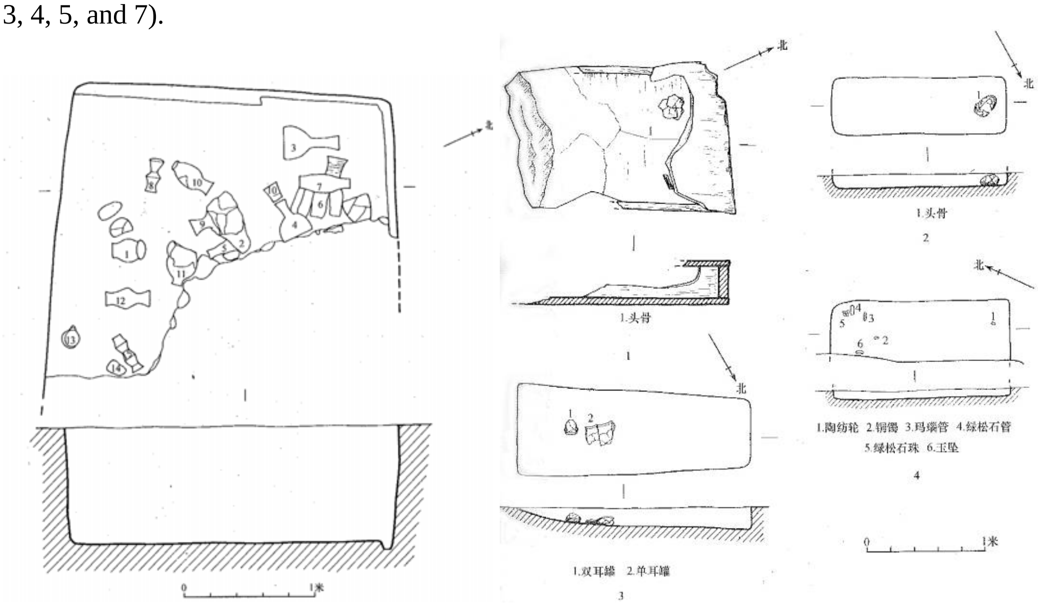


Figure 5.38: Huili Leijiashan M1 and Huili Guojiabao M1-M4 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 2; Chengdu et al. 2009: Figure 3).

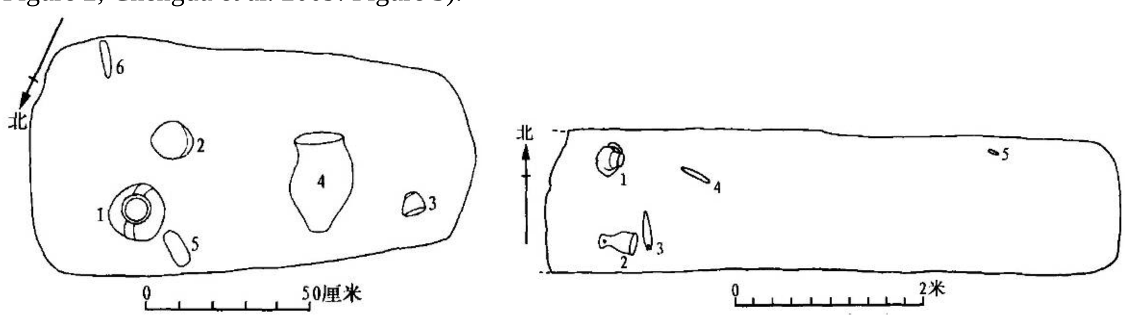


Figure 5.39: Dayangdui M2 and M3 (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 5-6).

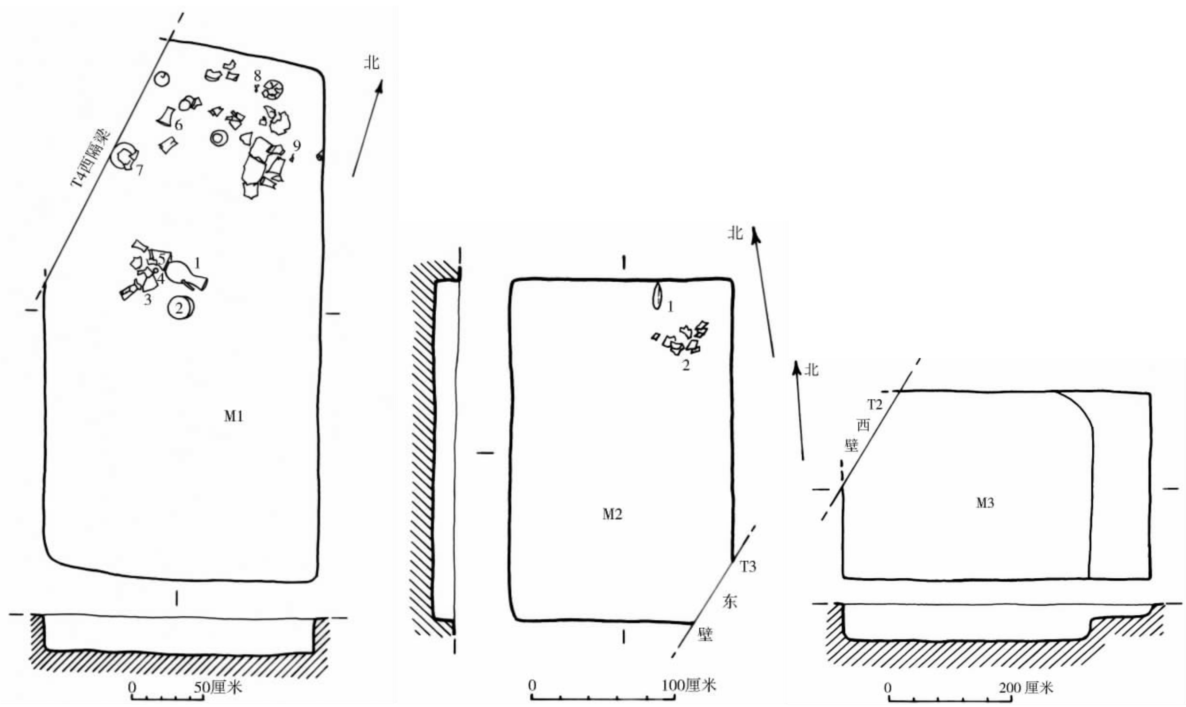


Figure 5.40: Xichang Qimugou M1, M2, and M3 (Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 4, 8, and 16).

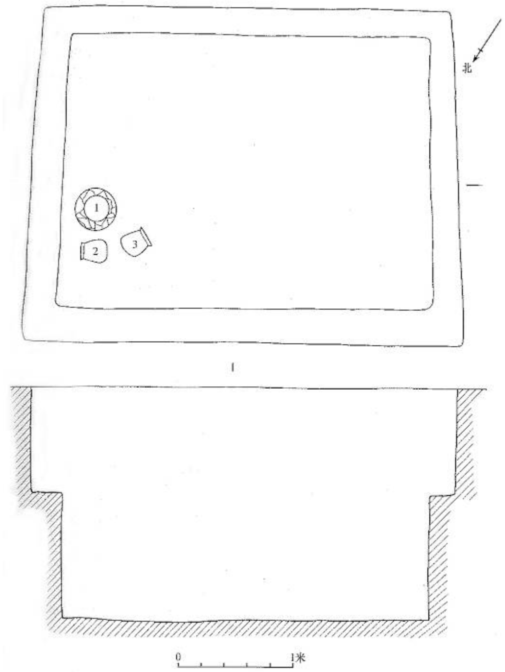


Figure 5.41: Xichang Ma'anshan M1 (Chengdu, Liangshan, and Xichangshi 2007: Figure 5).

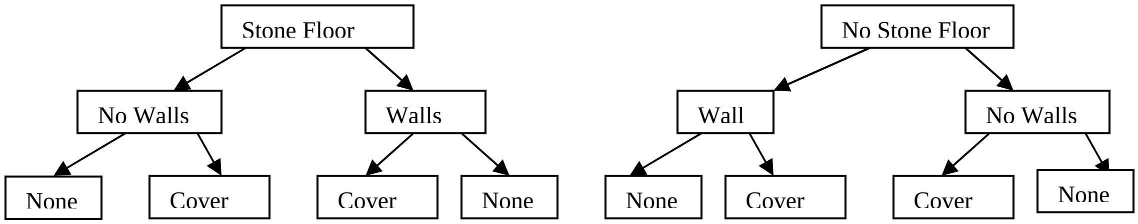


Figure 5.42: Decision-Tree for Stone-Construction Graves.

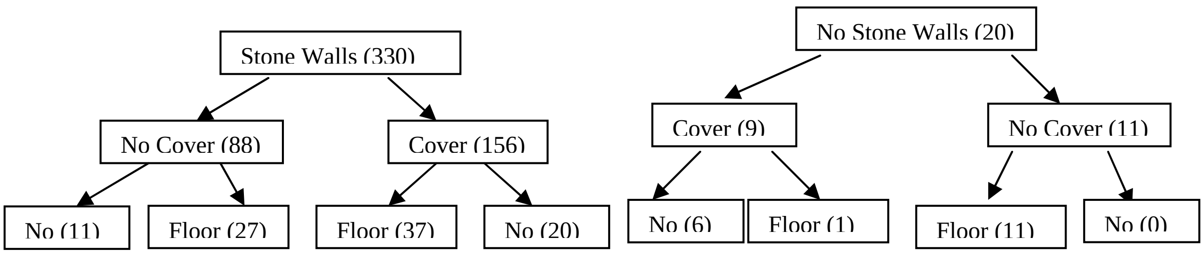


Figure 5.43: Clustering for Stone-Construction Graves.

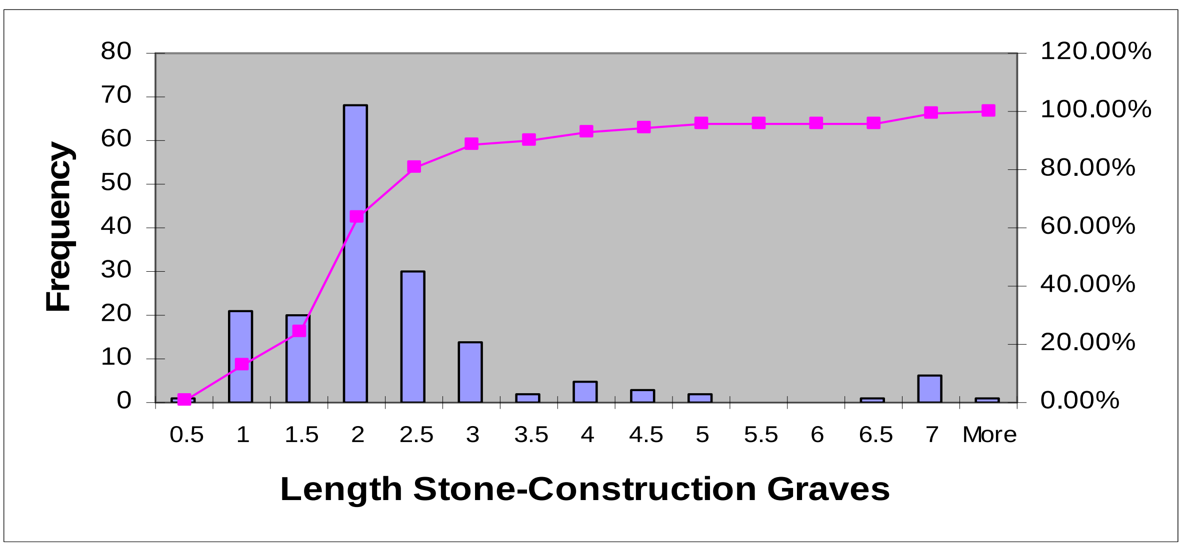


Figure 5.44: Histogram and Cumulative Frequency for the Length of Stone-Construction Graves.

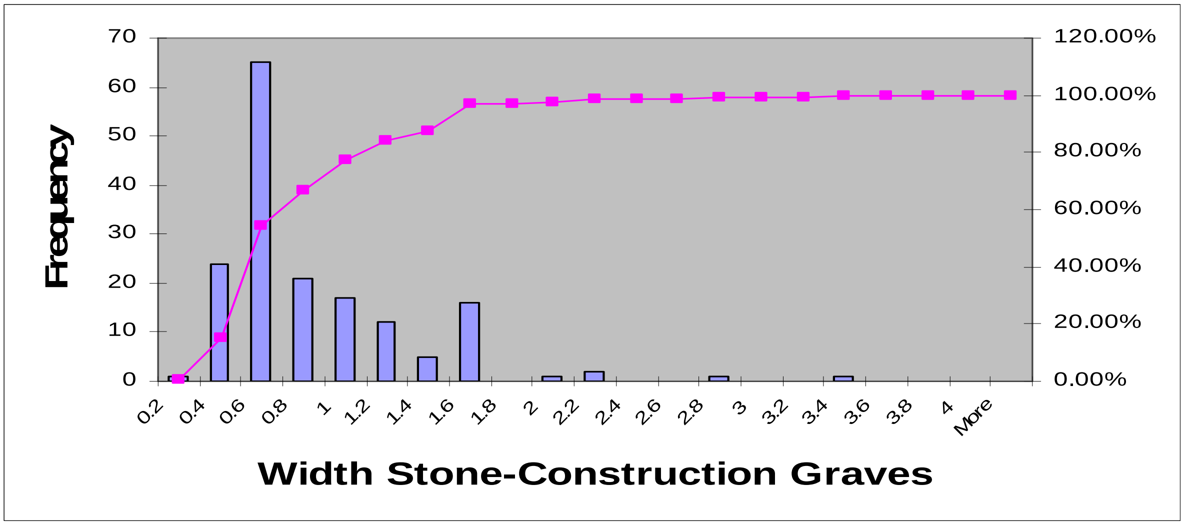


Figure 5.45: Histogram and Cumulative Frequency for the Width of Stone-Construction Graves.

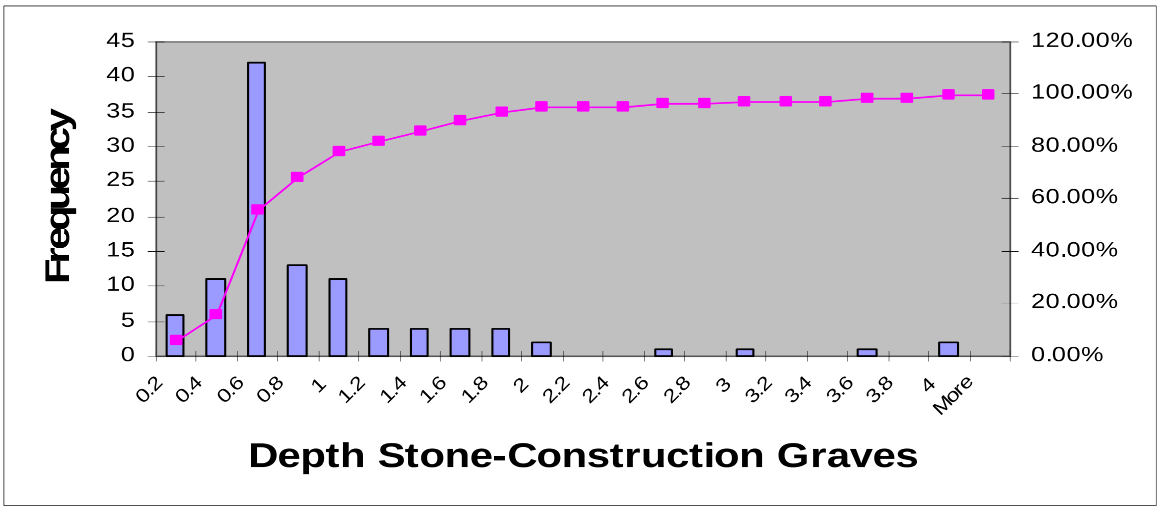


Figure 5.46: Histogram and Cumulative Frequency for the Depth of Stone-Construction Graves.

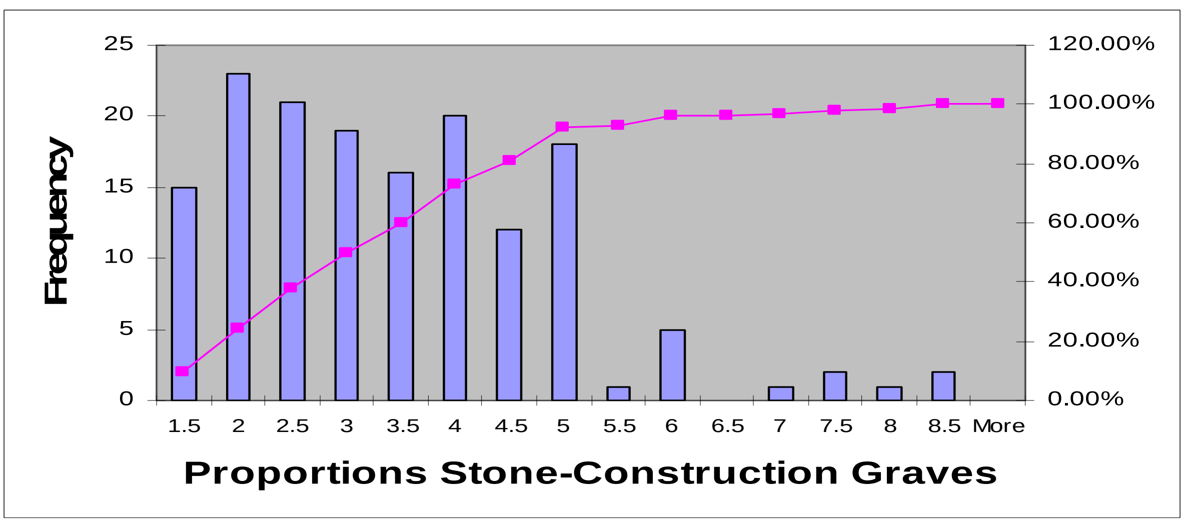


Figure 5.47: Histogram for the Proportions of Stone-Construction Graves.

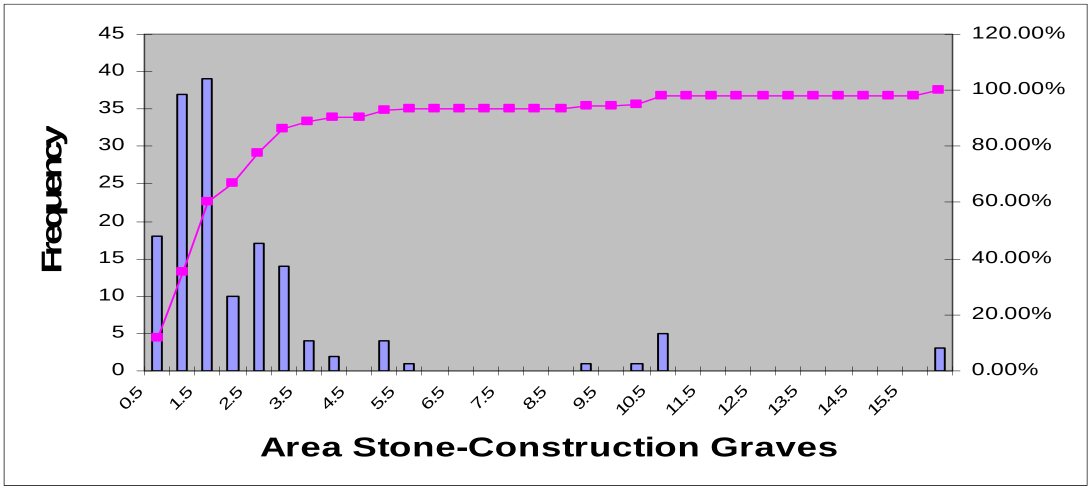


Figure 5.48: Histogram and Cumulative Frequency for the Area of Stone-Construction Graves.

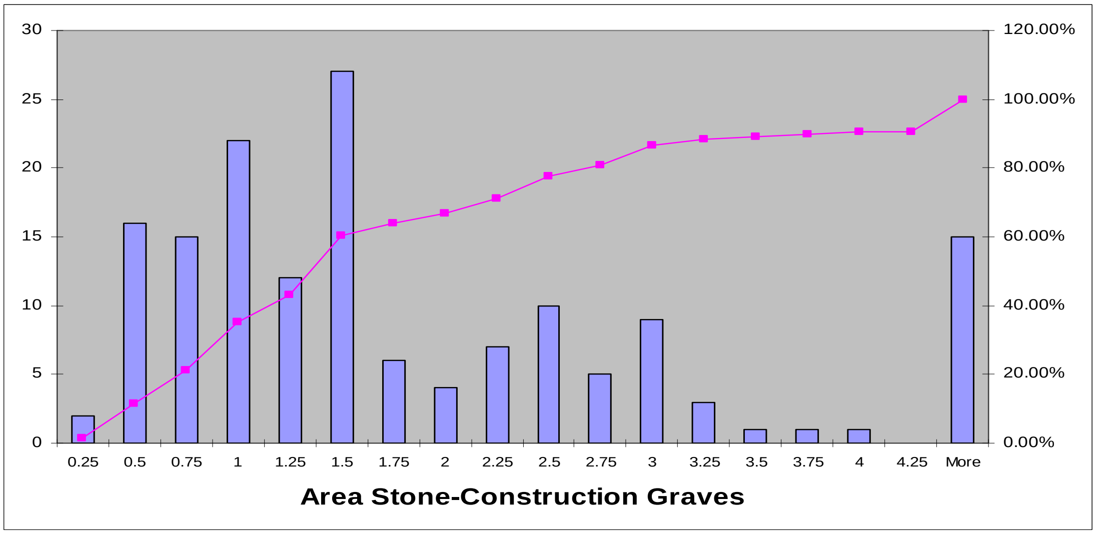


Figure 5.49: Histogram for Volume Adjusted to Smaller Values.

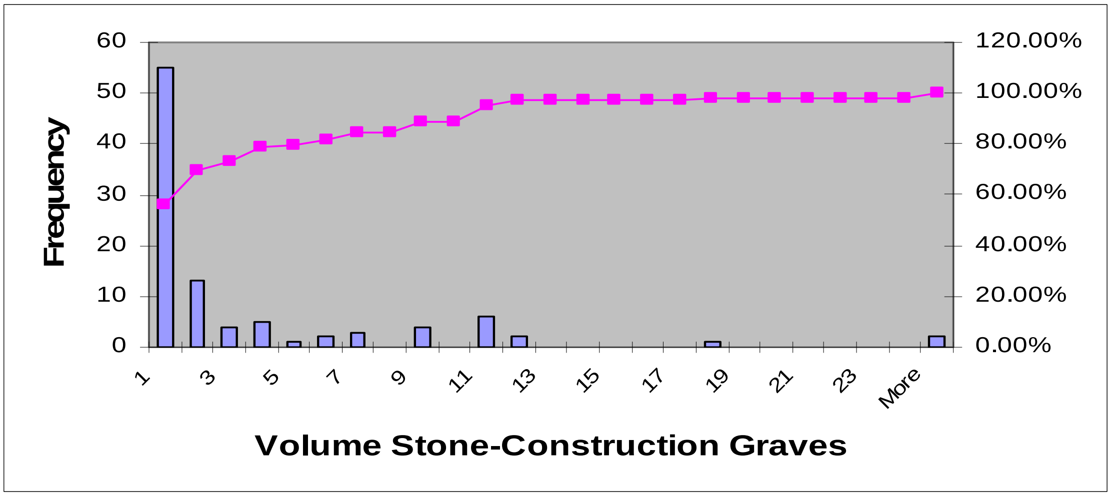


Figure 5.50: Histogram and Cumulative Frequency for Volume of Stone-Construction Graves.

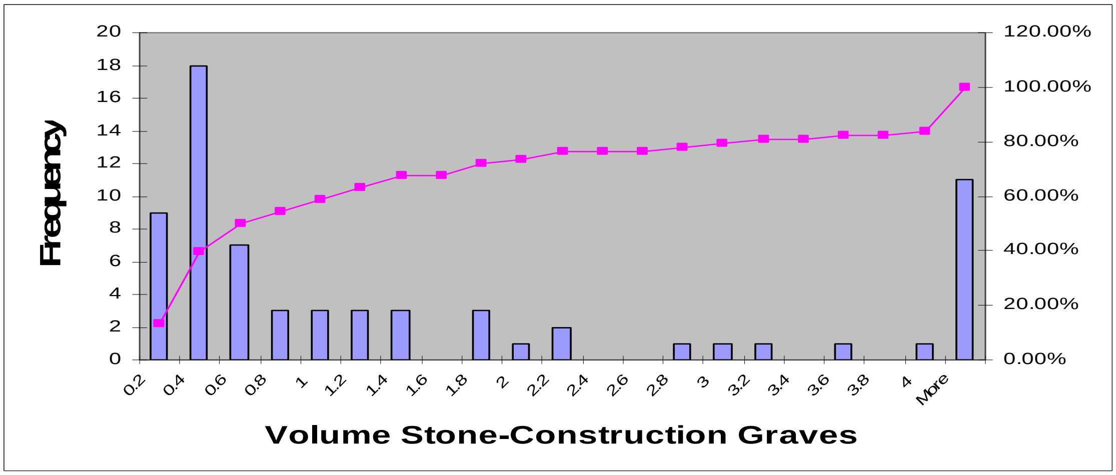


Figure 5.51: Histogram for Volume Adjusted to Smaller Values.

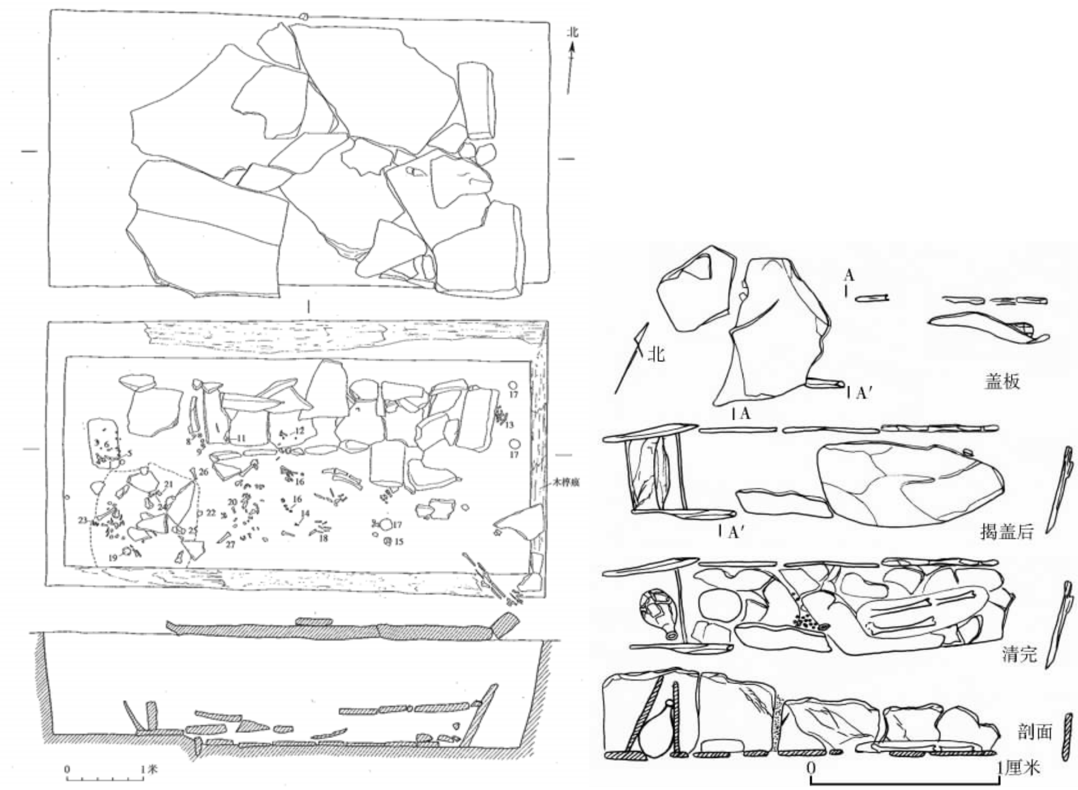


Figure 5.52: Type 1 Stone-Construction Graves: Yanyuan Laolongtou M9 (Type 1.2.1.2), Huili Xiaoyingpan M21 (Type 1.3.1.1) (Sichuansheng, Liangshan, and Huilixian 2006: Figure 6; Liangshan and Chengdu 2009: Figure 17).

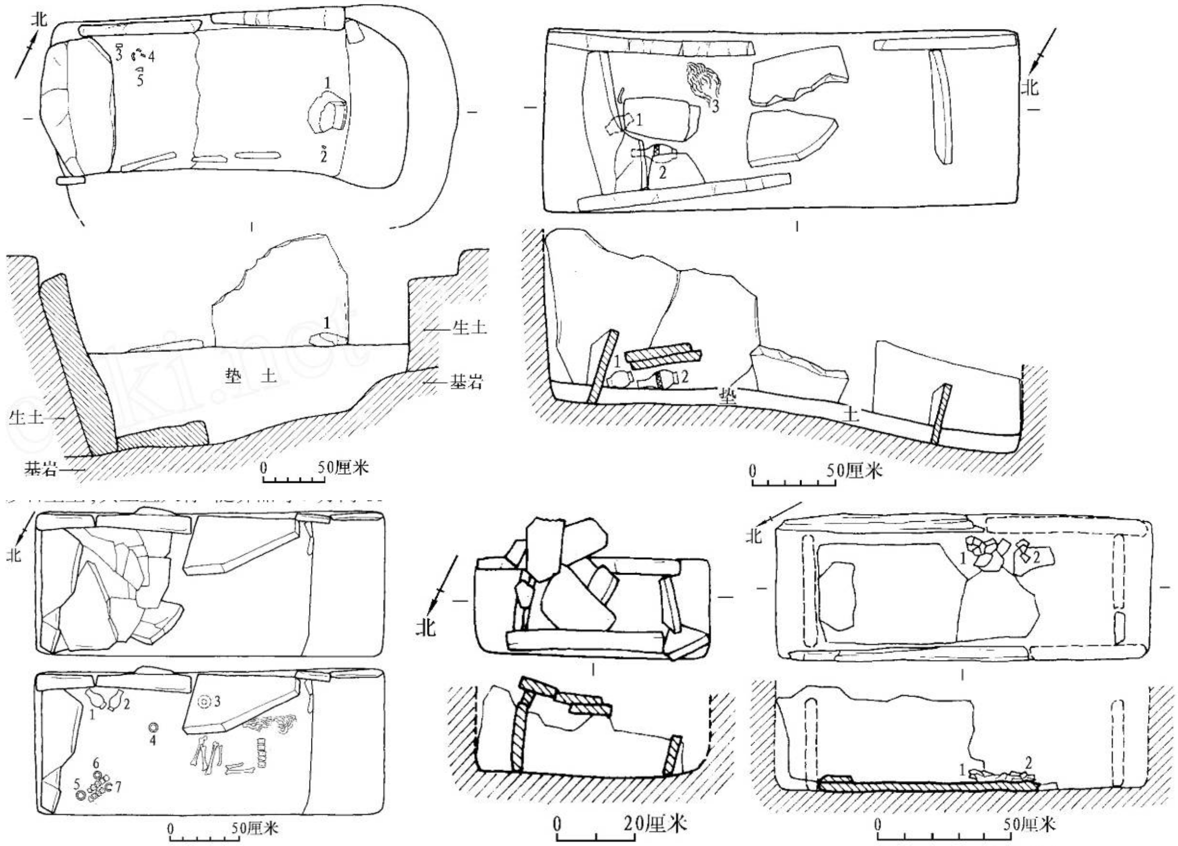


Figure 5.53: Type 2 Stone-Construction Graves: Zhaojue Eba Buji M1 (Type 2.1.1), Zhaojue Pusu Bohuang M3 (Type 2.3.2.2), M6 (Type 2.4.1.1.1), M9 (Type 2.4.1.2.2) (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 5, 8, 4, 7, and 9).

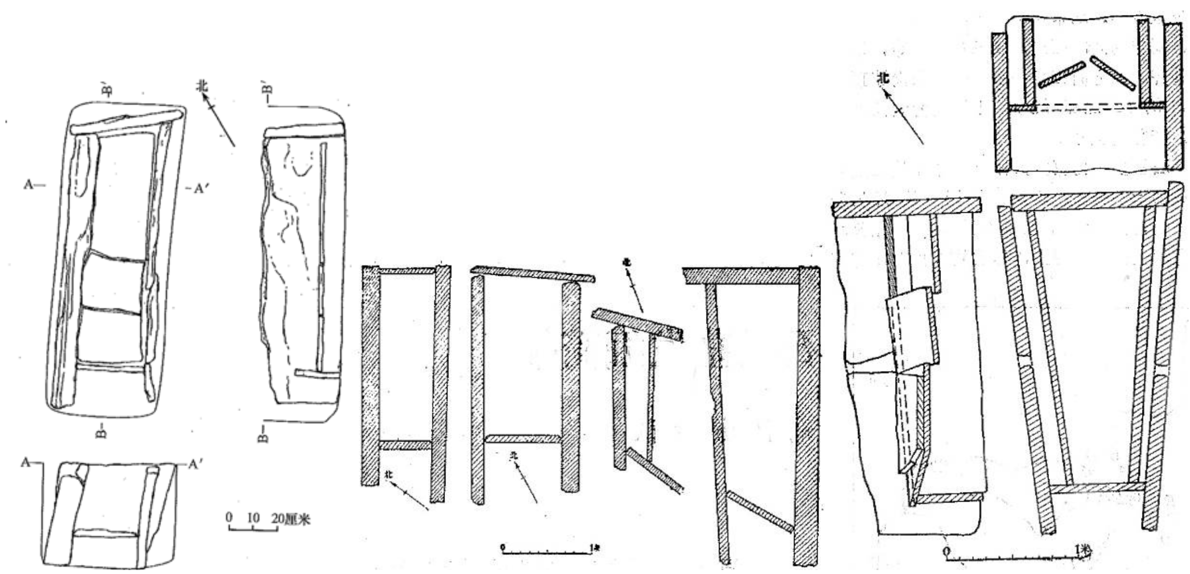


Figure 5.54: Type 2.4 Stone-Construction Graves: Zhaojue Jike Jijie M1 (Type 2.4.4.2), Zhaojue Erba Keku M9 (Type 2.4.1.2.2), M11 (Type 2.4.2.1), M10 (Type 2.4.4.1), and Zhaojue Wazhaishan M5 (Type 2.4.4.2), and Zhaojue Fuchengqu M3 (Type 2.4.3) (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 11; Liangshan Yizu 1982: Figure 2-3).

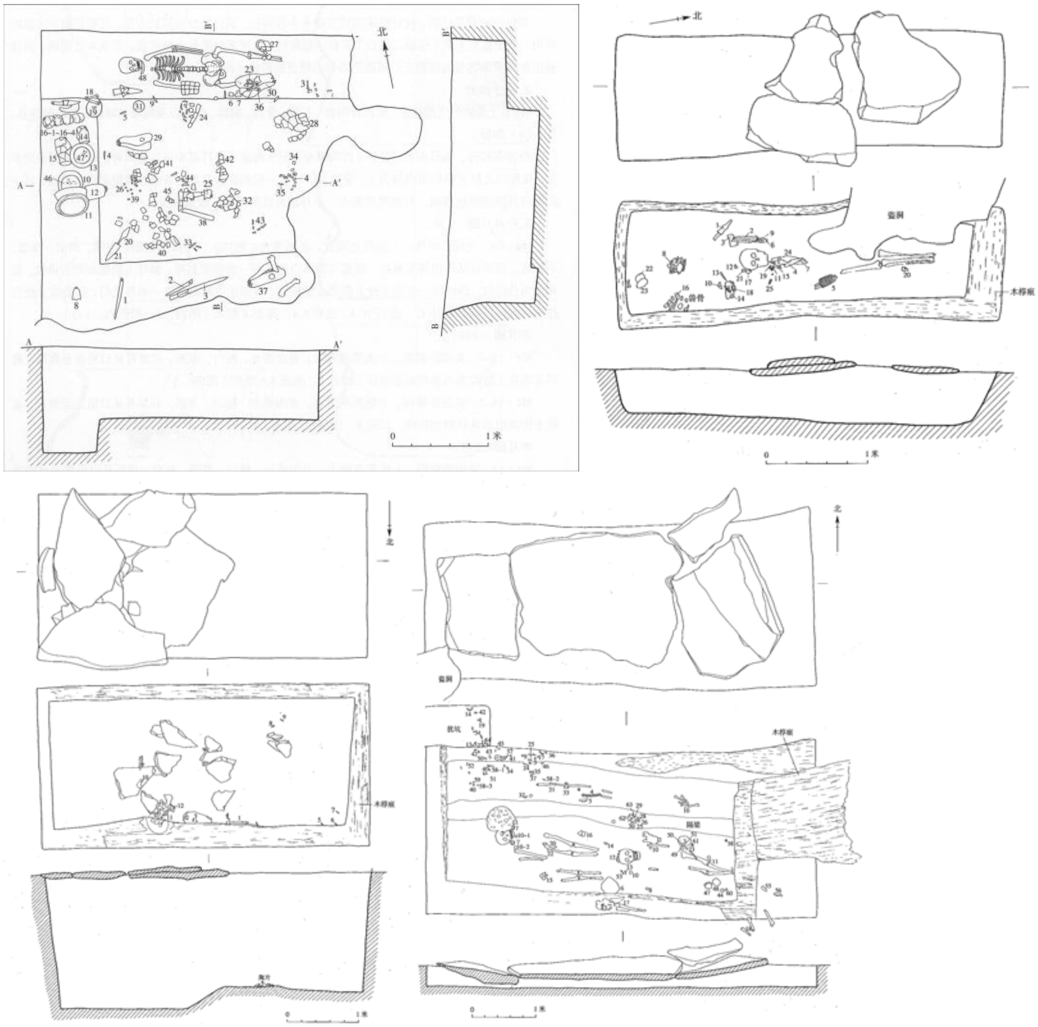


Figure 5.55: Type 3 Stone-Construction Graves: Yanyuan Laolongtou M4 (Type 3.1.1), M11 (Type 3.1.1), M7 (Type 3.1.2), M6 (Type 3.1.3) (Liangshan and Chengdu 2009: Figure 3, 22, 26, 9).

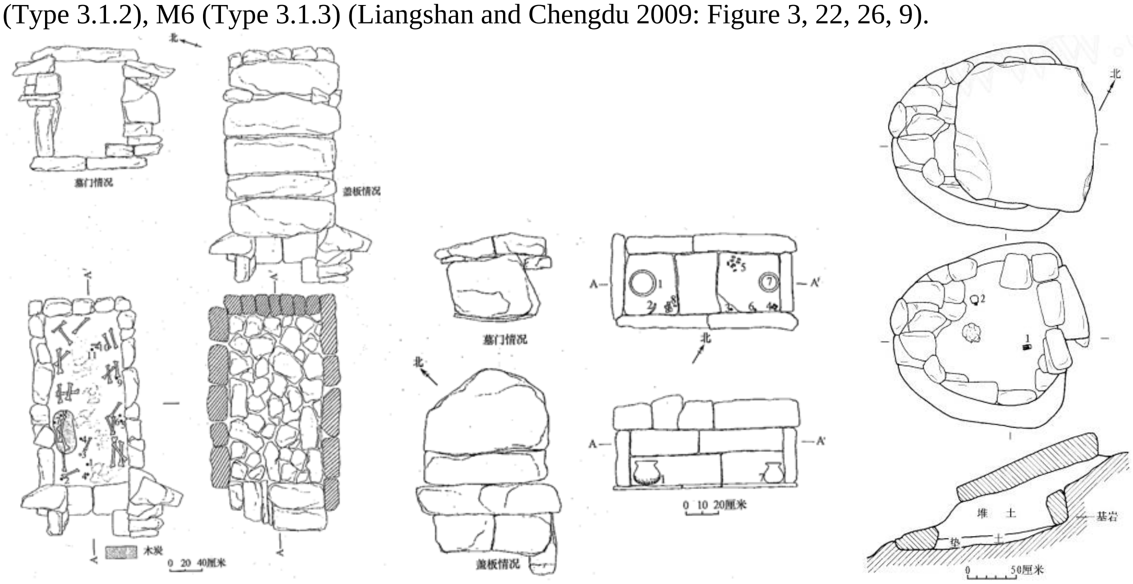


Figure 5.56: Type 5 Stone-Construction Graves: Zhaojue Chike Boxixian M3 (Type 5.1.1.1), Zhaojue Chike Boxixian M1 (Type 5.1.1.2) (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 6, 7), Zhaojue Eba Buji M3 (Type 5.2) (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 9).

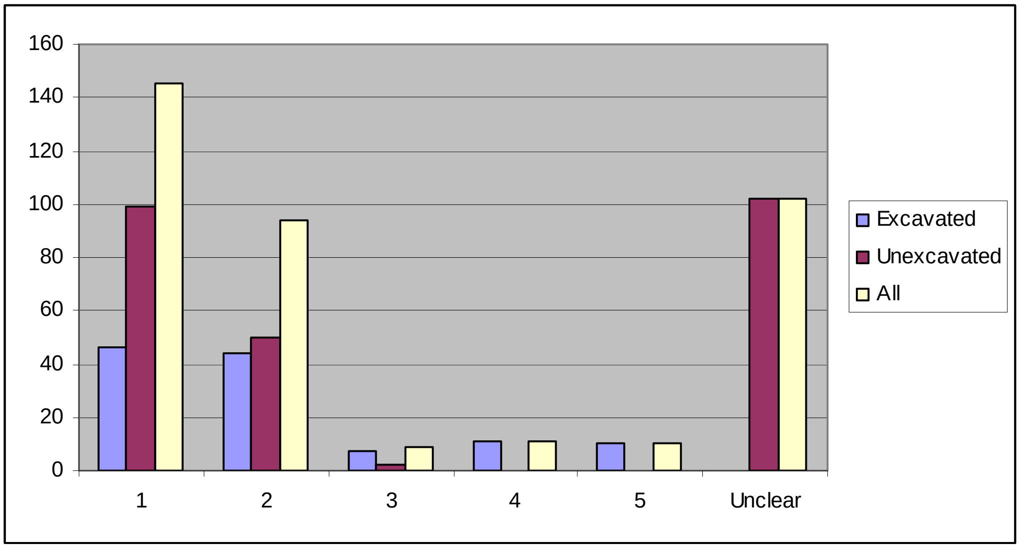


Figure 5.57: Bar-Chart for Stone-Construction Grave Types.

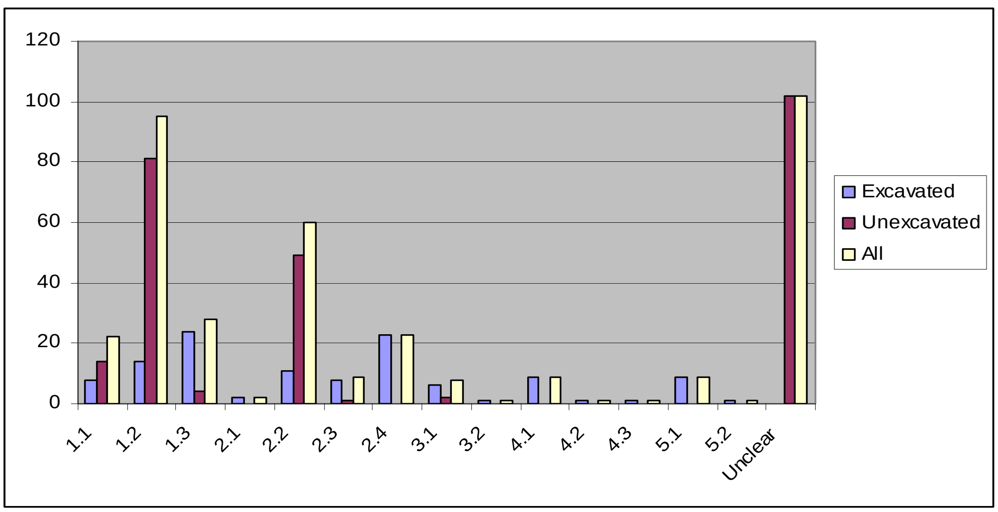


Figure 5.58: Bar-Chart for Sub-types of Stone-Construction Graves.

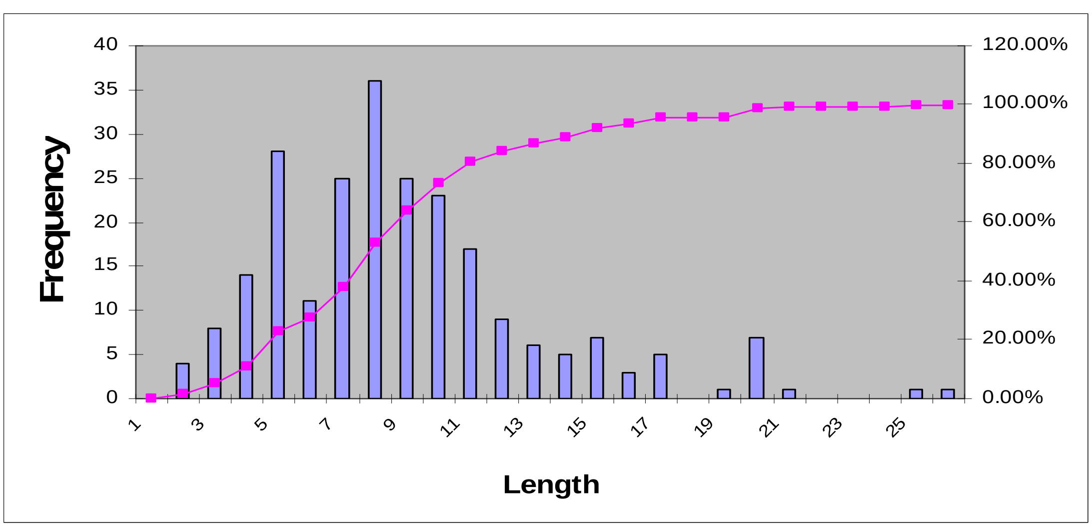


Figure 5.59: Histogram and Cumulative Frequency for the Length of Megalithic Graves.

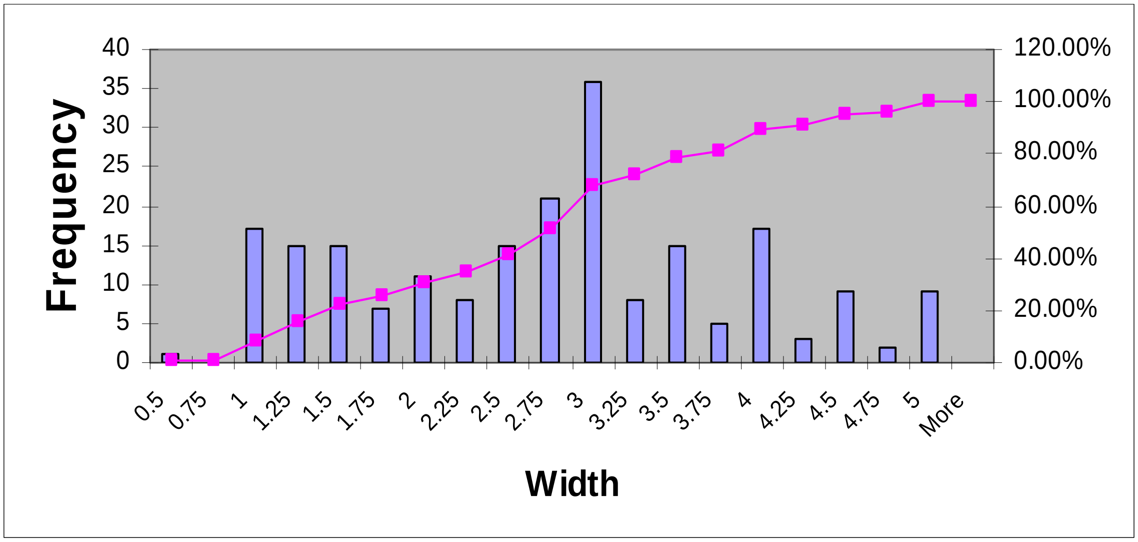


Figure 5.60: Histogram and Cumulative Frequency for the Width of Megalithic Graves.

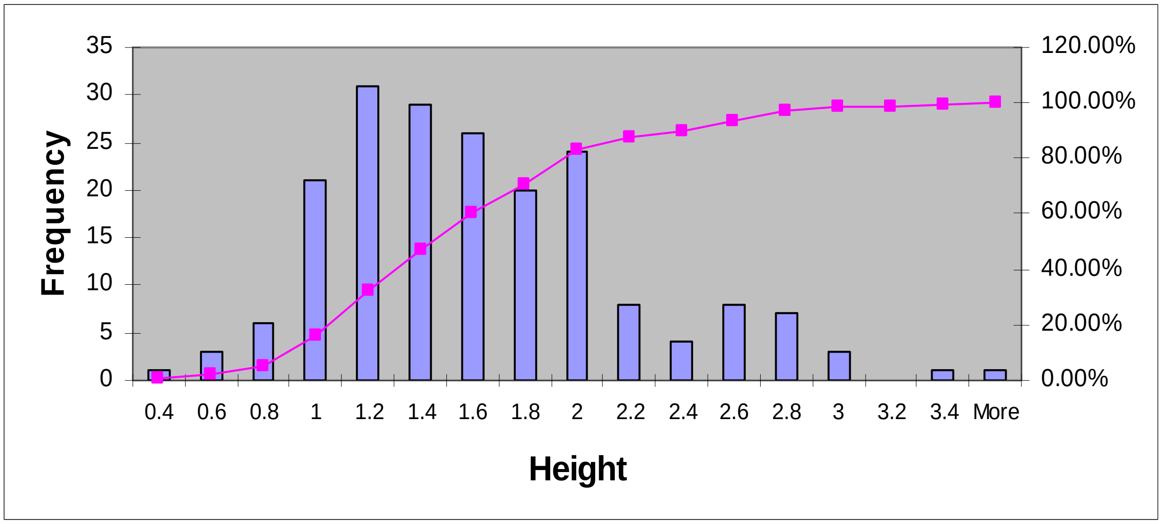


Figure 5.61: Histogram and Cumulative Frequency for the Height of Megalithic Graves.

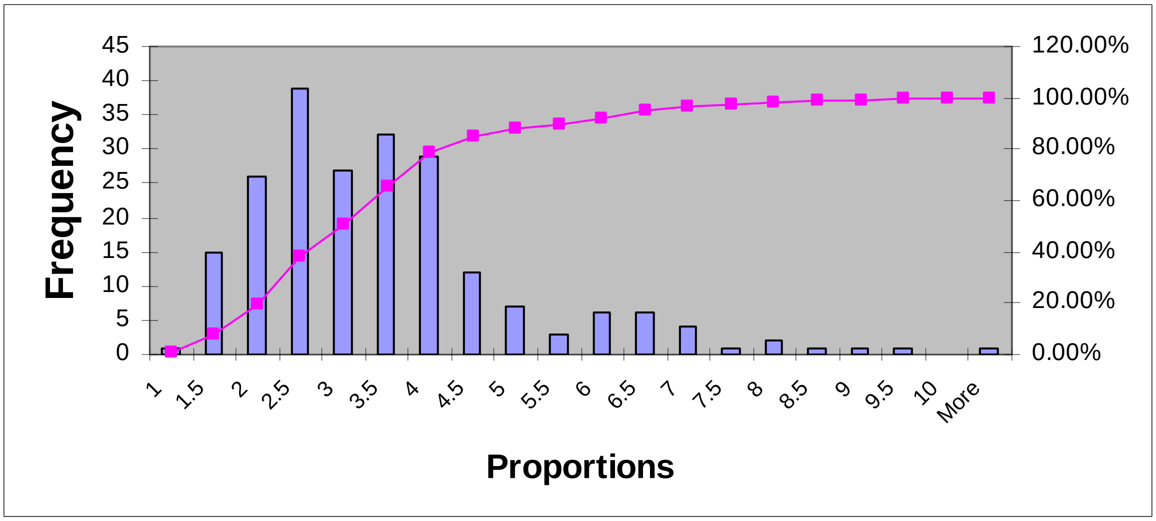


Figure 5.62: Histogram and Cumulative Frequency for the Proportions of Megalithic Graves.

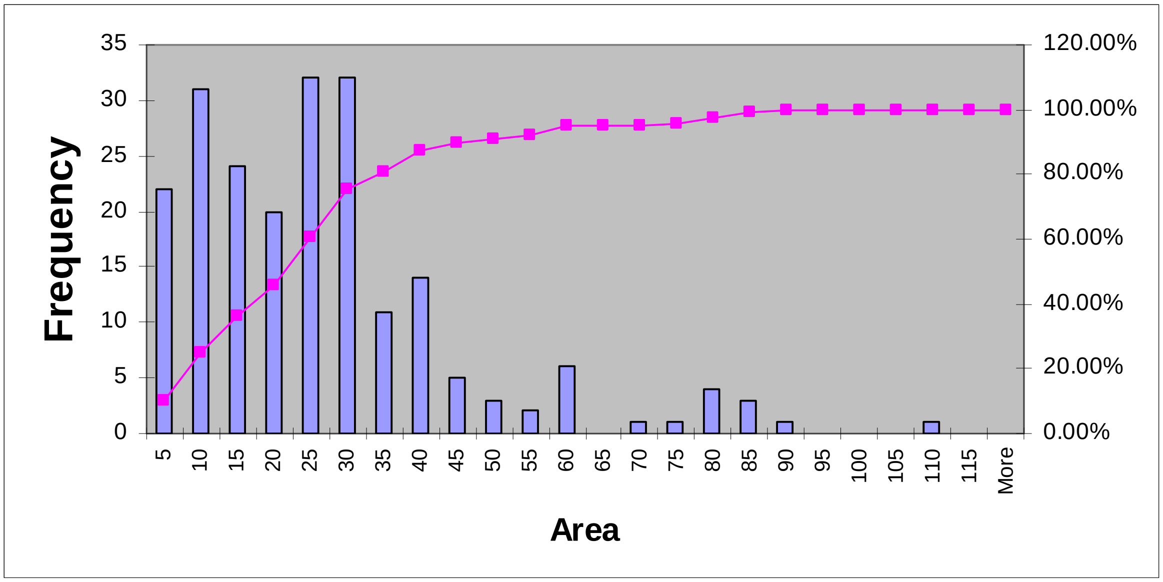


Figure 5.63: Histogram and Cumulative Frequency for the Area of Megalithic Graves.

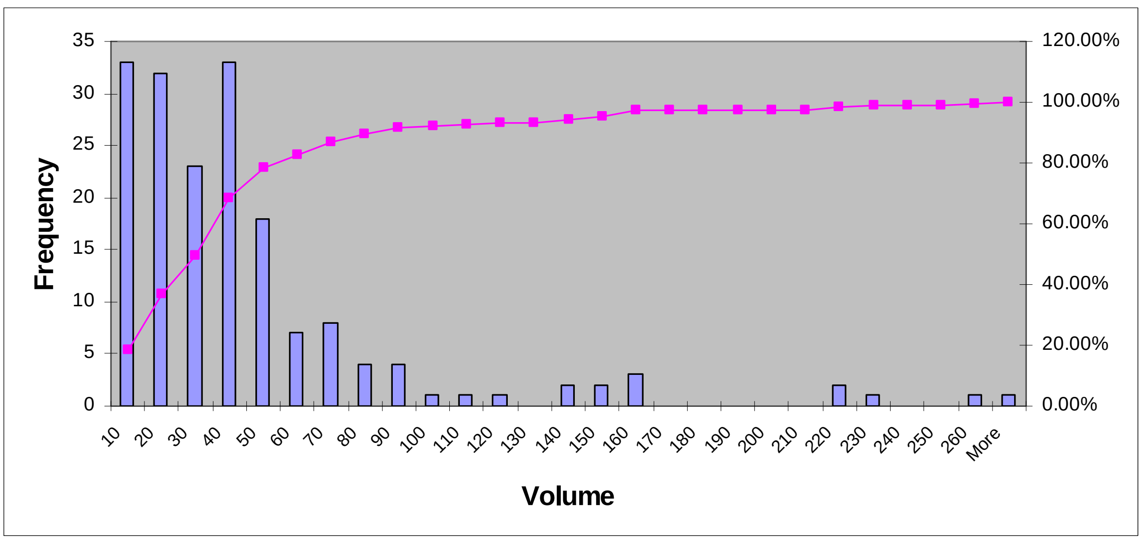


Figure 5.64: Histogram and Cumulative Frequency for the Volume of Megalithic Graves.

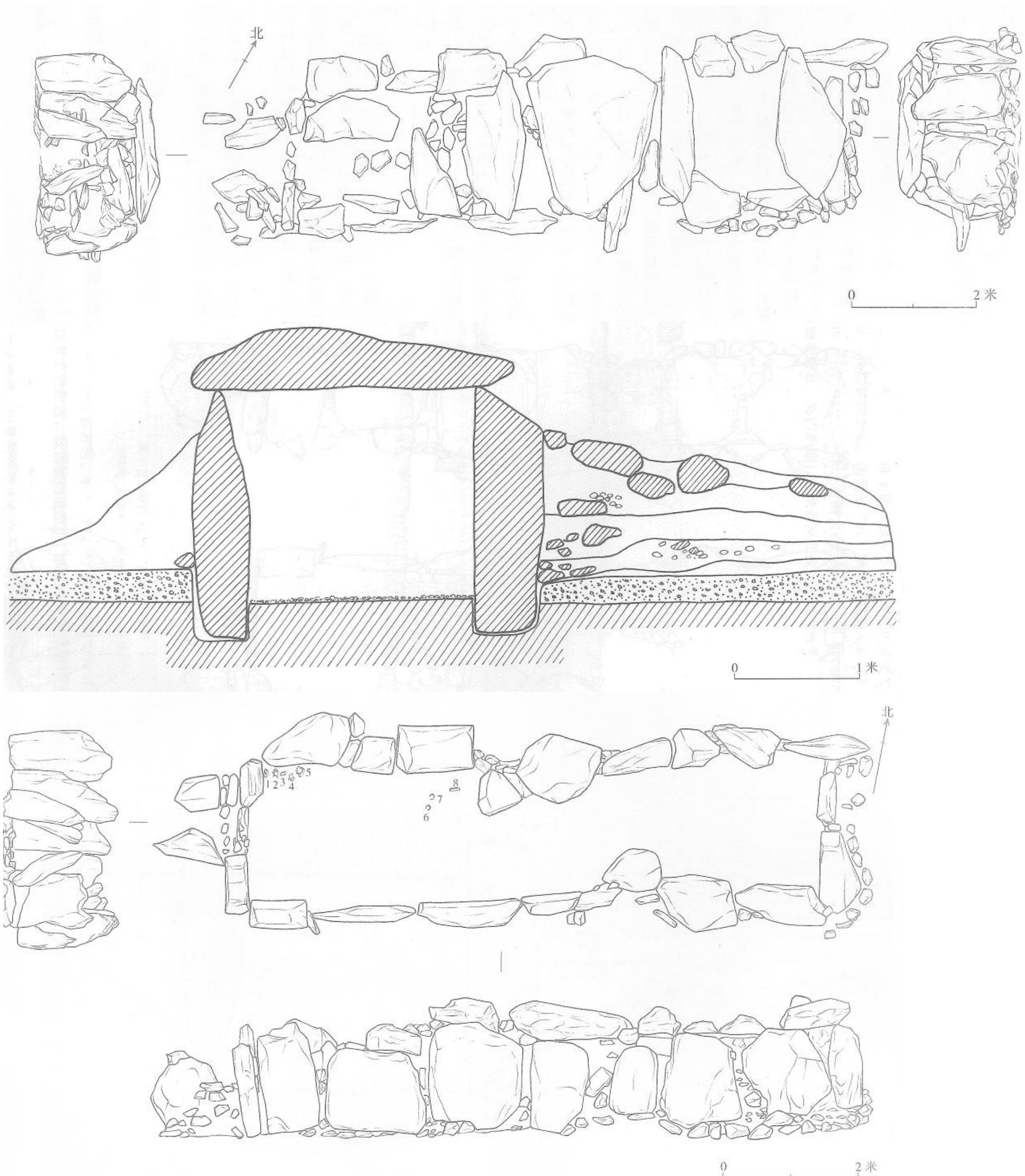


Figure 5.65: Megalithic Grave Type 1.1.1: Dechang Arong M4 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 12-14).

