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ENTANGLED WITH THE RAIN SPIRITS: INTENSIFICATION OF RITUAL CAVE USE IN THE MIMBRES REGION AS AN INDEX OF SOCIAL AND RELIGIOUS TRANSFORMATIONS DURING THE LATE PIT STRUCTURE AND MIMBRES CLASSIC PHASES

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by

Scott Nicolay

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In

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Committee
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2024

CERTIFICATION OF APPROVAL

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2024

DEDICATION

To Cameron Scott Griffith

(December 6, 1968-May 30, 2023):

You were my original guide through Xibalba;

may Chaac convey my gratitude.

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My graduate education and dissertation research would not have been possible without the generous financial support of the University of California, Merced. I am grateful to this rising institution, a much-needed presence in the Central Valley, and I hope that many generations of students, both graduate and undergraduate, will find it as great a source of opportunities as it has been for me. I am also grateful to the Henry Luce Foundation, which provided additional funding during the summer for Baskets-2-Bytes and the Rock Art Heritage Preservation Project, two projects that allowed me to work in collaboration with Indigenous groups from California. The Indigenous friends and research partners with whom I have worked on these projects remain important to me, especially Cecilia Moreno (*Tachi Yokut/Wukchumni*), Jennifer Malone (*Wukchumni*), Dr. Carolyn Smith (*Karuk*), and Southern Sierra Miwuk Nation leaders Sandra Chapman, Waylon Coates, Tara Fouche-Moore, Anthony Lerma, and Irene Vasquez. Finally, an exceptionally generous Fletcher Jones fellowship allowed me to devote my final year to writing and to compensate for time lost to the pandemic.

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ritual in the Southwest to her landmark 2004 SAA session, an opportunity that forced me to accelerate my scholarship and which ultimately cemented my commitment to archaeology. This later became my first published paper when it appeared in her seminal 2012 volume *Sacred Darkness: Global Perspective on the Ritual Use of Caves.* When Dr. Moyes came to UC Merced, she recruited me, and when the time was right, I came. I have not regretted it. Thank you, Holley for all you have taught me, and for always looking out for my best interests.

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Of the many friends and colleagues who guided and supported me in so many ways, one stands above all: my bunny-trail-buddy Margaret Berrier. For almost two decades we have bounced ideas off each other, collaborated, traveled down hundreds of rabbit-holes, and argued (mainly about goggle-eyes/Tlaloc), and I feel that together we have managed to change the way the discipline thinks about iconography and cosmovision in the Southern Mogollon region. Margaret's professional drawings and photographs have added immensely to almost all my publications, including this dissertation. She has also put me up and put up with me in her spare room on multiple trips to New Mexico and Texas for fieldwork and conferences, and thus opened opportunities (and laundry options) that might not otherwise have been affordable for me.

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As I began to focus on cave use in the Southwest/Northwest, I was fortunate to receive the support, encouragement, and friendship of many fine archaeologists. I have been waiting for two decades to give Larry Baker the thanks he deserves for allowing me access to the excellent library at the Salmon Ruins Museum: he truly did me a great favor there. Lori Reed was a wonderful friend and mentor and so much more, and she also connected me with several others who became great friends and mentors in turn. I give special thanks to perishables experts Dr. Laurie Webster and Dr. Edward Jolie: the excitement of our early email discussions will never be surpassed (and Ed, I hope the size of that rattlesnake I almost stepped on next to the Grants Basket Site will not be surpassed in our experience either). John Cater, then still on the journey to his own doctorate, became an early and lasting friend.

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2023 Out of the Blue: Revisiting Walter Hough's "Great Sacred Cave in Eastern Arizona." In *Collected Papers of the 21st Biennial Mogollon Archaeology Conference*, edited by Lonnie C. Luderman and Michael W. Diehl.

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2022 Before the Borders: Reconsidering Southern Mogollon Connections, Society for American Archaeology's 87th Annual Meeting, Chicago, IL. (co-chair with Thatcher A. Seltzer-Rogers)

2010 A Darker Discipline: Expanding the Frontiers of World Cave Archaeology, Society for American Archaeology's 75th Annual Meeting, St. Louis, MO.

2009 The Subterranean Discipline: Cave Archaeology in the 21st Century, Society for American Archaeology's 74th Annual Meeting, Atlanta, GA.

2008 Dark Origins and Bright Futures: Speleocentric Approaches to the Archaeology of Caves in North America. Society for American Archaeology's 73rd Annual Meeting Vancouver, BC Canada.

2007 Sipapus, Sinkholes, and Shrines: New Approaches to the Study of Ritual Cave Use in Southwestern Archaeology. Society for American Archaeology's 72nd Annual Meeting Austin, TX.

Professional Presentations

2023 Bar and Dot Patterns in the Southern Mogollon Region and Beyond. Paper Presented at the 23rd Biennial Jornada Mogollon Archaeology Conference, El Paso, TX. (primary author, with Margaret Berrier, Felicia Rhapsody Lopez, Michael Marshall, and Mark Willis).

2023 Lives of Baskets, Lives of Weavers: Using Digital Heritage and Interdisciplinary Research to Restore Social Memory. Poster presented at the 88th Annual Meeting of the Society for American Archaeology, Portland, OR. (primary author, with Miranda Fengel, Manuel Dueñas Garcia, and Cecilia Moreno).

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2022 Taking the Serpent by the Horns: Reconsidering Quetzalcoatl in the Southwest/Northwest. Paper presented at the 87th Annual Meeting of the Society for American Archaeology, Chicago, IL.

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2019 Cold Cases and Forgotten Caves: Reconstructing the Provenience of Unique Artifacts from the Greater Southwest. Paper presented at the 84th Annual Meeting of the Society for American Archaeology, Albuquerque, NM.

2018 Offerings in the Mogollon Underworld: Big-Eyed Beings and Birds. Paper presented at the 83rd Annual Meeting of the Society for American Archaeology, Washington, DC.

2010 The Underground Gardens of Easter Island: Cave Agriculture, Water Management, and Prehistoric Cave Use on Rapa Nui. Paper presented at the 75th Annual Meeting of the Society for American Archaeology, St. Louis, MO. (primary author, with Sergio Rapu and J. Judson Wynne).

2008 Caves, Agriculture, Ancestors, and Rain: Archaeology of the Mimbres Underworld. Paper presented at the 73rd Annual Meeting of the Society for American Archaeology, Vancouver, BC.

2007 Water from a Stone: A Reexamination of the Feather Cave Archaeological Complex in Lincoln County, New Mexico. Paper presented at the 72nd Annual Meeting of the Society for American Archaeology, Austin, TX.

2006 Findings of the Feather Cave Archaeological Complex Project. Field Report presented at the 69th Annual Pecos Conference, Bloomfield, NM.

2005 The Grand Opening: A New Perspective on the Location of Pueblo Bonito in Chaco Canyon, New Mexico. Paper presented at the 70th Annual Meeting of the Society for American Archaeology, Salt Lake City, UT.

2004 Footsteps in the Dark Zone: Ritual Cave Use in Southwest Prehistory. Paper presented at the 69th Annual Meeting of the Society for American Archaeology, Montreal.

Archaeological Field Reports

2023 *Gateway to the Northern Mimbres: Archaeological Investigations at the Ranger Station Site / Cottonwood Creek Pueblo (LA 5066), Upper Mimbres Valley, Grant County, New Mexico*. Report submitted to the Gila National Forest. (primary author, with Barbara Roth)

2009 Expedición Rapa Nui: Proyecto Natural y Cultural de la Historia Espeleológica. Prepared reports on nine caves: Ana Aharo, Ana Henua Mea, Ana Heva, Ana Kakenga, Ana Roiho, Ana te Pahu, Ana te Pora, Ana Toki Toki, Ana Vaiteka.

2005 Spirit-Bird Cave Archaeological Survey Project, Field Report. Report submitted to the Edge of the Cedars Museum, Blanding.

2005 An Archaeological Reconnaissance of Bear Creek Cave, Greenlee County, Arizona. Report submitted to the Apache-Sitgreaves National Forest.

2005 Feather Cave Archaeological Complex Project, Field Report on the First Session. Report submitted to the Bureau of Land Management, Roswell Field Office.

2005 Feather Cave Archaeological Complex Project, Field Report on the Second Session. Report submitted to the Bureau of Land Management, Roswell Field Office.

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2005 Feather Cave Archaeological Complex Project, Field Report on the Fourth Session. Report submitted to the Bureau of Land Management, Roswell Field Office.

Reviews

2019 *Footprints of Hopi History: Hopihiniwtiput Kukveni'at.* Edited by Leigh J. Kuwanwisiwma, T. J. Ferguson, and Chip Colwell. *Current Anthropology* 60(4): 602-603.

2019 *Mimbres Life and Society: The Mattocks Site of Southwestern New Mexico.* Edited by Patricia A. Gilman and Stephen A. LeBlanc. *Current Anthropology* 60(1): 152-153.

2006 *The Sweet Potato in Oceania: a Reappraisal.* Edited by Chris Ballard et al. *Rapa Nui Journal*. 20(2):144-146.

2005 Island at the End of the World: The Turbulent History of Easter Island, by Steven Roger Fischer. *Rapa Nui Journal*. 19(2):142-143.

2005 Diffusionism Reconsidered: Linguistic and Archaeological Evidence for Prehistoric Polynesian Contact with Southern California, by Terry L. Jones and Kathryn Klar. *Rapa Nui Journal*. 19(2):141-142.

2003 *Easter Island*, by Jennifer Vanderbes. *Rapa Nui Journal*. 17(2):145-146.

Archaeological Field Experience

2021 ENMU Field School, Mares Rockshelter, Doña Ana County, New Mexico. Excavated and documented multiple units in a multi-component rockshelter and taught excavation skills to undergraduate students under the supervision of Dr. Robert Stokes, ENMU.

2019 City of Rocks Kiva, City of Rocks State Park, NM. Excavated and documented multiple units in an isolated Mimbres kiva under the supervision of Dr. Robert Stokes, ENMU.

2019 Cottonwood Puebloe Survey Project, Gila National Forest, NM. Conducted survey and documentation of surface artifacts, organized and led volunteers at a site in the Mimbres River Valley with Pithouse and Classic Mimbres components under the supervision of Dr. Barbara Roth (UNLV).

2017 Las Cuevas Archaeological Reconnaissance, Chiquibul Forest Reserve, Belize. Conducted excavations and other research in multiple caves and surface architectural sites at a Late Classic Maya site.

2009 Expedición Rapa Nui: Proyecto Natural y Cultural de la Historia Espeleológica, Rapa Nui. Served as Field Archaeologist on cave biology expedition, surveyed and documented cultural features of nine caves.

2003-2008 Cave Archaeology Research and Survey Team. Coordinated non-invasive survey, reconnaissance and documentation of prehistoric cave shrines in New Mexico, Utah, Colorado, and Arizona.

2003 Western Belize Regional Cave Project, Belize. Surveyed and explored multiple Maya ceremonial caves in the Belizean rainforest.

2002 University of Hawai'i Rapa Nui Archaeological Field School, Manoa and Rapa Nui. Trained in archaeological theory and field methods. Earned six credit hours.

Degrees

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Abstract

ENTANGLED WITH THE RAIN SPIRITS: INTENSIFICATION OF RITUAL CAVE USE IN THE MIMBRES REGION AS AN INDEX OF SOCIAL AND RELIGIOUS TRANSFORMATIONS DURING THE LATE PIT STRUCTURE AND MIMBRES CLASSIC PHASES

by
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Over two dozen cave shrines are known from the Mimbres Mogollon region, more than have been reported from any other cultural region in the United States Southwest and Northwest Mexico (SW/NW). Despite some variation, the archaeological record of these sites is remarkably consistent and readily allows for their identification as shrines due to the presence of ethnographically recognizable offertory materials such as prayer sticks (*pahos*), cane cigarettes, and painted wood objects ("*tablitas*"). It remains difficult to determine, however, whether this phenomenon represents a stronger interest in cave ritual among the Mimbres or is simply the product of more thorough cave survey in that region, especially the work of Harriet and C. Burton Cosgrove in the 1920s and Walter Hough in 1905. Neighboring regions show related patterns but fewer cave shrines. A synthesis of available data, including the few available 14C dates, suggests that cave ritual did indeed reach unprecedented levels during the Mimbres Classic (ca. 1000–1130 CE). Herein I synthesize a wide range of data in order to place Mimbres cave ritual in its spatial and temporal context. Available evidence suggests that this intensification in cave ritual was driven simultaneously by population expansion, and by social, political, and environmental factors.

Chapter 1: Introduction

At the start of the twelfth century CE, three distinct regional phases dominated the cultural area comprised of the Southwest United States and Northwest Mexico (hereinafter the SW/NW): the Sedentary Hohokam in southern Arizona, the Bonito Phase of the Chaco Interaction Sphere based in northwest New Mexico, and the Mimbres Classic centered in the Mimbres Valley of southwest New Mexico. Although a number of other groups also flourished within the larger area during that period, none occupied as much territory or left as extensive, distinctive, and regionally cohesive an archaeological record as these three. Societies throughout the eastern part of the SW/NW had, by that time, largely completed the pithouse-to-pueblo transition, and most had committed to sedentary lifeways that emphasized maize-based agriculture. These and other shared traits establish the SW/NW as a clearly definable culture area on a scale comparable to Mesoamerica to the south. However, one of the common features of societies in the SW/NW is that these communities never adopted the same levels of social complexity as groups in Mesoamerica, despite their comparable dependence on maize and numerous other similarities including many common aspects of cosmovision. Nonetheless, each of these three preeminent groups—the Mimbres Mogollon, Hohokam, and Chaco—conducted some level of interaction with Mesoamerica, processes that remain poorly understood, despite the presence of various "smoking gun" markers in the archaeological record such as copper, cacao, and scarlet macaws.

The focus on *cosmovision*, and especially the elements thereof shared between the SW/NW and Mesoamerica, is central to this dissertation. This perspective shifts the

emphasis back to ideological aspects of cave ritual that remained largely outside the interests of the successively-dominant bodies of archaeological theory in the SW/NW, whether of culture-history, processualism, or post-processualism. The operating definition of this term herein is: "the conception that Indigenous peoples have, both collectively and individually, of the physical and spiritual world and the environment in which they conduct their lives" (https://www.lawinsider.com/dictionary/). This version is applied in Native American law practice, and it thus reflects Indigenous perspectives, which fits with my efforts to approach emic perspectives more closely.

Additionally, I use *cosmovision* rather than *cosmology* as the former is the term preferred by colleagues working in Mexico. In this dissertation, I deliberately apply a southern perspective to certain ideological elements of Mimbres Mogollon culture (and of the neighboring Jornada Mogollon as well). I do so partly to emphasize the distinction between southern Mogollon culture and its Ancestral Puebloan contemporaries to the north, whose study has largely driven the area's archaeology, but also in the hope that colleagues working in Mesoamerica will engage with this research. Additionally, I seek to illuminate those ideological and material expressions that potentially have Mesoamerican origins—or which are "cognate" with aspects of Mesoamerican culture through origins in "deep time," i.e. during the Early Holocene, the Pleistocene, or beyond. Above all, my goal in centering cosmovision is to apply a filter that will allow at least some reconstruction of an emic perspective that has remained elusive in the study of a people for whom no direct ethnographic or ethnohistoric data are available.

The Archaeological Context of Mimbres Cave Ritual

By the middle of the twelfth century, Chaco and the Hohokam had undergone major reorganizations, including significant contractions in their previous spheres of influence, while the people of the Gila and Mimbres drainages had depopulated their communities and disappeared almost entirely from the archaeological record. They left behind dozens of cobble-walled adobe villages (several of them among the largest sites for their time anywhere in the SW/NW area), tens of thousands of elaborately-painted ceramic vessels, and extensive accumulations of mostly perishable artifacts in dozens of cave shrines. Unfortunately, the Mimbres archaeological record has suffered some of the most violent depredations of looters for well over a century, with entire sites bulldozed into oblivion and cave shrines stripped bare. Indeed, awareness of what one senior scholar has described as the "holocaust" of Mimbres archaeology (Karl Laumbach, personal communication 2022) contributed directly to the passage of the New Mexico Cultural Properties Act of 1978 and the Archaeological Resources Protection Act of 1979.

Although most research in the Mimbres region has focused on settlement patterns and ceramics, the data from cave shrines in the Mimbres and Gila drainages offer extraordinary opportunities to further our understanding not only of prehistoric ideology, but also of settlement and subsistence patterns, the mainstays of human behavioral ecology. Much of this data was unfortunately lost due to vandalism and looting by Anglo-American settlers, which began as early as the 1870s (Anonymous 1978). Nevertheless, thanks primarily to the timely early-twentieth century work of Walter Hough (1907, 1914, 1915) and Cornelius Burton Cosgrove (1947) and Hattie Cosgrove, some portion of the archaeological record from cave shrines in the Mimbres and Gila

drainages survives in museum collections, if not *in situ* within the original cave shrines themselves. Thus, although prehistoric cave ritual was not exclusive to the Mimbres region and was clearly also extensive throughout much of the SW/NW—especially in the Jornada Mogollon region to the east (Ellis and Hammack 1968; Nicolay and Beresh 2023), in the Reserve region to the north (Martin et al. 1952), and in the sky islands of Arizona to the west (Fewkes 1898; Hough 1907:37)—the systematic efforts of these early researchers have left us collections with levels of completeness and documentation as to allow for the comparison of approximately two dozen sites. No comparable datasets exist for Chaco, the Hohokam, or for any other cultural region in the SW/NW before or after. Therefore, despite the wholesale decimation of much of the Mimbres archaeological record, a substantial set of cave data survives from the region that remains unparalleled elsewhere in the SW/NW (other than for the closely-related Jornada Mogollon region, discussed in Chapter 4, for which a roughly comparable dataset can be assembled from a much wider array of sources). The systematic examination of this dataset offers the potential to deepen our understanding of area-wide patterns on a larger scale—hence the selection of the Mimbres and Gila drainages for this study. The Eastern Mimbres region, which extended up to the Rio Grande, does not form part of this discussion because with the possible exception of Chavez Cave, a multicomponent site discussed in Chapter 4, no potential cave shrines have been identified there.

It is important to note however, that Hough and the Cosgroves, as well as other pioneering archaeologists who excavated caves elsewhere in the SW/NW during the late nineteenth and early twentieth centuries, had little interest in the study of prehistoric cave ritual *per se*. They did not conduct their excavations with the goal of learning more about

the activities that created the mostly perishable assemblages whose badly disturbed and fragmentary remnants they recovered. For them, the study of ritual was the province of ethnographers, whose research had already made it easy for them to recognize caves as shrines through the presence of items such as *pahos* (Hopi: prayer sticks), *tablitas* (painted wooden boards), and cane cigarettes that remain intimately associated with Pueblo ritual to this day. These early cave excavations served primarily for museum stocking, although by the time of the Cosgroves, who received their formal archaeological training from A. V. Kidder, the emphasis had begun to shift toward the establishment of culture-historical frameworks for the region. In all cases, however, the immediate goal was the acquisition of a perishable assemblage that was largely unavailable from excavations in open sites. A sense of urgency also compelled these early workers, as they were well aware that caves were being looted and vandalized on a massive scale. Therefore, it is thanks to their timely intervention and forethought that the most complete dataset for the study of *both* prehistoric cave ritual *and* perishables from anywhere in North America survives today.

Nonetheless, one of the important questions that this dissertation seeks to address is whether the large number of cave shrines identified in the Mimbres and Gila drainages simply reflects the product of earlier and more systematic survey work than in other regions of the SW/NW, or if it points to the genuine presence of proportionally *more* such cave shrines and/or cave ritual than in neighboring regions. If this quantitative difference indeed reflects more than an "artifact" of differential survey and research, then concomitant questions follow, including:

1. Why did cave ritual become so widespread and intensive in this region?
2. What was the chronology of ritual cave use in the Mimbres region?
3. How does this chronology relate to other large-scale processes, including climatic events and the cultural trajectories of both neighboring regions in the SW/NW and Mesoamerica?

Addressing these questions requires the application of theoretical models of more recent vintage than those applied by the original excavators. Archaeologists have recognized the ancient connection between prehistoric humans and caves since the foundations of the discipline. Caves have provided and continue to provide some of the greatest discoveries about human prehistory all the way back to earlier hominid species. Yet even within the discipline of archaeology, and partly for these reasons, understanding of this relationship remains obscured by the clichéd image of the "cave man," which was already "well-entrenched by the late 1800s" (Moyes 2012:3). This concept persists in popular culture through cinema and cartoons depicting early humans wearing animal skins and living in caves furnished as crude versions of the modern American suburban home, often accompanied by dinosaurs and other gross anachronisms. The late Andrea Stone addressed this misconception by situating the cave-human relationship in a broad spatiotemporal frame, observing that "cave ritual, like food or anything else ideally suited for satisfying critical human needs, serves a purpose that is fundamental and therefore is reimagined over and over again in different times and places" (2012:365). The immense chronological and geographical range of cave ritual in human societies suggests some degree of the potential these sites offer to archaeological research. Indeed, we must

consider that cave ritual has origins in the deepest measure of "deep time," extending far before the population of the New World and potentially back to the earliest appearance of modern *Homo sapiens* and the origins of human cognition and symbolic thinking in their contemporary forms. Although research questions on that scale remain far outside the much more limited focus of this dissertation, it is important nonetheless to keep in mind that Mimbres cave ritual, whatever its degree of intensity, is but one expression of a category of human behavior that has occurred all over the world and throughout the development of our species.

Mimbres Cave Ritual in the Southwest/Northwest

The ritual use of caves and other earth openings clearly has great antiquity in the SW/NW (Ellis and Hammack 1968; Nicolay 2012; Nicolay and Beresh 2023; Sandberg 1950) and might be evidenced in the archaeological record as early as the late Pleistocene, as it appears that early hunter-gatherers in the area left their distinctive bifacial spearpoints as offerings in the dark zone of several caves in New Mexico (Harrington 1933; Hibben 1941; Mera 1938; Thompson and Haynes 2012).[1] Significant manifestations of ritual activity appear at several major sites across the region coincident with the Middle to Late Holocene transition ca. 4000 BP, including *wahaniak shukuk shtuitauw*, a.k.a. the Correo Shrine (Geib et al. 2017; Sandberg 1950), Ceremonial Cave near El Paso, Texas, and multiple split-twig figurine caves in the Grand Canyon (Emslie et al. 1987, 1995). Although the earliest usage of these Archaic sites begins roughly around the same time as the initial arrival of maize agriculture in the region and precedes

by only a few centuries the Middle to Late Archaic transition ca. 3500 BP, ceremonial assemblages in most of the caves dating prior to the middle of the first millennium CE exhibit almost exclusive associations with hunting and/or warfare. Their composition also suggests a slow deposition and accumulation of offerings such as atlatl darts, spearpoints, grooved fending sticks, or split-twig figurines over long periods of time. Chapter 3 provides an overview of the chronological and geographical dimensions of cave ritual in the SW/NW in order to establish a context for the analysis of the localized manifestations of these practices in the Mimbres region.

This pattern changes significantly at the same time that the signals for processes associated with the Agricultural Demographic Transition (ADT) first become pronounced in the archaeological record of the SW/NW (Kohler et al. 2008; Kohler and Reese 2014). Identification of this phenomenon remains somewhat controversial for the SW/NW, especially when described via Old World terminology (i.e. as the *Neolithic* Demographic Transition), but globally it is associated with the transition from mobile hunter-gatherer lifeways to agriculture and sedentism, as well as being marked by accelerated population growth, usually followed by several centuries of increased mortality rates and eventual societal collapse. In the southern SW/NW, including the Mimbres region, this period is marked by significant population growth, the advent of sedentary lifeways, increasing dependence on maize agriculture, the appearance of Mesoamerican prestige goods, replacement of atlatls and darts by bows and arrows, and the regional pithouse-to-pueblo transition. Not all these processes necessarily relate directly to the broader ADT phenomenon, however.

In the Mimbres region, the signals for processes comparable to the ADT end ca. 1130 CE with the nearly complete depopulation of the Mimbres and Gila drainages concurrent with a period of unpredictable precipitation regimes that culminated in a regional megadrought (Benson and Berry 2009:100; Grissino-Mayer et al. 1997; Minnis 1985:153–154). The number of cave shrines, the intensity of their use, and the variety of offerings left in them also appears to rise significantly during the period immediately prior to this exodus, although this increase might simply reflect concomitant local population growth prior to the end of the Mimbres Classic.

While the deposition of offerings related to hunting and/or warfare continued and even increased during the final "boom" of the Mimbres Classic, as represented by extraordinary quantities of arrows and bows in some caves, offerings related to agricultural ceremonialism dominate the latter half of the first millennium through the early twelfth century CE in the major Mimbres cave shrines. And then these patterns end, at least in the Mimbres region, almost entirely and permanently, except for a few sites in the north (along the San Francisco River and the upper Blue River) that appear to have been taken over by Highland Mogollon people of the later Tularosa phase as they extended their territory southward during this time, and one or two other peripheral locations where elaborate ceremonial items were deposited or stored and never retrieved.

As Above, So Below

The drastic increase in population density in the Mimbres region during the Classic phase[2] would have required new adaptive social strategies for people living in

larger communities and greater proximity than ever before, all while undergoing radical shifts in subsistence practices. Shafer (2003:216–222) has proposed that a form of ancestor veneration linked to land tenure and manifesting in subfloor intramural burial served an important integrative role during this period. Although Shafer did not incorporate cave data into this proposal, he explicitly described subfloor burial as evidence for ancestor veneration and the operation of a tiered and chthonocentric cosmovision in the region (2003:212–216). The potential role of caves within this framework, as liminal spaces that would have represented actual points of access to the Underworld, becomes readily obvious within Shafer's model, in which Mimbres intramural burials functioned to validate the rights of elite lineages to the best agricultural land and other resources.

In such a tiered model, caves, springs, and the symbolic representations of the *sipapu* (Underworld emergence place) in kivas and other architectural contexts would have served along with intramural burials as the symbolic nexus with the ancestral Underworld. Although the combined archaeological and ethnographic records suggest that a similar cosmovision relating to rain and the Underworld has been pervasive in the Southwest for at least two millennia and remains in place today (Schaafsma and Taube 2006), this complex seems to have incorporated a specialized mortuary tradition as a central component during the Mimbres period.

The melding of cave ritual with ancestor veneration as an ideological complex for maintaining land tenure and perpetuating the rain cycle would have provided an ideal mechanism for giving meaning to both space and time. As geological/geographic features, caves would have situated villages in a sacralized landscape shared across

generations through a corpus of social memory in which cave shrines manifested as a numinous index (*sensu* Peirce 1955) of the Underworld. Andrea Stone recognized this connection as an aspect of the human relationship with caves that has reoccurred throughout human history and prehistory: "Cave ritual's ability to strengthen social solidarity because it melds ideology with a unique spatial milieu is an enduring fact, as true in primordial as in modern times" (2012:365).

However, the intensification of Mimbres cave ritual would also have led to the expansion of emically-perceived relationships with ancestral spirits and other chthonic entities, relationships that could have become "dependencies" of the sort that Hodder describes in his entanglement theory (Hodder 2011, 2012). Although Hodder's emphasis was on material culture and the relationships between humans and things, his theoretical work, due to its simplicity and elegance, extends easily to emic relationships with ancestral spirits, deities, and other "non-corporeal" entities. Figure 1.1 shows both Hodder's original linear formulation of the entanglement model of human-thing dependencies (a) and my expanded version designed to show the emic relation with invisible spirits (b). As Hodder was always implicitly describing a cyclical and intensifying set of relationships, presenting entanglement in this way seems natural, and the position of relationships between humans and the spirits to whom they made offerings becomes obvious. I will discuss these relationships at length in later chapters.

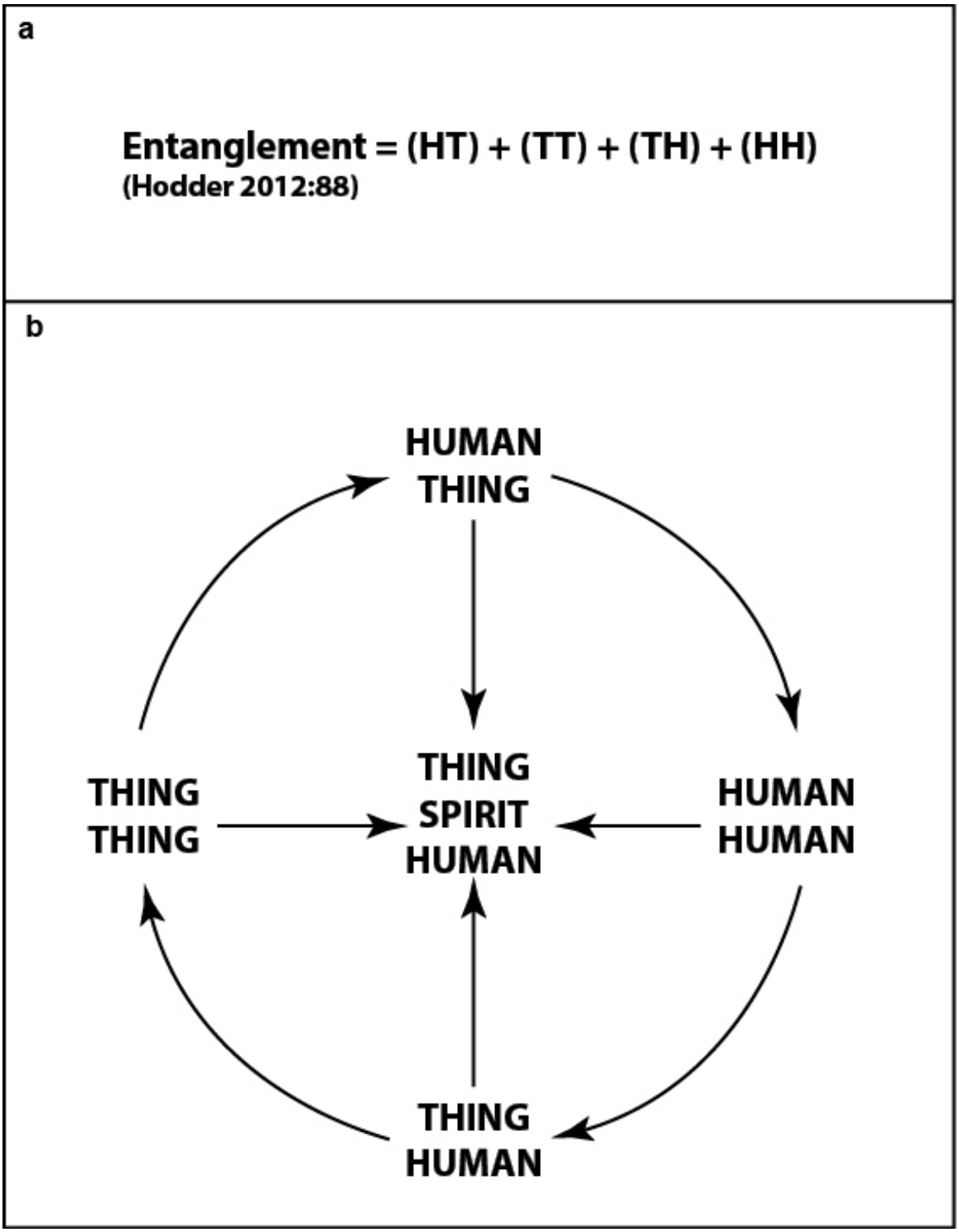


Figure 1.1. Entanglement formulae: (a) Hodder's original Entanglement formula (2012:88); (b) Entanglement formula modified to incorporate a cyclical structure and dependency on spirits.

Despite the wholesale decimation of the Mimbres archaeological record, significant bodies of evidence exist in cave ritual, mortuary patterns, and ceramic and rock art iconography to identify at least the broad outlines of these relationships. This dissertation considers all those aspects of Mimbres material culture that shed light on these emic relationships, and the ways they potentially developed into the sort of dependencies that would have circumscribed societal options during the worsening climatic conditions at the end of the Mimbres Classic. Chapters 10 and 11 focus on Mimbres ancestor veneration, the local northern variation of Tlaloc, and possible "proto-*Katsinam*" in the context of a modified entanglement model, suggesting how the perceived breakdown of tightly woven relationships between Mimbres society and chthonic rain-bringers could have contributed to the end of the Mimbres Classic and the depopulation of the Mimbres and Upper Gila regions in the first half of the twelfth century.

Spirits in the Material World

Even considering the comparatively high quality of the available dataset for cave archaeology in the SW/NW, this pattern seems uniquely evident in the Mimbres region and adjacent areas, especially in the Mimbres and Upper Gila River drainages, which were occupied until the early twelfth century by branches of the groups collectively designated as the Mimbres Mogollon.[3] Whereas evidence suggests that much of the ritual cave use elsewhere in the SW/NW focused for millennia on a limited number of isolated sites of the sort that hunter-gatherer groups have visited periodically, people in the

Mimbres region utilized dozens of rockshelters and caves as shrines, most of which appear to have been in use more or less simultaneously between ~650–1130 CE. I write "appear" because very few radiocarbon dates are available from the enormous quantity of materials recovered from the caves of the Gila and Mimbres areas. However, the lack of atlatls, darts, and fending sticks in most of these caves—along with the limited associated ceramics—suggests that the use of most of these sites began during this timeframe and not before, and that it ended with the Mimbres Classic. Little ceramic evidence exists to suggest that these sites received offerings during the subsequent Black Mountain, Cliff, and Animas phases, when ceramic types from neighboring regions dominated local assemblages. Other than those few caves in the north that appear to have been reused by Tularosa phase and Salado populations, ceramic data and most of the few available radiocarbon dates point primarily to the Mimbres Classic (ca. 1030–1130 CE).

The presence of both full-sized and miniature (votive) bows and arrows in many of these shrines, sometimes in very large numbers, provides another relative temporal baseline. The large numbers of bows and arrows in these shrines suggest that increased cave use in the Mimbres and Gila drainages postdates the arrival of this technology from the north around the beginning of the Late Pithouse period/San Francisco phase ca. 500 CE (Roth et al. 2011) and ends before the area-wide transition from sharpened reed and wood composite arrows to stone-tipped wooden arrows and sinew-backed bows sometime during the thirteenth century.

The early 500–700 CE time period for the initial transition from darts to bows and arrows in the category of hunting offerings is also marked by the appearance of a unique goggle-eyed deity in the iconography of the Mimbres and neighboring Jornada Mogollon

regions (Miller et al. 2023, 2024). Although the origins of this figure remain contested, it shares many contextual associations (beyond the goggle eyes) with the Mesoamerican rain deity ethnographically known in Nahuatl as "Tlaloc," including caves and the Underworld, ancestors, hilltops and mountains, water, rain, and lightning (Schaafsma 1980, 1997, 2000; Schasfsma and Schaafsma 1974; Schaafsma and Taube 2006). Several new and previously ignored radiocarbon dates place the appearance of the goggle-eyed figure and associated iconography and technologies in the Southwest as early as 650 CE, near the beginning of the Epiclassic in northern Mesoamerica and within living memory of the initial depopulation of Teotihuacan (Hyman et al. 1999; Miller 2018; Miller et al. 2023, 2024; Nicolay 2018; Rowe 2005). The arrival of this figure in the current US/Mexico borderlands thus appears to coincide with the intensification of both sedentism and ritual cave use around the start of the San Francisco Phase in the Mimbres region ca. 650–750 CE, or the mid-eighth century transitions between the Initiation and Expansion phases (Anyon et al. 2017:239), or from the Early to Middle Pit Structure phases (Gilman and LeBlanc 2017:18–20, Table 1.1), suggesting that it is one archaeological marker for a new ritual complex, one possibly linked to more complex societies to the south, and to one of the "hinge points" that I will discuss further in later chapters. If this "*Tlaloc del Norte*" is indeed a version of the Mesoamerican deity, and it retains similar associations in the Mogollon area, its appearance in the SW/NW could be an index for the initial restructuring of Mimbres society toward a greater emphasis on rain ritual and ancestor veneration, with the former tied to the latter, and the latter likely tied to land tenure systems, a development also linked to the ADT in many other parts of the world, including South America and Mesoamerica.

A second religious transformation appears to have swept the Mimbres region during the first half of the proposed Transitional phase (ca. 900–1000 CE) at the end of the Late Pithouse period, which was marked by the ritual closure or retirement of many of the great kivas in the Mimbres Valley and a transition to smaller, "corporate" kivas associated with public or semipublic plazas (Anyon and Creel 2010). This transition closely follows the end of the Epiclassic in Mesoamerica and the subsequent onset there of the Postclassic, pointing to another possible macro-areal hinge point. During this period, complex urban societies (the Guadiana and Suchil Chalchihuites) largely withdrew from the eastern Sierra Madre Occidental, while the markers for a new cultural complex known as Aztatlán extended northward through the western coastal region of Mexico all the way to southern Sinaloa. The appearance of copper crotals (tinkler bells) and scarlet macaws in the Mimbres region at this time provides evidence both for a religious transformation and a changing relationship with groups in the shifting and expanding northern periphery of Mesoamerica, especially in West Mexico, where copper metallurgy was first introduced from South America ca. 600 CE.

Iconography resembling *Katsinam* also begins to appear in the Mimbres regions, and possibly also in the adjacent Jornada region, during the Expansion phase (ca. 750–1000 CE) and continues throughout the Mimbres Classic/Differentiation phase (ca. 1000–1130 CE), appearing afterward, but not immediately, in neighboring regions. Changes in both architecture and iconography during the Mimbres Classic point to the appearance of at least some form "proto-*Katsinam*" during this phase, perhaps beginning with the shift in ceremonialism marked by the termination of the great kivas and the move toward the

communal use of plazas instead. Community-accessible dances in plazas are a defining element of *Katsina* rituals in Pueblo communities today.

The period ca. 1040–1125 CE, which encompasses most of the Mimbres Classic, was one of above average and highly reliable rainfall in the Mimbres region, and within this time, the decade ca. 1100–1120 CE was the wettest period recorded in the entire 1,373 year period (ca. 600–2000 CE) that Grissino-Mayer and colleagues reconstructed (1997:24). This favorable precipitation regime gave way abruptly ca. 1125 CE to unprecedented low annual totals and high climate variability (Grissino-Mayer et al. 1997:2). Sometime after 1130 CE, the Mimbres largely abandoned the Mimbres and Gila drainages and discontinued the Black-on-white pottery tradition that serves as the most recognizable marker for their presence in the archaeological record. Although an informal consensus exists among scholars that some continuity exists between the populations of the Mimbres Classic and the subsequent Black Mountain phase in the southern and central Mimbres Valley, substantial differences exist in the material culture of these phases, especially in architecture and ceramics. Notably, although Black Mountain phase communities often established themselves in close proximity to Mimbres Classic villages, they rarely reoccupied these earlier sites, suggesting some social prohibition or taboo regarding their ancestral homes.

The primary depopulation of the Mimbres area ca. 1130 CE precedes by less than a single generation that of both Chaco Canyon to the north and Tula Grande in Mesoamerica far to the south, as well as the contraction and reorganization of the Sedentary Hohokam phase in southern Arizona, all of which occurred ca. 1150 CE. With populations in much of the Mimbres region at carrying capacity by the start of the twelfth

century (Minnis 1985:154), conditions would have been right for the onset of catastrophic food stress and concomitant strain on the established social order.

I have previously argued that the people who left this region experienced a religious schism during this time, abandoning their existing tradition of *specific* ancestor veneration but retaining a form of *general* ancestor veneration, wherein all initiated members of society, and not just those named and commemorated individuals buried beneath household floors, became rain-bringing spirits in the afterlife (Nicolay 2008). This latter form is consistent with the nature of ethnohistoric and contemporary *Katsina* ceremonialism, a religious tradition that had spread throughout most of the agricultural communities of the current US Southwest by the time of Spanish contact (with the exceptions of the O'odham and Athapaskan groups, and possibly Taos Pueblo in the far northern Rio Grande). Within a century after the Mimbres depopulation, *Katsina* iconography begins to appear in regions outside the Mimbres and Jornada territory, possibly carried by Mimbres emigrants, at least in the western portion of the Pueblo world. Ethnographically, *Katsinam* in many contemporary pueblos are chthonic spiritual entities whose ultimate home is in a lake or other point of access to the watery underworld. Although not all *Katsinam* are ancestral spirits, this category represents the largest category of these beings at most pueblos, particularly in the west (White 1935:138).

Research Questions

Based on this initial synthesis, I argue that the period ca. 650–1150 CE is bracketed by two major religious and demographic shifts: the arrival of a version of the Mesoamerican storm god ca. 650 CE, which provided the basis for a system of ancestor veneration that entangled ancestors with rain and maize agriculture, and which would have validated land tenure, and the end of the Mimbres version of that system ca. 1130 CE. Approximately halfway through this period, during the early tenth century, an intermediary shift occurs, marked by the burning of large communal kivas and a shift to smaller, lineage-oriented kivas associated with public or at least semipublic plazas (Anyon and Creel 2010). This shift potentially indicates changing relationships with societies on the northern periphery of Mesoamerica as well as the adoption of ancestor veneration practices that manifested in an early form of *Katsina* ceremonialism. Multiple cave shrines continued in use throughout this transition, and materials recovered from these sites potentially contain evidence for associated shifts in religious behavior, including at least one portable artifact from a Mimbres cave shrine bearing the painted image of a "proto-*Katsina*" (Cosgrove 1947; Miller et al. 2023, 2024; Nicolay 2008). In Chapter 11, I will address the possible Mimbres origins of the *Katsina* tradition in detail.

The survival of a portion of this extraordinary archaeological record is largely due to the region's especially dry climate, which preserved the extensive and predominantly perishable assemblages of many shrine caves virtually intact throughout the SW/NW. The Athapaskan people who subsequently occupied the Mimbres and Gila drainages do not appear to have disturbed the ancient caves much or at all, likely due to their own religious prohibitions regarding the handling of materials associated with predecessor cultures, a tradition known in English as "avoidance." I first became familiar with this

practice while living on the Diné Nation as a tribal in-law, but I know from *Ndee* (Apache) contacts that they practice it as well, as described by Cowell and Laluk: "Ndee (Western Apache) communities often avoid ancestral sites and places associated with the past out of respect. Ndee communities demonstrate such respect in the form of avoidance to protect both community members and archaeological sites from potential harm. Most importantly, avoidance helps maintain *Gózhó*, a state of balance and harmony in the world" (2023). Thanks in large part to such cultural practices, the archaeological record of Mimbres cave shrines remained intact until the arrival of white colonial settlers in the latter half of the nineteenth century. These newcomers almost immediately commenced the systematic and commercial looting of both caves and open sites (Anonymous 1878).