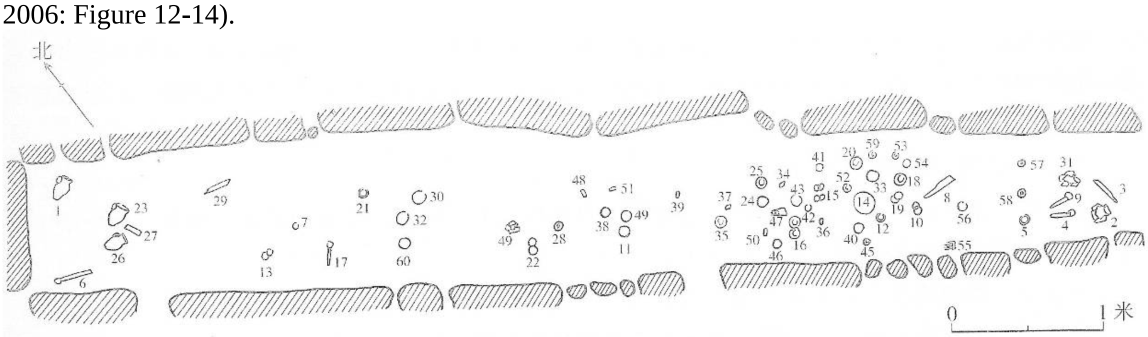


Figure 5.67: Megalithic Grave Type 1.2.1, Xide Guluqiao M1 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 17).

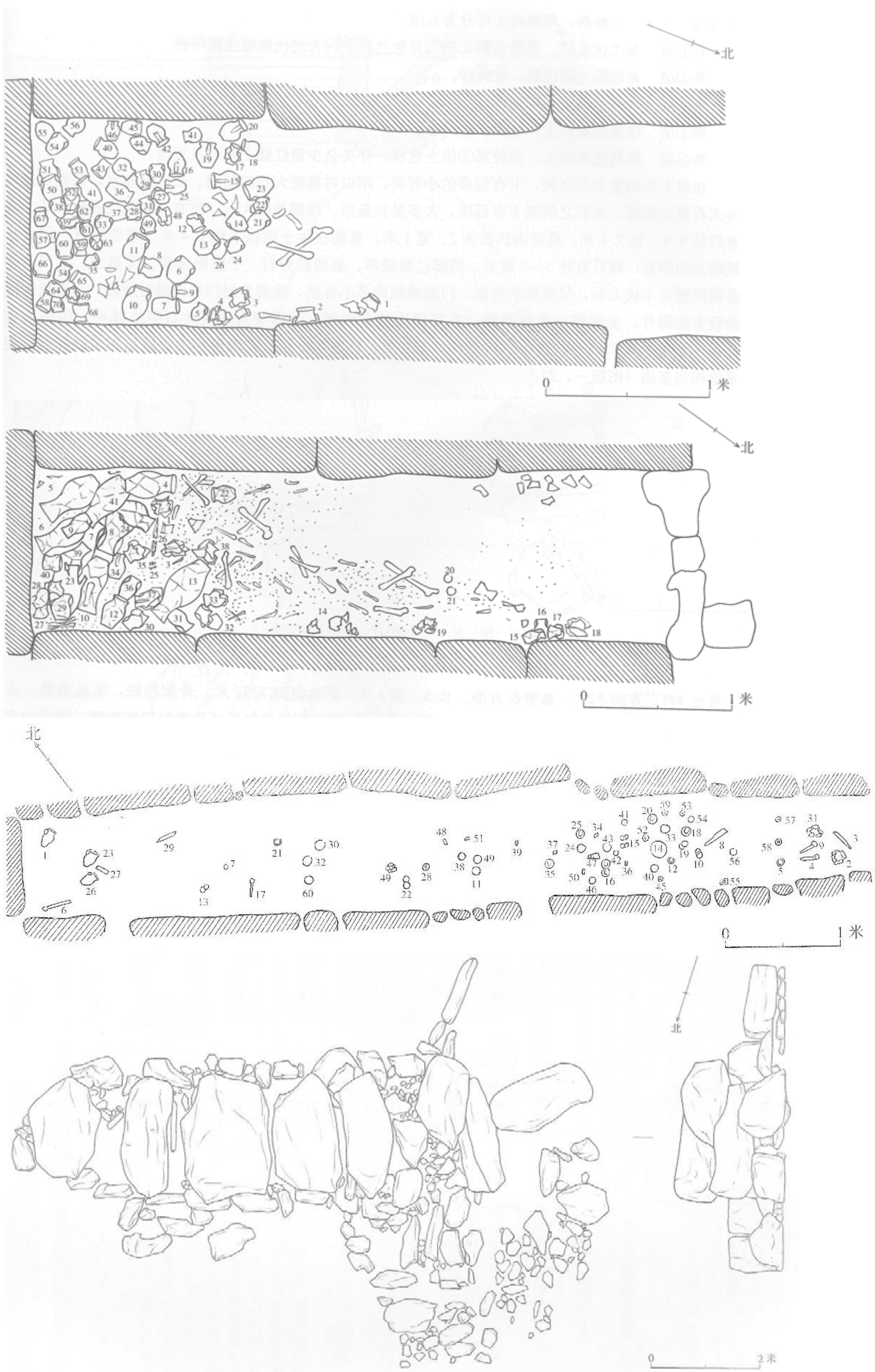


Figure 5.68: Megalithic Graves Type 1.2.1: Miyi Wanqiu M1 and M2, Xide Guluqiao M1, Xichang Wanao M2 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 7, 16, 17, 19)

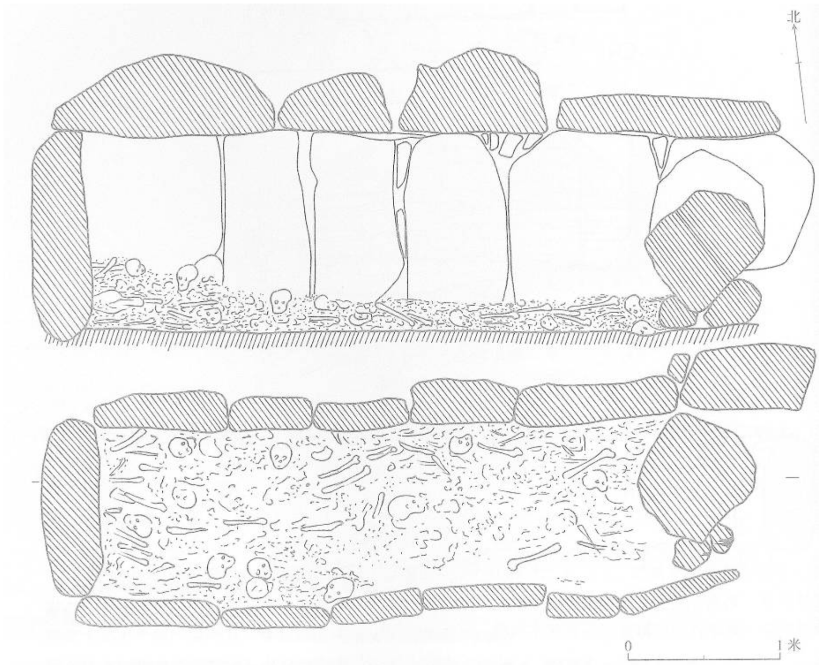


Figure 5.69: Megalithic Grave Type 1.2.1, Xichang Bahe Baozi M6 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 6).

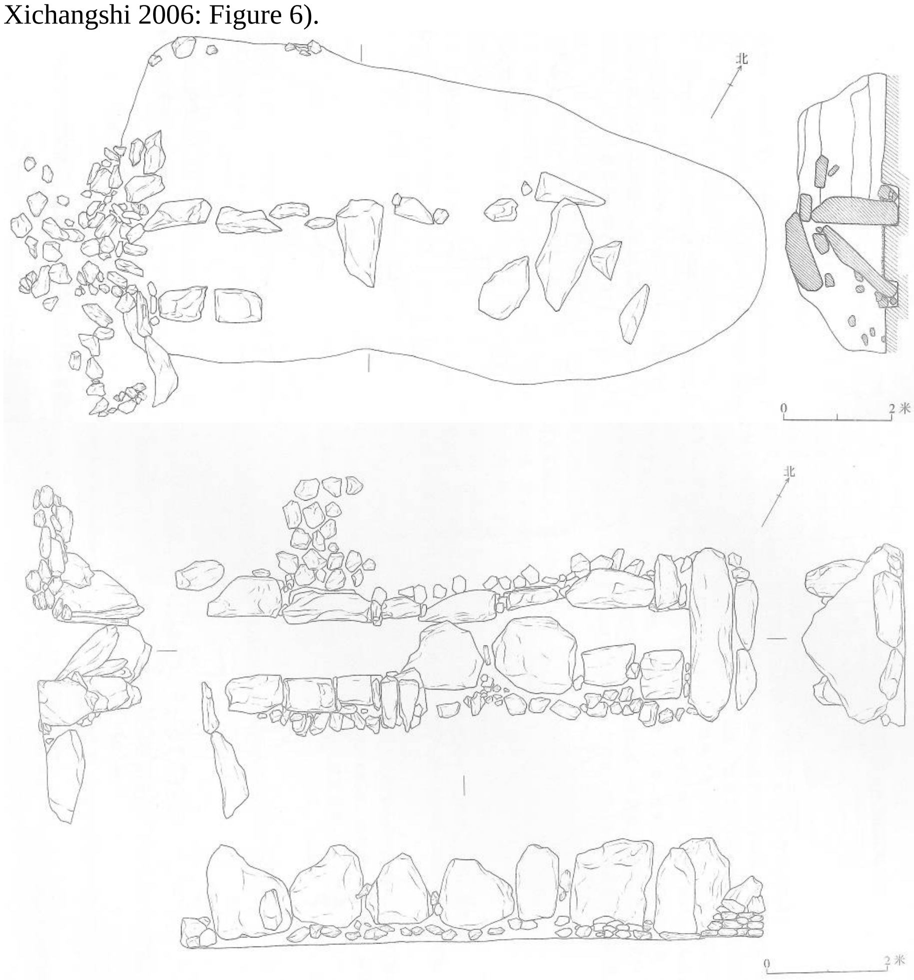


Figure 5.70: Megalithic Grave Type 2.1.1.2: Dechang Arong M1 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 9-10).

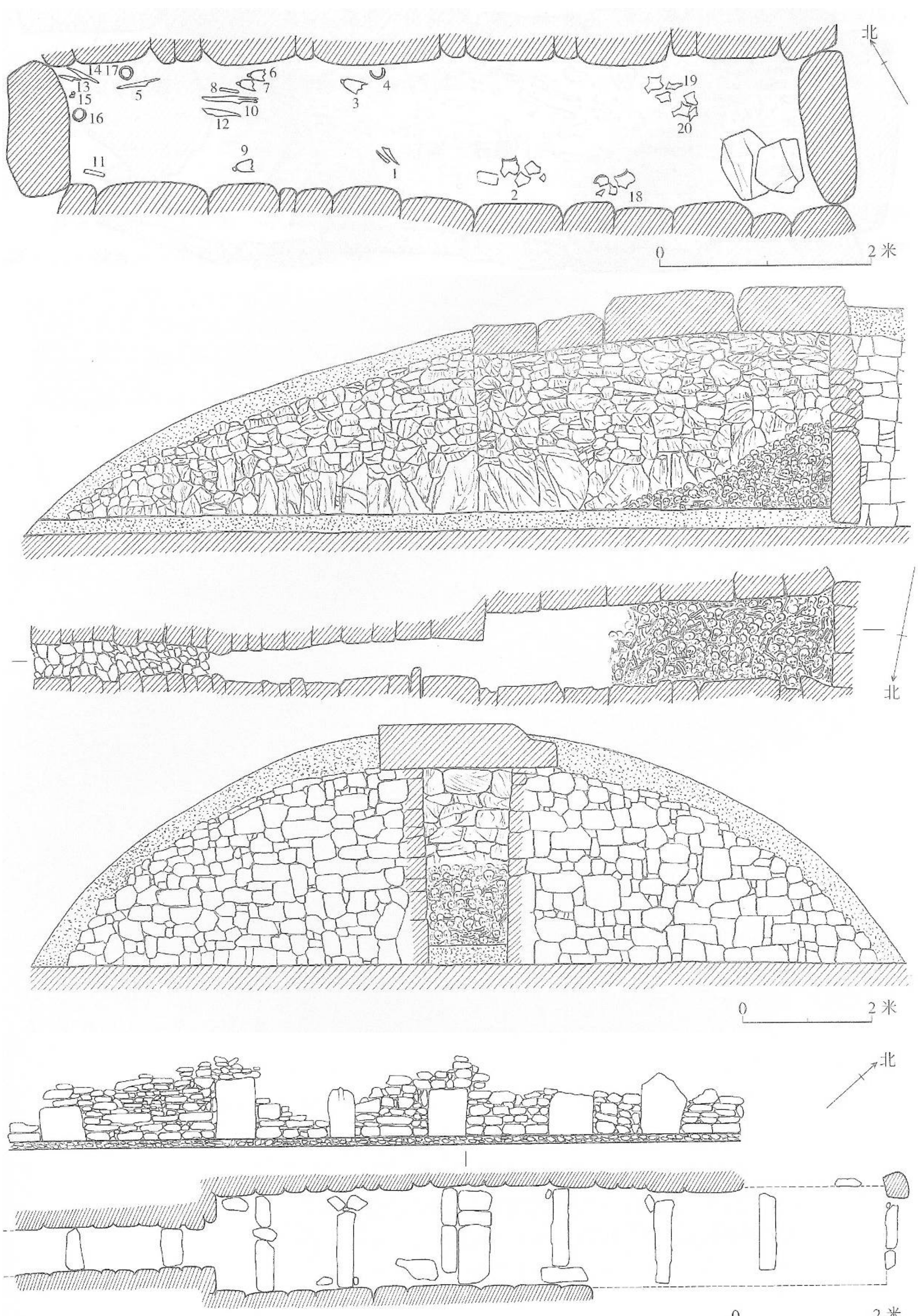


Figure 5.71: Type 2.1 Megalithic Graves: Xichang Hexi Gongshe M2 (Type 2.1.1.1), Xichang Bahe Baozi M1 (Type 2.1.2), Xichang Xijiao M1 (Figure 2.1.3.2.1 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 5, Figure 25-26).

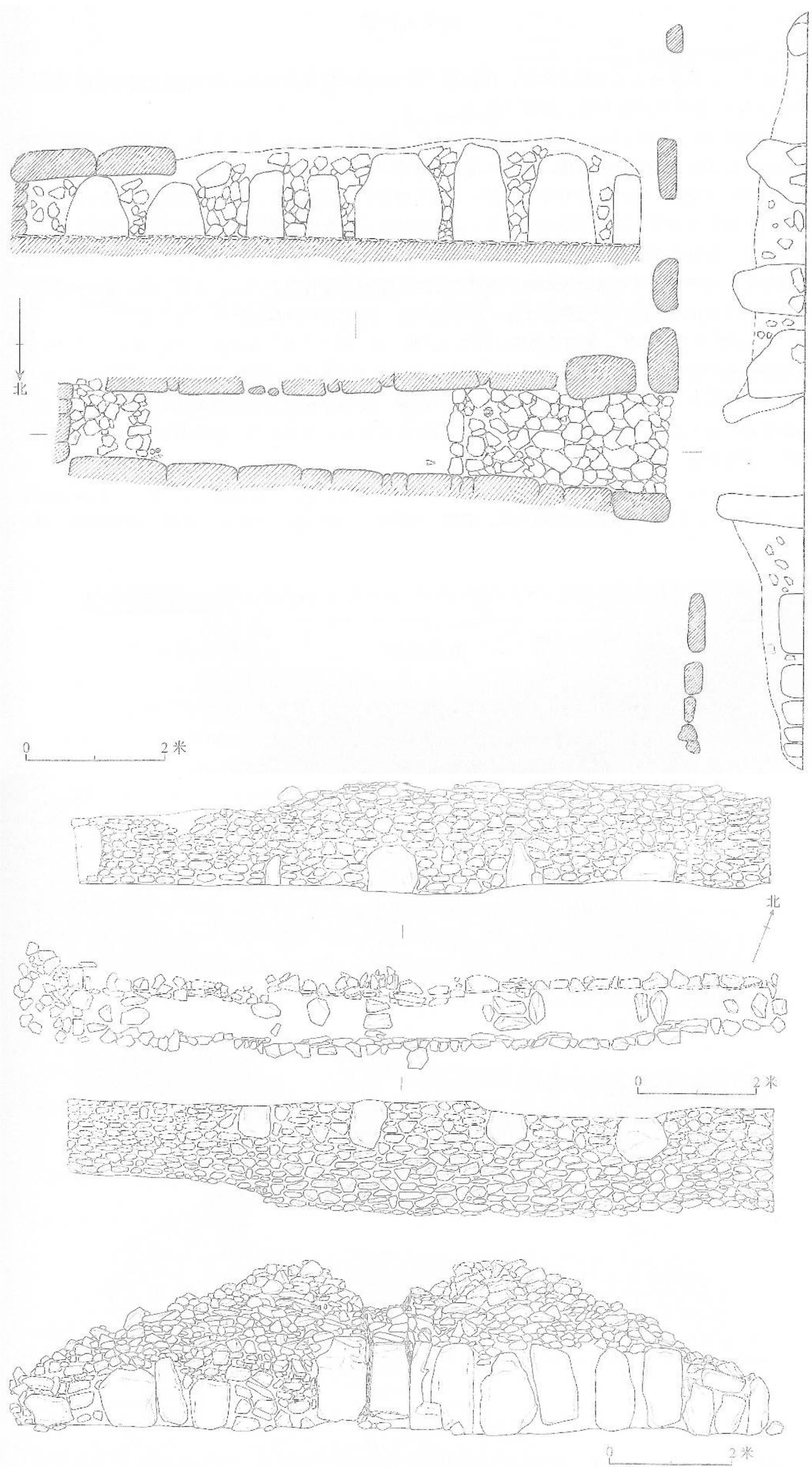


Figure 5. 72: Type 2.1.3 Megalithic Graves: Xichang Hexi Gongshe M3 (Type 2.1.3.1), Xichang Wanao M1 (Type 2.1.3.2) (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 15, Figure 22-23).

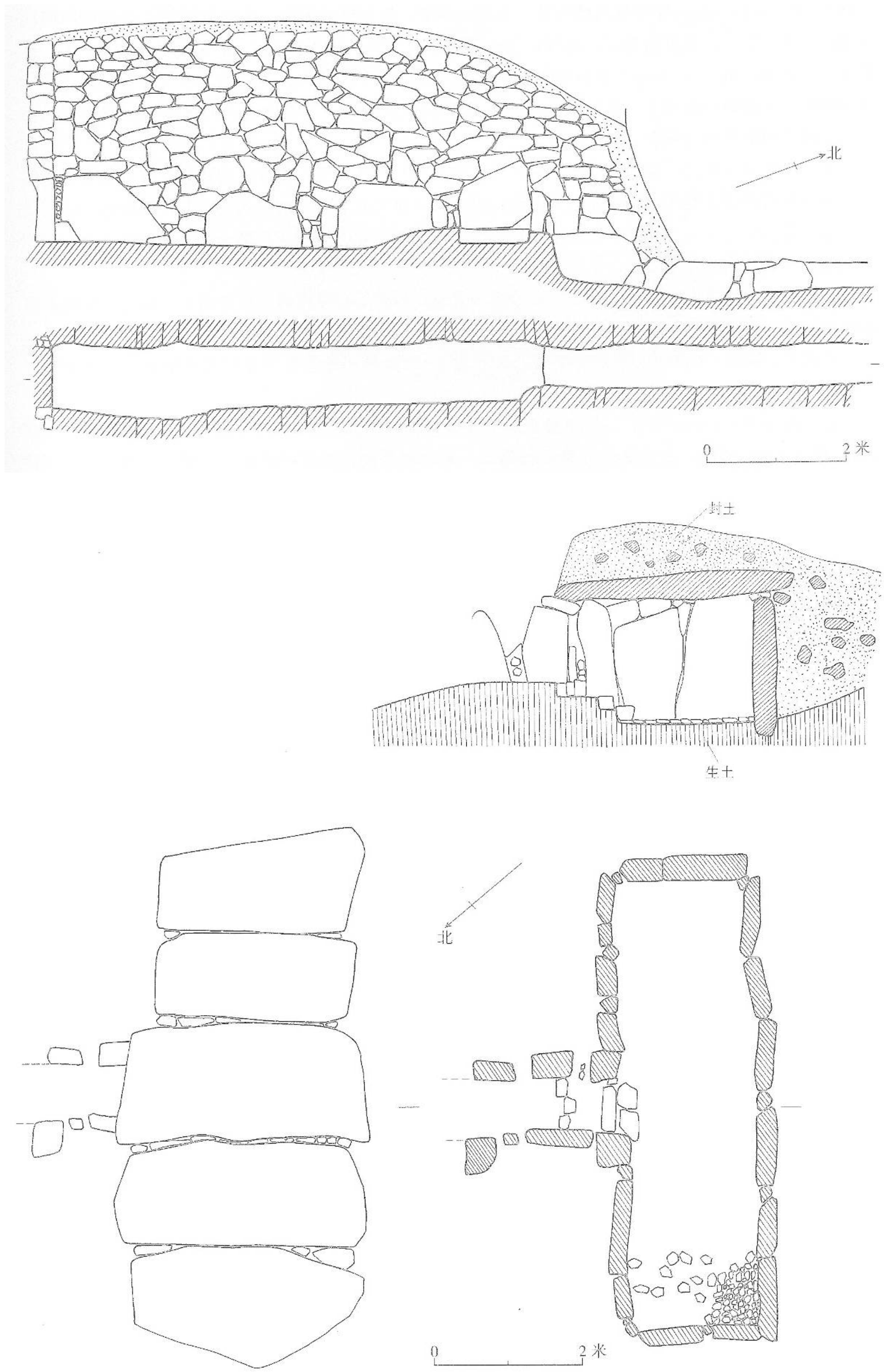


Figure 5.73: Type 2.2.1 Megalithic Graves: Xide Lake Sihe M8 (Type 2.2.1.1), M1 (Type 2.2.1.2) (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 27 and Figure 31).

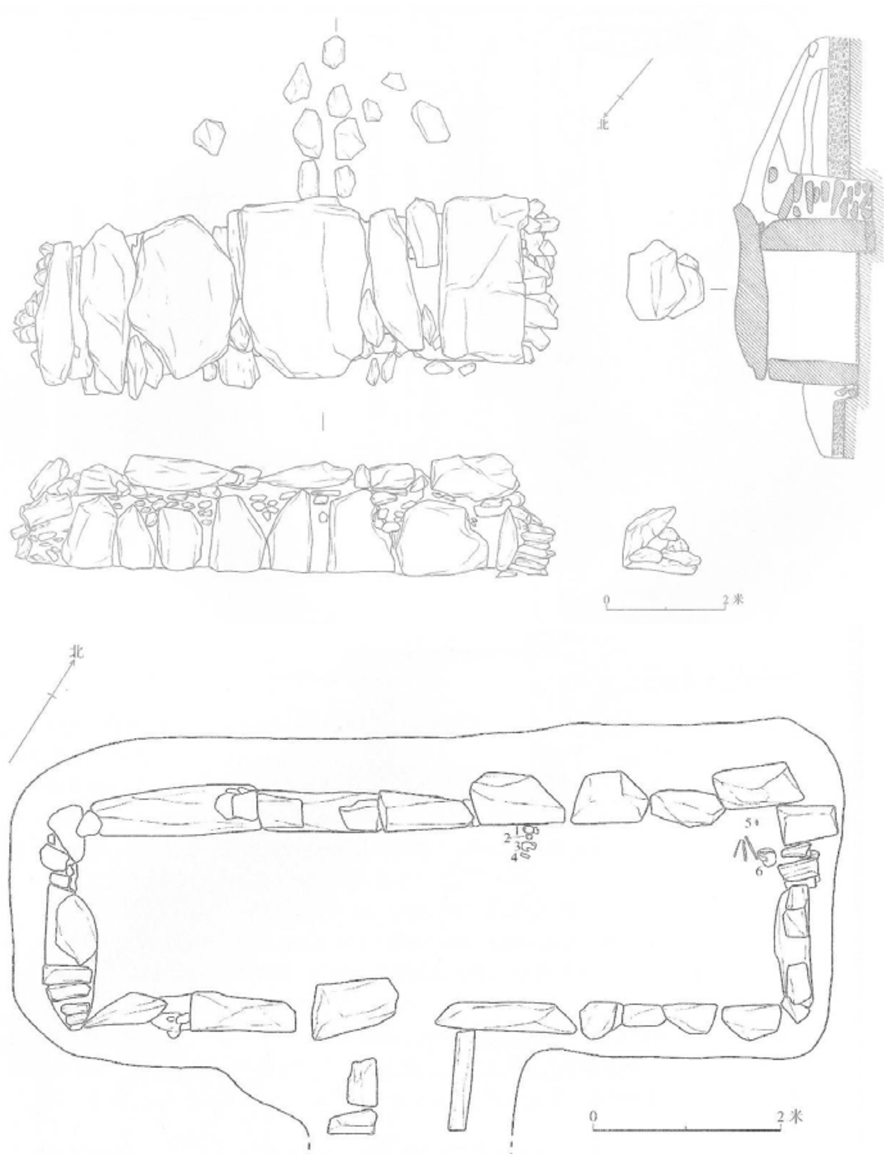


Figure 5.74: Megalithic Grave Type 2.2.2: Dechang Arong M3 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 28-29).

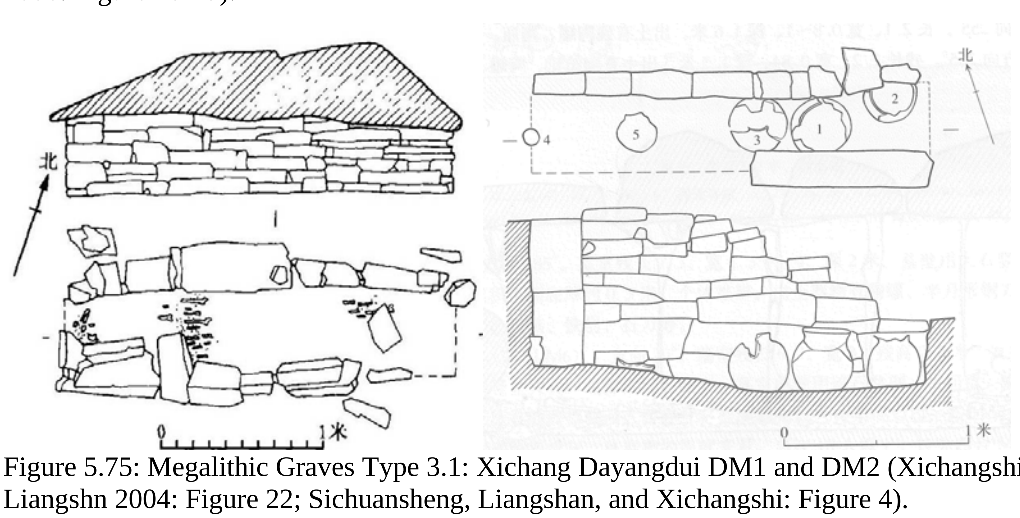


Figure 5.75: Megalithic Graves Type 3.1: Xichang Dayangdui DM1 and DM2 (Xichangshi, Sichuansheng, and Liangshn 2004: Figure 22; Sichuansheng, Liangshan, and Xichangshi: Figure 4).

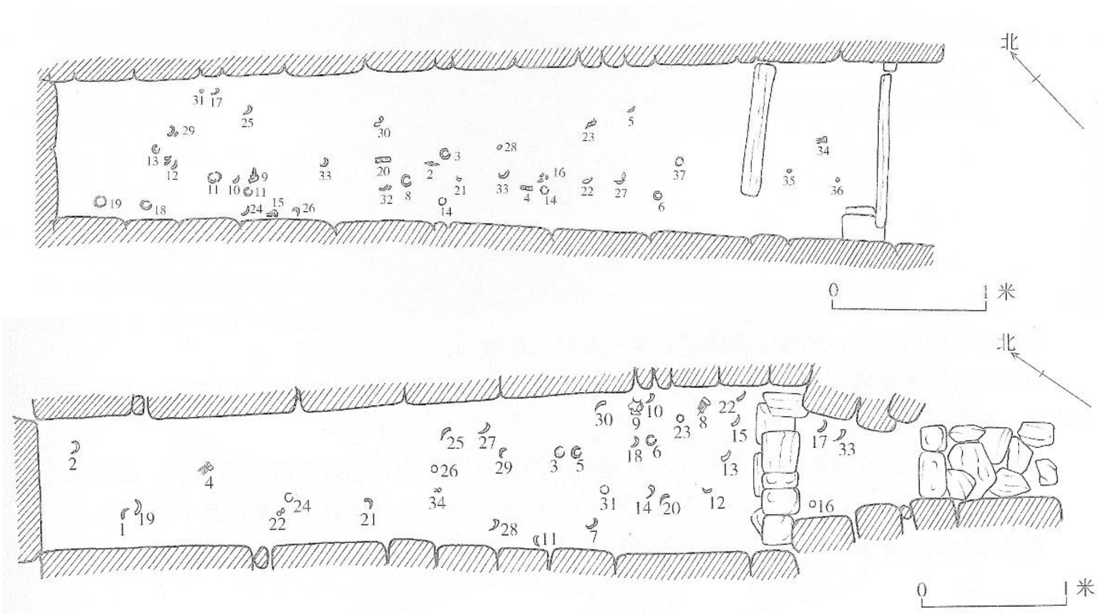


Figure 5.76: Type 4.1.2 Megalithic Graves: Puge Xiaoxingchang BM4 and BM2 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 18-19).

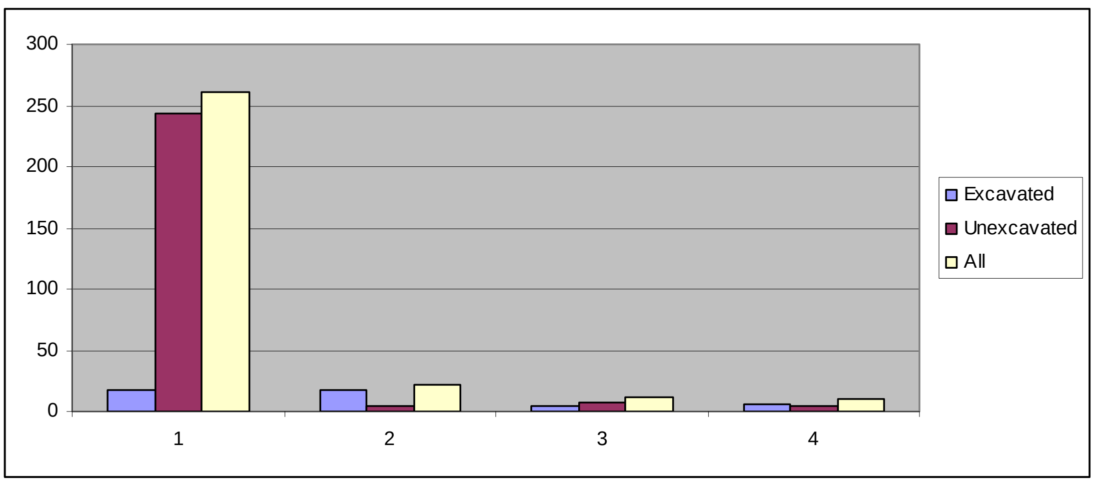


Figure 5.77: Bar-Chart for Megalithic Grave Types.

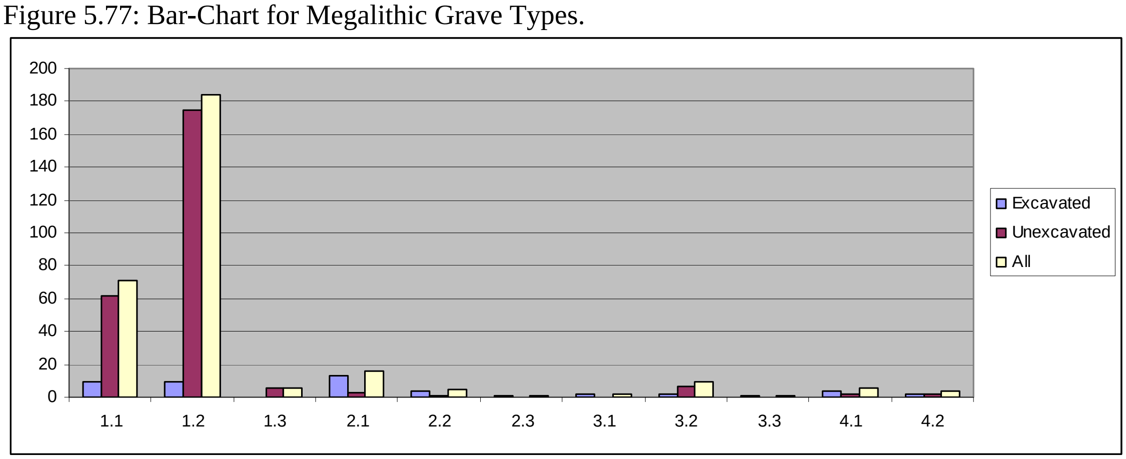


Figure 5.78: Bar-Chart for Subtypes of Megalithic Graves.

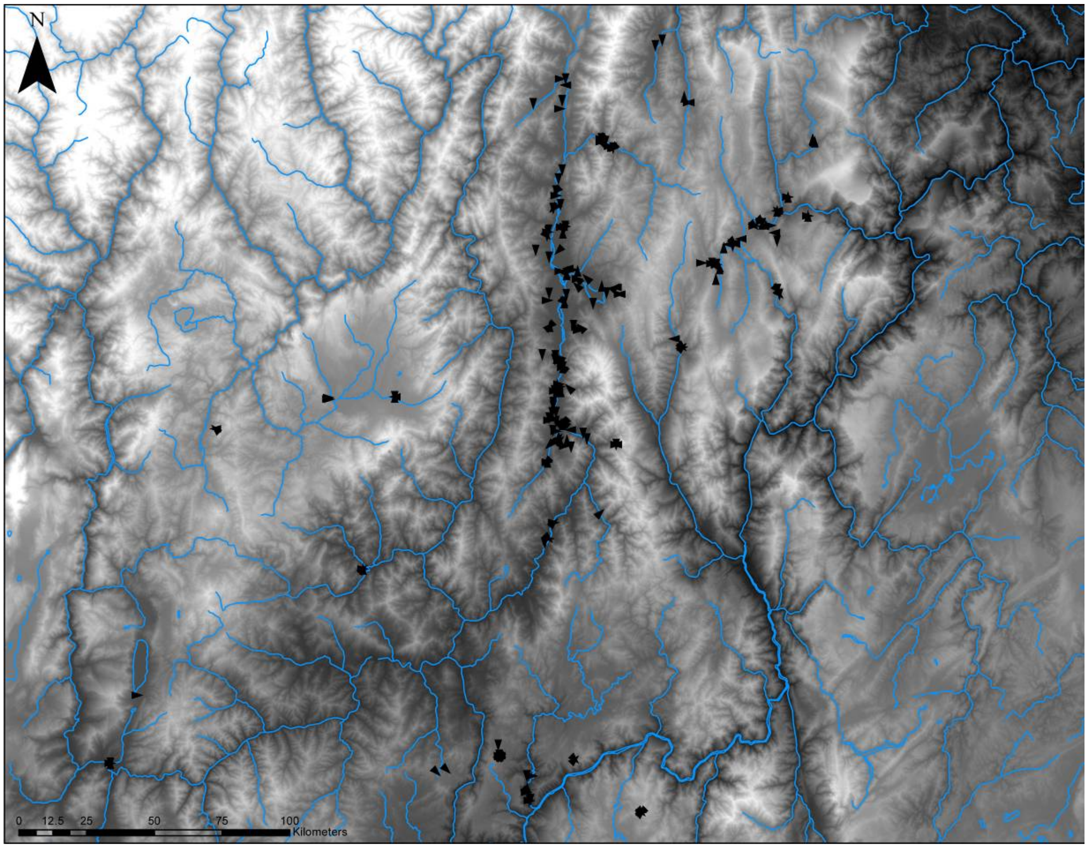


Figure 5.79: Orientation of Graves in the Research Area displayed through Arrows.

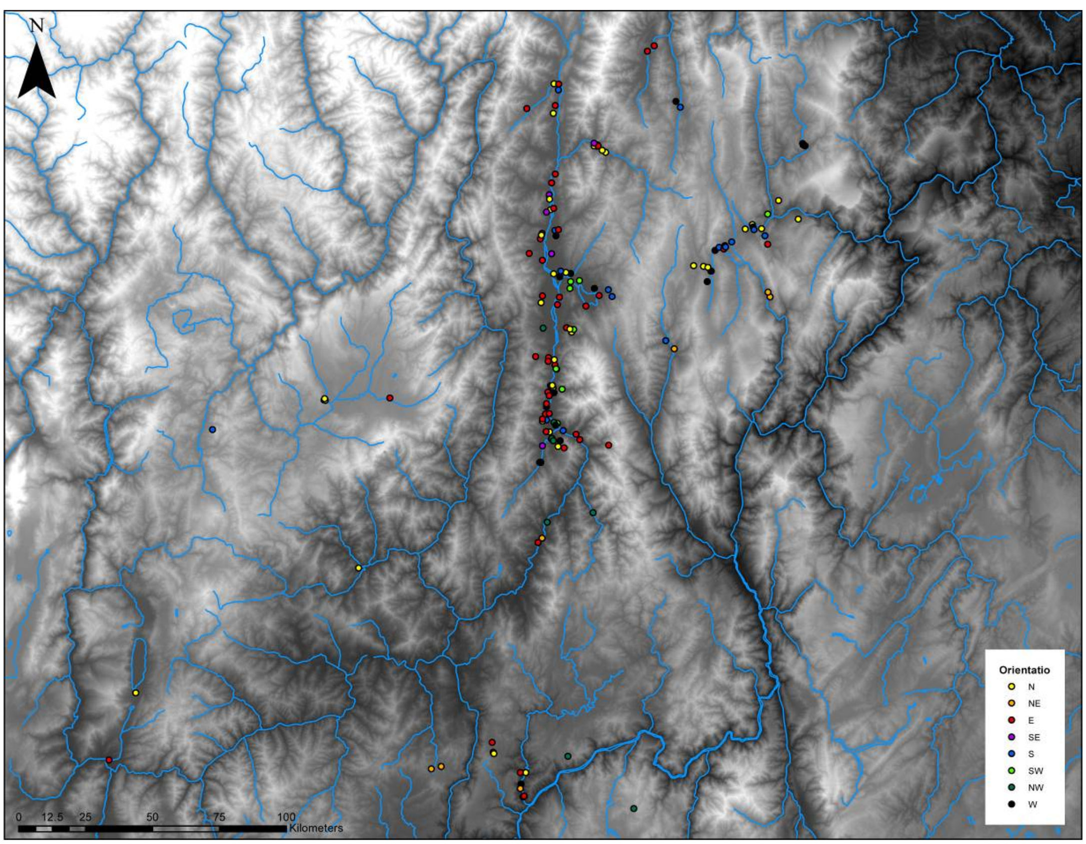


Figure 5.80: Orientation of Graves in the Research Area displayed by Colors.

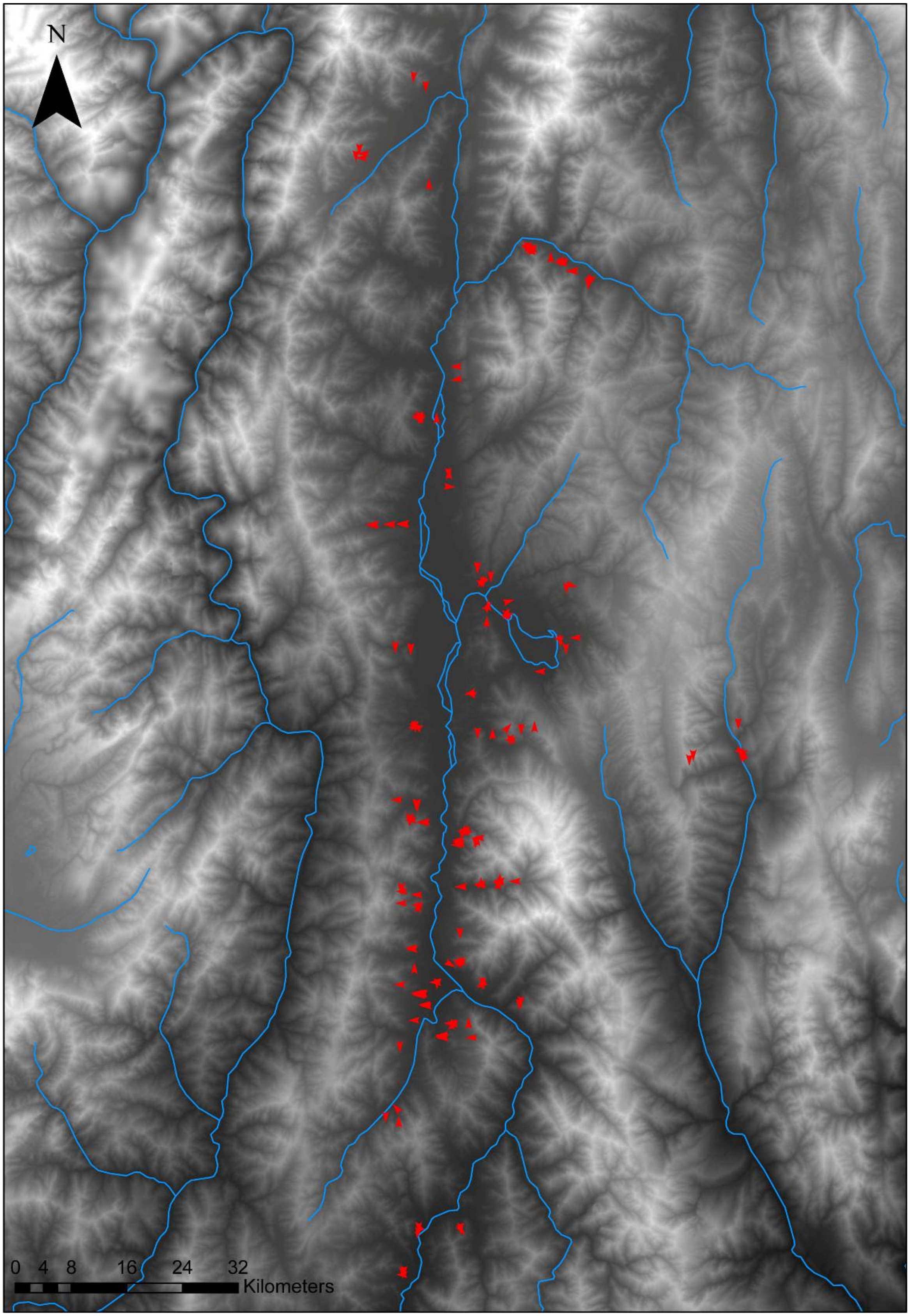


Figure 5.81: Orientation of Megalithic Graves in the Research Area displayed through Arrows.

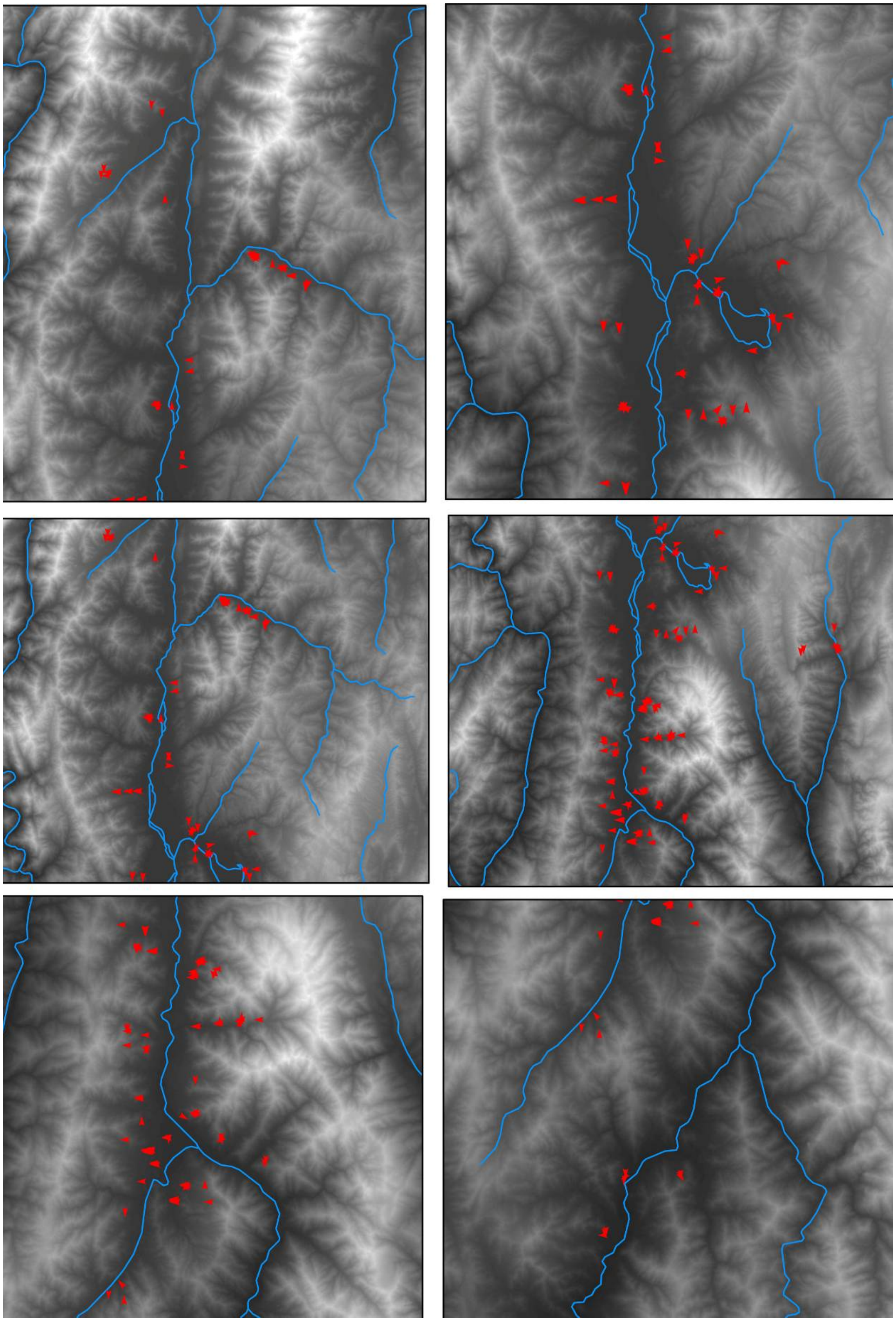


Figure 5.82: Orientation of Megalithic Graves in the Research Area displayed through Arrows (Close-up Views).

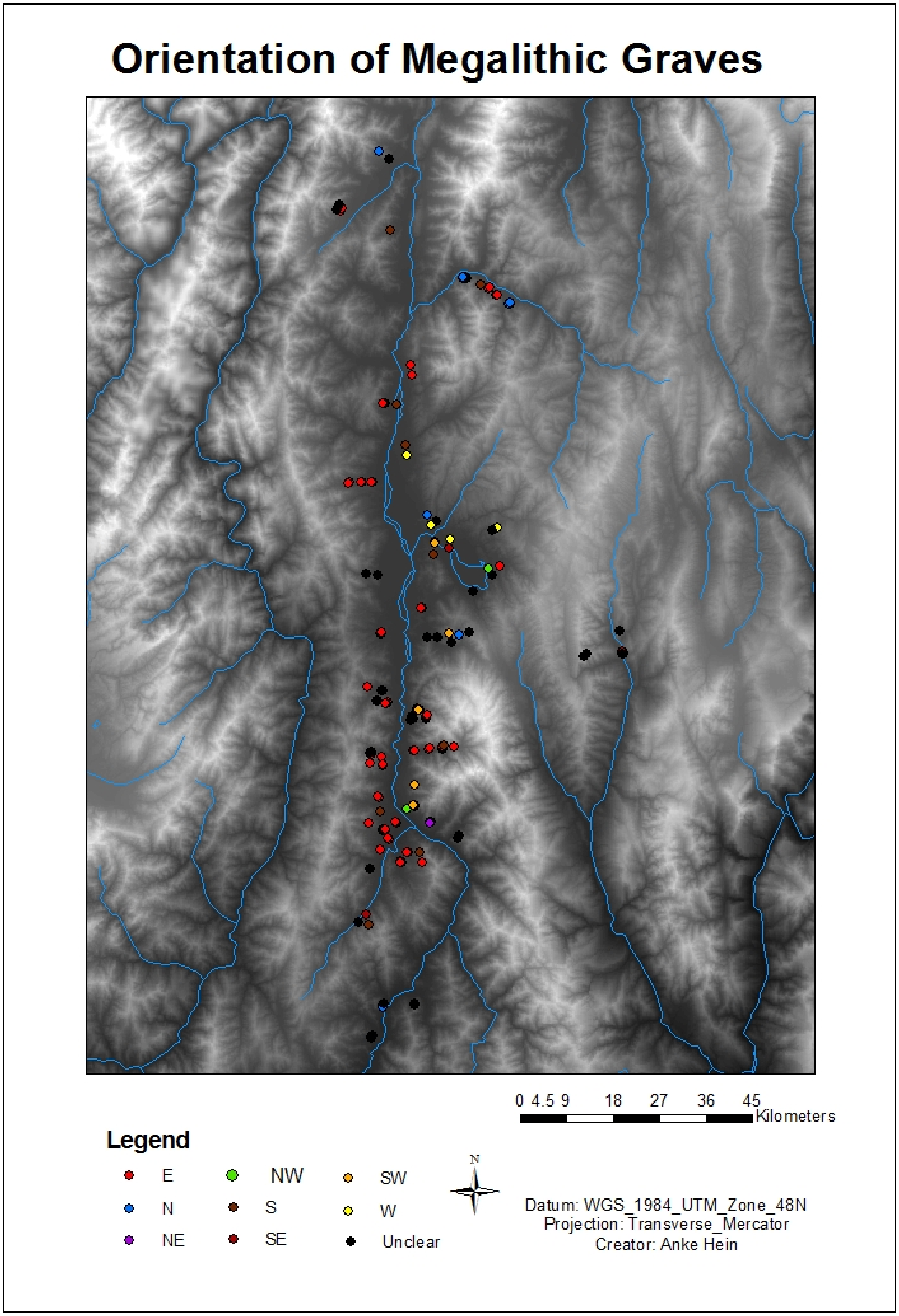


Figure 5.83: Orientation of Megalithic Graves in the Anning River Valley displayed by Colors.

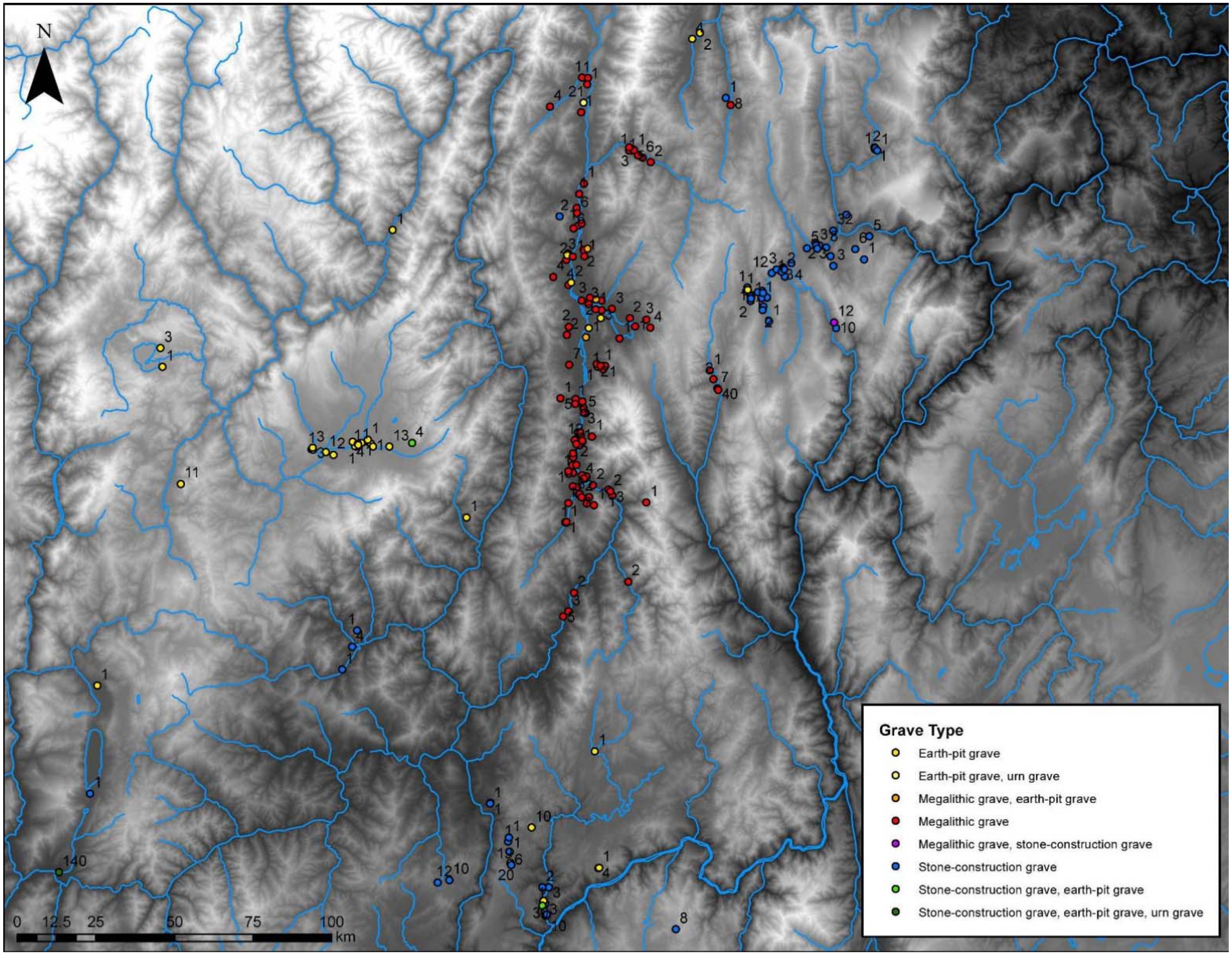


Fig. 5.84: Distribution of Grave Types (Number Indicates Number of Graves at Each Site).

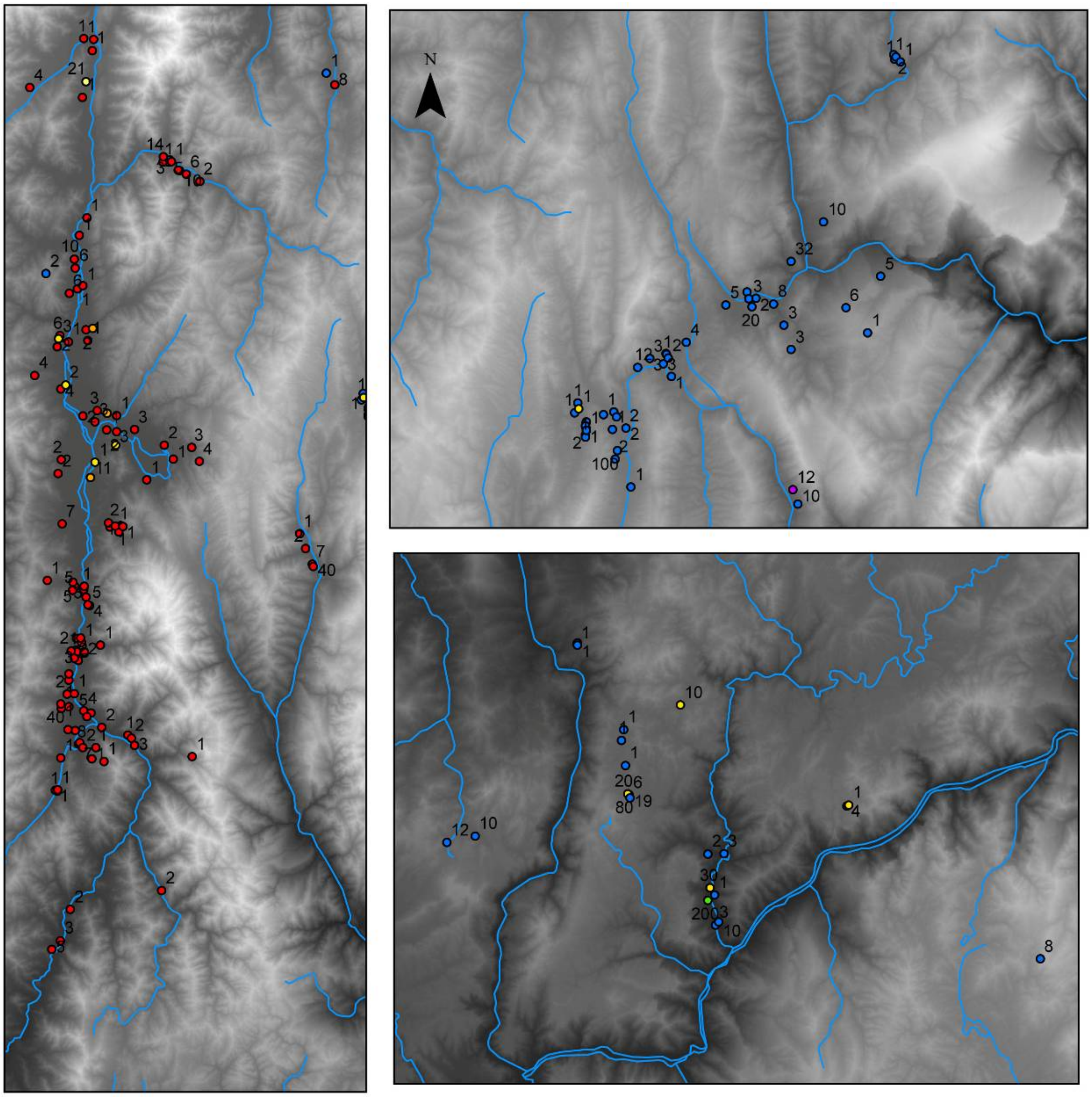


Figure 5.85: Close-Up View of Distribution of Grave Types in the Anning River Valley (Left), in the Northeast (Upper Right), and in the South (Lower Right).