Fortunately, as described above, Walter Hough, the Cosgroves, and a few other early archaeologists recovered portions of the archaeological record from some of these caves before the near-complete decimation of this cultural heritage. Both Harvard's Peabody Museum and the National Museum of Natural History retain large collections of materials from caves in the Mimbres, Gila, and other subsidiary and adjacent drainages, the former due to the efforts of the Cosgroves in the 1920s (Cosgrove 1947), and the latter thanks to work by Hough in the first decade of the twentieth century (Hough 1907, 1914, 1915). Although these researchers did not provide detailed spatial provenience for the materials they recovered (and in most cases the original provenience was impossible to reconstruct because of the disturbance that these deposits had already undergone), they nonetheless recovered extensive collections of perishable materials, including many artifacts readily recognizable as associated with contemporary Pueblo ceremonialism. Archaeologists often exhibit a strong resistance to identifying artifacts as "ritual," but

early cave researchers had no need for such reluctance, as the ethnographers who preceded them had already confirmed the roles of many of these items in religious contexts (Cushing 1990:143–146).

I must note however, that my purpose in studying ritual cave assemblages is not to link the archaeological record to any *specific* practices of contemporary Pueblo communities. Not only does that level of detail remain beyond reach; the Pueblo people clearly do not desire it. As archeologists, we must recognize that outsider knowledge of sacrosanct ceremonies has harmful effects on contemporary communities, including the exposure of uninitiated community members to esoteric information (Brandt 1980), and the further theft of sacred objects by outsiders, which remains an ongoing problem. Attempts to identify elements of specific contemporary ceremonies in prehistory are not only extraneous to this research but both disrespectful to descendant communities and misguided overall. The general patterns of prehistoric traditions and the processes of their change over time are of interest to the archaeologist, as these potentially hold considerable information about settlement, subsistence, climate, social structure, and politics, but the ideological specifics of these activities remain the province of Indigenous communities alone.

Moreover, despite the possibility of drawing occasional direct links, little potential remains for tying most of these ancient traditions to the ethnographic record, which is itself incomplete and problematic in regard to the specifics of extant ceremonies. In the case of the Mimbres, many unique practices almost certainly did not survive their emigration from their original homeland—for instance, the distinctive bat impersonators that appear on multiple bowls, something that did not survive into ethnohistoric times.

Although we can perhaps address the reasons for the Mimbres exodus, and for the subsequent erasure of associated traditions from social memory, we have no need to seek the *details* of specific living Pueblo traditions in the Mimbres Classic. Therefore, this dissertation does not pursue proprietary Pueblo information of that kind.

Although the precise thoughts of prehistoric and non-literate peoples remain forever beyond the scope of archaeologists to recover, the *patterns* of that thought do leave their traces in the archaeological record. We can clearly see evidence for the presence of a complex, profound, and consistent cosmovision in almost every major aspect of the Mimbres archaeological record, including cave shrines, architecture, mortuary ritual, and ceramic and rock art iconography. By the time of the Mimbres Classic, this cosmovision had come to focus profoundly on ancestors, rain, hunting, and the underworld. How this emphasis manifested in cave ritual and the assemblages it produced, and whether associated changes in the archaeological record of cave shrines are visible in the early tenth century CE or before are important questions.

Moyes and colleagues (2009:175–206) argue for the ascendance of a "drought cult" in the Maya region during the Late Classic (the Epiclassic elsewhere in Mesoamerica), and that this drought cult led to intensification of prehistoric Maya cave use. Their hypothesis leads to a further question: Does the evidence from the Mimbres region support the development of a comparable religious response there during the ca. 1125–1140 CE drought that marked the end of the Mimbres Classic? Moyes and colleagues base their conclusions on a shift in ritual practice coincident with a drastic climactic downturn. The simultaneous proliferation of hunting/warfare offerings in the Mimbres region does not immediately seem to support such a shift in ritual practice,

suggesting instead a slow intensification of petitions for the increase of game animals concomitant with the accelerating dependence on sedentism and agriculture during the Late Pithouse Period and into the Mimbres Classic. This fits with the predictable and documented decrease in large game animals in the vicinity of settlements, artiodactyls especially, that would have accompanied the transition to sedentism and associated population increases (Schollmeyer et al. 2018; Shafer 2003:126–129, Figure 7.9). Nor do rain-related offertory practices appear to have been a late addition to the ceremonial repertoire of the Mimbres Classic, although to be sure, the lack of undisturbed stratified deposits in cave shrines makes this progression difficult to determine.

Evidence for the development of a pervasive ancestor veneration tradition during the late Three Circle/Transitional and Classic phases, and the presence of the Mogollon form of the Mesoamerican Storm God in the Mimbres Valley prior to 900 CE, as evidenced by multiple images of this figure on Mimbres Style I B/w ceramics, all strongly suggest that ancestor-related weather control became a component of Mimbres ceremonialism and cosmovision prior to the pithouse-to-pueblo transition and over a century before the start of the severe drought during which the Mimbres Classic ended in the Mimbres and Gila drainages. Nonetheless, the climactic crisis that coincides with the end of the Mimbres Classic could have led to the proliferation of offerings in caves within the parameters of existing traditions rather than a distinctive shift in ritual practice as identified in the Maya region by Moyes and colleagues (2009). Thus, any change in Mimbres cave offerings was likely in quantity only. Although the sheer amounts of offerings in some sites, especially Mule Creek Cave and Greenwood Cave, suggest this possibility, the extant archaeological record simply might not be fine-grained enough to

disaggregate the pertinent data and identify any qualitative shift at that time. Ultimately, the narrow interval between the commencement of the regional drought and the depopulation of the Mimbres Valley is potentially too small to discern with 14C dating.

Although my focus in this dissertation is on the systematic comparison of the materials recovered by early twentieth century archaeologists, in Chapters 7 and 8, I will supplement that dataset with information from a handful of other caves in the Mimbres and Gila drainages, including several with anomalous but obviously ceremonial elements. I will also consider comparative data from cave shrines in adjacent regions and the archaeological record from open sites, with a special emphasis on data from ceramic and rock art iconography that have the potential to illuminate the speleo-archaeological record. Altogether this information offers significant insights not only into Mimbres cosmovision and ceremonialism, but also into the processual changes that these beliefs and practices underwent during the Late Pithouse period and Mimbres Classic phase. Developments in the Mimbres region during the final phase of regional occupation appear to have provided models for aspects of the larger Pueblo world that had become dominant by the time of initial European contacts, including apartment-style pueblos with plazas, a relatively egalitarian social structure, and a generalized form of ancestor veneration (*Katsinam*). Therefore, the cosmovision of the Mimbres Classic deserves special attention.

Based on these foundational considerations, this dissertation will address the following research questions:

1. If cave ritual in the Mimbres Mogollon region was quantitatively and/or qualitatively distinct from related practices in adjacent regions, then how do these differences manifest in the archaeological record?
2. If shifts in Mimbres cave ritual reflect corresponding shifts in village life, including the pithouse-to-pueblo transition, the burning of the Great Kivas, and factors leading to depopulation ca. 1130 CE, then what are the material correlates of these shifts in the cave archaeological record?
3. If changes in Mimbres cosmovision reflect the impact of major outside events, especially catastrophic climate events and changing relationships with Mesoamerican polities to the south, then how do these changes manifest in ritual practice and iconography?

Overall, the goals of this dissertation are to clarify the chronology and role of Mimbres cave shrines in the region's cultural trajectory and to relate the use of these sites to the evolving religious practices in villages. The lack of spatially controlled data from excavations in cave shrines complicates this effort. However, a handful of 14C dates and the potential for relative dating make the recovery of some chronological data possible, and these data might be enough to draw links between cave deposits and major events of the Mimbres sequence.

In subsequent chapters, I will frame Mimbres cave ritual within the overall Mimbres sequence and the larger tradition of cave ritual within the SW/NW as a culture area, with special emphasis on the adjacent and closely-related Jornada Mogollon region; as well as with major shifts and events elsewhere in the SW/NW and in Mesoamerica,

and significant regional climactic events. I will further supplement the Primary Dataset with information on several "alienated assemblages," i.e. obviously ritual assemblages that lack specific provenience, but which all can be connected to locations in the Gila drainage. I will also examine Mimbres cave shrines in relationship to the region's overall archaeological record, comparing the distribution of cave shrines to regional settlement patterns and exploring the material culture recovered from these caves in relation to both the assemblages from open sites and the iconography of Mimbres Black-on-white ceramics and rock art. This extraordinary corpus of images, some of which depict artifacts and practices that do not appear to have survived into the ethnographic present, provides an incredible resource that deserves close and systematic attention in any large-scale study of Mimbres society. Collectively, this information can aid in the interpretation of the reasons the Mimbres people used cave shrines, how they used them, and when these activities commenced and reached their apogee.

Chapters 10 and 11 build on this presentation of data in order to address Mimbres ancestor veneration. Chapter 10 considers ancestor veneration as a global phenomenon and in the SW/NW, as well as *Katsina* traditions in their contemporary forms. Chapter 11 examines the manifestations of this practice in the Mimbres archaeological record, including Tlaloc and "proto-*Katsinam*" and their link to the Underworld, as well as what could be the earliest dated image of a *Katsina* in the SW/NW, which was recovered by the Cosgroves from Mule Creek Cave (Cosgrove 1947; Miller et al. 2023, 2024). These chapters apply a modified version of Hodder's entanglement model (2011, 2012; Figure 1.1), extending that theory's original material emphasis to consider how the Mimbres locked themselves into increasingly irreversible relationships of "dependency" with the

chthonic beings—ancestors especially—that they believed responsible for maintaining precipitation regimes. The direct link between ancestor veneration, land tenure, and rainfall would have placed these perceived "spiritual entanglements" at the very heart of the social structure, ultimately leaving Mimbres society vulnerable to precisely the sort of internal fracture that could explain its dissolution, regional depopulation, and the apparent deliberate erasure of the Mimbres Classic from the social memory of descendant communities.

Notes

[1]It remains possible that some of these occurrences represent much later deposition of culturally-curated artifacts, and Sandia Cave, included here as the primary exemplar of a Paleoindian cave shrine, is a highly controversial site. No controversy however exists as to the legitimacy of the Folsom points recovered from this cave and their association with an extensive ocher deposit, a material known to have ritual associations during the Paleoindian period (see for instance Bement [1997], and Bement et al. [1997]), which potentially points toward an offertory assemblage rather than a utilitarian cache. Just as Thompson and Haynes (2012) returned to the dating and faunal analysis of materials from that site, the context of its Paleoindian use also deserves fresh attention, although such an analysis is outside the scope of this dissertation by some hundreds of kilometers and thousands of years.

[2]During the Mimbres Classic, populations in the Mimbres Valley attained the highest levels they have ever reached, before or since.

[3]The Mimbres region actually encompasses at least three distinct subregions: the Mimbres Valley and its tributaries, the Upper Gila and its tributaries, and the Eastern Mimbres area, which is the region between the Black Range on the west and the Rio Grande in the east. The archaeology of the Eastern Mimbres area remains much less well understood than that of the Mimbres and Gila drainages. Most importantly, an exhaustive literature search (including the highly restricted database of New Mexico caves that is

managed by the Southwest Region of the National Speleological Society) has revealed no cave shrines in this region, nor any caves with evidence of prehistoric use. The only possible Mimbres cave shrine close to this region is Chavez Cave, in the Robledo Mountains near Las Cruces (Cosgrove 1947; O'Laughlin 2003), which appears to be a multicomponent site that includes use by Archaic, Jornada, and possibly Mimbres populations.

Chapter 2: The Mimbres Sequence and Macro-Areal "Hinge Points"

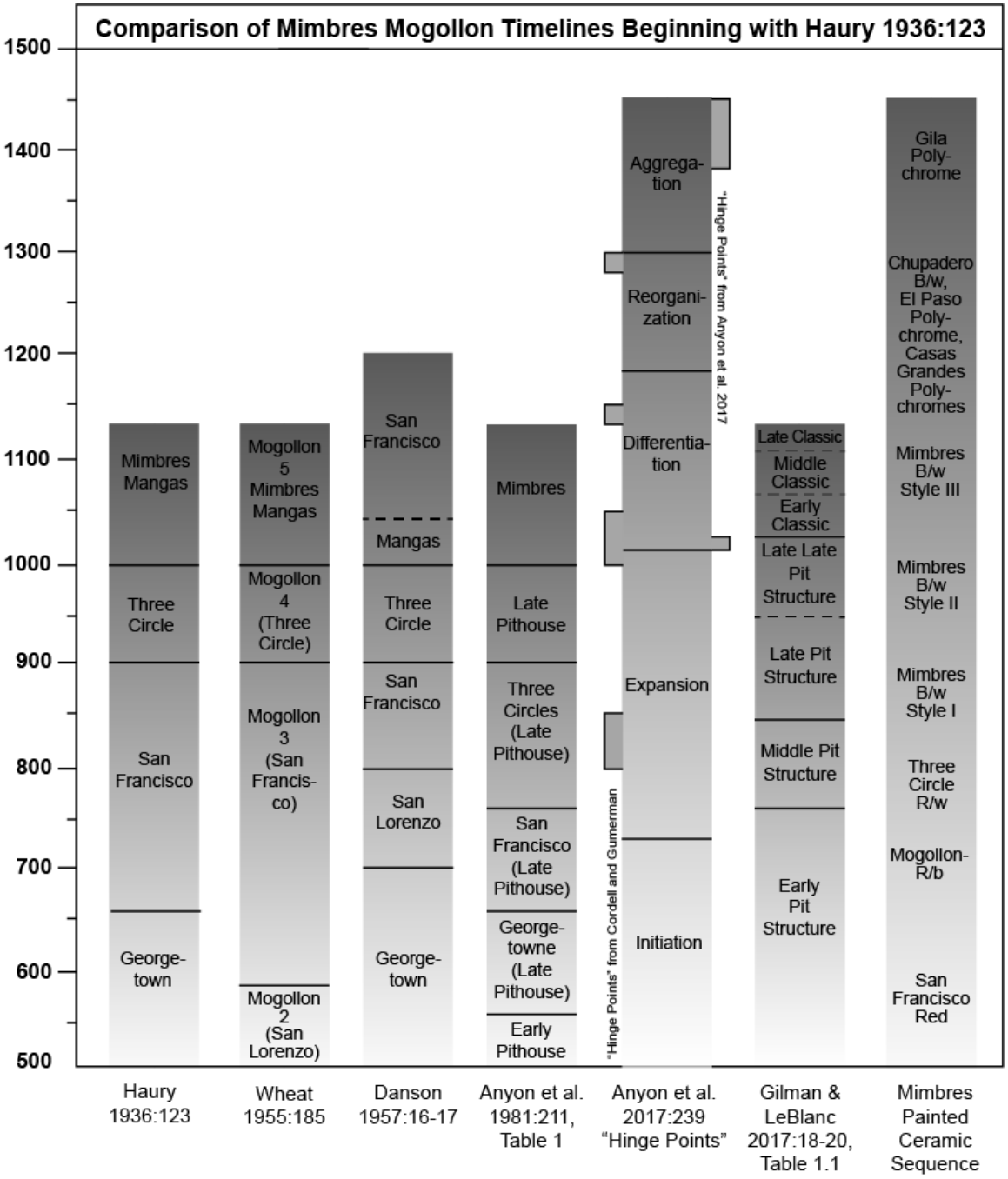


Figure 2.1. Comparison of Mimbres Mogollon timelines beginning with Haury (1936a:123).

The original culture-historical chronology of the Mimbres region derives from Haury (1936:123), and this classification remained the primary standard for almost half a century, despite several proposed revisions and alternate versions (Danson 1957:16–17; Graybill 1973:42; Wheat 1955:185). Anyon and colleagues (1981:211, Table 1) presented a revised chronology based on the radiocarbon and tree-ring dates that had become available since Haury first proposed his chronology, and this revision was the first chronology to gain significant traction among Mimbres scholars. One feature that makes it especially useful is that it groups the three phases that precede the Mimbres Classic into a "Late Pithouse period."

In 2017, two groups of Mimbres archaeologists separately published another set of revised chronologies of the Mimbres sequence (Anyon et al. 2017:339; Gilman and LeBlanc 2017:18–20, Table 1.1) (Figure 2.1, Tables 2.1 and 2.2). The former represents the work of a convocation of Mimbres scholars who primarily based their reevaluation on dendrochronological, radiocarbon, and archaeomagnetic dates that were not entirely available to earlier researchers (Anyon et al. 2017:316–343. In that paper, the authors noted that some major transitional events in the Mimbres region appeared to correspond to the area-wide "hinge points" that Cordell and Gumerman described for the SW/NW *toute entire*, and they propose their own modified—and somewhat narrower—hinge points for the Mimbres region specifically (Anyon et al. 2017:339; Cordell and Gumerman 1989:6; Table 4) (Figure 2.1, Table 2.1).

Table 2.1. Revised Mimbres Chronology from Anyon et al. (2017:339).

Descriptive Titles from Cordell and Gumerman	Hinge Point Dates (CE) from Cordell and Gumerman (1989)	Mimbres Hinge Point Dates (CE)*
Initiation	200/500-750/800	170/290-735
Expansion	770/800-1000/1050	735-1000/1010/1020
Differentiation	1000/1050-1130/ll5O	1000/1010/1020-1170/1125
Reorganization	1130/ll50-1275/1300	1170/1125-1300
Aggregation	1275/1300-1540	1300-1380/l515

*Based on Bayesian analyses of short-lived plants/beams/archaeomagnetic date medians.

I explore the possible relationships of "hinge points" to Mimbres cosmovision and ritual herein, and further consider the possibility that at least some of these transitions are also demonstrable in Mesoamerica and thus potentially "macro-areal." I consider it vital to examine closely possible correlations and causality in that context. Several questions are important in this regard. These questions integrate with my primary research questions, but cannot be answered fully within the scope of this dissertation, as necessary data—some of which must come from beyond the Mimbres region—is not entirely available at this time. Nonetheless, I will address them to the fullest extent possible.

1. If these correspondences demonstrate interregional and/or even inter-areal cultural interaction, then do they represent the shared effects of wide-reaching climatic events (keeping in mind that these possibilities are not mutually exclusive)?
2. If long-distance cultural interactions contributed to these temporal correspondences, then what was the direction of influence, and with which

societies, within or beyond the SW/NW, did the Mimbres engage (and was this engagement direct or mediated)?

3. To what extent did major events in the Mimbres region influence or affect events elsewhere in the SW/NW before and after the end of the Mimbres Classic ca. 1130 CE?

Although the archaeological record in the Mimbres region has experienced such a high degree of damage that its capacity to address all aspects of these questions is limited, these considerations remain important, and engaging with them demonstrates the relevance of Mimbres archaeology to the larger SW/NW cultural area. Pueblo society at the time of European contact more closely resembled that of the Mimbres Classic than of more hierarchically structured communities such as Chaco Canyon, Aztec Ruins, and Paquimé in several major aspects: apartment-style pueblos, a relatively egalitarian social structure, and a generalized ancestor veneration tradition (*Katsinam*). Despite obvious but ultimately superficial differences in material culture, the possibility exists that the relocation of Mimbres emigrants had a significant influence on agricultural communities throughout much of the SW/NW beginning as early as the second half of the twelfth century and continuing throughout subsequent prehispanic periods, especially during and after Cordell and Gumerman's "Aggregation Period," which they identify as beginning ca. 1275–1300 CE (1989:6). Therefore, an enhanced understanding of the dynamics in operation at the end of the Mimbres Classic has the potential to offer interpretative insights for the SW/NW as a whole.

Archaeologists have long recognized that patterns in the Mogollon region do not fully correspond to the Pecos Classification, a culture-historical timeline first developed

by Alfred Vincent Kidder and his colleagues at the first Pecos Conference (Kidder 1927a). One of the most significant differences is that the primary depopulation of sites in the central and southern portions of the Mimbres Valley appears to have taken place as early as ca. 1130 CE (with populations from the northern Mimbres Valley and the Upper Gila departing a decade or more earlier). Therefore, this exodus potentially began as much as a generation prior to the drastic contractions and reorganizations of Ancestral O'odham (Hohokam) and Chacoan society that took place ca. 1150 CE, marking the end of the Pueblo II period and the transition to Pueblo III (in the Hohokam region, this time marked the dramatic transition between the Colonial and Classic periods).

An early depopulation of the Mimbres region is not a problem for the model proposed by Cordell and Gumerman, however, as they present their "hinge points" as date *ranges* and assign the dates of 1130–1150 CE as the hinge point turning from their Differentiation period to their Reorganization period (Cordell and Gumerman 1989:6; Table 4). The various chronologies for the Mimbres, and their "transitions" and/or "hinge points," have great significance for this dissertation, especially as it relies primarily on relative dating to identify the periods during which documented cave shrines were utilized, as well as any major transitions in the varieties and quantities of the offerings and other materials deposited in these sites. For these reasons, changes in material culture and the conventional traits of culture-history are important.

Original Culture-Historical Chronology

Several major transitions define the Mimbres sequence in any form. Preeminent among these is the adoption of ceramics in the Mimbres region, which occurred ca. 200 CE, contemporary with the arrival of this technology in the neighboring Hohokam region and in both cases presumably as the result of diffusion from regions further south (and ultimately from Mesoamerica). Mimbres ceramics initially included only plain and red-slipped varieties. The celebrated Mimbres Style III Black-on-white variety with its semi-realistic depictions of anthropomorphic actors did not appear until sometime in the eleventh century, perhaps as late as ca. 1060 CE (Harry Shafer, personal communication 2023). It was preceded however by Mimbres Black-on-white Style II, which began ca. 900 CE, and Mimbres Black-on-white Style I, which first appeared as early as ca. 750 CE. The successive development of these three related types is clearly visible in the archaeological record and becomes a defining feature of the Mimbres culture during its apogee and culminates in the Classic phase (Figure 2.).

Bowls with figurative imagery are far more common in the Mimbres Valley than in the Gila drainage, the Eastern Mimbres region, or any of the various peripheries and communicating areas. This distribution suggests that the Mimbres Valley did indeed represent some kind of central “core” that exported at least some aspects of a centralized ideology to a larger periphery. In the neighboring Jornada Mogollon region, the Hueco area near present-day El Paso appears to have functioned in a similar way. Notably, considerable evidence also suggests that the Jornada and Mimbres Mogollon shared extensive elements of cosmovision and iconography, despite differences in material culture, especially architecture and ceramic types. Cave ritual also exhibits remarkable similarities between the Mimbres and Jornada regions, as well as with the Sierra Blanca

and Salinas regions to the north of the latter, but as described in Chapter 4, cave ritual in these regions displays greater time depth and exhibits greater overall variation, although this variation is itself potentially a function of the greater time depth.

Lekson (1988) has argued for the existence of the Mangas or Transitional phase, ca. 900–1000 CE, which was the time of the pithouse-to-pueblo transition in the Mimbres region. The pithouse-to-pueblo transition took place across the SW/NW in both the Mogollon and Ancestral Puebloan regions, but not in the Hohokam and Patayan regions of southern Arizona, nor in the Loma San Gabriel region of northern Mexico, which appears to have been otherwise culturally Mogollon (Foster 1982:260). In the Mimbres Mogollon, this process coincides with a distinct shift in ceramic decoration style, leading to what is known today as "Style II." Notable features of Style II Mimbres ceramics include the replacement of wavy hachure with the fine-line hachure technique and design fields that extend to the rims of the vessels (Shafer 2003:182). Figurative motifs also become somewhat more common during Style II, but the depictions of human beings for which Style III ceramics are so famous do not occur, and the few anthropomorphic motifs in Style II appear to be depictions of supernatural beings and/or avian therianthropomorphs (i.e. human/animal blends).

Ultimately, Lekson's argument is largely superseded by the more recent chronologies (Anyon et al. 2017; Gilman and LeBlanc 2017). However, the dynamic nature of Mimbres society in the tenth century remains important to recognize, as a range of evidence points toward significant changes in ceramic decoration, architecture, cosmovision, and social structure. Identifying the markers for these shifts in cave assemblages presents special challenges, however.

Although figurative imagery became more common during this time, limited figurative imagery does appear even on Style I vessels, despite Shafer's assertion to the contrary (2003:183). Of particular importance is that figurative imagery on Style I vessels includes images of the goggle-eyed "Tlaloc" figure, and these images are thus far the only anthropomorphic representations known from Style I. Curiously, depictions of this figure on Style II bowls all have an avian character, with the distinctive trapezoidal or rectangular head of the goggle-eyed placed atop a highly-stylized aviform body with triangular wings (Nicolay 2008). The avian bodies of these images suggest cormorants (family *Phalacrocoracidae*) or anhingas (family *Anhingidae*). Although, Gilman recently reported a cormorant bone from a Classic room at the Powers Ranch site (personal communication 2023), evidence for Mimbres familiarity with any of these species is limited to iconography.

Gilman and LeBlanc Chronology

Almost simultaneously with the revised Mimbres chronology suggested by Anyon and colleagues (2017:316–343), Gilman and LeBlanc proposed another alternate classification of the Mimbres sequence, dividing it overall into Early, Middle, and Late Pit Structure periods (Table 2.2). This version notably shifts the previous Georgetown phase into the Early Pit Structure period, whereas Anyon and colleagues (1981) placed it as the first phase of the Late Pithouse period. Gilman and LeBlanc place the division between their Early and Middle Pit Structure periods ca. 750 CE due to the advent of the

first painted ceramic types around that time: Mogollon Red-on-brown and Three Circle Red-on-white (2017:18–20, Table 1.1).

Table 2.2. Revised Mimbres Chronology from Gilman and Colleagues (2017:19, Table 1.1).

Mimbres Chronology: Pit Structure period dates from Gilman and colleagues (2017:19, Table 1.1); Classic period dates from Shafer and Brewington (1995:17–22). The chronology presented here generally has one painted pottery type per time period.			
Period	**Dates CE**	**Architecture**	**Pottery**
Early Pit Structure	200–750	shallow pit structures	plain, red-slipped
Middle Pit Structure	750–800/850	deep pit structures	Mogollon Red-on-brown, Three Circle Red-on-white
Late Pit Structure	800/850–900/950	deep pit structures	Boldface Black-on-white
Late Late Pit Structure	880/950–1020/1050	deep pit structures	Transitional Black-on-white
Early Classic	1010–1080	pueblos	Early Classic Black-on-white
Middle Classic	1060–1110	pueblos	Middle Classic Black-on-white
Late Classic	1110–1130	pueblos	Late Classic Black-on-white

Although not all Mimbres scholars have accepted this chronology, Gilman and LeBlanc's major division that marks the end of the Early Pit Structure period, which is based on the transition to painted pottery types is important here, especially if this transition represents the initial manifestation in the archaeological record of an ideological shift that increasingly came to define the Mimbres. A small suite of fresh 14C dates from the Mimbres and Jornada Mogollon regions suggests that this is indeed the case (Miller et al. 2023, 2024). Notably, Mimbres cave ritual appears to have intensified at this point, as suggested by the scarcity in cave shrines of atlatl darts and fending sticks in comparison to bows and arrows.

Bow and arrow technology probably arrived in the region between ca. 500–750 CE, and it had certainly supplanted the atlatl-dart complex by the end of that date range (Roth et al. 2011). Although only a third of the caves in the sample set contained darts, arrows have been reported from all but the Royal John Mine Cave, sometimes in enormous numbers. Early archeologists also recovered bows from almost half of the caves in the dataset, either as full-sized and functional examples, or miniature "votives." Significantly, even when caves contained arrows in three- or four-digit quantities, very few of these arrows had stone points (<5%), which was an innovation that did not come into wide use until well after the Mimbres Classic, when it spread rapidly throughout the SW/NW together with sinew-backed bows. Available data does not indicate any of the latter from Mimbres caves.

Documented ceramic types and hunting weapons narrow the bulk of Mimbres cave ritual to a period ca. 750–1130 CE. If cave offerings suggestive of interests in agriculture and/or weather control follow a similar timeline, then the emphasis on these elements also belongs to that time period. Given the especially large numbers of items reported from some sites, such as Greenwood Cave and Mule Creek Cave, the shared use of caves for both agricultural and hunting offerings appears to have intensified simultaneously greatly during this relatively short period of four centuries or less. In comparison, available dates from the large artifact accumulations reported from some of the cave shrines in the neighboring Jornada Mogollon region suggest millennia of activity beginning at least in the Middle Archaic (Nicolay and Beresh 2023). Only limited evidence exists for use of Mimbres cave shrines prior to Gilman and LeBlanc's Middle Pit Structure Period (2017:18-20); therefore, this dissertation focuses primarily on the

portion of the Mimbres chronology beginning ca. 750 CE and ending with the close of the Mimbres Classic ca. 1130 CE.

Archaeologists have identified several post-Classic occupation phases in the Mimbres region: Black Mountain, Cliff, and Animas, as well as use of some portions of the Upper Gila drainage by Tularosa phase populations from the north, but of these, only the Tularosa and Black Mountain phase peoples seem to have made major reuse of any of the same cave shrines as the Mimbres, and these only on the edges of the Mimbres Mogollon region (U-Bar Cave, which is discussed in Chapter 8, appears to be a southern exception). Therefore, post-Classic phases will receive only limited discussion herein. I will, however, address possible reasons why the people of later phases made little or no use of prior cave shrines or villages.

In sum, although I rely primarily on the 1981 chronology established by Anyon and colleagues, the recent chronologies assembled by Anyon and colleagues (2017) and by Gilman and LeBlanc (2017) also provide a valuable framework for the temporal discussion and conclusions in this dissertation; in particular the "hinge points" emphasized by the former and the transitions that structure the latter. Additionally, I will consider the hinge points discussed by Anyon and colleagues (2017) in relation to the area-wide hinge points from Cordell and Gumerman (1989:6; Table 4). In Chapter 12, I will bring those chronologies into dialogue with both concurrent events in Mesoamerica and the climatic records of the SW/NW, in order to explore potential correlations with events in the Mimbres region.

The Decorated Ceramic Sequence of the Mimbres Region

This dissertation relies heavily on relative dating, and ceramic types provide much of that evidence. Additionally, the iconography of later types, especially Mimbres Black-on-white Styles II and III, provides evidence for the interpretation of elements of cosmovision and material culture related to cave ritual. Therefore, an overview of Mimbres painted ceramic types is important at this juncture.

Early ceramic vessels of the Mimbres region consist of the same undecorated brownware that is common throughout the larger Mogollon region. The first slipped ware to appear is San Francisco Red, which shows up shortly after the introduction of ceramics in the region ca. 200 CE and continues throughout the entire Mimbres sequence, although in limited quantities during later phases (Haury 1936b:28–31). San Francisco Red resembles Alma Plain, but it exhibits a red slip over the underlying brown ware paste. Vessels of this type are mostly bowls, but San Francisco Red ollas also occur. Surfaces of these vessels display a fine polish, but the slip is uniform in application without any geometric or figurative motifs.

The first painted ceramic type with decorative motifs to appear in the Mimbres region is Mogollon Red-on-brown (Haury 1936b:10–17). This type is essentially a Mogollon brownware with simple geometric motifs executed using a hematite-based pigment. The production period of Mogollon Red-on-brown was relatively brief, stretching only from ca. 700–900 CE. Mogollon Red-on-brown was followed closely by Three Circle Red-on-white. The two types are essentially contemporaneous through much of their occurrence, although Three Circle Red-on-white does not exhibit as wide a

distribution and appears to have largely been confined to the northern Mimbres Valley (Haury 1936b:18–21). Three Circle Red-on-white is the first Mimbres type with a white slip, and thus represents a transitional type between Mogollon Red-on-brown and the more famous types of the Mimbres Black-on-white sequence that followed. As with Mogollon Red-on-brown, the motifs on this type are only geometric, and as with San Francisco Red, bowls predominate in both types, although once again, some jar forms are present.

At some point around the end of the eighth century, these early painted types are joined by Mimbres Black-on-white Style I ceramics (Haury 1936b:18–27), and all three types remain in concurrent use until ca. 900 CE, when Mimbres Black-on-white Style II develops and largely supplants all earlier painted types. Like Three Circle Red-on-white, Style I also displays a white slip, but unlike its predecessor, this type employs a mineral paint that becomes black when fired in a reducing atmosphere. Mimbres Black-on-white Style I is also known in some early publications as Mimbres Bold Face Black-on-white or Mangas Black-on-white. Mimbres B/w Style I employs a wider variety of geometric motifs than its predecessors, with wavy hachure and interlocking scrolls being particularly common. Some of these motifs resemble contemporaneous motifs from certain Hohokam ceramic types, especially those produced on the Arizona side of the Gila drainage, such as Gila Butte Red-on-buff, Santa Cruz Red-on-buff, and Sacaton-Red-on-buff (LeBlanc 1989:184). The division of interior bowl designs into quadrants, a Mesoamerican approach also present in the Hohokam region, first appears with Style I.

Most importantly, Mimbres Black-on-white Style I is the first ceramic type to incorporate figurative motifs, even if only to a very limited extent. Approximately two

dozen Style I vessels with figurative motifs appear in the Mimbres Pottery Images Digital Database (MimPIDD), although approximately half of these lack provenience, and one or two might be misidentified examples of bowls from later styles with crude execution. Aviforms and reptiles predominate among the motifs on these vessels, but a few display anthropomorphs, all of which are early versions of the goggle-eyed "Tlaloc" figure with arms and legs. The latter examples confirm the presence of this figure in the Mimbres region prior to ca. 900 CE.

As with previous decorated types, bowls dominate the formal repertoire of Style I ceramics, but ladles, jars, effigy vessels, and *tecomates* (seed jars) also appear. Potters continued to employ both oxidizing and reducing firing environments during the production period of Style I ceramics—and indeed, throughout the entire run of the Black-on-white sequence—which means that these vessels can actually appear as Black-on-white, Red-on-white, or Brown-on-white. The color red is the one "through-line" during the entire Mimbres ceramic sequence (Roger Anyon, personal communication 2021), extending almost 1,000 years from the first appearance of San Francisco Red to the end of Mimbres Black-on-white Style III in the Eastern Mimbres region in the late twelfth century.

Shafer places the appearance of Mimbres Black-on-white Style II between 850–900 CE (2003:182–183, Figure 10.6). In this type, design fields extend to the rim of the vessel, which remains a feature throughout its production, with some carryover into Style III. Figurative motifs become more common during the latter half of this part of the sequence. Mimbres Black-on-white Style II also roughly coincides with the pithouse-to-pueblo transition in the Mimbres region.

Mimbres Black-on-white Style III appears in the early eleventh century. These vessels display fine-line hachure with fine-line borders. In this type, the earlier wavy hachure only appears in individual lines that usually emanate from the mouths of zoomorphs and/or humans. These wavy lines possibly represent breath, moisture, or even speech. Figurative motifs become much more common during this part of the sequence, accounting for approximately 30% of bowls produced in this style. It is important to note, however, that vessels with figurative motifs remain uncommon outside the Mimbres drainage. Anthropomorphs and fish are among the motifs that become far more common during this portion of the sequence.

Style III bowls usually display rim bands that frame any internal design (although many vessels lack internal motifs and contain only blank, white-slipped areas). Toward the end of the sequence, these rim bands often become ornate and extend into the interiors of the bowls, which are sometimes undecorated. Geometric designs can incorporate a bare circle or rectangle in the center of the bowl, suggesting that the potters who painted these vessels were aware that they might eventually be punctured for the accompaniment of a burial. A rare Polychrome variation of Mimbres Style III also occurs and is one of earliest polychrome ceramic types from the SWNW). Mimbres Style III Polychrome incorporates fills of earth-tone pigment, ranging from yellow, to brown, to red. Style III Polychromes employ both figurative and geometric motifs. Flare-rim bowls also appear during the Style III portion of the sequence.

Shafer has proposed a micro-seriation of Style III, and to a lesser extent, of Style II, dividing the former into Early, Middle, and Late versions and the latter into Early and Late (Figure 2.2 and Figure 2.3). He based this seriation on the tightly-controlled excavations at the NAN Ranch (2003:183–184, Figure 10.6). Unfortunately, as the entire reported archaeological record of Mimbres cave shrines contains only one complete

bowl, a Style II bowl recovered from Mule Creek Cave by the Cosgroves (1947:30, 138–139, Figure 43), Shafer's micro-seriation of the Style III portion of the Mimbres painted ceramic sequence cannot be applied to relative dating of these sites.

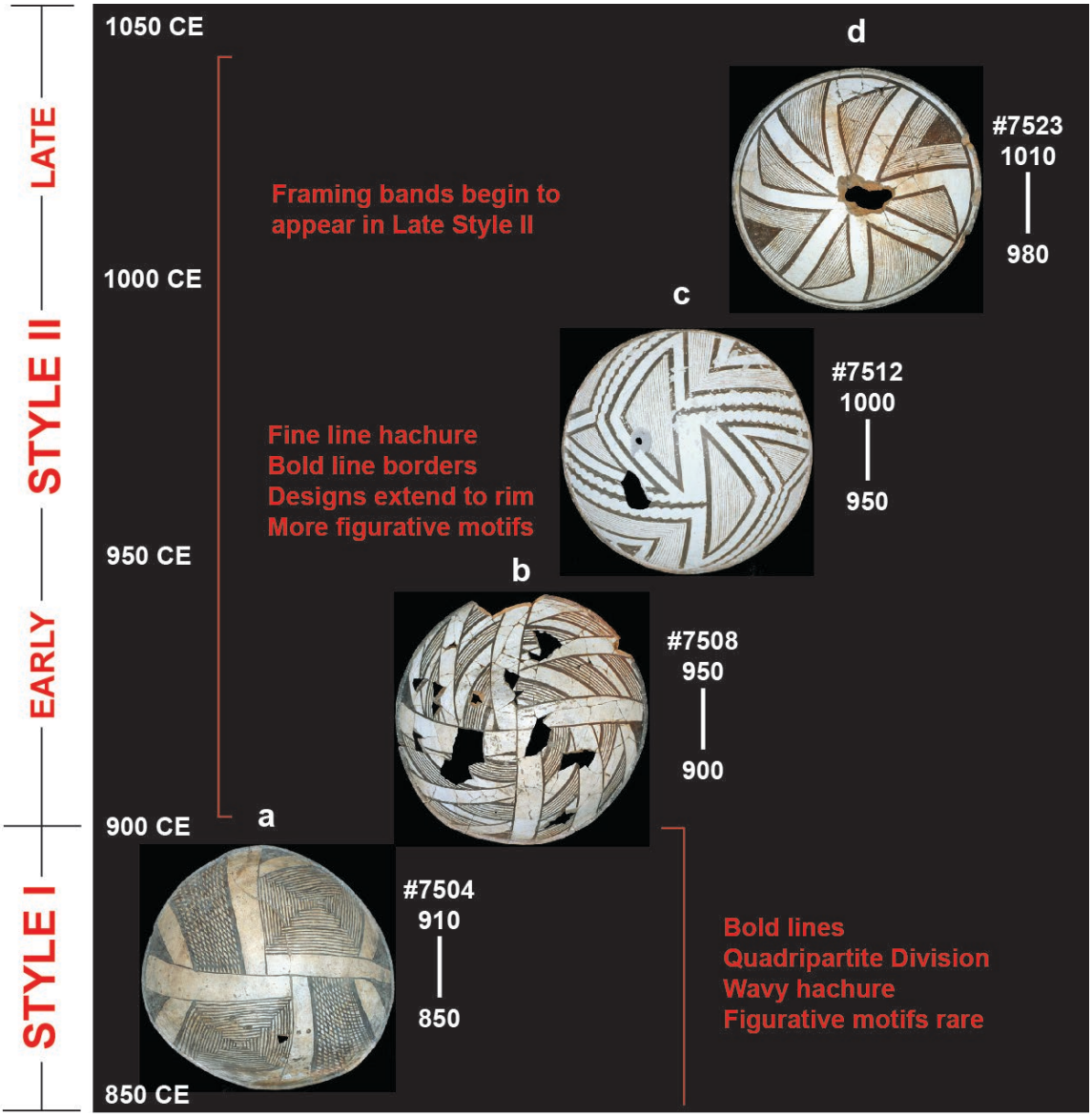


Figure 2.2. Mimbres Black-on-white, Style I-II sequence (after Wayne Smith in Shafer 2003:183, Figure 10.6; photos by Harry Shafer and James Lyle, used with permission).

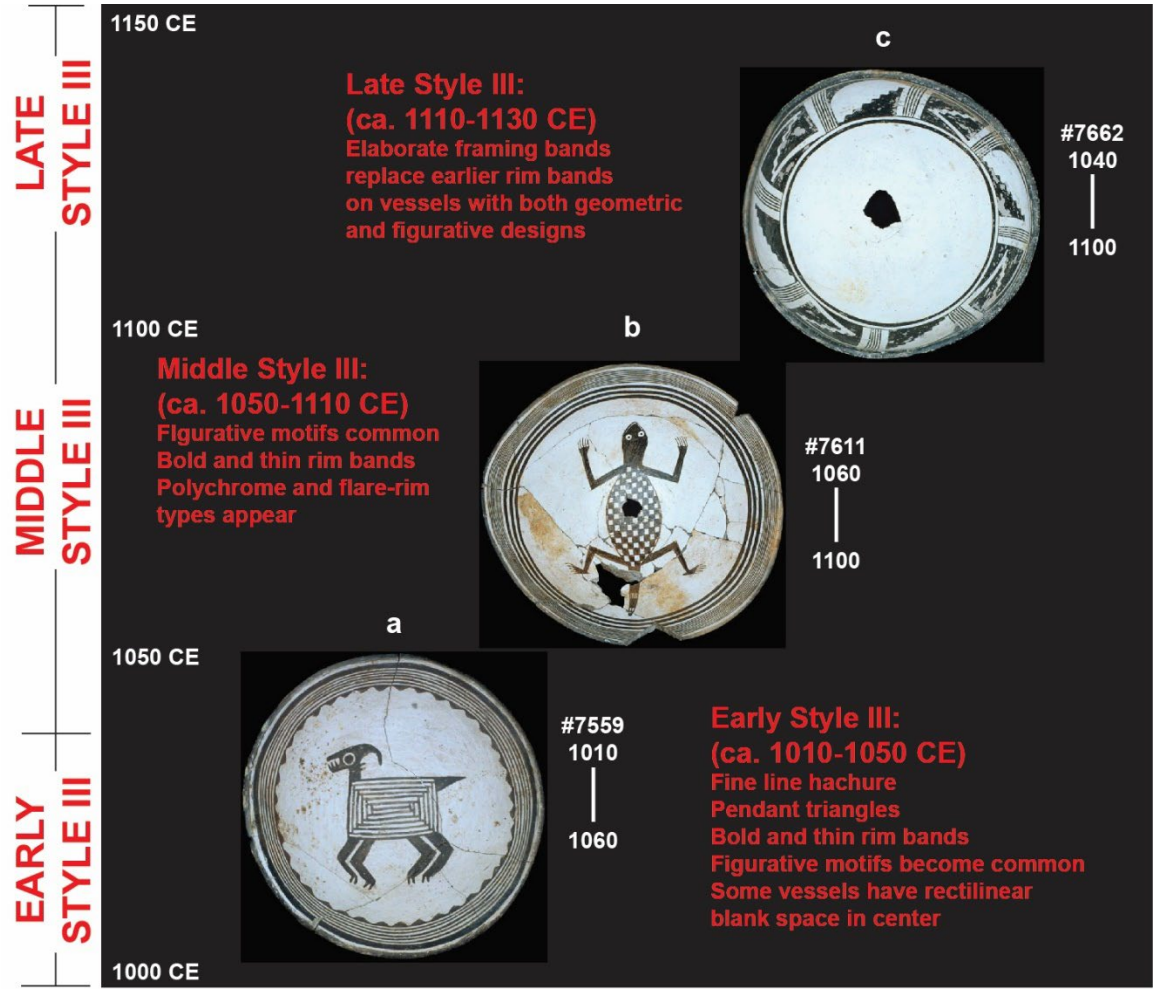


Figure 2.3. Mimbres Black-on-white, Style III sequence (after Wayne Smith in Shafer 2003:183, Figure 10.6; photos by Harry Shafer and James Lyle, used with permission).

The phases that postdate the Mimbres Classic employed decorative types associated with population centers outside the original Mimbres Mogollon region. During the Black Mountain phase, Chupadero Black-on-white, El Paso Polychrome, and Casas Grandes Polychromes were all among the most common types. Bowls of these types were sometimes "killed" and placed with subfloor burials, but the production of Mimbres Black-on-white never recommenced in the Mimbres Valley. Cliff phase sites also employed various polychrome wares associated with the Salado phenomenon. The earlier

of these outside types began to appear in the Mimbres region before the end of the Mimbres Classic.

Various unpainted ceramic types account for a large portion of the Mimbres ceramic record, but I focus here on the painted wares, as these vessels are an important component in the relative dating of cave shrines. They also sometimes contain images of bats, of artifacts that occur in cave assemblages, and in several cases, possible depictions of caves themselves, as well as figures that appear to represent supernatural beings and mythological events that are relevant to my arguments. Thus, the Mimbres Black-on-white painted ceramic sequence is an indispensable source of evidence for understanding the archaeology of cave shrines in the region and the role these sites played in Mimbres settlement patterns and cosmovision.

Chapter 3: Prehistoric Cave Use and Cave Ritual in the SW/NW

Before proceeding further, the usage of the term "cave" needs to be addressed not only in this dissertation but also as it has been applied previously in the archaeology of the SW/NW. In the archaeology of some cultural areas, including the "self-conscious subdiscipline of Mesoamerican cave archaeology" (Moyes 2012; Scott 2007), the southeastern United States (Claassen 2012:211–224; Faulkner 1997:148–153; Faulkner et al. 1984:350–361; Muller 1986; Simek et al. 2012:195–210; Watson 2012:185–194), or the extensive body of Old World research that focuses on early *Homo sapiens* (see, for instance: Breuil 1979; Clottes 2001), "cave" often does refer to the sort of deep karstic features with extensive "dark zones" that recreational cavers and serious speleologists would also identify as caves. In the SW/NW, however, this distinction does not always apply.

A dark zone is an area of the cave that never receives even indirect natural light. Speleologists of all disciplines use this phrase to distinguish these zones from two other categories: "twilight zones," which can receive *indirect* natural light during the day; and "light zones," which can receive *direct* sunlight during the day (Faulkner 1988:30–38; Moyes 2012:5–7). Dark zones are especially important in both cave biology and cave archaeology, as extensive research shows that both animals and humans behave differently in these areas. Indeed, humans are one of the few vertebrate species that can navigate in and out of dark zones, thanks of course to our ability to carry with us fire and/or artificial lighting.

Solutional caves in carbonate rock formations such as limestone, gypsum, and marble often contain dark zones that can extend a kilometer or more. “True caves” of this type dominate the archaeological literature of the Maya region, the Franco-Cantabrian region of France and Spain, and parts of the southeastern US. Basalt lava tubes in relatively young lava flows also possess dark zones as well, and archaeologically important caves of this type occur in Idaho and Oregon, as well as in two limited regions of New Mexico: El Malpais and the Valley of Fires. Basalt lave tubes are also abundant in Hawai’i and much of Polynesia.

Given that the southwestern states of the US contain some of the largest and most spectacular caves in North America, even the world, it might seem ironic that many of the sites identified as caves in the archaeological literature are not “true” caves. The major regions of cave formation in the area, however, do not always coincide with the regions of extensive habitation by either prehistoric agricultural peoples or contemporary Indigenous populations. The Colorado Plateau, which underlies much of the northern SW/NW and largely encompasses the Ancestral Puebloan region, is primarily sandstone, a non-carbonate sedimentary rock that is not conducive to speleogenesis. Many sites in this region popularly identified as caves achieve spectacular size and contain equally spectacular architecture—i.e., the famous “cliff dwellings” of Mesa Verde and Cañon de Chelly—but these are technically “rockshelters,” or large overhangs, which usually lack natural dark zones (cf. for instance: Gifford 1980; Guernsey 1931; Guernsey and Kidder 1921; Hargrave 1970; Haury 1945a; Hays-Gilpin et al. 1998; Hurst 1947; Lockett and Hargrave 1953; Nusbaum 1922; Van Valkenburgh 1940).

The Mimbres region, in turn, is largely volcanic in origin, but instead of young lava flows, it contains thick strata formed from compacted volcanic ash, and this geology is also unconducive to speleogenesis. Thus, only one cave in the Primary Dataset of this dissertation, the Royal John Mine Cave, is an actual solutional cave in limestone with a full dark zone (it also has a deep lake, a unique feature in this region and a rare one in the SW/NW overall), and only one actual artifact, a *tecomate* (MimPIDD #359), can be confirmed from this site. At least two other sites in the study area, Greenwood Cave and Mule Creek Cave, probably have limited dark zone areas, and others, such as Steamboat Cave and Doolittle Cave, are dark enough to provide habitat for bats. Otherwise, all sites in the Mimbres region dating to the Mimbres Classic or earlier are rockshelters without full dark zones. One important site that appears to have been in use both before and after—but not during—the Mimbres Classic, U-Bar Cave in the New Mexico bootheel, is a deep cave with a dark zone (Greer and Greer 1999; Harris 1985; Lambert and Ambler 1965; Schaafsma 2007). I discuss this site in Chapter 8.

In the Maya region, Scott and Little (2003) emphasize the need for cave archaeologists to recognize that all earth openings, natural or artificial, can hold emic status as caves and be thoroughly imbued with all the sacred connotations thereof. The archaeological record suggests that a similar perspective existed and probably still exists among the peoples of the SW/NW. In her massive study of Pueblo religion, Parsons (1996:308) reports that: "Any available cave or near-cave like a rock shelf will be used as a shrine" (Nicolay 2012:172–173). The implication here is that archaeologists in the SW/NW should approach all Earth openings—including "true" caves, rockshelters, grottos, sinkholes, fissures, and earth cracks—as places potentially considered sacred,

whether in prehistory, ethnohistoric times, or the present. This means recognizing the existence of "social" or "cultural" caves that were and/or are emically recognized as liminal spaces providing access to the underworld. Ultimately, this perspective is little different from the way in which the dominant Anglo-American culture views such sites, as Hough (1907, 1914), the Cosgroves (1947), and other researchers working in the SW/NW labeled most of the sites they studied as "caves," although few of these are deep caves with dark zones.

Nonetheless, the evidence from the SW/NW, Mesoamerica, and many other areas suggests that dark zone sites were particularly important, especially those with naturally restricted entrances requiring visitors to pass through a narrow crawlway or keyhole, such as the Arrow Grotto of Feather Cave (Ellis and Hammack 1968), Chavez Cave (Cosgrove 1947; O'Laughlin 2003), Red Cave (Ferg and Mead 1993), Spirit-Bird Cave (Cutrone 2003), Surratt Cave (Caperton 1981; Greer and Greer 1995, 1996, 1997, 1998, 2002), and U-Bar Cave (Greer and Greer 1999; Harris 1985; Lambert and Ambler 1965; Schaafsma 2007). Similarly, in Red Bow Cliff Dwelling, Gifford (1980:24) identified a ceremonial area that was partially blocked by two large boulders and could not have accommodated more than three people at once (the ceremonial area contained *pahos* [prayer sticks], miniature bows and arrows, and hundreds of cane cigarettes; Nicolay 2012:173). Few of the sites in this dissertation's Primary Dataset exhibit this type of feature, but Chavez Cave, Feather Cave, and U-Bar Cave do, and all are Mogollon, if not actually Mimbres, and will receive further attention in later chapters.

Precedents

In an earlier paper, originally presented at the 2004 SAA meeting and published in revised form in 2012, I synthesized available data on cave ritual in the SW/NW and described an overall pattern of offerings related primarily to hunting and weather control. Of necessity, this earlier work provides the basis for the bulk of this chapter, as no one else has published any comparable synthesis since. However, although my 2012 paper represented what I believe remains to date the most extensive synthesis of this data, several earlier and important partial syntheses, all of which were undertaken in the context of the study of specific sites, anticipated many of my conclusions and deserve recognition. These publications include Sandberg on *wahaniak shukuk shtuitauw* (1950), Ellis and Hammack on Feather Cave (1968), Lambert and Ambler on U-Bar Cave (1965), Ferg and Mead on Red Cave (1993), and O'Laughlin on Chavez Cave (2003). Some of these drew in turn on the large datasets recovered and reported by Walter Hough (1907, 1914) and the Cosgroves (published posthumously in 1947). My work over the last two decades has benefited from the foundations laid by these predecessors. Unlike them, however, I have also had the advantage of access to a generation of ritual cave studies from the southeastern United States and Mesoamerica, as well as my own subterranean fieldwork experience in Belize in 2003 and 2017, and on Rapa Nui in 2002 and 2009, along with an increasingly global scholarship and understanding of cave ritual and prehistoric cave use.

It is important to note that early studies of cave ritual in the SW/NW, especially Sandberg (1950) and Ellis and Hammack (1968), largely anticipated the Mesoamerican

ritual cave paradigm—even to the extent of incorporating Mesoamerican data into their syntheses—well prior to the inception of systematic studies of cave ritual in that area. This recognition is remarkable and deserves more attention. Certainly, it points to the macro-areal nature of both the underlying cosmologies and perhaps even to certain categories of ritual practice. Parallel scholarship in southeastern North America, the Caribbean, and South America increasingly suggests that at least some of these patterns are hemispherical in nature, with antecedents in deep time, potentially as far back as the Pleistocene, with certain core elements even originating prior to the initial settlement of the Americas. In this chapter, I review key data from my earlier synthetic paper on cave ritual in the SW/NW in the light of two additional decades of my own research and that of others (Figure 3.1).

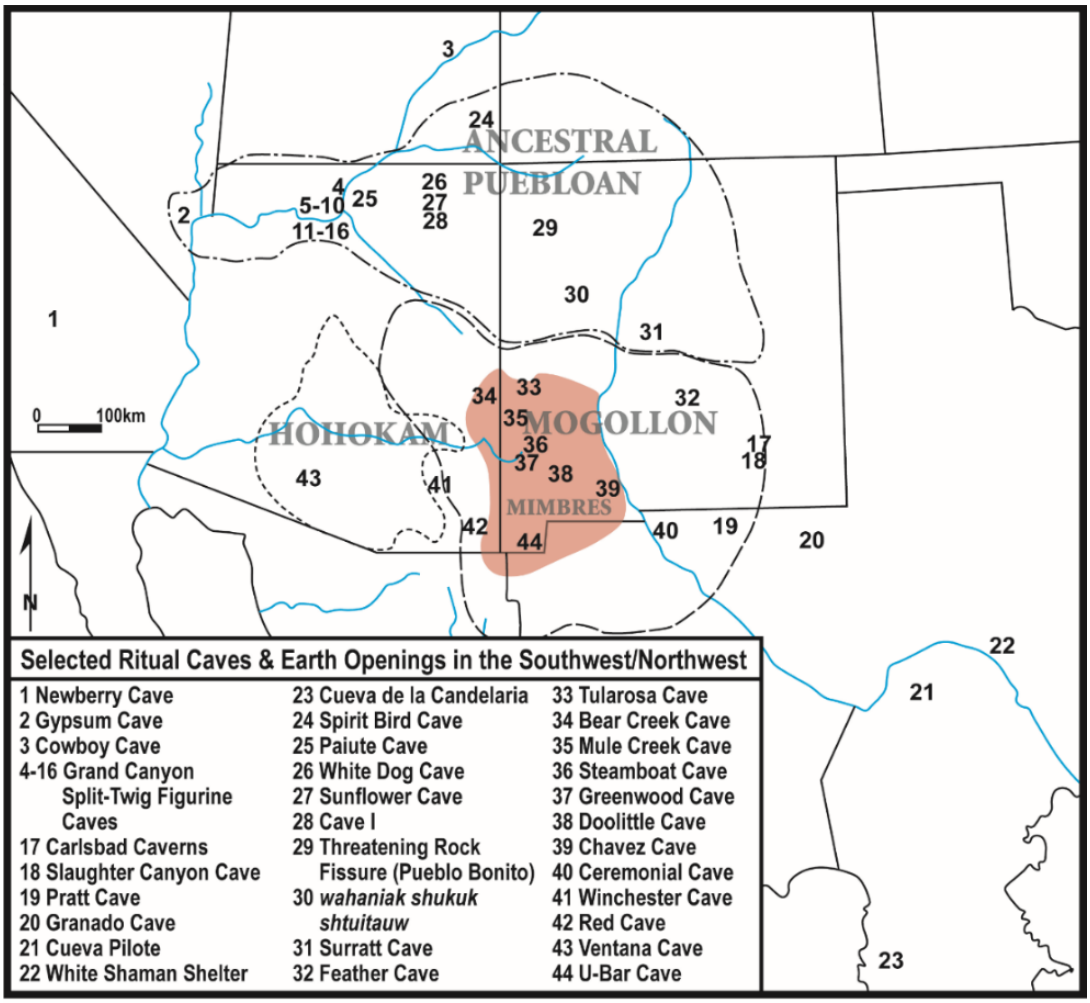


Figure 3.1. Selected ritual caves and earth openings in the SW/NW.

Inevitably, early archaeologists in the SW/NW would focus on the area's dry caves and rockshelters. These sites, as well as those in neighboring cultural areas such as the Great Basin, northern Mexico, the Trans-Pecos, and southern California offered unparalleled preservation of perishable artifacts. These sites attracted the attention of archaeologists as far back as the late nineteenth century. Thanks to the efforts of these pioneers, many early reports of cave investigations are available today. Often, these studies came as part of regional surveys that included related surface sites (Alexander and

Reiter 1935; Alves 1930, 1932; Coffin 1932; Cosgrove 1947; Crimmins 1929; Ferdon 1946; Fulton 1941; Guernsey 1931; Guernsey and Kidder 1921; Harrington 1933; Haury 1945a; Holden 1937; Hough 1907, 1914; Howard 1932, 1935; Hurst 1947; Jeancon 1929; Kidder and Guernsey 1919; Martin et al. 1952, 1954; Mera 1938; Nusbaum 1922; Sayles 1930; Steward 1937; Wheeler 1935; Woolsey 1936) .

Many early anthropologists also recognized the ritual significance of some of these caves due to the presence of artifacts known from contemporary Pueblo ceremonialism, such as *pahos* (prayer sticks), cane cigarettes, and *tablitas* (painted wooden panels made from yucca and agave blossom stalks) (Fewkes 1898, 1971 [1898]). The use of these distinctly ceremonial objects was known ethnographically by these researchers, often firsthand from attendance at Pueblo ceremonies. Frank Hamilton Cushing notably encountered similar offerings in both actively-used and ancestral cave shrines in and adjacent to the historic Zuni region (Cushing 1990:143–146). Unfortunately, Cushing and other early excavators were primarily concerned with museum stocking rather than the study of prehistoric cave use, and most of Cushing's collections were lost (Cushing 1990:383, n2).

Despite this early awareness of caves as ritual sites however, few systematic attempts have been made to investigate the overall importance of caves within the religion and ideology of the ancient peoples of the SW/NW and descendants. Most studies of ritual cave sites have focused primarily on descriptions of material culture, and the few notable exceptions that have explored the nature of ritual cave use have been primarily site-specific analyses (B. Bilbo 1997; M. Bilbo 1997; Creel 1997; Ellis and

Hammack 1968; Ferg and Mead 1993; Greer and Greer 1995, 1996, 1997, 1999, 2002; Lambert and Ambler 1965; Lekson et al. 1971; O'Laughlin 2003).

The divergent trajectories of archaeological cave studies in the SW/NW and Mesoamerica deserve attention. Archaeologists studying cave use in Mesoamerica faced difficulty gaining recognition for caves in their area as ritual sites. In the SW/NW the situation has been almost the reverse, with early and essentially unquestioned recognition of ritual cave use—something that did not take hold in Mesoamerica until several generations later. As far back as 1898, Fewkes wrote, as follows, of the ritual significance of caves in the SW/NW:

> Many caves in this region have narrow entrance into passages which extend with many ramifications into the bowels of the earth. Most of these were used in ancient times for religious purposes, and still contain relics left on former visits by the Indians. The nature of the objects found in them shows that the caves were not inhabited, but were resorted to for purposes of prayer and sacrifice…[1898:166]

Fewkes, notably, was referring to sites in the Upper Gila River Valley, mostly in areas adjacent to the Mimbres region and occupied by other upland Mogollon groups. Hough (1914), who excavated caves nearby in the northwestern periphery of the Mimbres region itself, wrote casually of a typical ceremonial cave assemblage and even referred to a "cave cult" which was "responsible for the preservation of perishable objects connected with the religious beliefs of the ancient Pueblos," adding "this cult has survived to the present." He also identified caves as "essentially a place for the worship of the beings of the underworld" (Hough, 1904: 91). Early researchers such as Cushing, Fewkes, and

Hough had the advantage of familiarity with objects employed in contemporary Pueblo ceremonialism, and they recognized the similarity between the ethnographic assemblage and what they encountered in caves. This connection shows that certain core elements of cave ritual in the SW/NW have survived with little alteration for a millennium or more.

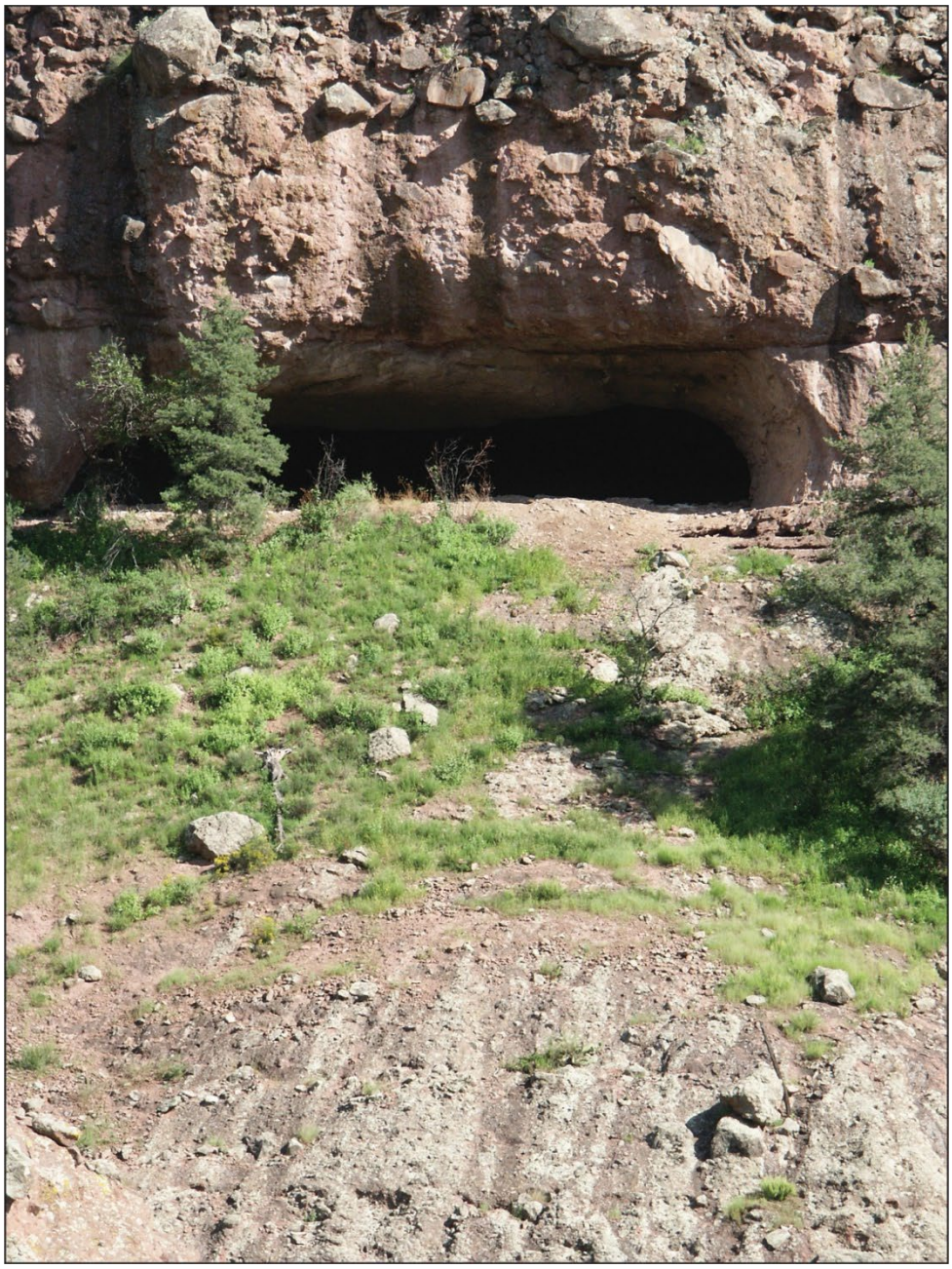


Figure 3.2. Entrance to Bear Creek Cave in the Blue River Valley (photo by Scott Nicolay).

Unfortunately, this "cave cult" received only limited attention during the remainder of the twentieth century. It is quite likely that early reporting of spectacular ritual cave sites (discussed in depth in later chapters) led later researchers to take such sites for granted, and perhaps even hindered them from recognizing other caves as ritual sites if they did not present similarly extensive cultural deposits. Examples include Bear Creek Cave (Hough 1907, 1914), in which "immense quantities of objects had been deposited…the whole mass of débris averaging 2 feet in depth" (Hough 1907:51) (Figure 3.2), or the Saddle Mountain Cliff Ruin (Hough's site 64) on Pueblo Creek in Socorro County, New Mexico, whose discoverer "found bows, arrows, painted tablets, and other objects arranged…in orderly manner around the walls of the cavern" (Cosgrove 1947:23–25; Hough 1907:57). Well before the time of Hough's fieldwork, extensive looting, guano mining, and wanton destruction of artifacts (some visitors used bundles of artifacts as torches to light their way in the caves [Hough 1907:52]) were already serious problems, and cultural deposits in most such sites were already seriously reduced by the 1920s. By the mid-twentieth century, the archaeological record of most cave shrines in the SW/NW had been decimated, and no researcher would again have the opportunity to study an intact cave shrine—or at least an intact shrine within a cave (Figure 3.3)—until the discovery of the Arrow Grotto of Feather Cave in 1964 (Ellis and Hammack 1968).

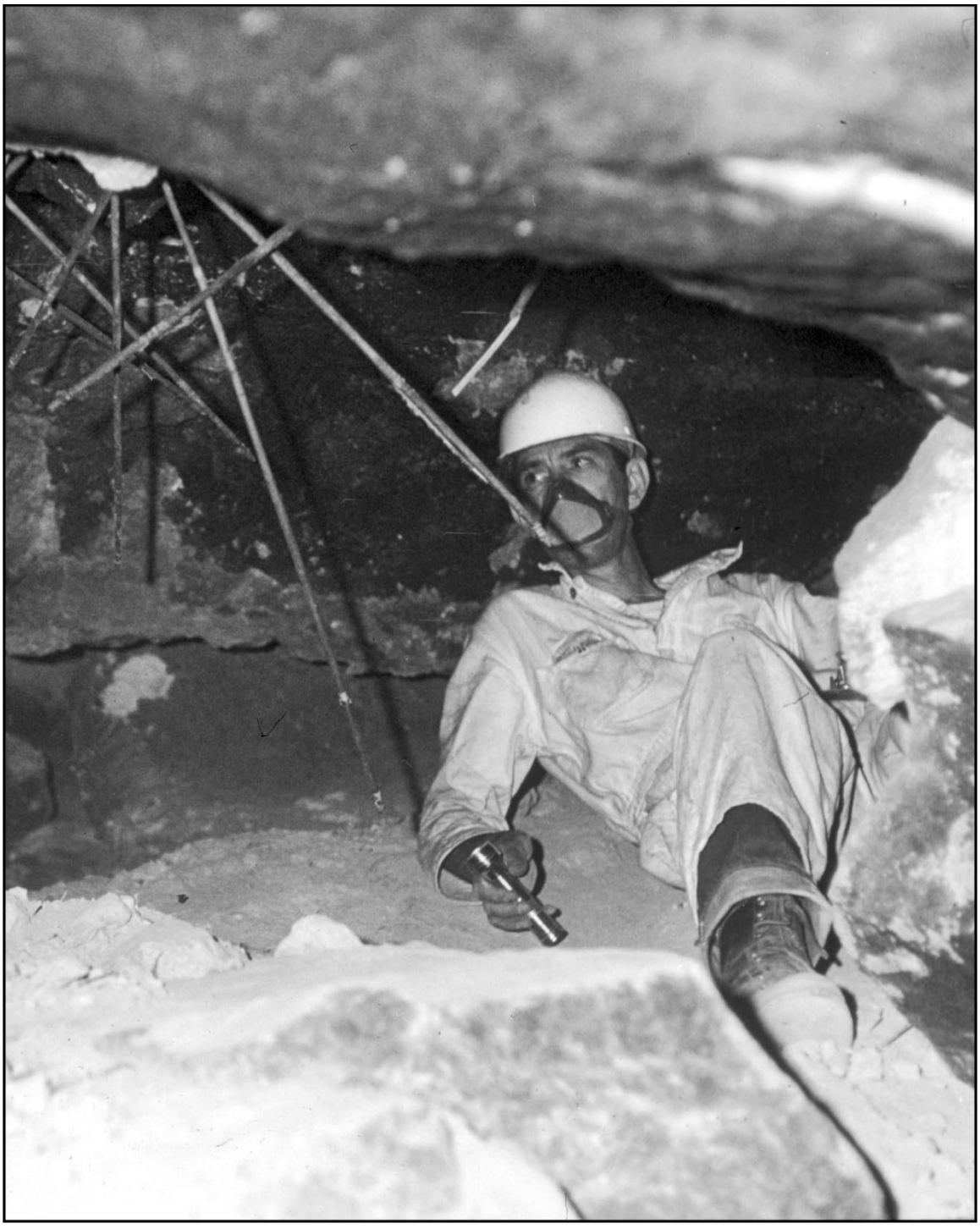


Figure 3.3. Caver Robert S. Willis examines an *in situ* assemblage of arrow offerings in the Arrow Grotto of Feather Cave, 1964 (photo by Laurens Hammack, author's files).

Ethnographic data on cave ritual in the SW/NW, though not totally lacking, also was limited to scattered references and constrained by what details Indigenous societies were willing to share and with whom. As Ellis and Hammack (1968:30) point out, "The significance of caves in this pattern has been little recognized by anthropologists because Pueblos are secretive about the subject, even native nonceremonialists being excluded from much information." This policy of secrecy has a twofold origin, deriving not only from the response to oppression by first Spanish and then Anglo-American authorities (Suina 1992:60–63), but also from the need to protect ceremonial information from the uninitiated (Brandt 1980:11–28).

What the ethnographic data does make clear is that shrines on hills and mountaintops, at lakes and springs, and in caves all play similar roles in contemporary Pueblo cosmovision as places to communicate with a wide array of subterranean supernaturals (Ortiz 1969:19; Stevenson 1905:23). Prehistoric sites appear to reflect similar practices and concerns. This use of caves relates directly to the emergence myth shared by all the Pueblos, in which their ancestors emerged from the Underworld through a special portal: "Specific caves and small lakes are revered by various pueblos as the Shipap opening, and all springs are assumed to connect with that underworld lake whence emerge the katcina rain spirits" (Ellis and Hammack 1968:31). The Hopi name for this portal, *sipapu,* is the most widely known, but each Puebloan language has its own word for it, and each Pueblo has its own sacred site of primal emergence, often located far from any contemporary village.

Although some artifacts recovered from caves remain too esoteric and/or obsolete in nature to identify with confidence, most of the cultural materials from ritual cave sites

can be divided into three general categories: rain/fertility, warfare/hunting, and gaming. The first two are not surprising, given the considerable evidence from Mesoamerica that exists for caves as the loci of fertility ritual associated with rain and maize agriculture. Schaafsma and Taube (2006) argue for the SW/NW's participation in this Mesoamerican ritual complex, and good evidence indicates that ritual cave use in the prehistoric SW/NW, particularly among the Mogollon, reflects this type of activity.

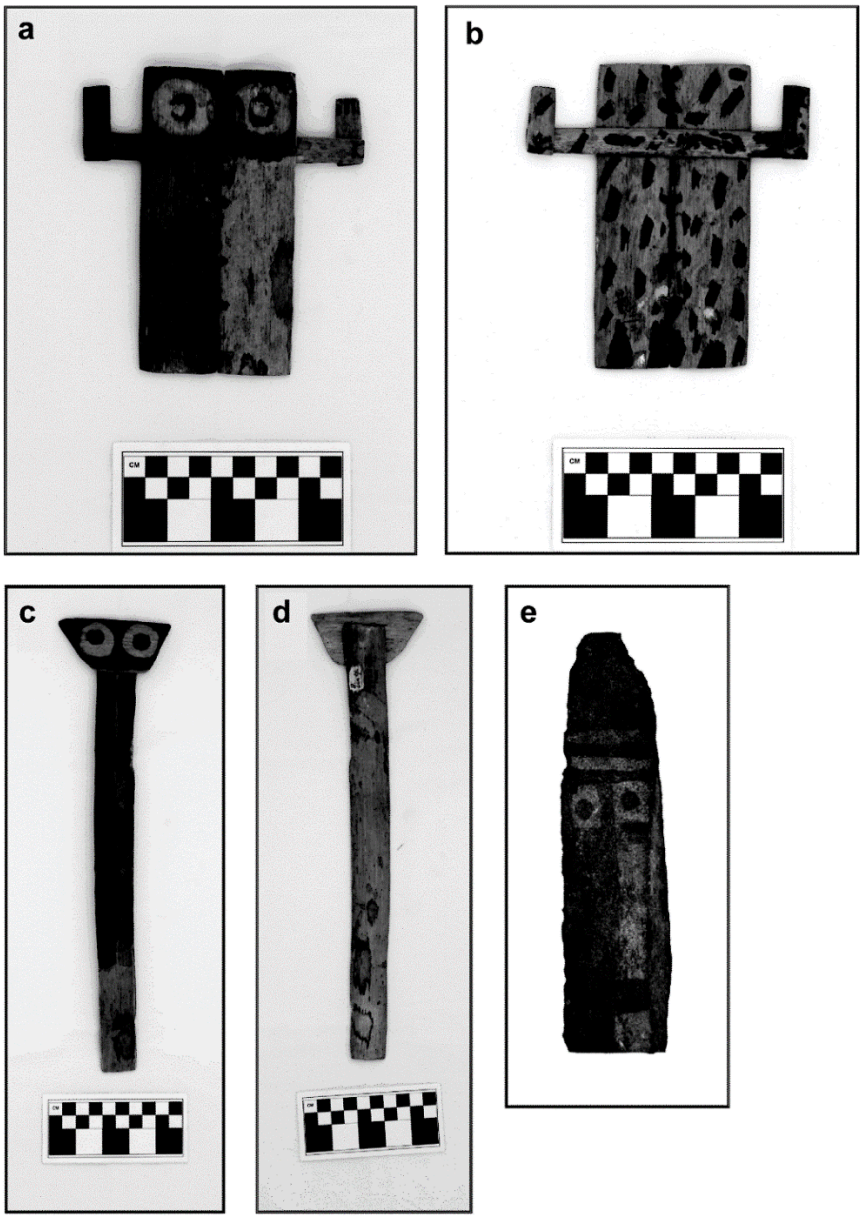


Figure 3.4. Goggle-Eye "Tlaloc" effigies from caves in New Mexico: (a–b) U-Bar Cave, Hidalgo County, height 13.84 cm (courtesy of Museum of New Mexico); (c–d) Lincoln County, exact provenience unknown but probably Feather Cave, height 34.85 cm (courtesy of Museum of New Mexico); (e) Chavez Cave, Doña Ana County, height 8.9 cm (courtesy of New Mexico Archaeological Society).

Some of the most powerful support for the hypothesis of subterranean rain ritual in the SW/NW comes from four effigies recovered from in caves in southern New Mexico and Arizona that appear to portray the goggle-eyed Mesoamerican storm god known in Nahuatl as "Tlaloc" (Lambert and Ambler 1965; O'Laughlin 2003; Owens 2019:101; Schaafsma 1999; see Figure 3.4). Surratt Cave is a deep cave in Lincoln County, New Mexico near the Pueblo V site of Gran Quivira. Within the dark zone, pictographs display both cloud terraces and lightning serpents, imagery intimately associated with rain ritual, as well as a pair of goggle eyes opposite its entrance (Caperton 1981; Greer and Greer 1995, 1996, 1997, 1998, 2002). Above all, the abundance of ritual items in cave sites related to rain/maize ceremonialism such as prayer sticks (*pahos*), cloud blowers, *tablitas*, cane cigarettes, and ears of corn presents a strong case for this type of activity.

Many caves also contained gaming equipment, and some of this material (such as wooden balls, dice, kick-sticks, and possibly sandals) probably relates to weather-control rituals. Ellis and Hammack (1968:330) discuss this connection: "Miniature or full-size kick balls or kick sticks are left for the katcinas by all the Pueblos, in hope that as those beings race across the sky playing their favorite kick stick game they will bring rain" (Nicolay 2012:174–175). "Retired" gaming pieces is one explanation for the large

number of sherd discs recovered from two caves in southeastern Arizona, Red Cave (Ferg and Mead 1993:43–51) and Winchester Cave (Fulton 1941:15, 24–25).

Figure 3.5. Split-twig figurine in situ in a Grand Canyon Cave (photo courtesy of Steve Emslie).

Lambert and Ambler (1965:83) suggest that U-Bar Cave, a Mogollon site in Hidalgo County, New Mexico, was primarily a hunting shrine. Ferg and Mead (1993:59–61) consider Red Cave, a Hohokam cave shrine near Tucson, as a probable "dual purpose shrine" that was used for both fertility and hunting ritual. Despite the wealth of artifacts related to hunting from these and other ritual cave sites (split-twig figurines, atlatls and

darts, fending sticks, full-size and miniature bows and arrows, large rabbit nets), limited ethnographic support exists for the use of caves in the SW/NW as hunting shrines (Figure 3.5). Some documentation exists for hunting ritual in caves in Mesoamerica (Brown 2005:131–146, 2009:39–59), but we must also note that whether from the Archaic Period or later, the artifacts indicative of such activity in the SW/NW (other than faunal remains) are largely of a perishable nature and the sort which do not survive in the wet caves of Central America. Ellis and Hammack (1968:32–33) identify "miniature—and sometimes full size—bows and arrows, rabbit sticks, lightning sticks, prayer sticks…such items as the netted shield of the War gods, and images of plants and animals for which increase is desired" as "winter offerings…addressed to supernaturals concerned with warfare and hunting." This also points out the importance of remembering that to distinguish hunting and warfare offerings is not always possible, as these activities often involve the same objects: bows and arrows, and before these, atlatls, darts, and fending sticks. All these materials occur in cave shrines of the SW/NW (Figure 3.6).

Early Use of Cave Shrines in the SW/NW

Figure 3.6. Fragment of a grooved fending stick (lower left) and a reed arrow (center) in a cave shrine in south-central New Mexico (photo courtesy of Joel Craig Williams).

Although the most extensive evidence for ritual cave use in the SW/NW postdates the adoption of sedentary lifeways focused on agriculture, there appears to be an even earlier period of ritual cave use in the region, one which clearly seems related to hunting, and which predates virtually all evidence of strong connections with Mesoamerica. This tradition is suggested by split-twig figurines, found primarily in caves and rockshelters in four states (Arizona, California, Nevada, and Utah), but most extensively in the Grand Canyon (Coulam and Schroedl 2004; Davis and Smith 1981; Emslie et al. 1987, 1995; Euler 1984; Farmer and deSaussure 1955; Geib and Keller 2003; Jett 1962, 1987; Schroedl 1977; Schwartz et al. 1958). The figurines date to the Late Archaic, ca. 2900–

1250 BCE (Coulam and Schroedl 2004:41). Though no clear ethnographic analogies exist for items of such antiquity, these figurines strongly suggest hunting rituals as they appear to represent game animals exclusively. Some examples are pierced with a small "spear," and some contain a pellet of animal dung. The figurines appear to be the material correlatives of assemblages related to hunting ritual from both contemporary and later sites in other regions (Nicolay 2012:175). The following chapter also examines this Archaic focus on cave offerings related to hunting ritual as it manifested in the Jornada Mogollon region.

An ethnographically identified Laguna war shrine, first documented by Parsons (1924) and later excavated by Sandberg (1950), w*ahaniak shukuk shtuitauw* (the Correo Shrine), contained prayer sticks, bows and arrows, darts, fending sticks, and sandals. The site is cave-like but not a cave—an open pit atop a small hill left by an extinct hot spring or geyser. Perhaps what is most important about w*ahaniak shukuk shtuitauw* is that no evidence exists that it was ever a habitation site; the assemblage represents ritual items exclusively (Sandberg 1950:178–180). Although the site did not contain examples of many of the artifacts associated directly with rain/fertility ritual (cane cigarettes, cloud blowers, and *tablitas*), Sandberg (1950:170) postulates a period of agricultural emphasis based on the presence of two miniature pots of a type associated with agricultural ritual. Miniature or votive offerings in ritual cave sites (including miniature rabbit sticks, bows and arrows, and clothing, as well as ceramics) are common in both Mesoamerica and the SW/NW. Schaafsma and Taube (2006:30) write that "in both the Southwest and Mexico, miniature offerings and caches were dedicated to the deities of rain, and small clay vessels were utilized in many rain rituals." Ellis and Hammack (1968:32) provide one of

the few explanations for these votive objects, explaining that "miniature offerings of any type are believed to enlarge to the correct size for use of the supernatural who receives them" (Nicolay 2012:175).

Perhaps the only artifacts that do not have any obvious association with either rainmaking, hunting, or war are the numerous sandals found in almost every cave shrine in the region. Sandals are found in a variety of sites, and by themselves their presence is not conclusively indicative of ritual activity, but in conjunction with other ceremonial artifacts, they appear to represent part of a ritual complex. The enormous numbers of sandals in some sites, and their presence in known shrines that have no habitation component such as w*ahaniak shukuk shtuitauw* and Ceremonial Cave, make it clear that they possess a religious significance in some contexts. Mera (1938:54) reports that in the Guadalupe Mountains caves he studied "sandals by far outnumbered all other kinds of woven objects obtained during both excavation and reconnaissance." The Cosgroves (1947:92) recovered 923 whole and fragmentary sandals from Ceremonial Cave in the Hueco Mountains of West Texas, and this find was after extensive looting. Cosgrove (1947:97) interprets these as evidence for a "custom of leaving worn-out footgear in shrines." Ellis and Hammack (1968:34) suggest that "sandals found in the outer room of Feather Cave could have been those worn by participants in these ceremonial races and then left as offerings, evidence of religious zeal." Moccasins used in the *Diné* shoe game, a socio-ceremonial activity, are afterwards considered sacred and cannot be used as footgear (Nicolay 2012:177–178). In the next chapter, I propose a novel hypothesis for the presence of sandals in Mimbres and Jornada caves.

Caves as Burial Places

The prehistoric use of caves in the SW/NW for human burial deserves some discussion, although this purpose does not appear to have been a major element of Mimbres cave activity (only four of the caves in the dataset contained any human remains). Some might argue that the disposal of the dead in this context was purely expedient, however, ethnographic sources are consistent throughout the region in describing the dead as returning to the Underworld, which suggests a cosmological association. Boyd is explicit in identifying mortuary practice in the Chihuahuan Desert and nearby areas as reflecting such beliefs: "The use of vertical shaft caves as mortuary sites in the lower Pecos was a means of returning the dead to the place of origin . . ." (2003: 63). Even in largely secular Western society, mortuary practice remains intrinsically ceremonial.

Among the sites that show evidence of such activity is the area's most famous cave, Carlsbad Caverns. Early explorer Jim White described a calcite-covered skeleton in the Big Room (1940:9–10). Long and Long, who supervised the excavation of the massive guano deposit inside the natural entrance, described other burials:

> What is more, skeletons have been found in the cave, some buried in baskets! These were found on shelves in the walls. Other skeletons were found buried beneath piles of guano far back in the cave, together with bits of pottery and broken arrow points . . . Some archaeologists believe the cave was used mostly as a tomb [Long and Long 1956:72].