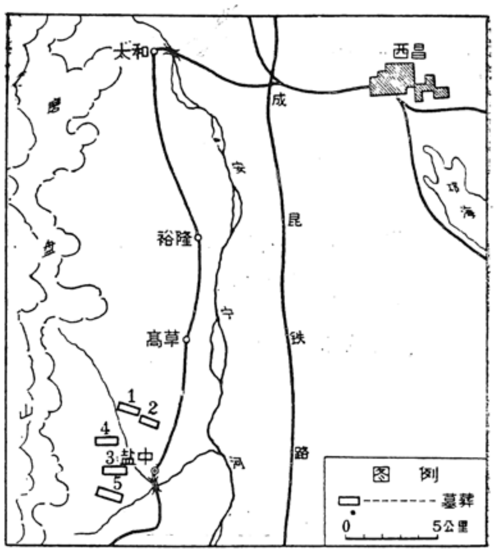


Figure 5.86: Plan of Xichang Hexi (Xichang Diqu 1978: Figure 1).

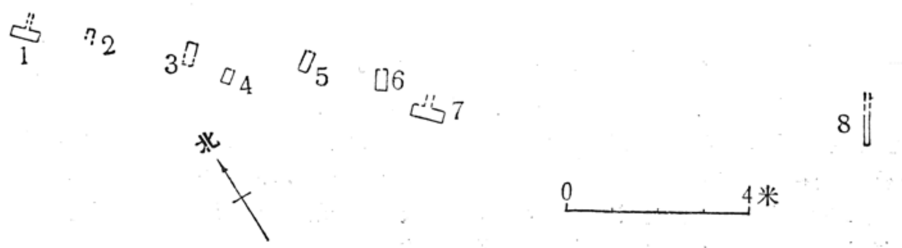


Figure 5.87: Plan of the Cemetery of Xide Lake Sihe (Liangshan Diqu 1978:Figure 1).

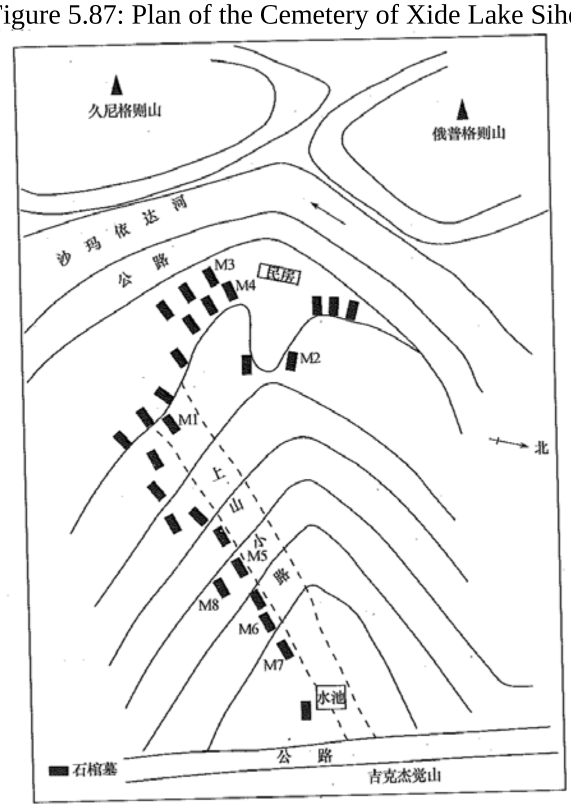


Figure 5.88: Plan of Zhaojue Layimu (Liangshan, Sichuan, and Zhaojuexian 2010: Figure 10).

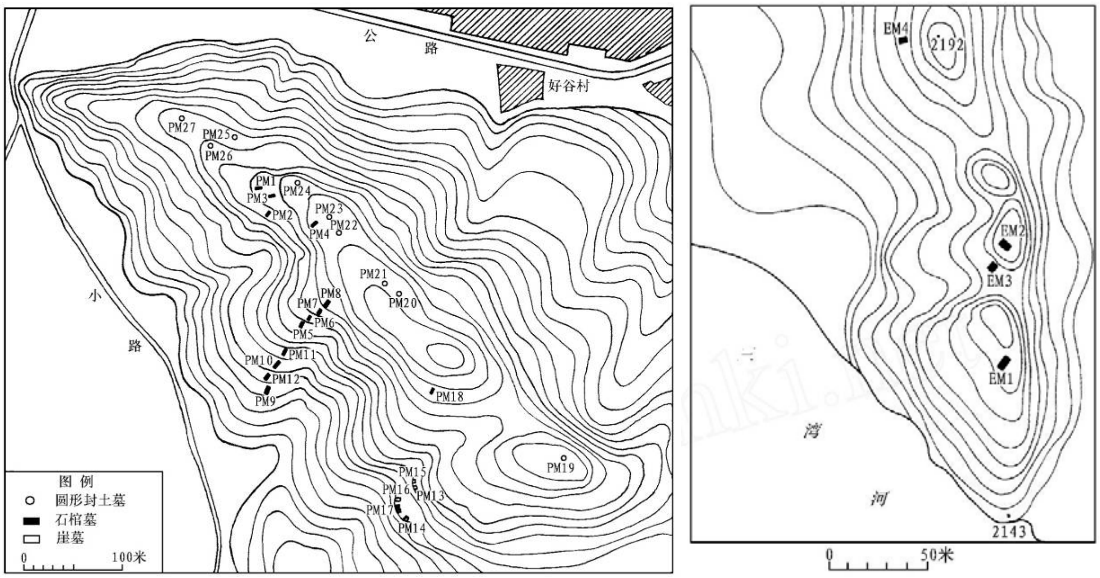


Figure 5.89 Zhaojue Pusu Bohuang and Eba Buji (Liangshan, Sichuan, and Zhaojuexian 2009: Figure 2-3).

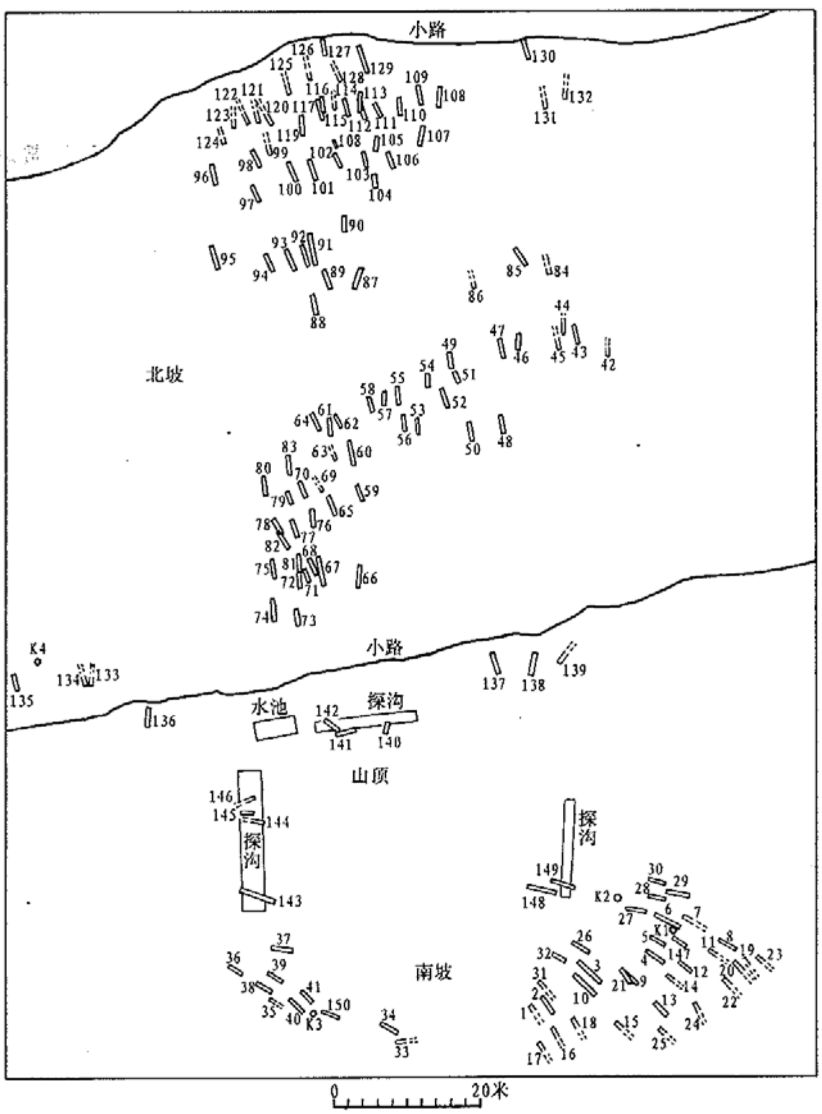
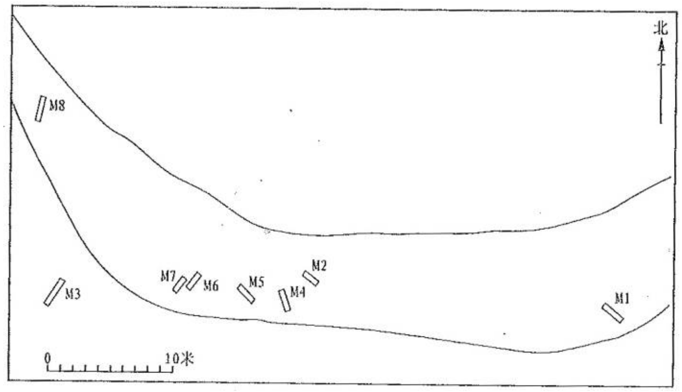


Figure 5.90: Plan of Huili Fenjiwan (Huilixian, Liangshan, and Sichuansheng 2004: Figure 1).



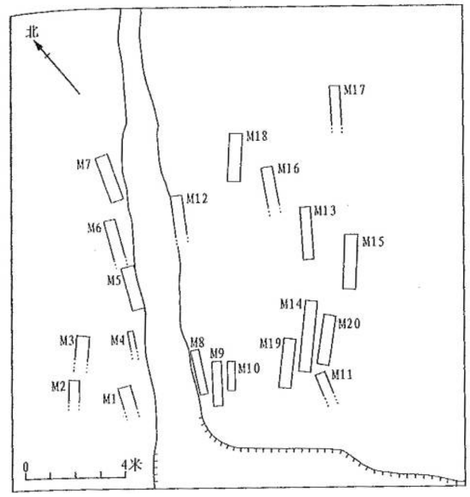


Figure 5.91: Plan of Luquan Yingpanbao (Kunmingshi et al. 2007: Figure 2 and 9).

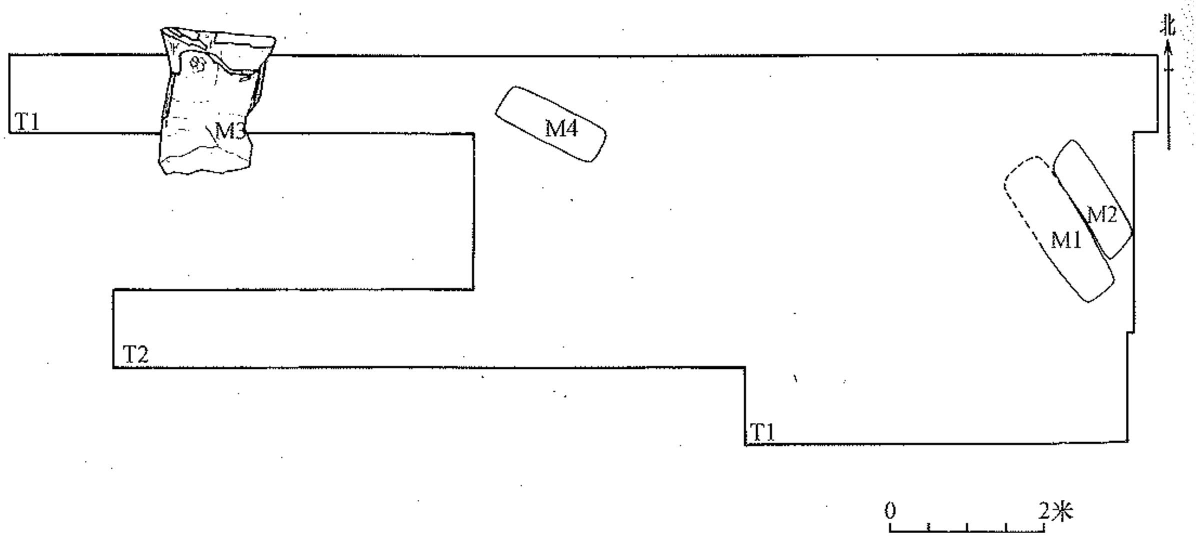


Figure 5.92: Plan of Excavation Area of Huili Guojiabao (Chengdu Wenwu et al. 2010: Figure 2).

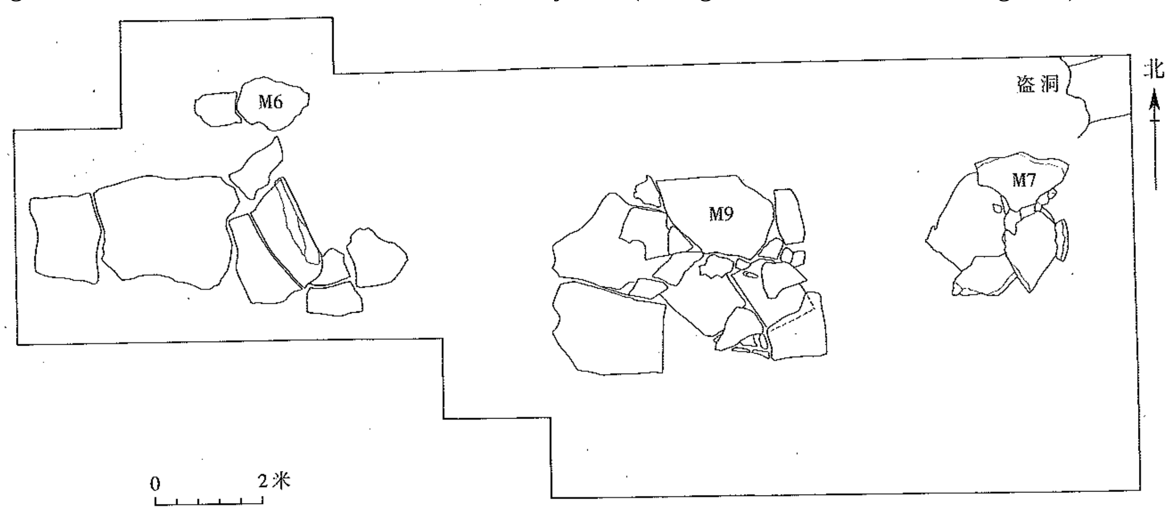


Figure 5.93: Plan of Yanyuan Laolongtou (Liangshan Yizu 2009: Figure 2).

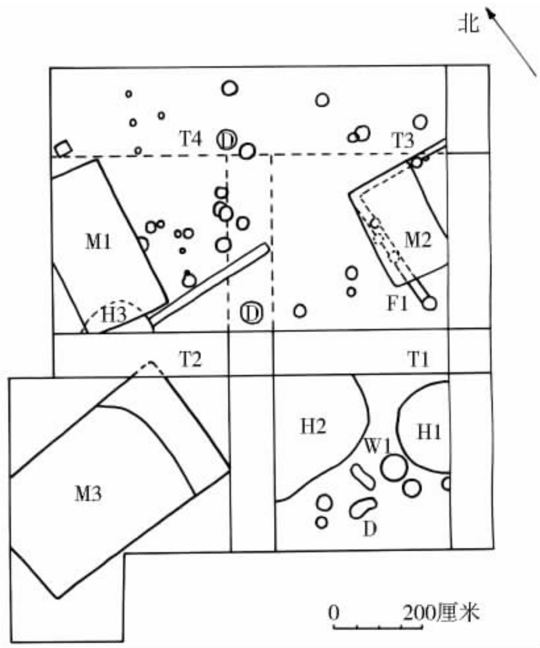


Figure 5.94: Plan of Excavation Area of Qimugou (Chengdu, Liangshan, and Xichangshi 2009: Figure 2).

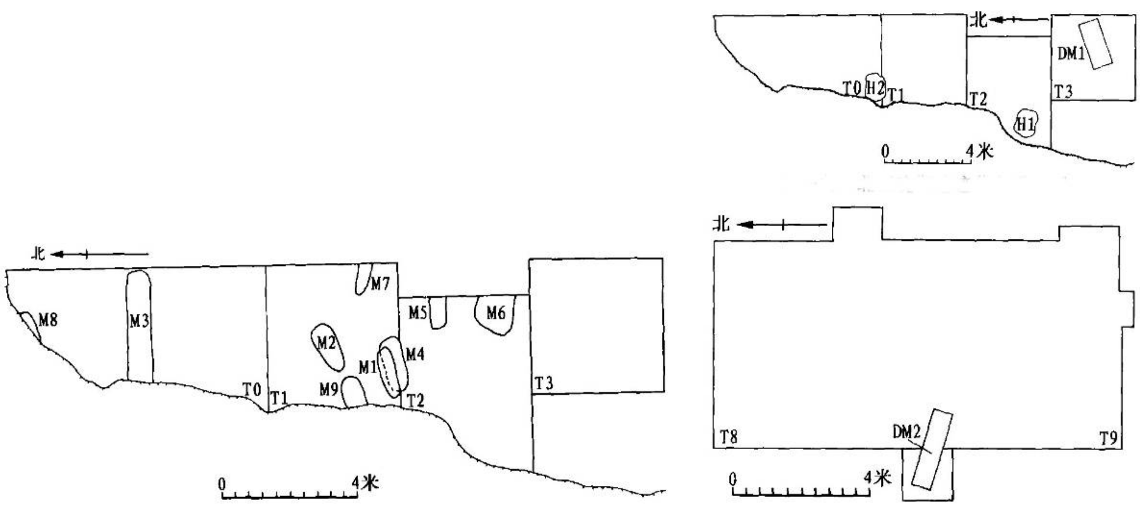


Figure 5.95: Plans of Excavation Areas of Dayangdui (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 4 and 20).

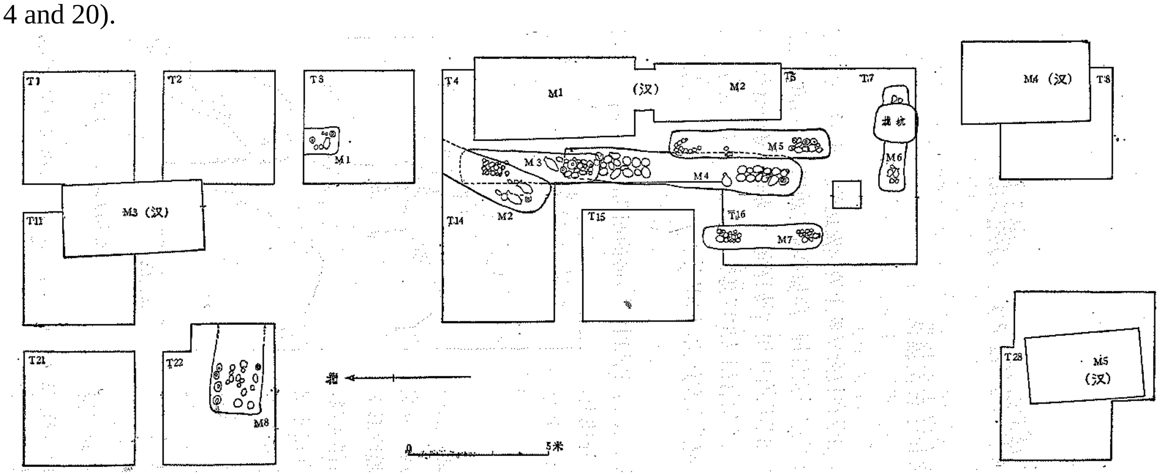


Figure 5.96: Plans of Excavation Areas of Lizhou (Lizhou 1980: Figure 2).

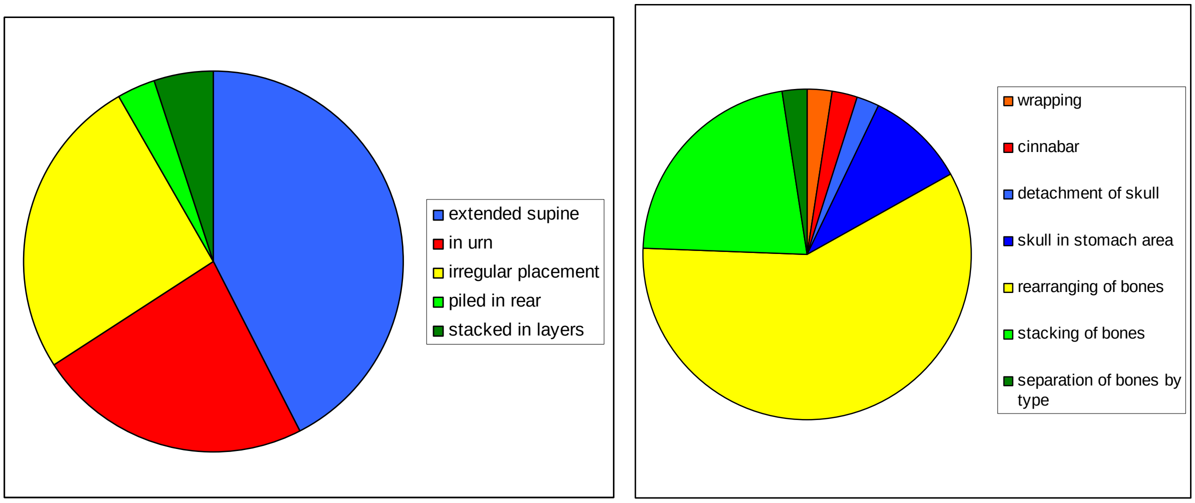


Figure 5.97: Relative Frequency of Different Skeleton Positions (Left) and Types of Body Treatment (Right), disregarding Unclear Cases or Cases with no reported Special Body Treatment.

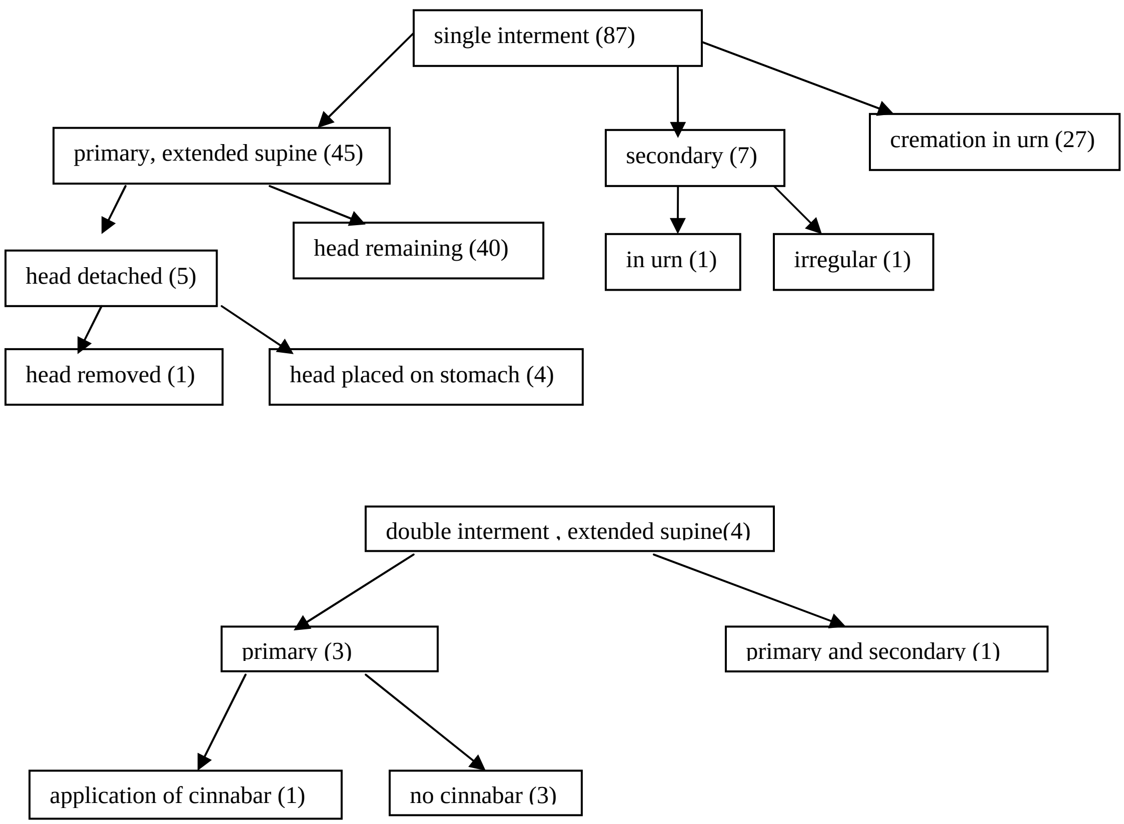


Figure 5.98: Decision-Tree for Interment-Types; Cases with Unclear Elements have been kept within the Decision-Tree until the Un-Clarity occurred.

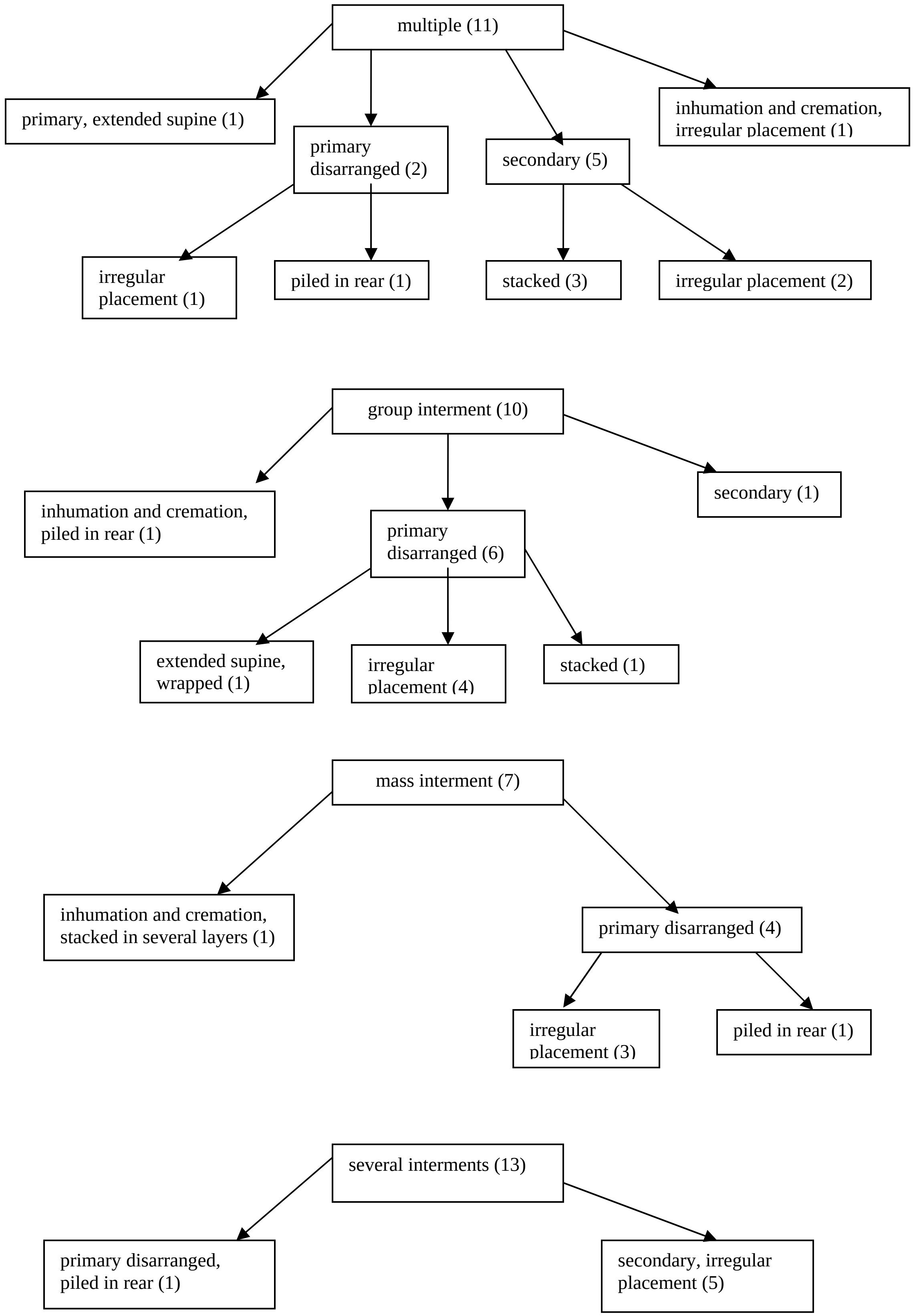


Figure 5.99: Decision-Tree for Interment Types; Cases with unclear Elements have been kept within the Decision-Tree until the Un-Clarity occurred (Cont.).

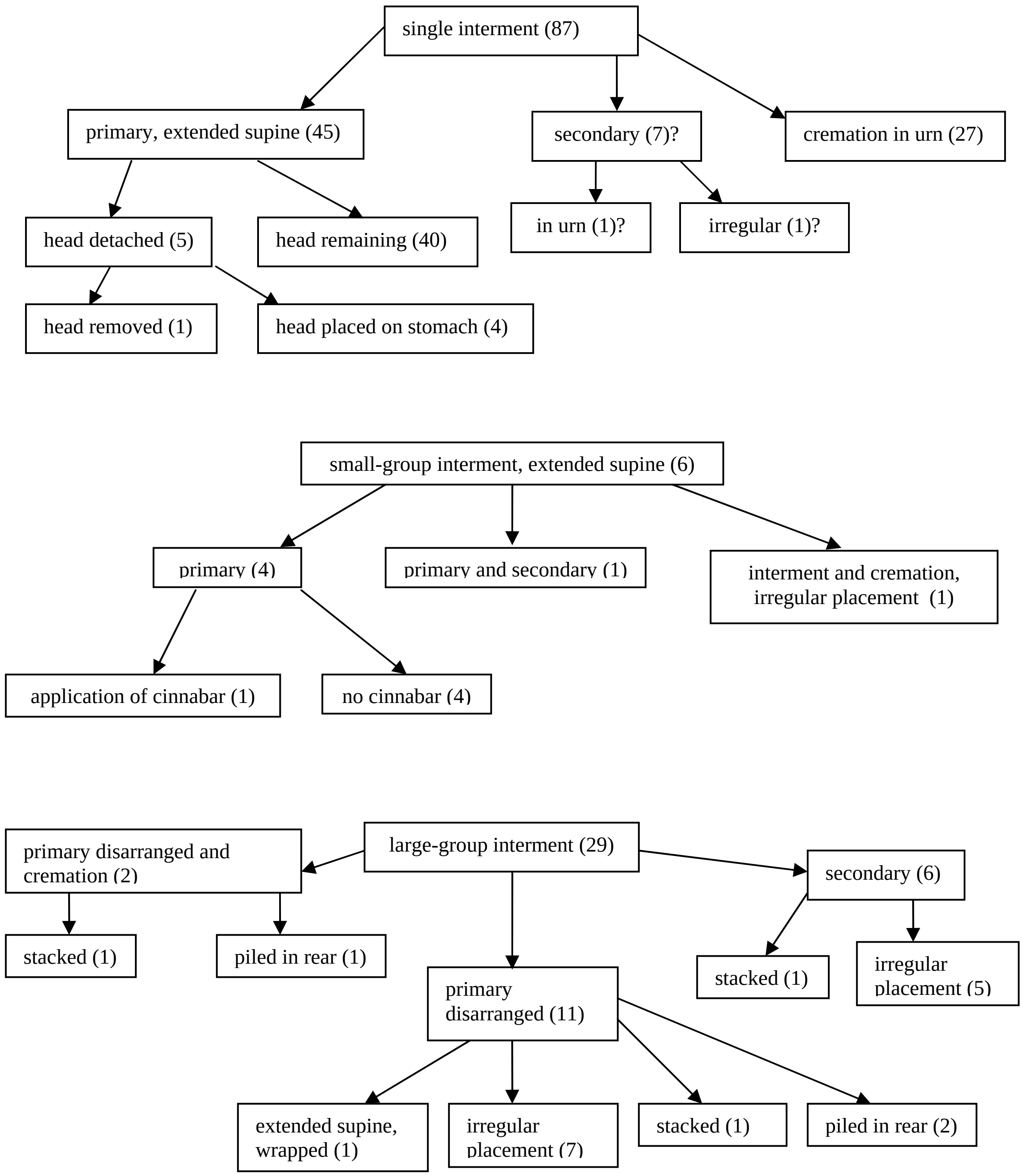
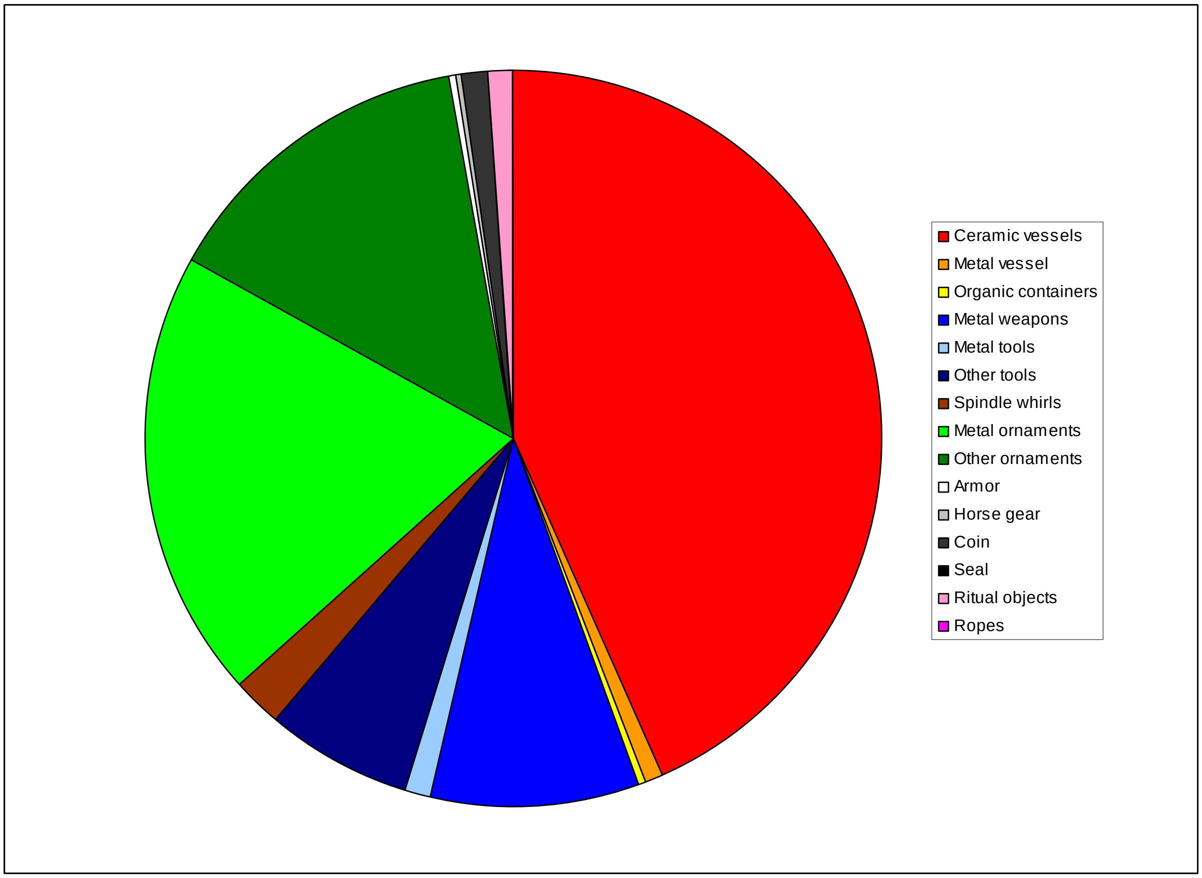


Figure 5.100: Behavioral Pattern for Interments.



	Number	**Percentage**
Ceramic vessels	1589	43.21%
Metal vessel	23	0.63%
Organic containers	16	0.44%
Metal weapons	339	9.22%
Metal tools	35	0.95%
Other tools	237	6.45%
Spindle whorls	81	2.20%
Metal ornaments	725	19.72%
Other ornaments	517	14.06%
Armor	17	0.46%
Horse gear	10	0.27%
Coins	36	0.98%
Seals	2	0.05%
Ritual Objects	36	0.98%
Calcinated ropes	5	0.14%
SUM	*3668*	*99.76%*

Figure 5.101: Types of Objects and Relative Frequency of Occurrence at Grave Sites (n=394).

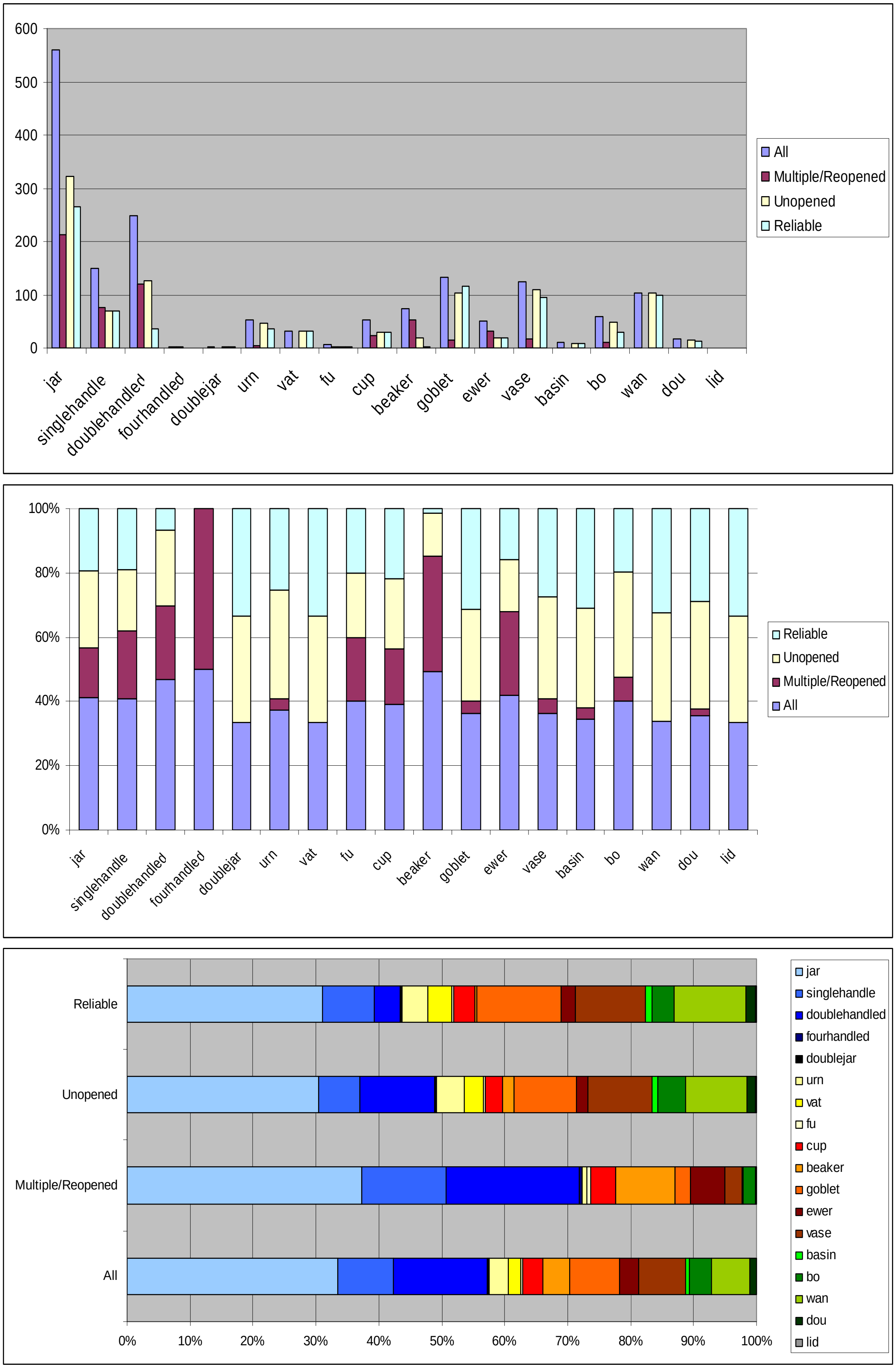


Figure 5.102: Frequency of Occurrence of Various Functional Ceramic Types in Graves.

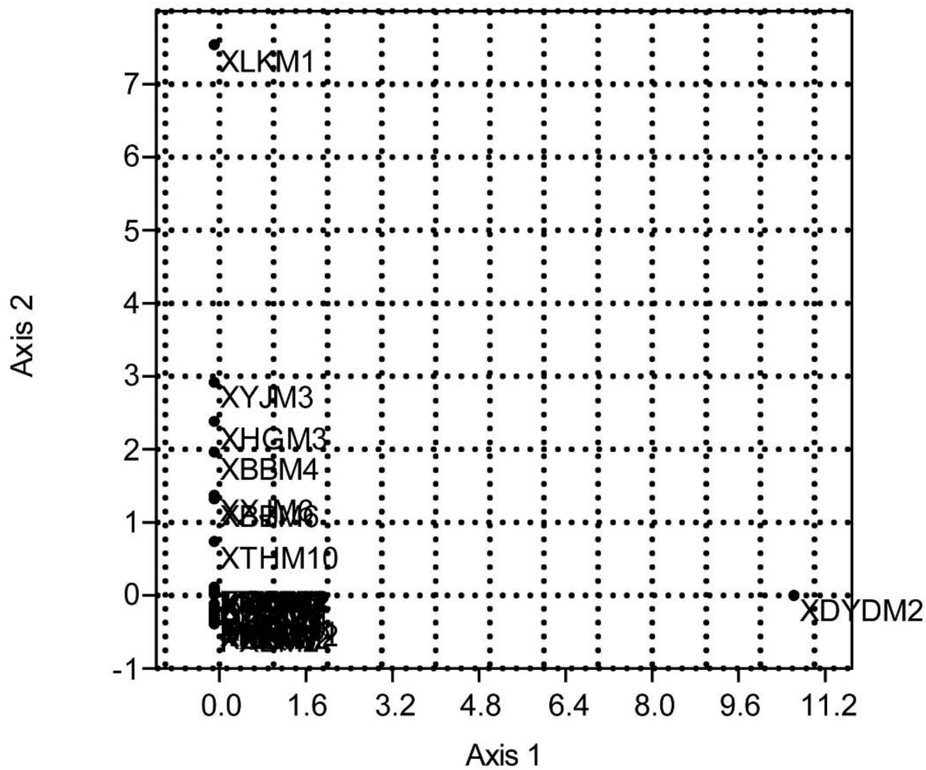


Figure 5.103: Plot for First Two Dimensions of Correspondence Analysis Conducted on Multiple-Interment Burials.

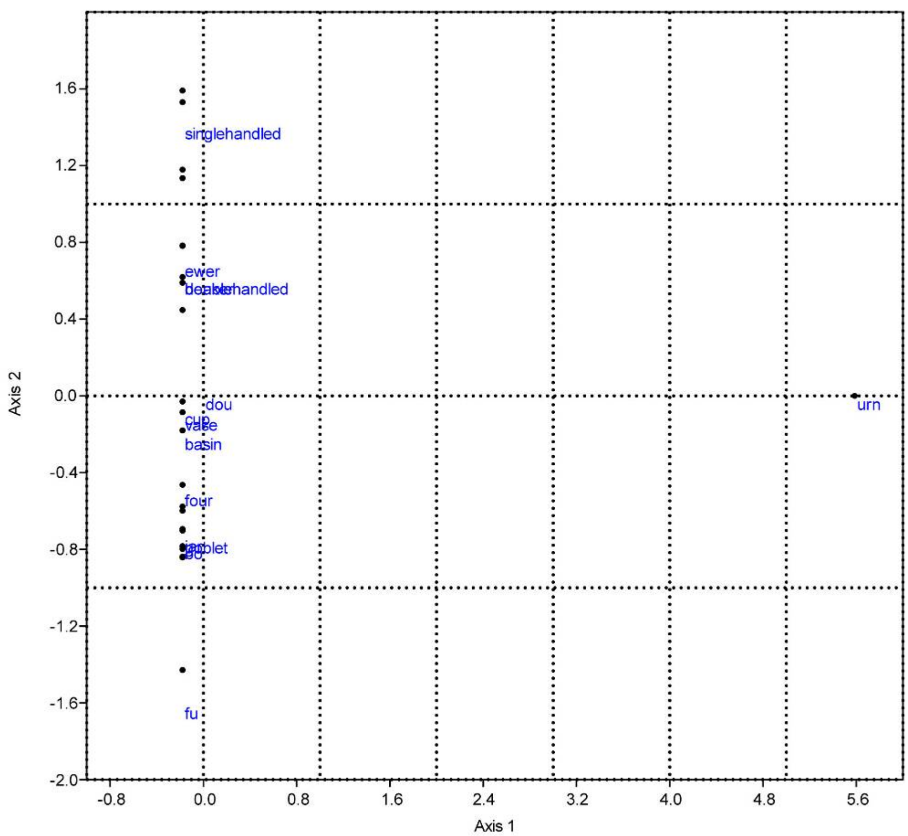


Figure 5.104: Plot for First Two Dimensions of Correspondence Analysis for Ceramics Conducted on Multiple-Interment Burials excluding particularly Large Assemblages.

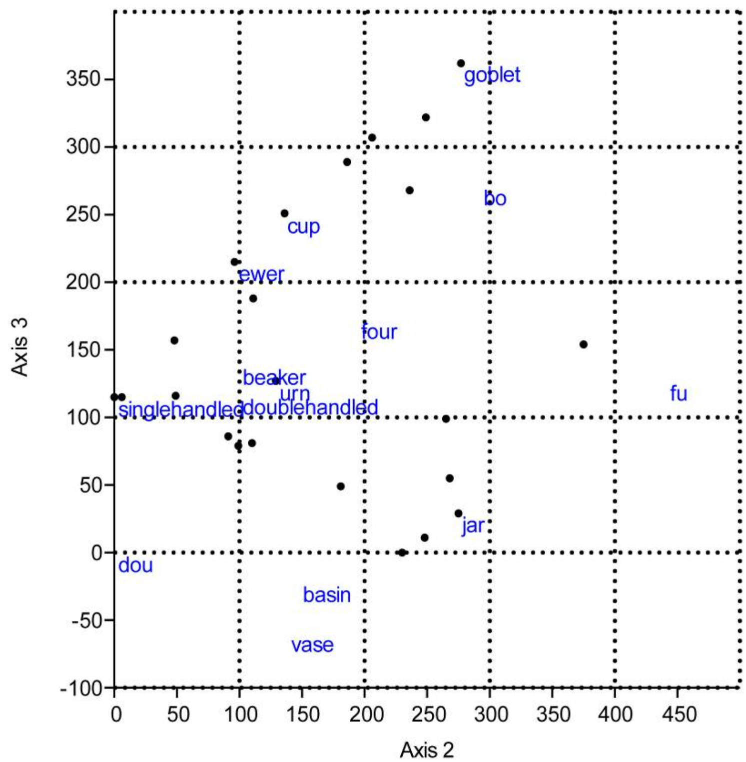


Figure 5.105: Plot for Second and Third Dimensions of Correspondence Analysis for Ceramics conducted on Multiple-Interment Burials excluding particularly Large Assemblages.

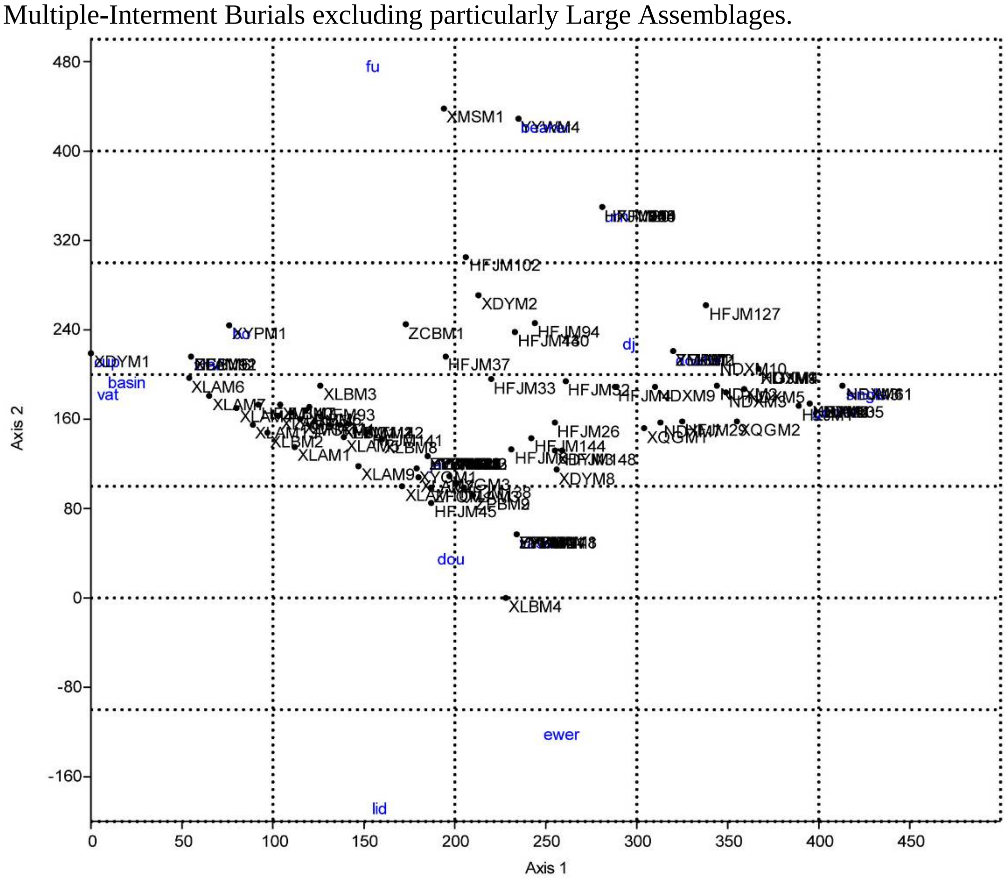


Figure 5.106: Plot for First and Second Dimension of Correspondence Analysis conducted for Ceramics in Undisturbed and Well-Reported Burials with no Signs of Re-Opening.

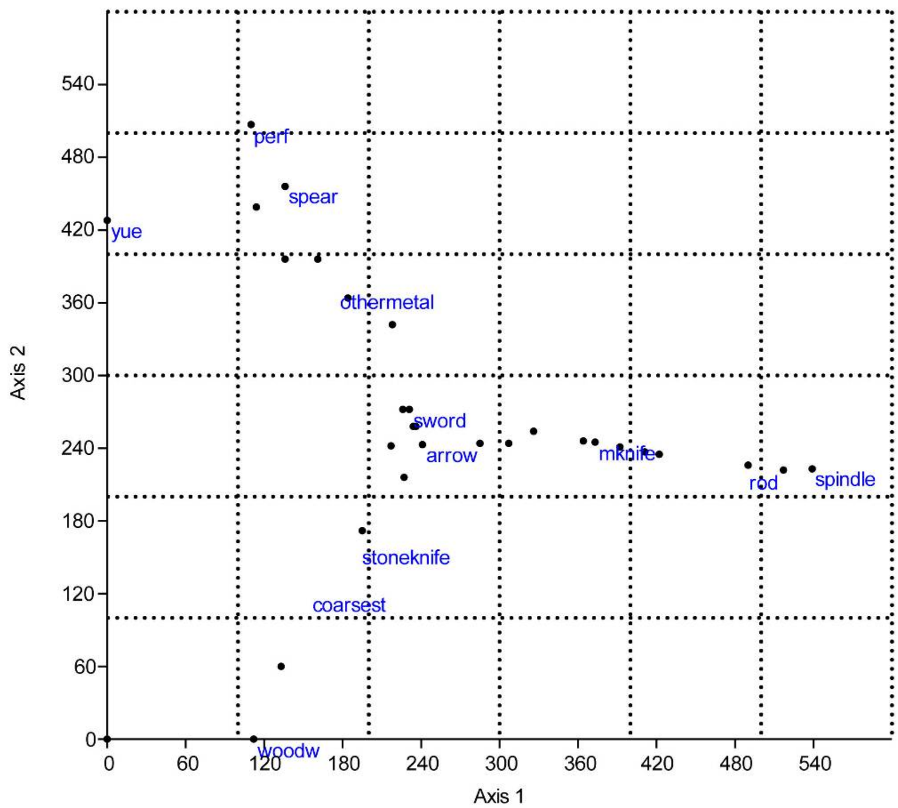


Figure 5.107: Plot for First and Second Dimension of Correspondence Analysis conducted for Weapons and Tools in Undisturbed and Well-Reported Burials with no Signs of Re-Opening.

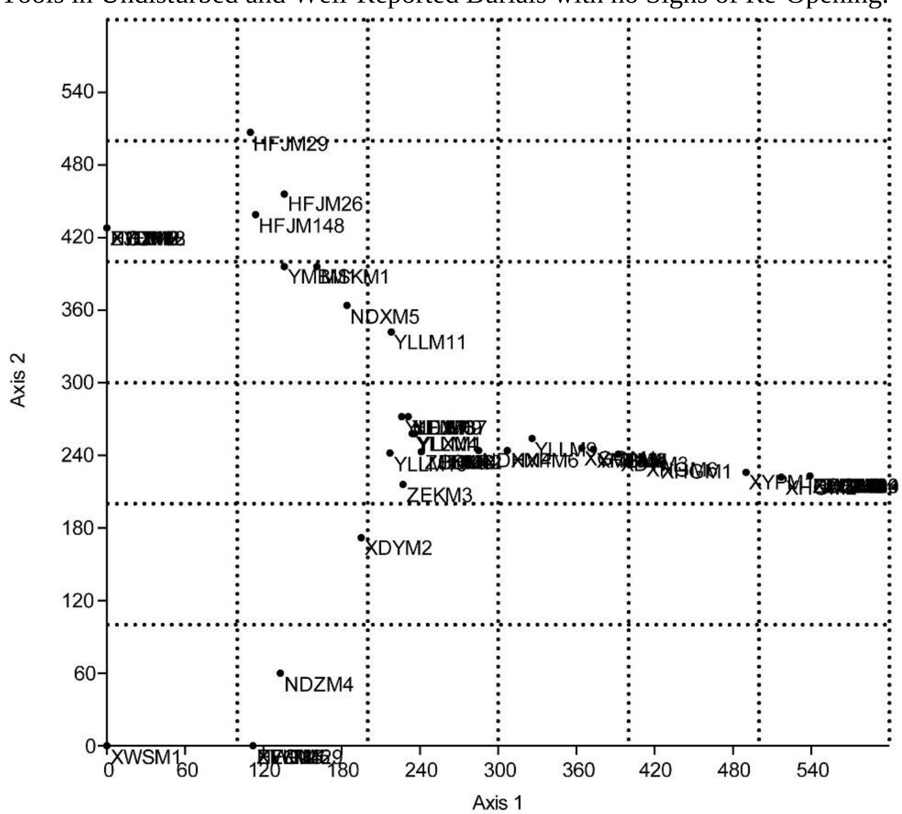


Figure 5.108: Plot for First and Second Dimension of Correspondence Analysis conducted for Weapons and Tools in Undisturbed and Well-Reported Burials with no Signs of Re-Opening.

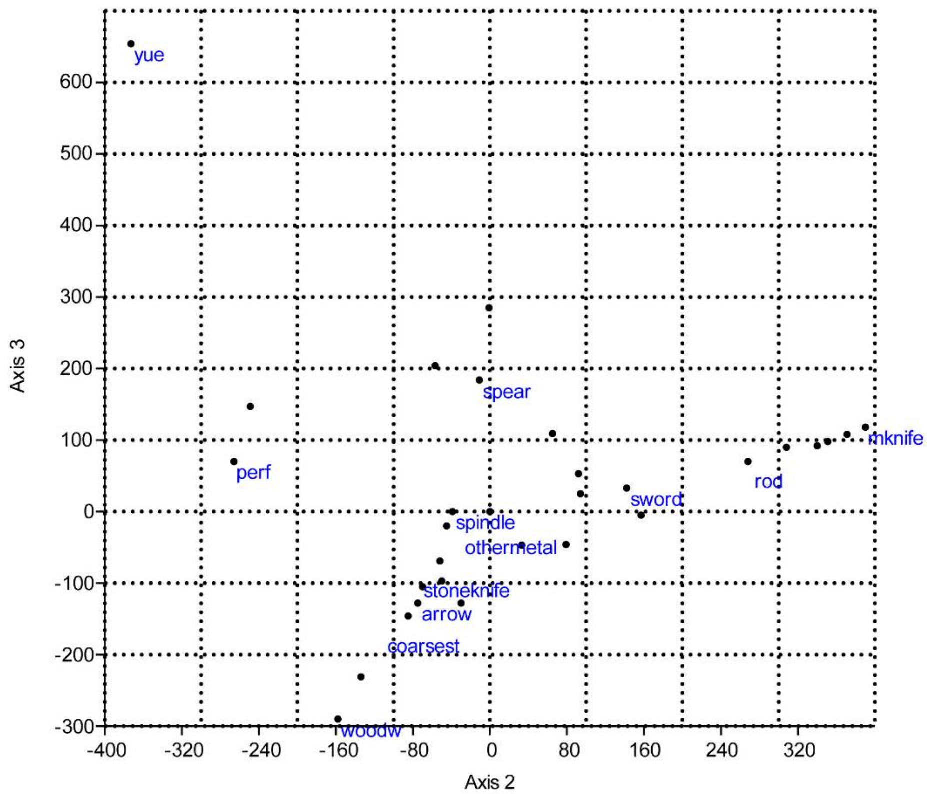


Figure 5.109: Plot for Second and Third Dimension of Correspondence Analysis conducted for Weapons and Tools in Undisturbed and Well-Reported Burials with no Signs of Re-Opening.

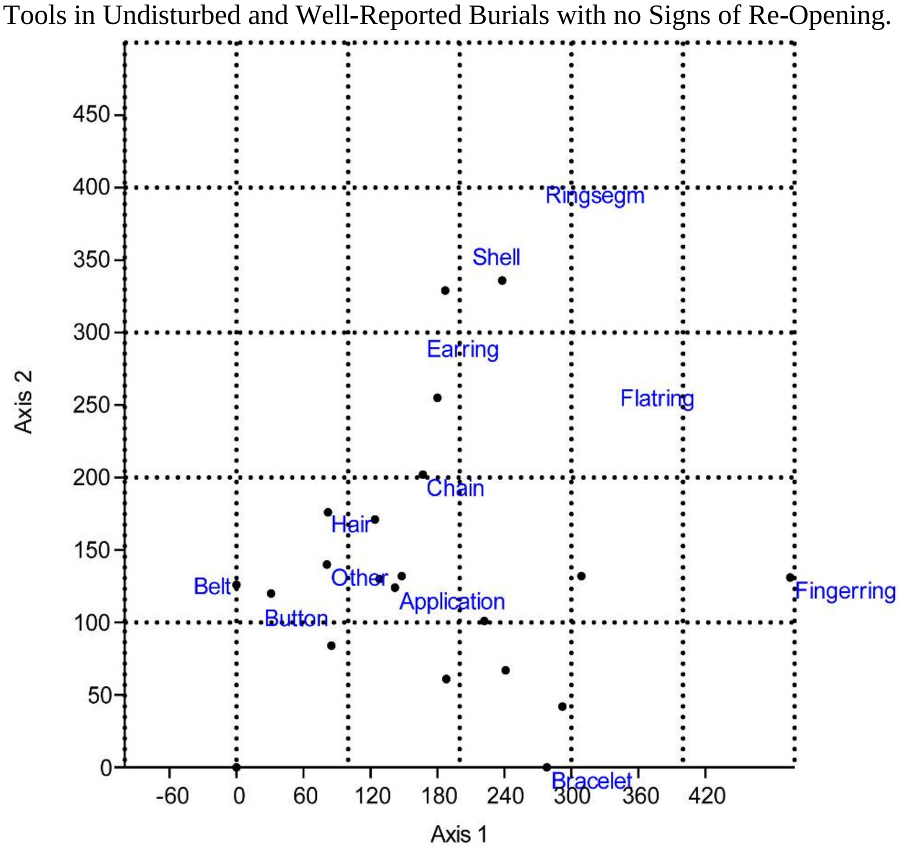


Figure 5.110: Plot for Second and Third Dimension of Correspondence Analysis for Ornaments in Undisturbed and Well-Reported Burials with no Signs of Re-Opening.