Basket burials are generally Archaic, but the presence of ceramics clearly points to an additional later period of use. Other caves in the Guadalupe Mountains, easily the most famous cave region in the SW/NW, also show evidence of mortuary activity (Howard 1932, 1935; Mera 1938; Schroeder 1983). Sadly, however, looting in this area appears to have been systematic and thorough from the latter half of the nineteenth century onward. Mera reports the case of a local settler who looted a burial cave and "decorated the fence posts surrounding his house with skulls" (1938:10). Casa Malpais, an ancestral Zuni site in Arizona, contained hundreds of burials in volcanic "catacombs" beneath the settlement (Hohmann 1990). An especially well-documented mortuary site is Cueva de la Candelaria in Coahuila, Mexico (Aveleyra Arroyo de Anda et al. 1956). Burials in this site contained elaborate ceremonial artifacts, including some similar to those reported from the Lower Pecos region of Texas. This evidence supports conclusion that connected beliefs about the Underworld and ancestors have a considerable time depth throughout the SW/NW (Nicolay 2012:178).

Geographic Distribution of Cave Sites

The majority of reported ritual cave sites in the SW/NW belong to the Mogollon region, but they are no means limited thereto. One of the most important cave shrines in this area is the Arrow Grotto of Feather Cave in the Sierra Blanca region. Certainly, the paper by Ellis and Hammack (1968) on this site deserves recognition as the cornerstone of all subsequent ritual cave studies in the SW/NW. In their exploration of the prehistoric significance of their site, the authors incorporate large amounts of data from Indigenous

research partners, most of which would be difficult or impossible to replicate today. However, the paper contains only limited information about the cultural materials from this site, and not all of the information it contains about other sites is accurate (Creel 1997:85). The Field School of the University of New Mexico excavated the outer area of Feather Cave in 1950 and 1951, but the only materials reported were large numbers of sandals (Beresh 2019; Roosa 1952). Other materials remain unreported, including collections at the Museum of Indian Arts and Culture in Santa Fe and Eastern New Mexico University in Portales (Nicolay 2012:178). Feather Cave and its material record receive more detailed discussion in the next chapter.

As with the Mimbres region, most of the dozens of Ancestral Puebloan sites identified as caves are actually rockshelters, and they do not appear to show the same kind of ritual use as deep caves do elsewhere. Some contain a great number of burials, however, as many as 96 in one site (Palmer 2001:117). Like those of the Chihuahuan Desert sites, these burials often included important ceremonial items; in other cases, ceremonial items were cached separately in rockshelters, often in carefully constructed stone-lined cysts. The most noteworthy of these caches came from Sunflower Cave (Guernsey and Kidder 1921:3–7; Kidder and Guernsey 1919:92–97), so named because of the cached pot found there that contained wooden and leather flowers along with cone-shaped objects, as well as a carved bird figurine. Wasley (1962) reports a similar cache from a cave on Bonita Creek, Arizona. The contents of both caches appear to be materials from Puebloan altars. Such caches can themselves have a ritual dimension, as Ellis and Hammack (1968:30) point out: “the Pueblos feel that persons more closely approach the underworld when they meet, store paraphernalia, or deposit offerings in caves.”

Figure 3.7. Modified entrance to Spirit-Bird Cave in Montezuma County, Utah (photo by Scott Nicolay).

One of the most obvious shrine caves in the Ancestral Puebloan region is Spirit-Bird Cave, a deep, angled crack near the top of a 30 m cliff face that is associated with the Nancy Patterson Village, a large Pueblo III community in southeast Utah. This natural fissure has been heavily modified with a stone doorway, elaborate internal architecture that includes a walkway paved with flagstones, and rock art (Cutrone 2003) (Figure 3.7). Another possible example is Paiute Cave, a deep solutional cave (Reilly 1973) located between the Echo Cliffs and Marble Canyon in northeastern Arizona. Pottery from this site dates at least as far back as Pueblo II, if not earlier (Reilly 1973:53).

In the Hohokam region, Ventana Cave, a rockshelter described by Haury (1950) as a type site for Hohokam culture, shows signs of ritual use in the presence of prayer sticks, grooved fending sticks, cane cigarettes, and gaming pieces. The best-documented Hohokam ritual cave site, however, is Red Cave (Ferg and Mead 1993). In order to provide context for their site, Ferg and Mead (1993:59–60) explore the literature of other ritual sites, both cave and surface. In the process, they touch on an important dichotomy in artifact assemblages, which, despite a clear need for further study, suggests a valid method for interpreting sites as either hunting shrines, emergence/fertility shrines, or "dual purpose shrines" based on the assemblage of artifacts. Given, however, the consideration that many artifacts associated with hunting can also relate to war, and the possible interrelation of war ritual to rain/maize ceremonialism, the prehistoric peoples who used these caves potentially did not always make a clear emic distinction between these categories of activity (Nicolay 2012:179).

Although the preponderance of cave shrines have been reported from southern New Mexico and Arizona, the actual boundaries for the SW/NW ritual cave complex are difficult to define, as they clearly extend beyond the area as it is usually defined. The Archaic split-twig figurine complex stretches into southern California's Newberry Cave (Davis and Smith 1981), and the later warfare/hunting ritual complex described above, as represented first by offerings of grooved fending sticks and darts, then later by bows and arrows, extends as far west as southern Nevada, most notably in Gypsum Cave (Harrington 1933; Wheeler 1935). To the south, a number of sites also are found in the Big Bend and Lower Pecos areas of west Texas (Coffin 1932; Epstein 1963; Hamilton 2001; Martin 1933; Ross 1965; Word and Douglas 1970). Although not all of these places are clearly shrines, the sacredness of some, such as the White Shaman Shelter, is clearly evidenced by elaborate rock art (Boyd 2016). The assemblages in many of these caves are also marked by the presence of numerous engraved and painted pebbles, some of which date back at least to the Early Archaic, perhaps representing a distinct ritual complex (Parsons 1965:146). Lister (1958:90–92) recovered arrows, a miniature bow, reed cigarettes, and a possible offering of corncobs on a string from caves in the northern Sierra Madre Occidental.

Even further to the south, Lumholtz (1902:159–163, 174–177, 199) reports both hunting and water-related cave ritual among the Huichol, including the offering of arrows and prayer sticks in caves. Cueva de la Candelaria in Coahuila, Mexico contained a wide variety of ceremonial paraphernalia, mostly as grave goods, some of it identical to materials from the Lower Pecos (Aveleyra Arroyo de Anda et al. 1956, Boyd 2005). Boyd (1996) describes rock art from northern Mexico dating to the Late Archaic that

depicts shamanic ritual in conjunction with cave entrances (Nicolay 2012:179). One of the best-known sites in Coahuila, Cueva Espantosa, contained a quantity of sandals comparable to Ceremonial Cave in Texas (see next chapter), as well as other features suggestive of offerings (Taylor 1972, 2003).

Chronology of Ritual Cave Usage

Cave ritual in the SW/NW extends at least as far back in time as the Middle Archaic, as represented by the Grand Canyon split-twig figurines, the oldest of which date ca. 2900 BCE. This ritual complex continued until at least 1250 BCE. If the nonutilitarian painted/incised pebbles from west Texas and northern Mexico and/or the unfired clay figurine tradition from Cowboy Cave in Utah represent ritual activity, then cave ritual in areas adjacent to the SW/NW potentially dates back to the Early Archaic. A much more extensive and diverse cave ritual complex developed with the appearance of the agricultural Basketmaker-Puebloan, Hohokam, and Mogollon cultures shortly before the beginning of the Common Era, and despite gaps in the record, elements of this complex appear to continue to the present, with several sites documented for the current Pueblo VI period (Nicolay 2012:179–180).

One of the best-documented Pueblo VI sites is Jemez Cave (Alexander and Reiter 1935), which appears to have been a secondary ritual site for Jemez Pueblo, associated with a smaller cave beneath the nearby Soda Dam, which had greater ritual significance (Figure 3.8). Alexander and Reiter (1935:65) conclude that the initial use of Jemez Cave was as a temporary shelter, but add, “It may, even during this early period, have had

ritual significance." After a period (ca. 1250–1300 CE) of more permanent occupation, the cave returns to its use as a temporary shelter. However, they also note that the Jemez people, "may also establish a secondary, ceremonial use for the site" (1935:67) because the natural dam located there was recognized as being of ceremonial importance. A more recent study of Jemez Cave identified it as an early maize site with a date range of ca. 2440 +/- 250 BP (Ford 1975:22). Conversely, Bat Cave, one of the best-known early maize sites in the SW/NW, also yielded arrows, cane cigarettes, pipes, and gaming pieces in the higher levels of the excavation, which dated to the Mogollon I period, ca. 200 BCE–500 CE (Dick 1965:81). These artifacts suggest that Bat Cave served as a shrine during this time.


a
b

Figure 3.8. Soda Dam: (a) Tourists in the grotto, an important shrine for the people of Jemez Pueblo, and before this part of the Soda Dam was dynamited during highway construction, a waterfall ran over it; (b) flowstone basin inside the Soda Dam, once a focus of ceremonial activities (photo by Scott Nicolay).

Despite the restrictions of Pueblo secrecy, significant evidence exists for the ethnohistoric and contemporary use of caves in the SW/NW. Stevenson (1905:234) identifies *He'patina*, a cave near the top of a high rock outcropping, as an emergence shrine for the Zuni. Despite the importance of this shrine, Stevenson writes that only expert climbers could reach it. Jeancon (1929:7) describes a cave near Taos as a ceremonial cave used by the inhabitants of Taos Pueblo until the founding of the Hispanic town of Arroyo Seco nearby. Although this site had been abandoned and contained no artifacts, Devereux (1966) relocated a *shipap* shrine (a place of ancestral emergence from the underworld) ethnographically attributed to the Eastern Keresan Pueblos. Sandberg (1950:180) reported that when he revisited *wahaniak shukuk shtuitauw* after his excavations were complete, it contained fresh offerings. Laurens Hammack reports seeing offerings of canned goods, paper money, and loaves of bread there in 1957 or 1958 (personal communication, 2008). Woods (1945) suggests a continuity of ritual cave use from the Hohokam to the contemporary Pima, but as noted earlier, more reporting is needed from this area for all periods (Nicolay 2012:179–180).

Whether undertaken for success in agriculture, hunting, witchcraft, or war (any or all of which can be interrelated), much or all cave ritual in the prehistoric SW/NW receives its context from a belief in caves as gateways between this world and another world beneath or within the earth, one which is the home of powerful supernaturals whose intervention is needed for the success of endeavors in this world, whether the

support of oneself and one's relations or the destruction of one's enemies. Good things—rain, grain, and game—all are stored within the earth and can only be obtained through supplication of the beings who control the portals of the cave-mountains. In this aspect, cave ritual in the SW/NW appears fundamentally similar to that in Mesoamerica (Nicolay 2012:180).

All these data combine to reveal area-wide patterns of cave ritual that show broad consistency with activity in the Mimbres and Jornada regions, as will become clear in subsequent chapters, as well as an underlying cosmovision that extends into adjacent cultural areas including Mesoamerica, the southeastern United States, and the Trans-Pecos. Nonetheless, specific differences of practice will become apparent, and the fundamental question remains as to why so many sites have been reported from the Mimbres region. Does the abundance of such sites simply reflect the earlier and more extensive survey of cave shrines (Cosgrove 1947; Hough 1907, 1914), or was the emphasis on cave ritual genuinely more intense during this region during prehistory? Or, as the question is presented in the introductory chapter of this dissertation, "Was cave ritual in the Mimbres Mogollon region quantitatively and/or qualitatively distinct from related practices in adjacent regions, and if so, how?" I believe sufficient data exist to address this question, and Chapters 4–6 will present that data.

Chapter 4: Comparative Data on Ritual Cave Use in the Jornada Mogollon Region

This chapter presents data on ritual cave use in the Jornada Mogollon region for purposes of comparison with the more extensive Mimbres data that will follow. I first presented much of the data on Feather Cave in a 2007 SAA paper, and a paper I gave during the 2021 Jornada Mogollon Conference contained descriptions of some of the other caves discussed herein. I subsequently expanded the 2021 conference paper for publication in the conference proceedings volume, and for the published version of the paper, I collaborated with Tara Beresh, who provided valuable data from her 2019 University of New Mexico Master's thesis on the sandals of Feather Cave and the southern Mogollon region overall (Nicolay and Beresh 2023). As sandals appear to be an essential part of the southern Mogollon cave offertory complex, portions of Beresh's data are incorporated here, with her generous permission, and all sections that derive all or in part from our 2023 paper are cited accordingly.

The "core" of the Jornada Mogollon region was approximately centered around an area that includes present-day El Paso, Texas, and large portions of northeastern Chihuahua and southeastern New Mexico. The "Greater" Jornada region also includes two closely related regions to the north: Sierra Blanca and the Salinas or Gran Quivira/Chupadera Mesa (Wiseman 2019). The archaeological record in both these northern regions, and of cave use in particular, displays similar iconography and evidence of a cosmovision similar to that of the Jornada core. "Jornada" as used hereinafter will refer to all three of these cultural regions collectively (Figure 4.1).

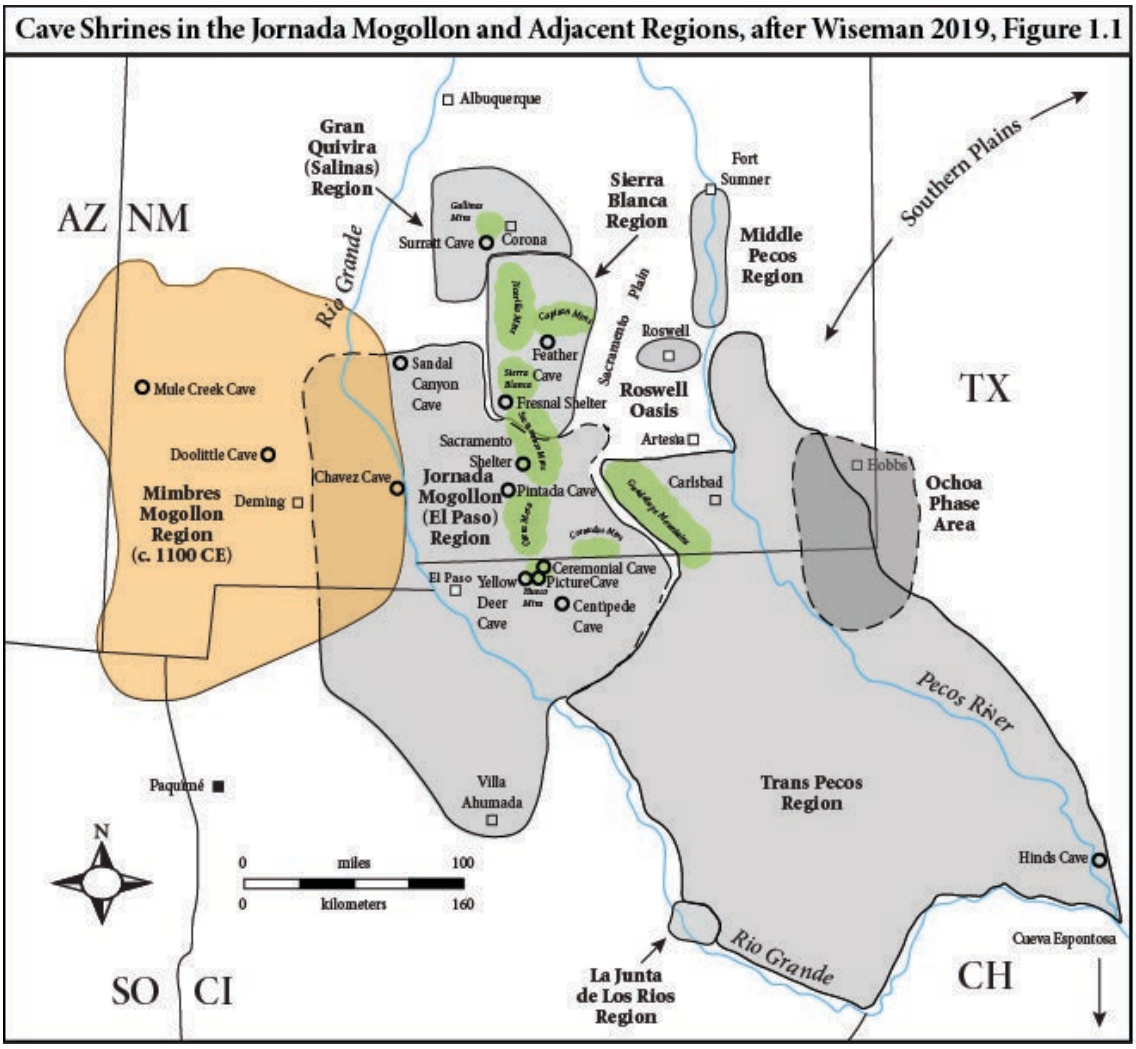


Figure 4.1. Cave shrines in the Jornada Mogollon and adjacent regions (mountain ranges in green), after Wiseman (2019:Figure 1.1).

The Jornada Mogollon people occupied the territory east of the Rio Grande, a natural boundary representing a narrow dividing line between them and the Eastern Mimbres, and they remained in this territory much longer than the Mimbres, only depopulating it ca. 1450 CE. At that point, all remaining Mogollon populations largely disappeared from northern Mexico, southern New Mexico, southeast Arizona, and west Texas, so that at the time of the first Spanish *entradas*, the Gran Quivira or Salinas region

contained the most southerly agricultural villages. Although the Jornada are distinguished from the Mimbres by conventional culture-historical traits such as ceramics and architecture, if one considers these two groups based on cosmovision and iconography, they appear to be a single population with an east-west cline. This similarity becomes especially strong when the two groups are viewed from the perspective of cave ritual. There is a general, but informal consensus among scholars that the Jornada Mogollon absorbed at least some part of the population of the Mimbres region during the Late Doña Ana phase, ca. 1150–1300 CE.

Although data on cave shrines from the Mimbres region is arguably more extensive and systematized (given that the bulk of it comes from a single source [Cosgrove 1947]), the two sites that arguably best define this pattern, and which serve as de facto "types sites" for cave shrines in the SW/NW overall, both belong to the extended Jornada Mogollon region: Ceremonial Cave near El Paso, Texas (in the Jornada "core"), and Feather Cave near Lincoln, New Mexico (in the Sierra Blanca region). Publications by the Cosgroves on Ceremonial Cave (1947) and Ellis and Hammack (1968) on Feather Cave defined a paradigm of ritual cave use related to ancestors and chthonic deities that operated throughout much of the Mogollon region and beyond.

In the 1920s, recognizing the urgent need to document cave sites before their archaeological record was altogether lost, Cornelius Burton and Harriet Cosgrove conducted extensive excavations in dozens of caves and rockshelters in southern New Mexico and west Texas, including three important cave shrines in the Jornada Mogollon region: Ceremonial Cave, Picture Cave, and Chavez Cave. Although their research focused on recovering perishable artifacts that rarely survived in open sites, they

nonetheless readily recognized the ceremonial nature of many of these sites. The materials they recovered have provided critical baseline data on cave assemblages (and perishable assemblages in general) throughout the Southern Mogollon region. Unfortunately, their book, *Caves of the Upper Gila and Hueco Areas of New Mexico and Texas,* did not see print until 1947 due to C. B. Cosgrove's premature death in 1936 and subsequent wartime paper shortages. Although his work remains invaluable both for the study of the Mogollon region and of prehistoric perishable technologies, as well as for cave use in the SW/NW overall, its reception was further hampered by Cosgrove's attempt to frame his data within the Pecos Classification. Haury did not define the Mogollon as a culture distinct from the Hohokam and Ancestral Puebloans until 1936, and Lehmer only established the Jornada as a distinct branch in 1948. Thus, Cosgrove's "Basketmaker" attributions must now be understood as the Hueco phase of the Jornada in the east and as the Late Archaic and/or Early Pithouse periods for the Mimbres in the west (Nicolay and Beresh 2023:125–126).

A paper that arguably represents the foundational publication on cave ceremonialism in the SW/NW appeared two decades later, its subject a Jornada cave shrine that had sadly escaped the Cosgroves' attention, given that they might have been able to study it before the deposits in the main part of the cave were fully ransacked. Florence Hawley Ellis and Laurens Hammack's 1968 *American Antiquity* paper, "The Inner Sanctum of Feather Cave: A Mogollon Sun and Earth Shrine Linking Mexico and the Southwest," emphasized the ritual nature of activities in the then-newly-discovered Arrow Grotto in the rear of Feather Cave, a deep solutional limestone cave near Lincoln, New Mexico. Even though it comprises only one area in the rear of a larger cave, the

Arrow Grotto remains the only major intact cave shrine ever viewed by archaeologists in the SW/NW during the twentieth century.

In this chapter, I examine those characteristics that make particular sites unique among Jornada Mogollon cave shrines, as well as those that show parallels, relationships, or even direct connections between sites, both within the "core" Jornada Mogollon region and beyond—especially with cave shrines in the Mimbres region. The sample of sites and accompanying data is now large and detailed enough to illuminate broad geographic trends as well as important local practices, and thereby to reveal aspects of ritual behavior and cosmovision on multiple scales, from site-based to macroregional, over a period of at least 4,000 years. By necessity, the discussion in this chapter is limited to a handful of the dozens, perhaps hundreds of caves, rockshelters, grottos, and other earth openings that held cosmological significance to the Jornada Mogollon and their ancestors (and this is not even to mention the obvious importance of related geographical features, such as hilltops, mountains, rock outcrops, and springs).

The selection of sites in this chapter reflects some emphasis on dark zone caves, as evidence from around the world suggests that such locations served primarily or even exclusively for ritual purposes (Moyes 2012:6–7). I also focus overall on those sites that retained the most extensive cultural records and which have contributed most to our understanding of Jornada Mogollon ritual and cosmovision. Ultimately however, the caves discussed in this chapter are simply those for which the most information is available. It must be understood that to some extent, this is a factor of differential preservation, as some important sites would have been completely looted prior to any possible archaeological attention, while others might have been sealed and lost in pre- or

protohistoric times either via ritual termination and/or natural collapse. Although assembled from a variety of sources rather than from a few large-scale surveys as with the Mimbres region, these data nonetheless provide a valuable basis for comparison, with both similarities and difference that cast light on Mimbres cave ritual, as well as a wider range of dates.

Ceremonial Cave (41EP19)

Although Ellis and Hammack (1968) presented Feather Cave as the definitive example of a Mogollon ceremonial cave, Ceremonial Cave remains probably the most widely known example of a cave shrine from the entire SW/NW. It owes this status to its spectacular archaeological record; the suite of early publications concerning it (Alves 1930, 1932; Crimmins 1929; Kidder 1927b; Roberts 1929; Woolsey 1936), initially culminating in the detailed documentation provided by the Cosgroves (1947); its robust contemporary online presence thanks to the excellent *Texas Beyond History* website (http://www.texasbeyondhistory.net/ceremonial/); its relative proximity to the celebrated Hueco Tanks rock art site and other sites of interest; and of course, its very name. Located in the Hueco Mountains in the heart of the core Jornada Mogollon region, near El Paso and on present-day Fort Bliss, Ceremonial Cave clearly played an even more important role in prehistory. Its extensive archaeological record suggests that it served as the primary emergence shrine; i.e. the ancestral *sipapu*, for at least some portion of the Jornada Mogollon population.

Unfortunately, Ceremonial Cave suffered the depredations and desecrations of looters before it ever came to the attention of legitimate archaeologists, just like every other known cave shrine in the SW/NW. We owe much of our knowledge of this site, and much of the surviving collections, to Eileen Alves, who recovered significant portions of the looted collections from her own colleagues in the El Paso Archaeological Society and initiated serious archaeological research, eventually leading to timely and systematic excavations by the Cosgroves in 1927 and 1928 (Alves 1930, 1932; Cosgrove 1947:35; Creel 1997:76–78; Kidder 1927b:9; Nicolay and Beresh 2023:128).

Between the collections that Alves saved, the materials recovered during the Cosgroves' excavations, and materials collected later by E. B. Sayles, Tom O'Laughlin, and others, artifacts from Ceremonial Cave are now scattered across at least seven different institutions, with the largest portions thereof curated at the Harvard Peabody Museum and the Texas Archeological Research Laboratory (TARL). In 1975, a private collector found a sandstone frog effigy, 16 cm in length, in an arroyo at the base of the talus slope below Ceremonial Cave (Brook 1982:217). The current location of this artifact is unknown.

Several 14C dates are available from Ceremonial Cave perishables in museum collections. Three hafted Carlsbad points (from dart shafts) dated to 2350–1730 BP or 400 BCE–220 CE (2-sigma calibration), and a single Hueco point dated to 3640–3480 BP or 1690–1530 BCE (2-sigma calibration) (Dial and Creel 2011). However, the earlier date range for the Hueco point would place it several centuries before the accepted classification of this type (Dial and Creel 2011). Even older than these artifacts is a flattened yucca stalk panel with red and black wavy/zigzag designs that dated to ca.

3080–2900 BCE (Miller et al. 2023:5). This object thus precedes the "*tablitas*" recovered from Ceremonial Cave and other cave shrines across the southern SW/NW, as well as from Chetro Ketl in Chaco Canyon (Vivian et al. 1978). Along with a later but still very early 14C date obtained by O'Laughlin on a split-stick wand from Yellow Deer Cave (O'Laughlin 2007:90), the combined evidence from Jornada cave shrines suggests that this painted wood technology, which is also characteristic of Mimbres Mogollon cave shrines, originated in the Jornada Mogollon region. Today, painted wood objects of this type are closely associated with altars and ceremonial performance regalia throughout the SW/NW (including the elaborate headgear of the famed Apache *Gaan* dancers). These earliest examples predate any similar objects recovered elsewhere by over two millennia (Nicolay and Beresh 2023:128–129).

The 3080–2900 BCE date (Miller et al. 2023:5) also places the use of Ceremonial Cave as a cave shrine contemporaneous with the earliest such reliably dated cave shrines in the SW/NW, including *wahaniak shukuk shtuitauw* (LA 46316, the Correo Shrine; Geib et al. 2017; Parsons 1918; Sandberg 1950) and the split-twig figurine caves in the Grand Canyon (Coulam and Schroedl 2004; Emslie et al. 1987, 1995; Jett 1962, 1987; Schroedl 1977; Schwartz et al. 1958). Although the assemblages from these other sites all point toward an offertory emphasis on hunting and/or warfare, and the multiple atlatl darts from Ceremonial Cave indicate that similar interests operated there, the painted wood objects cannot be assigned to this or any other specific practice with certainty. Overall, the combined archaeological record of Ceremonial Cave and the several smaller rockshelters associated with it is enormous and diverse, spans at least four thousand years, and shows little if any evidence of habitation (Nicolay and Beresh 2023:129).

Interestingly, none of the multiple studies of Ceremonial Cave have reported any rock art, as this is a very characteristic feature of both caves and open sites in the Jornada Mogollon region. Moreover, the entire reported ceramic assemblage from the site consisted of two plainware sherds and one of El Paso Polychrome. As mentioned above, Ceremonial Cave is not simply one cave, but a complex of multiple earth openings that includes at least seven smaller caves or rockshelters with the large dark-zone cave as its focus (Figure 4.2a). Furthermore, Creel emphasized that the Cosgroves' map is only complete as to the portion of the cave exposed in 1927 (Creel 1997:81–82). Sayles later excavated two additional "drifts" (horizontal passages) that do not appear on the Cosgroves' map (Cosgrove 1947:34; Creel 1997:81–82; Sayles 1935), and there could be more. These anterior passages might have been ritually terminated and sealed just as the Arrow Grotto of Feather Cave appears to have been (Nicolay and Beresh 2023:129). Two other Jornada Mogollon cave shrines investigated by the Cosgroves also deserve special attention: Picture Cave and Chavez Cave.

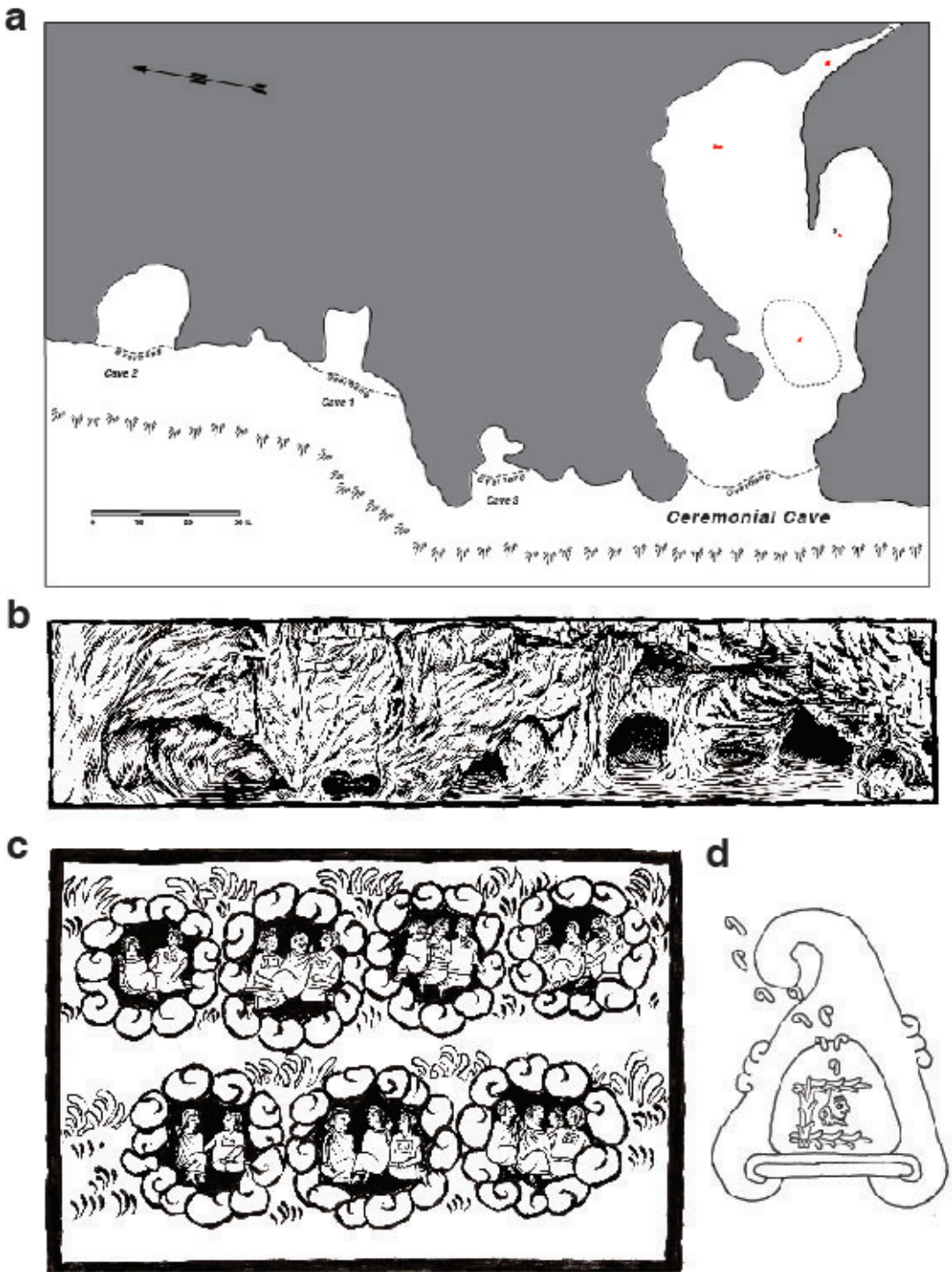


Figure 4.2. Chicomoztoc and Culhuacan in the Jornada Mogollon context: (a) plan view of Ceremonial Cave showing multiple openings in the cliff face and multiple drifts in the main cave, as well as internal features: [a] "dust-filled drift narrowing as it extended for an unknown distance," [b] "greatest depth of rubbish extending to the back wall," [c(x)] location of "adult Hueco Basket-maker burial," and [d]area of large ceremonial deposit) (after Cosgove [1947:35,

Fig. 18]); (b) panoramic view of Picture Cave showing its multiple openings in a row, similar to some Nahua depictions of the Chicomoztoc (after Miller et al. 2012); (c) Nahua depiction of the Chicomoztoc from the Codex Tovar (Tovar 1951); (d) Culhuacan glyph from the Atlas de Duran (Duran 1994) (drawings b-c by Nickolas Gucker; d by Margaret Berrier).

Picture Cave (41EP737)

Picture Cave is a complex rockshelter also located in the Hueco Mountains, approximately 1 km southeast of Ceremonial Cave and on the opposite side of the range. The Cosgroves recovered very few artifacts from this site, none of them conclusively indicative of ritual use (Cosgrove 1947:33–34). However, they did document an extensive and elaborate body of pictographs at this site, primarily executed in a red pigment, including four goggle-eyed "Tlaloc" figures, multiple masks, and four horned serpents, all of which are "signature" motifs of Jornada Mogollon rock art (Figure 4.3). The rock art assemblage demonstrates the ceremonial importance of this site.

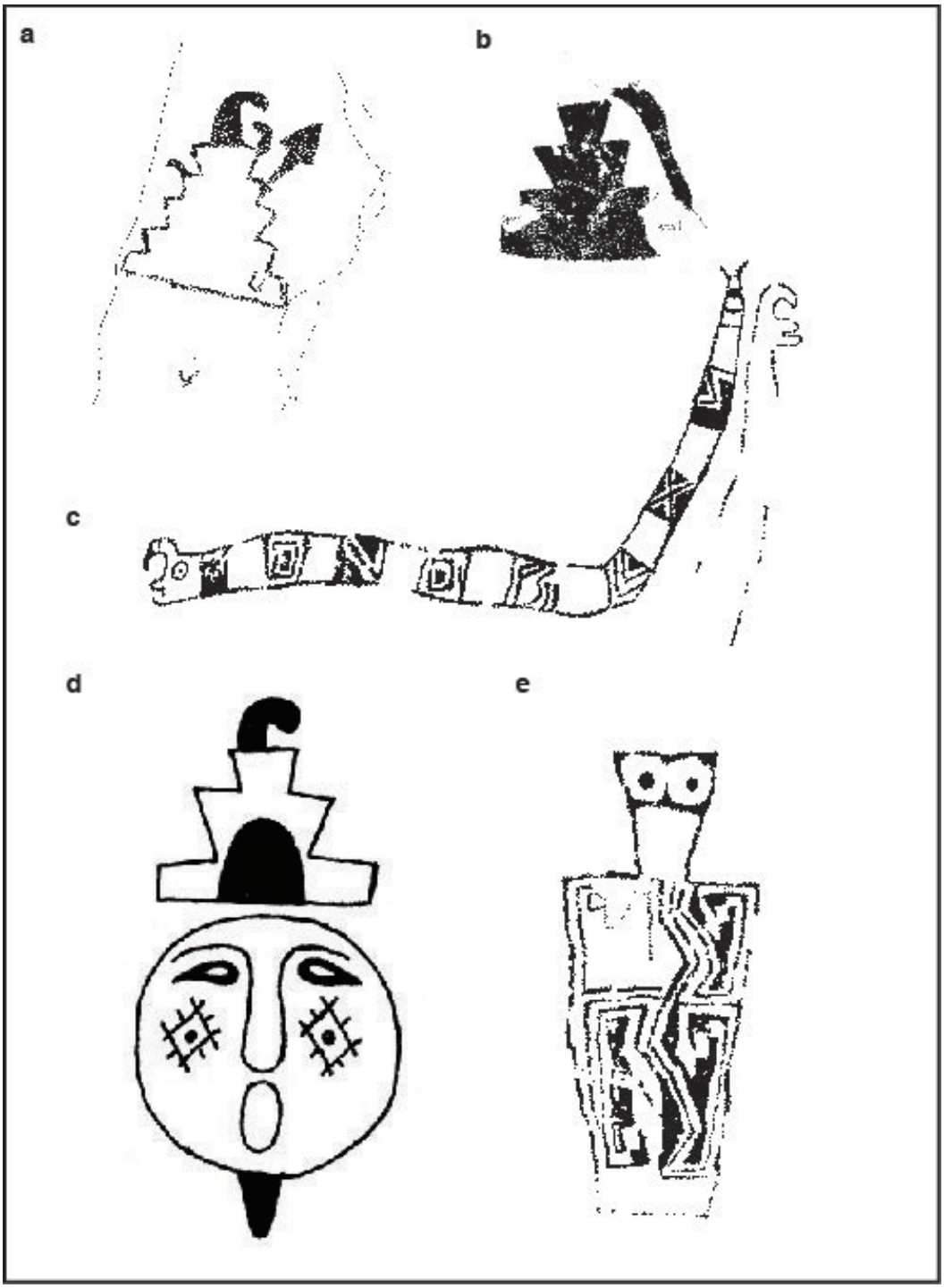


Figure 4.3. Pictographs from Picture Cave: (a–b) possible Jornada Mogollon variations of the Nahua Culhuacan (Bent Mountain) toponym; (c) horned serpent; (d) possible mask surmounted by a third possible variation of the Culhuaca toponym, this one showing a cave opening, which is also a feature of the Culhuacan and general altepetl glyphs in Nahua writing; (e) a goggle-eyed

"Tlaloc" figure; several hundred such images occur in the Jornada Mogollon region (all drawings by Margaret Berrier).

Like Ceremonial Cave, Picture Cave is not simply one earth opening but a group of openings in a single cliff face. While the Cosgroves (1947:33) describe Picture Cave as "two caves connected by an unsheltered ledge," Miller and colleagues (2012:95) characterize it as "actually a series of interconnected solution cavities, caves, and passages." A panoramic photo included before the title page of their lengthy and authoritative report shows a series of openings along a ledge (Miller et al. 2012; Figure 4.2b). This image bears a striking resemblance to one of the ways in which Nahua-speaking groups of Mesoamerica envisaged *Chicomoztoc*, the sacred seven caves of emergence, in Contact period documents, including Chimalpahin Cuauhtlehuanitzin (1997:29–31, 69–75), de Sahagún (1961:10:195–197), Durán (1994:21–22, 212–216), and Tovar (1951), all of which describe it as either a place of seven caves (or a seven-roomed cave) from which tribes ancestral to the Mexica and/or other Nahua-speaking peoples emerged. *Chicomoztoc* was thus a particularly specialized version of the general underworld emergence narrative that was common to both Mesoamerica and the SW/NW (Figure 4.2c). Sixteenth-century Mesoamerican sources portray *Chicomoztoc* as either a single womblike cave with seven interior chambers, or a row of seven cave openings in a hillside or cliff face. Both Ceremonial Cave and Picture Cave resemble depictions of the latter type.

One of the more unusual rock art motifs inside Picture Cave makes this similarity even more striking: a terrace with a bent or curled element at the top, which closely resembles the glyph for the mythic *Culhuacan* (Bent Mountain), a site intimately

associated with *Chicomoztoc* and sometimes conflated with it (Figure 4.2d). Three versions of this motif occur in Picture Cave (Figure 4.3a–b, d), and it is only known to occur at one other site in the Jornada region (Margaret Berrier, personal communication 2023). Tate has recently suggested that prehistoric peoples also recognized some of the large and heavily decorated rockshelters in the neighboring Trans-Pecos cultural area to the southeast of the Jornada region as manifestations of the *Chicomoztoc* (Tate 2022:75–111.

Centipede Cave (41HZ/SSR2)

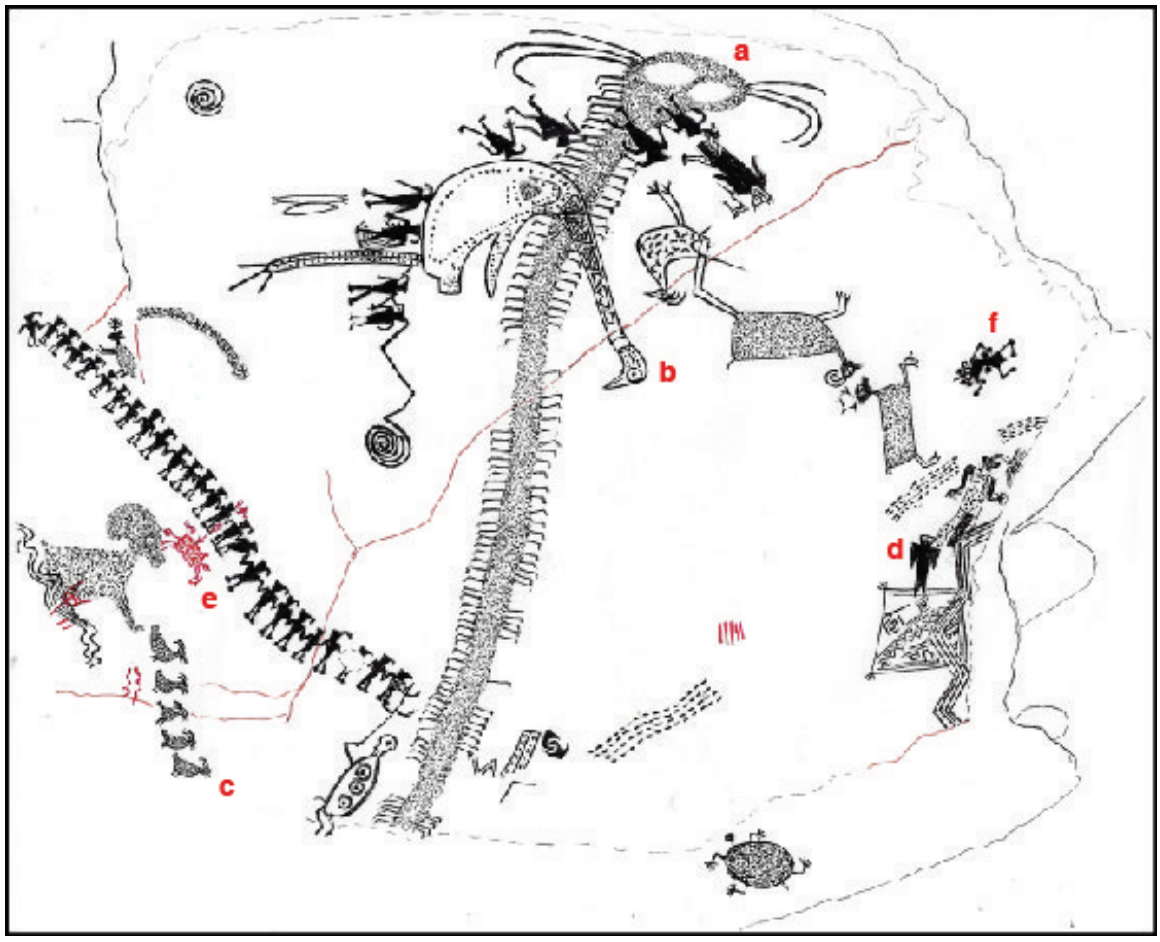


Figure 4.4. Overview of rock art in Centipede Cave: (a) centipede; (b) wading bird (crane, heron, or egret); (c) row of pale yellow crested water birds, possibly ducks or night herons; (d) stylized aviform version of the goggle-eyed "Tlaloc" motif (this version also occurs on Mimbres Style II B/w ceramics, primarily from the Transitional phase (ca. AD 900–1100); (e) figure in the Red Linear rock art style, probably Archaic; (f) wasp-waisted figure, probably Apache (drawing by Margaret Berrier).

Another site that deserves mention alongside Picture Cave is Centipede Cave, a small but heavily decorated rockshelter located on private land east of El Paso (Figure 4.1). Although only about 3 m deep, 3 m high, and 4 m wide, Centipede Cave is a spectacular and significant rock art site even by the standards of the Jornada Mogollon region, which includes some of the most impressive rock art in North America (Arias et al. 2021:34–38; Berrier 2003:1–2). The largest image in this shelter, and its defining element, is an elaborate pictograph of a centipede over 3 m in length that "runs the length of the roof of the shelter from the lip of the opening to the ground level at the back of the shelter" (Berrier 2003:5; Figure 4.4a). Although centipedes are a "fairly common motif" in the rock art of the SW/NW, including Jornada sites, and they also occur on Mimbres B/w ceramics, this example is by far the largest in any medium reported from the region (Berrier 2003:5). This image is likely intended to represent the giant desert centipede (*Scolopendra heros*), the largest centipede in North America, which is endemic to and common within the Jornada Mogollon region and the southern SW/NW, but which does not occur north of the Mogollon Rim.

The elaborate image of a large wading bird painted in white, either a crane, heron, or egret, appears intertwined with and superimposed over the centipede pictograph (Figure 4.4b). This figure is over 1.5 m in height. Additional avian images from the site include a row of pale yellow crested water birds, perhaps ducks or night herons (Figure

4.4c), which are painted at the back of the shelter (Berrier 2003:7). Also present is a version of the highly-stylized aviform goggle-eyed "Tlaloc" (Figure 4.4d) which is the dominant version of this figure on Mimbres B/w Style II ceramics (Berrier 2003:5; Nicolay 2008), a topic to be discussed later in this dissertation. Additional images include other birds, geometric forms, and various anthropomorphs (Berrier 2003:8–13). Several motifs painted in red in the Red Linear rock art style of the Archaic in the Trans-Pecos, including a quadruped pierced by atlatl darts, demonstrate the persistence of this site as a sacred place over at least two millennia (Figure 4.4e). One other anthropomorph is a wasp-waisted figure executed in a style associated with Apache rock art, probably representing a later addition (Figure 4.4f). This figure is not superimposed over any of the other images and is isolated from them (Berrier 2003:12).

Although Berrier and her colleagues did not encounter any portable artifacts remaining in Centipede Cave, the rock art corpus from this site clearly indicates its ceremonial importance, possibly extending from Archaic times to historical Apache visitations. Based on the rock art motifs and artifacts recovered from the area in front of the shelter (fire-cracked-rock, lithics, groundstone, and a single sherd of Chupadero B/w), Arias and colleagues assign the site to both the Archaic and Formative periods, with date ranges of 6000 BCE–500 CE and 500–1450 CE (Arias et al. 2021:34). Stretching from the Archaic up to and beyond the region's primary depopulation ca. 1450 CE, this potentially long period of use is consistent with other cave shrines in the Jornada Mogollon region. Despite its small size and lack of portable artifacts, Centipede Cave clearly demonstrates how caves in the Jornada region continued to serve as shrines over a

period of at least four millennia despite shifts in religious practices and even entire populations (Nicolay and Beresh 2023:134).

Yellow Deer Cave

Yellow Deer Cave is also located in the Hueco Mountains (Figure 4.1). All available data from this site derives from a single short paper by Thomas O'Laughlin based on fieldwork conducted there in 1975 and 1986, along with the analysis of items removed from the site prior to 1975 by a looter and later examined by O'Laughlin at the University of Texas, El Paso (2007:85). O'Laughlin does not appear to have assigned the site a trinomial in the Texas Archaeological Sites Atlas. Materials from Yellow Deer Cave indicate the possibility of use both as a sporadic camp site and a locus of ritual activity (O'Laughlin 2007:83, 87–88, 90). The most notable aspect of the overall assemblage from this site is a collection of 26 "split-stick wands" made from the dried blossom stalks of yucca and *lechuguilla* (O'Laughlin 2007:87–90). O'Laughlin compares these to both *tablitas* and the split-stick wands recovered earlier by the Cosgroves from Ceremonial Cave, although the examples from Yellow Deer Cave are longer than the latter. He suggests that these wands are antecedent to the more obviously ceremonial *tablitas*, which are known from throughout much of the Mogollon region. O'Laughlin obtained a 14C date on one of the split stick wands from Yellow Deer Cave with "an intercept date of 10 BC and a 2-sigma calibrated range of 190 BC to AD 130" (O'Laughlin 2007:90). In conjunction with the even earlier date from a painted panel at Ceremonial Cave, this date suggests that this painted wood technology and its use in

ritual originated in the Jornada Mogollon region—perhaps specifically in and around the cave shrines of the Hueco Mountains—and only later spread to the Mimbres Mogollon region and elsewhere in the SW/NW (Nicolay and Beresh 2023:134). Newly available dates on painted wood objects from both the Mimbres and Jornada regions provide additional support for this conclusion (Miller et al. 2023, 2024).

Feather Cave (LA 37551)

Feather Cave (LA 37551) is primarily familiar to archaeologists in the SW/NW through the aforementioned 1968 paper by Florence Hawley Ellis and Laurens Hammack, a text that stands as a cornerstone in the study both of ritual cave use and of connections between the SW/NW and Mesoamerica. A University of New Mexico field school also excavated the main chamber of Feather Cave under Paul Reiter from 1950–52, but the findings of these earlier investigations remain mostly unpublished except for two short papers by field school students: one on sandals (Roosa 1952) and another that described the meager ceramic assemblage (Jelinek 1952). The field school records were widely considered lost after Reiter's death in 1953 (Adams and Wiseman 1994:8; Stubbs 1953:67), but some documents resurfaced in 2006 thanks to the efforts of former Maxwell Museum curator David Phillips and my own investigations. The surviving materials include student journals and maps of the cave's main chamber (excluding the then-undiscovered Arrow Grotto), along with some of Reiter's correspondence related to the project. Unfortunately, Reiter's personal records do indeed appear to be lost (Nicolay 2007; Nicolay and Beresh 2023:134–135).

The Bureau of Land Management currently manages Feather Cave together with five associated sites: Beth's Cave (LA 47481), a small grotto or rockshelter 200 m west of Feather Cave; Fly Cave, a narrow winding dark zone cave 145 m east of Feather Cave; Bonito Shelter (LA 37920, a.k.a. Feather Shelter, Handprint Shelter), a highly decorated rock art site on the western periphery of the complex; Lower Stanton Ruin (LA 69102), a Lincoln phase pueblo located directly south of Feather Cave across the Rio Bonito; and the Rio Bonito Pithouse Village (LA 37452), located 0.7 km southeast of the caves (Kilby and McNally 1994). The seasonal Rio Bonito winds along the base of the ridge in which all four earth opening sites are located, and Government Spring, a permanent water source, is located almost directly below Feather Shelter. The mutual proximity of these six sites, along with the river and the spring, suggests a shared prehistoric relationship with Feather Cave as the primary focus (Kilby and McNally 1994:29). George F. Hopkins, a UNM graduate student whose notes for an uncompleted dissertation on Feather Cave were among the documents recovered, wrote that the Lower Stanton Ruin and Feather Cave had a "cultural connection" based on a single massive sherd scatter that ran between the two sites and extended 200 ft (61 m) to the east and west of the cave and 300 ft (91.5 m) up the hill to the north (Maxwell Museum, University of New Mexico [UNM], 76.67.176:1). These data suggest that the entire group of earth openings represents a single site with Feather Cave as its center, just as Ceremonial Cave and Picture Cave potentially served in the Jornada core to the south.

Although more data is available from Feather Cave than any of the other associated sites, the earliest dates from the complex belong to an "undocumented pithouse occupation" beneath the Lower Stanton Ruin (Kilby and McNally 1994:29;

Lynch 1989:859). Thus, although occupation of the Lower Stanton Ruin itself appears to date "from the middle of the fourteenth century into the early part of the fifteenth century" (Shelley and Wenzel 2002:xxiii), a period contemporaneous with Ellis and Hammack's estimate for use of the Arrow Grotto, this site closest to Feather Cave might still mark one of the earliest settlements in the Rio Bonito valley. One recently-published 14C date challenges this chronology, and I will discuss that date later in this chapter.

Feather Cave itself is a solutional passage in the San Andres limestone that opens above the Rio Bonito between Capitan and Lincoln, New Mexico. Prior to and even during the UNM field school, it was known by several other names, including Brown's Cave, Dan's Cave, Schmetnick Cave, Stern's Cave and *[Cueva de los] Siete Manos*. Reiter's unpublished correspondence reveals that local residents also confused it with the far more extensive nearby Fort Stanton Cave, whose sinkhole entrance is located less 1 km due south of Feather Cave (Maxwell Museum, University of New Mexico [UNM], 76.67.209). Feather Cave is also clearly recognizable as the site that Lehmer refers to as "Hale Cave" (1948:72–74), which makes it one of the Jornada Mogollon ceramic type sites.

Figure 4.5. Full plan map of Feather Cave, showing both the Main Chamber and the Arrow Grotto (drawing by Amalia Kenward).

At some time in the past, a collapse divided the cave into two parts, now known as the Main Chamber and the Arrow Grotto (Figure 4.5). This event almost certainly occurred long before any human use of Feather Cave. The Arrow Grotto is thus a small tectonically formed chamber atop the collapse at the north end of the cave. The UNM field school worked in Feather Cave for three years without discovering this chamber. Access to the Arrow Grotto is through a narrow crawlway floored with a thick deposit of powdered porcupine feces, cactus needles and other detritus, and loose rock. The cavers who rediscovered this chamber in 1964 reported that this deposit filled the entrance to within an inch of the roof and contained rocks too large to have been moved by animals, suggesting that the passage was deliberately blocked off, i.e "ritually terminated" in prehistoric times, and they discussed this possibility even before they discovered the Arrow Grotto (Charles Carrara, personal communication 2006). However, the location of rock art panels in this area suggests that a narrow passage over the top of the collapse existed in prehistory; if so, that could have been the primary entrance to the Arrow Grotto at that time (Nicolay and Beresh 2023:136).

As with many other nineteenth- and twentieth-century New World cave investigations, the quest for evidence of "Early Man" drove Paul Reiter's work in the Main Chamber of Feather Cave. In an unpublished letter, Reiter claims that hearths found in the lower layers of his excavations date from the early Holocene (Maxwell Museum, University of New Mexico [UNM], 76.67.209), but he does not describe any diagnostic artifacts as associated with the hearths and provides no 14C dates. A reexamination of these features suggests at least some of them are intrusive. Ellis and Hammack (1968:25)

refer only briefly to the field school's excavations, summing them up in a single sentence: "little was found [in the Main Chamber] except masses of reeds and 114 sandals." This statement is misleading: UNM's Maxwell Museum currently holds thousands of artifacts from this part of the cave in its collections, including such obvious ceremonial objects as *pahos*, *tablitas*, and arrows. Additional collections from Feather Cave are curated at the Laboratory of Anthropology in Santa Fe, Eastern New Mexico University in Portales, and the Lincoln State Monument. All or most of these collections came from local collectors. ENMU acquired its collections from the infamous Fred Miles, who is known to have looted both archaeological materials from Feather Cave and mineral formations from Fort Stanton Cave (Sweet Espinosa 2002).

Many if not all of these other collections probably predate the UNM excavations. Ellis and Hammack also describe artifacts from Feather Cave in another private collection, which among other objects contained portions of painted bird effigies similar to those from ritual contexts in both Ancestral Puebloan and Western Mogollon sites, most notably Bear Creek Cave (Ellis and Hammack 1968:35–37, Figures 5 and 7; Hough 1914:101–106), but also from an assemblage recovered at the Chacoan great house Chetro Ketl (Vivian et al. 1978).

In 2005, Michael Bilbo and I assembled a team of cavers and archaeologists to resurvey Feather Cave and the three associated earth opening sites in the Feather Cave Archaeological Complex (FCAC). Though not a particularly large cave, Feather Cave presents special technical requirements, including the presence of dangerous histoplasmosis spores and the restrictive squeezeway necessary to access the Arrow Grotto. The need to wear air filter masks and the extreme isolation of the Arrow Grotto

create heightened feelings of claustrophobia that even some veteran cavers find challenging. That sensation is worthy of mention considering the psychological impact this environment would have had on the prehistoric peoples who lacked access to such accoutrements of the modern caver as portable electric lighting, hardhats, and polyurethane padding. Through fieldwork, museum and archival research, and oral history, my team and I uncovered and recovered information on a range of important prehistoric activities at the sites (Nicolay 2007; Nicolay and Bilbo 2005a, 2005b, 2005c, 2005d; Nicolay and Beresh 2023:137).

One of the most important research questions for the FCAC Project was the extent of rock art and other evidence for ritual activity in the Main Chamber of Feather Cave. Ellis and Hammack (1968:26–27) only documented rock art in the Arrow Grotto, and that incompletely, but the Main Chamber contains at least a dozen units of rock art, including handprints, a goggle-eyed figure, and a peculiar ovoid bird form. The bird motif closely resembles another pictograph in Surratt Cave to the north. One panel still bears two positive handprints and portions of a third that has been badly vandalized. According to another letter in Reiter's files, this panel originally bore seven handprints, which was why the cave was once known as [*Cueva de los*] *Siete Manos*. A local man removed a portion of this panel and placed it in his garden, where rain quickly destroyed the pictographs **(**Maxwell Museum, University of New Mexico [UNM], 76.67.209). During field sessions, two team members also identified a faint charcoal pictograph of a simple face with a zigzag body on the ceiling of the Main Chamber near the entrance. This faint pictograph is in a different medium and style from the rest of the known rock art in the cave. At more than 1 m in length, it is also the largest recorded pictograph in the cave and

is the only remaining cultural feature on the ceiling of the Main Chamber (Nicolay and Bilbo 2005b:3, Figure 5). It probably depicts either a lightning-serpent or a tadpole, both images fairly common in the Jornada rock art style. Both interpretations support connections to rain-related ritual.

My team also documented previously unreported cupules in the entrance to Fly Cave (Nicolay and Bilbo 2005d:4) and extensive rock art in the Feather Shelter, including concentric circles (similar to those in the Arrow Grotto), handprints, and polychrome masks. The rock art corpus at the shelter shows significant overlap with both rooms of Feather Cave, but the cupules in Fly Cave appear to be unique in the complex, although they occur at other nearby Jornada Mogollon rock art sites. Of the four earth opening sites, only tiny Beth's Cave bears no discernible rock art. The recovered assemblage from Beth's Cave consisted largely of maize ears, but ritual artifacts were present, just as in both chambers of Feather Cave (Adams and Wiseman 1994:10; Wiseman 1988:4, 6).

Another one of Reiter's unpublished letters (Maxwell Museum, University of New Mexico [UNM], 76.67.209) makes it clear that the current name of the cave did not come from its shape, as Ellis and Hammack report (1968:25), but because the ceiling of the Main Chamber was once decorated with actual feathers, some of which were still present as late as the 1960s. According to the Carrara brothers, these feathers were arranged on the ceiling of the cave in circles from 1–3 m in diameter. They were allegedly removed by Fred Miles (Charles and Chester Carrara, personal communication 2006). Miles owned a gas station and curio shop in Roswell in which he displayed his collection of minerals and artifacts, including the mummified remains of several individuals, which he claimed came from "burial pits" on the north side of Lower Stanton

Ruin (John Corcoran, personal communication 2005; Kilby and McNally 1994:29; Nancy Sweet-Espinosa 2002). Eastern New Mexico University later acquired these mummies together with the rest of Fred Miles's archaeological and geological collections.

Miles was one of several aggressive looters from the area who appear to have amassed large collections of artifacts from the Main Chamber of Feather Cave, a process that likely began in the nineteenth century (Kilby and McNally 1994:28) and quite likely included the legendary William Bonney himself. Later looters, including German POWs housed at nearby Fort Stanton during the Second World War, both dug and dynamited in and around the cave looking for "Billy the Kid's gold" (Nicolay and Beresh 2023:139–140). Nancy Sweet Espinosa made the mummies from the Miles collection the subject of her master's thesis (2002), identifying them as Tarahumara, and putting to rest their unlikely attribution to an open site. Sweet Espinosa's thesis also suggests that Miles was involved in a smuggling ring that transported Casas Grandes ceramics and Tarahumara mummies into the United States (2002:39).

The potential for documentation of the lost feathers from Feather Cave has special importance, as feathers were also attached to the walls of at least two other important ceremonial caves in New Mexico. Lambert and Ambler mention feathers stuck to the wall of U-Bar Cave (1965:16), and at least one caver has observed feathers stuck to the walls of Surratt Cave near Gran Quivira (Bill Ellis, personal communication 2002). Interestingly, these are also the only other two caves in New Mexico outside the Guadalupe Mountains with documented dark zone rock art (Greer and Greer 1999).[2] Most importantly, feathers also were attached to the walls of the Arrow Grotto in association with the pictographs. Ellis and Hammack report that feathers, including those

of the scarlet macaw (*Ara macao*), once "ringed" the primary mask in the Arrow Grotto (1968:27–28). A few of these feathers remain visible in an 8mm film of the 1964 Arrow Grotto fieldwork made by the Carrara brothers. Curatorial staff at ENMU have only recently begun to analyze the Fred Miles materials from Feather Cave, and they have reported the presence of feathers in this collection, but specifics are not yet available (Samantha Bonkamp, personal communication 2022). Cave crickets inhabit this site, and as they very likely would have devoured feathers left anywhere else in the cave (Ellis and Hammack:1968:27), the specimens at ENMU might include some that Miles removed from the cave ceiling. Feathers have great importance in both Puebloan and Mesoamerican religious practices, but these are the only reported examples of their patterned application to cave walls and ceilings.

The aforementioned primary mask in Feather Cave, the largest and most complex of several in the Arrow Grotto, looks directly down from the low ceiling on what was once the largest assemblage of offerings in the room (Figure 4.6a). This mask displays the sort of rectangular peg-toothed mouth that is indicative of early *Katsina* representations (Hays 2000:51). Just to the left of this feature is the most elaborate pictograph in the cave, a stencil of a human hand and forearm painted with parallel lines on the wrist and fingers and a set of concentric circles in the palm. Below this pictograph is a horizontal crevice into which Ellis and Hammack report that 36 arrows had been either shoved or shot (1968:26–27). Increasing evidence from other caves suggests that this feature, though remarkable, was not unique. The practice of shoving or firing arrows into cracks and crevices in caves or rock faces was widespread and is attested both

prehistorically and ethnographically (Lambert and Ambler 1965:16–17; Nicolay 2007; Nicolay and Beresh 2023:140; Stevenson 1905:439; Zolbrod 1984:217).

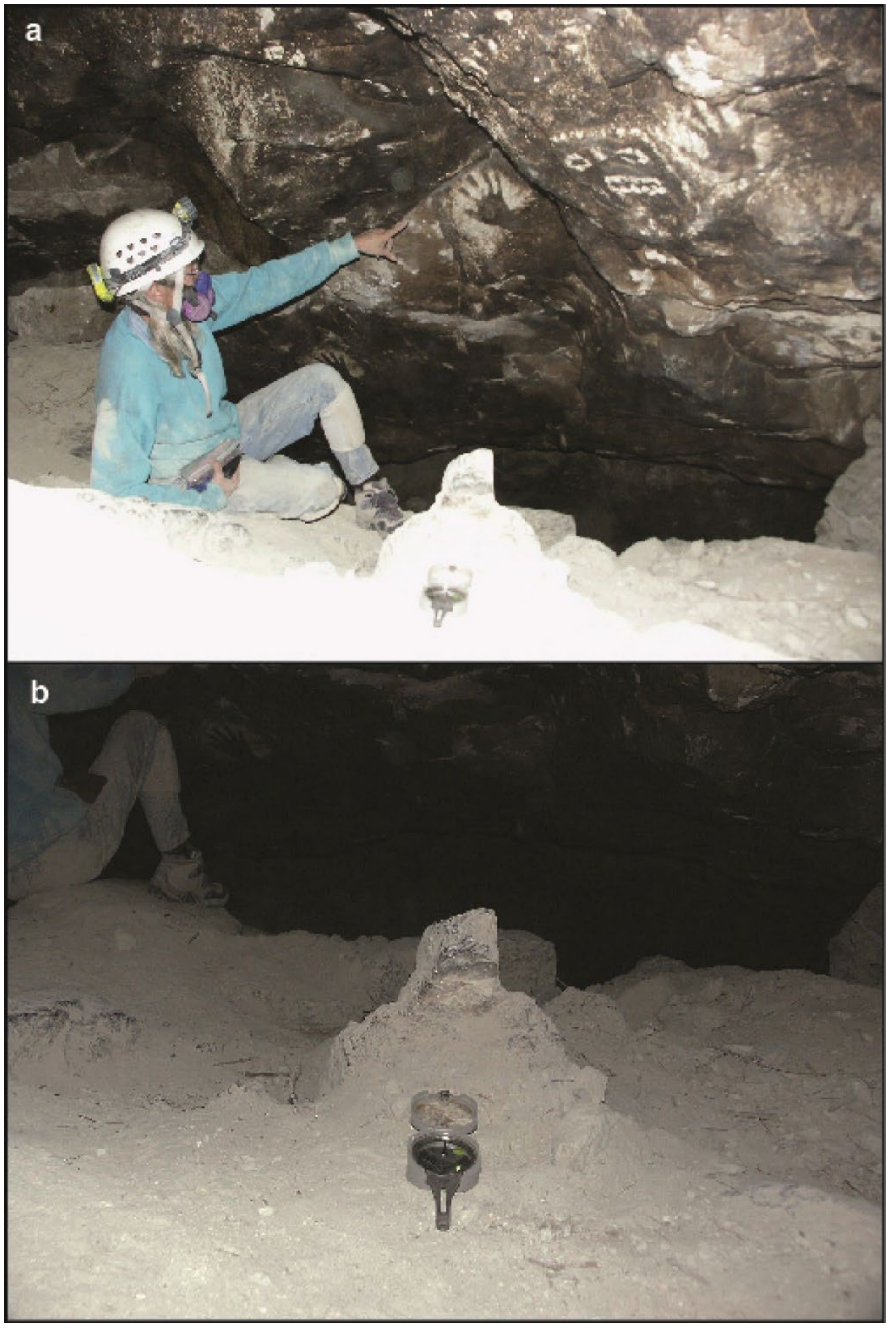


Figure 4.6. Arrow Grotto of Feather Cave: (a) New Mexico Caver Susan Herpin points toward the largest and most detailed of three mask motifs in the Arrow Grotto of Feather Cave; this figure once had a ring of macaw feathers pressed around it; (b) stone outcrop in the Arrow Grotto of Feather Cave in the shape of a cloud terrace altar; this outcrop, which has potentially been

culturally modified, was the primary locus of offerings in the Arrow Grotto (photos by Scott Nicolay).

The FCAC project team members documented a total of more than 40 units of rock art in the Arrow Grotto, three or four times the amount that Ellis and Hammack described (1968:27), and were able to identify the iconography of certain previously unidentified pictographs, including two bear paws and two additional masks, one of which appears to be the Jornada Mogollon "Thirsty Mask" with its protruding tongue (Figure 4.7a), an image best known from Hueco Tanks, where several versions exist in association with prehistoric water collection features. These masks are the pictographs that Ellis and Hammack described as "a cross with two circles" (this is the possible "Thirsty Mask") and "three ovals in triangular arrangement" (1968:27). Elaborate images of anthropomorphs with bear attributes and striped arms appear at both the Three Rivers (Schaafsma 1980) and Paradise Hills rock art sites (Sutherland 1978), suggesting that the bear paws and the striped hand in the Arrow Grotto might be related to the bear paws motifs painted there as well. This iconographic complex could reference the activities of a Mogollon Bear Clan and/or of ritual activities related to bears. Schaafsma identifies bear paws as one of the most common elements of the Jornada Mogollon rock art style, and she suggests that "the bear track stands for the curing power of the bear, and the paw is equal in power to the masks of other deities" (Schaafsma 1980:192; see also Nicolay 2007).

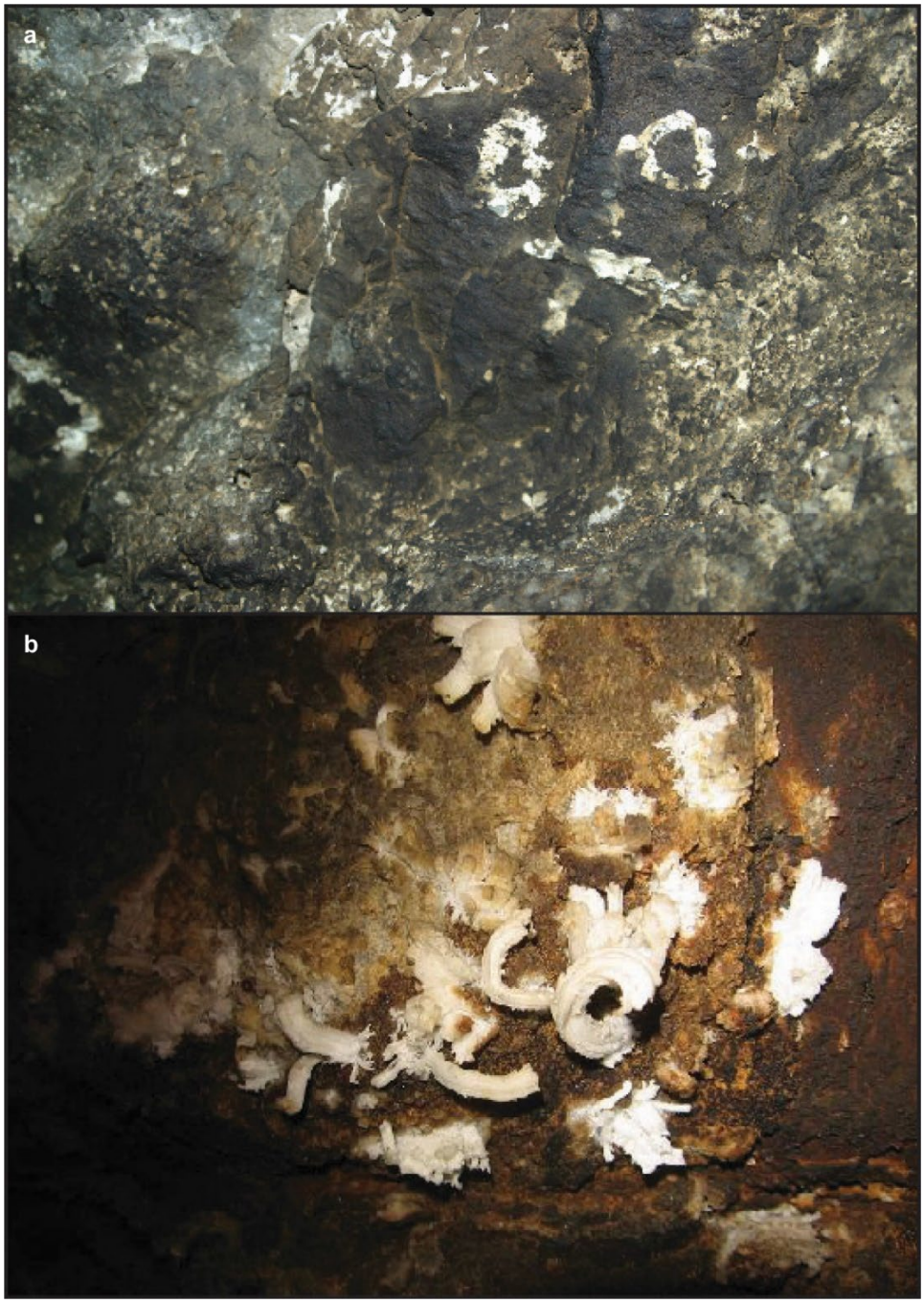


Figure 4.7. Feather Cave: (a) Possible example of the motif known as the “thirsty mask”; if this identification is correct, this is the most northern example of this motif; (b) gypsum speleothems (“flowers”) in a narrow cranny atop the breakdown pile at the rear of the Main Chamber of Feather Cave (photos by Scott Nicolay).

The team's most important discovery, however, was a possibly-modified vertical protrusion of breakdown in the Arrow Grotto (Figure 4.6a–b). Approximately 30 cm high, 8 cm thick, and 50 cm wide at its base, this slightly convex slab appears to have been chipped on both sides to enhance its resemblance to a stepped cloud terrace. The cloud terrace is a common motif in Jornada iconography, where it can represent or indicate an altar in and of itself (Myles Miller, personal communication, 2022). The resemblance is crude but unmistakable. In an early photo and in the Carrara brothers' film, a loose stone slab appears to cover this feature, which lies almost directly beneath the most elaborate mask, in a position that Ellis and Hammack identified as the locus of the largest deposit of prehistoric offerings in the room. This "cloud terrace stone" probably served as the primary altar and ritual focus of Feather Cave.

Hewett photographed an even larger cloud-terrace altar in the famous big kiva at Nambe (Hewett and Dutton 1945:45). Cloud altars are also documented at Hot Well and other Jornada sites (Fitzgerald 1984:36–37), and in a ceremonial room at the Piro site SOC-45 (Davis and Winkler 1975:54–56). This motif also appears on multiple El Paso Polychrome vessels (Jackson and Thompson 2005:5–6; Kurota et al. 2022:309–310, Figure 8). Most importantly, a pictograph depicting a cloud terrace occurs on the wall of the terminal chamber of Surratt Cave (Greer and Greer 1995, 1996, 1997, 1998, 2002) (Figure 4.8b). The shape and dimensions of this pictograph are almost identical to the previously-described rock outcrop in Feather Cave (Figure 5a–b), suggesting a relationship between the two caves (Nicolay 2007; Nicolay and Beresh 2023:141–143).

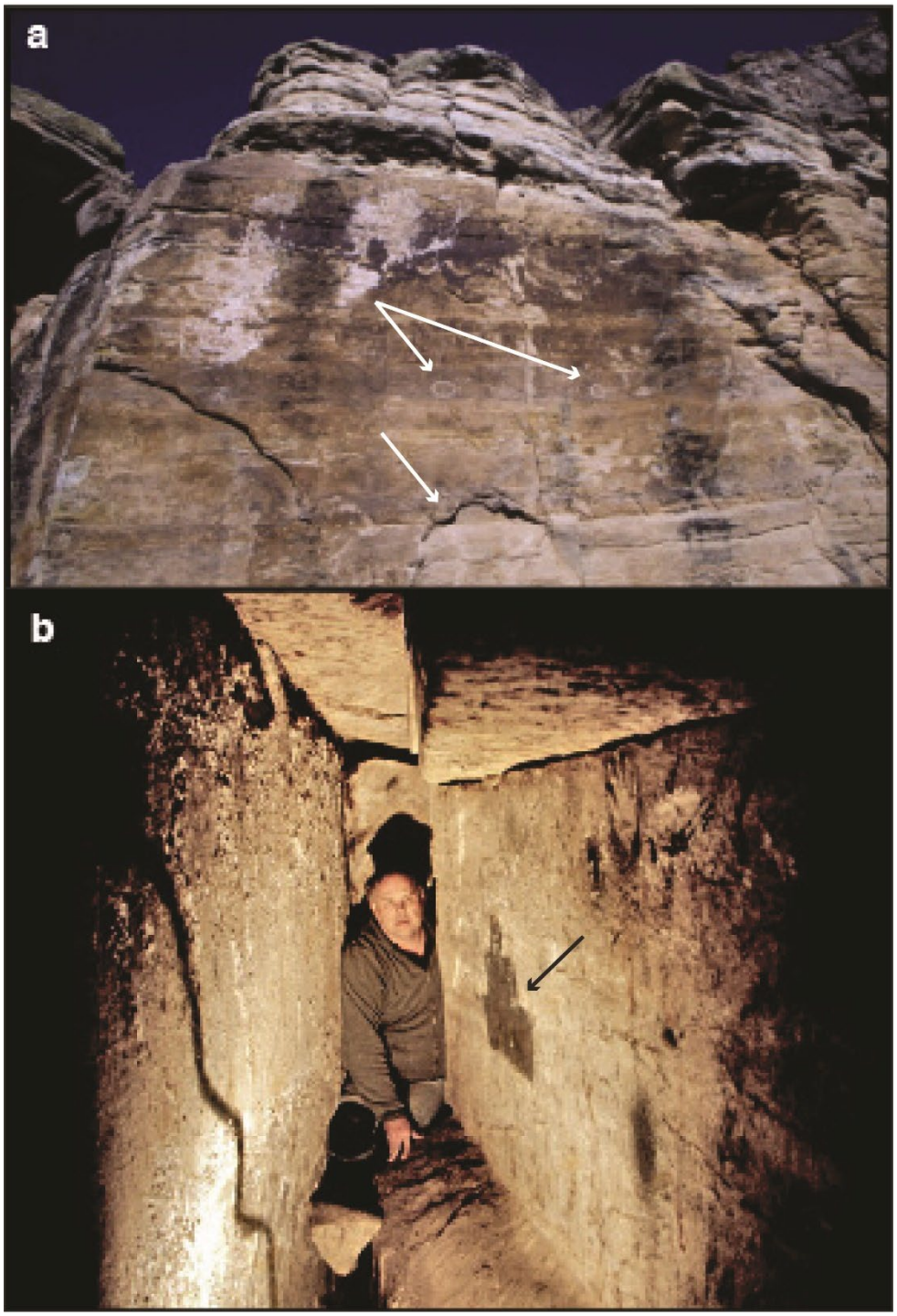


Figure 4.8. Surratt Cave: (a) the pair of goggle-eyes on the wall of the sinkhole opposite the entrance to the cave, showing area of spall that the Greers believe may represent the mouth of the goggle-eyed “Tlaloc” figure; (b) John Greer, at the entrance to one of the lowest rooms in Surratt

Cave, examining a cloud terrace motif similar in dimensions to the natural rock formation in the Arrow Grotto of Feather Cave (photos by John and Mavis Greer and courtesy of Greer Services).

Further evidence for rain-related ritual in the Arrow Grotto comes from the lower focus area, which is located between the entrance and the upper area already described. In 1964, Laurens Hammack recovered an assemblage from this area that included full-sized and miniature bows and arrows, crook *pahos*, a wooden ball, and a white shell bead (Ellis and Hammack 1968:26). Although arrows do not at first seem related to agriculture, they are closely associated with lightning, which is believed to fertilize planted fields in both the SW/NW and Mesoamerica (Parsons 1996:377, 705, 708).

Above this offering area are two pictographs: a negative hand stencil and a concentric circle design. No one noted any special reason for the choice of this area as a focus of offerings until I recorded a zigzagging overlap in the stone wall that forms a lightning bolt in low relief between the two pictographs. The focus of the majority of offerings on features representing lightning and a cloud suggests that rain-related ritual became a primary emphasis of activities in the Arrow Grotto even while offerings for hunting and/or warfare continued alongside. Much of Mesoamerican cave ritual had a similar emphasis on rain, agriculture, and fertility, and was directed at the rain god known variously as Chaac, Cocijo, Dzahui, or Tlaloc. Ironically, when Ellis and Hammack first proposed a Mesoamerican character to Feather Cave ritual in 1968, they were apparently unaware of the widespread presence of a goggle-eyed “Tlaloc” figure in Jornada Mogollon iconography (Nicolay 2007; Nicolay and Beresh 2023:141–143).

A wooden image of this figure long displayed at the Museum of Indian Arts and Culture in Santa Fe almost certainly came from Feather Cave. This is the figure reported

by Polly Schaafsma as coming from "Stanton Cave" (1999:179–180, Figure 12.16b). The attribution of this provenience came from Curtis Schaafsma, who once spoke to the "two old cowboys" who removed the effigy from the original cave. According to Schaafsma, these individuals identified the location as "Stanton Cave," i.e. *Fort* Stanton Cave, located approximately 1 km due south of Feather Cave (personal communication 2018). Although much larger than Feather Cave, Fort Stanton Cave is a wet cave in which perishable objects such as this effigy could not have survived. In fact, Fort Stanton Cave contains no prehistoric archaeological record except for some possible fragments of cane torches. Paul Reiter's correspondence shows that it was common for locals to confuse the two caves, especially during the early twentieth century when cave names in the area were not yet codified by modern cavers (Maxwell Museum, University of New Mexico [UNM], 76.67.209). Miller and colleagues reported a cal. 660–775 CE date for this effigy (2024:Table 1).

Surratt Cave (LA 9045)

Although Surratt Cave lies in the Salinas region, north of both Wiseman's Jornada and Sierra Blanca regions (Figure 4.1), it nonetheless appears to define the northern extent of the Jornada Mogollon cave ritual phenomenon. Located approximately 24 km due east of the historically occupied Jumanos pueblo of Gran Quivira in the foothills of the Gallinas Mountains (Caperton 1981:9; Greer and Greer 1995, 1996, 1997, 1998, 1999, 2002), this tectonic "cave" consists of a series of deep passages between massive breakdown blocks at the bottom of a large sinkhole. If any intact solutional passages exist

beneath this sink, they have not been documented historically, nor does any available evidence suggest that prehistoric peoples had access to them.

The archaeological record of Surratt Cave is unusual in that it consists almost exclusively of dark zone rock art: one of the rarest phenomena in the SW/NW. The rock art corpus of Surratt Cave is the largest in the region, but unlike Feather Cave, no evidence exists for any accompanying assemblage of offertory deposits. John and Mavis Greer, who researched this site extensively and documented it in a suite of publications (Greer and Greer 1995, 1996, 1997, 1998, 1999, 2002), have expressed amazement at its complete lack of portable artifacts, as even the most badly looted caves and rockshelters in the SW/NW usually still contain a few bits of cordage and fragmentary wooden artifacts (John Greer, personal communication 2007). However, in 2002, caver Bill Ellis shared with me a photo of a possible arrow or dart shaft protruding from a crack in the cave ceiling in a passage that the Greers had not accessed, and local rumors claimed that some persons have removed wooden artifacts from the cave (Caperton 1981:10), or even that "archaeologists from UNM" excavated it (Bill Ellis, personal communication 2002). No excavation records for Surratt Cave exist in New Mexico's ARMS database, nor are any artifacts from this site catalogued at either UNM, NMSU, ENMU, or the Laboratory of Anthropology. Quite likely, however, members of one of the regional archaeological societies of New Mexico or Texas conducted excavations in this cave but never wrote up their work or reported it. This explanation seems the most likely one, as no evidence exists for Indigenous peoples anywhere in the SW/NW removing offerings from a cave shrine. Another possibility is that Spanish priests stripped these materials from the cave,

but if this were the case, they almost certainly would have made at least some attempt to efface the rock art, especially the masks (Nicolay and Beresh 2023:143).

The extensive rock art corpus of Surratt Cave shares many motifs with Feather Cave, including masks, handprints, lightning serpents, a single ovoid bird, and cloud terraces. In fact, the respective iconographic sets of these two sites are almost entirely homologous. One of Surratt Cave's most interesting features is a pair of goggle eyes located not inside the cave but across the sinkhole from the cave entrance (Figure 4.8a). The Greers identified an area of pecking and spall beneath these circular petroglyphs and suggested that prehistoric peoples pounded the rock face with a stone at this spot to make the goggle-eyed face "speak" (Greer and Greer 1996:8, Figures 6–7; 1997:29; 2002:38; see Figure 4.8a). U-Bar Cave, an important shrine in the New Mexico Bootheel, also had goggle eyes associated with its entrance, but guano miners destroyed this feature during the process of enlarging the cave's entrance with dynamite. Lambert and Ambler recovered a painted wooden goggle-eyed effigy from U-Bar Cave that was very similar to the one that probably came from Feather Cave (Lambert and Ambler 1965:77–78). Although the U-Bar Cave goggle-eye effigy is morphologically different from the Feather Cave example, their color scheme is identical (Nicolay 2007; Nicolay and Beresh 2023:143–146).

Surratt Cave is not the only earth opening feature associated with Gran Quivira and the prehistoric/protohistoric population of Chupadero Mesa. In the 1980s, Park Service employees inadvertently blocked up a blowhole that once existed at Gran Quivira (Ball et al. 2005:49; SWCA Environmental Consultants 2016). As with the better-known blowhole at Wupatki in Arizona (Lamar 1962; Sartor 1964; Schley 1962), no definitive

evidence exists to confirm whether this feature existed and was known to Indigenous inhabitants during the occupation of the site, but such coincidences seem unlikely at either location.

Pintada Cave (LA 37037/FB 9369)

Richard "Scotty" MacNeish excavated both Pintada Cave and nearby Pendejo Cave in the 1980s and '90s. The latter has of course received far more attention and is the subject of an entire volume (Macneish and Libby 2004), but as Pendejo Cave showed little or no evidence of ceremonial use, it will not receive any further attention in this dissertation. Pintada Cave belongs to a complex of 11 rockshelters, several of which are decorated with pictographs. MacNeish led his crew in an excavation of the stratified deposit on a long limestone bench at the rear of Pintada Cave, where they had encountered a layer of:

> powdery sediments loaded with artifacts varying from 10–30 cm in depth prior to the start of their excavations. This apparent offertory deposit turned out to hold numerous projectile points, shell beads, a tubular stone "cloudblower" pipe that still contained tobacco, and many lithic flakes [Loendorf et al. 2013:129; MacNeish 1998].

Much to MacNeish's disappointment, none of this material turned out to be pre-Clovis (Loendorf et al. 2013:129; MacNeish 1998). Nonetheless, this assemblage represents an obvious and significant ritual deposit, as well as one that is largely distinct in its material signature from other cave shrines in the area. MacNeish (1998:41) suggests

that the earliest points in this deposit date as far back as the Gardner Springs phase (6300–8000 years BP), although the largest sample belonged to the Hueco phase (1600–2900 years BP), placing it contemporary with early use of Ceremonial Cave. Although these dates fall far short of the Pleistocene, the evidence suggests both that Pintada Cave was one of the earliest-used cave shrines in the Jornada region, and notably, that the offerings there relate almost exclusively to hunting and/or warfare (although the cloudblower probably relates to rain ritual). The site is therefore consistent with early cave and earth-opening shrines elsewhere in the SW/NW, but this particular practice of discard—accumulated projectile points on a bench—remains unique (Nicolay and Beresh 2023:146). The nature of the original offertory deposition probably consisted of whole darts, or at least their foreshafts.