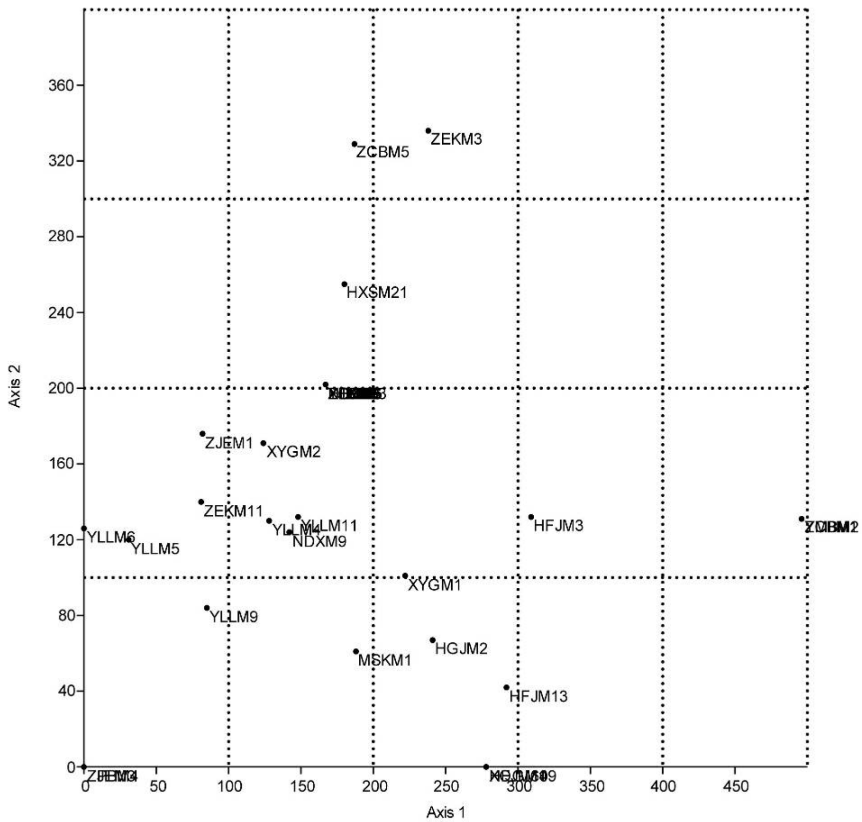


Figure 5.111: Plot for Second and Third Dimension of Correspondence Analysis for Ornaments in Undisturbed and Well-Reported Burials with no Signs of Re-Opening.

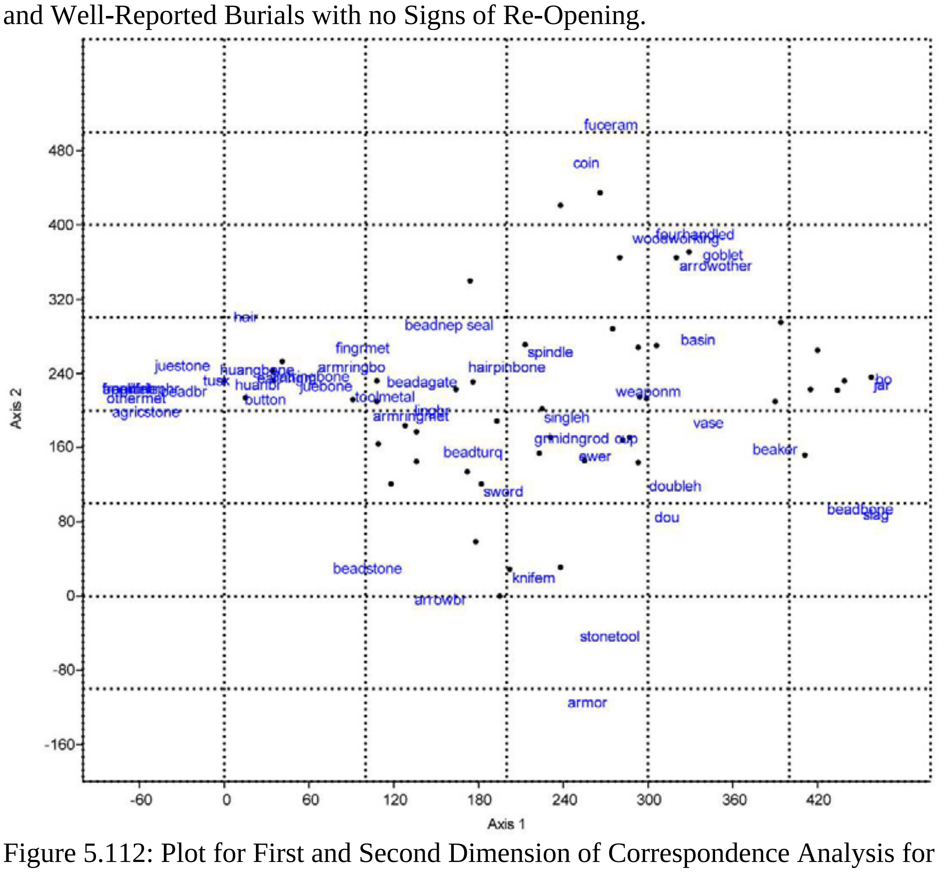


Figure 5.112: Plot for First and Second Dimension of Correspondence Analysis for all Megalithic Graves.

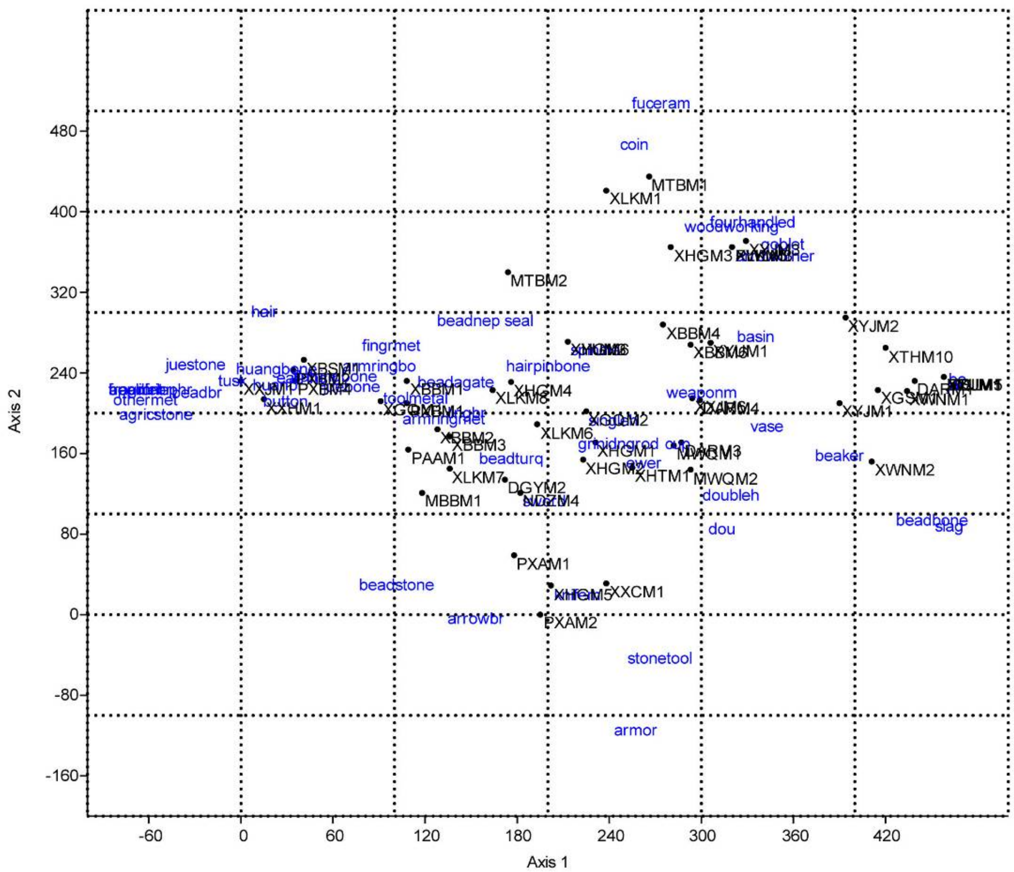


Figure 5.113: Plot for First and Second Dimension of Correspondence Analysis for all Megalithic Graves.

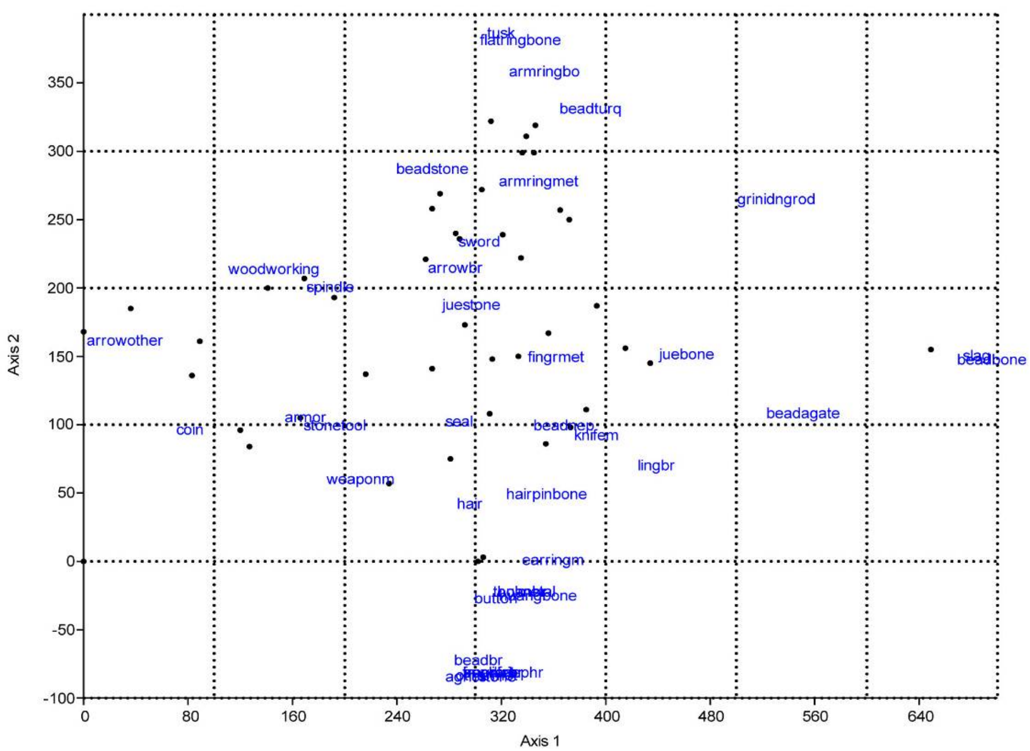


Figure 5.114: Plot for First and Second Dimension of Correspondence Analysis for Non-Ceramic Objects in Megalithic Graves.

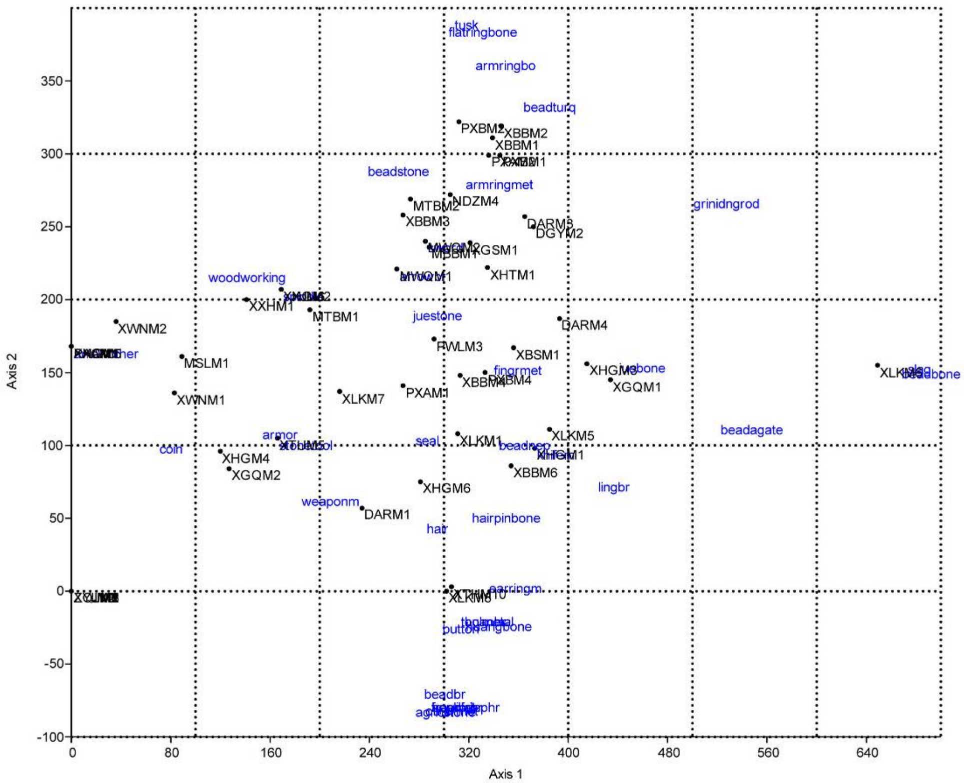


Figure 5.115: Plot for First and Second Dimension of Correspondence Analysis for Non-Ceramic Objects in Megalithic Graves.

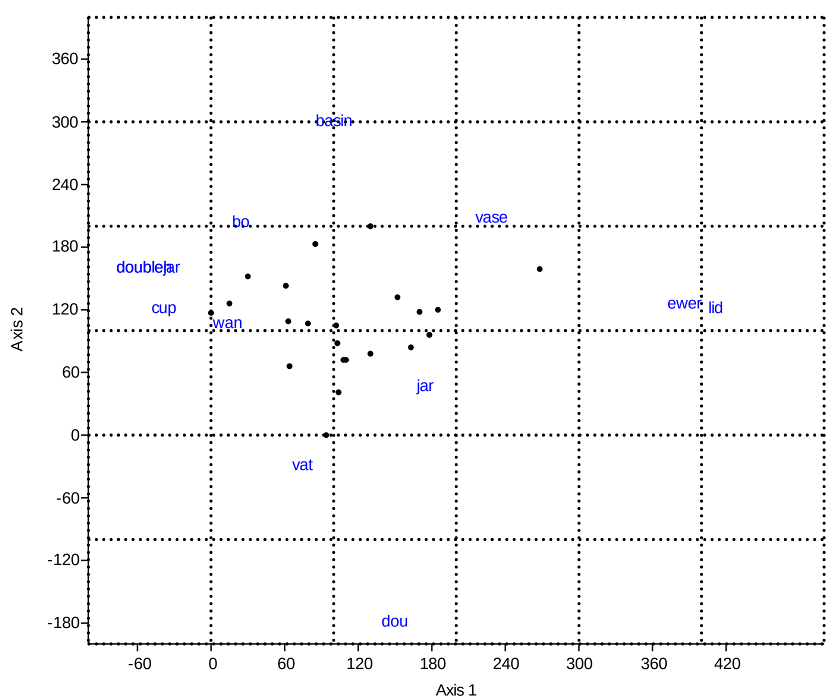


Figure 5.116: Plot for First and Second Dimension of Correspondence Analysis for Artifacts in Graves at Xichang Lizhou.

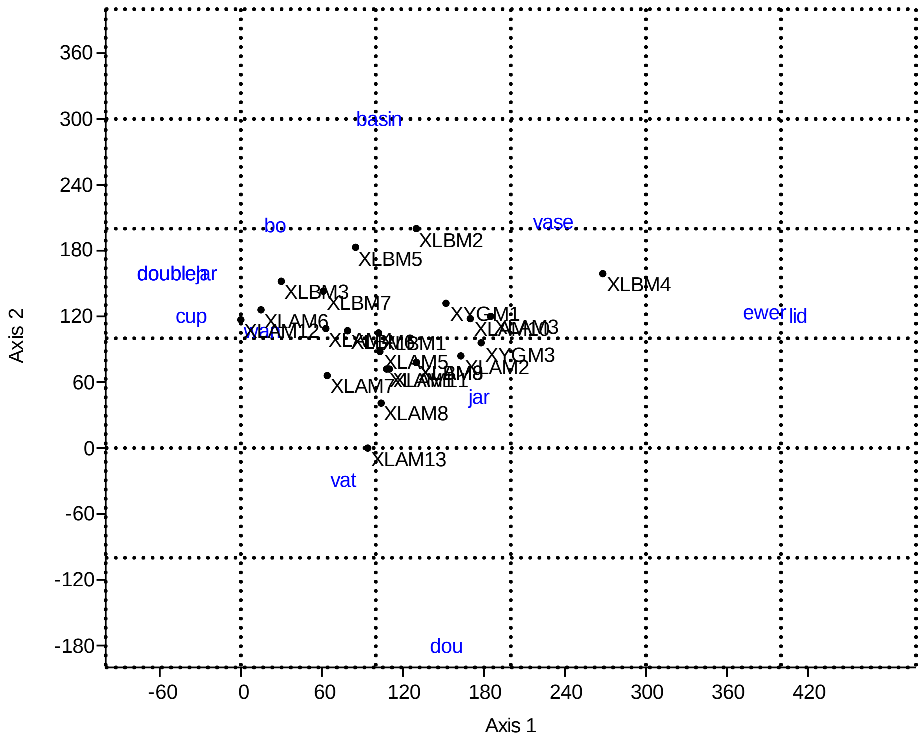


Figure 5.117: Plot for First and Second Dimension of Correspondence Analysis for Artifacts in Graves at Xichang Lizhou.

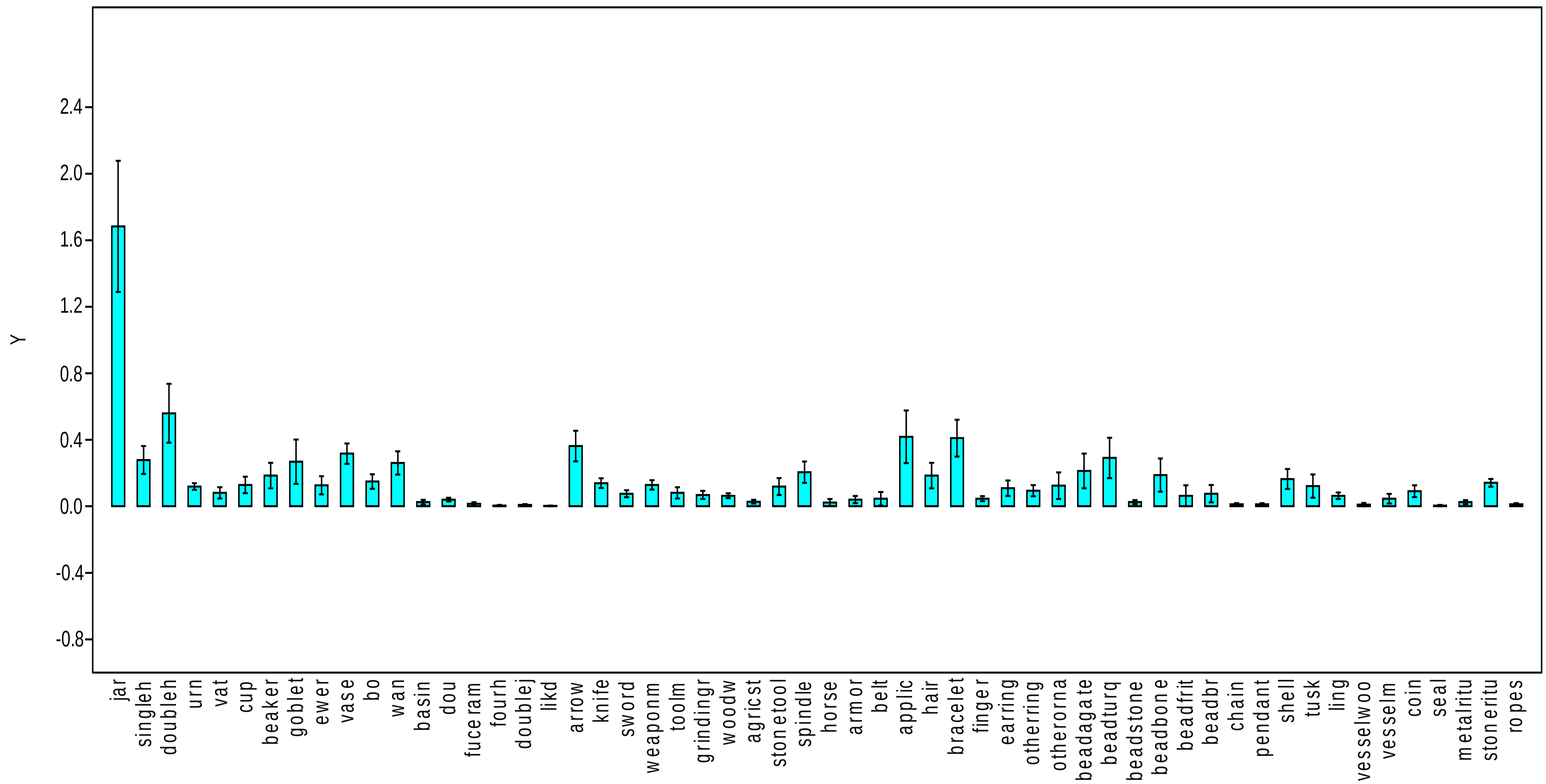


Figure 5.118: Overall Frequency of Different Object Types at Grave Sites.

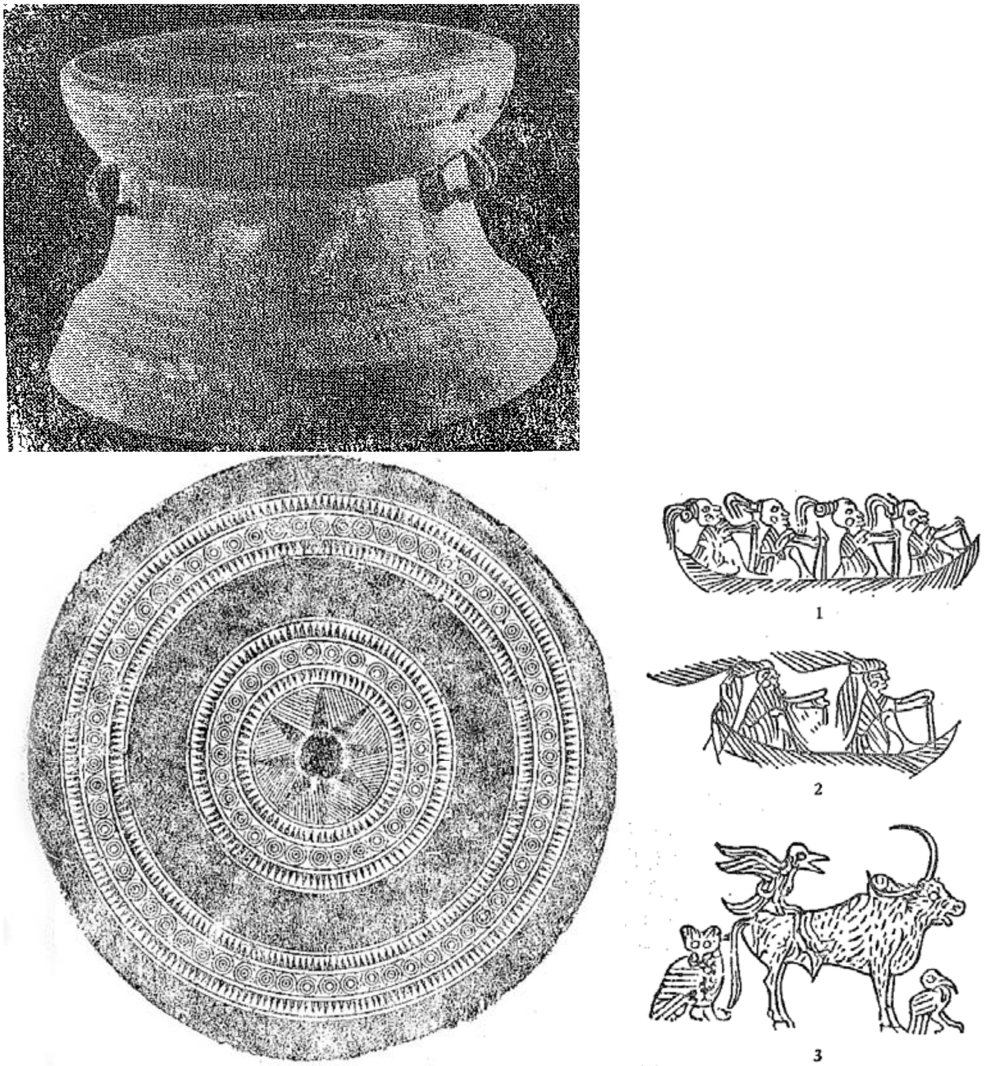


Figure 6.1: Photographs and Rubbing of the Drum from Huili Luoluochong (Huilixian 1977:Figure 1-3).


Figure 6.2: Photograph of the Drum from Huili Guoyuan (Bao Yuehe 1989:Figure 1).

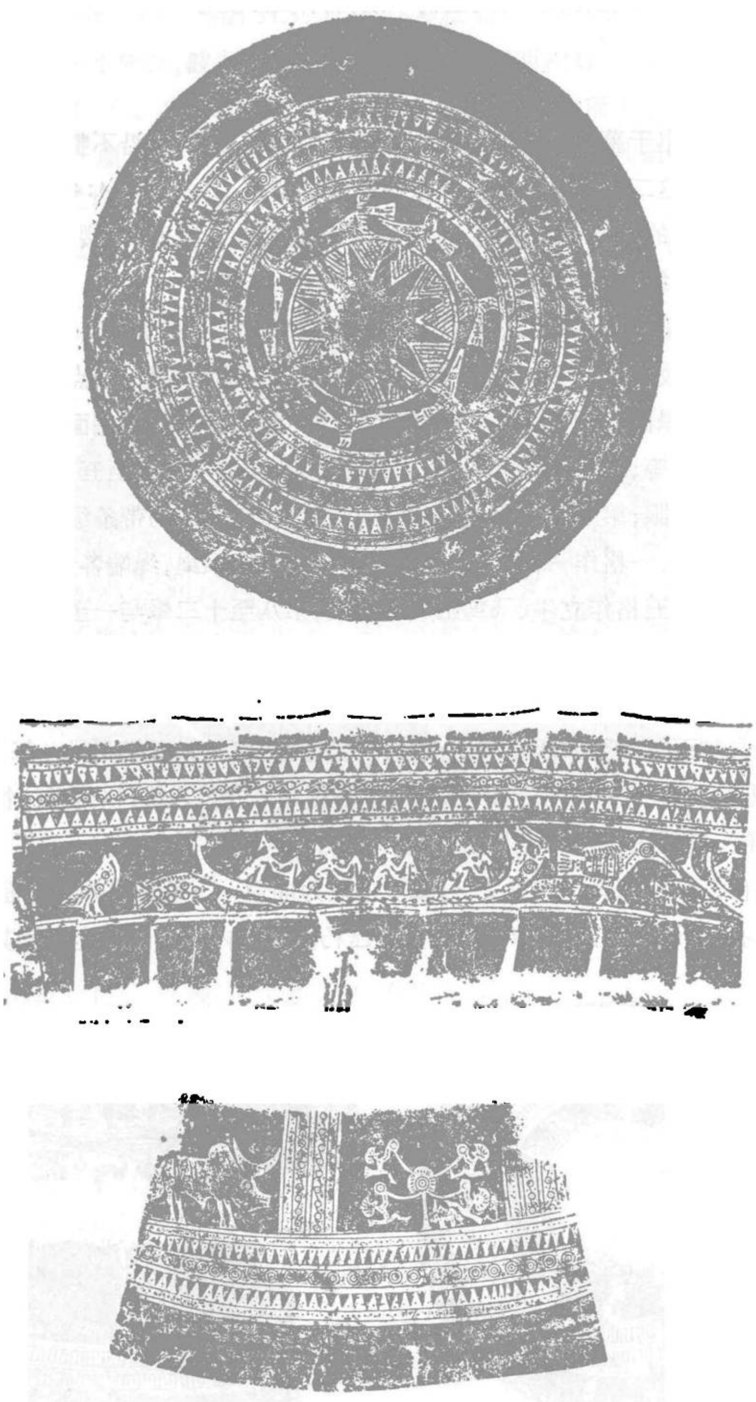


Figure 6.3: Rubbings of Drum M24:42 from Lijiashan (Yunnansheng 1975:Figure39).

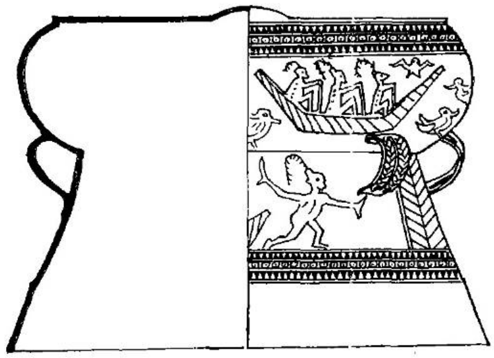


Figure 6.4: Shizhaishan Drum M1:58 (Li Weiqing 1978:Figure1.2).

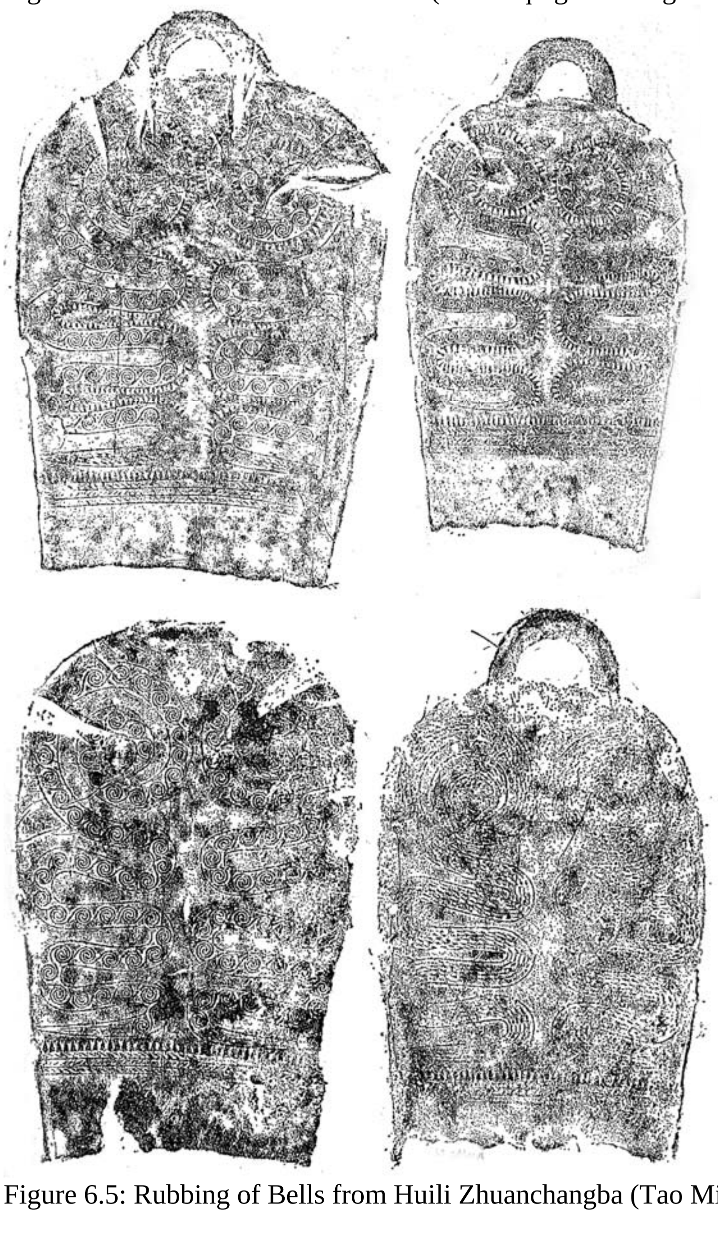


Figure 6.5: Rubbing of Bells from Huili Zhuanchangba (Tao Mingkuan 1982:Figure 1-2).

Figure 6.6: Close-up Photograph of Decoration of a Bell from Hili Zhuanchangba (Photograph by the Author).

Figure 6.7: Bell from Laolongtou M4 (Liangshan and Chengdu 2009: Color Plate 7.1) and Bell from Dabona (Yunnansheng 1964:Figure 9).

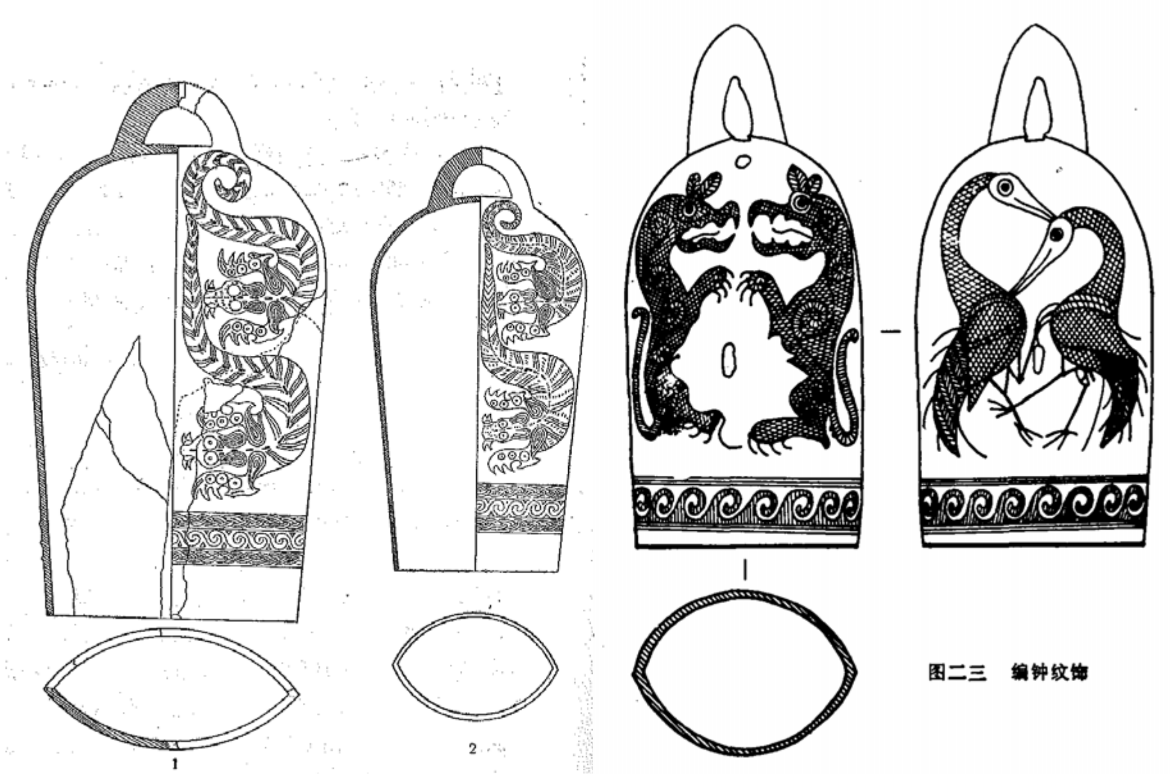


Figure 6.8: Bells M6:117 and M6:118 from Shizhaishan (Yunnansheng 1959:Figure 23) and Bells from Xiangyun Jiancun (Li Chaozhen 1983:23).

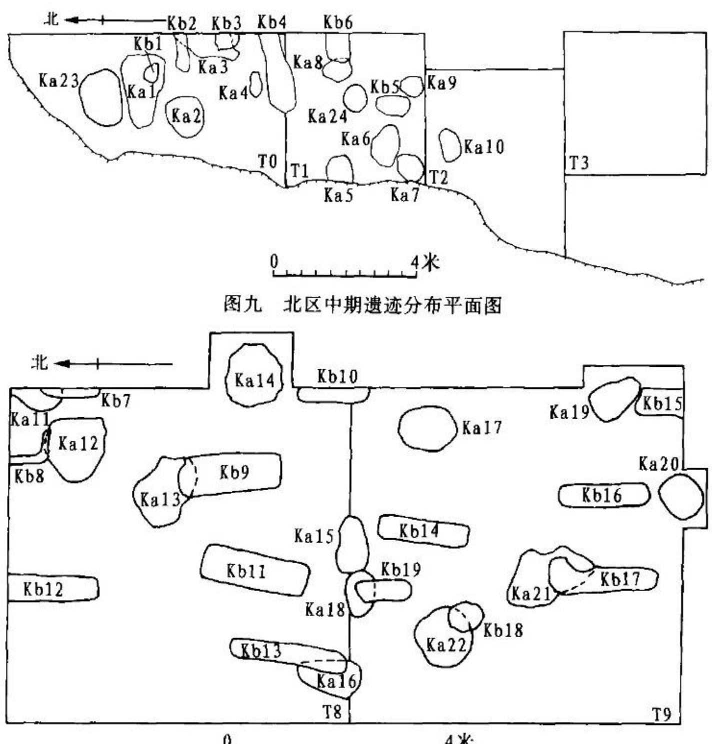


Figure 6.9: Plan of the Pit in the Northern (Top) and Southern (Bottom) Part of Xichang Dayangdui (Xichangshi, Sichuansheng, and Liangshan 2004:Figure 9-10).

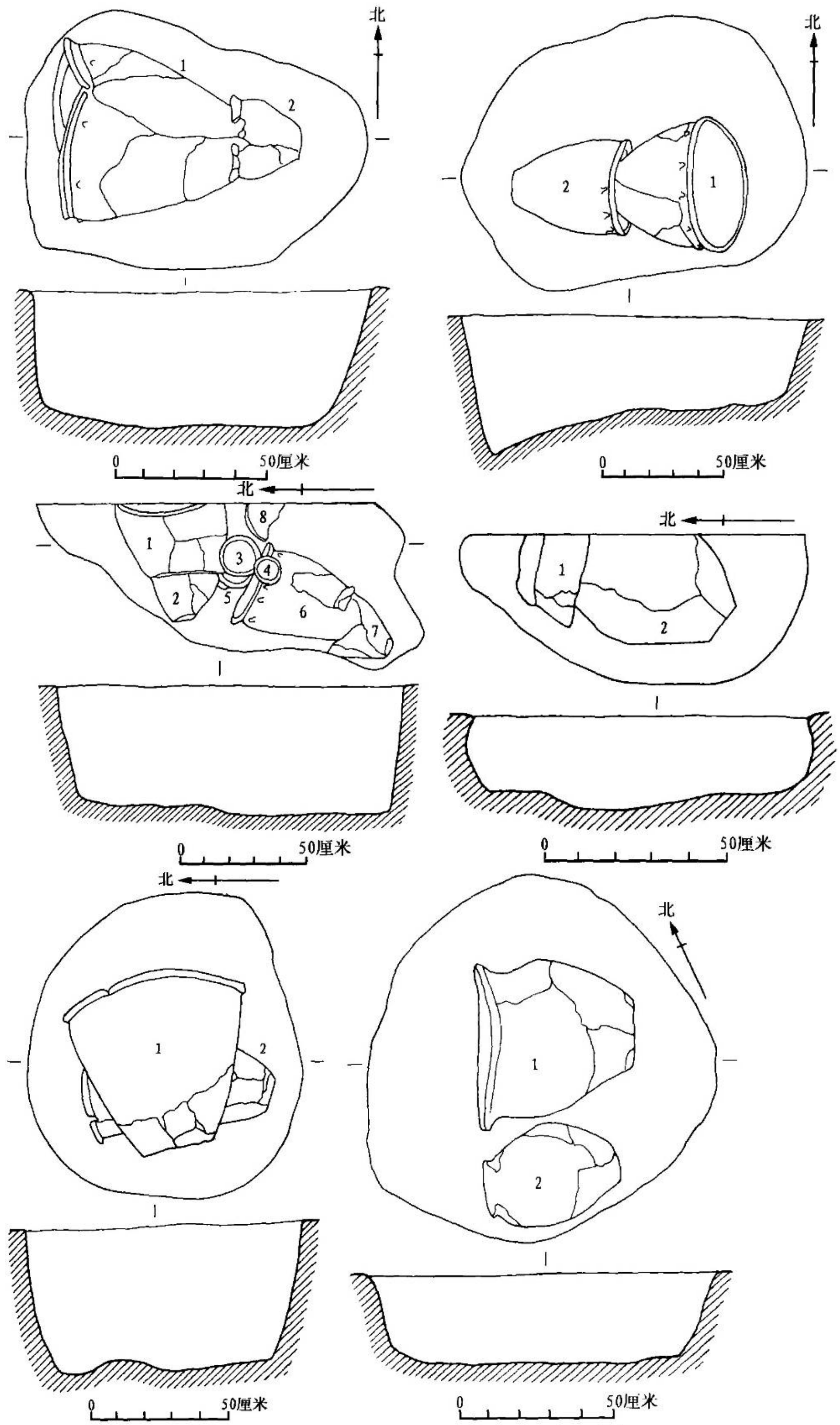


Figure 6.10: Plans of Xichang Dayangdui Ka21, Ka23, Ka3, Ka11, Ka14, and Ka2 (from Top Left to Bottom Right) (Xichangshi, Sichuansheng, and Liangshan 2004:Figure 11-17).

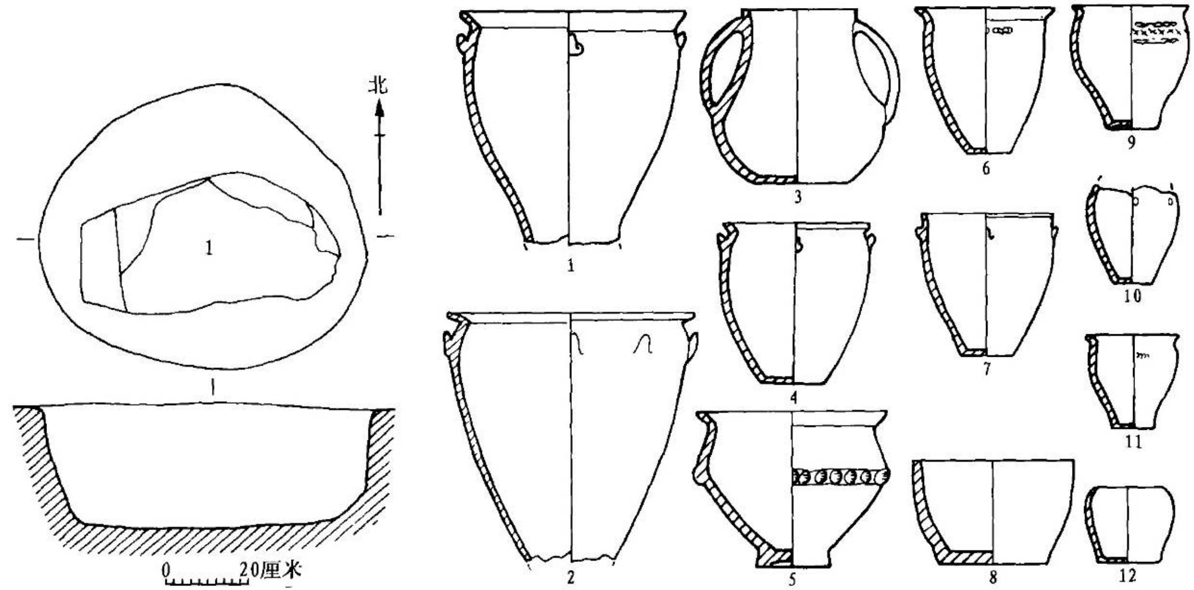


Figure 6.11: Plan of Xichang Dayangdui Ka24 (Left) and Objects from Pits (1. Ka19:1, 2. Ka23:1, 3. Ka13:5, 4. Ka12:2, 5. Ka13:1, 6. Ka3:2, 7. Ka19:2, 8. Ka3:4, 9. Ka21:2, 10. Ka17:2, 11. Ka15:1, 12. Ka13:4 (Xichangshi, Sichuansheng, and Liangshan 2004:Figure 17-18).

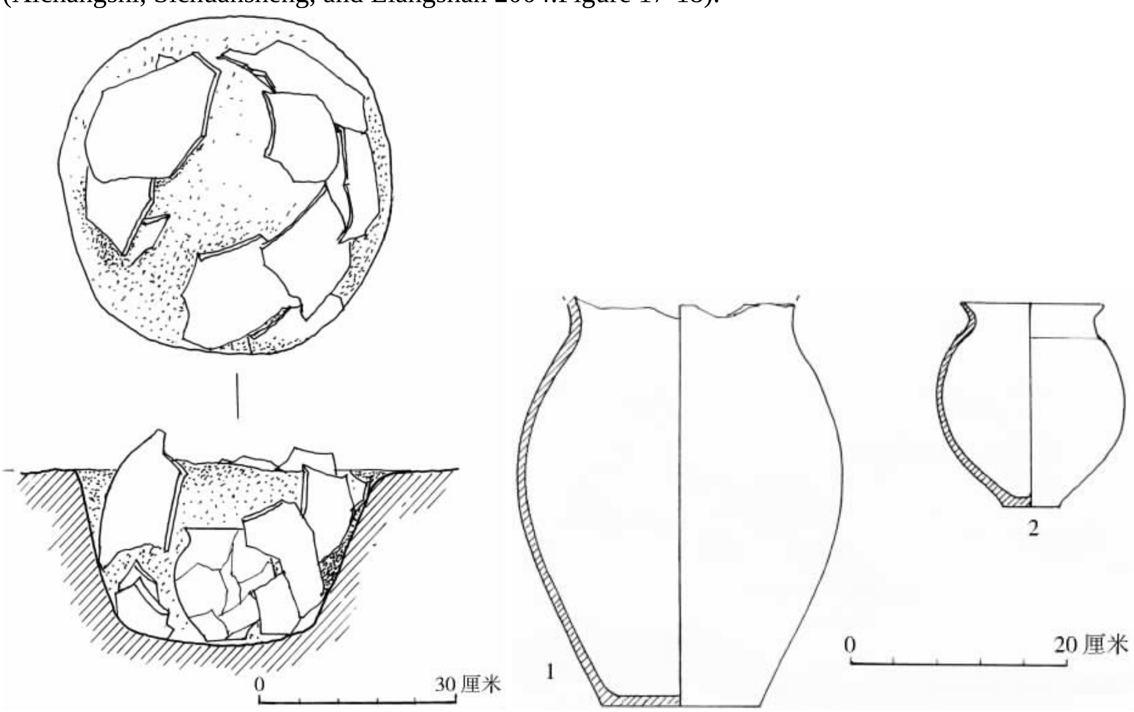


Fig 6.12: Plan of Xichang Qimugou W1 (Left) and Objects W1:1 and W1:2 (Chengdushi, Liangshanzhou, and Xichangshi 2009:Figure 18-19).

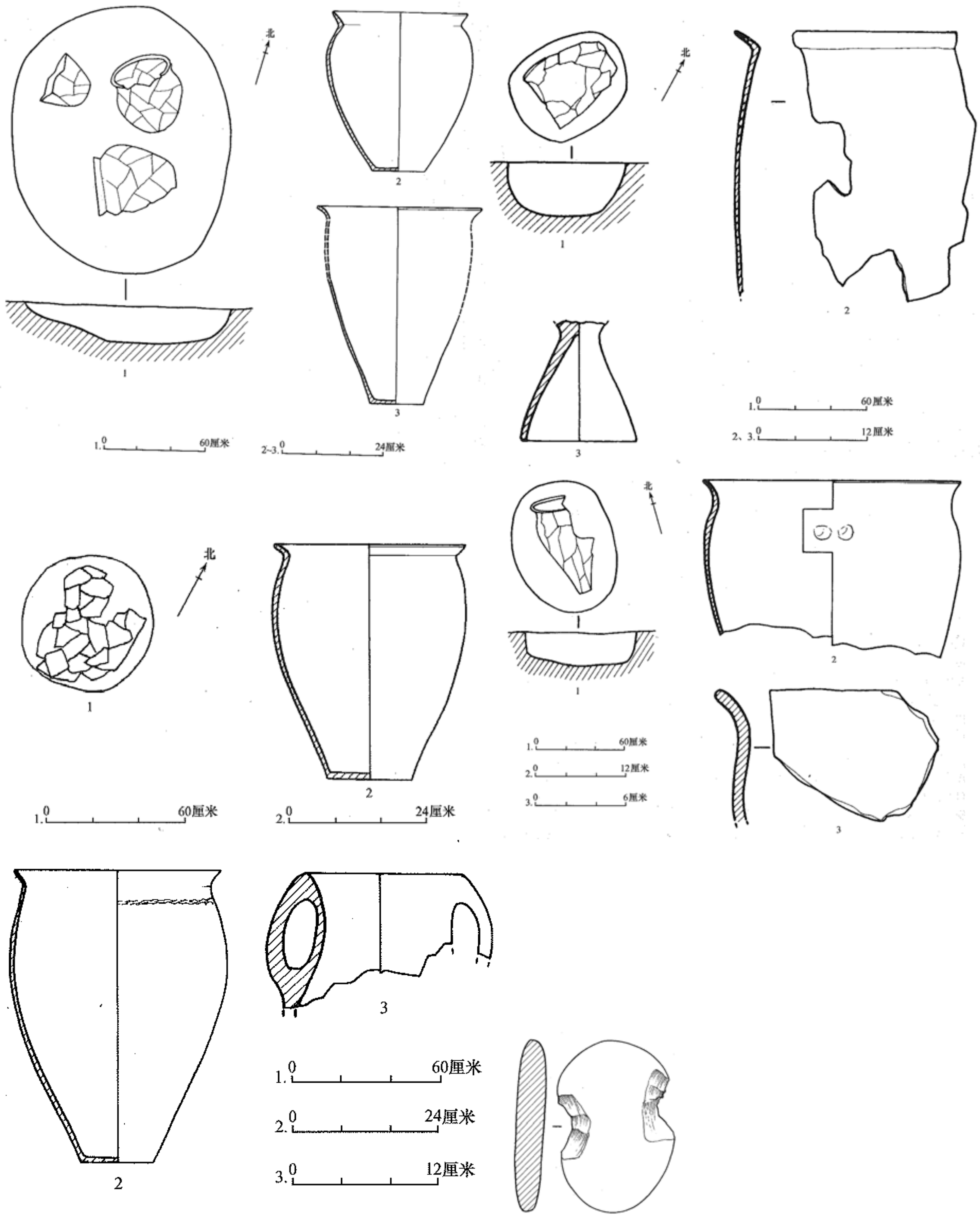


Figure 6.13: Plans and Assemblages of Xichang Yingpanshan W2, W5, W9, W8, Ceramics from W6, Stone Net Weight from W12 (From Top Left to Bottom Right) (Chengdushi, Liangshan, Xichangshi 2005:Figure 7, 10, 14, 13, 11, 17).

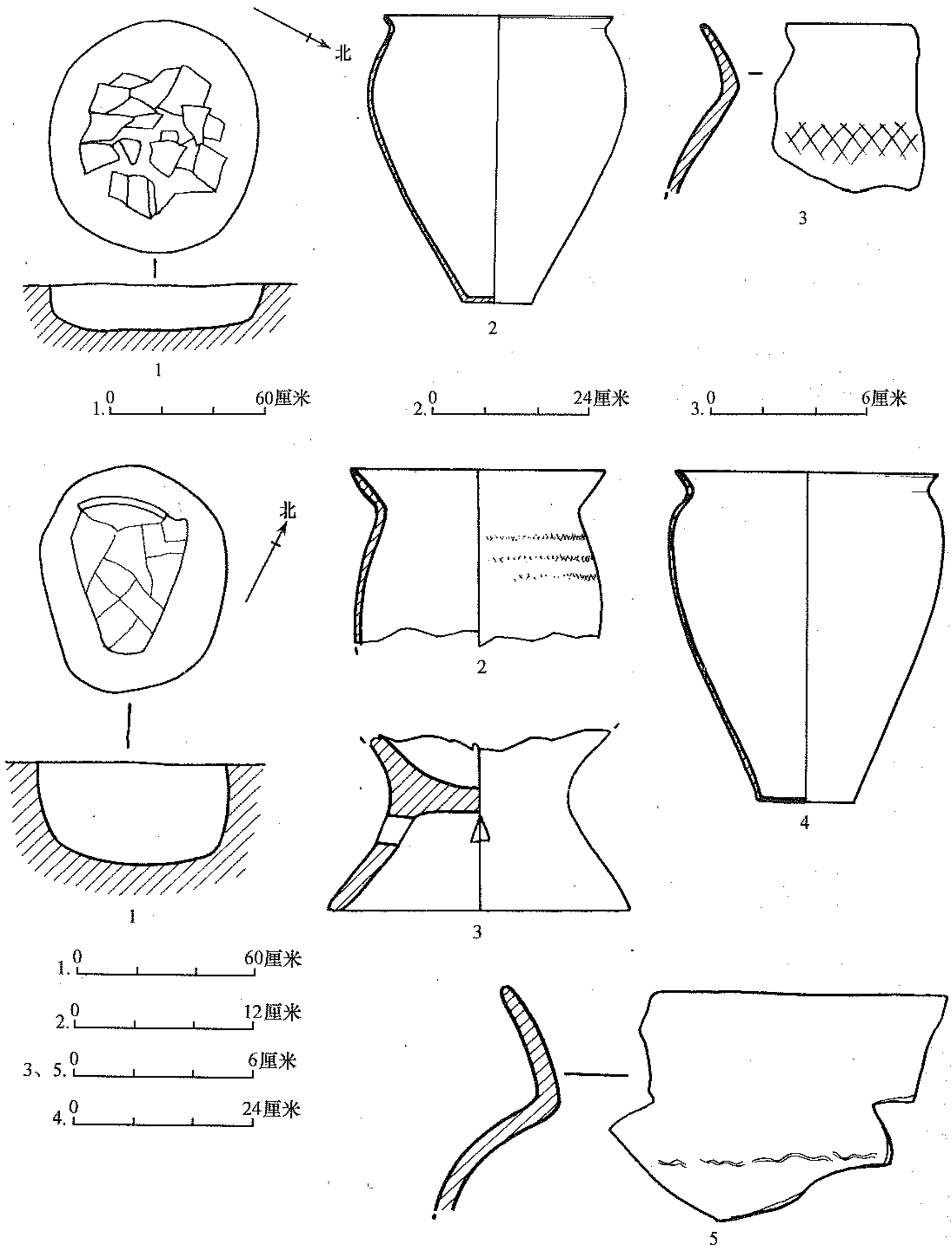


Figure 6.14: Plans and Assemblages of Xichang Yingpanshan W7 and W11 (Chengdushi, Liangshan, Xichangshi 2005:Figure 12, 16).

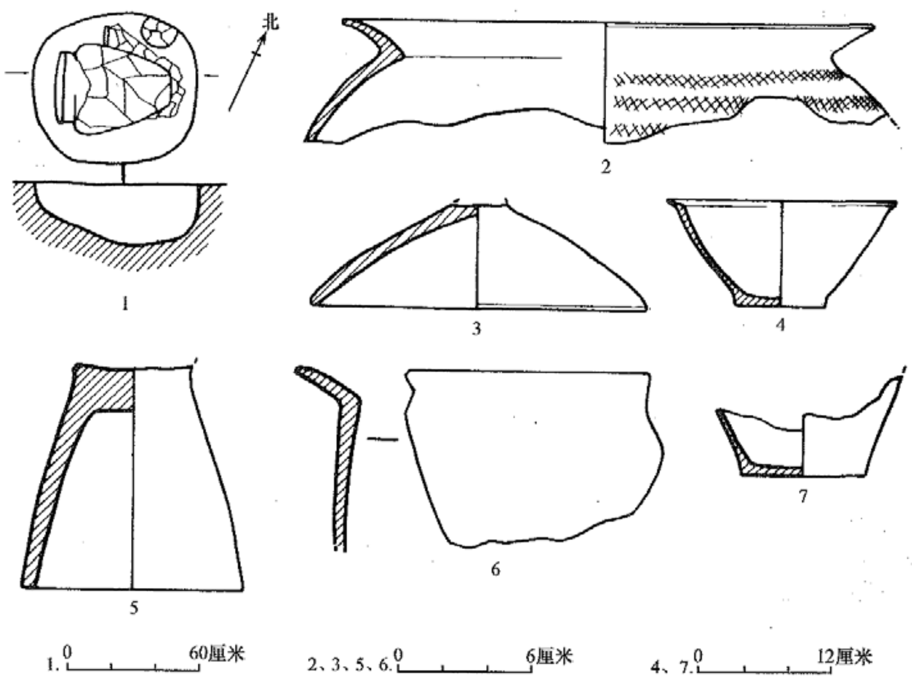


Figure 6.15: Plan and Assemblage of Xichang Yingpanshan W13 (Chengdushi, Liangshan, Xichangshi 2005:Figure 18).

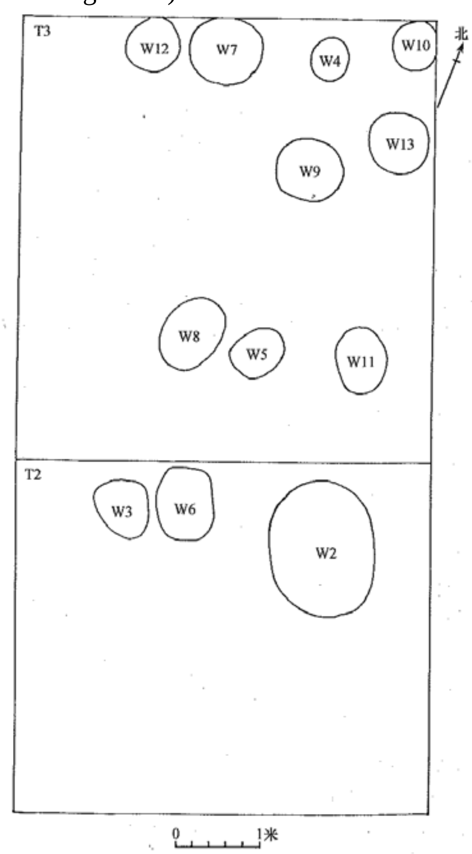


Figure 6.16: Plan of Xichang Yingpanshan Layer 4 (Chengdushi, Liangshan, Xichangshi 2005:Figure 3).