Fresnal Shelter (LA 107268)

Fresnal Shelter is a large south-facing rockshelter in the Sacramento Mountains (Figure 4.1). Archaeological interest in this site has focused on its significance as an Archaic site with a large assemblage of faunal remains and evidence of early agriculture (Merchant and Bohrer 2006). Although the site certainly shows evidence of at least seasonal residence, it also yielded the second largest assemblage of sandals from any single site in the SW/NW. Beresh reports that Human Systems Research excavated "several hundred sandals" from Fresnal Shelter, but no analysis of these specimens is available (2019:11–12). They are currently curated at Eastern New Mexico University (Karl Laumbach, personal communication 2023). Merchant and Bohrer analyzed 159

sandals recovered by ENMU under Cynthia Irwin-Williams—a prodigious number for one site, and far more than other nearby rockshelters that probably also served as seasonal camps (Beresh 2019:11–12; Merchant and Bohrer 2006:153–157).

Fresnal Shelter demonstrates well how although deep caves with dark zones in the Mogollon region represent exclusively ritual sites, rockshelters could have served multiple purposes, both utilitarian and ceremonial, that changed over time, and this possibility makes the interpretation of these sites far more complicated. In this case, the number of sandals seems far too high to dismiss simply as the detritus of even long-term occupation. Such a disproportionate number of domestic artifacts is one of several factors that can point to the use of a site for ritual offerings. Moyes has described how a similar pattern became an initial stumbling block for early Maya cave studies (Moyes 2012:8). Whereas dark zone caves have served almost exclusively religious purposes throughout the world (Moyes 2012:1–11), rockshelters have been used variously as shrines, camps, and storage areas at different times, or even simultaneously, as such usage of space was not necessarily as compartmentalized for Indigenous peoples in the SW/NW as it has long been in Western society.

Sacramento Shelter (LA 37321)

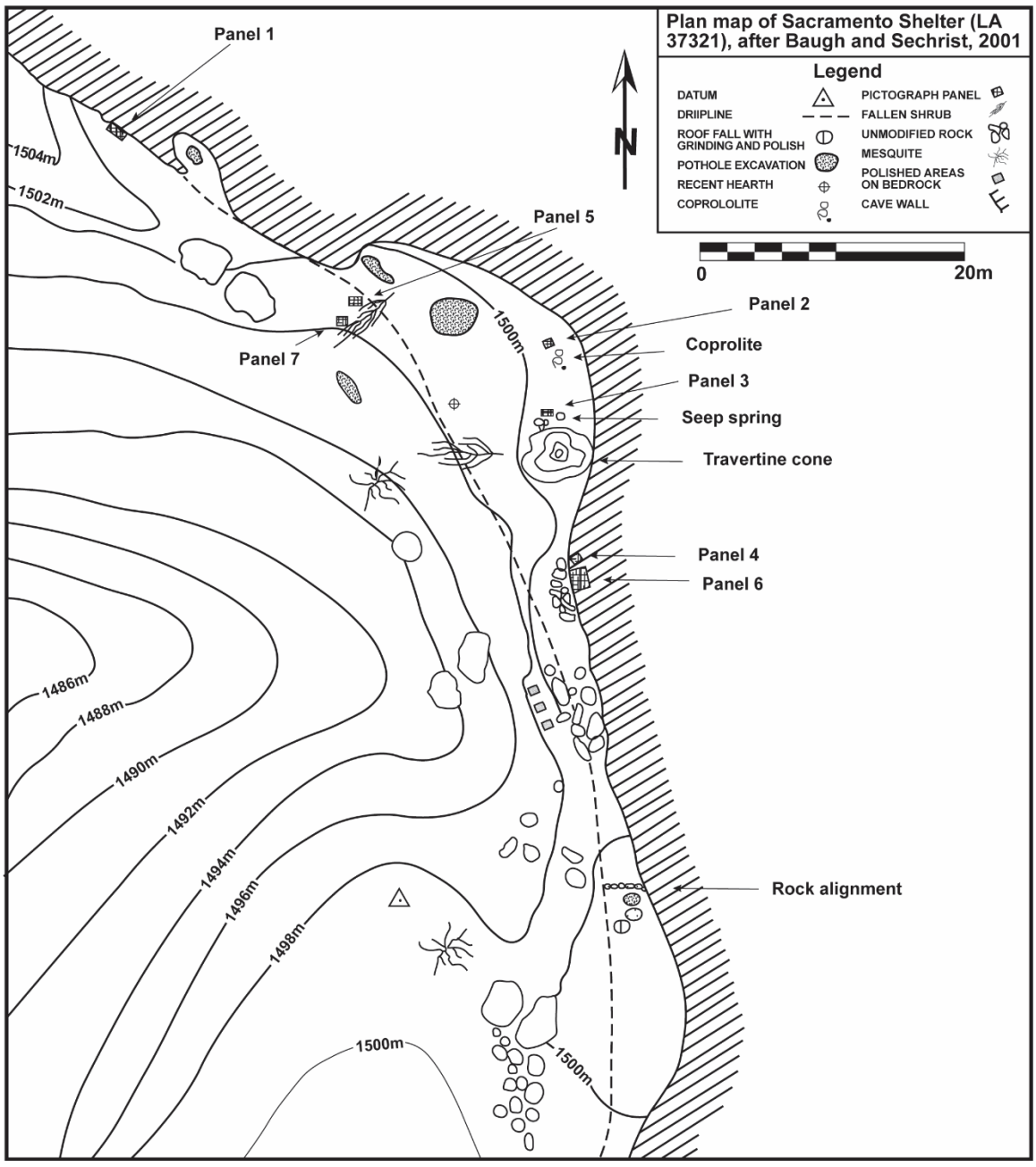


Figure 4.9. Plan map of Sacramento Shelter, after Baugh and Secrist (2001:120, Figure 6.21).

Sacramento Shelter is a large rockshelter on the southwestern escarpment of the Sacramento Mountains, clearly visible from as far as 10 km away, which suggests the

importance of this feature in the prehistoric landscape (Figure 4.1). Several archaeologists and archaeological firms have visited this site, including Timothy G. Baugh and Mark Sechrist from TRC, Inc., in 1998 (Baugh and Sechrist 2001:116–124). Among the features that Baugh and Sechrist recorded was a dripping seep spring with an associated travertine cone (2001:118) (Figure 4.9). The presence of a water source inside a shrine cave, no matter how small, is a rare phenomenon in the Jornada Mogollon region (none of the other sites in the Jornada region discussed herein, and few in the Mimbres region, included anything comparable), and this feature likely enhanced the cave's prehistoric ceremonial significance. Just north of this feature was a low cluster of cobbles that Baugh and Sechrist suggest was an altar, and above that they recorded ceiling pictographs of a stepped terrace and a mask (2001:118). All these findings support identification of this area as the ceremonial focus of the cave and a primary reason for the overall importance of the site (Nicolay and Beresh 2023:147).

Additional evidence for the prehistoric importance of Sacramento Shelter comes from intensive work that Myles Miller and Versar, Inc., conducted in this area in 2018. During that time, Miller identified a trail leading from Sacramento Shelter to a cluster of large plaza pueblos to the south at LA 37227. This residential cluster includes a distinctive rectangular adobe mound with a central plaza area (Miller et al. 2019a, 2019b). At 75 to 100 rooms, the dimensions of the room block are equivalent to those of the largest plaza-oriented pueblos known from the Jornada region, such as the Alamogordo pueblos and Indian Tank (Lehmer 1948; Lekson and Rorex 1987). According to Miller (personal communication, 2021):

> These trails were not formally constructed linear roads such as found in the Chaco and Mimbres regions (Creel 2006; Vivian 1997), but rather travel and communication routes used repetitively over long periods of time. The first such pathways identified consisted of four trail segments located south of Sacramento Shelter (Kludt et al. 2007a, 2007b). The spatial plot of ceramic data on an aerial image shows a clearly defined corridor leading from the plaza pueblo of LA 37227 to the base of the cliff directly below Sacramento Shelter. No other reason exists for the pathway to end just below the shelter—no settlements, agricultural fields, agave communities, or other resource procurement areas, and no access to the forested uplands of the Sacramento Mountains. This ceramic pathway thus represents an archaeologically defined processional route between a major Jornada Mogollon village and a shrine cave. This discovery is significant because it establishes a connection between a specific pueblo and specific sacred place, as well as a process of habitual and repetitive movement of people and of things between the two loci.

As discussed earlier herein, a similar albeit shorter pathway once connected Feather Cave with the Lower Stanton Shelter to the south (Maxwell Museum, University of New Mexico [UNM], 76.67.176:1). Other Jornada cave shrines might also connected to settlements by similar pathways of scattered sherds, but that these examples remain unrecorded or have been obliterated by historic agriculture and/or other more recent activities. The pathway from Sacramento Shelter probably also led directly to a communal plaza or communal room within the pueblo, but unfortunately early twentieth

century agricultural fields and irrigation features destroyed any evidence of a 1.5 km segment of the trail leading north from the pueblo (Miller et al. 2019a, 2019b; Nicolay and Beresh 2023:147–149).

Sandal Canyon Cave (LA 8677)

Mike Marshall, Laurens Hammack, and Major General John Shinkle excavated Sandal Canyon Cave in 1961, but their collections remained unanalyzed until 2013, when Steven B. Needle undertook the project for his MA thesis at New Mexico State University (it is worth noting that both Marshall and Hammack participated in the investigations of the Arrow Grotto of Feather Cave a few years later; Needle 2015, 2017). The cave is located on the White Sands Missile Range in the Rhodes Canyon area of the San Andres Mountains. Although the assemblage that Needle reports from the cave lacked some elements common to many cave shrines in the Southern Mogollon region, such as *pahos*, *tablitas*, and bows and arrows, it did include sandals as well as multiple other items with likely ritual associations, such as fossil shells, quartz and selenite crystals, as well as culturally-curated Archaic and Paleoindian projectile points (Needle 2017:58). This assemblage suggests that whether or not anyone made offerings in Sandal Canyon Cave, one or more ceremonialists at least employed the site for the storage and/or terminal discard of sacra, which reinforces the role of caves and rockshelters as liminal spaces in Jornada Mogollon cosmovision. As with Pintada Cave, this site provides evidence for the overall variation of cave ritual in the Jornada region and the possibility of multiple temporal components (Nicolay and Beresh 2023:149–150).

Chavez Cave (LA 5220)

Chavez Cave is located west of the Rio Grande and north of Las Cruces in the Robledo Mountains. The site is contained within the current Organ Mountains-Desert Peaks National Monument. The Cosgroves excavated there in 1927, but unfortunately the cave had been badly vandalized and looted the year prior by a crew of eight men hired by Jacobo Chavez, who believed his father had rights to the site under the Mesilla Land Grant. Chavez hired his crew to dig for treasure in the cave for five weeks (Cosgrove 1947:31; Kidder 1927b:3–5). Considering this systematic assault on the site, it is amazing that the Cosgroves recovered anything. Fortunately, they also were able to obtain some artifacts from Chavez himself, including a partial atlatl (Cosgrove 1947:31), suggesting that use of the cave as a shrine began earlier than the sixth century, the approximate date of the arrival of the bow and arrow in the Southern Mogollon region, after which it rapidly replaced the atlatl/dart/fending stick complex that had preceded it (Geib et al. 2017:360; Roth et al. 2011). Both weapons complexes are important elements of the offertory assemblages in cave shrines across the Southern Mogollon region and beyond. The Cosgroves also recovered fragmentary reed arrows in the cave, showing that its use as a shrine continued beyond this technological shift. Other likely ritual offerings from Chavez Cave included *pahos*, reed cigarettes, and two tortoise shell rattles (Cosgrove 1947:32–33). The latter likely represents the same sort of "retirement" of ceremonial artifacts as suggested above for Sandal Canyon Cave (Nicolay and Beresh 2023:150).

Thomas O'Laughlin conducted limited excavations in Chavez Cave at an unspecified time between 1970 and 1993 (O'Laughlin 2003:29), during which he confirmed that the deepest parts of the cave represent a true dark zone. O'Laughlin's collections included fragments of painted *tablitas*, a painted gourd disk, the first bone fishhook reported from the SW/NW, and a painted stone goggle-eyed "Tlaloc" effigy, decorated similarly to the wooden examples from Feather Cave and U-Bar Cave. O'Laughlin's paper about his work at this site, though brief, represents one of the more important contributions to the study of ritual cave use in the SW/NW (Nicolay and Beresh 2023:150; O'Laughlin 2003).

We cannot, however, be certain that Chavez Cave was exclusively a Jornada Mogollon cave shrine. The ceramic types recovered from this site (Alma Plain and Scored, San Francisco Red [O'Laughlin 2003:29]), as well as its location west of the Rio Grande, suggest that it was also a Preclassic Mimbres site. All of the objects and iconography documented at the site, including the goggle-eyed "Tlaloc" effigy, were shared by both groups. Fumi Arakawa of New Mexico State University has recently undertaken a fresh round of work at this site, including collaborations with Octavius Seowtewa and other elders from the Pueblo Zuni. They have confirmed its role as a shrine, and these efforts have provided a clearer picture of the cave's prehistoric use (Fumi Arakawa, personal communication 2022). Most likely Chavez Cave is a multicomponent site that served primarily as a shrine from the Archaic period through the El Paso phase of the Jornada Mogollon. Berrier has identified both Archaic and Jornada Mogollon rock art in the cave (personal communication, 2023).

Discussion of Jornada Mogollon Cave Ritual

The preceding descriptions of 11 caves and rockshelters in the Jornada Mogollon region provide some idea of both the diversity of the archaeological record of these sites as well as patterns common to two or more Jornada cave shrines and even across the Mogollon region overall. Ellis and Hammack's 1968 paper on Feather Cave and the Cosgroves' earlier work on the Ceremonial Cave complex (1947:34–40) anticipated many key aspects of Mesoamerican cave archaeology by years and even decades, and Ellis and Hammack (1968) devoted much of their paper to examining possible parallels between ceremonialism and cosmovision in the two areas. These factors make it worthwhile to compare research from cave archaeology in both areas, and to consider whether the respective bodies of research can inform each other—and if so, how (Nicolay and Beresh 2023:151).

In a 2004 paper synthesizing two decades of Mesoamerican cave research, Moyes and Brady outlined five core aspects of Mesoamerican ritual cave use:

1. Their association with what is conceived of as the basic organization of the cosmos into four directions and a center.
2. Their identification as the place of origin of human groups.
3. Their role in the sanctioning of place, which is reflected in the incorporation of caves into site core architecture.
4. The appropriation of caves by elites to legitimize their positions.
5. Finally, and very importantly, the ritual use of caves relates to the creation of life, fertility, and renewal.

Several of these conclusions fit the use of cave shrines in the Jornada region remarkably well. The deliberate siting of both the Lower Stanton Ruin and an earlier pithouse community due south of Feather Cave not only suggests that the cave served as the focus of settlement in the valley, but also that it could reflect the frequent motif of an emergence in the north prevalent in eastern Pueblo origin narratives. Salinas settlement patterns also appear intimately connected to Surratt Cave, and the blowhole at Gran Quivira (Ball et al. 2006:49; SWCA Environmental Consultants 2016) represents another possible earth opening directly in the core of a primary settlement. This aspect is consistent with some of the largest and most important sites in the SW/NW Wupatki (Lamar 1962; Sartor 1964; Schley 1962), Paquimé (Di Peso et al. 1974:371–381; Walker and McGahee 2006), and Pueblo Bonito (Nicolay 2005) in the SW/NW, as well as numerous sites in Mesoamerica, including Teotihuacan (Aguilar et al. 2005:69–87; Heyden 1975). All of these sites incorporated earth openings of various kinds, natural or artificial, in their site cores.

The focus of ritual in the Arrow Grotto of Feather Cave on natural features representing clouds and lightning suggests how intimately these activities were tied to the agricultural cycle that supported life in the valley below. Of the five principles that Moyes and Brady outlined, only the use of caves by elites cannot be clearly demonstrated in Jornada caves, but this absence is not surprising given that little if any evidence exists for social stratification and elites among either the Jornada or the Mimbres (the case for such associations seems much more supportable at Pueblo Bonito, Wupatki, and Paquimé). It also remains possible that the use of certain caves, or specific areas within the caves, may have been reserved for specific lineages or ceremonialists. The unusual

layout of rectangular shrines in Bear Creek Cave, which I discuss at length in Chapter 6, suggests such a possibility.

Overall, Jornada Mogollon cave shrines contain assemblages of ritual offerings similar to those found in cave shrines in the Mimbres Valley and Upper Gila drainages documented by the Cosgroves (1947) and Walter Hough (1907, 1914). Arrows and bows, *pahos*, and *tablitas* are common in caves and rockshelters across the combined Mimbres and Jornada Mogollon regions. Two artifact categories stand out for the Jornada region, however. The first, not surprisingly, is rock art, the medium in which the Jornada arguably created one of the most spectacular expressions in the SW/NW. Jornada shrines include numerous painted rockshelters, alcoves, and grottos, and two of the only five known caves in New Mexico with dark zone rock art. The only cave shrines in the Mimbres region that even exhibit associated rock art are Doolittle Cave (Cosgrove 1947:7–9), Map Cave, Beehive Cave, and the Postclassic U–Bar Cave, and only the latter has dark zone rock art—and even then a very limited amount consisting of the simplest motifs (Greer and Greer 1998, 1999). The first three sites are all shallow rockshelters that lack any dark zones. The other two caves in the SW/NW with dark zone rock art are Slaughter Canyon Cave and Black Cave in the nearby Guadalupe Mountains, both of which date to the Archaic (Bilbo 1997; Nicolay and Beresh 2023:151–152).

A Closer Look at Sandals in Jornada Mogollon Caves

The other distinctive component of Jornada Mogollon cave shrine assemblages is the quantity of sandals (Tables 4.1 and 4.2). Shrine caves in the Mimbres region also

contain sandals, but never in the large numbers recorded from Jornada sites (I revisit these differences in Chapter 9). The abundant sample from Ceremonial Cave especially stands out. The Cosgroves recovered over 900 sandals there and estimated that the total prior to looting was as high as 1,200 to 1,300 (1947:35–36). Feather Cave and Fresnal Shelter, both sites in the Sierra Blanca region, contained over a hundred sandals each (Table 4.2; Beresh 2019). For comparison, the largest number of sandals recovered from any Mimbres site was 39, from Doolittle Cave, the southernmost and easternmost of major Classic Mimbres cave shrines[3] (Tables 4.1 and 4.2; Cosgrove 1947:7–9). Looting does not necessarily explain this difference, as both Mimbres and Jornada cave shrines were heavily pillaged prior to any systematic archaeological attention, and Paul Reiter's UNM crew recovered over 100 sandals from Feather Cave despite a century of looting (Beresh 2019; Ellis and Hammack 1968; Roosa 1952; Nicolay and Beresh 2023:152, Table 1).

Table 4.1. Distribution of sandal types in Jornada and Mimbres cave shrines excavated by the Cosgroves (after Cosgrove 1947:93).

Type / Site	Scuffer-Toe & Fishtail Varieties													Wickerwork Varieties								
	4-warp	4-warp ½-sole	4-warp short	2-warp	2-warp	2-warp fish-tail	2-warp fish-tail toe	2-warp fish-tail scuffer-toe	2-warp fish-tail scuffer-toe	2-warp fish-tail scuffer-toe	2-warp fish-tail scuffer-toe	2-warp fish-tail scuffer-toe	2-warp fish-tail scuffer-toe	2-warp full-length	2-warp full-length	Full-length turned-heel	Full-length turned-heel	2-warp scuffer-toe	2-warp full-length	5-warp full-length	6-warp full-length shoe sandal	Full-length soft wicker sandal
	1a	1b	1c	2	3	4a	4b	5a	5b	5c	5d	5e	5f	7	8	9a	9b	10	11	12	13	14
Ceremonial Cave	112	19	1	24	234	14	26	26	11	29	46	68	4	8	4							
Picture Cave	2	1		1	1	1	3															
Chavez Cave	8			1	3	4	1	5	4	1	6											
Doolittle Cave	1							1								14	25					
Steamboat Cave																		9	9			
Site 3, Sapillo																						
Water Canyon Cave																			2			
Cave 1, Mid. Fork																			1			
Cave 2, Mid. Fork																			1			1
Cave 2, West Fork																						3
Kelly Cave																6			2	1	1	
Cave 1, Goat Basin																1						5
Cave 5, Sipe Canyon																3	6					
Mule Creek Cave																7	5		1			

Table 4.2. Distribution of sandal types in Jornada and Mimbres caves, including Feather Cave and Fresnal Shelter (after Beresh 2019:29).

Site Name	Sandal Weave				Sandal Shape				Sandal Completeness		Totals
	Plaited	*2-Warp*	*4-Warp*	*Indet.*	*Fishtail*	*Scuffertoe*	*Other*	*Indet.*	*Complete or Nearly Complete*	*Fragmentary*	
Mule Creek Cave	12	1	—	—	—	—	13	—	13	—	***13***
Doolittle Cave	39	1	1	—	1	1	39	—	39	2	***41***
Lemitar Rockshelter[a]	3	1	3	1	3	1	3	1	6	2	***8***
Chavez Cave	—	25	8	—	12	21	—	—	32	1	***33***
Ceremonial Cave[b]	—	494	132	—	390	224	12	—	626	?[b]	***626***
Pendejo Cave	1	5	4	—	4	5	1	—	6	4	***10***
Fresnal Rockshelter[c]	—	144	15	—	147	—	12	—	62	97	***159***
High Rolls Cave[d]	—	6	—	—	2	4	—	—	5	1	***6***
Feather Cave[e]	3	70	38	5	42	10	34	30	67	49	***116***
Totals	**58**	**747**	**201**	**6**	**601**	**266**	**114**	**31**	**856**	**159**	**1015**

[a] Nine sandals recorded as recovered from site, only eight found and analyzed in collections.
[b] 935 recovered, 626 analyzed; total estimated 1,200–1300 sandals. It is unclear how many fragments were recovered (Cosgrove 1947:35).
[c] Estimated 400 sandals were recovered during HSR excavations but remain unanalyzed. These are from Cynthia Irwin-Williams excavations (Merchant 2002).
[d] Three sandals too fragmentary for analysis (Merchant and Bohrer 2006:153).
[e] 143 sandals recorded as recovered from site, only 116 found and analyzed in collections.

Beresh's 2019 UNM Master's thesis examined sandals from the Southern Mogollon region, with an emphasis on the collection from Feather Cave curated at UNM. She found that sandal types and quantities demonstrate a distinct east-west clinal variation, both in quantity and type. Although these clines were already recognizable in the Cosgroves' data (Table 4.1), their research did not distinguish between the two cultural regions. Moreover, because previous classifications systems lacked "consistency to which attributes are recorded, if recorded at all for any given site" (Beresh 2019:13), and the lack of clear distinctions between counts of whole and partial sandals, Beresh was

forced to create her own classification system for the Feather Cave sandals (Table 4.2). She found that fishtail and scuffer-toe sandals dominated the assemblages from Jornada Mogollon caves, whereas wickerwork sandals became more common in the Mimbres Mogollon region (Tables 3.1 and 3.2; Figure 4.10a–b, c–d). Moreover, the numbers of sandals in Mimbres caves are far lower than those in Jornada caves, although sandals remained a component of Mimbres cave shrines and invariably occur in cave shrines that contained abundant ritual offerings with no evidence of domestic activity. In fact, most Mimbres caves with ceremonial assemblages showed little if any evidence of domestic use, supporting the conclusion that sandals in these sites were offerings, probably representing a repetitive ritual practice of some kind.

Similar evidence for sandals as offerings in earth opening shrines comes from *wahaniak shukuk shtuitauw* (the Correo Shrine), which although neither a cave nor a rockshelter, is a large earth opening that yielded an extensive assemblage of ritual objects, including atlatl darts, sandals, and large quantities of beads and shell (Geib et al. 2017; Parsons 1918; Sandberg 1950). The abundant historical presence of rattlesnakes in this feature rules out any possibility that it ever served for habitation, nor did excavations uncover any evidence of habitation. The site's use as a shrine has been documented ethnographically (Parsons 1918), and it remains in use for this purpose today (Laurens Hammack, personal communication 2005; Nicolay and Beresh 2023:155).

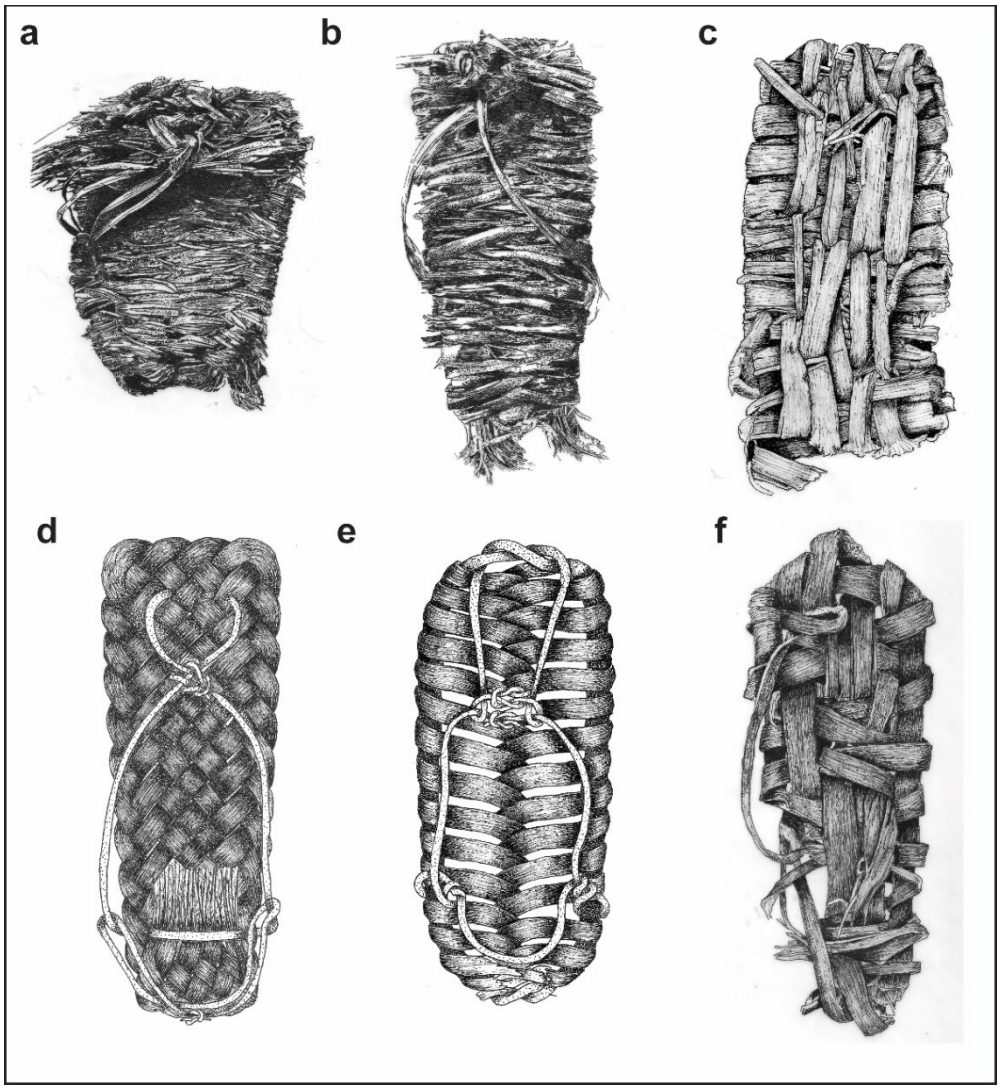


Figure 4.10. Sandal types from caves in the Jornada, Mimbres, Coahuila, and Trans Pecos regions: (a) Cosgrove's Type 1a; four-warp scuffer-toe sandal (after Cosgrove 1947:Figure 87); this was the second most common sandal type recovered from Ceremonial Cave and also occurred in Picture Cave and Chavez Cave; (b) Cosgrove's Type 3a, two-warp scuffer-toe sandal (after Cosgrove 1947:Figure 87); two-warp sandals were the most common types in Ceremonial Cave, Feather Cave, Fresnal Shelter, and Chavez Cave; (c) opposed-warp plaited sandal from the Shumla Caves in the Texas Lower Pecos region, dated to the San Felipe Interval, 4,100–3,200 BP (after Shafer 2013:76; (d) Cosgrove's Type 9b, full-length, turned heel wickerwork sandal (after Cosgrove 1947:Figure 92); this was one of the two most common sandal types in Doolittle Cave, a Mimbres Cave shrine in the Lower Mimbres Valley, and in several other Mimbres cave shrines in the Upper Gila; (e) Cosgrove's Type 11; two-warp full-length wickerwork sandal (after Cosgrove 1947:Figure 92); this was one of the two most common sandal types in Steamboat Cave, a Mimbres Cave shrine in the Upper Gila; (f) two-warp plaited sandal of Zamandoque,

from Frightful Cave in Coahuila (after Taylor 2003:56, Figure 5.1) (drawings by Margaret Berrier).

The pattern of sandal discard in caves also extends to the southeast, but with another interesting variation. Caves in the Trans-Pecos area of southwest Texas exhibit quantities of sandals comparable to Jornada Mogollon sites, culminating further south at Cueva Espantosa ("Frightful Cave") in Coahuila, where Walter Taylor recovered nearly 1,000 sandals (Taylor 2003:54). Sandals in west Texas and Coahuila were primarily plaited (Figure 4.10c, f). Interestingly, some of these sites, including Cueva Espantosa, also yielded large numbers of coprolites (Bryant 2013:112–115; Taylor 2003:66–68), an element not documented in any Jornada or Mimbres Mogollon caves, with the sole exception of Ceremonial Cave. In Hinds Cave on the Lower Pecos, the coprolites occurred in two discrete "latrine areas" between sleeping areas (Shafer 2003:99). Hinds Cave, however, is a rockshelter that exhibited distinct evidence of habitation, unlike either Ceremonial Cave and Cueva Espantosa, which are both deep caves with limited or no evidence for domestic use (Nicolay and Beresh 2023:155).

Whatever the practice of leaving worn sandals in caves meant to the prehistoric peoples of the southern Mogollon region, it appears to have been significant in but not exclusive to their religious traditions. This tradition held some importance over a wide area and a lengthy time period, but perhaps nowhere more so than among the Jornada. Cosgrove suggested that pilgrims left their sandals at their destination, which remains a plausible interpretation (1947:97). Ellis and Hammack posited that the sandals found in caves were employed in sacred activities, such as kick-stick races (1968:34). After two decades of considering this unusual aspect of ritual cave assemblages, I offer a different, if difficult-to-test hypothesis. Several considerations and lines of evidence led up to this

thinking. Recent research by colleagues Margaret Berrier, Myles Miller, Polly Schaafsma, and Thatcher Seltzer-Rogers suggests that if viewed from the perspective of iconography and ritual rather than that of architecture, ceramics, and lithics, the peoples of the Jornada and Mimbres Mogollon areas appear to have shared a single cosmovision, albeit with some clinal variation and with certain key differences including mortuary practices and discarding used sandals in cave shrines. The association of a punctured bowl with burials, a defining characteristic of the Mimbres Classic, was not common among the Jornada, although it is not unknown there; likewise, the Mimbres also left sandals in their cave shrines, though, as noted here, never in such great numbers as recorded in some Jornada sites (Nicolay and Beresh 2023:157).

The second line of evidence that can aid in interpreting this practice is the prominent rock art imagery and recorded oral history related to feet and footwear in the SW/NW, most notably in the Hopi covenant with the deity *Masauwu*, who instructed Hopi ancestors to leave their "footprints" here in the Fourth World, with such footprints, including depopulated villages, artifacts, other traces of ancestors, and virtually the entire archaeological record (Colwell and Koyiyumptewa 2018:22). Footwear and footprints represent the human interface with the Earth and mediate between the world of the living and the world of the ancestors. For example, among the Diné, a deceased person's shoes are reversed so that they cannot follow their footprints back from the land of the dead, which is located in the underworld of the primordial emergence, just as it is for the Pueblo peoples. Although moccasins replaced sandals throughout much of the SW/NW during the twelfth century, ethnographic evidence suggests that these beliefs transferred over to the new form of footwear. A notable example comes from Stevenson's 1906

notes on a ceremonial procession from Taos Pueblo to Blue Lake, as reported by Bodine (1988:96). Just like cave shrines, this lake is considered the "abiding place of the cloud people, *łaciną* (*Katsina*) and the dead" (1988:94). A central element of the ceremony is for participants to cast their moccasins into the lake as offerings (Bodine 1988:96; Nicolay and Beresh 2023:157).

Finally, and most specifically, it is necessary to consider the existence of comparable examples from other caves in neighboring cultural areas to the southeast: the Trans-Pecos and Coahuila. Cueva Espantosa contained a quantity of sandals almost identical to what the Cosgroves recovered from Ceremonial Cave. During his excavations there in 1941, Walter Taylor recovered over 950 sandals, and these came primarily from the cave's dark zone. Some of these specimens, among the earliest in the cave, were found in conjunction with many cut hanks of human hair, which Taylor identified as possibly reflective of mourning ritual (Taylor 1972:176). Large numbers of sandals also came from Hinds Cave, the Shumla Caves, and other caves in the Trans Pecos area (Nicolay and Beresh 2023:157; Shafer 2003:63–64, 73, 75).

I hypothesize that the large accumulations of sandals in Jornada cave shrines are at least partially the result of a mourning or mortuary ritual where one or more of a deceased person's sandals was placed in a cave shrine. Through the placement of a personal object, so closely associated with the individual in life, in a powerful and *liminal* space, i.e. a location mediating between this world and the underworld, the Jornada would have enacted a ritual that played a similar role to the placement of a punctured Mimbres B/w bowl with a subfloor burial. Shafer argues that Classic Mimbres subfloor intramural burial practices represented a form of ancestor veneration most likely tied to

land tenure (Shafer 2003:9, 83). Although sharing similar beliefs regarding the relationships between ancestors, the underworld, and rain, the more mobile Jornada might have had less interest in establishing strict inheritance protocols for agricultural fields and other land-based resources, but would nonetheless have sought to establish ties to the deceased in their role as rainmakers. Therefore, I argue that the sandals in Jornada caves represent a practice ideologically related to the punctured bowls in Mimbres graves. Both practices probably served to establish extended relationships with ancestors through the placement of highly personal objects in a space that mediated between the world of the living and that of the ancestors (Nicolay and Beresh 2023:157–158). Sandals were also recovered from over half the Mimbres cave shrines in the dataset, though never in numbers so large as in the collections from Ceremonial Cave or Feather Cave.

I do not, however, suggest that all sandals left in caves in the Jornada region, the Trans-Pecos, and Coahuila represent identical practices of ancestor-related ritual. Although absolute dates are not available from Jornada (or Mimbres) sandals, sandals from the oldest layers in Coahuila's Cueva Espantosa dated as early as 6200 years BP (uncalibrated 14C; Taylor 1988:150; Turpin 2003:31, 40). These were plaited sandals, whose use spanned approximately 5,000 years at that site, an impressively long time for the continued use of one site and one technology (Turpin 2003:13). Although the discard of even a single sandal every five years would have been enough to account for the quantity in Frightful Cave, the association of many of these sandals with evidence of mortuary ritual suggests that something more than casual discard accounted for such a disproportionately large assemblage (Nicolay and Beresh 2023:158).

Whatever the origins of this practice, the reasons behind it could have changed over the millennia, not only in Coahuila, but in the Jornada region as well—where feet and footprints are common motifs in the extensive corpus of rock art iconography. Although the discard of worn sandals in caves might have originated as an expedient behavior during the Archaic, the association of sandals with cut hanks of human hair in Cueva Espantosa suggests another, more specific purpose, which is that both these items were deposited in the rear of the cave to protect them from access by witches. The belief in witchcraft is universal among Indigenous peoples in the SW/NW (Stevenson 1904:392), and the belief that witches can do harm to an individual by obtaining personal items, especially their hair, is also widespread (Kluckhohn 1944:31). I lived for many years on the Navajo Nation and became familiar with this concern during that time and its almost daily influence on behavior regarding the discard of hair, fingernail clippings, and other personal items. Interestingly, a related belief exists, at least among the Diné, that witches can even use the excavated soil of a person's footprint in this way, a belief that strongly reinforces the emic significance of feet, footwear, and footprints in the SW/NW (Nicolay and Beresh 2023:158).

Whatever the original reasons for the discard of sandals in Jornada caves during the Archaic, these purposes probably shifted in later phases, developing into a form of ancestor veneration because people recognized that their own ancestors had left sandals in caves. Coulam and Schroedl (2004:44–46) and Emslie and others (1987:514–516; 1995:170–171) have all argued that Archaic people selected caves in the Grand Canyon for the offering of split-twig figurines specifically because those sites contained the bones and dung of extinct artiodactyls. The transition of sandal-discard in caves of the Jornada

region (and possibly elsewhere to the south) to a form of ancestor veneration also could have developed based on a comparable process centered on the presence of Archaic sandals in those caves, with later populations in the respective regions reacting to the emically-perceived significance of the archaeological (and/or paleontological) record as they encountered it in their time (Nicolay and Beresh 2023:158–159).

Another unusual feature shared between Ceremonial Cave and other caves to the south such as Hinds Cave and Cueva Espantosa deserves notice: many of these sites contained large numbers of coprolites. Although Cueva Espantosa possibly was employed both for domestic and ceremonial purposes, little if any evidence supports the domestic use of Ceremonial Cave, and the presence of so many coprolites in a shrine seems difficult to explain. One possible explanation lies in the "friable, crystalline formation" that Cosgrove mentioned occurring on the ceiling of that cave but not in any of the other nearby caves and rockshelters (Cosgrove 1947:34; Creel 1997:80). This encrustation was probably either calcium sulfate or gypsum ($CaSO_4 \cdot 2H_2O$), both of which belong to a class of sulfate speleothems that occur naturally in certain caves. Sulfate salts function as laxatives of varying strengths, and Patty Jo Watson and George Crothers have documented the harvesting of gypsum, mirabilite ($Na_2SO_4 \cdot 10H_2O$), and epsomite ($MgSO_4 \cdot 7H_2O$) and their use as medicinal purgatives by Archaic peoples in Upper Salts Cave and Mammoth Cave in Kentucky (Crothers 2012; Watson 1969:57–64). Possibly the Jornada also harvested, ground, and consumed such naturally occurring sulfate speleothems in Ceremonial Cave for use in purgative healing practices.

Several artifacts in the Cosgroves' report that could have been employed in this process include a "hammerstone; two irregularly shaped rubbing stones . . . amphibolite

schist pestle, with carrying straps of yucca; three flake scrapers or knives," as well as a variety of wooden tools (Cosgrove 1947:36). Various fragmentary baskets potentially served as containers for the collected material (Cosgrove 1947:36–37). The Cosgroves do not appear to have collected any of the coprolites in Ceremonial Cave (Creel 1997:81), but if any specimens do survive there, and if samples of this crystalline speleothem can still be obtained, it might be possible to confirm or disprove this hypothesis, just as Crothers did in the Southeast via analysis of paleofeces from Mammoth Cave (Nicolay and Beresh 2023:159).

Although the Jornada potentially had ready access to surface gypsum deposits, gypsum speleothems probably possessed greater appeal due to their subterranean origin and greater purity. If enhanced by any admixture of mirabilite and or epsomite, they would also have possessed greater efficacy as purgatives. As no possible sulfate speleothems have been reported from caves in the Trans-Pecos and Coahuila, I cannot speculate here regarding the potential existence of such a practice elsewhere than in Ceremonial Cave. Feather Cave contains very well-developed gypsum flowers both in the Arrow Grotto and above the breakdown at the end of the Main Chamber (Figure 4.7b), and if these formations also existed in the rest of the Main Chamber, they could have been harvested in prehistory. Harvested, ground, and mixed with water or some other binder, these gypsum flowers probably provided the pigment for the brilliant white pictographs in the Arrow Grotto. However, coprolites did not occur in any large number in this cave, so if a connection did exist between sulfate speleothems and the coprolites in Ceremonial Cave, that practice does not appear to have extended to Feather Cave or to

any of the dozens of other reported cave shrines in the Jornada or Mimbres regions (Nicolay and Beresh 2023:159).

The study of Jornada cave ritual extends beyond the caves themselves. Over the last two decades, both Myles Miller and I have gathered reports and museum records of at least two dozen speleothems, i.e. cave minerals/formations, primarily calcium carbonate stalactites and stalagmites, that have been recovered from open sites in the SW/NW, including the Jornada region (Miller 2023b; Miller et al. 2019b). The harvesting of speleothems and their use as offerings has been well-documented in Mesoamerica (Brady et al. 2005:213–224; Peterson et al. 2005:225–248) and seems to have followed similar patterns in the SW/NW, with specimens recovered from explicitly ceremonial assemblages in the Jornada and Mimbres areas, as well as at Pecos, Awat'ovi, and other sites (Cosgrove and Cosgrove 1932: 67, Plate 77; Kidder 1932:88; Woodbury 1954:193, Figure 37j).

The Jornada Mogollon and other peoples in the SW/NW probably recognized speleothems as a category of the sort of ensouled objects known in Tewa as *xayeh*, or comparable thereto (Ortiz 1969:20, 30–31). Archaeologists have recovered speleothems from dedication and termination caches, medicine bundles, and altar assemblages, along with other special objects such as quartz crystals, fossils, concretions, *tchamahias*, culturally-curated Paleoindian and Archaic lithics, miniature/votive ceramic vessels, clay figurines, and stone effigies. Sourcing some of these speleothems back to their specific caves of origin might be possible (Nicolay and Beresh 2023:159–160).

No need exists, however, to invoke diffusion to explain parallels between cave ritual in Mesoamerica and the SW/NW. Many speleocentric elements of New World

cosmovision appear to have great antiquity and could be "cognate" between the regions, and many paradigms that were first recognized through research into Mesoamerican cave ritual are equally applicable in the SW/NW. The influence of caves on settlement patterns in both regions is especially important. In a paper widely cited in Meosamerican cave archaeology, García-Zambrano writes:

> Mesoamerican migrants searched for an environment with specific characteristics that comprised several symbolic levels . . . Such a place had to recall the mythic moment when the earth was created: an aquatic universe framed by four mountains with a fifth elevation protruding in the middle of the water. The mountain at the core had to be dotted with caves and springs . . . [García-Zambrano 1994:218]

With its hillside location, four earth openings, and its proximity to a river and a permanent spring, the Feather Cave Archaeological Complex fits this model almost as well as any site in Mesoamerica. Although this argument is less applicable to some of the other sites discussed herein, which lack associations with water sources, even those sites usually incorporate a "cave-mountain" complex (or at least a "cave-hill"). Surratt Cave has multiple complex internal passages (Greer and Greer 1995, 1996, 1997, 1998, 1999, 2002). The Cosgroves reported seven other rockshelters from the same escarpment as Ceremonial Cave, which itself contained at least three distinct internal drifts (Figure 4.3a). The presence of possible *Culhuacan* pictographs at Picture Cave suggests that this site, too, represented an emergence place (Figure 4.3d). Given that the Cosgroves recovered only four reed arrow fragments and three pottery sherds from Ceremonial Cave (1947:36), while the rock art corpus of Picture Cave included late motifs such as masks

and the horned serpent, it could be that the latter site supplanted the former as the primary emergence shrine for the region, possibly during the El Paso phase (ca. 1300–1450 CE) or even the Doña Ana phase (ca. 1000–1300 CE), if not earlier. Most interesting is that each of the three regions seems to have one dark zone cave that served as the focus of ritual activities: Surratt Cave in the Salinas, Feather Cave in the Sierra Blanca, and Ceremonial Cave in the Jornada Mogollon core (possibly supplanted by Picture Cave later). This suggests that these sites, each of which reflects some aspects of the Mesoamerican *Chicomoztoc*, served as the primary emergence shrines for their regional populations.

The settlement paradigm that García-Zambrano describes is recognizable in the practice of "seeking the center place" that is a common thread in many Pueblo migration narratives. Archaeology has been slow to recognize the implications of this pattern, which is almost ubiquitous in the ethnographic data throughout the SW/NW. Ortman and Bradley (2002:41–78) suggest that Sand Canyon Pueblo, one of the largest communities in the northern San Juan region, was deliberately sited with a spring at its center as part of a symbolic strategy that replicated a ceramic serving bowl via its architectural footprint. Nearby Yellow Jacket Pueblo was similarly constructed with the rockshelter known as Ash Cave as a focus (Adler 2002:36; John Cater, personal communication 2004). Perhaps many other examples of what is arguably an Indigenous Puebloan practice similar to the Chinese *feng shui* await recognition (Nicolay and Beresh 2023:161).

Evidence supports the hypothesis that at least some major ritual caves in the SW/NW were even intended to replicate the Mesoamerican model of *Chicomoztoc*, the seven caves or seven-*roomed* cave of emergence. The five naturally vaulted chambers of

Bear Creek Cave in Arizona were augmented by two circular shrines at each corner of the entrance that could have represented two artificial rooms (Hough 1907, 1914; Nicolay 2008). The unusual floor plan of Mule Creek Cave, an important Mimbres ceremonial site, shows probable tunneling to create seven chambers (Cosgrove 1947:29; Nicolay 2008). Ceremonial Cave combines one cave of multiple drifts with several smaller rockshelters on the same hillside (Figure 4.3a; Alves 1930; Cosgrove 1947:35; Creel 1997; Crimmins 1929; Woolsey 1936).

The paradigm of seven caves or seven rooms actually appears to be a relatively late development in Mesoamerica, as the early artificial cave beneath Teotihuacan's Pyramid of the Sun terminates in four chambers, not seven, with two side chambers branching off before its terminus (Heyden 1975). If a four- or six-chambered emergence model was prevalent earlier in Mesoamerica and parts of the SW/NW, perhaps the concept of a seven-room emergence cave originated somewhere in northern Mexico and diffused to both the south and the north during the Mesoamerican Postclassic. An earlier emphasis on the number four in both regions might relate to the typical Southwestern cosmological model in which human ancestors passed through four lower worlds before eventually settling in this one. What makes the Feather Cave Archaeological Complex stand out among the other Southwestern examples cited is the intimate association between a dark zone cave and a surface settlement. Such a relationship is also visible at Sacramento Shelter, where a similar but much longer processional pathway connected the rockshelter to a large settlement (Nicolay and Beresh 2023:161).

Elsewhere in the SW/NW, this pattern seems to have been so important that other types of earth openings became the focus of settlement when dark zone caves were

unavailable, such as cliff-slump fissures behind Pueblo Bonito and Hungo Pavi in Chaco Canyon (Marshall 2003; Nicolay 2005; Stein 2003) and the Nancy Patterson Site in southeastern Utah (Cutrone 2003; Nicolay 2005); the Walk-in-Well at Paquimé (Di Peso et al. 1974:371–381; Walker and McGahee 2006); or the natural blowholes at Wupatki (Lamar 1962; Sartor 1964; Schley 1962) and Gran Quivira (Ball et al. 2006:49; SWCA Environmental Consultants 2016). In Mesoamerica, artificial caves were constructed in central locations at many sites in non-karstic regions, including Teotihuacan (Heyden 1975) and Acatzingo Viejo, where Aguilar and others (2005:77) documented a complex of seven artificial caves grouped on a single hillside. I will revisit this possibility in later chapters.

Conclusions regarding Jornada Mogollon Cave Ritual

Previous studies of cave shrines in the Jornada Mogollon region have made great contributions to our knowledge of prehistoric Jornada ceremonialism and cosmovision, and this knowledge holds relevance to related practices in the Mimbres Mogollon region. Although two deep karstic caves with actual dark zones, Ceremonial Cave and Feather Cave, have dominated the discussion of Jornada cave shrines, smaller rockshelters and other types of earth openings have complex archaeological records with many unique features, and these sites deserve attention, too.

Considerable evidence demonstrates that the ceremonial use of caves and rockshelters in the Jornada Mogollon region began early and spread widely. The archaeological record there includes offerings related to both agriculture and

hunting/warfare, as well as unique retirements of spiritually powerful objects, and a few burials, which are uncommon in cave shrines elsewhere and probably indicate use during the Archaic. Although certain artifact categories—particularly *pahos*, *tablitas*, and sandals—seem to be shared across much of the Mogollon region (with bows and arrows replacing atlatls, darts, and fending sticks sometime by the mid-seventh century, if not sooner), each site has its unique characteristics. Rock art and burials appear to be important variables. Burials likely date primarily to the Archaic, when cave burial was a common practice in Texas, Coahuila, and the Guadalupe Mountains of New Mexico (this period is also contemporaneous with the shaft and chamber tomb tradition in West Mexico and the inland Chupícuaro region). In some cases, the suitability of the geological substrate probably dictated the presence or absence of rock art, but clearly other factors are at play, some of which might relate to the facing directions of cave openings as well as overall locations and directional relations to settlements and/or other surface features.

The possible relationship between Feather Cave and Surratt Cave remains intriguing, as the high degree of correspondence between the rock art motifs in the two caves suggests that the painted cloud terrace in the depths of the latter was intended to replicate the stone outcrop in the inner sanctum of the former. If so, this can tell us something important about the relationship between the Sierra Blanca and Salinas regions. Both Wiseman (2019:1–18) and Kelley (1984:158) speculated that the people of both areas spoke a form of Piro as their primary language. Piro belonged to the Kiowa-Tanoan language family, and was closely related to Southern Tiwa. Unfortunately, the lack of portable artifacts from Surratt Cave and the limited available dates from Feather

Cave complicate any efforts to pursue this question further (Nicolay and Beresh 2023:162).

The overall diversity of the archaeological record in Jornada cave shrines is remarkable, especially when compared with Mimbres cave shrines (Cosgrove 1947:7–33). While the Mimbres caves display considerable uniformity, each cave in the Jornada region appears unique in some way. Nonetheless, almost every major feature of any one of these sites occurs in at least one other. The cloud terraces in Feather Cave and Surratt Cave demonstrate this pattern especially well. The evidence suggests the possibility that one cave in each of Wiseman's subregions served as the primary emergence shrine thereof, specifically: Surratt Cave in the Salinas region, Feather Cave in the Sierra Blanca region, and Picture Cave possibly replacing Ceremonial Cave in this role at some point during the El Paso phase (if not before) in the "core" Jornada Mogollon region (Nicolay and Beresh 2023:162).

The possibility that the practice of leaving large quantities of sandals in caves originated in Texas or Coahuila is also interesting, although little overlap is present between the sandal types in Cueva Espantosa and Ceremonial Cave. Nonetheless, the fact that these two caves, each containing over 900 sandals, are located in neighboring cultural regions seems difficult to discount as coincidence (Nicolay and Beresh 2023:162).

Finally, the possible natural and painted representations of elements related to Nahau emergence narratives in the caves of the Hueco Mountains point to the potential presence of Uto-Aztecan speakers in the Jornada Mogollon core, just as similar representations do for the Upper Gila drainage (Nicolay 2008, 2023), an area whose

prehistoric inhabitants we can be confident at least had Uto-Aztecan speakers for neighbors. Boyd and Cox (2016:97–162) have argued for the extensive presence of motifs from Uto-Aztecan cosmovision in the mural at the White Shaman site, a large rockshelter in the Lower Pecos. As mentioned earlier herein, Tate (2022:75–111) has already suggested that prehistoric peoples recognized some of the large rockshelters in that region as examples of the *Chicomoztoc*. However, whereas if the *Chicomoztoc* concept did indeed operate in the prehistoric SW/NW and Trans Pecos areas, it likely arrived via the original Uto-Aztecan diaspora several millennia ago. The possibility that an even later Nahua motif, the *Culhuacan* toponym, occurs in the Jornada and Sierra Blanca regions remains more difficult to explain and deserves further study. This motif has not been reported from the Mimbres region and its distribution in the Jornada region is limited almost exclusively to Picture Cave.

Long dismissed as the backwoods hillbillies of Southwest archaeology (Miller 2018), the Jornada Mogollon left us an extraordinary record of their cosmovision and ritual practices in the caves and rockshelters of their prehistoric homelands. Despite the depredations of looters and vandals, these sites, the legacy collections that our disciplinary predecessors collected from them (most of which still await any extensive analysis), and the published and unpublished records that those predecessors have left us still offer enormous potential to further our understanding of some of our greatest unresolved questions, including the nature of the connections between the Mimbres Mogollon region, the greater SW/NW, and Mesoamerica. Chapter 5 presents this dissertation's Primary Dataset on Mimbres cave shrines, and these sites show both an overall similarity to the Jornada Mogollon data presented in this chapter as well as clinal,

qualitative, and quantitative differences that range from the subtle variations to the binary distinctions in the presence or absence of specific traits.

Notes

[1]As discussed in Chapter 3, in this chapter, I refer to both deep solutional caves with dark zones and shallower rockshelters that mostly do not experience full darkness during the day as caves, based on the names assigned to them in published reports and common parlance. Furthermore, it is important to note that other earth openings in the SW/NW, such as sinkholes, talus and fissure caves, and earth cracks, probably also served—and continue to serve—as sacred sites with similar significance to dark zone caves and rockshelters. I argue, based on the similarities in the assemblages recovered from both dark zone caves and rockshelters throughout the greater Mogollon region, that the use of a single term for these features reflects something close to the original emic taxonomy. Moyes and Brady (2012:151) and Scott and Little (2003) have documented precisely such a pattern in Mesoamerica, where even an abandoned archaeological trench became a liminal space for an Indigenous shaman.

[2]Unlike these three caves, dark zone rock art in the Guadalupe Mountains caves appears to derive from the Archaic period (B. Bilbo 1997; M. Bilbo 1997).

[3]Bluhm (1952:231) reports a total of 251 sandals combined from both Tularosa Cave and Cordova Cave, located in the upper San Francisco drainage of the northern Mogollon region just north of the sites described in the Primary Dataset of the next chapter. Stratigraphic evidence suggests that many of those specimens, particularly in the former site, belong to early, possibly even preceramic phases (1952:233).

Chapter 5: Descriptions of Caves in the Primary Dataset

This chapter synthesizes available data on 22 caves located in the Mimbres and Gila drainages. The bulk of this information comes from the systematic survey work conducted by Harriet and C. Burton Cosgrove during the 1920s (published in 1947), with additional data from the earlier efforts of Walter Hough in 1905 (published in 1907, 1914), the latter primarily regarding sites in the Blue River and San Francisco River drainages, which are tributaries of the Gila. A few additional publications and unpublished reports by other researchers provide supplementary data, and in the cases of two of the most important examples, Mule Creek Cave and Doolittle Cave, I am able to provide data from my own noninvasive visits to these sites. I also include some additional information from the Cosgroves' unpublished field notes and personal interviews. What almost all the caves in this chapter have in common is that they were visited and systematically studied by archaeologists, and the depth and quality of their reporting makes it much easier to compare these sites (Table 5.1).

Table 5.1. Caves of the Primary Dataset.

Cave	References	County	State	Depth[a]	Width[a]	Height[a]
Doolittle Cave	Cosgrove 1947: 7–9, 161	Grant	NM	30	42	N/A
Greenwood Cave	Anon 1878; Cosgrove 1947:9–10; Cushing 1990; Hough 1914:104–106, figs. 216, 218–220	Grant	NM	64 vert. ft.	15	23
Steamboat Cave	Cosgrove 1947:10–13	Grant	NM	90–95	122	30
Lone Mountain Cave	Cosgrove 1947: 9	Grant	NM	15+30	25	8–10
Site 1, Mogollon Creek Cave	Cosgrove 1947: 13	Catron	NM			
Site 3, Cave, Gila River	Cosgrove 1947: 14–15	Grant	NM	10?	6?	
Site 6, Cave in Water Canyon	Cosgrove 1947: 15	Grant	NM	24	35	
Site 7, Cliff Ruin in Sapillo Creek Canyon	Cosgrove 1947:15–16	Grant	NM	30–60	240	
Cave 2, Middle Fork, Gila	Cosgrove: 1947:20	Catron	NM			
Cave 1, Middle Fork, Gila	Cosgrove: 1947:20	Catron	NM		55	
Cave 2, West Fork, Gila	Cosgrove: 1947:22	Catron	NM	70–80		
Kelly Cave(s)	Cosgrove 1947:25–26	Catron	NM	33	60	12
Cave 1, Goat Basin	Cosgrove 1947: 26–27	Catron	NM	70	15	12–15
Cave 4, Goat Basin	Cosgrove 1947: 28	Catron	NM			
Cave 5, Sipe Canyon	Cosgrove 1947: 28	Catron	NM			
Cave 6, San Francisco Drainage	Cosgrove 1947: 28	Catron	NM	12	4	
Mule Creek Cave	Cosgrove 1947:29–30; Hughes 1956	Grant	NM	110	106	25
Bear Creek Cave	Hough 1905, 1907:50–52, 1914, 1915	Graham	AZ	70 m	50 m	3 m
Royal John Mine Cave	Grinstead 2009:1–5	Grant	NM	166	165	40
Hough Site #3, "Cliff House and Cave" (Gila Cliff Dwellings?)	Hough 1907:30–32; Bandelier 1892:360–362; Henshaw 1879:370–371, Watson 1929	Socorro	NM			
Hough Site #32 "Cave shrine"	Hough 1907:46–47, Fig. 13	Graham	AZ			2-story
Hough Site #35 [several] "Caves"	Hough 1907:47–48	Graham	AZ			
Hough Site #64 (Saddle Mountain Cliff Ruin)	Cosgrove 1947:23–25	Catron	NM	25	30	12

[a]As available; measurements remain in feet as originally reported, with the exception of Bear Creek Cave, which Swanson and Symcox resurveyed in 2002.

Figure 5.1 shows the distribution of cave shrines in the Mimbres region on both sides of the Continental Divide in relation to significant villages from the Mimbres Classic, along with several major pithouse villages that lack evidence of subsequent Classic occupation and important natural features that likely helped to define the region's prehistoric sacred landscape. This last aspect is important, as both the ethnographic and archaeological records make it clear that cave shrines were part of a larger system that includes hilltops, mountaintops, isolated outcrops, lakes, and springs. Figure 5.1 includes some additional smaller villages that are referenced in the text as well.

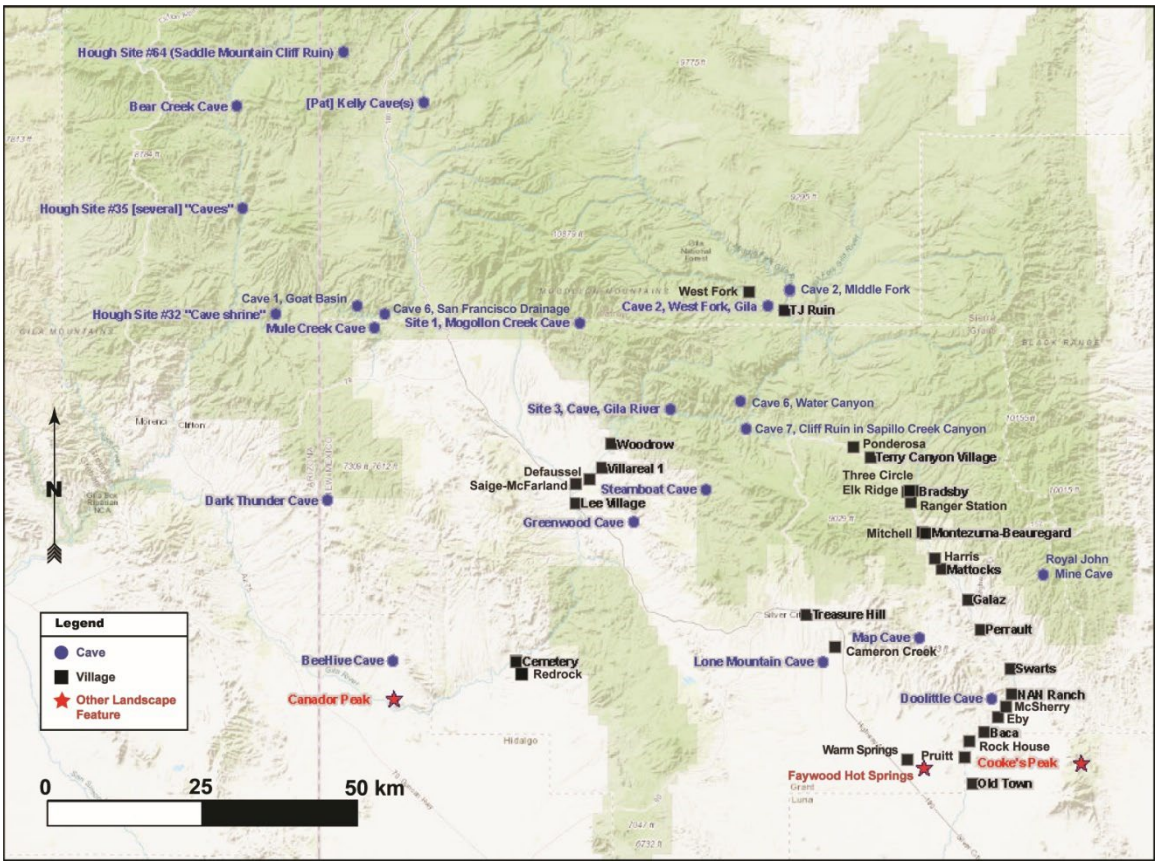


Figure 5.1. Cave shrines and Mimbres Mogollon settlement pattern in the study area, with additional significant landscape features (map by Adrianna Nicolay and Scott Nicolay).

Chapters 6–8 present supplementary data on other caves and/or cave assemblages that require special discussion for several reasons. One site in the dataset, Bear Creek Cave, is so important and has so many unique features, that I address it in its own separate chapter (Chapter 6). Chapter 7 examines several "alienated assemblages," i.e. groups of indisputably ceremonial artifacts whose specific provenience and provenance remains incomplete, but which definitely came from caves in the Gila drainage. A third supplementary chapter, Chapter 8, addresses Dark Thunder Cave, Map Cave, and Beehive Cave—three anomalous sites in the study area that did not fit the consistent model of cave shrines that emerges from this and previous chapters, but which nonetheless appear more likely to be shrines than domestic sites. Chapter 8 also includes data on one of the most important and better-documented cave shrines in the SW/NW, U-Bar Cave, which appears to represent a locus of post-Classic Mimbres ritual activity. Chapter 8 concludes with several other sites that likely also defined the Mimbres sacred landscape, and which provide comparison and reference for the role of cave shrines in the Mimbres Mogollon region. Chapter 9 examines the material culture of these sites.

In this study, caves in the sample set were identified as shrines based on the presence of artifacts from at least three of six categories that typify ritual assemblages in southern Mogollon cave shrines:

1. *pahos* (prayer sticks)
2. *tablitas* (painted boards)
3. cane/reed cigarettes
4. votives (miniatures) of any kind, including miniature bows and arrows
5. full-sized bows and/or arrows

6. sandals

I make exceptions for caves that contained examples from only two of these categories if they included at least one of the first four categories listed above, given that these artifacts appear to have served exclusively in ritual with no domestic/utilitarian use; however, most caves that contained artifacts from any of these categories contained examples of three or more. Some caves contained additional artifacts and/or other elements primarily or exclusively associated with ritual activity, such as stone pipes (Steamboat Cave), stone plaques (Doolittle Cave and Kelly Cave), human remains (Doolittle Cave, Site 7, Gila West Fork Cave 2, and Saddle Mountain Cliff Ruin) and rock art (Doolittle Cave, Saddle Mountain Cliff Ruin, and Gila River Cave Site 3). As most of these occurred in only one or two caves in the sample, and in each case, three or more of the other categories were also represented in each of these caves, these elements were not included in the overall criteria. Their presence does, however, demonstrate the complexity and diversity of cave ritual in the Mimbres region.

Atlatl darts and/or fending sticks occurred as part of the archaeological record for six caves in the sample (Doolittle Cave, Steamboat Cave, Gila Middle Fork Cave 1, Gila West Fork Cave 2, Kelly Cave, and San Francisco Cave 6). As described in Chapters 3 and 4, these objects appear to have served as offerings in other earth opening sites in the SW/NW both in and beyond the Mogollon region. However, they were not considered as identifying criteria for three reasons. First, none of the sites in the Mimbres region contained these artifacts in large enough quantities to identify them as offerings (nor do they occur as votives, as with bows and arrows). Second, these objects occur only in small numbers in six caves in the sample. Third, the emphasis of this research is on the

intensification of Mimbres cave ritual beginning with the Late Pithouse Period, around the same time as bows and arrows arrived from the north, supplanting the earlier atlatl/dart/fending stick weapons complex (Roth et al. 2011). Finally, the degree to which use of any of these caves during the Early Pithouse period or the preceramic Late Archaic represents ritual activity is difficult to distinguish due to the generally small samples of early materials, the lack of any clear pattern in the archaeological record from these periods, and the absence of absolute dates. Assessment is further complicated by the extensive looting, burning, vandalism, and general "churning" of artifacts and deposits in these sites by Anglo-American settlers prior to any systematic archaeological work by Hough, the Cosgroves, or others. As discussed in Chapters 3 and 4, multiple groups in the SW/NW utilized cave as shrines the during the Archaic, including in the neighboring Jornada Mogollon region, but at present these can only be clearly associated with hunting and/or warfare.

I made a special exception to these criteria for the Royal John Mine Cave, whose identified archaeological record currently consists of only three artifacts, a *tecomate* (MimPIDD #359), a basket, and a sash, none of which have ironclad provenience, and two of which are very doubtful. This site is a deep dark zone cave, with a tiny natural entrance and a large interior lake, and the presence of standing water would certainly have amplified its importance in the Mimbres region. Around the world, with very few and very limited exceptions, the interiors of dark zone caves were used only for ritual, water-gathering, and disposal of the dead (the latter two activities not being mutually exclusive with the first). Although the Royal John Mine Cave certainly had the potential to serve as a water-gathering site, the only evidence that survives to suggest that this

activity took place might be the *tecomate*, which is also the only artifact purported to come from this site whose current curatorial location is known: the Western New Mexico University Museum.

Because the assemblages that occur in cave shrines throughout much of the Mogollon region are similar (as can be seen with the Jornada Mogollon sites described in the previous chapter), and these patterns hold true to varying extents throughout the SW/NW, a second set of criteria was needed to identify those sites as Mimbres cave shrines, as opposed to those employed by neighboring groups. Sites met this criterion in two ways:

1. a location in either the Mimbres or Upper Gila drainages; and/or
2. the presence of ceramics from the Mimbres B/w sequence.

Nonetheless, several sites are included in the sample that might also have served Reserve and/or Tularosa phase Mogollon populations located to the north of the Mimbres region, either simultaneously with the period under study, or subsequent thereto. These sites are all located in the watersheds of either the San Francisco River or the Blue River, both of which drain into the Gila River in Arizona. I include those caves here in order to define the boundaries of the Mimbres tradition of cave ritual. The most important of them is Bear Creek Cave, on the Blue River, which is the subject of the next chapter. The three available but unpublished 14C dates from this site all coincide with the Mimbres Classic (Jolie 2018:Table 5.3, and personal communication 2021), and a painted bird effigy from this site was structurally and stylistically almost identical to another example recovered from a cave somewhere in the New Mexico drainage of the Gila River. A similar effigy from an unidentified cave in the Gila drainage figures prominently in Chapter 7.

The caves in this chapter are listed primarily in the order in which they appear in the Cosgroves' 1947 volume *Caves of the Upper Gila and Hueco Areas in New Mexico and Texas*, with sites from other sources (predominantly Hough 1907 and 1914) interpolated according to the Cosgroves' geographic groupings. The individual discussion of each cave emphasizes both that site's participation in the larger patterns of Mimbres cave ceremonialism and any notable aspects that make that cave unique within the overall sample. Where smaller subsets of two or more caves share specific features of potential importance, such as rock art, I examine these features in somewhat greater depth. Certain additional themes are developed within this chapter as various aspects of individual sites provide the basis for addressing them.

Caves of the Mimbres Drainage

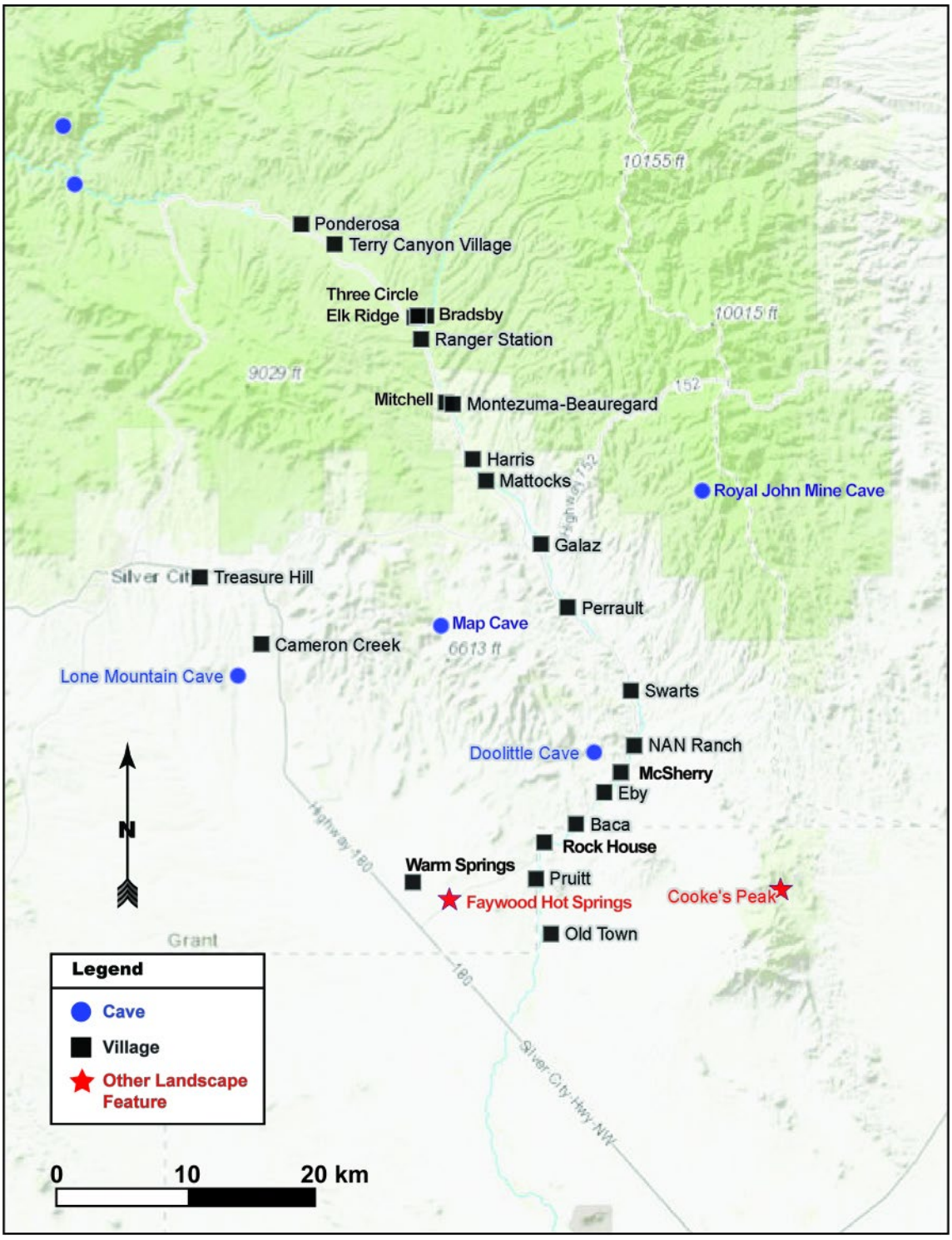


Figure 5.2. Cave shrines of the Mimbres drainage, showing settlement pattern and additional significant landscape features (map by Adrianna Nicolay and Scott Nicolay).

The Mimbres River has no outlet; it runs approximately 145 km north-to-south along the western side of the Black Range, eventually descending into the desert sands north of Deming, New Mexico. Old Town, one of the largest Mimbres villages, was located where its agricultural fields could take advantage of the saturated soil of the underground portion of the river. Although the Mimbres Valley was clearly the cultural heartland of the Mimbres Mogollon cultural region, few of the documented cave shrines are in its drainage, and none of these are located in the valley itself (Figure 5.2). This is almost certainly at least partly a function of the difference in geology between the Mimbres drainage and the rugged Upper Gila region just to the west over the Continental Divide. Nonetheless, one of these cave shrines, Doolittle Cave, appears to have been among the earliest-used and most important in the entire Mimbres region.

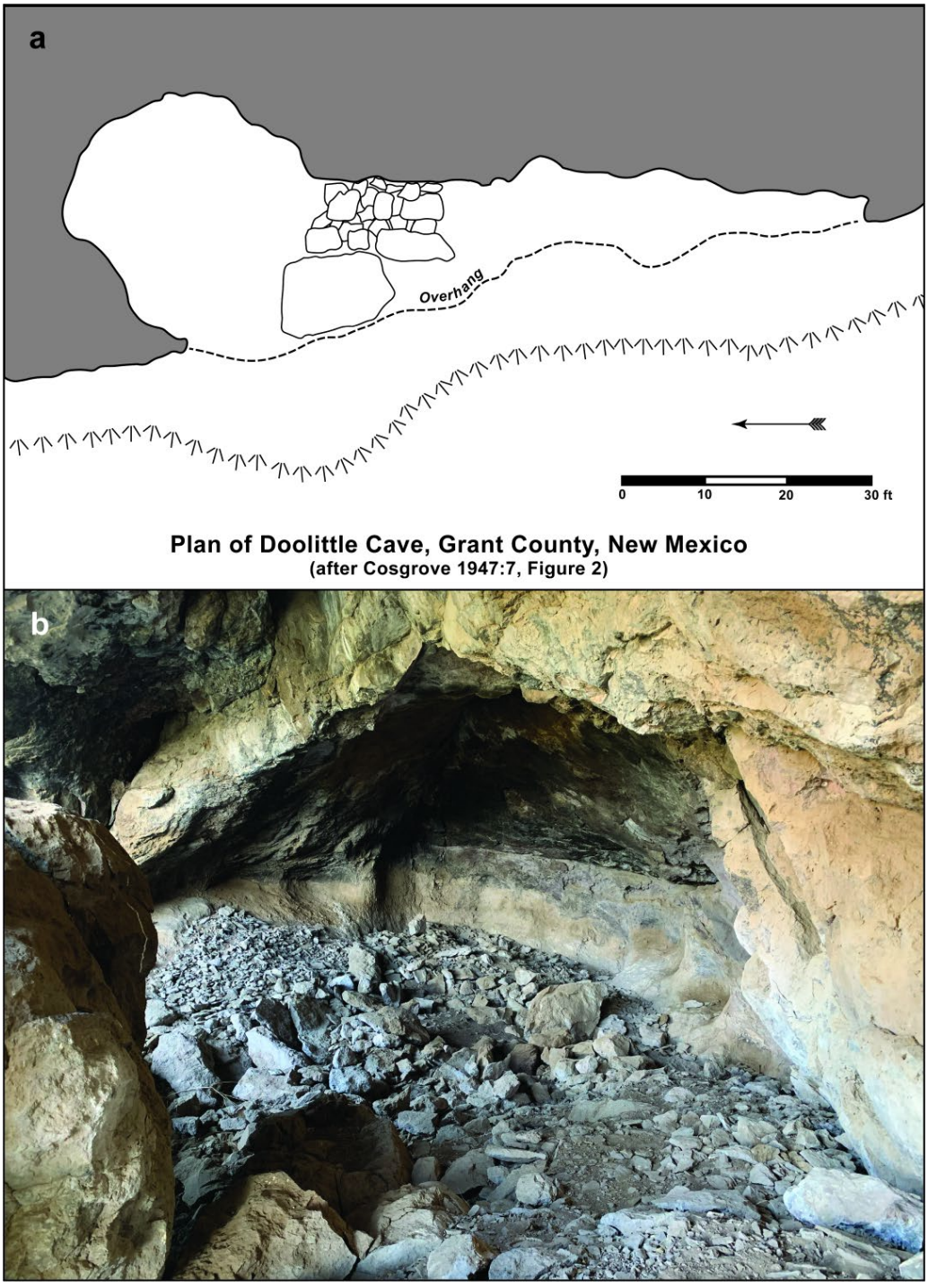


Figure 5.3. Doolittle Cave, Grant County, New Mexico: (a) plan map (after Cosgrove 1947:7, Figure 2); (b) interior of Doolittle Cave (photo by Scott Nicolay).

Doolittle Cave is the best-documented and likely the most important of the three reported cave shrines actually located in the Mimbres drainage, or at least on the east side of the Continental Divide, the others being Lone Mountain Cave and the Royal John Mine Cave. It is the first cave that the Cosgroves describe in their report (1947:7–9). This site consists of a shallow rockshelter and six smaller associated grottos in the same cliff face (Figure 5.3). The Doolittle Cave complex is located in the lower part of the Mimbres drainage, not far from several major Mimbres villages, including Old Town, the NAN Ranch, Rock House, Baca, McSherry, and the Eby cluster of sites. The Eby family currently owns and ranches this property and has for some time. Mr. and Mrs. Eby allowed me to visit the site in July 2019 and graciously allowed me to use one of their off-road vehicles to access it.

Given the presence of six other rockshelters in the same escarpment, Doolittle Cave should be considered a complex of multiple earth openings rather than a single site. In this way, it resembles the Ceremonial Cave complex of the core Jornada region and Feather Cave in the Sierra Blanca region, both of which I discussed in the previous chapter. None of the other rockshelters associated with Doolittle Cave yielded any artifacts during the Cosgroves' excavations that might conclusively be considered offerings, however. The Cosgroves report pictographs in red, yellow, and black from the largest of these, located north of Doolittle Cave (Figure 5.4), and "2 or 3 very dim pictographs" from the main cave (1947:7, 159, fig. 47, h, 1 and 4). Margaret Berrier has documented these pictographs more recently. Doolittle Cave is one of only two caves in

the sample with associated rock art (and the only one in the Mimbres drainage, the other two being Gila River Cave Site 3 and the Saddle Mountain Cliff Ruin in the upper San Francisco River drainage). However, none of the other Mimbres and Gila caves have been inspected using modern techniques and technologies that might reveal pictographs that are faint or faded. It remains possible that other sites had pictographs that have faded severely. Overall, rock art seems to be more commonly a feature of Jornada Mogollon cave shrines than for the Mimbres, and this is one of the main differences in cave ritual between these two major subregions of the Southern Mogollon.

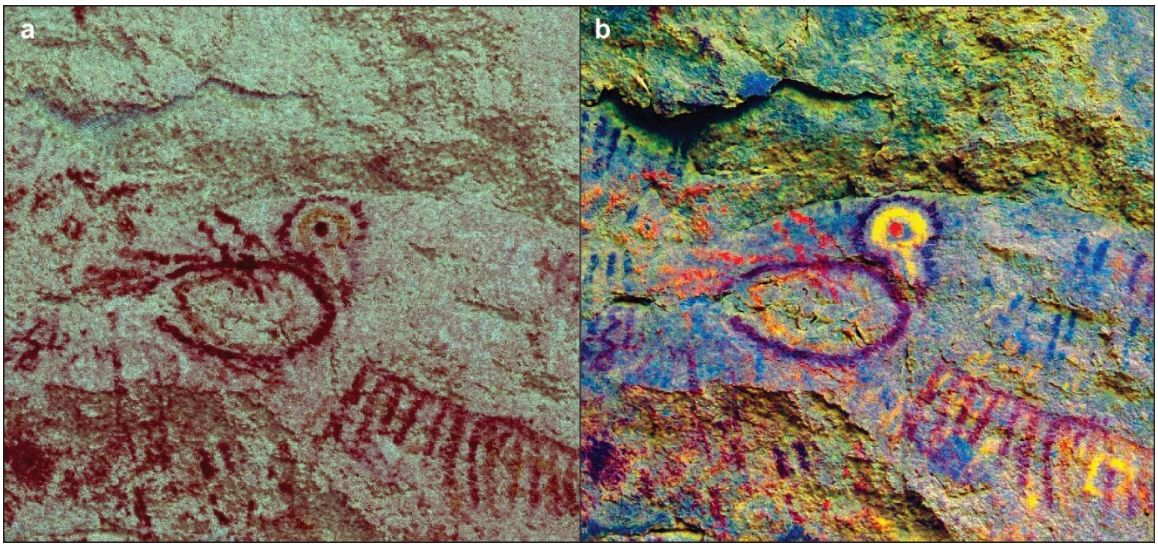


Figure 5.4. (a) Rock art panel in shelter in the Doolittle Cave Complex, Grant County, New Mexico; (b) Dstretch lds version (photos by Margaret Berrier).

At the time that the Cosgroves excavated there, the property belonged to Mrs. J. B. Doolittle (1947:8). The Doolittles' cabin still stands within sight of the cave, although the Ebys have extensively remodeled it, adding utilities and multiple bunks. Of all the

sites described by the Cosgroves, Doolittle Cave is the closest to the Mimbres Valley proper. The cave was already badly looted even at the time of the Cosgroves' visit. However, during the COVID-19 pandemic, the Eby family gave permission to a local collector, Brandon Jones, to dig in the talus slope in front of the cave. Jones recovered over 1000 beads (primarily shell but also turquoise), fragmentary *Glycymeris* shell bracelets and reed arrows, a *Haliotis* shell bird effigy in a small San Francisco Red bowl, and several projectile points, including an especially long and elaborate example that is likely a nonfunctional eccentric made specifically as an offering (Brandon Jones, personal communication 2022) (Figure 5.5). This point resembles both Hohokam Snaketown points and Livermore Stemmed points from west Texas, as well as other Late Archaic types. Livermore points have been recorded in the Jornada Mogollon region, and a pair were deposited as offerings in a large burned rock ring midden in the Sacramento Mountains (Myles Miller, personal communication 2024). However, the point recovered at Doolittle Cave is longer than either known Livermore or Snaketown points. Regardless of type, this point shows no sign of use and thus was likely manufactured for ceremonial purposes alone.

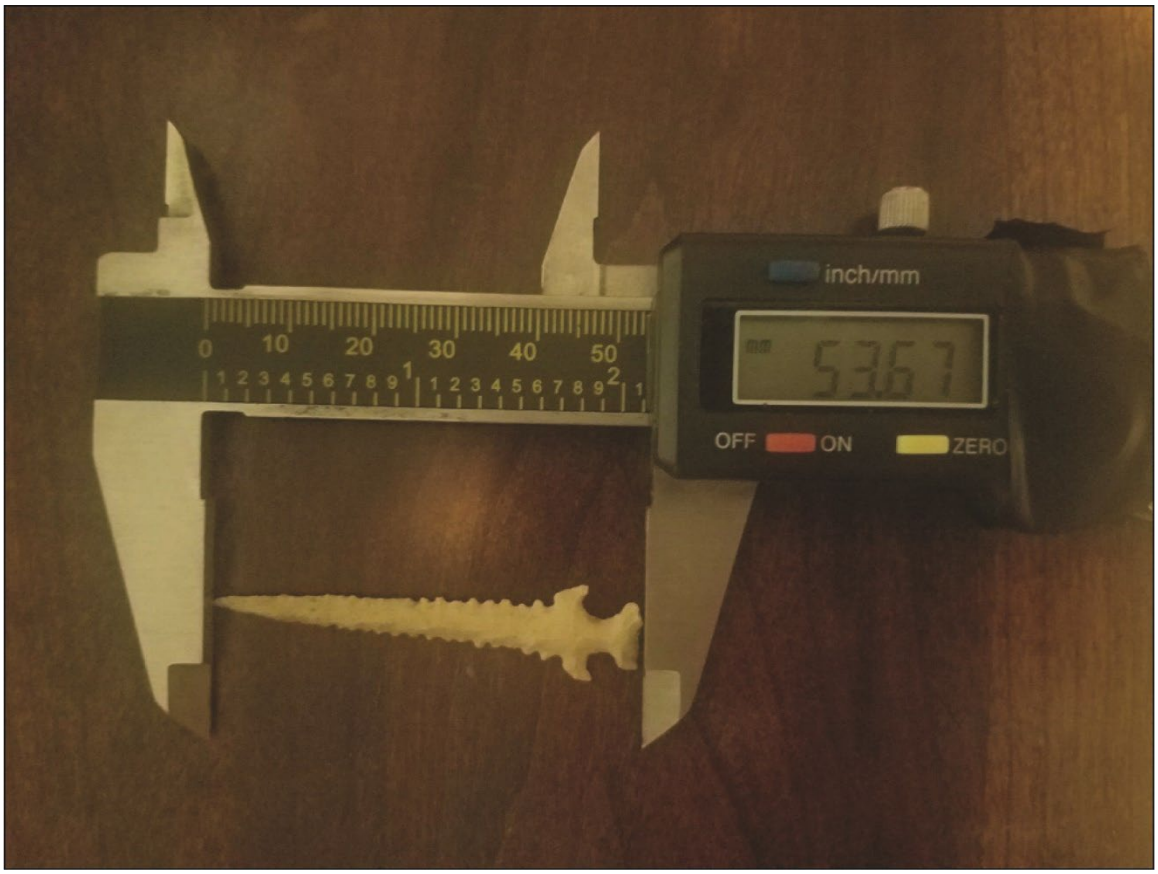


Figure 5.5. Probable nonfunctional eccentric projectile point from the talus slope in front of Doolittle Cave (photo courtesy of Brandon Jones).