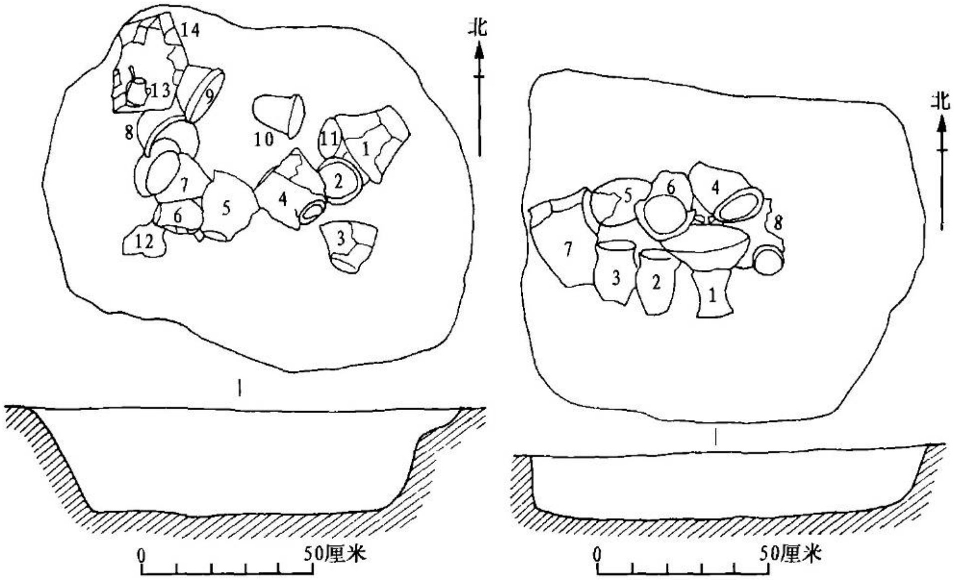


Figure 6.17: Plans of Dayangdui H1 (Left) and H2 (Right) (Xichangshi, Sichuansheng, and Liangshan 2004:Figure 13-14).

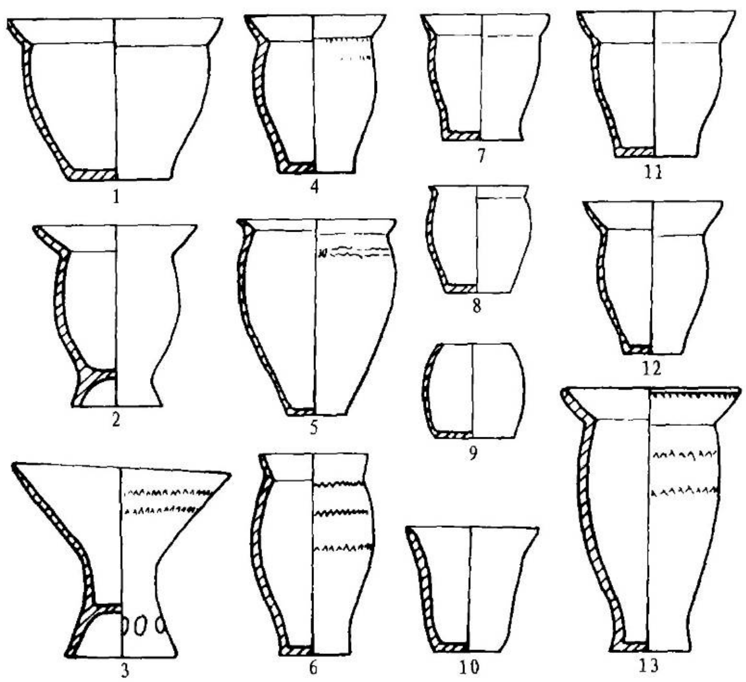


Figure 6.18: Objects from Pits H1 and H2 and Grave DM2 at Dayangdui: 1. H1:1, 2. H2:6, 3. H2:1, 4. H2:3, 5. DM2:1, 6. H2:5, 7. H1:10, 8. DM2:4, 9. H1:13, 10. H1:6, 11. H2:2, 12. H1:5, 13. H2:4 (Xichangshi, Sichuansheng, and Liangshan 2004:Figure 15).

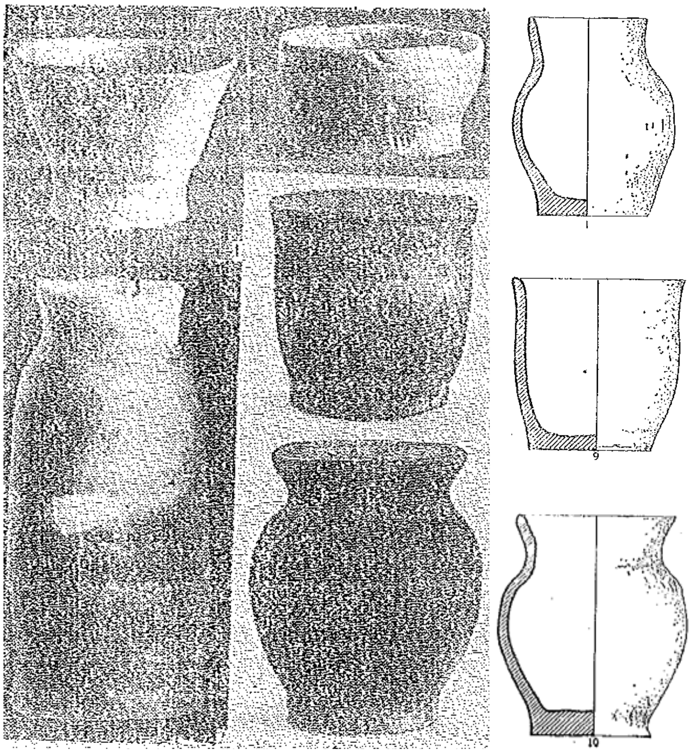


Fig 6.19: Objects from Puge Wadaluo H1 (Liangshan and Puge 1983:Figure 3.1, 9, 10 and Figure 4).

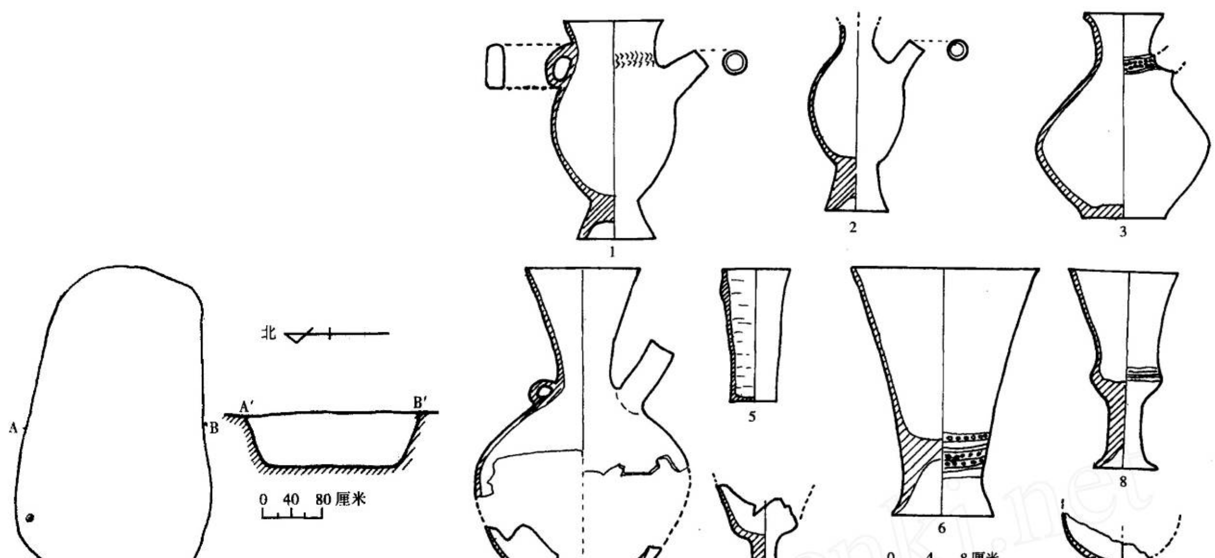


Figure 6.20: Plan and Ceramics of Xichang Maliucun H1 (Sichuansheng, Liangshan, and Xichangshi 2006b: Figure 1-2).

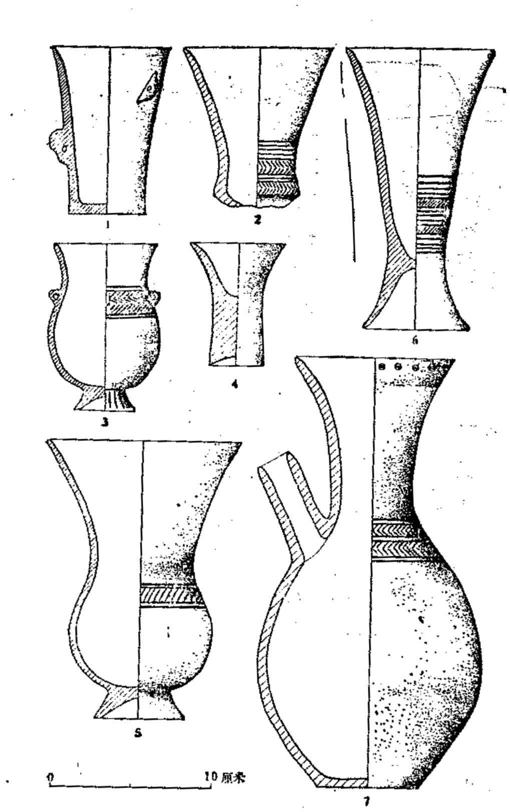


Figure 6.21: Ceramics from Xichang Bahe Baozi M4 (3 and 5) and M6 (1, 2, 4, 6, and 7) (Xichang Diqu et al. 1978:Figure 3).

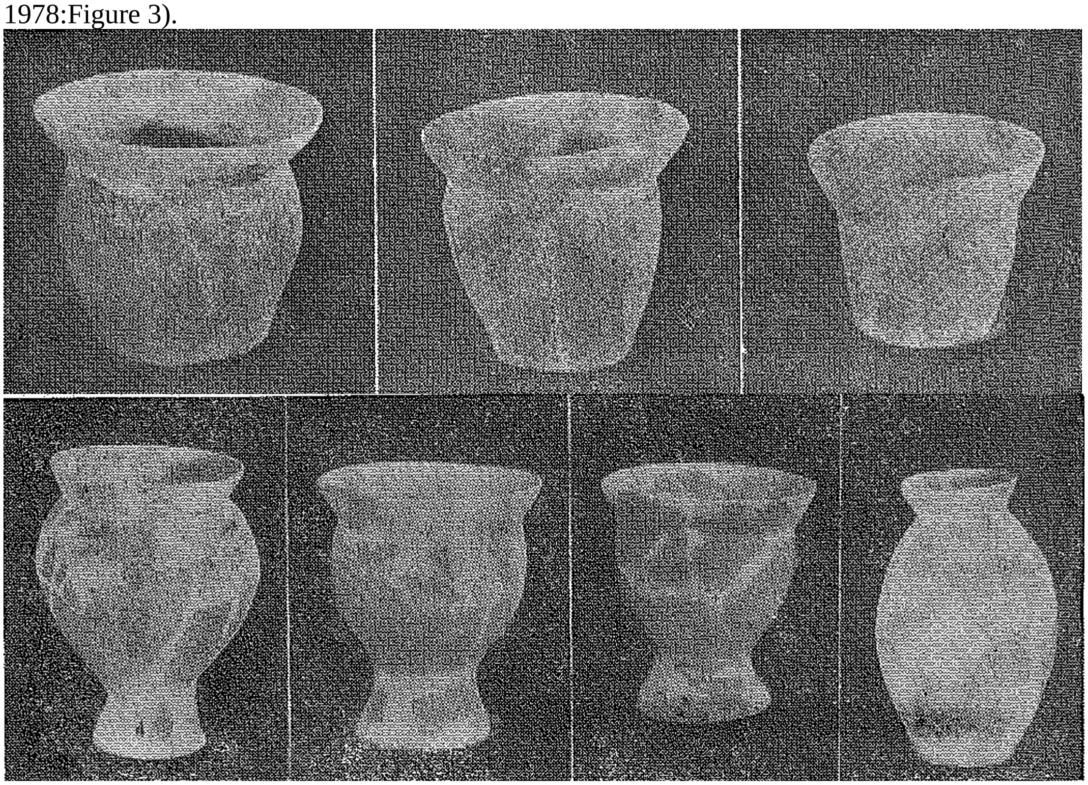


Figure 6.22: Ceramics from Xichang Tianwangshan M10 (Liangshan 84:Figure 4).

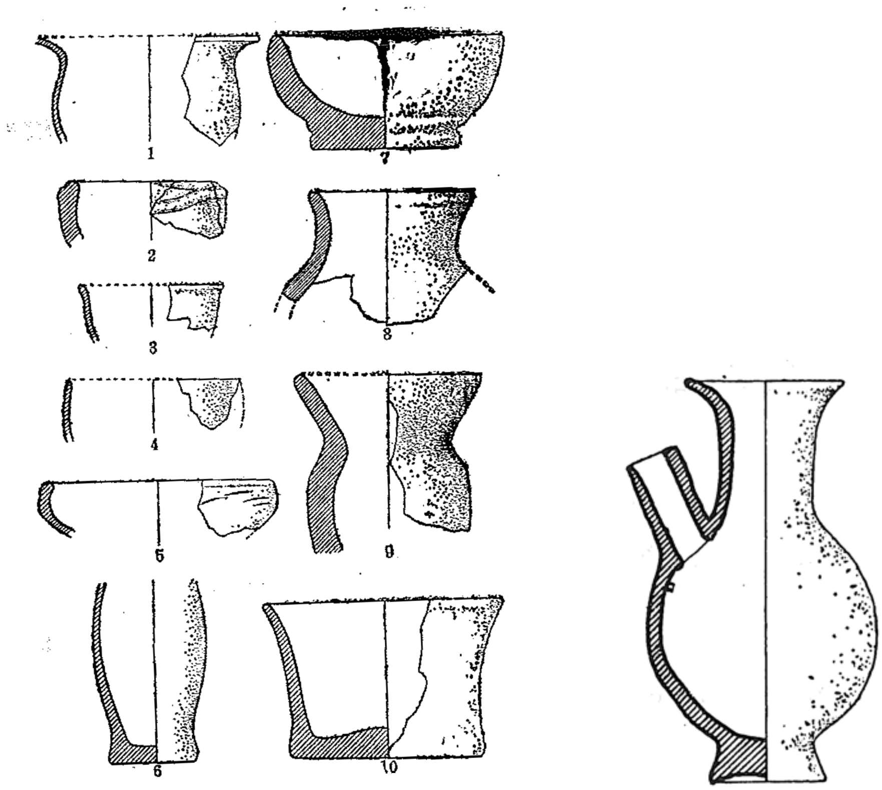


Figure 6.23: Ceramics from Surface Surveys at Settlement Sites in Puge (Left) and Ewer from Puge Xiaoxingchang M1 (Right) (Liangshan and Puge 1982:Figure 4, Liangshan and Puge 1987:Figure 8.1).

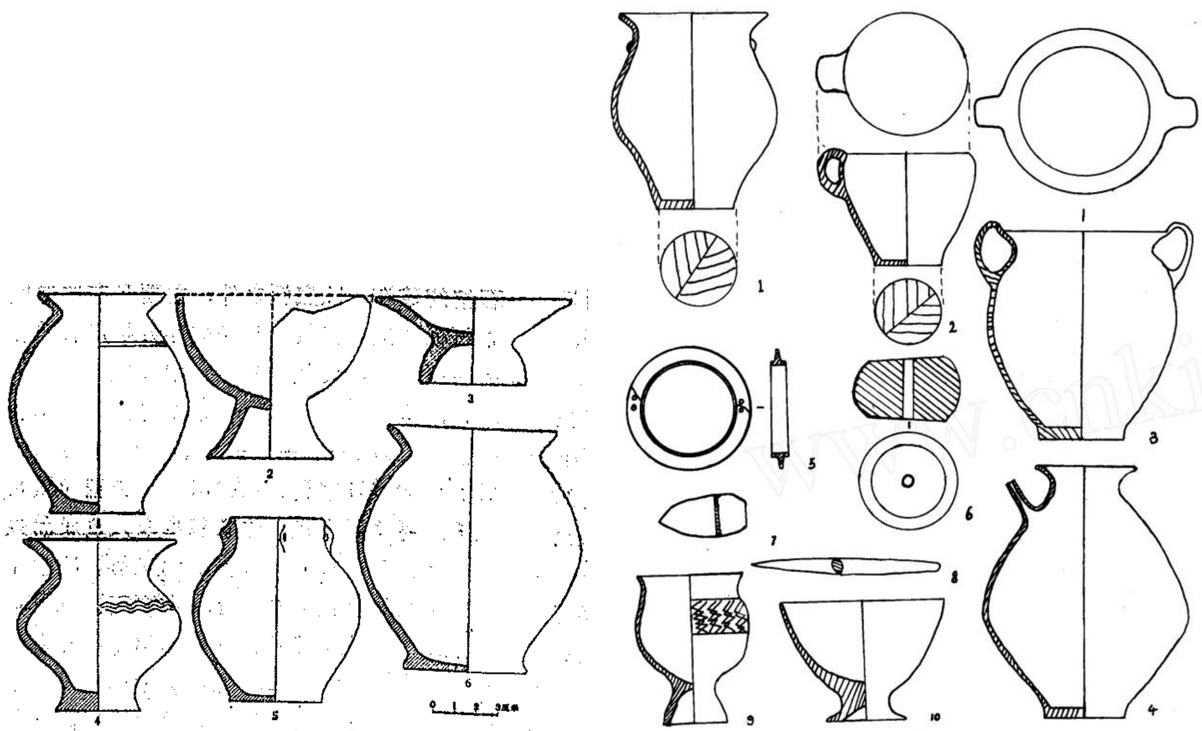


Figure 6.24: Ceramics from Zhaojue Fuchengqu M1 (1-3 and 6) and Erba Keku M3 (4-5) (Left) (Liangshan 1981:Figure 7) and Ceramics and Stone Tools from Earth-Pit Graves in Huili (Tang Xiang 1999:Figure 2).

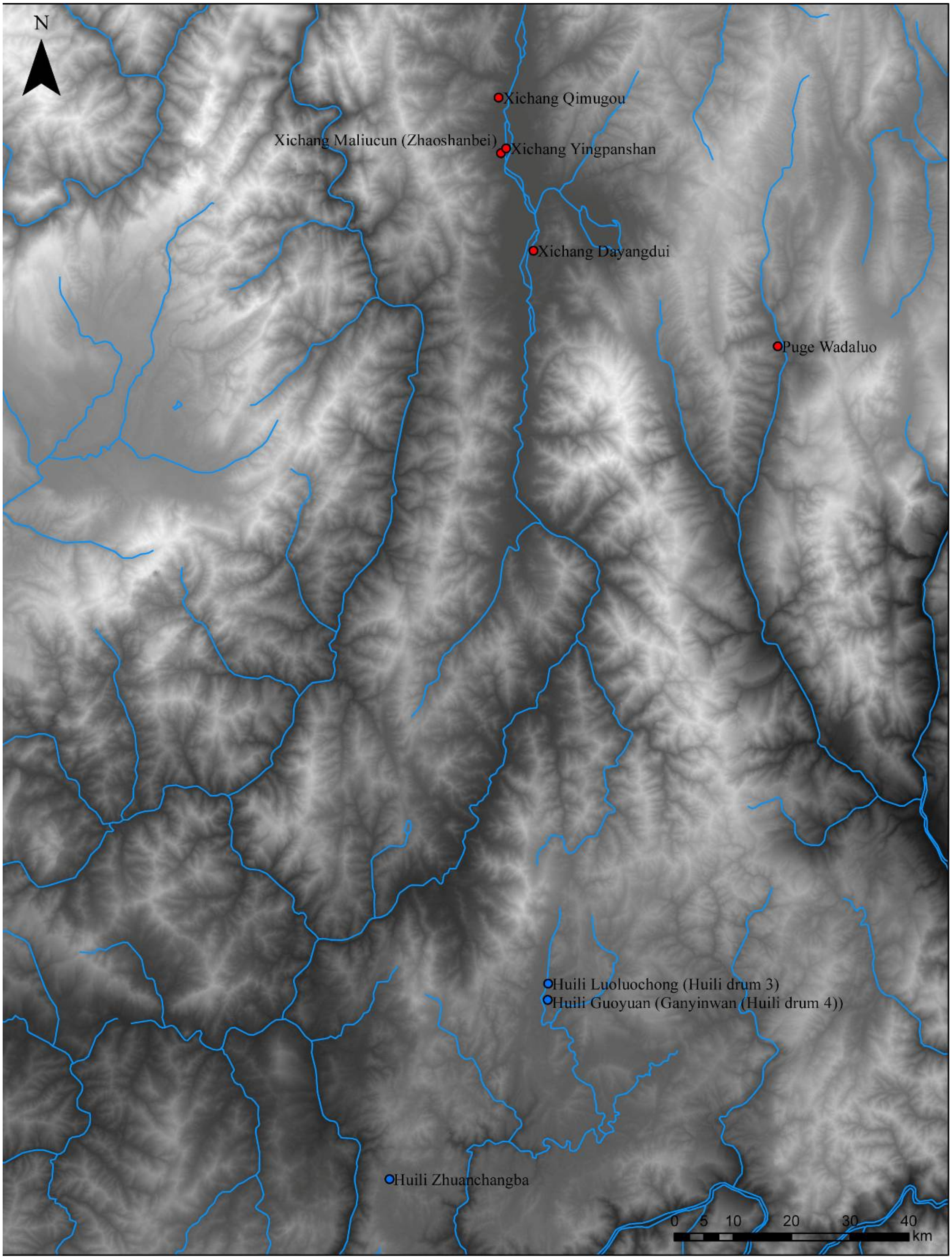


Figure 6.25: Object Pits and their Distribution in the Research Area. Bronze Assemblages are marked with Red, Ceramic Assemblages with Blue.

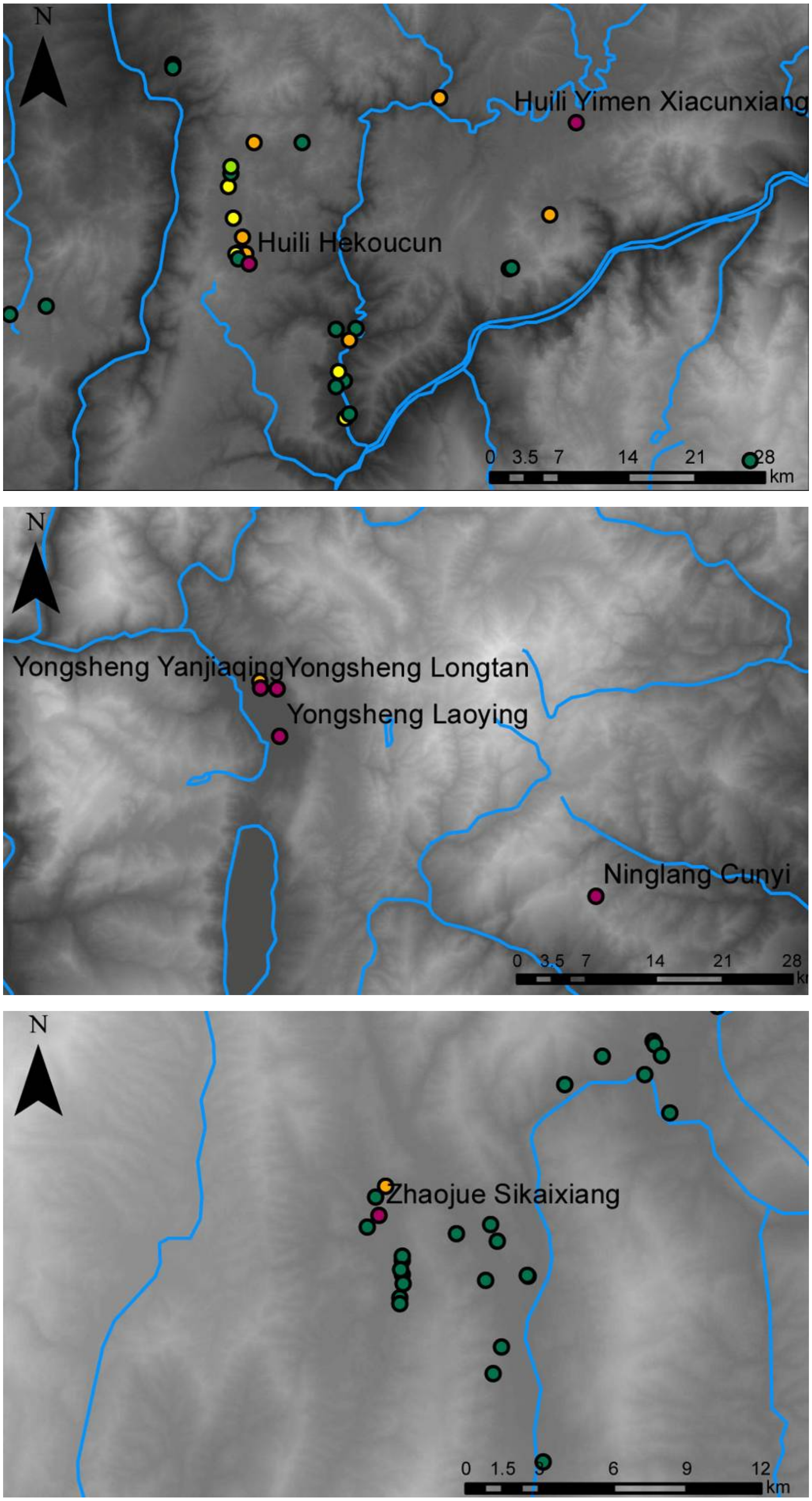


Figure 6.26: Close-up Views of the Regions from which Single Finds have been reported.

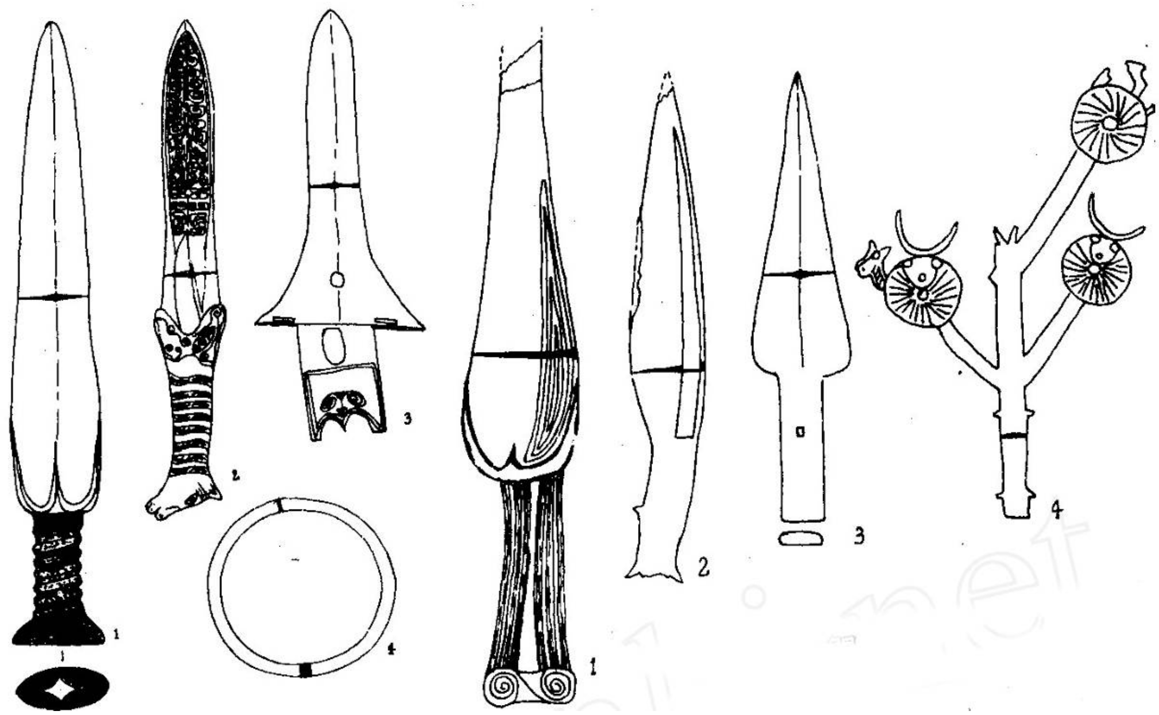


Figure 6.27: Bronze Objects from the Art Market in Huili. Left: 1. Aa Sword, 2. F Sword, 3. AaIII *Ge* Dagger-Axe, 4. BbII Armring; Right: 1. CaI Knife, 2. AbII Knife, 3. C *Mao* Spear-Head, 4. Cf Staff-Head (Tang Xiang 1996:Figure 1-2).

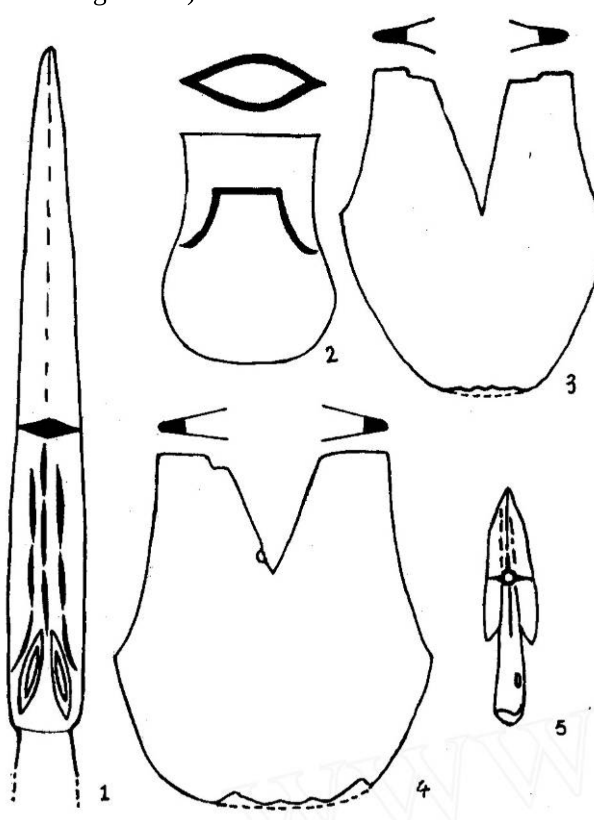


Figure 6.28: Typical Bronze Finds from Huili (Tang Xiang 1999:Figure 3).

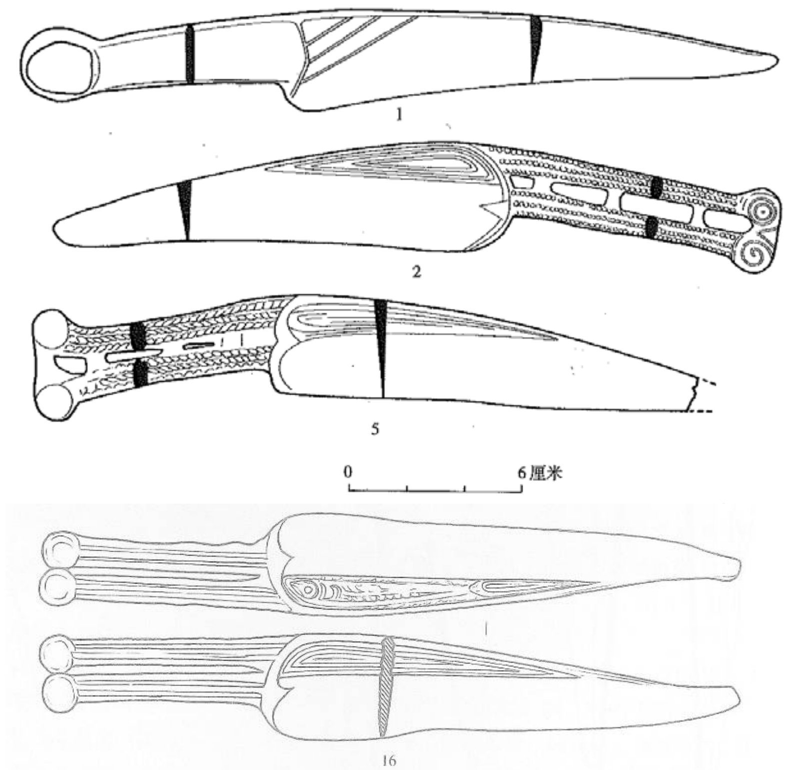


Figure 6.29: Bronze Weapons from Yanyuan: 1. AbII Knife (Liangshan and Chengdu 2009:Figure 74.1), 2. and 5. CaI Knife (Ibd.:Figure 69.2 and 69.5) and from Hexi Gongshe M2: 16. CaI Knife (Sichuan, Liangshan, and Xichangshi 2006a:Figure 88.16).

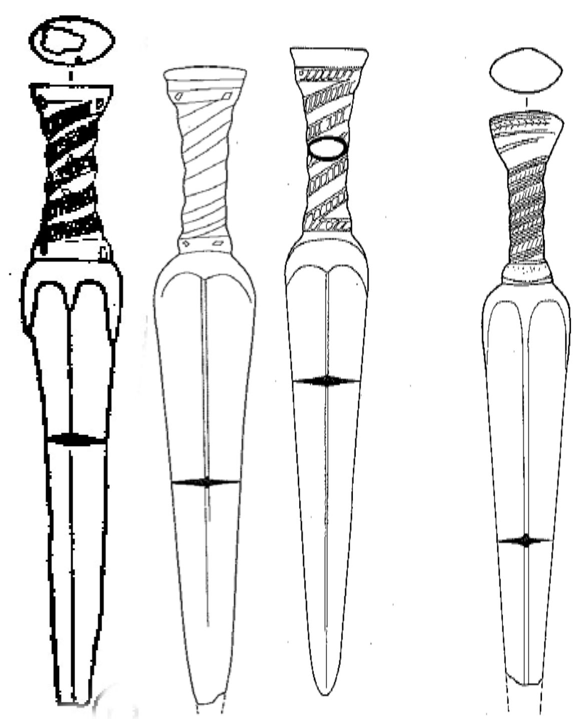


Figure 6.30: Aa Sword: NDXM7.2 (Yunnansheng 1983:Figure5.1), YLLM4:3 (Liangshan and Chengdu 2009:Figure 6.8), Yanyuan Art Market C368, C248 (Ibd.:Figure 41.12-13).

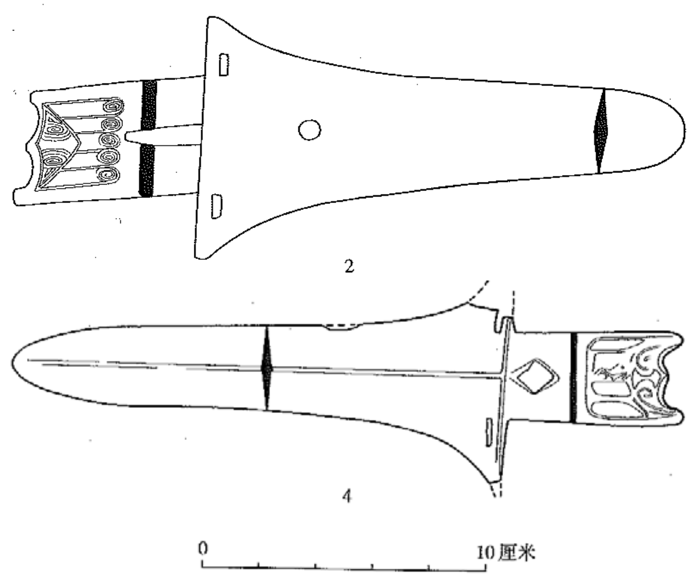


Figure 6.31: AaIII Dagger-Axe: 2. YLLM11.7 (Liangshan and Chengdu 2009:Figure 23.2), 4. Yanyuan Art Market C196 (Ibd.:Figure 45.4).

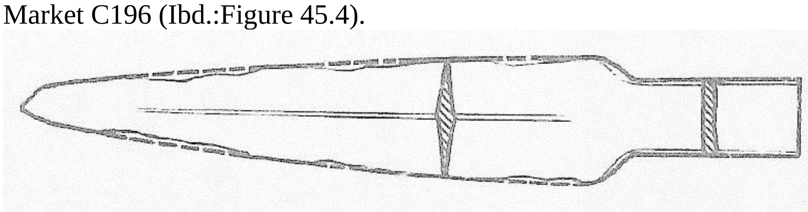


Figure 6.32: C Spear-Head, DARM1.41 (Sichuan, Liangshan, and Xichangshi 2006a:Figure 89.5).

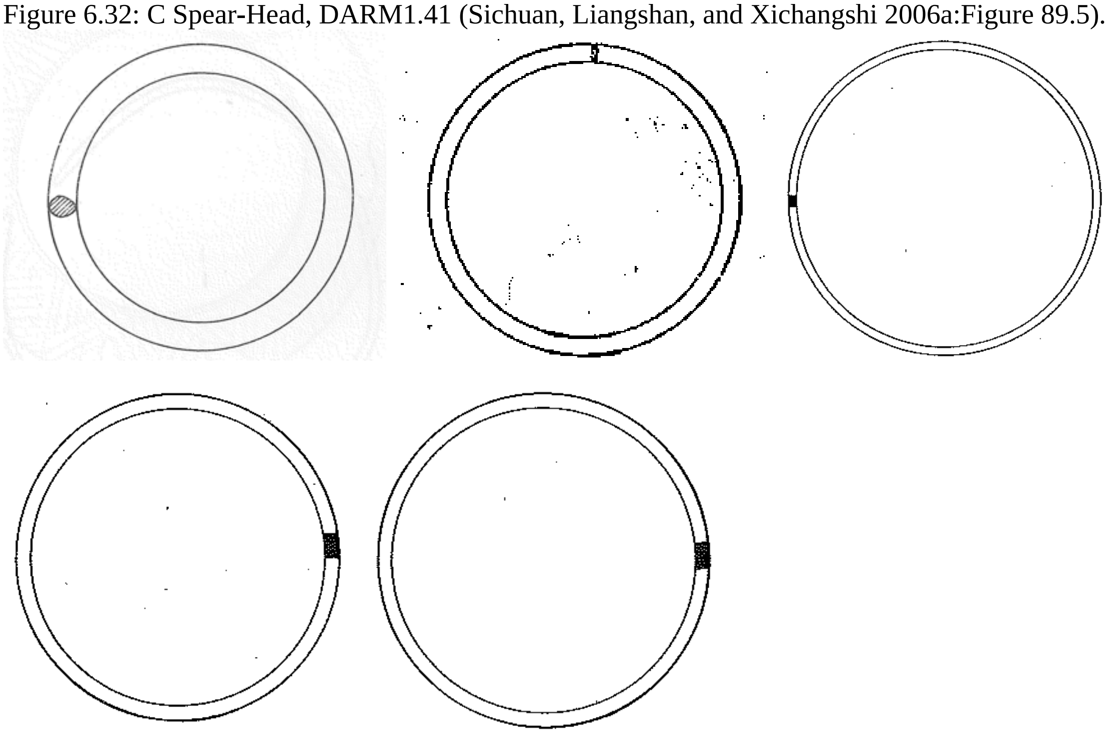


Figure 6.33: BbII Arm-ring: XBBM1.17 (Sichuan, Liangshan, and Xichangshi 2006a:Figure 78.4), XXM4.5 (Xichang 1978:Figure 5.3), YLLM11.5 (Liangshang and Chengdu 2009:Figure 25.7), Yanyuan Art Market C178 and C180 (Ibd.:Figure 109.1-2).

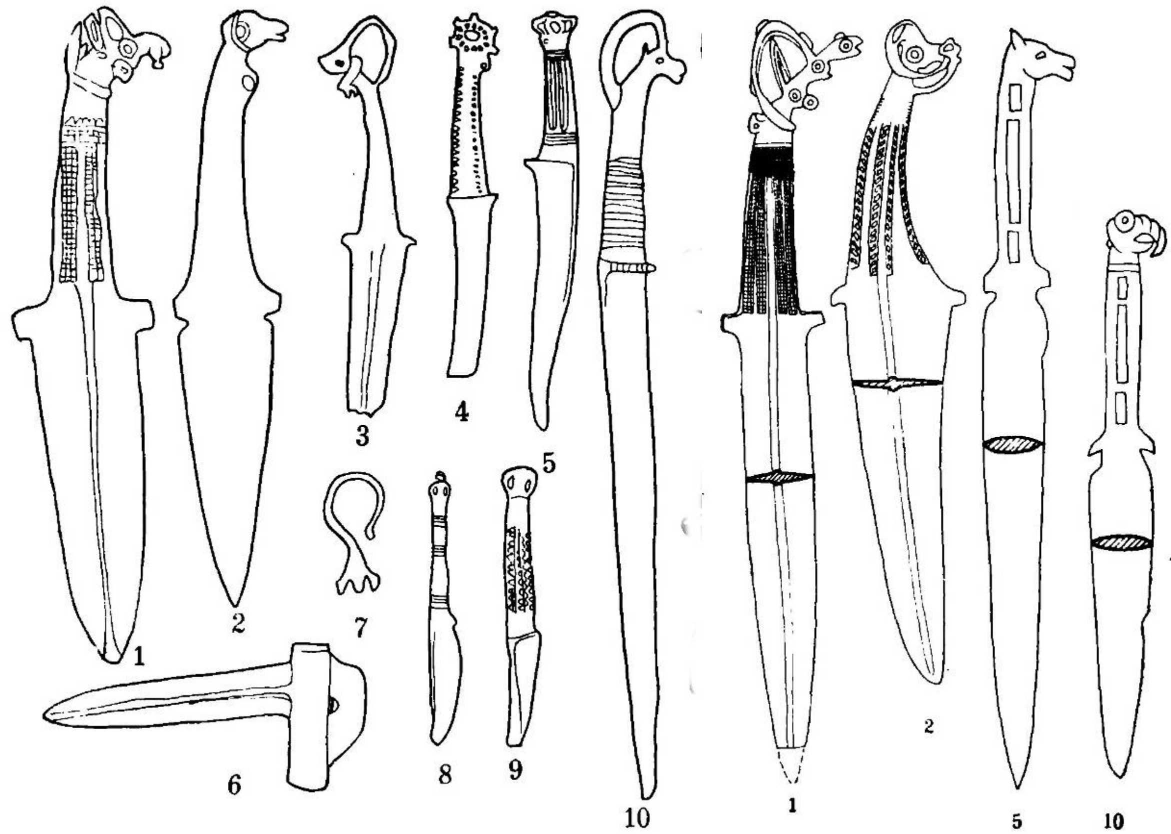


Figure 6.34: Weapons from Left: 1., 4., 5., 8.-10. Mongolia, 2.-3., 6.-7. Siberia (Wu En 1985:Figure 6); Right: 1.-2. Hebei, 5. and 10. Beijing (Ibd.:Figure 1).

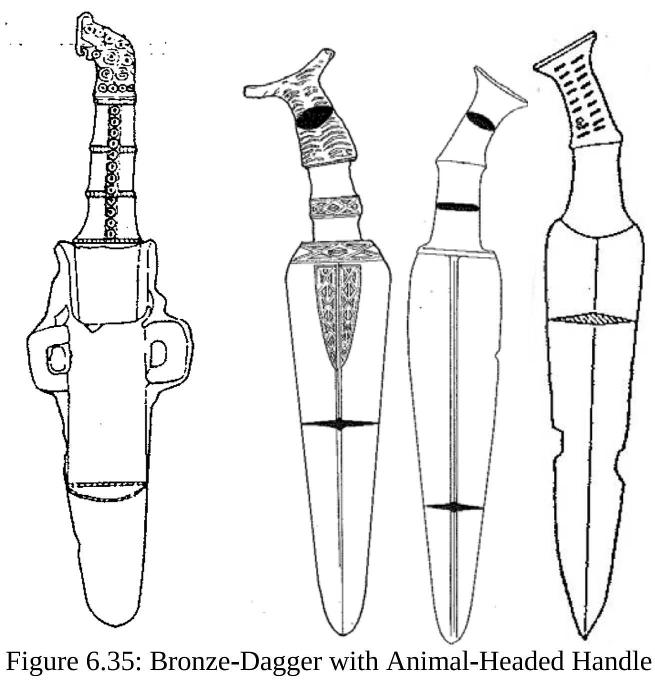


Figure 6.35: Bronze-Dagger with Animal-Headed Handle from Maoxian Moutuo M1, Sichuan (Falkenhausen 1996:Figure 20c); Ea and Eb Type Short-Sword from Yanyuan Laolongtou M11 and M7 (Liangshan and Chengdu 2009:Figure 24.7 and 27.1); Short-Sword from Yunnan Deqin Nagu M22 (Yunnansheng 1983:Figure 7.3).

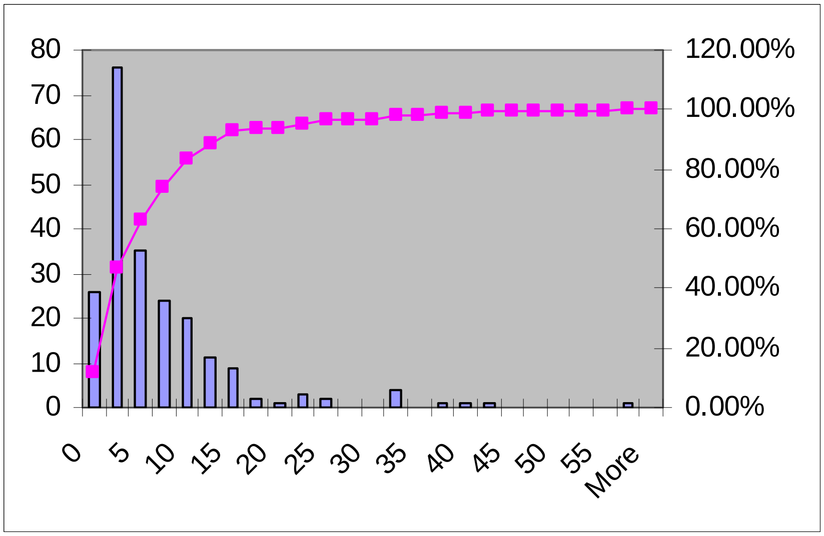


Figure 7.1: Distance between Grave Sites and Nearest Settlement Site.

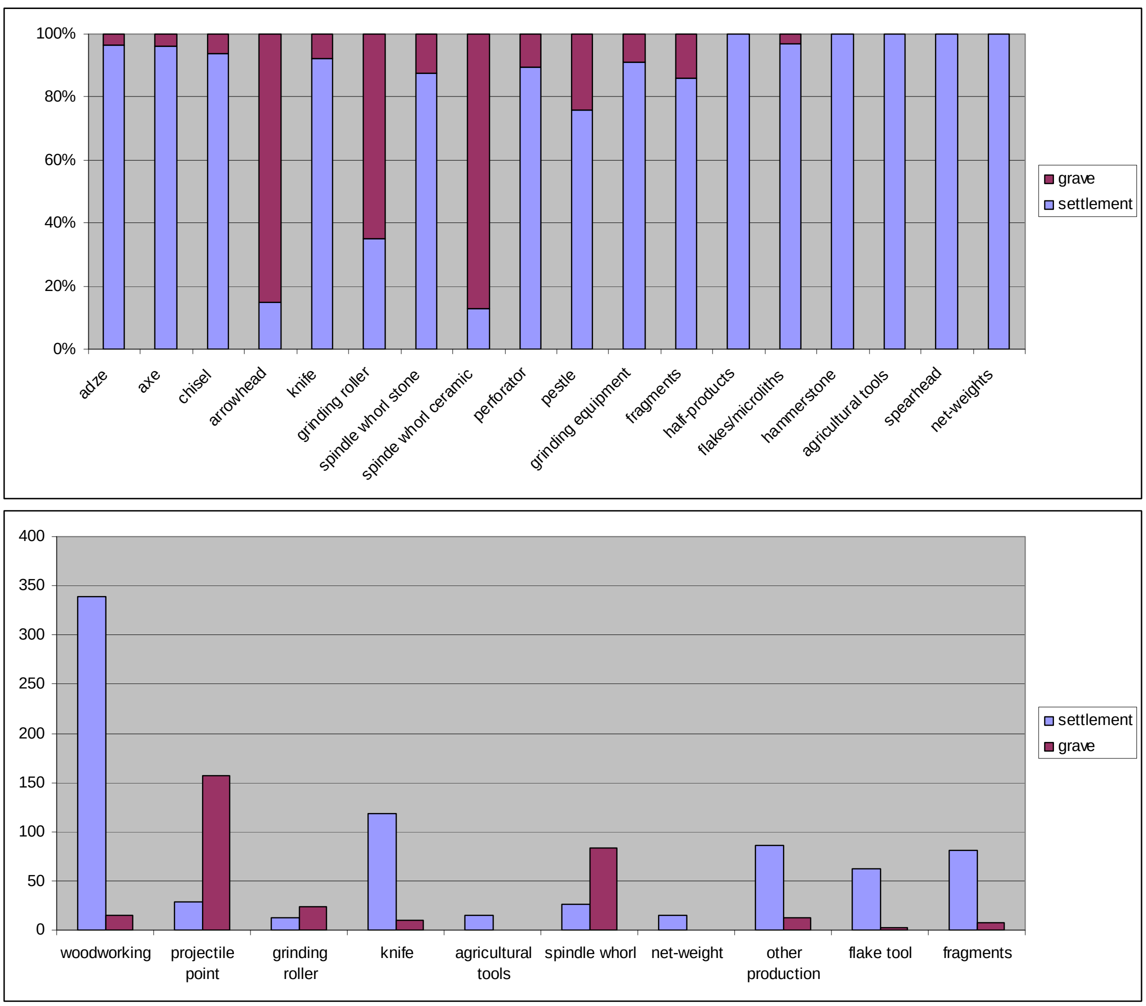


Figure 7.2: Stone and Ceramic Tools in Settlement Sites and Graves.

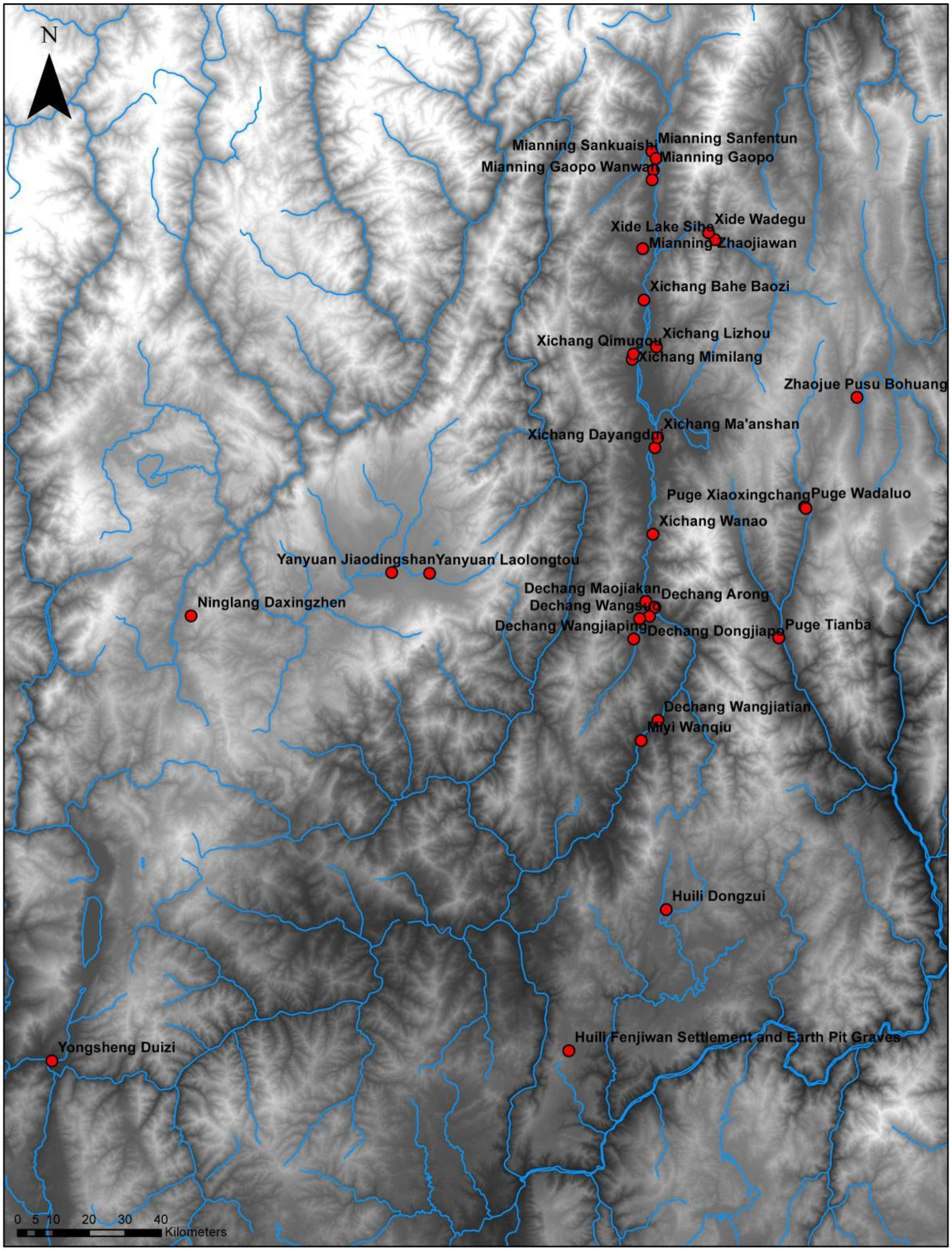


Figure 7.3: Distribution of Ceramics with Leaf-Vein Impression on the Bottom within the Research Area.

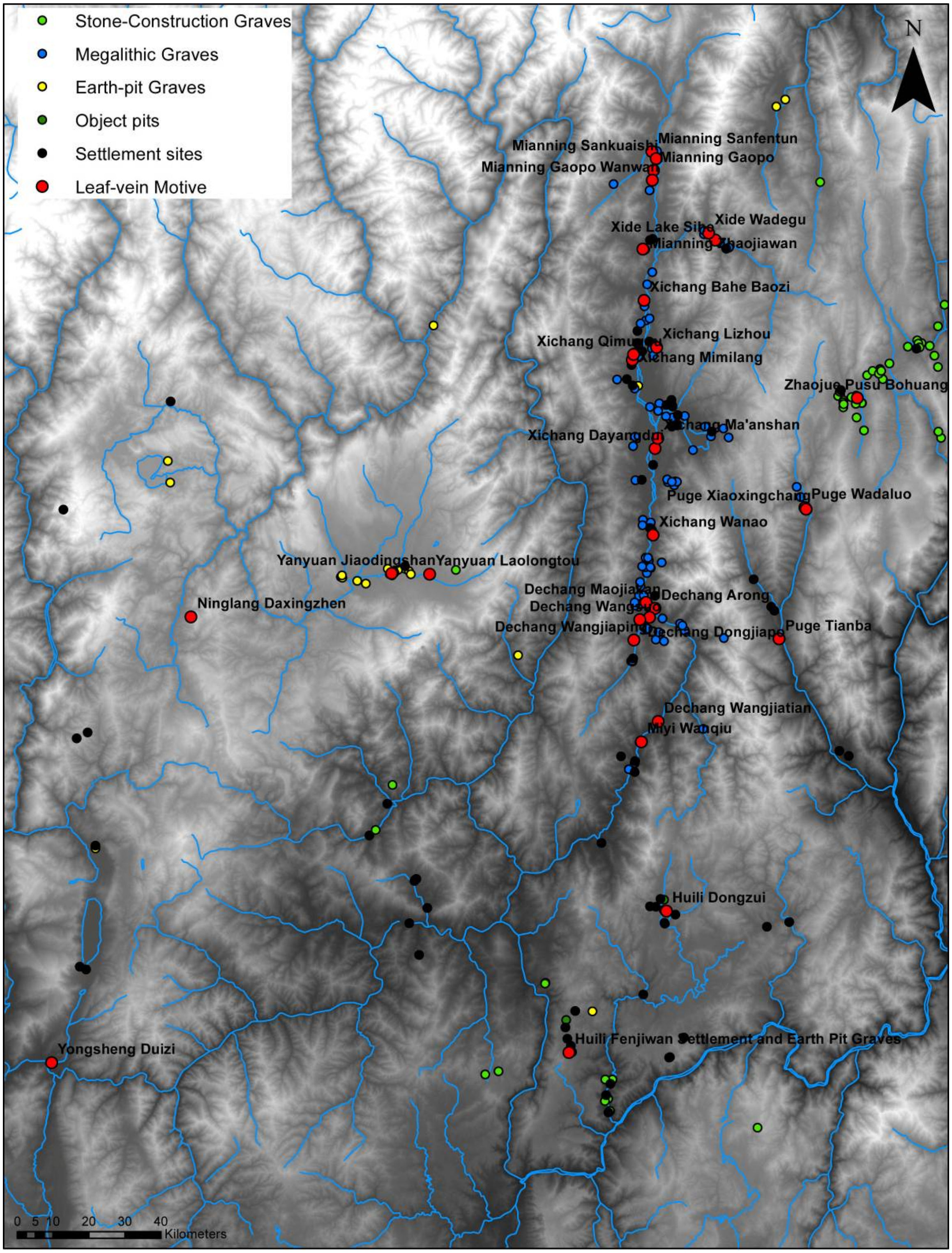


Figure 7.4: Distribution of Ceramics with Leaf-Vein Impression on the Bottom within the Research Area compared to Other Sites.

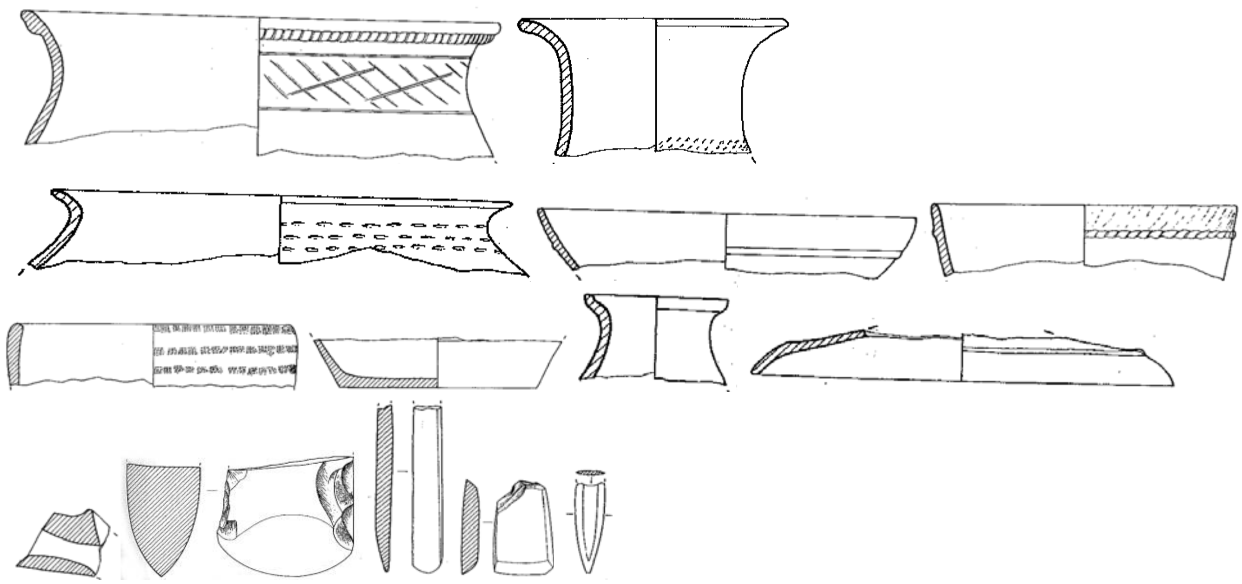


Figure 7.5: Assemblage from Xichang Henglanshan (Early Henglanshan) (Chengdu, Liangshan, and Xichangshi 2004: Figure 8-11).

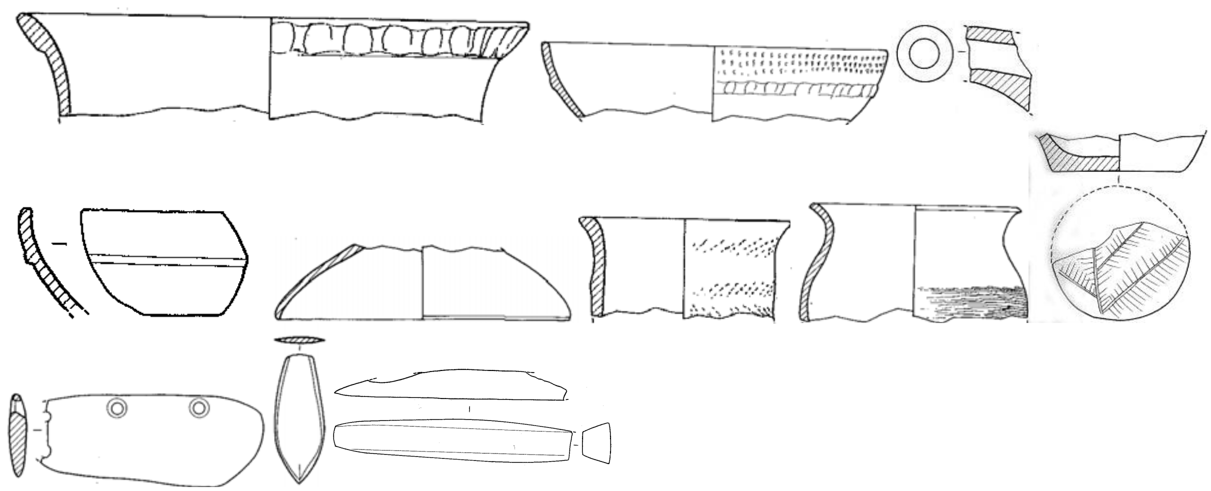


Figure 7.6: Assemblage from the Settlement of Xichang Ma'anshan (Chengdu, Liangshan, and Xichangshi 2006: Figure 17-22).

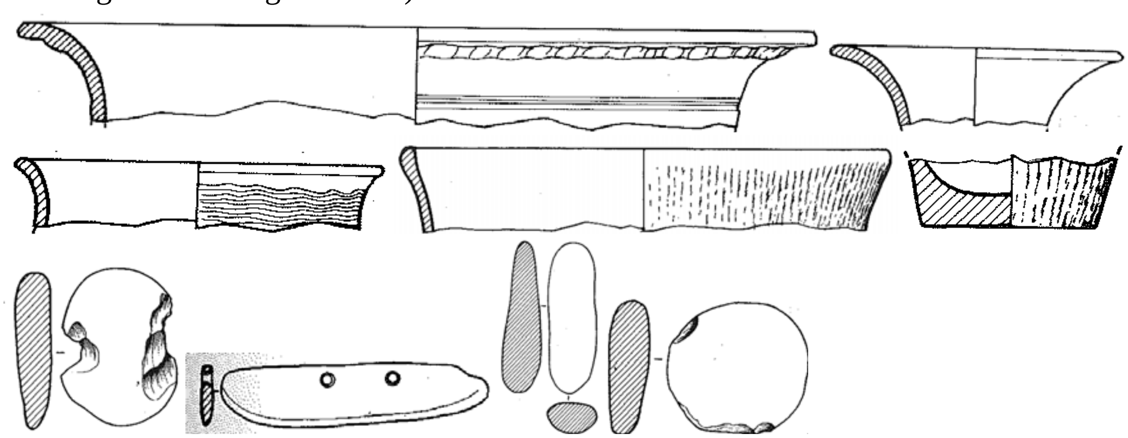


Figure 7.7: Assemblage of Lower Yingpanshan (Chengdu, Liangshan, and Xichangshi 2005: Figure 4.1, 4.7, 4.4, 5.1, 5.8, 6.5, 6.6, 4.9-10-6).

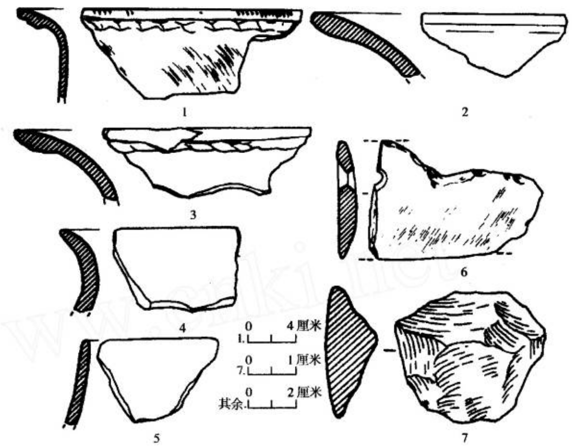


Figure 7.8: Assemblage of Lower Qimugou (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 4).

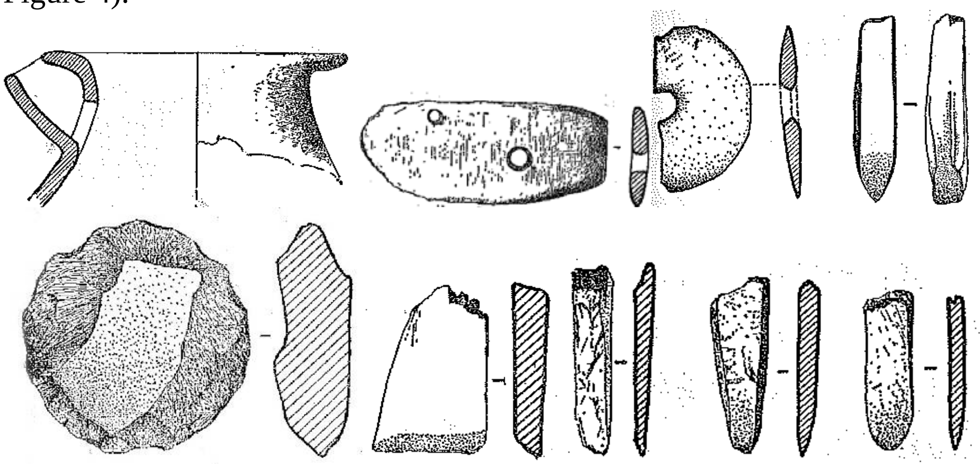


Figure 7.9: Assemblage from the Early Settlement Layers of Xichang Lizhou (Lizhou Yizhi 1080: Figure 7-8).

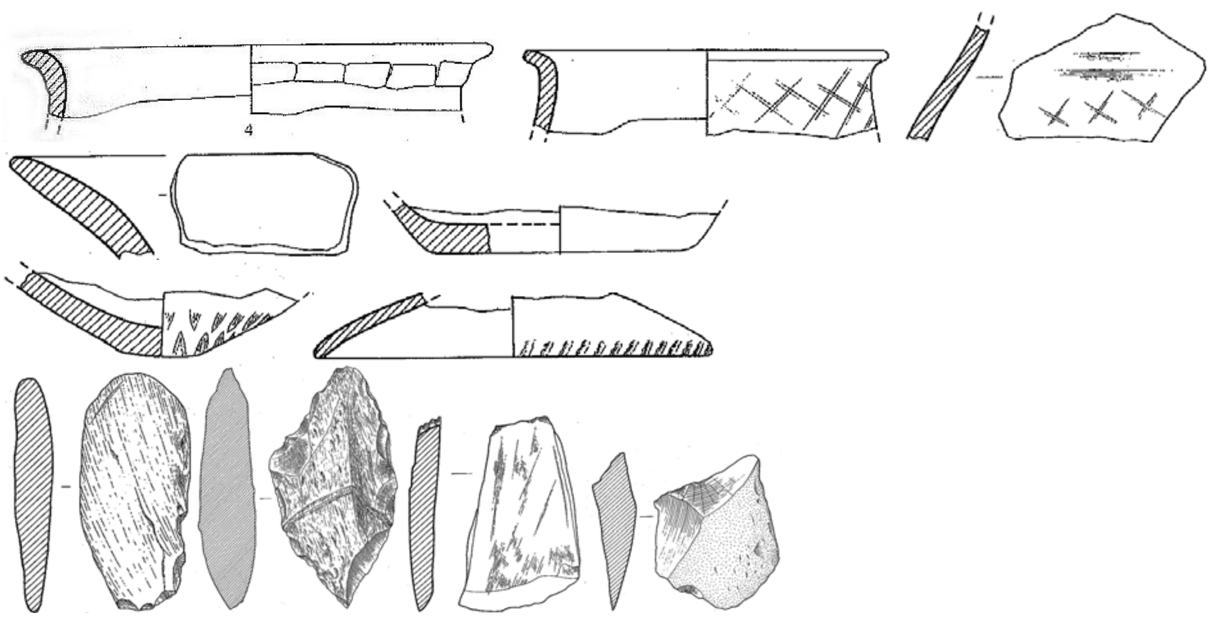


Figure 7.10: Assemblage from Dechang Wangjiaping (Chengdu, Liangshanzhou, and Dechang 2007: Figure 10.4, 5.1, 5.2, 10.6, 5.3, 11.10, 10.8, 5.8, 12, 13.4, 15.1).

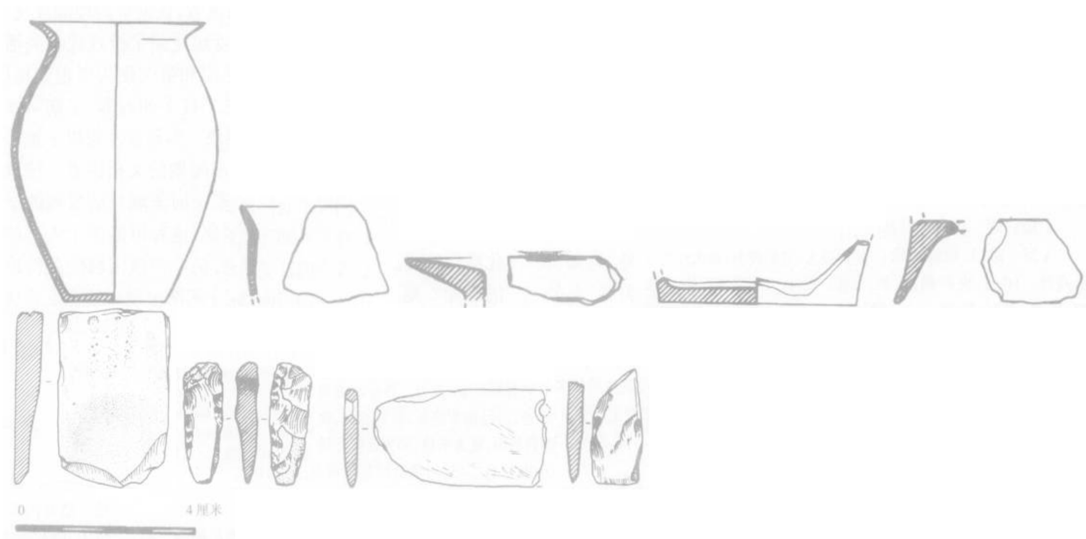


Figure 7.11: Assemblage from Dechang Maojiakan (Sichuansheng and Liangshan 2007: Figure 6-10).

Figure 7.12: Microliths from Dechang Maojiakan (Sichuansheng and Liangshan 2007: Figure 5).

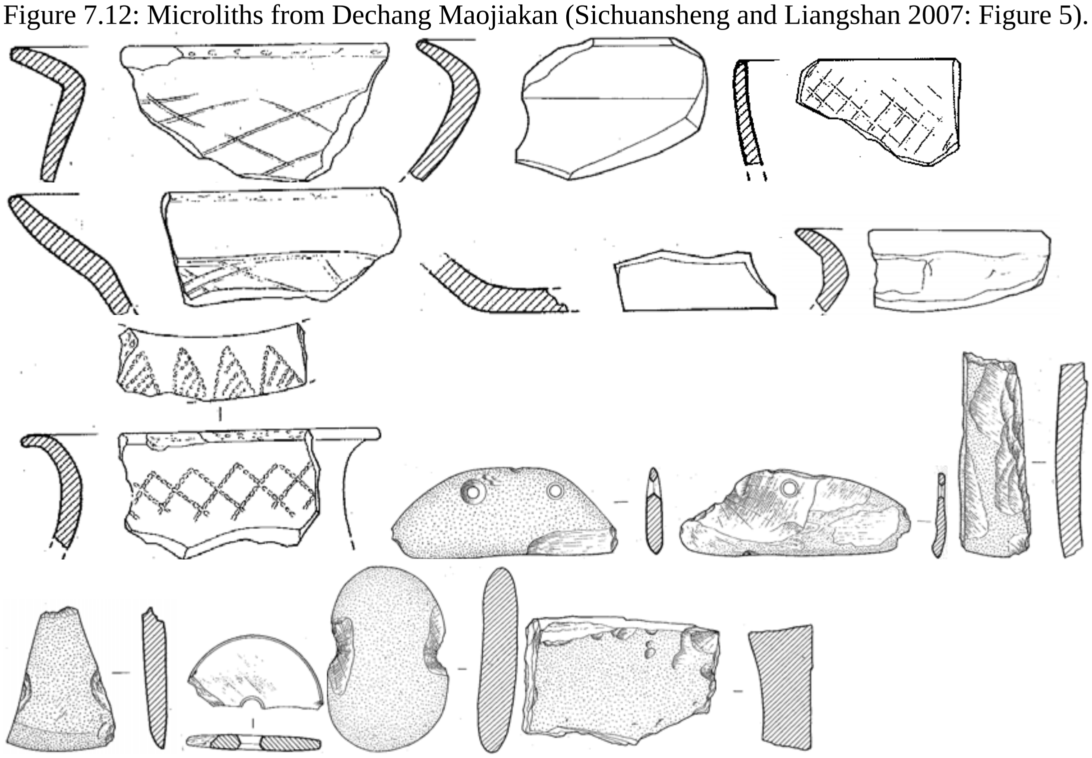


Figure 7.13: Assemblage of Dechang Dongjiapo, Early Phase (Chengdu, Liangshanzhou, and Dechangxian 2011: Figure 6-7, 13, 14, 19, 20).

Figure 7.14: Assemblage of Dechang Dongjiapo, Late Phase (Photographs by Author).

Figure 7.15: Ceramic Assemblage from Earth-Pit Graves at Xichang Lizhou, Middle Phase (Jiang Zhanghua 2007: Figure 2).

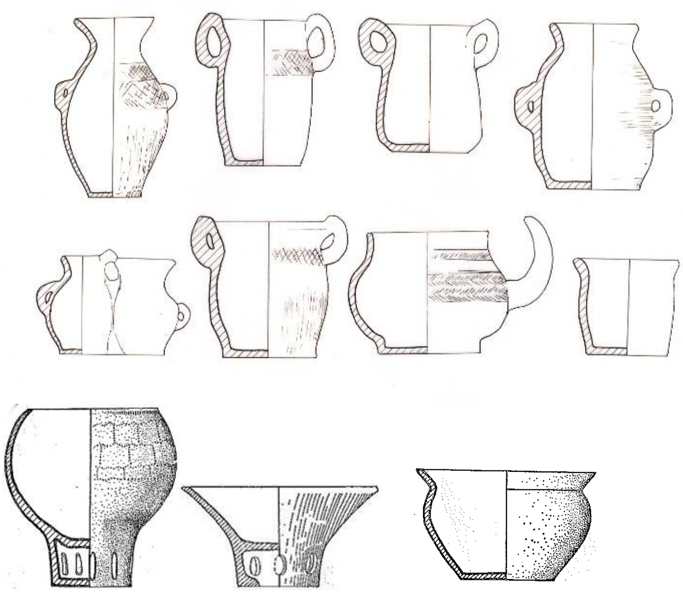


Figure 7.15: Ceramic Assemblage from Earth-Pit Graves at Xichang Lizhou, Late Phase (top two rows: Jiang Zhanghua 2007: Figure 3, bottom row: Lizhou Yizhi 1980: Figure 9.9, 9.7, 9.4).

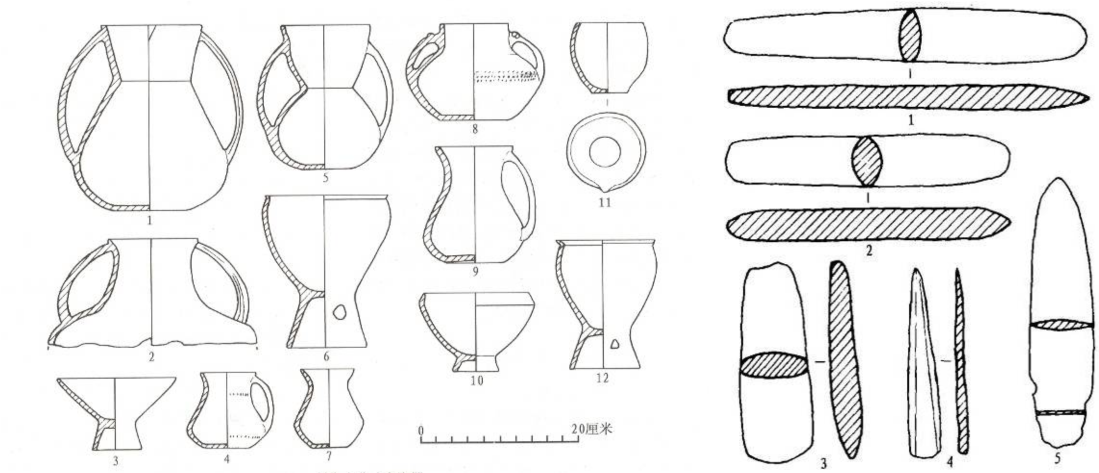


Figure 7.16: Xichang Dayangdui, Objects from Early Earth-Pit Graves: Ceramics (Left) and Stone Tools and Metal Sword (Right) (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 7-8).

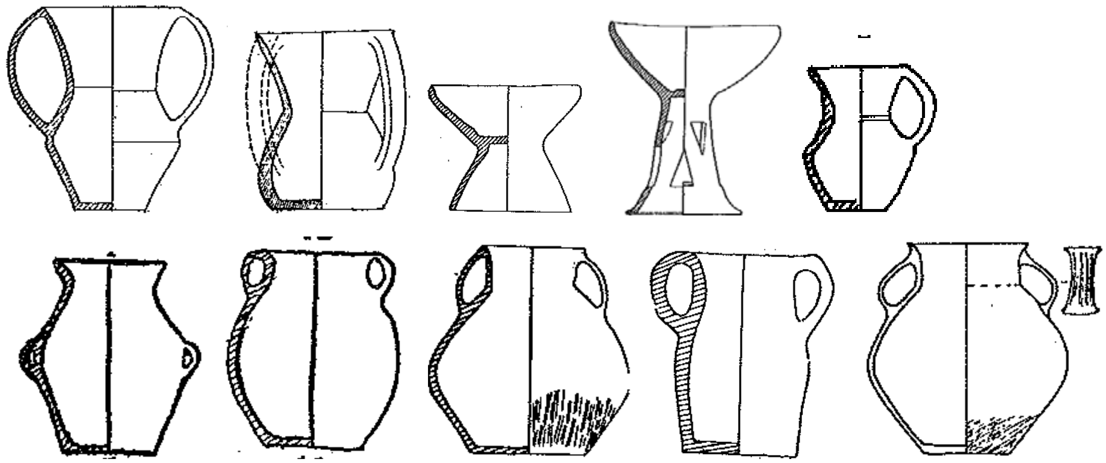


Figure 7.17: Qijia Ceramics from Gansu Yongjing Qinweijia (Zhongguo Kexueyuan 1975: Figure 16.5, 16.7, 18.5, 18.7), Yongjing Dahezhuang (Debaine-Francfort 1995: Figure 28.2), Minxian Xinlin (Debaine-Francfort 1995: Figure 19.5, 19.13), Qinghai Ledu Liuwan (Debaine-Francfort 1995: Figure 98.5 and 98.9), Ningxia Caiyuan (Debaine-Francfort 1995: Figure 116.7).

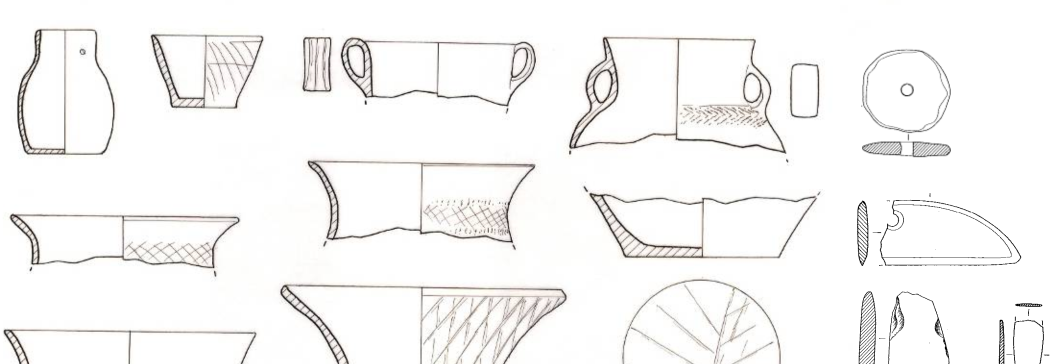


Figure 7.18: Ceramic Vessels (Jiang Zhanghua 2007: Figure 4) and tools from Xichang Mimilang (Liangshan, Chengdu, Xichangshi 2005: Figure 10.16, 11.2, 11.4, 11.9).

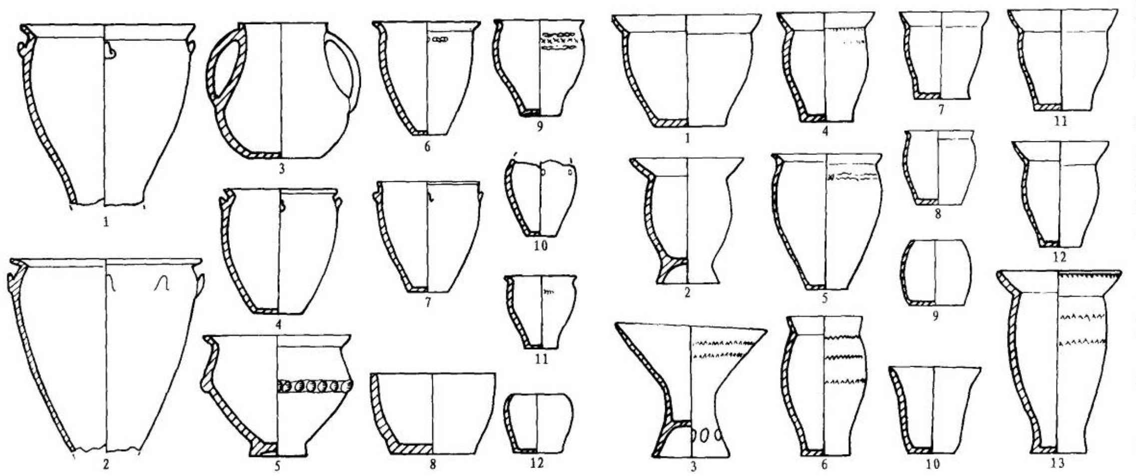


Figure 7.19: Xichang Dayangdui, Ceramics from Middle-Phase Ceramic Deposits (Left) and Late-Phase Pits and Megalithic Graves (Right, 5. from DM2, others from H1 and H2) (Xichangshi, Sichuansheng, and Liangshan 2004: Figure 18 and 25).

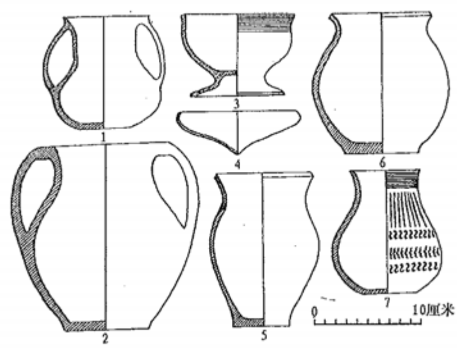


Figure 7.20: Ceramics from Wenchuan Zhaodiancun (Wenchuanxian and Shi 1999: Figure 3).

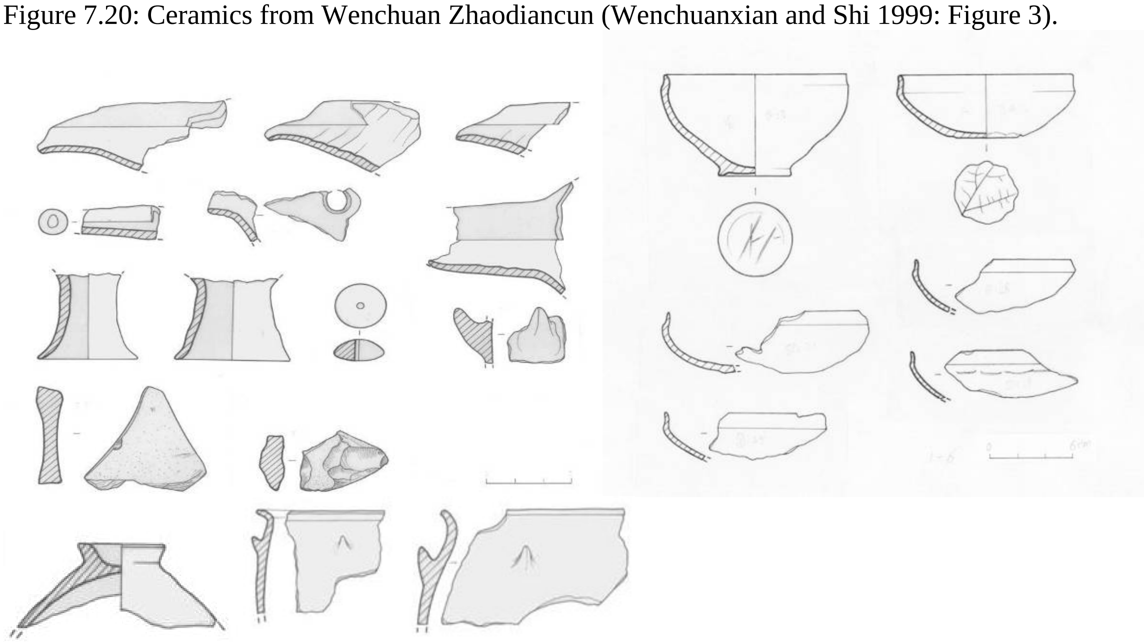


Figure 7.21: Ceramic and Stone Fragments from Mianning Gaopo (Drawings by the Author).

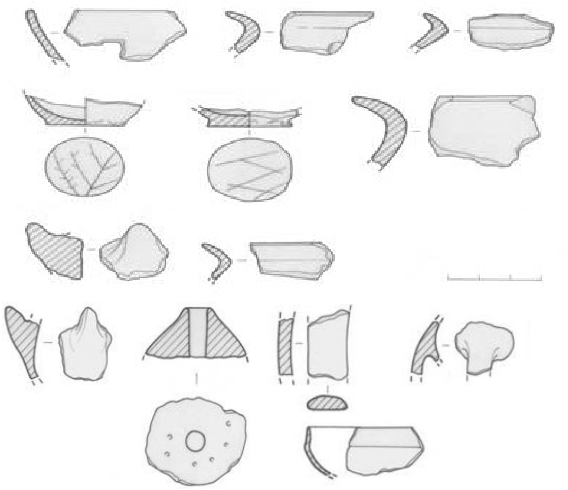


Figure 7.22: Ceramic Fragments from Mianning Zhaojiawan (Drawings by the Author).

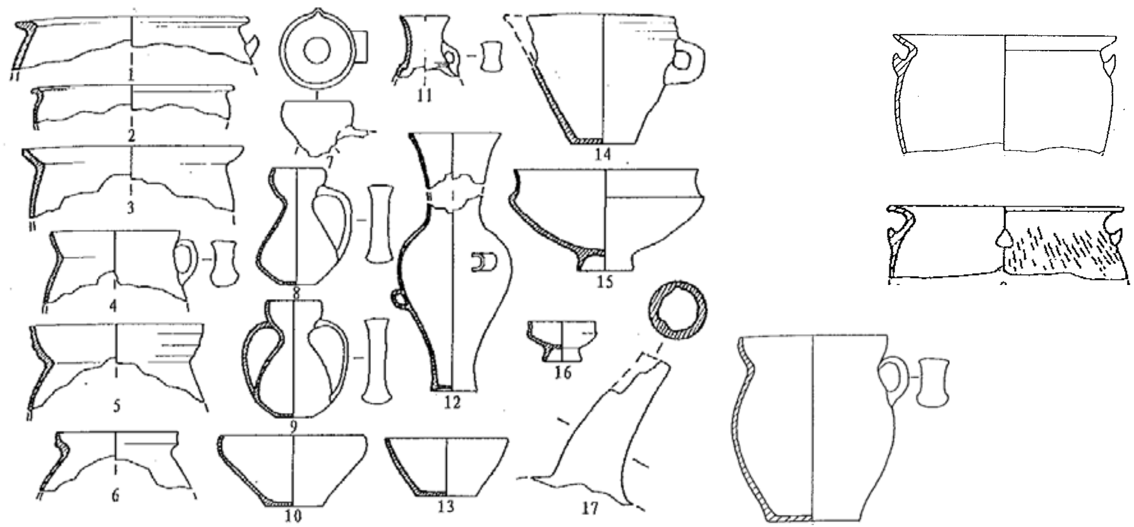


Figure 7.23: Ceramics from Ludian Yeshishan (Liu and Sun 2009: Figure 2, Yunnansheng, Zhaotongshi, and Ludianxian 2009: Figure 9.1, 9.8, 8.1).

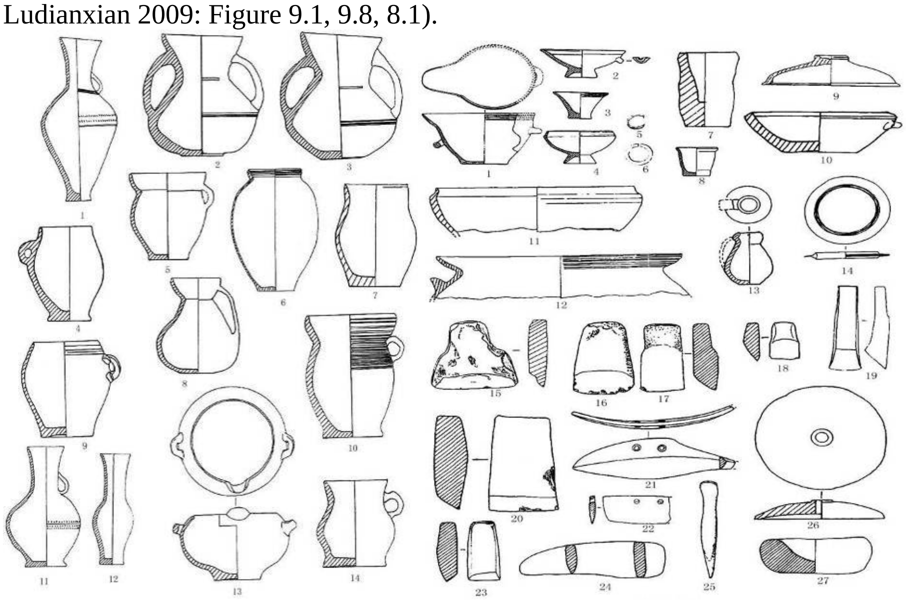


Figure 7.24: Ceramics and Stone Tools from Jigongshan (Zhou Zhiqing 2009: Figure 31-32).

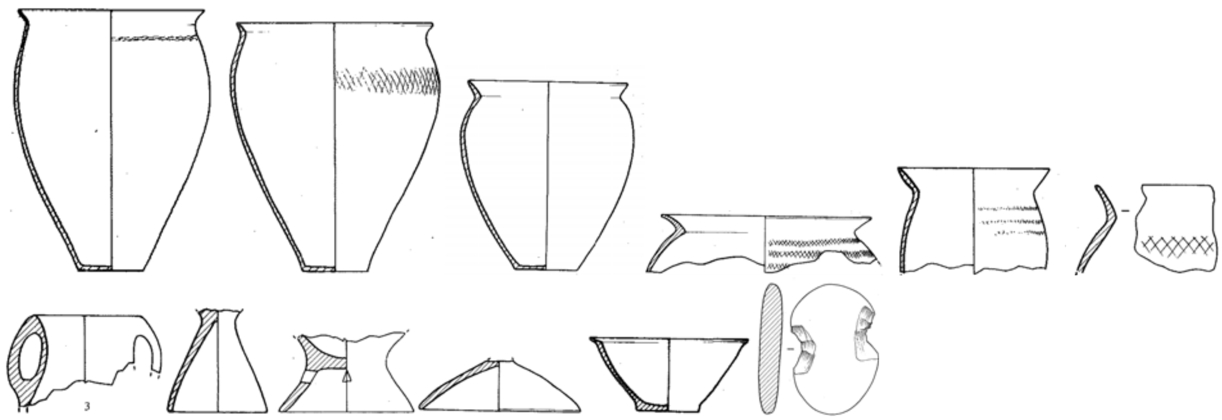


Figure 7.25: Objects from Upper Yingpanshan Ceramic Deposits (Chengdu, Liangshan, and Xichangshi 2005: Figure 11.2, 8.2, 7.2, 18.2, 12.3, 16.2, 11.3, 10.3, 16.3, 18.3, 18.4, 17.3).

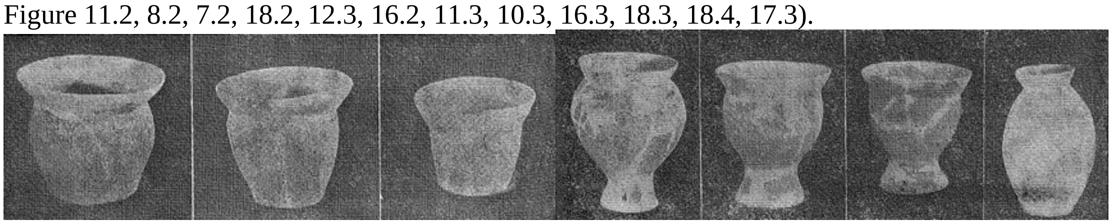


Figure 7.26: Ceramics from Xichang Tianwangshan M10 (Liangshan Yizu 1984: Figure 4).

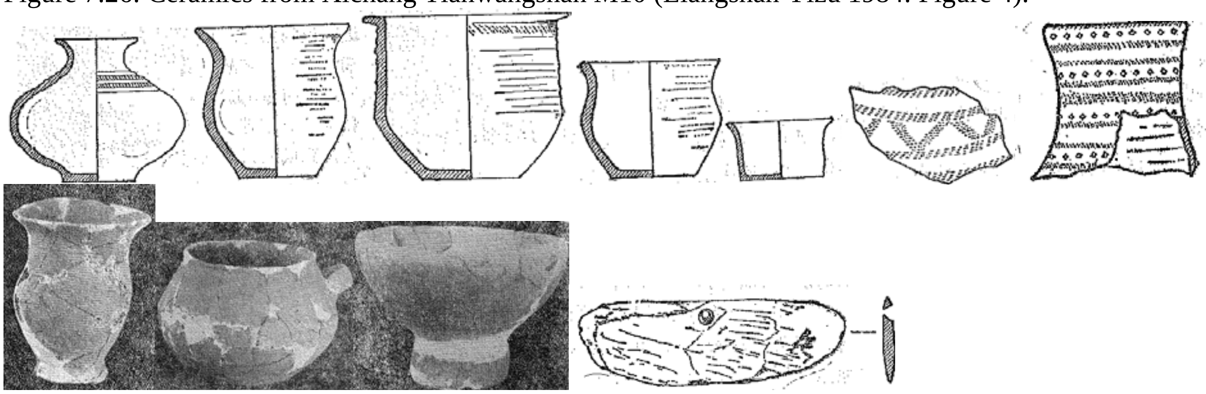


Figure 7.27: Ceramic and Stone Tools from Xichang Yangjiashan (Liu Shixu 1981: Figure 1.5-10, 1.13-14, 2, 6, 5, 1.4).

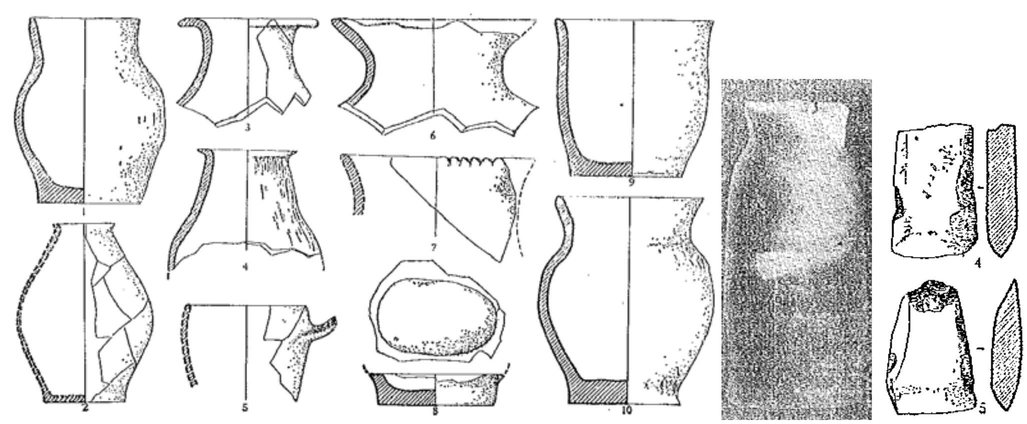


Figure 7.28: Ceramics and Stone Tools from Puge Wadaluo (Liangshan and Pugexian 1983: Figure 3, 4.2, and 2.4-5).

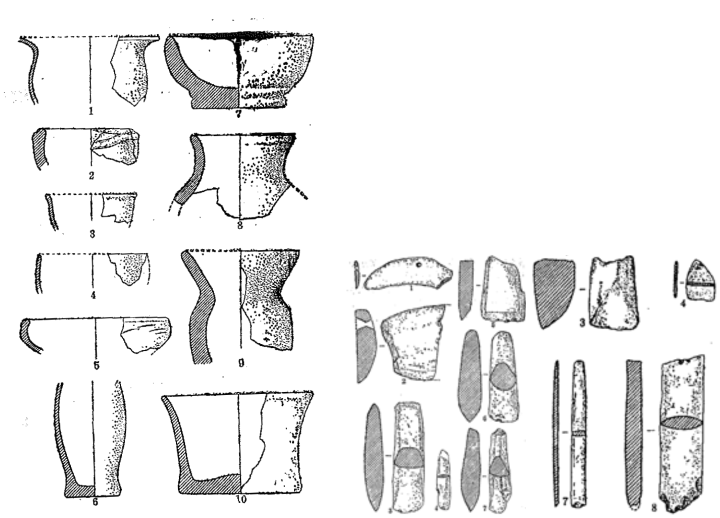


Figure 7.29: Ceramics and Stone Tools from Settlement Sites at Puge Xiaoxingchang, Zhongcun, and Tianba (Liangshan and Pugexian 1982: Figure 4, 5, 6.3-4, and 6.7-8).

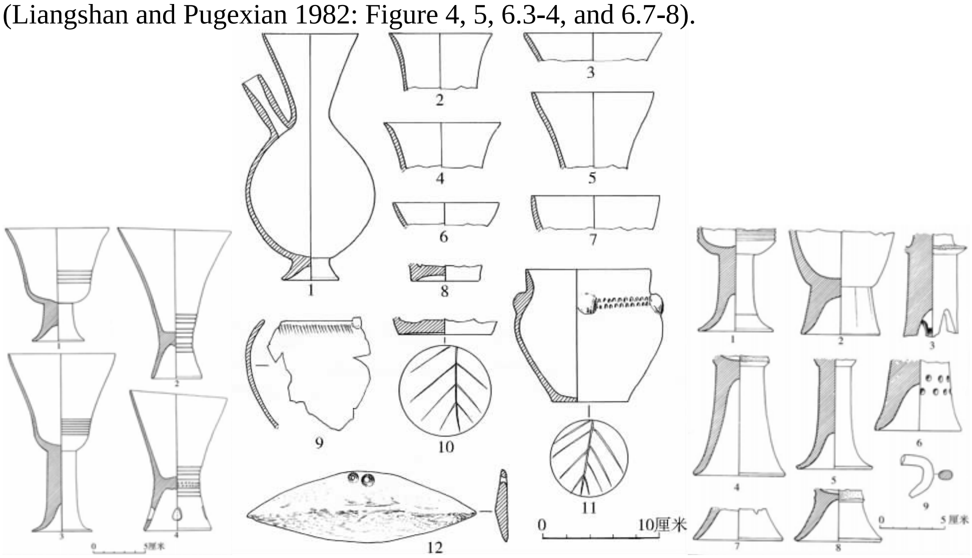


Figure 7.30: Assemblage of Qimugou M1 (Chengdu, Liangshanzhou, and Xichang 2009: Figure 5-7).

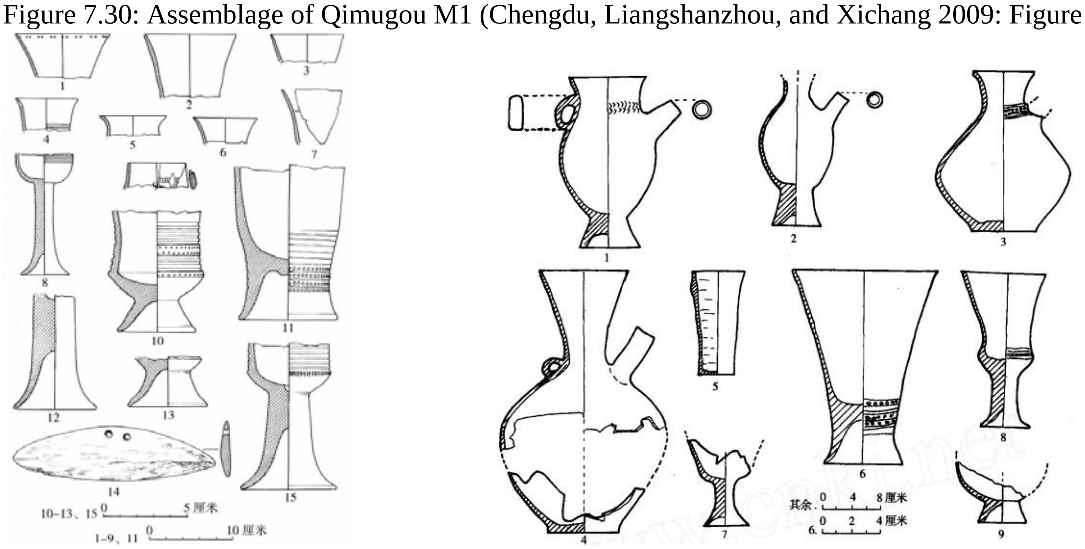


Figure 7.31: Assemblage of Qimugou M2 (Left, Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 9) and Maliucun H1 (Right: Sichuansheng, Liangshan, and Xichangshi 2006c: Figure 2).

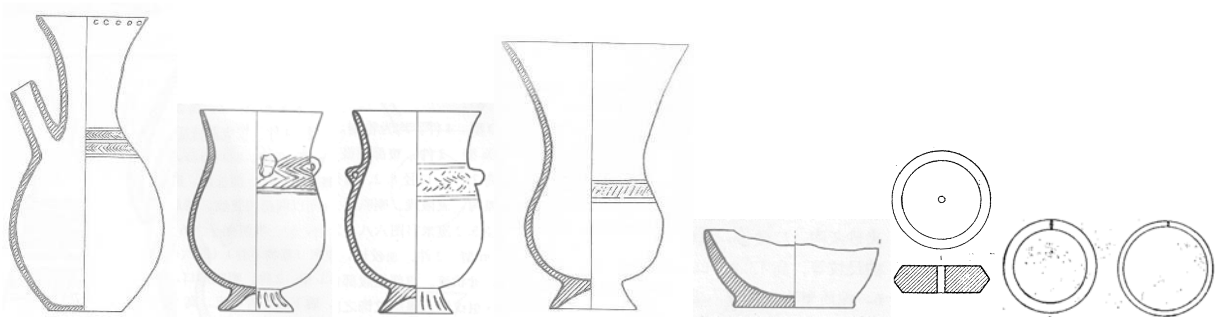


Figure 7.32: Assemblage of Bahe Baozi M4 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 67.5, 66.3, 66.5, 66.1, 65.8, 71.13, 78.4).

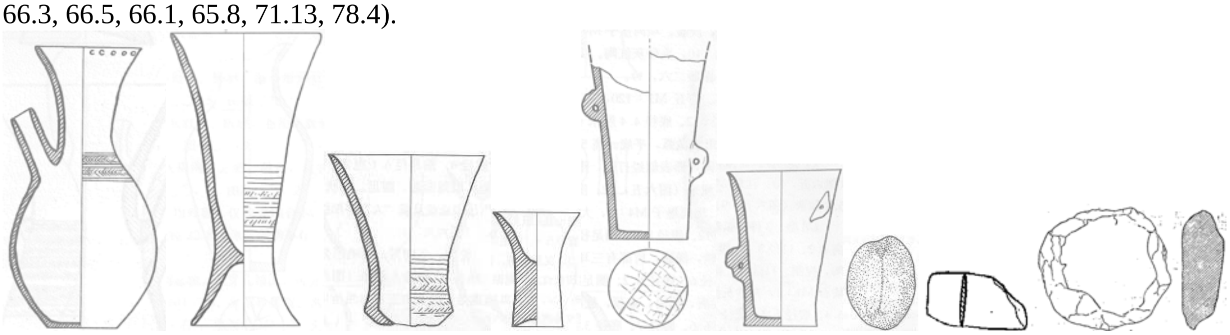


Figure 7.33: Assemblage of Bahe Baozi M6 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 67.6, 69.2, 66.6, 66.8, 66.9, 65.6, 65.7, 93.10, 93.17).

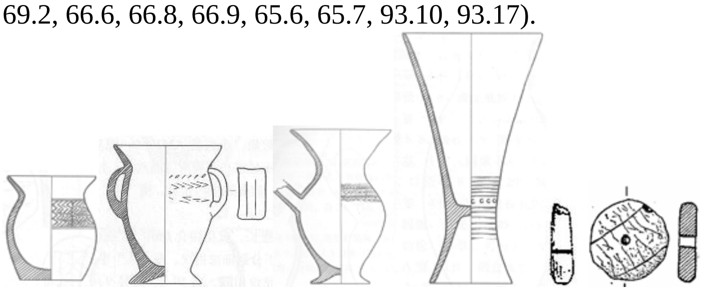


Figure 7.34: Objects from Xichang Lianghuan ((Sichuansheng, Liangshan, and Xichangshi 2006: Figure 63.4, 66.4, 68.2), and Yanjiashan M3 (ibid.: 69.1, 93.3, 71.10).

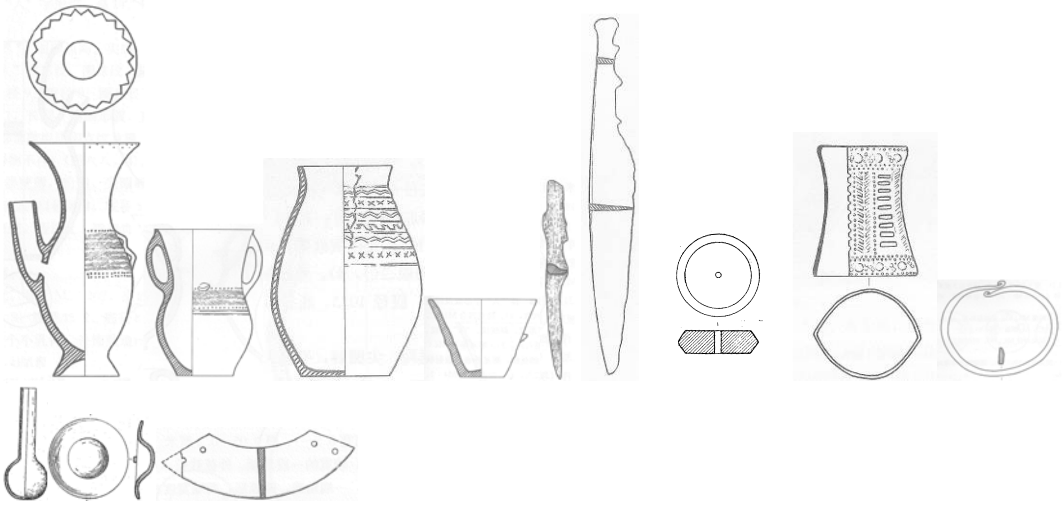


Figure 7. 35: Assemblage of Lake Sihe M6 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 69.3, 68.4, 59.4, 69.3, 65.4, 91.22, 91.29, 90.10, 88.14, 85.4, 83.6, 71.6).

Figure 7.36: Assemblage of Lake Sihe M1 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 66.2, 70.8, 89.10).

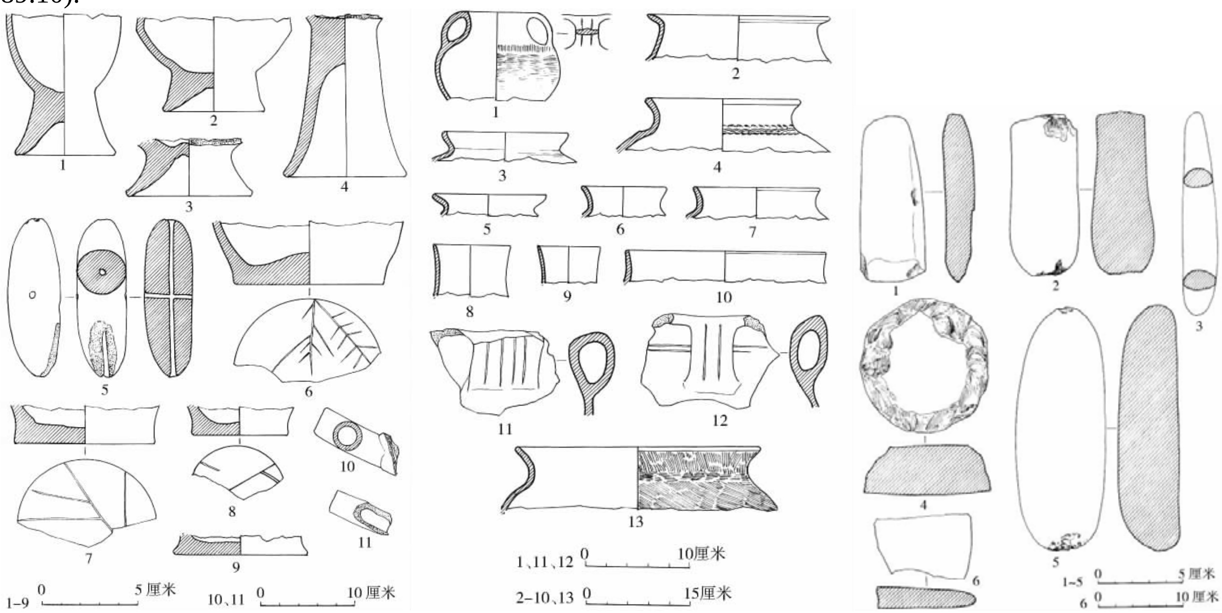


Figure 7.37: Ceramics and Stone Tools from Qimugou Layer 3 (Upper Qimugou) (Chengdu, Liangshanzhou, and Xichangshi 2009: Figure 13-15).

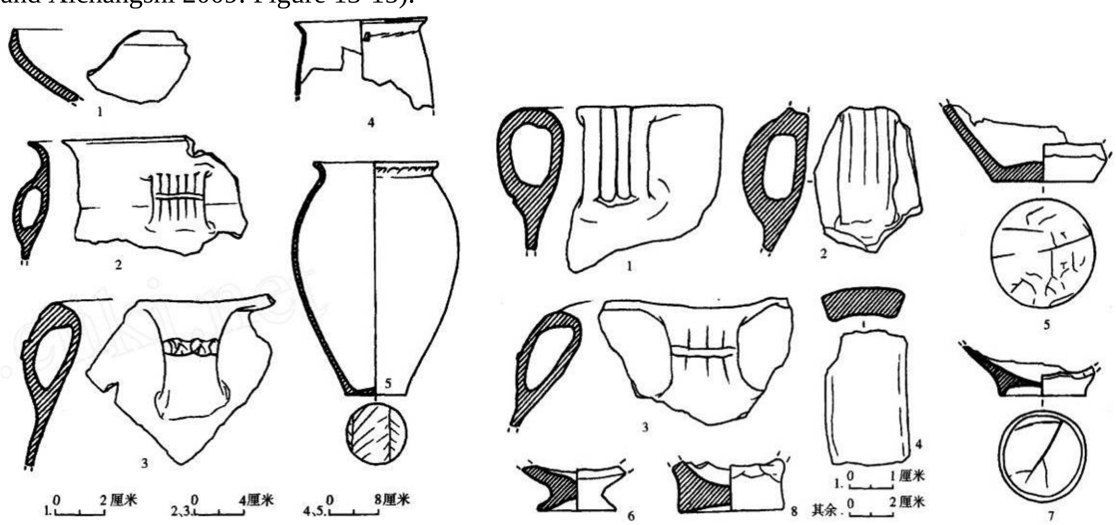


Figure 7.38: Ceramics and Stone Tools from Qimugou Layer 3 (Chengdu, Liangshanzhou, and Xichangshi 2006b: Figure 6-7).

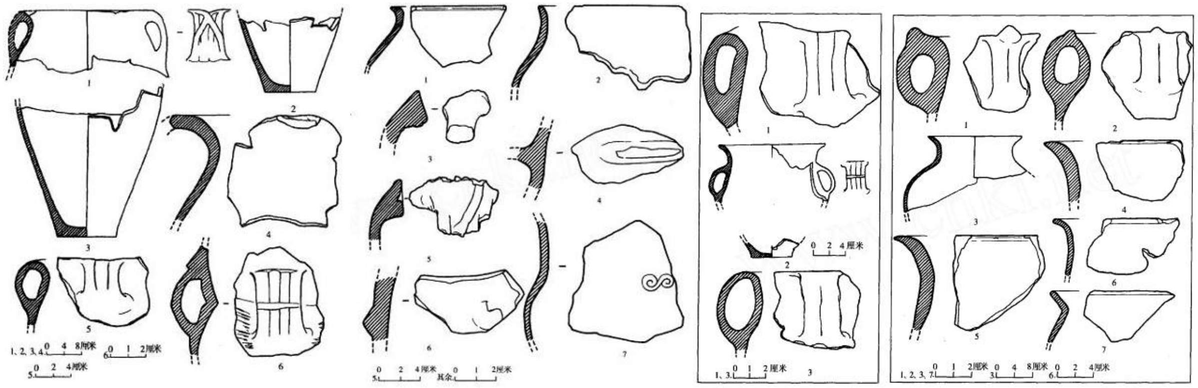


Figure 7.39: Ceramics from Dechang Wangjiatian H1 (Middle 7), H2 (Left 1-3; Right, First Box 2, Second Box 3), Layer 3 (Left 4-6; Middle 1-6; Right, First Box 1 and 3, Second Box 1-2, and 4-7) (Sichuansheng and Liangshan 2006: Figure 6, 9, 7-8).

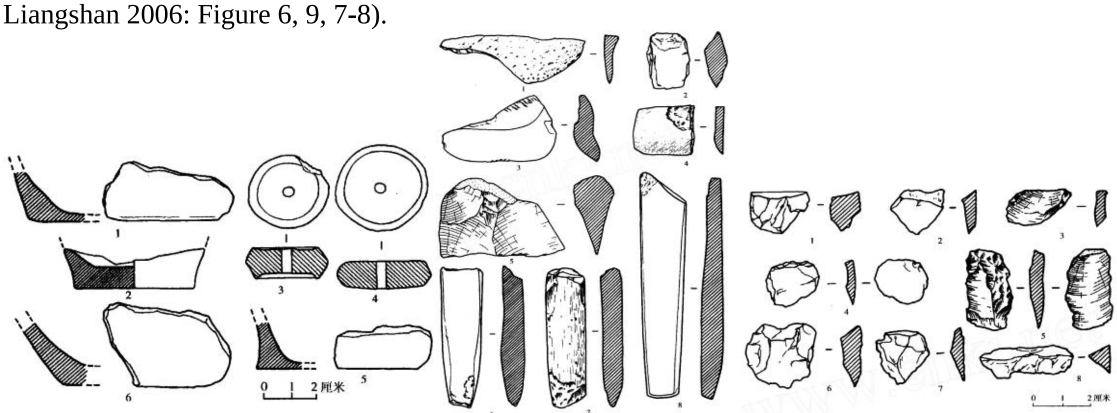


Figure 7.40: Ceramics and Stone Tools from Dechang Wangjiatian H2 (Left 2), H3 (Middle 4), and Layer 3 (Left 1 and 3-5; Middle 1-3, 5-8; Right 1-8) (Sichuansheng and Liangshan 2006: Figure 11-13).

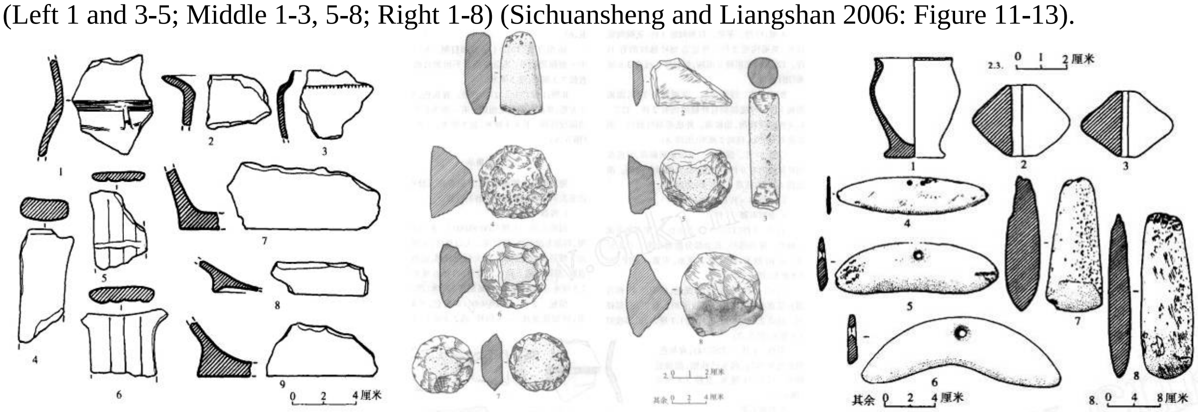


Figure 7.41: Ceramics and Stone Tools from Sanfentun Layer 5 and 6 (Left and Middle) and Surface Finds (Right) (Liangshan and Mianningxian 2006: Figure 4-6).

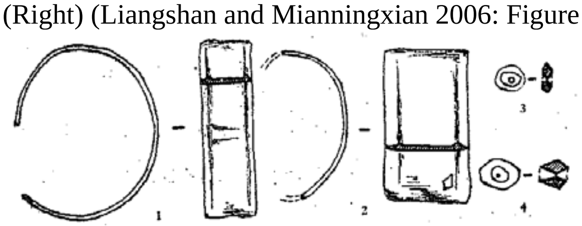


Figure 7.42: Personal Ornaments from Miyi Wanqiu M1 (Liangshan Yizu 1981: Figure 8).

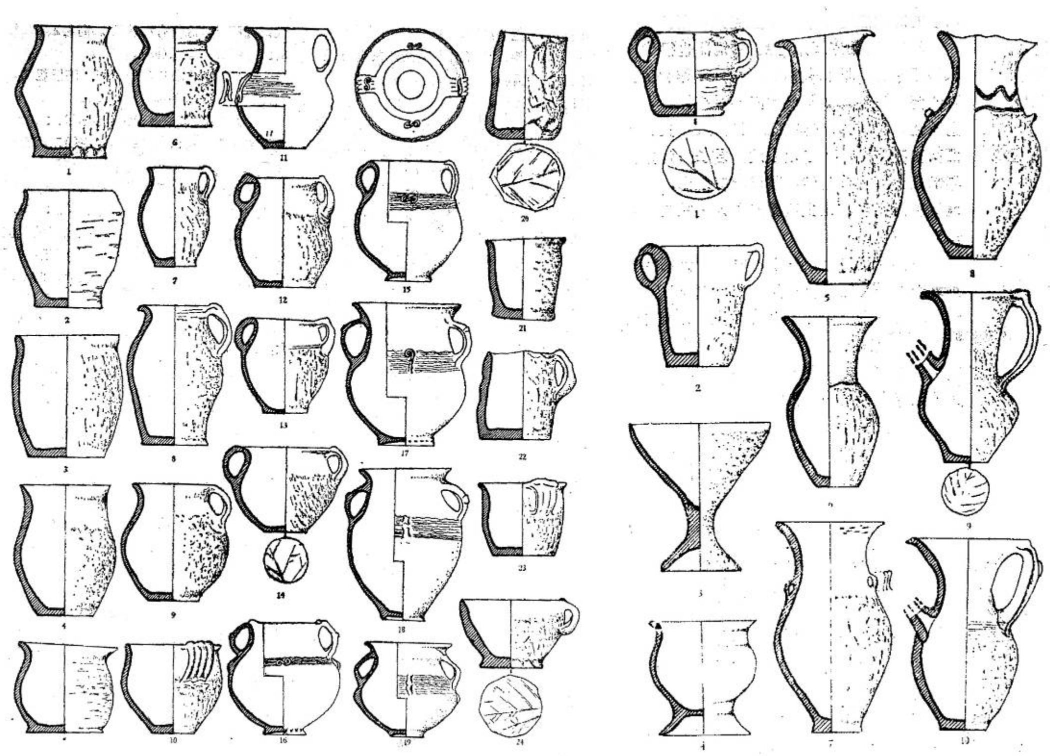


Figure 7.43: Ceramics from Miyi Wanqiu M1 (Left 3, 5-10, 12, 20-23, Right 5, 8-10) and M2 (Left 1-2, 4, 11, 13-19, 24; Right 1-4, 6) (Liangshan Yizu 1981: Figure 6-7).

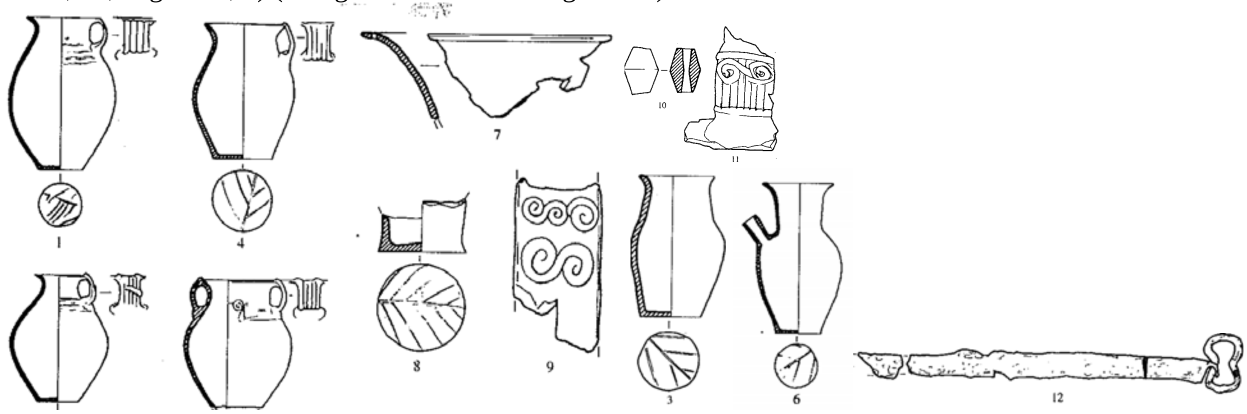


Figure 7. 44: Objects from Dechang Arong M3 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 15).

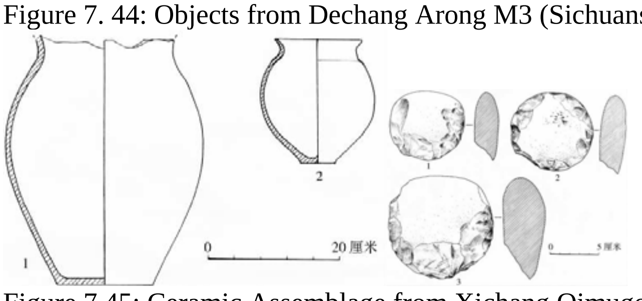


Figure 7.45: Ceramic Assemblage from Xichang Qimugou W1 (Left) and Stone Tools from M3 (Right) (Chengdu, Liangshan, and Xichangshi 2009: Figure 19 and 17).

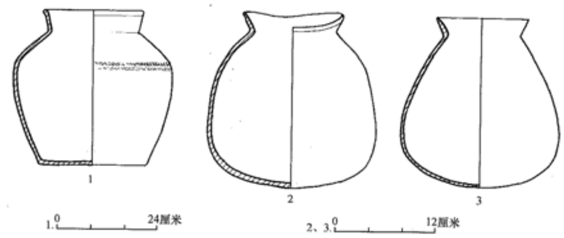


Figure 7.46: Assemblage of Xichang Ma'anshan M1 (Chengdu, Liangshan, and Xichangshi 2005: Figure 6).

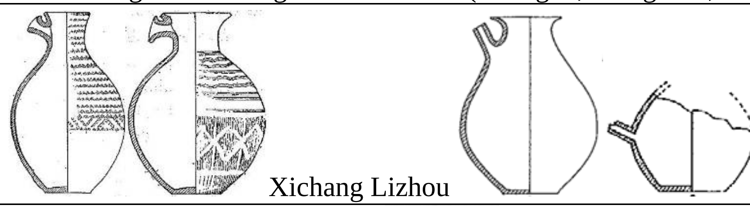
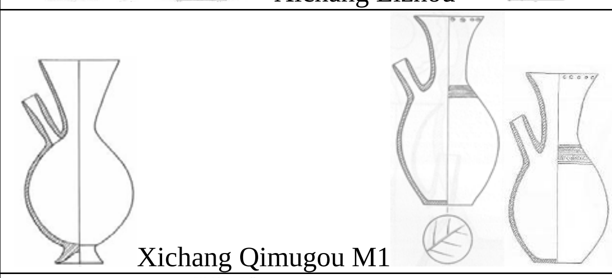
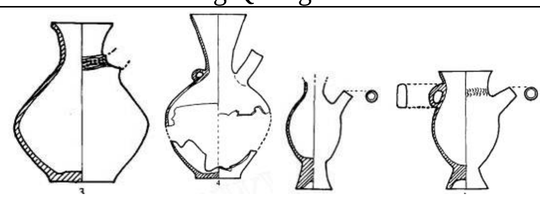
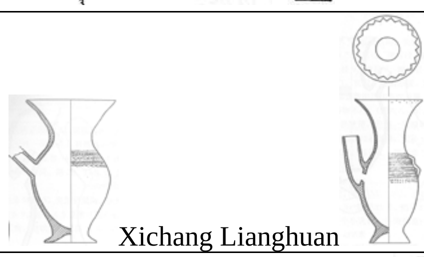
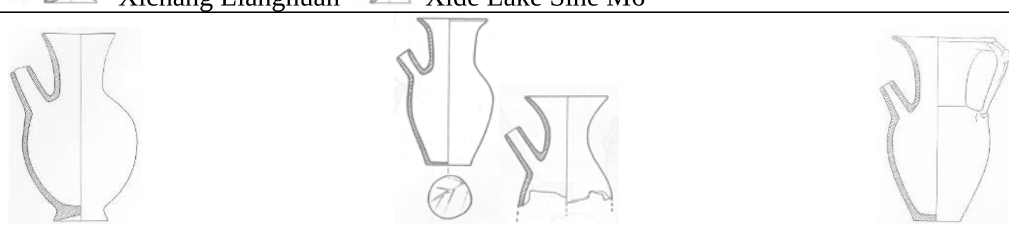
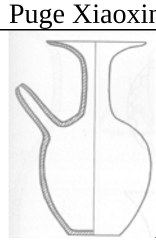
I	 Xichang Lizhou; Huili Fenjiwan
IIa	 Xichang Qimugou M1; Xichang Bahe Baozi
IIb	 Xichang Maliucun
III	 Xichang Lianghuan; Xide Lake Sihe M6
IV	 Puge Xiaoxingchang M1; Dechang Arong M1; Miyi Wanqiu M1
V	 Xichang Xijiao M1

Figure 7.47: Evolvement of Spouted Jar Forms (Lizhou Yizhi 1980a: Figure 10.11-12, Huilixian, Liangshan, and Sichuansheng 2004: Figure 12.2, 12.5

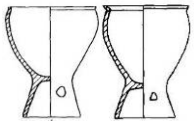
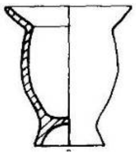
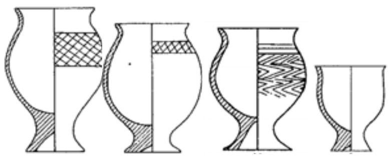
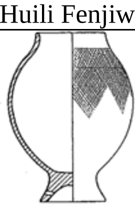
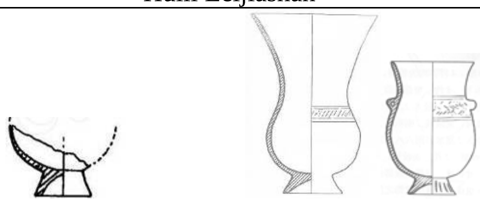
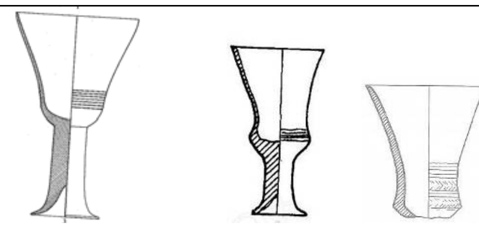
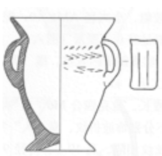
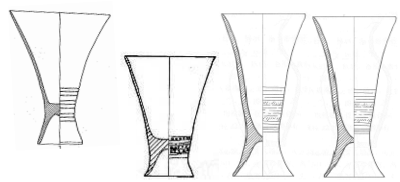
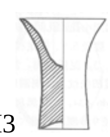
Ia	 Xichang Dayangdui (middle)	
Ib	  Xichang Dayangdui (late) Tianwangshan M10	
IIa	 Huili Fenjiwan	
IIb	 Huili Leijiashan	
IIIa	 Xichang Maliucun Bahe Baozi M4	 Xichang Qimugou Maliucun Bahe Baozi M6
IIIb	 Xichang Lianghui	 Xichang Qimugou M1, Maojiakan, Bahe Baozi M6, Yanjiashan M3
IV	 Xide Lake Sihe M1	
V		 Xichang Hexi M3  Bahe Baozi M3

Figure 7.48: Evolvement of Goblet and Small Footed Cup Forms.

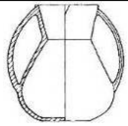
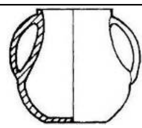
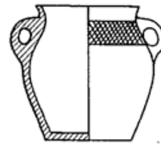
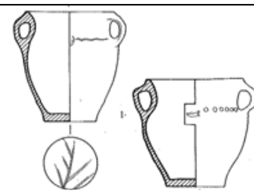
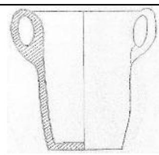
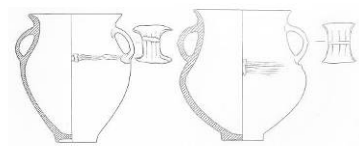
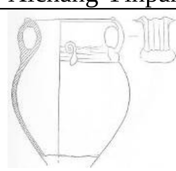
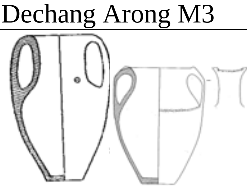
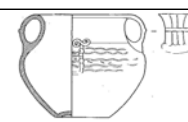
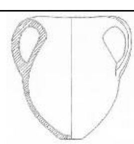
I	 Xichang Dayangdui M2			
IIa	 Dayangdui Ka13	 Xichang Lizhou BM2	 Huili Fenjiwan	
IIb			 Huili Guojiabao	
IIIa	 Xide Lake Sihe M6	 Miyi Wanqiu  Xichang Yinpanshan W6	 Miyi Wanqiu	
IIIb		 Dechang Arong M3		
IVa		 Ninglang Daxingzhen M5, Yanyuan		 Yanyuan Laolongtou M6
IVb		 Yanyuan , Yongsheng Duizi M91		
V	 Xichang Xijiao M1			

Figure 7.49: Evolvement of Double-Handled Forms.

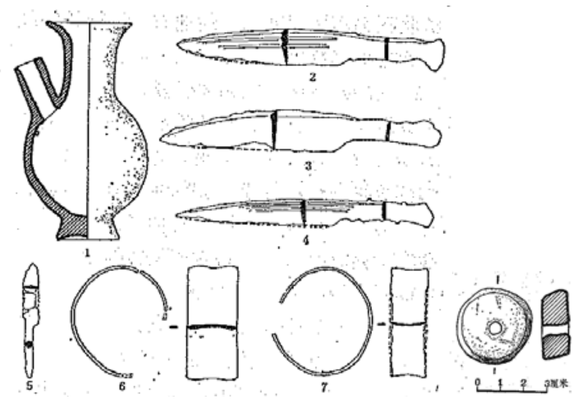


Figure 7.50: Assemblage from Puge Xiaoxingchang AM1 (Liangshan and Pugexian 1987: Figure 8-9).

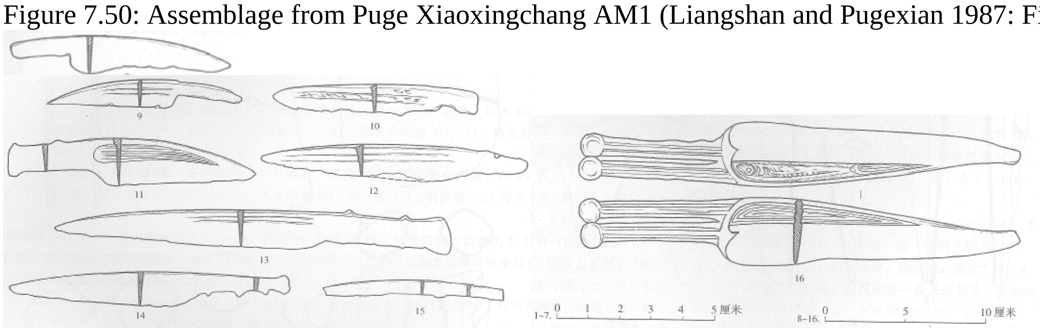


Figure 7.51: Bronze Knives from Xide Lake Sihe M8, Xichang Bahe Baozi M1, Guoyuan M2, Lake Sihe M7, Xiaoxingchang AM2, AM1, Lake Sihe M6, M8, Hexi M2 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 88.8-16).

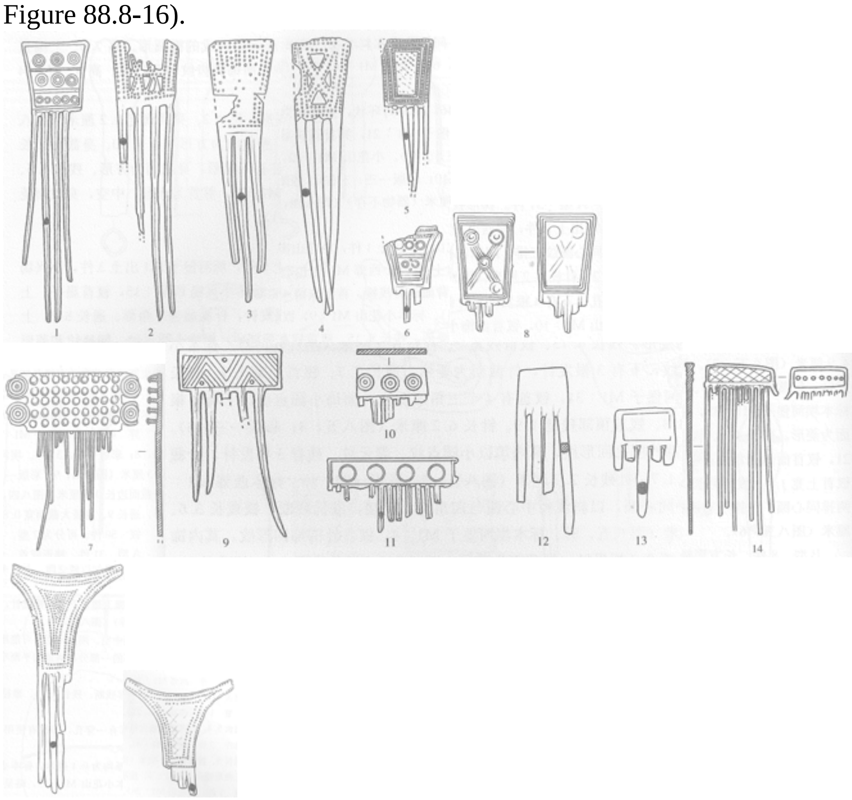


Figure 7.53: Different Types of Hair Combs Found in Megalithic Graves: Type I (Puge Xiaoxingchang BM4, Xichang Xiaohuashan M1 (2-3), Bahe Baozi M1 (4-6), Xijiao M1), Type II (Xide Guluqiao M1, Puge Xiaoxingchang BM4, BM2, BM4, Xijiao M1, Beishan M1, Xiaoxingchang BM2), Type III (Xichang Xijiao M1, Beishan M1) (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 84.5).

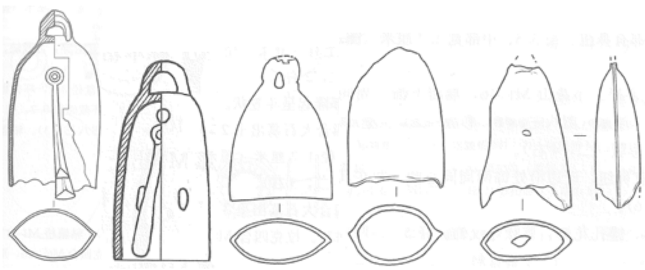


Figure 7.54: *Ling* bells from Xichang Hexi M2, Xide Lake Sihe M8, Xichang Bahe Baozi M1, Xide Guluqiao M1, Xichang Beishan M1, Xijiao M1 (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 82.1, 7-10).

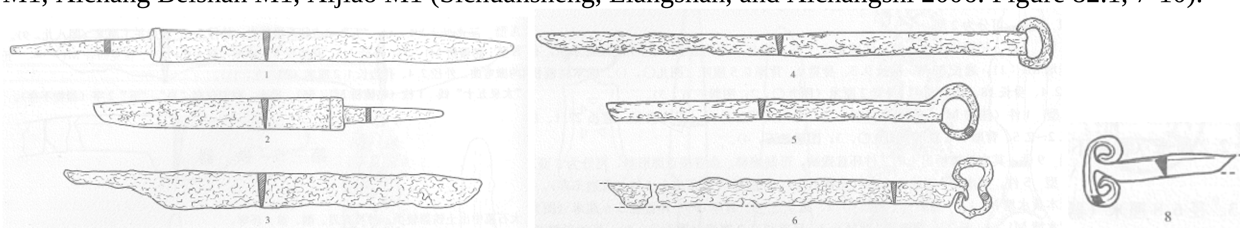


Figure 7.55: Iron Weapons from Xichang Wanao M1 (1 and 3), Guluqiao M1 (2), Huangshuitang M1 (4-5), Xiaohuashan M1 (8), Dechang Arong M3 (6) (Sichuansheng, Liangshan, and Xichangshi 2006: Figure 90.1-6 and 8).

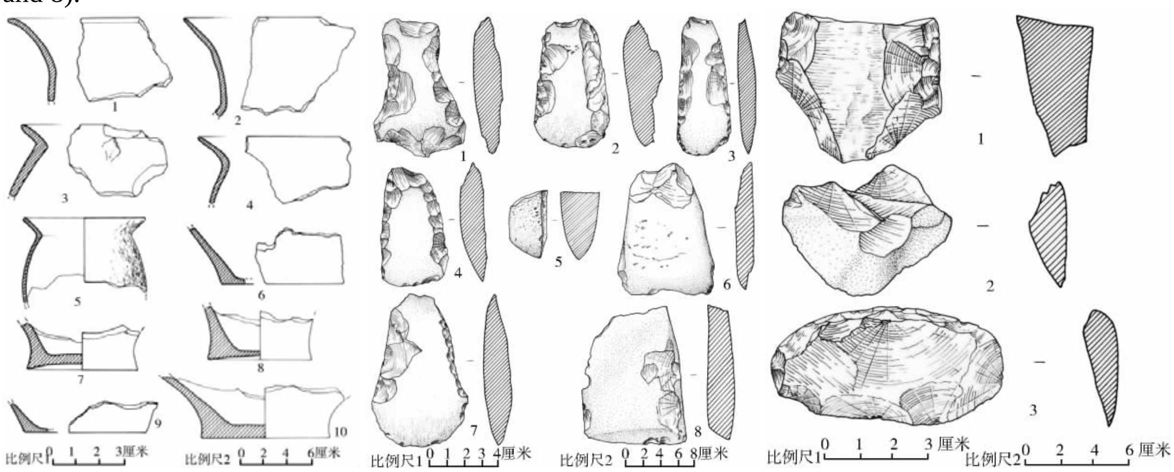


Figure 7.56: Ceramics and Stone Tools from Huili Houzidong (Sichuansheng, Liangshan, and Huilixian 2009: Figure 3-5).

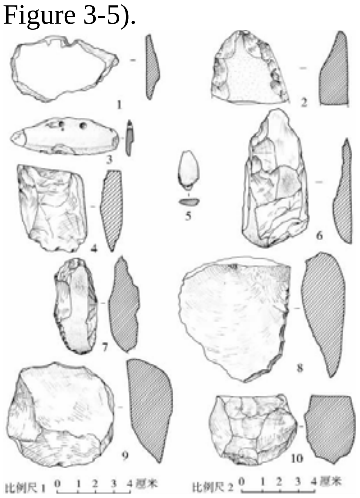


Figure 7.57: Stone Tools from Huili Guantianshan (1, 3, 6, 7), Yingpanshan (2, 4, 5), and Washitian (8, 9, 10 (Sichuansheng, Liangshan, and Huilixian 2009: Figure 2).

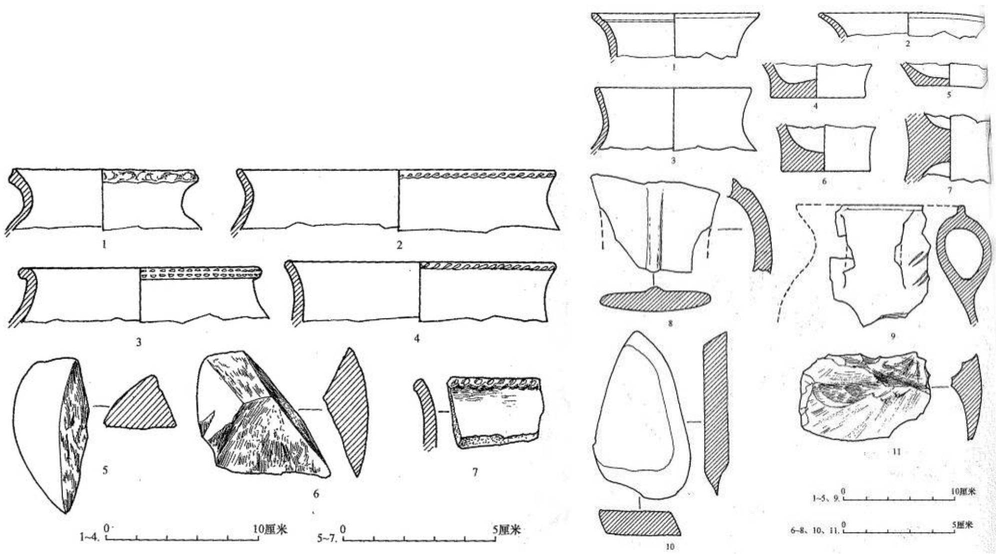


Figure 7.58: Ceramics and Stone Tools from Huili Dongzui H1 and H2 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 5 and 7).

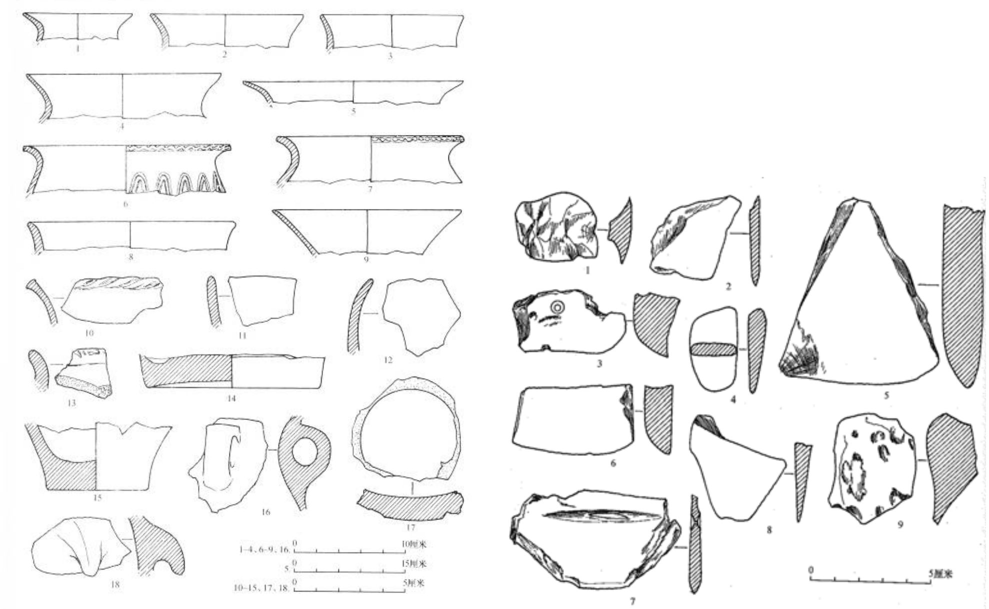


Figure 7.59: Ceramics and Stone Tools from Huili Dongzui Layer 5 (Chengdu, Liangshanzhou, and Huilixian 2008: Figure 13-14).

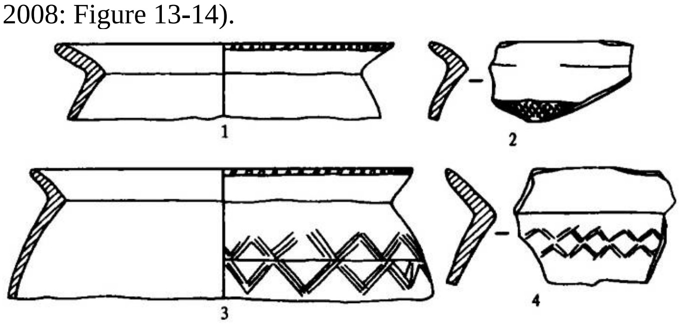


Figure 7.60: Ceramics from Yongren Chayuanzi (Yunnansheng Wenwu et al. 2003: Figure 17).

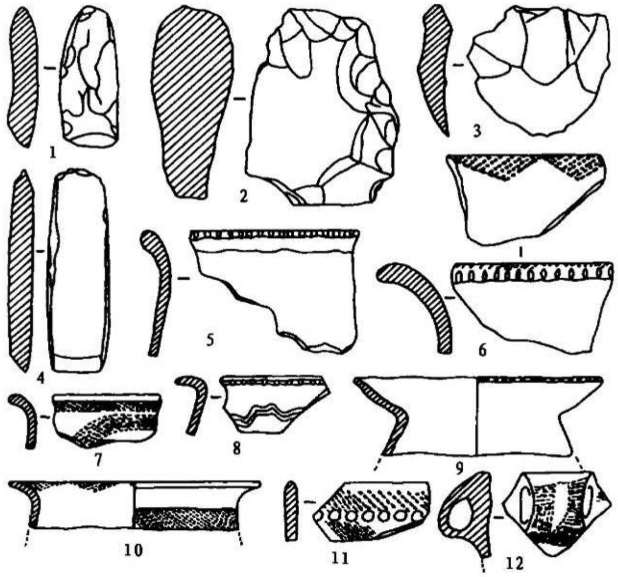


Figure 7.61: Ceramics and Stone Tools from Yongren Mopandi (Yunnansheng Wenwu et al. 2003: Figure 30).

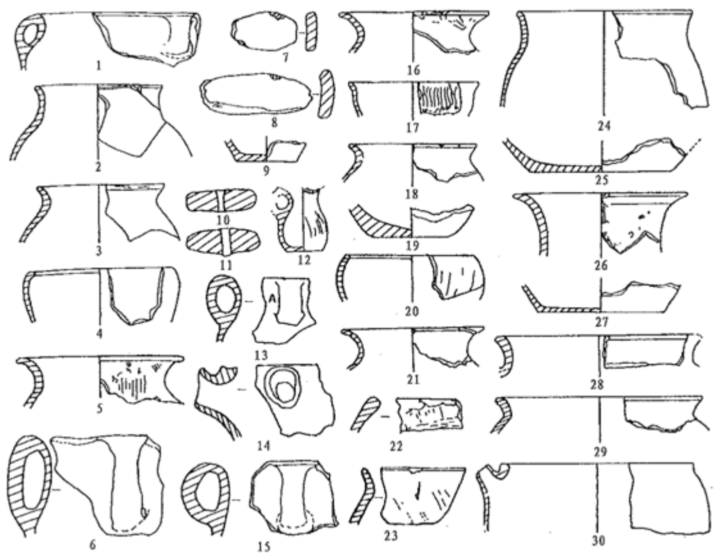


Figure 7. 62: Ceramics from Phase III at Haimenkou Dating to 3100-2500 BP (Yunnansheng, Dalizhou, and Jianchuanxian 2009: Figure 18).

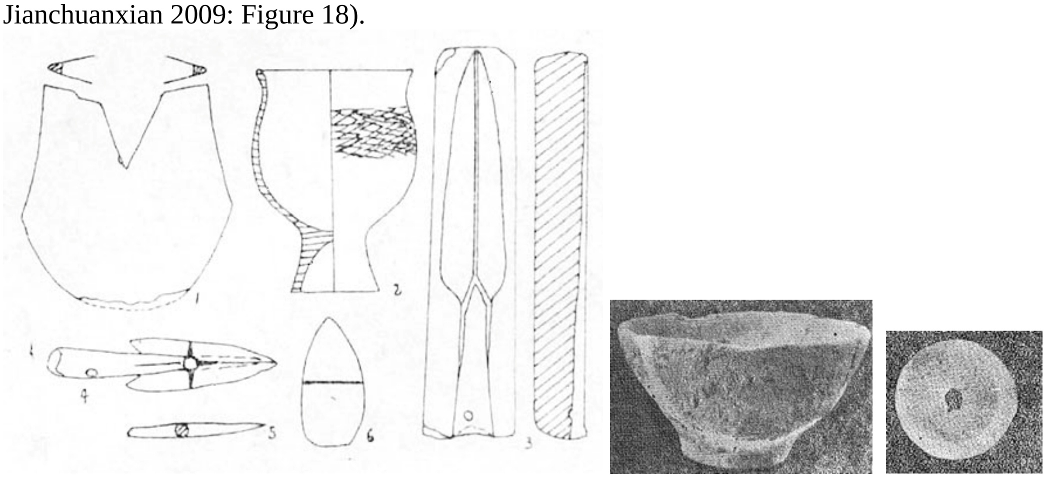


Figure 7.63: Finds from Huili Washitian (Tang Xiang 1992: Figure 5; Tao and Zhaodian 1981: Figure 1 and 3)

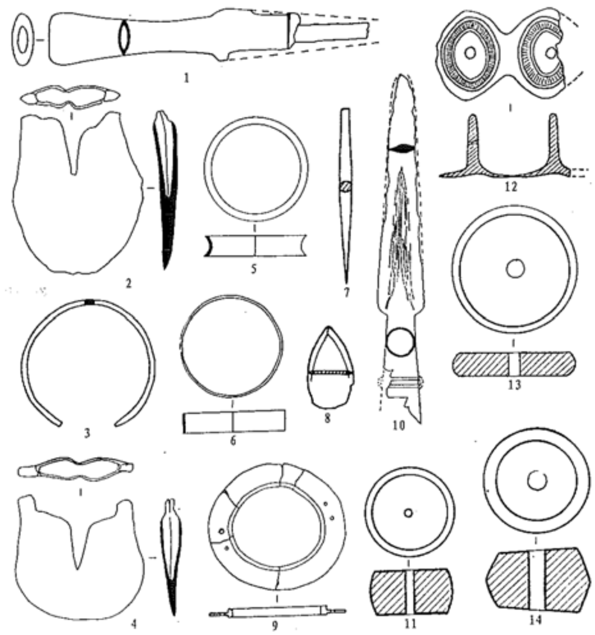


Figure 7.64: Metal and Stone Objects from Graves at Huili Fenjiwan (Huilixian, Liangshan, and Sichuansheng 2004: Figure 13).

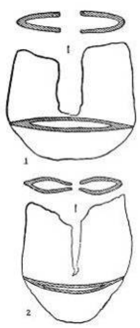


Figure 7.65: Bronze *Yue* Axes from Xiangyun Dabona (Li Chaozhen 1983: Figure 5).

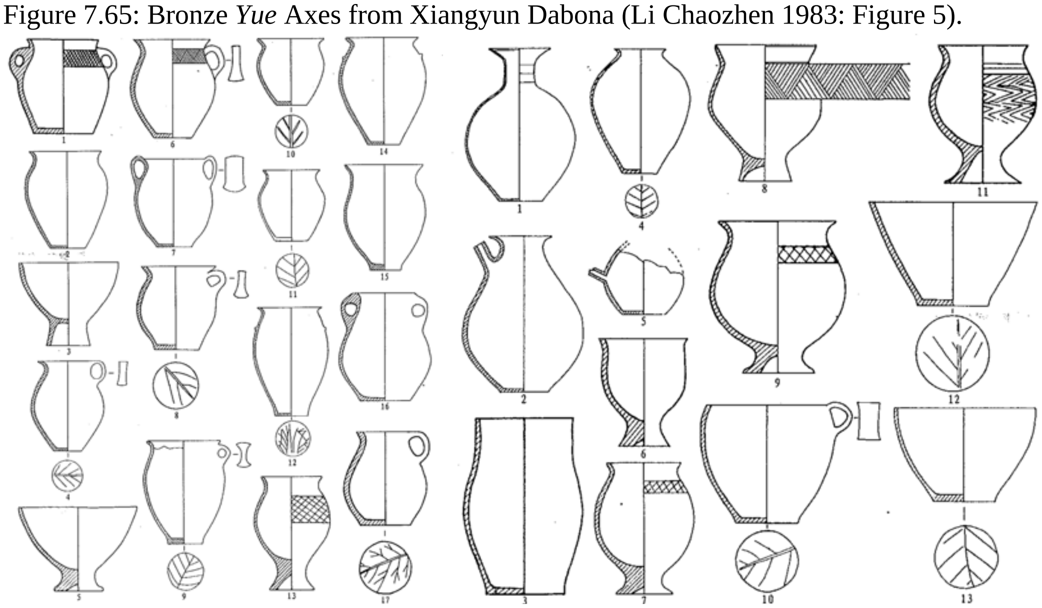


Figure 7.66: Ceramic Assemblage from the Graves of Huili Fenjiwan (Huilixian, Liangshan, and Sichuansheng 2004: Figure 11-12).

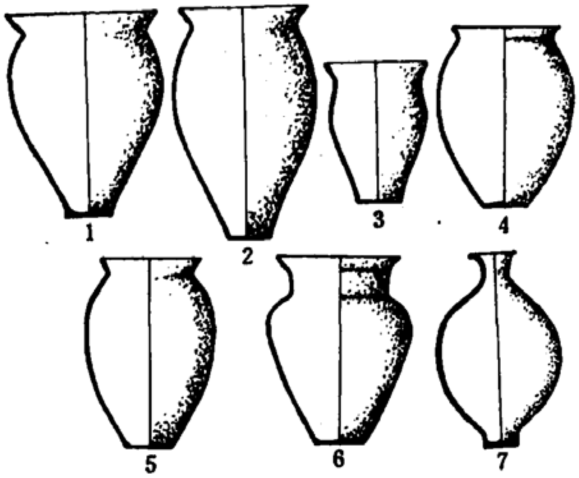


Figure 7.67: Ceramics from Graves at Yongren Dingzhen (Chuxiong and Yunnansheng 1986: Figure 6).

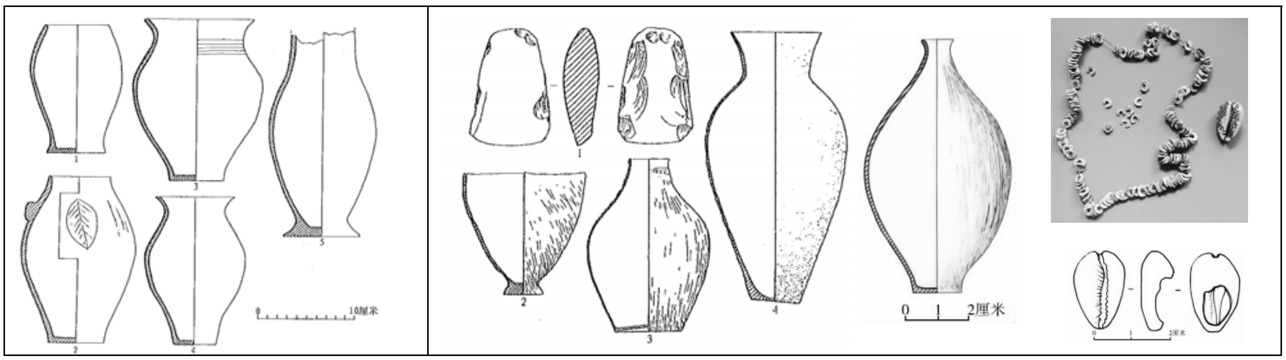


Figure 7.68: Objects from Graves at Luquan Yingpanbao (Left), Huili Xiaoyingpan (Right) (Kunmingshi Bowuguan et al. 2007: Figure 8 and 18; Sichuansheng, Liangshan, and Huilixian 2009: Figure 7-9).

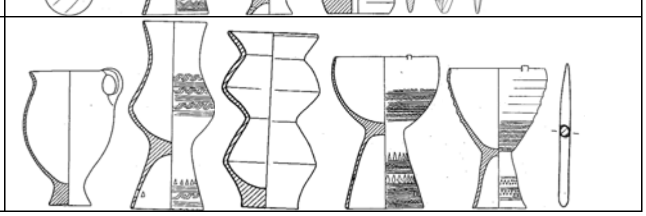
Yunnan connection	
Fenjiwan connection	
Megalithic grave connection	
Local Particularities	

Figure 7.69: Assemblage from Huili Leijiashan M1 and its Parallels (Chengdu, Liangshanzhou, and Huilixian 2009: Figure 6.1; Figure 6.1, 3.5, 3.3, 15.5; Figure 4.5, 7.2, 14.5, 19.2; Figure 5.3, 8.2, 9.9. 10.4, 12.2, 13.10, 19.3).

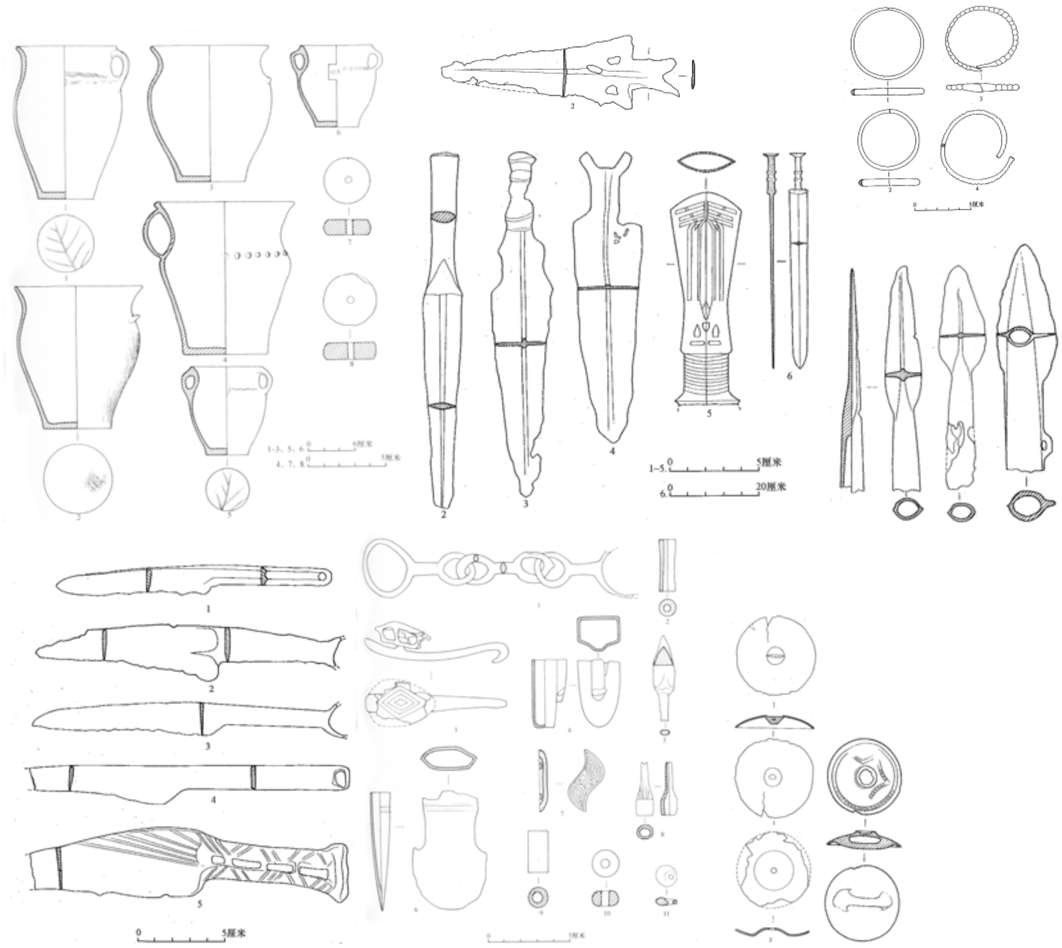


Figure 7.70: Objects from Huili Guojiabao (Chengdu Wenwu 2008: Figure 4, 5.2., 7.2-7.6, 9, 6.3, 6.8, 8, 11, 10.1, 10.4).

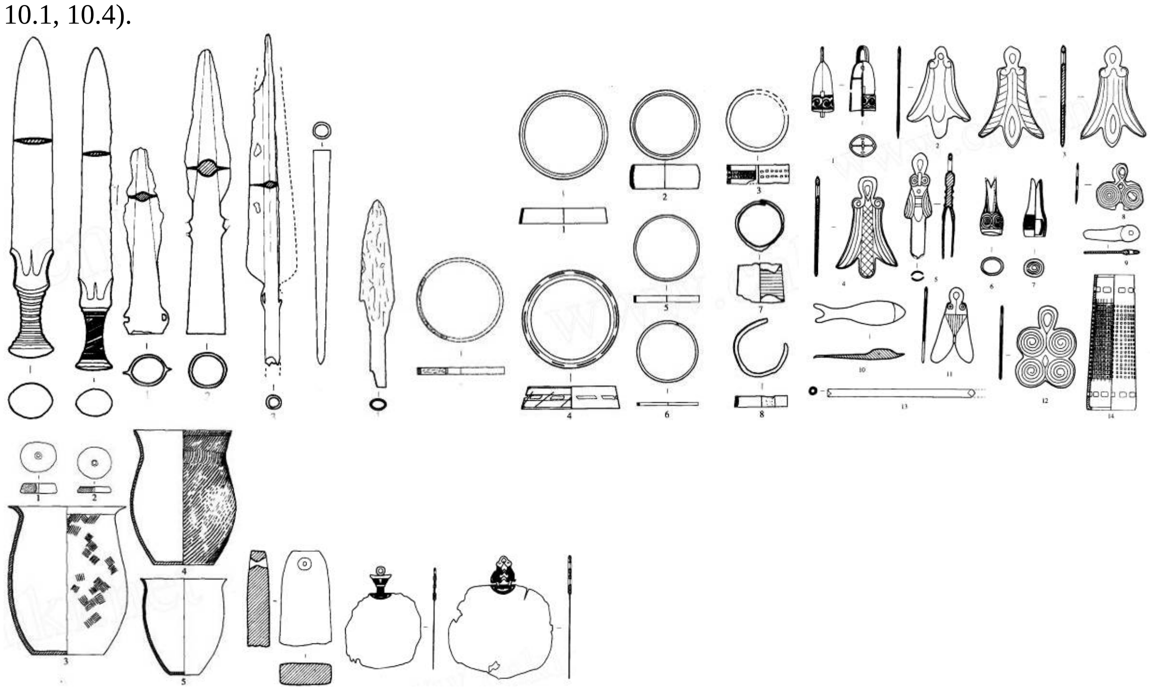


Figure 7.71: Objects from Graves at Changning Wenlinggang, Yunnan (Yunnansheng Wenwu 2005: Figure 19.5-6, 46, 20, 23, 36, 47, 48.2, 25

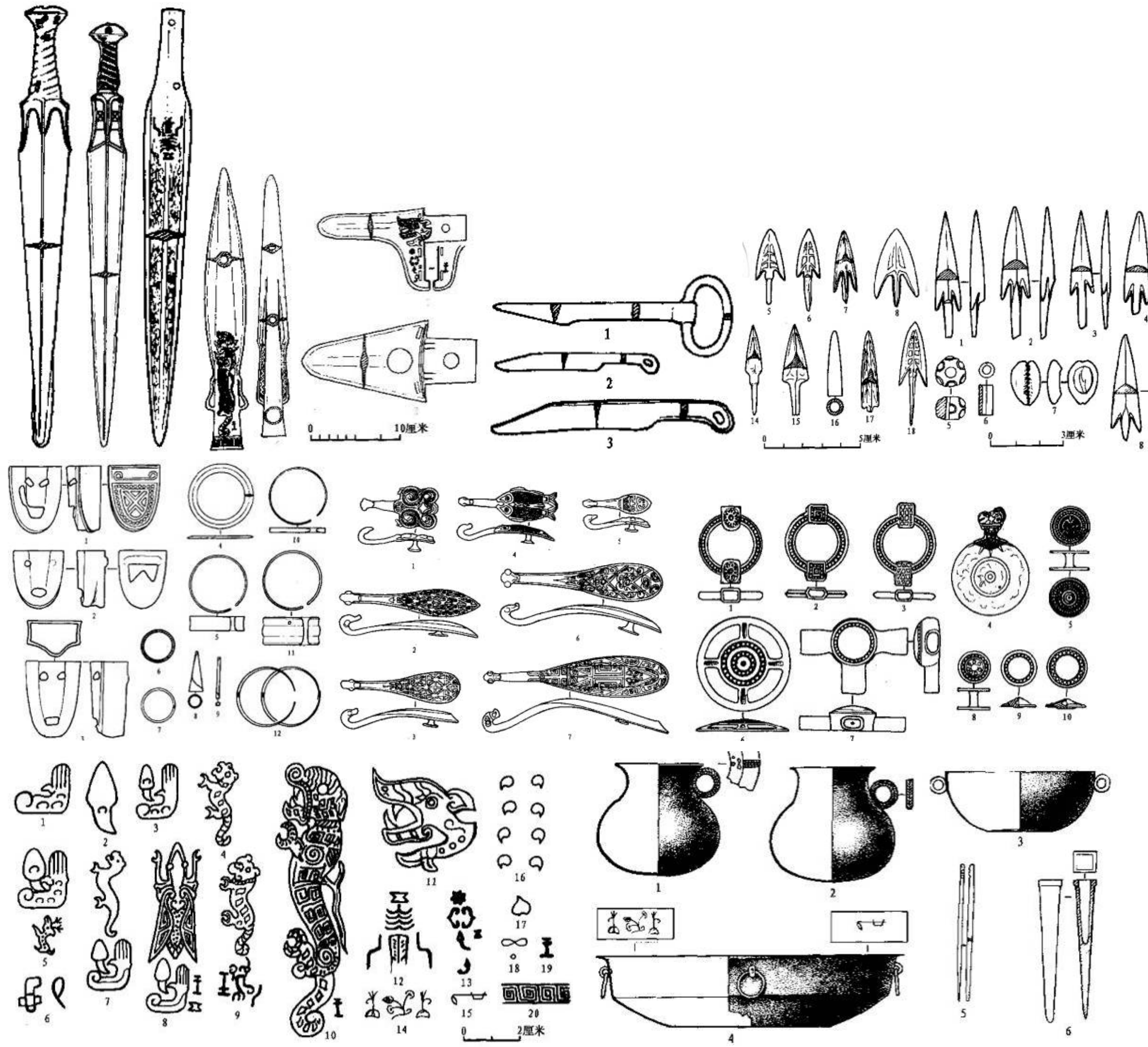


Figure 7.72: Objects from Graves at Baoxing Hantanshan (Sichuansheng, Ya'an, and Baoxingxian 1999: Figure 10.1, 10.9, 11.12, 13.1, 13.6-13.8, 12. 1-12.3, 15, 21, 16, 18, 17, 20, 19).

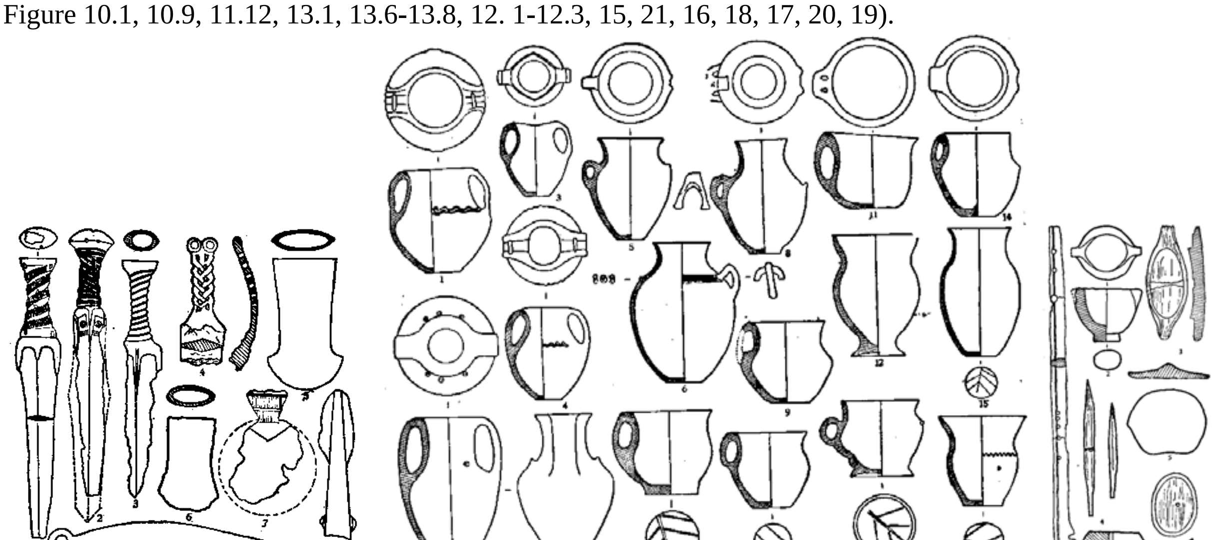


Figure 7.73: Objects from Graves at Ninglang Daxingzhen (Yunnansheng Bowuguan 1983: Figure 5-7).

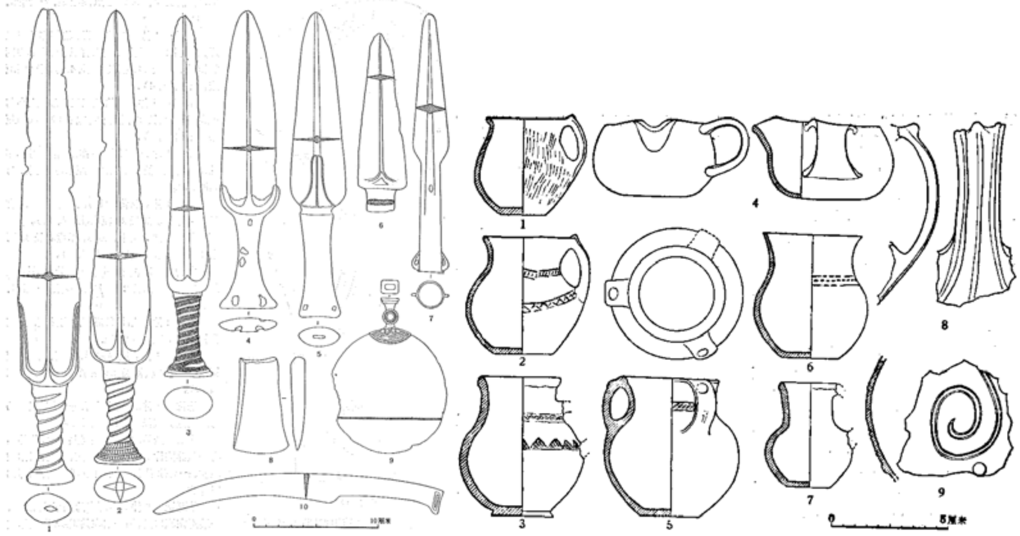


Figure 7.74: Objects from Graves at Deqin Yongzhai (Yunnansheng Bowuguan 1975: Figure 4-5).

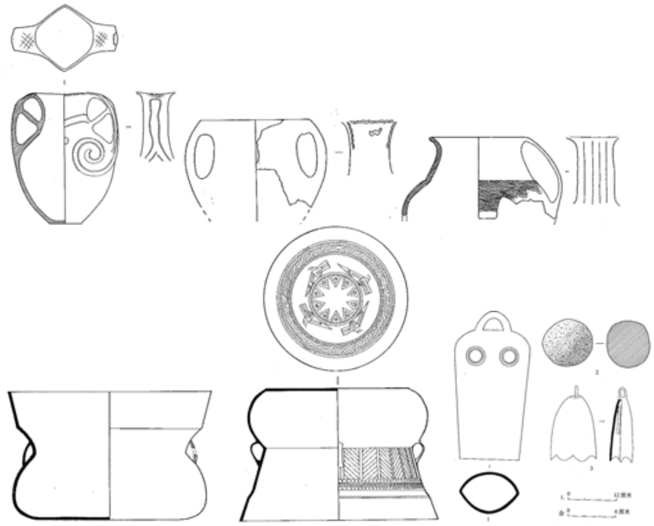


Figure 7.75: Objects from Yanyuan Laolongtou M4 (Liangshan and Chengdu 2009: Figure 4 and 5).

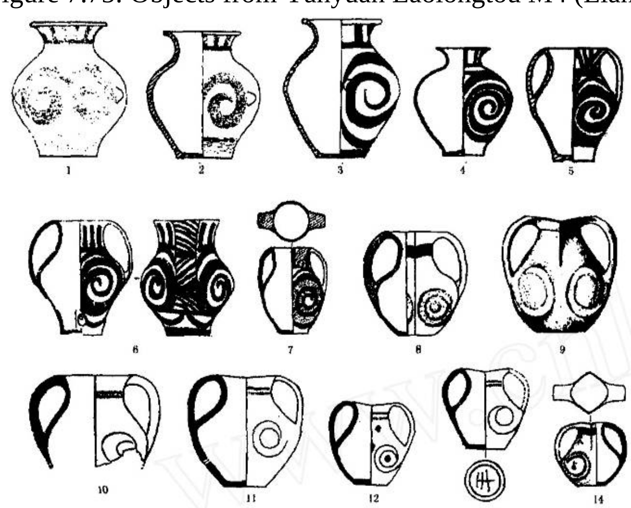


Figure 7.75: Vessels with Double-Spiral Motive from the Upper Minjiang River Valley; 7.-14. Retrieved from Graves of Western Han Date or Later (Dai Lijuan 2007).

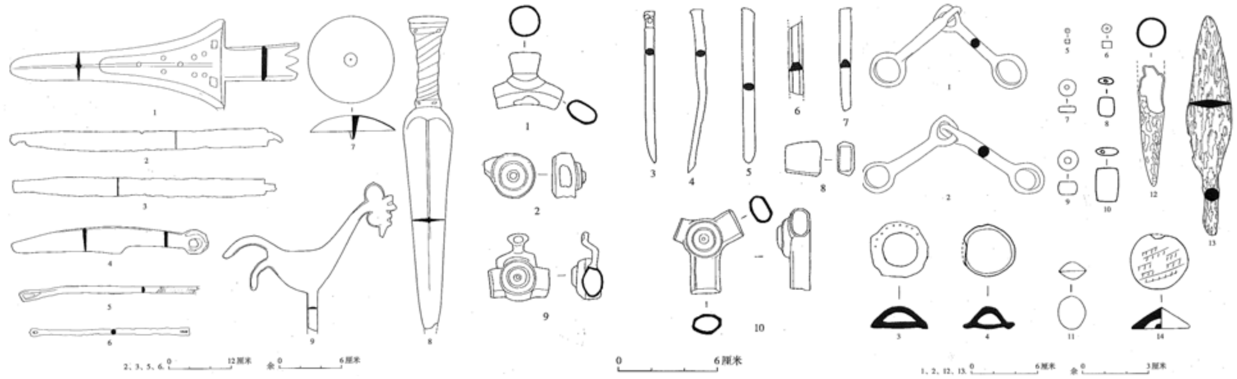


Figure 7.76: Objects from Yanyuan Laolongtou M4 (Liangshan and Chengdu 2009: Figure 6-8).

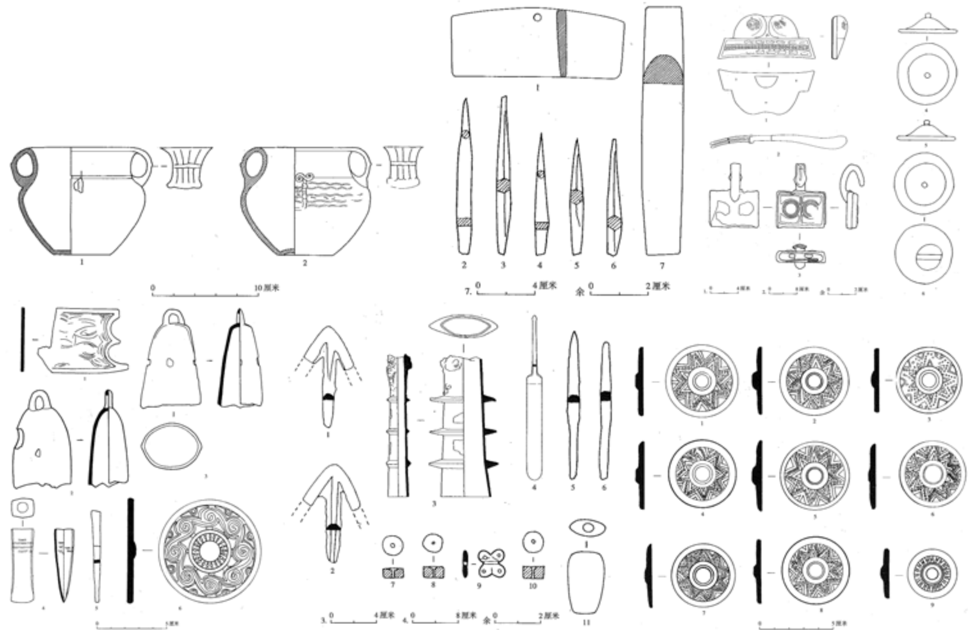


Figure 7.77: Assemblage of Yanyuan Laolongtou M6 (Liangshan and Chengdu 2009: Figure 10, 11, 13, 12, 15).

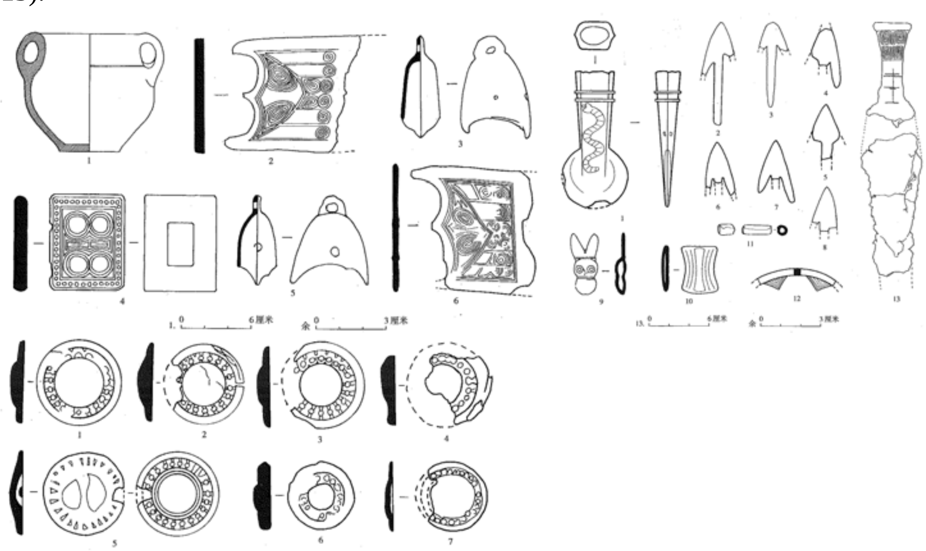


Figure 7.78: Assemblage of Yanyuan Laolongtou M9 (Liangshan and Chengdu 2009: Figure 18, 19, 21).

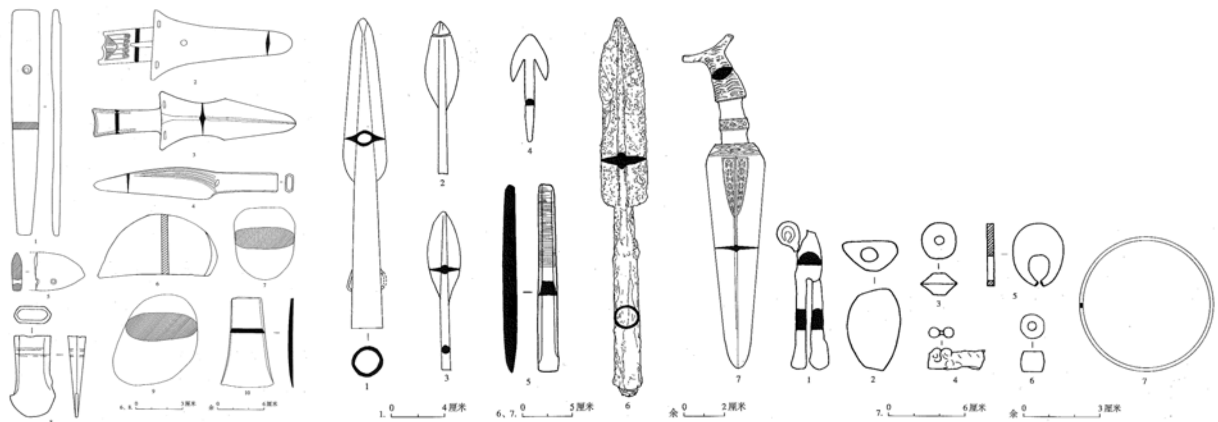


Figure 7.79: Assemblage of Yanyuan Laolongtou M11 (Liangshan and Chengdu 2009: Figure 23-25).

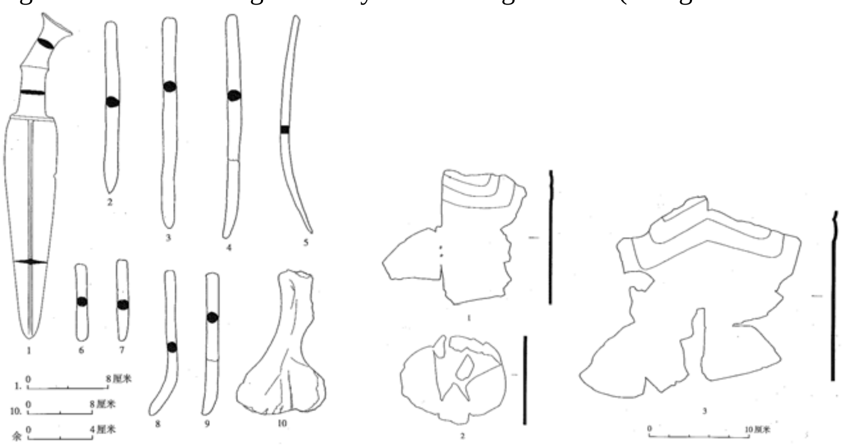


Figure 7.80: Assemblage of Disturbed Graves Yanyuan Laolongtou M7 (Left) and M5 (Right) (Liangshan and Chengdu 2009: Figure 27-28).

Figure 7.81: Objects from Phase IV at Yongsheng Duizi (Yunnansheng, Lijiangshi, and Lijiangshi 2010).

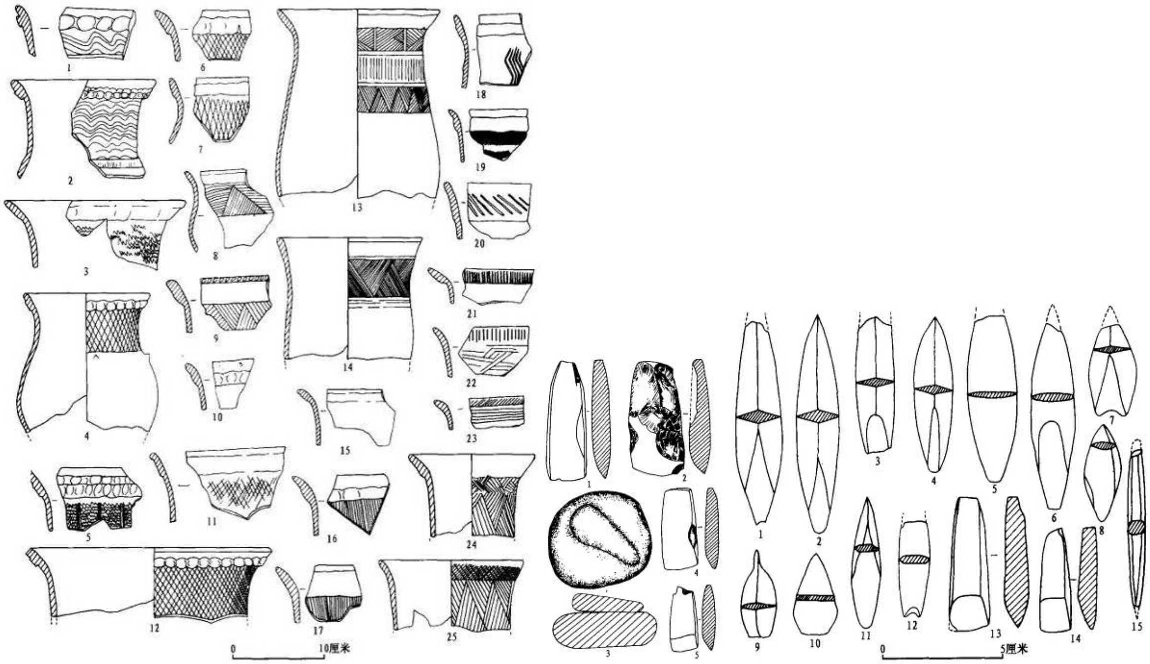


Figure 7.82: Ceramics and Stone Tools from Yongping Xinguang (Yunnansheng, Dalizhou, and Yongpingxian 2002: Figure 16 and 11-12).

Figure 7.83: Ceramics from Phase II Graves (Left) and Stone Tools from Phase III Settlement Sites at Yongsheng Duizi (Yunnansheng, Lijiangshi, and Lijiangshi 2010).

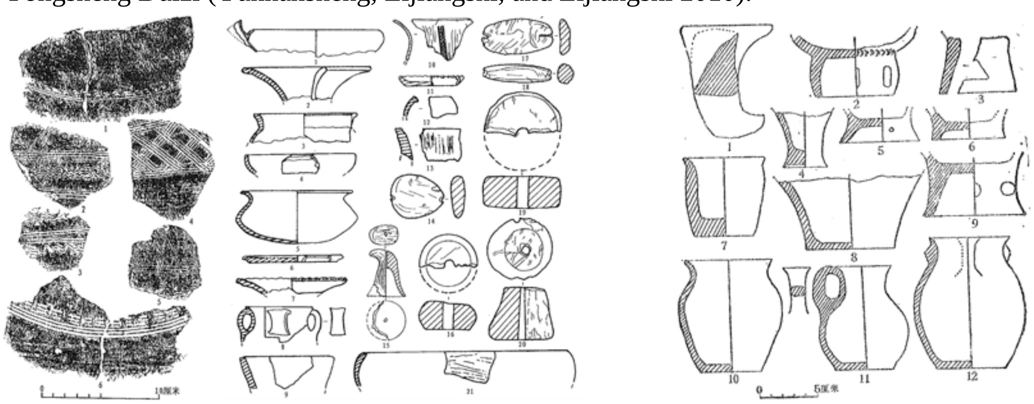


Figure 7.84: Decoration Motives and Ceramic Forms from Yinsuodao Phase III (Early Bronze Age) (Right) (Yunnansheng Wenwu et al. 2009: Figure 17-18) and Ceramics from Early Bronze Age Layers at Jianchuan Haimenkou (Right) (Yunnansheng Bowuguan 1995: Figure 12).

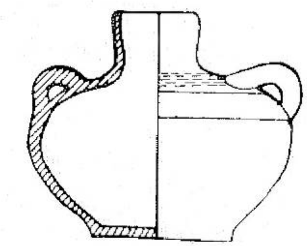


Figure 7.85: Ceramic Vessel from Yanbian Yumen Wanxiao M1 (Dukoushi Wenwu 1986: Figure 2).

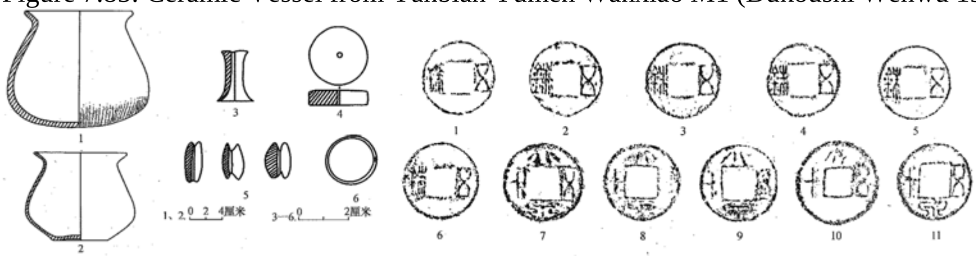


Figure 7.86: Objects from Stone-Construction Graves at Zhaojue Chike Boxixian (Lianghan, Sichuan, Zhaojuexian 2010: Figure 8-9).

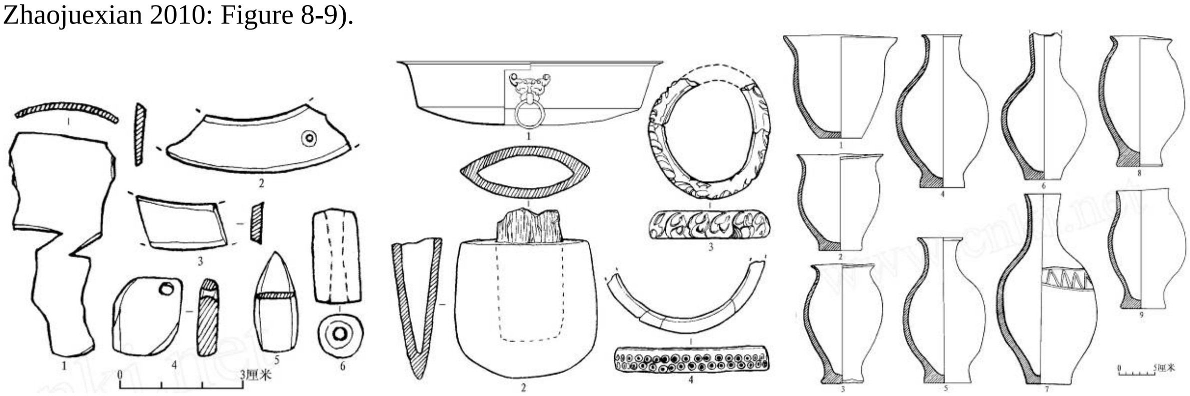


Figure 7.87: Objects from Eba Buji M1 (Left 1-3 and 5-6, Middle 1), M2 (Left 4), and M3 (Middle 2), and from Pusu Bohuang M3 (Middle 2 and 4, Right 3-6), M4 (Right 7 and 9), M8 (Right 2), M9 (Right 8), 11 (Right 1) (Liangshan, Sichuan, and Zhaojuexian 2009).

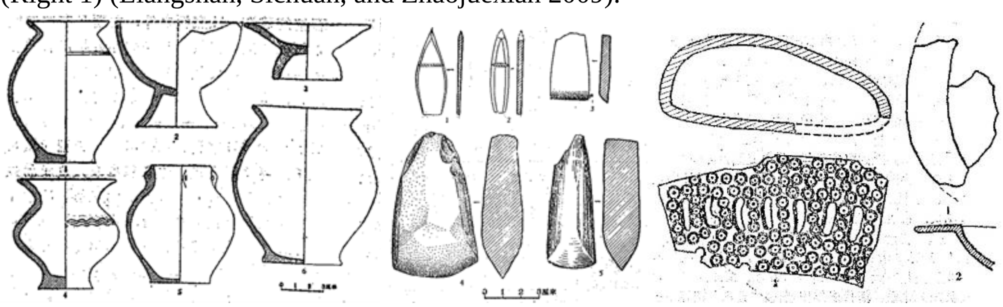


Figure 7.88: Objects from Zhaojue Fuchengqu M1 (Left 1-3), M2 (Middle 3), M3 (Left 4-6), Erba Keku M4 (Middle 2 and 4, Right 2), M5 (Middle 1), M9 (Middle 5, Right 1) (Liangshan Yizu 1981: Figure 6-8).

Figure 7.89: Calcinated Ropes from Zhaojue Wazhaishan (Photograph Curtesy of Zhao Deyun, Sichuan University).

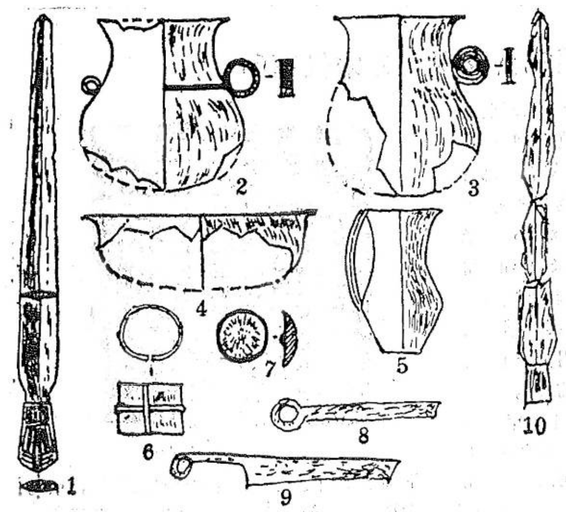


Figure 7.90: Bronze Objects from Graves at Yuexi Liaojiashan (Mao and Zou 1981).

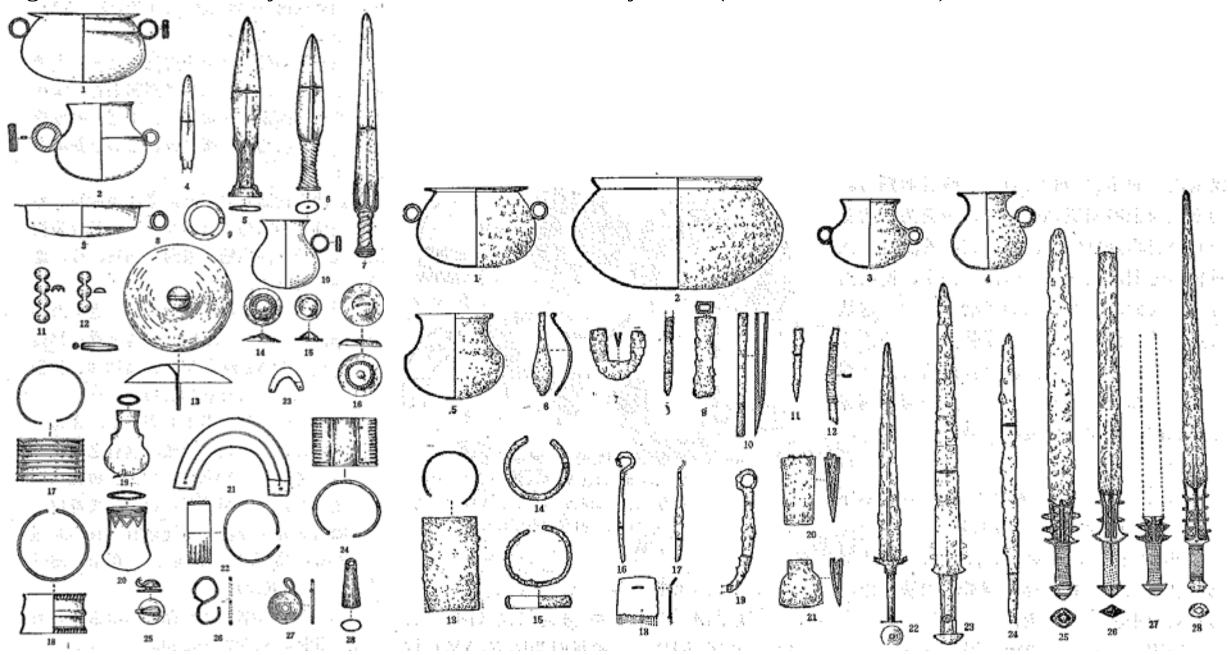


Figure 7.91: Metal Objects from Stone-Cist Graves in Maowen County (Sichuansheng and Maowenxian 1987: Figure 12-13).

Figure 9.1: The Anning River Valley Around Xichang Mimilang (Photograph Taken by the Author).

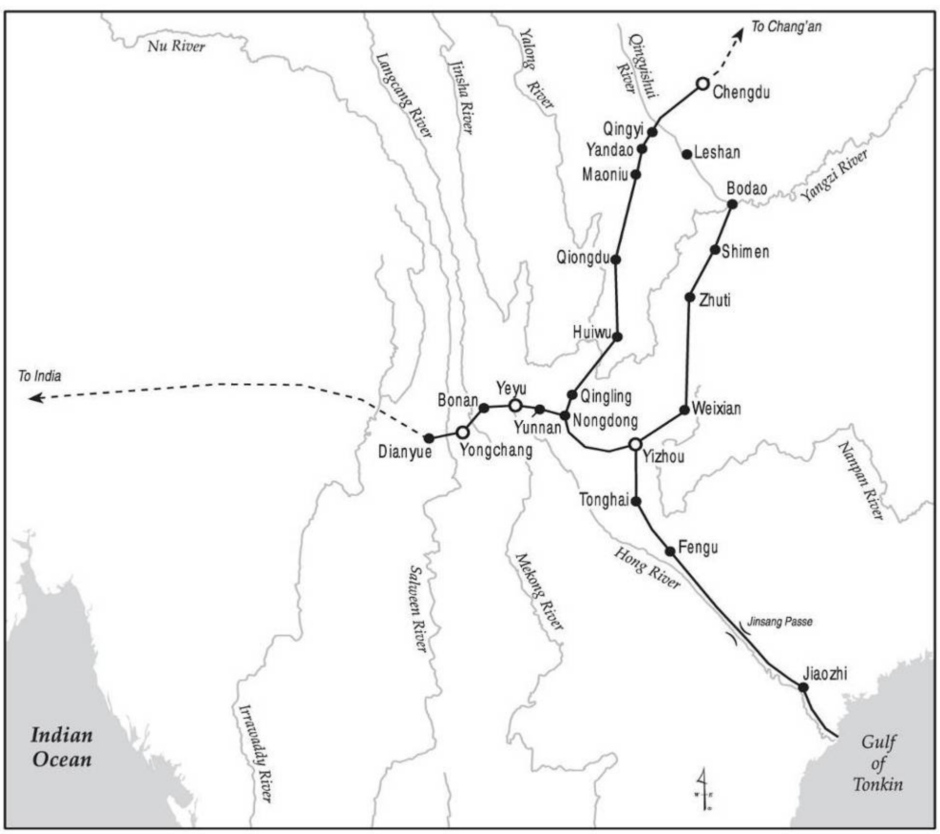


Figure 9.2: Southwest Silk Road or Tea-Horse Road Before the Third Century BC (Yang 2004: Map1).

Figure 9.3: Map of the Southern Silk Road (Jiang Yujian 1995:1).

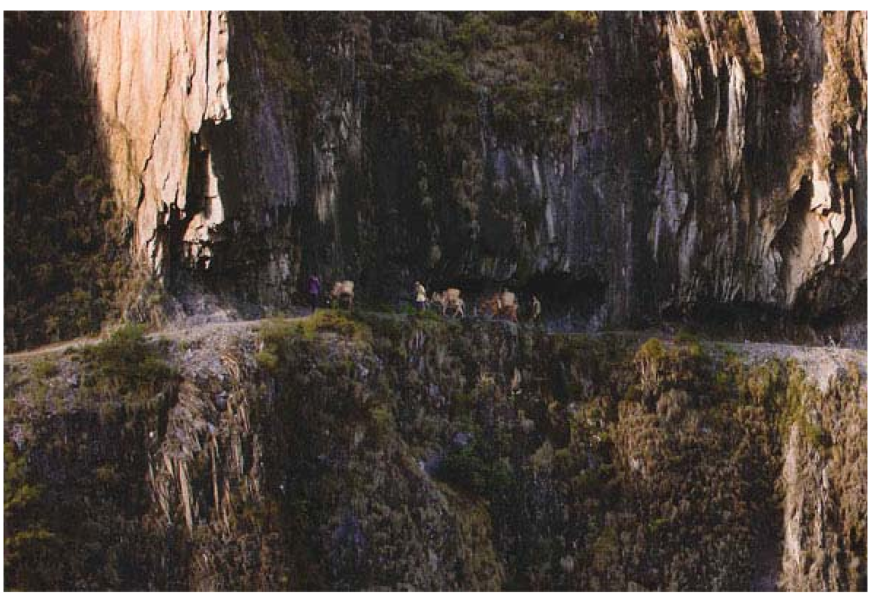


Figure 9.4: On the Tea-Horse Route (Freeman and Ahmed 2011:101).

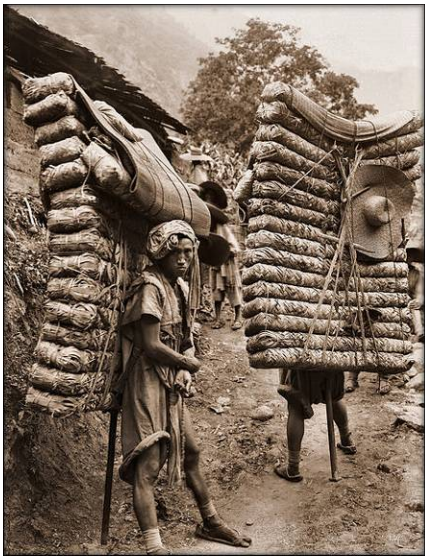


Figure 9.5: Men Laden With Tea, Sichuan, China, Taken by H. Wilson, 1908 (Freeman and Ahmed 2011:84).

Figure 9.6: Mule on a One-Rope Bridge, Yunnan c. 1990 (Left); Woman on a One-Rope Bridge, 2009 (Freeman and Ahmed 2011:137, 166).

Figure 9.7: On the Way from Luguhu to Lijiang (Photograph Taken by the Author).

Figure 9.8: On the Road Entering Xide (Left); Between Xichang and Yanyuan (Right) (Photographs Taken by the Author).

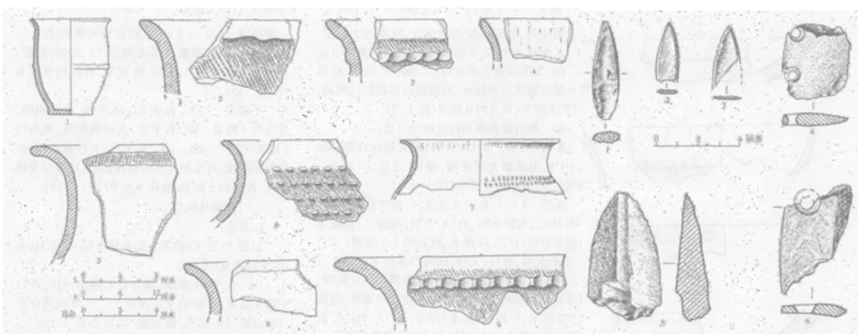


Figure 9.9: Ceramics and Stone Tools from from Hanyuan Maiping H1 and H4 (Zhongguo, Sichuansheng, and Chengdushi 2006: Figure 9-10)

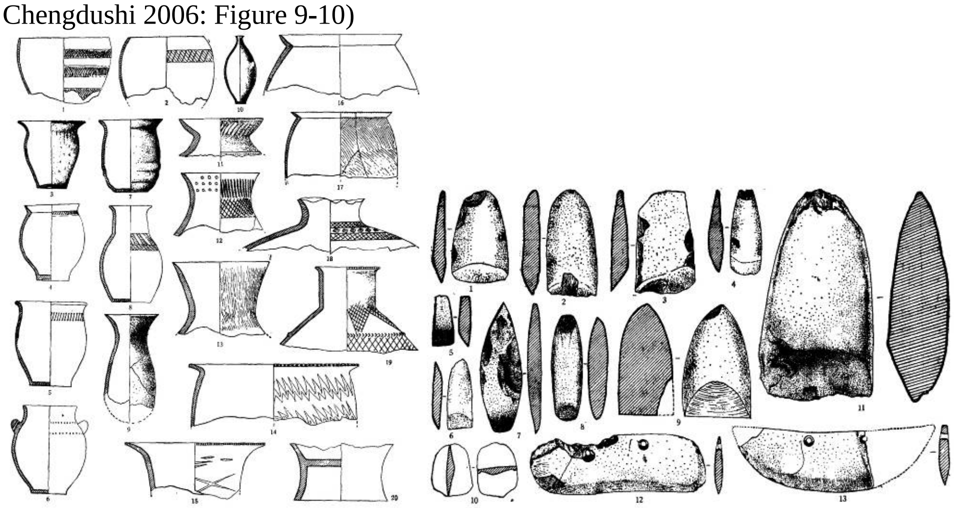


Figure 9.10: Ceramics and Stone Tools from Yuanmou Dadunzi (Yunnansheng Bowuguan 1977, Figure 17 and 11).

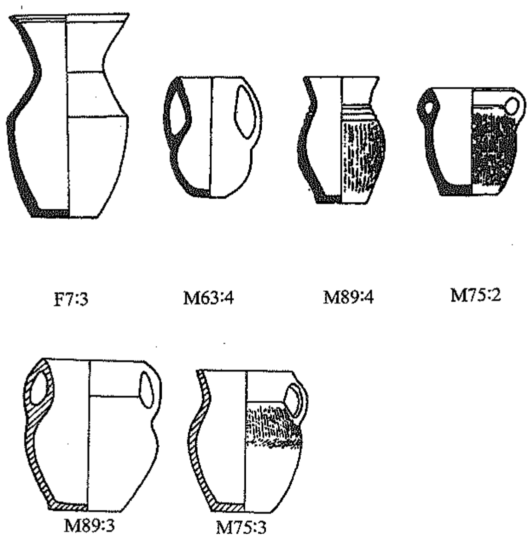
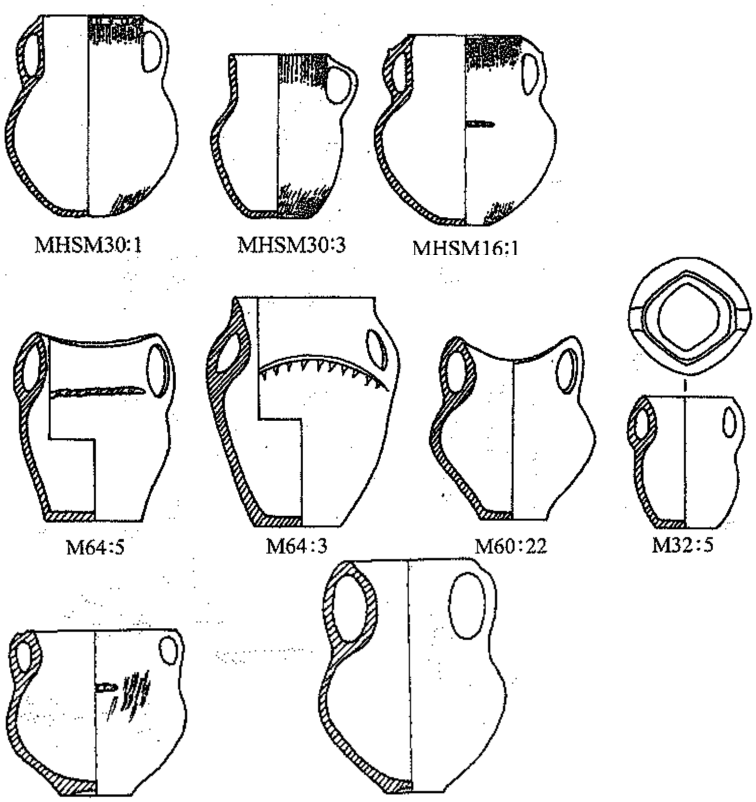


Figure 9.11: Late Qijia Ceramics from Gansu Yongjing Dahezhuan (Top) and Qinweijia (Bottom) (Shui Tao 2001: Figure 3-4).



81HLXPM32:3 81HLXPM32:5
Figure 9.12: Xindian Ceramics from Gansu Shanjiatou (Top), Siwa Ceramics from Liuzhan (Middle), Kayue Ceramics from Pujialiu (Shui Tao 2001: Figure 9, 22, 26).

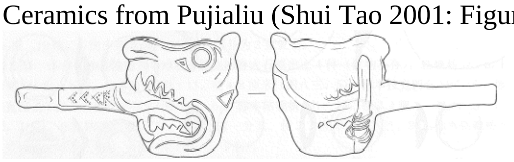


Figure 9.13: Belt Hook from Xichang Xijiao M1 (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 84.5).

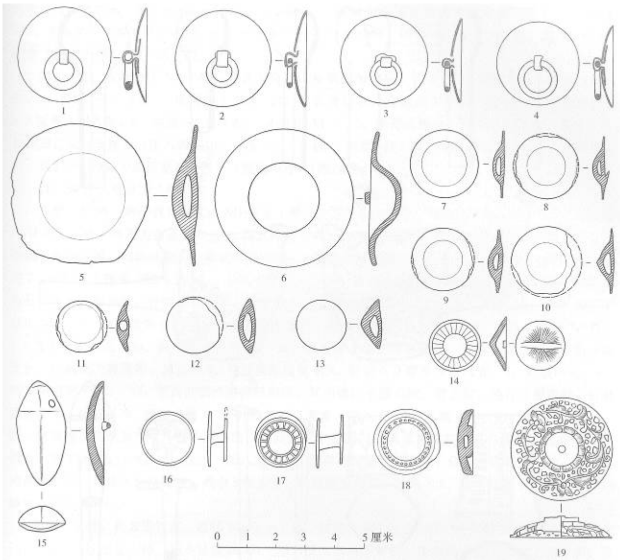


Figure 9.14: Buttons and Other Clothing Applications from Megalithic Graves (Sichuansheng, Liangshan, and Xichangshi 2006a: Figure 83).

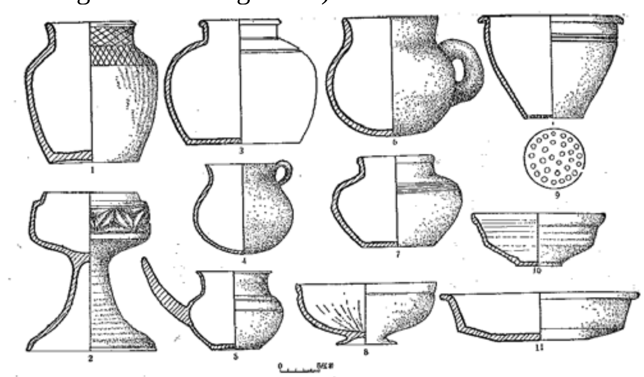


Figure 9.15: Ceramics from Han Graves at Xichang Lizhou (Lizhou Yizhi 1980b: Figure 6).

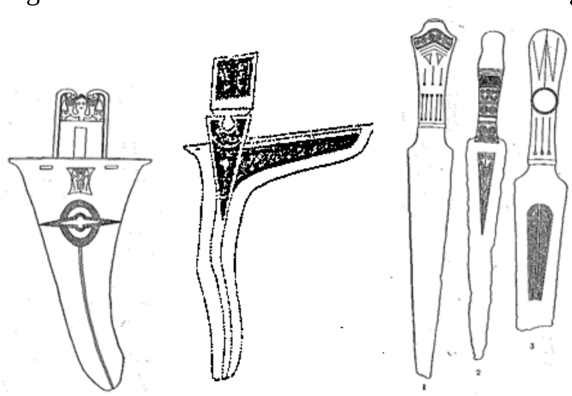


Figure 9.16: Weapons from Jining Shizhaishan (Yunnansheng Bowuguan 1995: Figure 1.1-2, Figure 9.1-3).

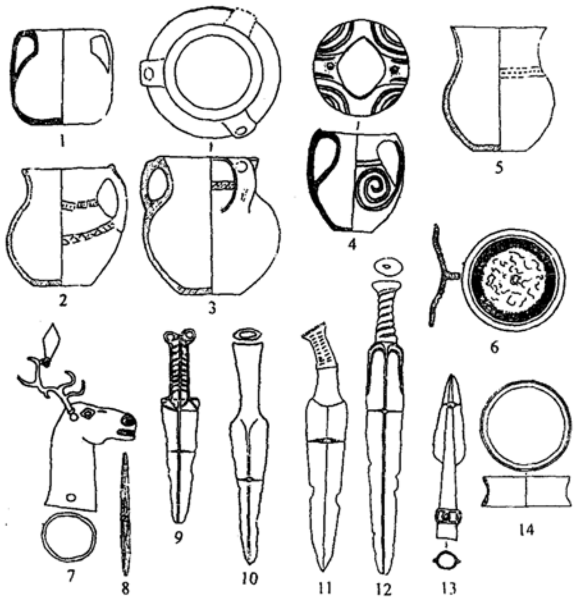


Figure 9.17: Ceramics and Metal Objects from Deqin (Guo Jiyan 2002: Figure 3).

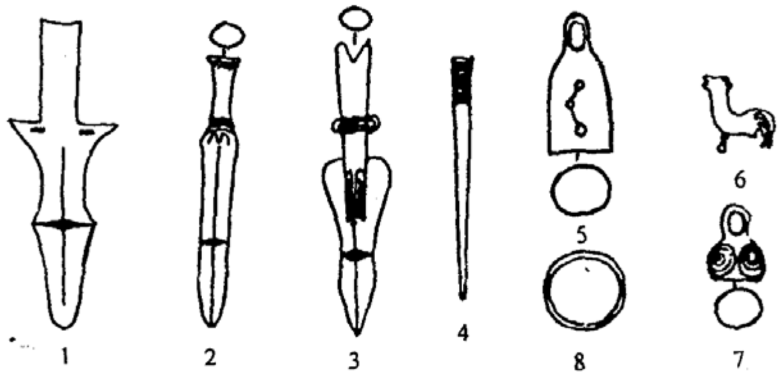


Figure 9.18: Metal Objects from Stone Graves in Xiangyun Bingchuan (Guo Jiyan 2002: Figure 2).

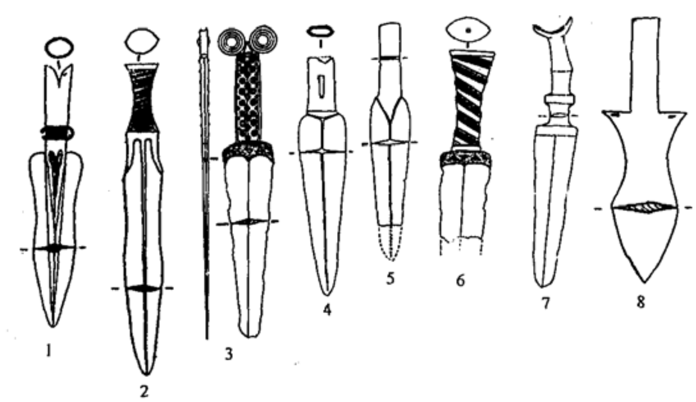


Figure 9.19: Typical Metal Weapons from Xiangyun, Yongsheng, and Chuxiong (Guo Jiyan 2002: Figure 5).

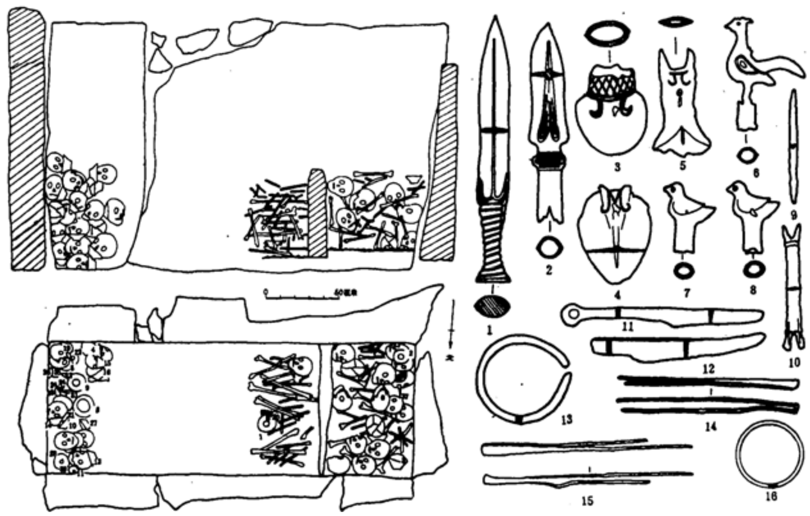


Figure 9.20: Structure of M7 and Objects from M1 and M5-M7 at Yunnan Midu Juli (Yunnansheng Bowuguan 1986).

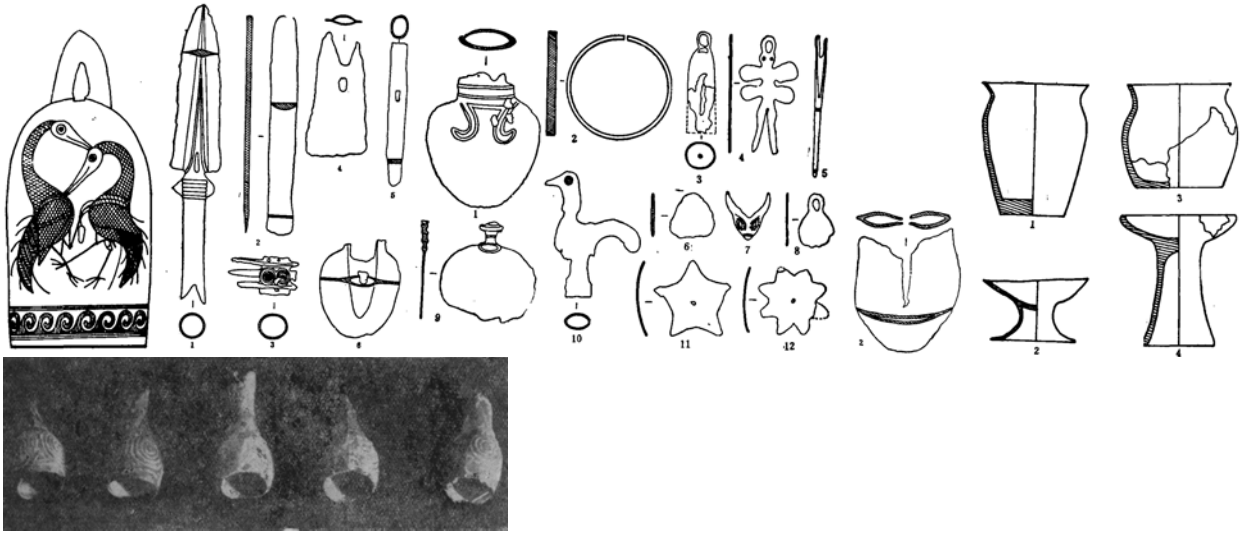


Figure 9.21: Objects from Graves at Yunnan Xiangyun Jiancun (Li Chaozhen 1983: Figure 22-25, 5, and 17).

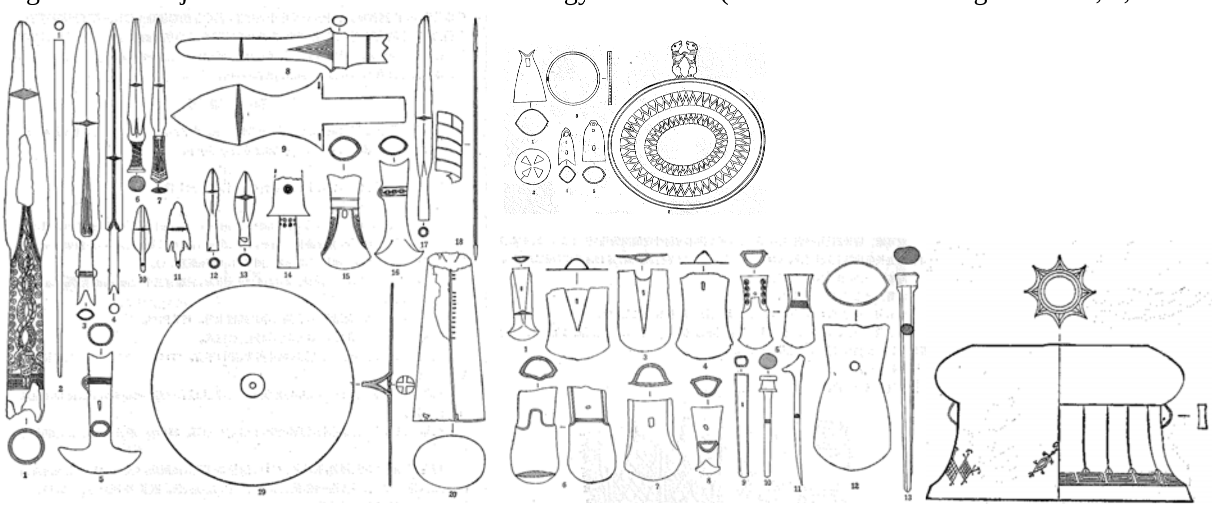


Figure 9.22: Objects from Earth-Pit Graves with Wooden Coffin at Yunnan, Chuxiong Wanjiaba (Yunnansheng Wenwu 1983: Figure 24-25, 30, and 32).

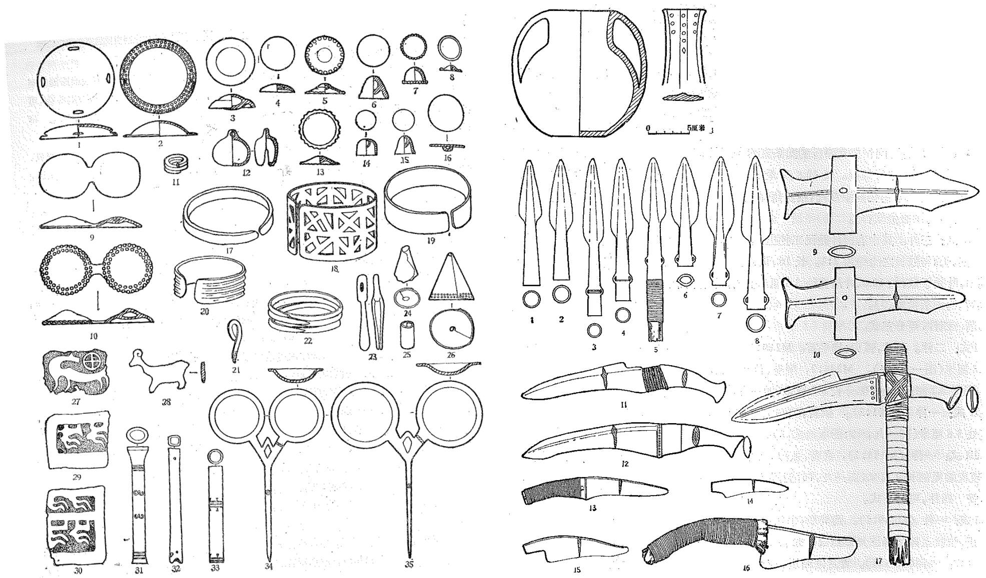


Figure 9.23: Assemblage from Sichuan Luhuo Kashahu (Sichuansheng and Ganzi 1991: Figure 20. 23, and 20).

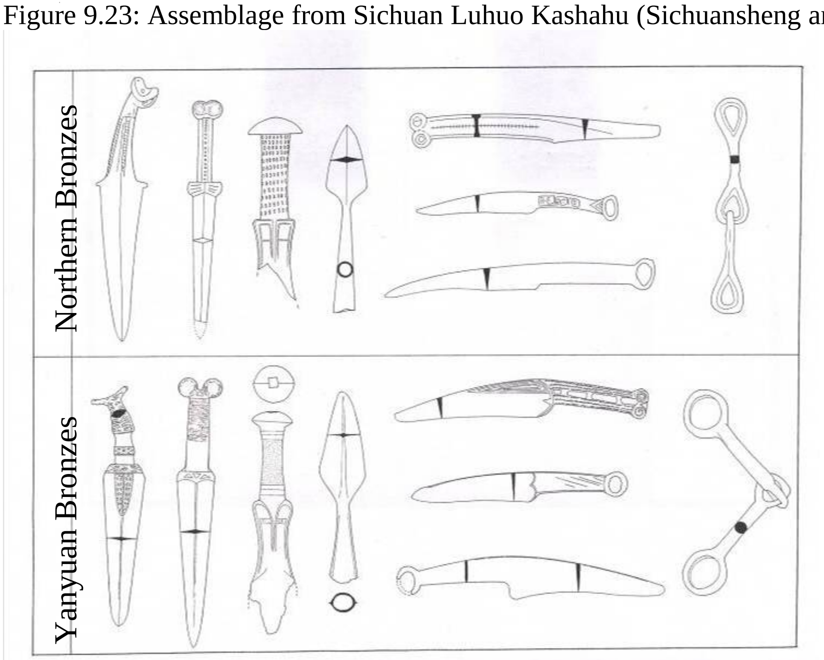


Figure 9.24: Comparison of Bronze Objects from Yanyuan and Northern China (1-2 Hebei, 3-4 and 6-8 Ningxia, 5 Ordos Region) (After Jiang Zhanghua 2009: Figure 7).

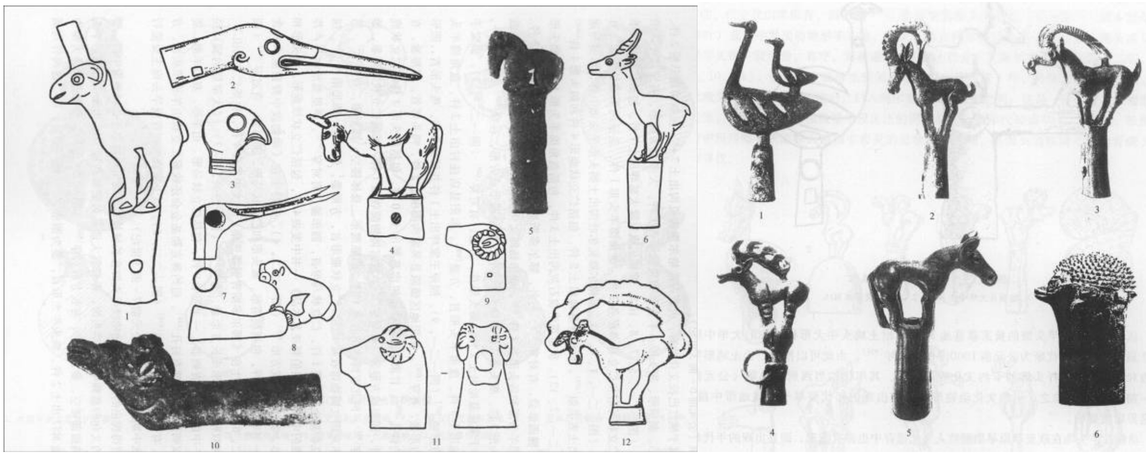


Figure 9.25: Yoke Ornaments from the Ordos Region, 9th-7th century BC (Wu'en Yuesitu 2008: Figure 122-123).

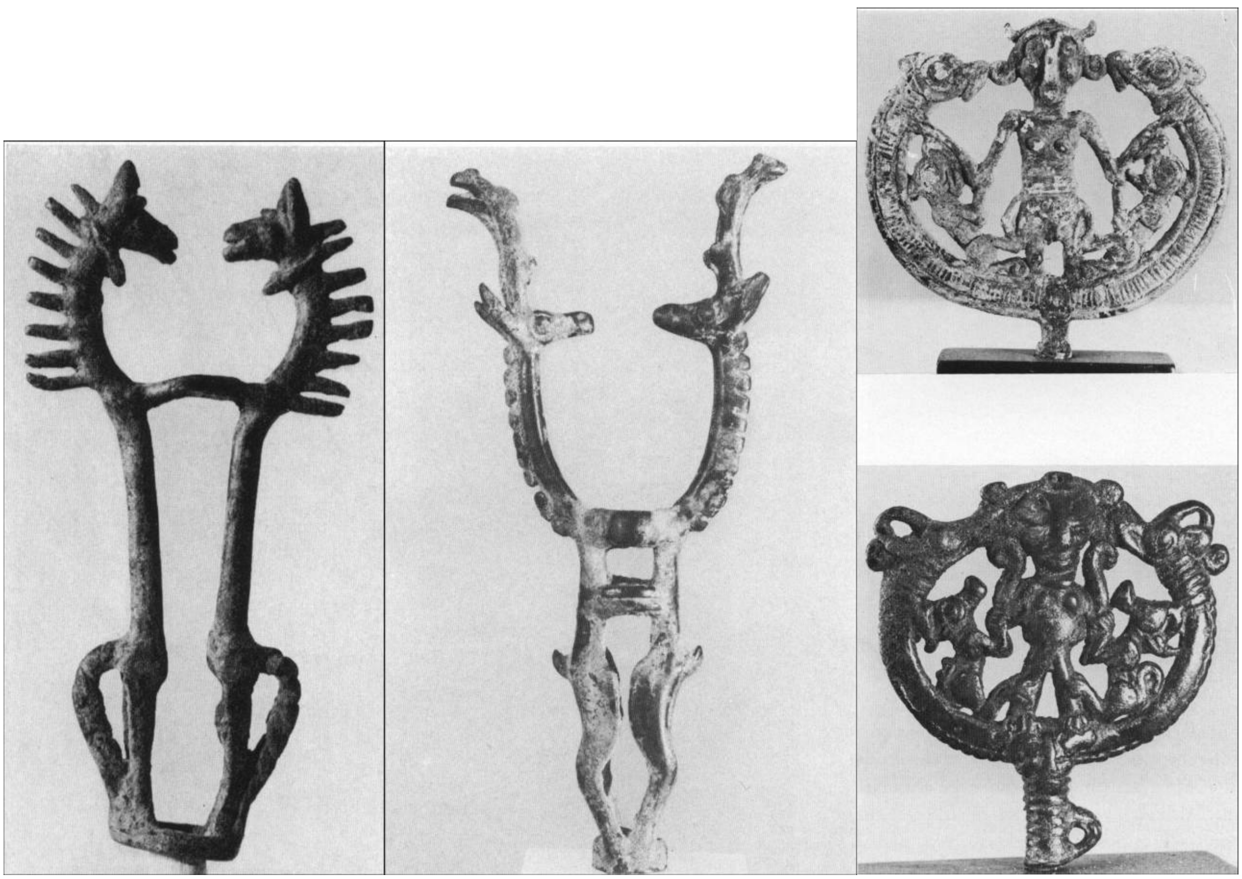


Figure 9.26: Luristan Bronzes Depicting Horses and Other Animals (Moorey 1974b: Figure 79, 77, 96, and 97).

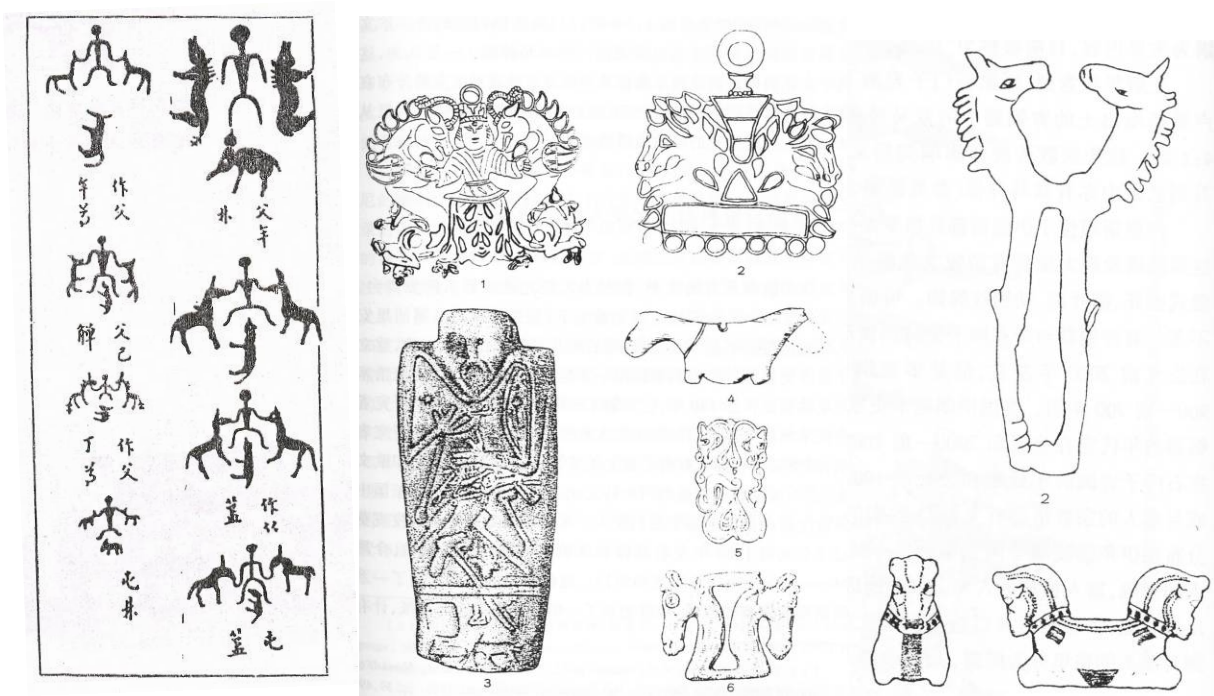


Figure 9.27: Clan Signs on Bronze Weapons from Xinjiang and Inner Mongolia; Gold Ornaments with Double-Horse Design from Afghanistan and Kazakhstan; Stone Figurine of Double-Horse from Persia and Iran (Lin Meicun 2000: Figure 5, Figure 1, Figure 3.2-3).

Figure 9.28: Object Types Unique to Yanyuan (Photographs Courtesy by Jiang Zhanghua).

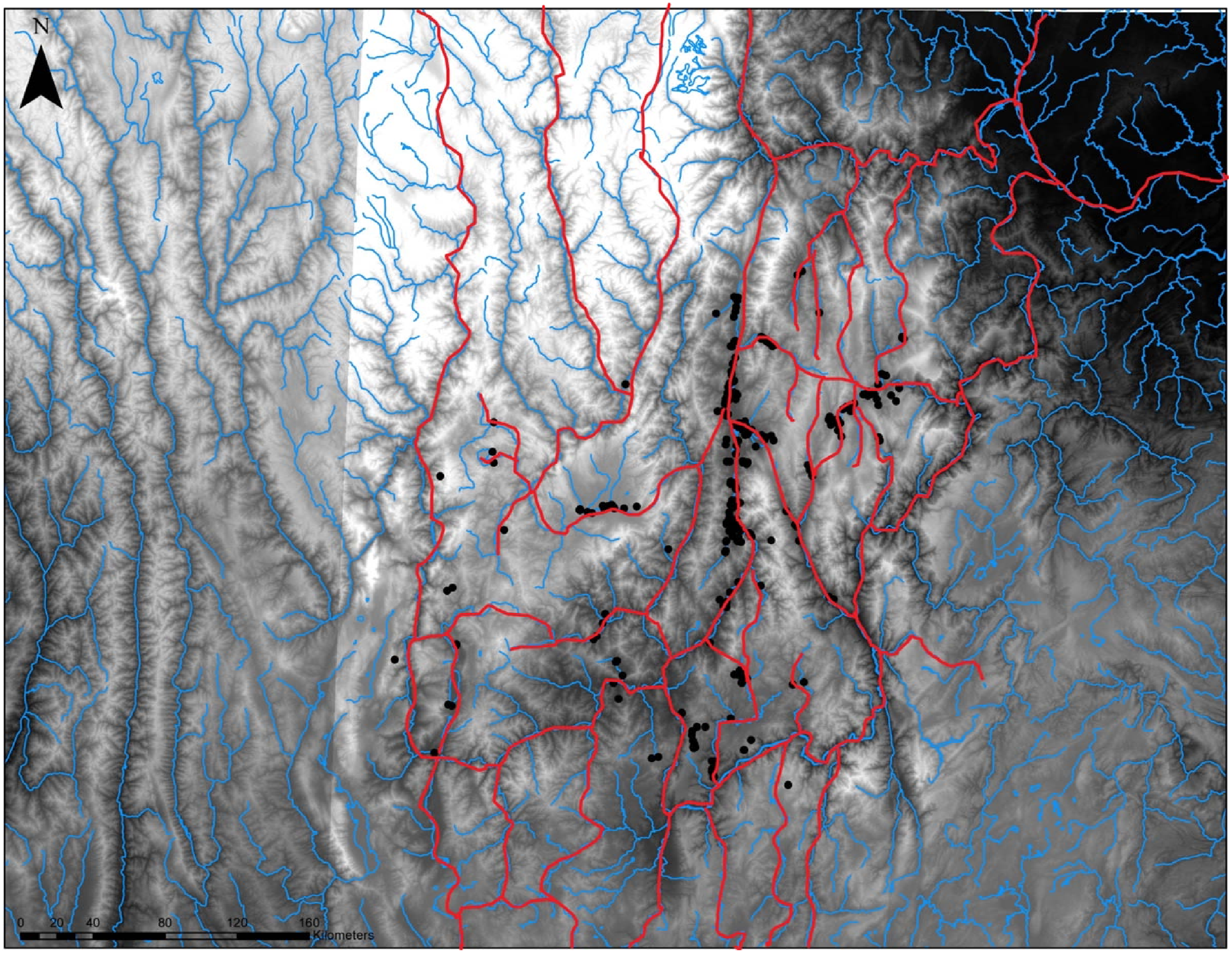


Fig. 9.29: Possible Contact Routes Throughout the Liangshan Region.

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