The Cosgroves also reported a dry spring below the cave. This association with a water source, especially one emanating from underground, is almost certainly not a coincidence and likely contributed to the prehistoric religious significance of this site, as it reflects a paradigm that appears to have operated throughout the SW/NW as well as in Mesoamerica (cf. García-Zambrano 1994:219–221). The Cosgroves excavated around a large boulder at the base of a trail leading to the cave and found many sherds of Mimbres B/w ceramics with no intrusive wares, just as they had in the cave. The boulder was associated with the extinct spring whose dryness they attribute—probably correctly--to modern arroyo cutting (1947:8). They report that "in 1908, Mr. R. P. Boone, the former

owner of the Doolittle Ranch, found buried beneath this boulder a number of nested Mimbres bowls and a small corrugated jug containing a quantity of turquoise beads sealed with a well-fitted pottery lid," an assemblage which they identified as an offering to the formerly living spring (1947:8). This recalls the "emergence shrine" reported from Cameron Creek Village (Harry Shafer, personal communication 2023), as well as the many small "votive" vessels recovered from various springs in the region (Hough 1914:117) and similar bead caches from the Eastern Mimbres area (Hester et al. 1977:141–172; Whalen 1987:176). Hough also recovered votive vessels from Bear Creek Cave (in fact, these were the only ceramics he reported from this site, although a more recent examination identified a range of post-Mimbres diagnostic types [Webster 2007:316–317n8]). Thus, at one time, the Doolittle Cave complex comprised seven earth openings and a spring. These features reflect an important analog with the Mesoamerican Chicomoztoc model that I discussed in the previous chapter and will revisit in Chapter 6.

In addition to its location, and the presence of rock art, Doolittle Cave is also notable within the overall sample of Mimbres cave shrines due to several components of its assemblage. It is one of only four caves in the Primary Dataset that contained human remains (two fragmentary infant femurs [1947:87, 161]), and one of only five that contained elements of the atlatl/dart/fending stick complex (1947:8, 58), with the rest located in the Gila drainage. Only two caves in the sample contained both human remains and darts: Doolittle Cave and Cave 2. The presence of human remains and atlatl darts in these caves suggests that they are among the earliest caves that served as shrines for the Mimbres, and that their use dates back to the Early Pithouse period or even earlier—potentially as far back as the Middle Archaic, when darts begin to appear as offerings in

other Earth opening sites elsewhere in the SW/NW (Geib et al. 2017; Miller et al. 2023, 2024). Thus, despite the small size of Doolittle Cave itself, the range of associated features and offerings, combined with the apparent time-depth of its use, suggest that this complex was one of the longest-used and most important cave shrines in the Mimbres region, and perhaps the most important in the Mimbres drainage.

Lone Mountain Cave

Lone Mountain Cave is located on Cameron Creek, a western tributary of the Mimbres River. Cameron Creek is also the location of one of the largest Mimbres villages between the Mimbres Valley proper and the Continental Divide. This site was excavated in 1927 under the direction of Wesley Bradfield (Bradfield 1931:7). The Cosgroves place Lone Mountain Cave "on the east side of the creek, 2½ miles [4 km] due west of Hurley, New Mexico" (1947:9). This and the Royal John Mine Cave are the only two caves in the Primary Dataset identified as solutional caves in limestone, i.e. the most common and best-known type of "cave" around the world. Cave shrines in Mesoamerica and Europe are usually limestone solutional caves, but as discussed earlier, this is not the case in the Mimbres region. Although the Cosgroves did not include a plan map of this cave (and none appears in their unpublished notes), their description of the cave, combining a narrow entrance with a chamber at right angles thereto, suggests that its inner room could be a true dark zone. The cave is currently part of the property of Freeport-McMoRan Inc., the company that operates the Chino Mine (a.k.a. Santa Rita del

Cobre). Freeport-McMoRan does not currently allow access to this site or to other archaeological sites on their land.

The Cosgroves recovered only a small assemblage from Lone Mountain Cave, although it is likely that more extensive offerings existed there originally, as they note that the cave soil, which was approximately 1 m in depth, "was damp and had rotted much of the material" and that the site "had been dug over by others, and we have been told that armloads of bows and reed arrows were taken from it" (1947:9). Despite these factors, they managed to collect materials including one complete full-sized bow, an unspecified number of reed arrows, three miniature bows, two reed cigarettes, fragmentary *tablitas*, grass-stem *pahos*, and painted twig *pahos*. They also recovered a single *Glycymeris* shell bracelet, and two "stone tablets or plaques" (1947:9). Lone Mountain Cave is one of only three cave shrines in the Mimbres area where stone plaques have been recovered, although other examples of this artifact class are known from open sites. Lone Mountain Cave is also the southwesternmost site in the sample, so it is interesting that artifacts associated with Hohokam ceremonialism, and possibly with Mimbres-Hohokam interaction, would come from this site. However, Doolittle Cave also contained two of these artifacts. Similar stone plaques or palettes are also known from the Harris site, a pithouse village, where they showed association with both burials and kiva rituals (Roth 2015:266, Fig. 9.9, 293, 401–402). The only diagnostic pottery that the Cosgroves list for Lone Mountain Cave is a single sherd of Mimbres B/w Style I, which they identify as being reworked into a "potter's tool" (1947:9). As this sherd was modified, it could belong to almost any phase of the Mimbres sequence from the Late Pithouse period onward.

Royal John Mine Cave

Although the Royal John Mine Cave obviously predates the modern Royal John Mine by a period much longer than that of any possible human occupation in the region, it is known primarily by its association with the latter. Apparently, it was also completely unknown to any other archaeologists before I brought it to the attention of senior scholars in 2019. The only publication on the archaeological record of this site is from an issue of *Just for the Record* ("A vibration monitoring newsletter about you, for you, and by you"), the house organ of Instantel, an Ontario-based corporation that provides various support services to the mining industry (Grinstead 2009 15(Q2):2–5). The newsletter article includes photos of three artifacts (Figure 5.6a–c) that purportedly came from this cave: a unique polychrome basketry tray, a "Mimbres shaman's sash," and a badly worn Mimbres B/w Style III *tecomate* (MimPIDD #359) (2009 15(Q2):2).

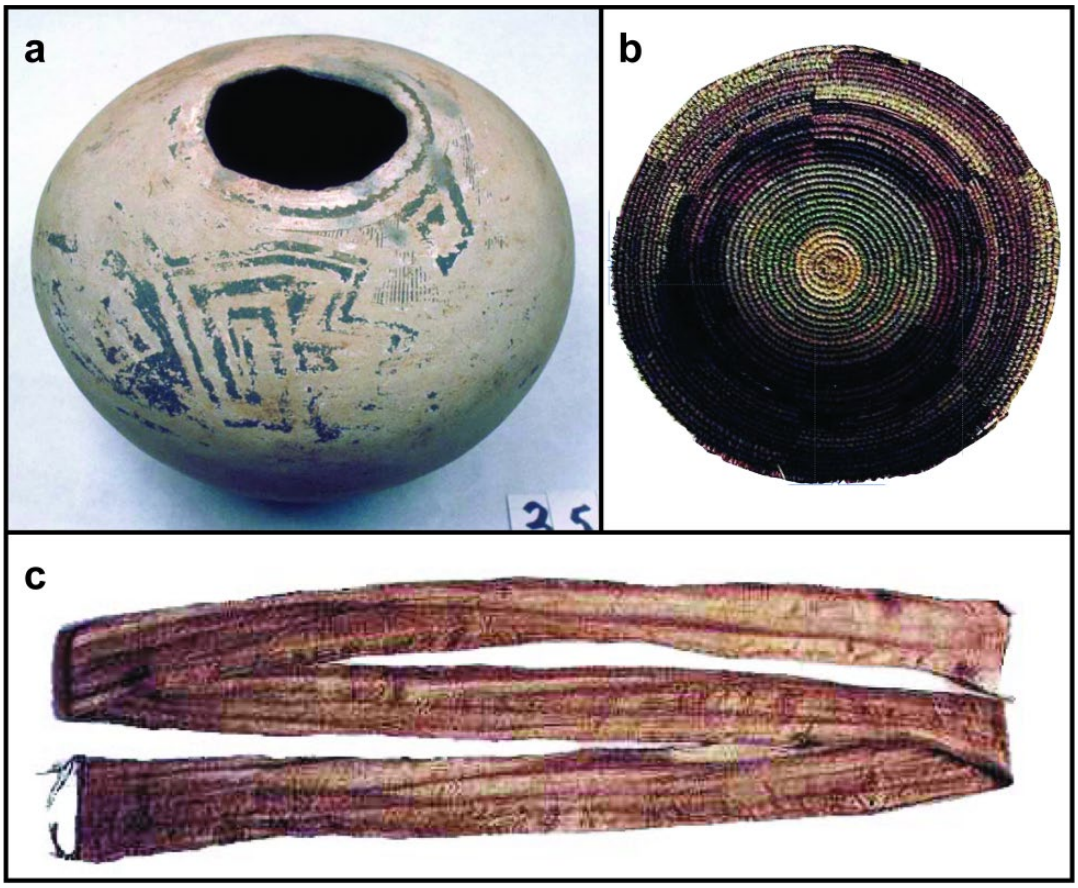


Figure 5.6. Purported artifacts from the Royal John Mine Cave: (a) Mimbres B/w Style III tecomate (MimPIDD #359); (b) polychrome basketry tray; (c) "Mimbres shaman's sash" (from Grinstead 2009 15[Q2]:2).

The *tecomate* is currently in the collection of Western New Mexico University Museum, where it is listed as the donation of Maude Kiner, identified as the sister of Albert L. Owen (1867–1954), the original mine owner who rediscovered the cave in the 1930s (Grinstead 2009 15(Q2):2). A portion of Grinstead's article is given over to an interview with Owen by one Lou Blachly when the former was about 80 years old. As the article gives the dates of Blachly's life as 1889–1965, this was clearly an archival interview, although no earlier source is credited.

The article alleges the chain of provenience for the three artifacts listed above as follows: “Along with numerous other artifacts, A. L. Owen gave these archaeological items to his sister, Maude Owen Kiner, who sent some of them to the Western New Mexico University Museum, Silver City. It was in the early 1940s that Maude Kiner released the remainder of these artifacts to Orville D. Holloway of Grant County, New Mexico., which were later purchased by Robert Cox from the descendants of Holloway” (Grinstead 2009 15(Q2):2). This would be Robert Lee Cox (1944-2007), who once ran the now-defunct www.mimbres.com website, some pages of which are accessible via the wayback machine at: <http://web.archive.org/web/20041210175807/http://www.mimbres.com/index.htm>. Prior to his death, Cox hosted photos of some of these artifacts on that site. Cox actually announced his terminal illness and impending demise on mimbres.com, along with the claim that he was going to hide a “treasure” in a Mimbres B/w bowl somewhere in the desert and would post clues later (similar to Forrest Fenn’s infamous treasure hunt, which cost at least six lives). The clues never appeared, and the website disappeared permanently shortly after.

Grinstead is Cox’s nephew, and most of the material in his article echoes was formerly available on Cox’s website, while the remainder came from Cox’s unpublished files. Unfortunately these files were destroyed in an accident (Bruce Grinstead, personal communication 2024). Although the cave is a plausible source for the *tecomate*, it is extremely unlikely that the elaborate perishable items (the sash and the basket) came from this very wet site. The current locations of those objects is unknown.

The Royal John Mine Cave is especially intriguing in the context of Mimbres archaeology for several reasons. Firstly, it is the only deep solutional limestone cave in the sample with a full dark zone (Figure 5.7a–b). Secondly, it contains a permanent spring-fed lake, something rare not only in the caves of the Mimbres region, but in the SW/NW overall, where water caves are few and far between. As discussed above, this association with underground water would likely have enhanced the site's symbolic importance. Unfortunately, no underwater archaeology has been conducted in the Royal John Mine Cave, and cave divers who have attempted to explore its depths have been unable to map the spring that feeds it. Moreover, because it is an active limestone cave, it is highly decorated; i.e. it has many calcium carbonate speleothems, primarily stalactites. Grinstead (via Cox) suggests that a 3 ¾ in [9.5 cm] speleothem section and several crystals of lead ore found in Ancheta Canyon are part of a "Medicine Man's Outfit" contained in another Style III *tecomate* and reported by the Cosgroves (1932: Plate 77), which originated from this site (Grinstead 2009 15[Q2]:2). Here again Grinstead echoes Cox (or vice versa), who originally presented this entirely plausible suggestion on the mimbres.com website. Finally, the Royal John Mine Cave is the easternmost documented cave shrine in the Mimbres area, and the only one reported from east of the Mimbres Valley proper, with the possible exception of Chavez Cave in the Robledo Mountains, a multicomponent site that I discussed in the previous chapter.

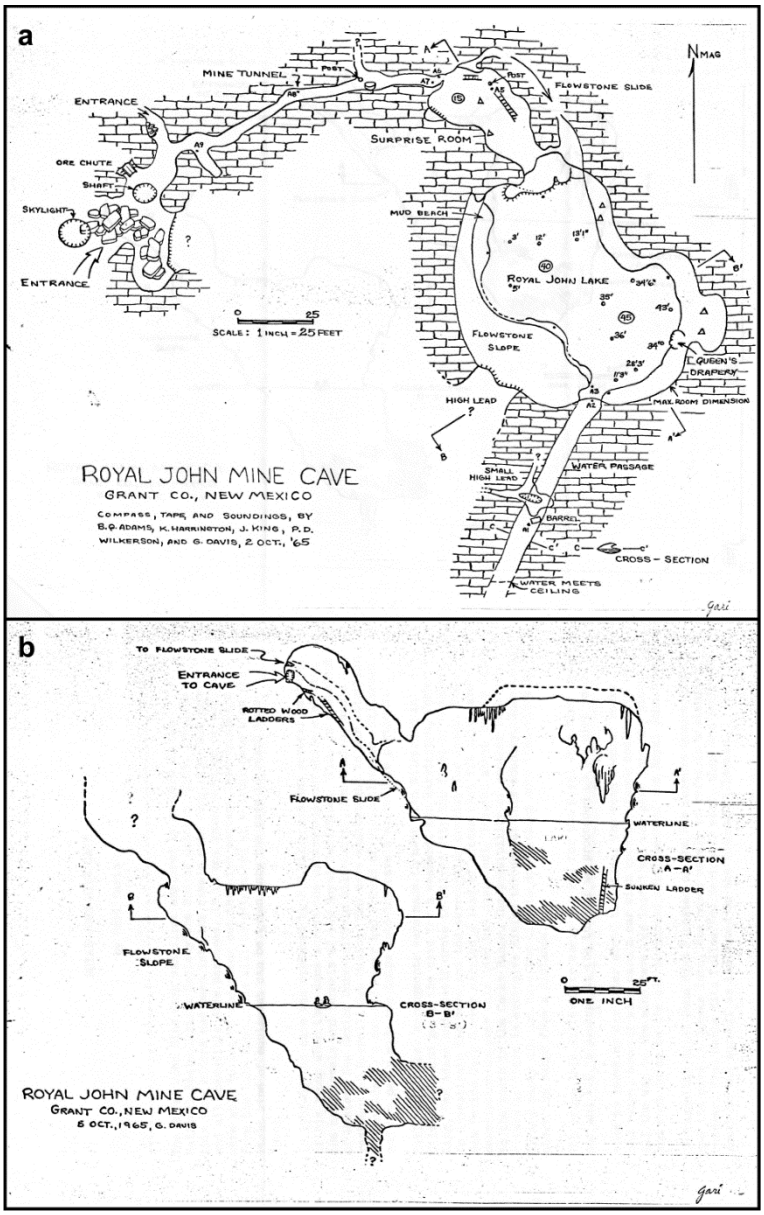


Figure 5.7. Plan and profile of the Royal John Mine Cave (courtesy of the Southwest Region of the National Speleological Society).

Despite the potential significance of this site, the three artifacts described above are the only known objects potentially associated with it, although Grinstead's 2009 article implies that there were other materials. If this cave was indeed accessed by prehistoric peoples, other offerings likely were deposited in the deep cave-lake itself.

Although perishables would not have been likely to survive in the water (or anywhere in the humid cave environment), lithics and ceramics materials would, suggesting that underwater archaeological survey of this cave could be fruitful. However, the Royal John Mine Cave has only been mapped to a depth of about 50 ft (15 m) below the waterline, and at least two passages unexplored passages continue (Figure 5.7b). An upper passage that extends from the ceiling of the cave also has not been explored. Unfortunately, the Royal John Mine Cave is not accessible at the present time due to disagreements between the current mine owner and the United States Forest Service (USFS), which controls the cave. Mitigation of lead contamination from the mine is also ongoing.

Caves of the Gila Drainage

All these sites are located on the western side of the Continental Divide, either on the Gila River proper, or on tributaries that drain into it, including its several forks, Sapillo Creek, the San Francisco River, and the Blue River in Arizona. Mule Creek empties into the San Francisco River prior to its confluence with the Gila in Arizona, and this is the location of one of the most important sites in the Primary Dataset (Figure 5.8).

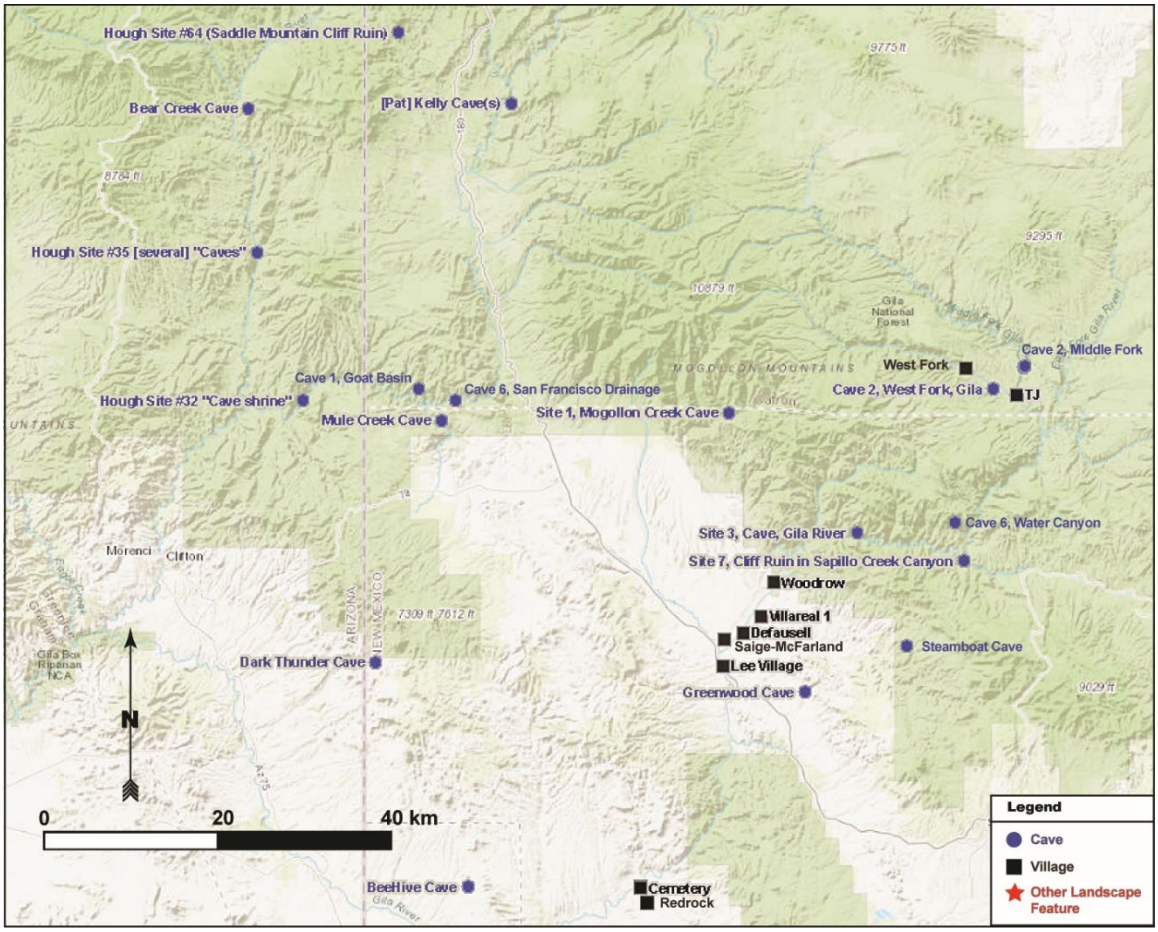
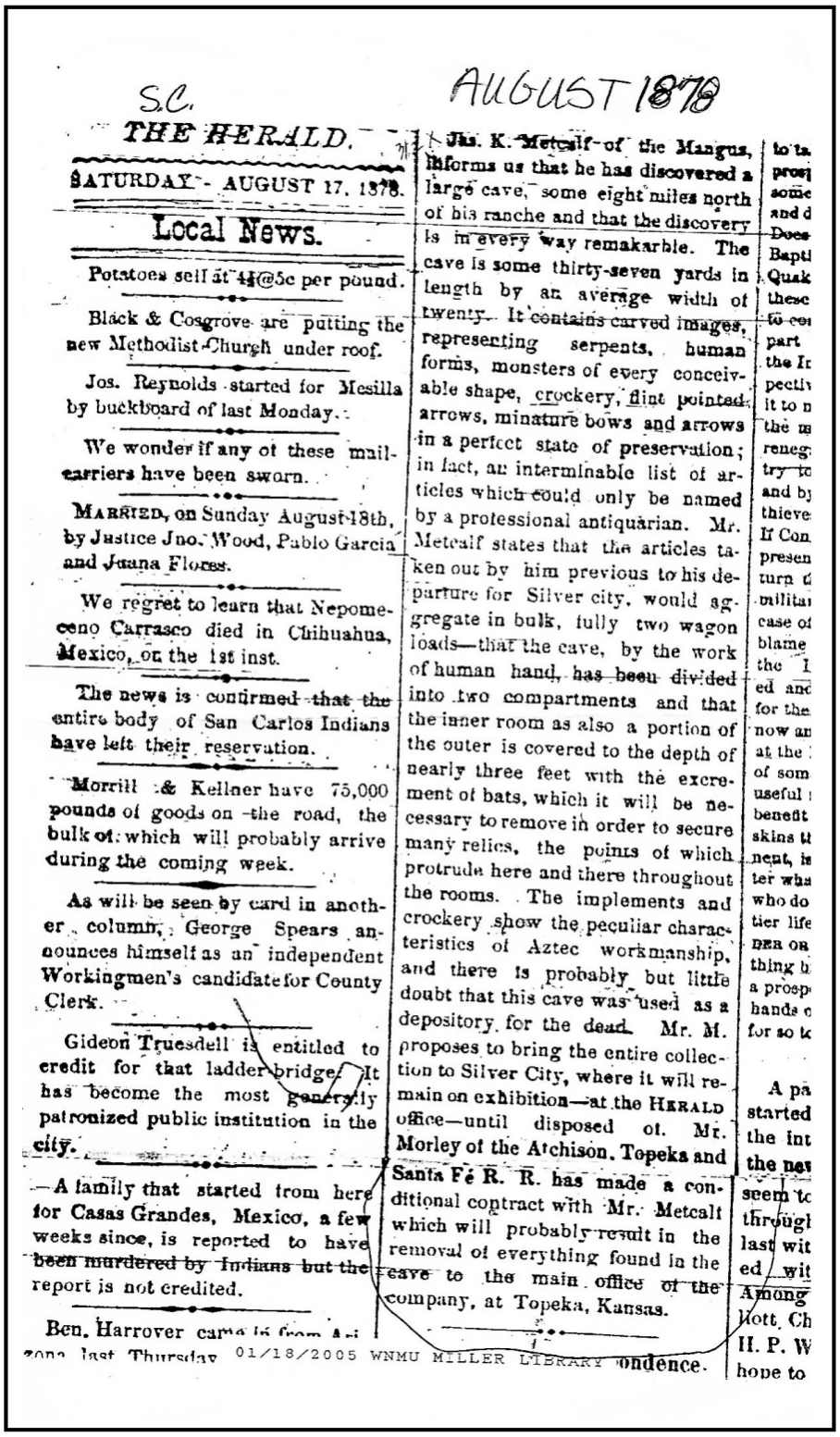


Figure 5.8. Cave shrines of the Gila drainage, showing settlement pattern and additional significant landscape features (map by Adrianna Nicolay and Scott Nicolay).

Greenwood Cave

Greenwood Cave holds a problematic position in the archaeological record and the literature pertaining to ceremonial caves in the SW/NW. The earliest description of this site and the materials it contained appears in an unattributed 1878 article in *The Herald*, a long-defunct weekly Silver City newspaper (Figure 5.9).



S.C.

AUGUST 1878

THE HERALD.

SATURDAY - AUGUST 17, 1878.

Local News.

Potatoes sell at 4½@5c per pound.

Black & Cosgrove are putting the new Methodist Church under roof.

Jos. Reynolds started for Mesilla by buckboard of last Monday.

We wonder if any of these mail-carriers have been sworn.

MARRIED, on Sunday August 18th, by Justice Jno. Wood, Pablo Garcia and Juana Flores.

We regret to learn that Nepomeceno Carrasco died in Chihuahua, Mexico, on the 1st inst.

The news is confirmed that the entire body of San Carlos Indians have left their reservation.

Morrill & Kellner have 75,000 pounds of goods on the road, the bulk of which will probably arrive during the coming week.

As will be seen by card in another column, George Spears announces himself as an independent Workingmen's candidate for County Clerk.

Gideon Truesdell is entitled to credit for that ladder-bridge. It has become the most generally patronized public institution in the city.

—A family that started from here for Casas Grandes, Mexico, a few weeks since, is reported to have been murdered by Indians but the report is not credited.

Ben. Harrover came in from Arizona last Thursday

Jas. K. Metcalf of the Mangus, informs us that he has discovered a large cave, some eight miles north of his ranche and that the discovery is in every way remakarble. The cave is some thirty-seven yards in length by an average width of twenty. It contains carved images, representing serpents, human forms, monsters of every conceivable shape, crockery, flint pointed arrows, minature bows and arrows in a perfect state of preservation; in fact, an interminable list of articles which could only be named by a professional antiquarian. Mr. Metcalf states that the articles taken out by him previous to his departure for Silver city, would aggregate in bulk, fully two wagon loads—that the cave, by the work of human hand, has been divided into two compartments and that the inner room as also a portion of the outer is covered to the depth of nearly three feet with the excrement of bats, which it will be necessary to remove in order to secure many relics, the points of which protrude here and there throughout the rooms. The implements and crockery show the peculiar characteristics of Aztec workmanship, and there is probably but little doubt that this cave was used as a depository for the dead. Mr. M. proposes to bring the entire collection to Silver City, where it will remain on exhibition—at the HERALD office—until disposed of. Mr. Morley of the Atchison, Topeka and Santa Fé R. R. has made a conditional contract with Mr. Metcalf which will probably result in the removal of everything found in the cave to the main office of the company, at Topeka, Kansas.

ondence.

Figure 5.9. Article from 1878 describing contents and looting of Greenwood Cave.

This piece appears to be the first published description of a cave shrine in the Mimbres area, and possibly in the entire SW/NW. The anonymous reporter does not give a name for the cave, but several details about the site's location in the text make it possible to identify it conclusively as the same cave to which the Cosgroves later assigned the name "Greenwood Cave," presumably due to its being in Greenwood Canyon. Although the Cosgroves, Cushing, and Hough all were aware of Greenwood Cave, none of them mention the 1878 article, and only the Cosgroves appear to have visited the site in person. The newspaper account is most important for the few details it provides about the characteristics of an intact ceremonial cave, something no archaeologist except perhaps Cushing has ever seen. The complete text follows below (see also Figure 5.9):

> Jas. K. Metcalf of the Mangus, informs us that he has discovered a large cave, some eight miles north of his ranch and that the discovery is in every way remarkable. The cave is some thirty-seven yards in length by an average width of twenty. It contains carved images, representing serpents, human forms, monsters of every conceivable shape, crockery, flint pointed arrows, miniature bows and arrows in a perfect state of preservation; in fact an interminable list of articles which could only be named by a professional antiquarian. Mr. Metcalf stated that the articles taken out by him previous to his departure for Silver city [*sic*], would aggregate in bulk, fully two wagon loads—that the cave, by the work of human hand, has been divided into two compartments and that the inner room as also a

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Additional references to Greenwood Cave, its archaeological record, and James and/or Henry Metcalf occur in the correspondence between Smithsonian curator Spencer Fullerton Baird (1823–1887), Frank Hamilton Cushing, and Colonel James Stevenson. The initial correspondence between Baird and the Metcalfs appears to have begun in response to the Smithsonian's famous 1878 "Circular 316," which sought information on archaeological remains from the Indigenous North American populations. Baird presumably reached out first to Stevenson as his primary man in the field. In the final paragraph of a letter to Stevenson dated November 18, 1879, Baird wrote:

> I have just had a letter from J. R. Metcalfe of Silver City, in which he says he is informed you have exhausted your appropriation & cannot visit him. He had several lots of choice things ready for transfer, & was, I think, willing to exhaust the contents of the cave in our behalf. Will it be

> possible, perhaps, to have Mr. Cushing go down there & superintend the exhumation & packing of the collections? It would be a pity to have this done carelessly, & especially in the interests of some other party . . . (63)

The next published reference to this site comes in a June 20, 1880, letter from Cushing to Baird, in which the former writes, "My interest in the Silver City Cave continues unabated. Indeed it has recently received great stimulus from the account of Lieut. Gardner, who recently returned this way from a scout after Victorio in that region" (112). Cushing then laments that Stevenson has not made the necessary arrangements for him to travel to Silver City and to the cave itself, and to speculate that the Apache leader Victorio might have done away with Metcalf, a circumstance that he suggests "will only have left the coast all the more clear for our final operations" (112). A note on the preceding states that Metcalf is not mentioned again in the correspondence (375n4). The Smithsonian Archives likely contain additional correspondence on this topic, and any letters from Metcalf could be of particular value. Reconstructing the spatial arrangement of Mimbres ceremonial cave assemblages is difficult, and the 1878 article on Greenwood Cave and Oric Metcalf's memory of the same site, as reported by the Cosgroves (1947:9), provides some of the few hints as to how artifacts might have been arranged in at least one major shrine.

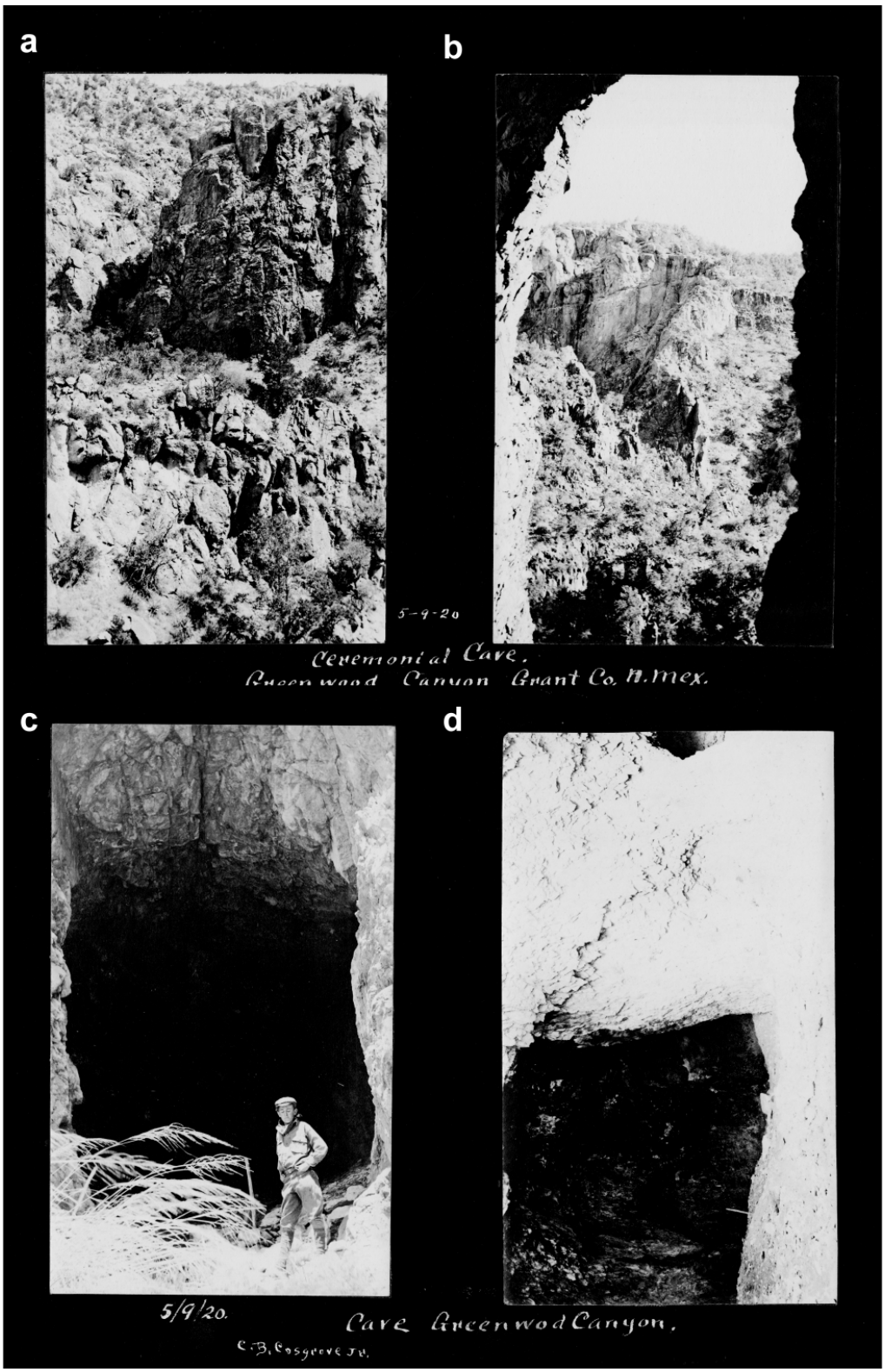


Figure 5.10. C. Burton and Hattie Cosgrove's photos of Greenwood Cave (courtesy of Carolyn O'Bagy Davis).

Although the Cosgroves' published report acknowledges their firsthand knowledge of Greenwood Cave (1947:9–10, 134), they do not provide a plan map thereof, as they did for most of the other major cave shrines they visited—perhaps this was because their visits occurred before they began documenting their work at that level. Carolyn O'Bagy Davis included three of the Cosgroves' previously unpublished photos of Greenwood Cave, collectively dated to May 9, 1920, in her biography of Hattie Cosgrove, and she shared these and one other with me (Figure 5.10a–d). These photos show, from left to right, the cave entrance from a distance, the view from out of the cave entrance, C. B. Cosgrove Jr. in the cave entrance, which appears roughly rectangular, and a (previously unpublished) view of the interior of the cave (1995:15). The Cosgroves gave the dimensions of the entrance as "15 feet wide by 23 feet high" (1947:9), which fits well with the photo showing their son for scale. That May 9, 1920, date places the Cosgroves' first documented visit to the Greenwood Cave just prior to forming their first professional archaeological connections, which followed upon a June 30, 1920, letter by Burt Sr. to Frederick W. Hodge. The Cosgroves had not yet connected with their primary mentor, Alfred Kidder at that time (Davis 1995:19, 199).

Davis later describes a second visit to Greenwood Cave in July 1926 during the start of the Cosgroves' field season at the Swarts site:

> Toward the end of the month Ted Kidder paid a visit to the camp and he and Burt, Burt Jr., and Harold Gladwin from the Gila Pueblo in Arizona made a brief trip to Greenwood Ceremonial Cave northwest of Silver City. The Cosgrove Family had visited the shrine cave on several occasions, and even though it was well known

> among local people who had dug and collected at the site, the group of archaeologists was able to excavate a good deal of rare and perishable material, including pahos (prayer sticks or medicine sticks), painted wood tablitas, a complete bow, and fragments of bows and arrows, cotton and yucca cord, reed cigarettes, and a cache of grass, buckskin, and yucca and cotton cord. (1995:47).

O'Bagy Davis' description of the materials removed from the cave during this visit matches closely enough with the Cosgroves' published description (1947:9–10) to suggest that they did not conduct further excavations there during their 1927 or 1928 field seasons when most of their systematic cave work took place—and it would explain the lack of a plan map to match those they created for caves visited afterward—nor is Greenwood Cave mentioned again in their unpublished notes. It appears likely that this visit, and subsequent work at Chavez Cave near Las Cruces the following month, provided the impetus for the Cosgroves to commence the systematic cave excavations that became their focus over the next several years, and without which an immense amount of data on prehistoric Mimbres cave use and perishable industries would have been lost forever. Even with their efforts, which were essentially salvage operations, only a small percentage of this part of the subterranean archaeological record from the SW/NW survives, and the cultural heritage of descendant communities has been desecrated and obliterated. Without the Cosgroves' 1947 report and Walter Hough's two volumes on the Upper Gila (1907, 1914), a contemporary visitor to these caves would not know that these sites had once held enormous assemblages of often elaborate ritual offerings. Today one finds only dusty, trodden-down cave floors, scattered gravel, odd

bits of cordage, and the occasional burned and broken fragment of something that might once have been a prayer stick or an arrow.

The Cosgroves supplemented their published discussion of Greenwood Cave with information from one "Mr. Oric Metcalf, of Silver City" (1947:9), presumably either the son or nephew of James R. Metcalf. The former provided additional details of value: "years before, when the cave was entered by members of his family, pahos or prayer-sticks, *tablitas*, and other offerings were set up in the dirt floor. He stated that they gathered great quantities of bows and arrows, and other objects were afterward taken to Denver" (1947:9). Unfortunately, the available information does not provide any more details about the spatial arrangement of these objects, although other sources suggest that full-sized bows and *tablitas* would also have been positioned against the walls of the cave. Cosgrove goes on to reference several pages in Walter Hough's 1914 volume in which the latter describes and illustrates "bird forms and wooden plumes found by Henry and James K. Metcalf," which demonstrates that at least a few artifacts from the Metcalf family's wholesale plundering of Greenwood Cave made it to the National Museum of National History (1947:9) (Figure 5.11a–d).

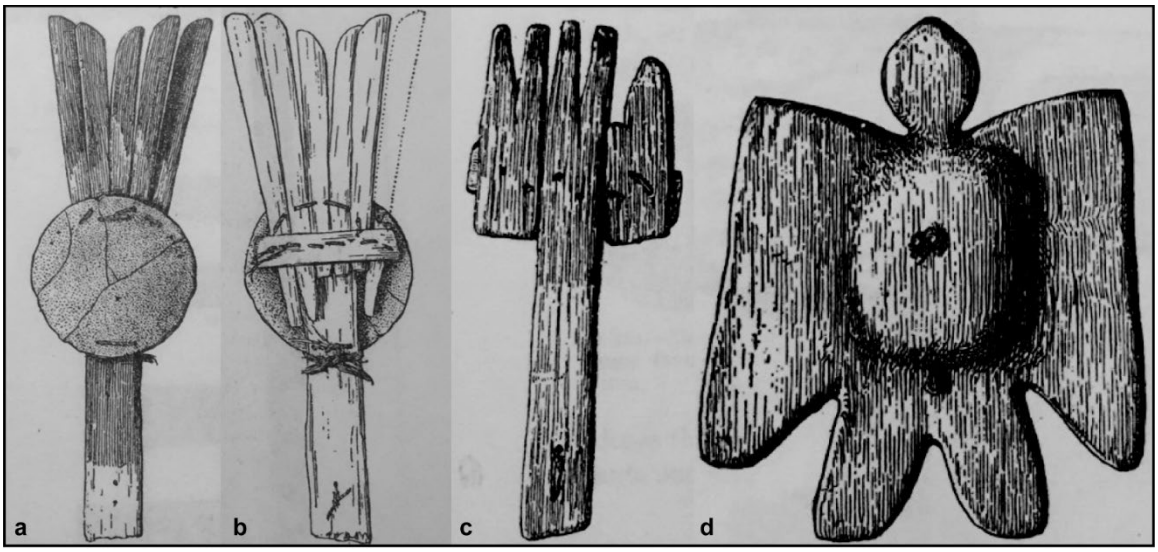


Figure 5.11. Artifacts from Greenwood Cave, from Hough (1914:104–106, Figures 216–220).

In his 1907 volume *Antiquities of the Upper Gila*, Hough makes brief reference to this cave shrine and others in the Silver City area, but he clearly did not visit Greenwood Cave or any of its neighbors during his fieldwork, as he attributes most of his knowledge of these sites to Prof. Ivan De Lashmutt, of the University of Arizona (1907:83–84). This information is important, however, as it suggests that Henry Metcalf, not James, rediscovered this site:

> The caves lying south of the Gila, which may be reached from Silver City, N. Mex., have long been known and investigated. In 1878 Lieut. Henry Metcalf, US Army, secured from them offerings, consisting of baskets, pottery, fire sticks, arrows, bows, and other objects, and forwarded them to the United States National Museum. About 1879 Mr. H. H. Rusby entered one of the ceremonial caves and secured numerous votive objects, including sandals, cord, and other materials, which were also sent to the National Museum, where they are now preserved [Hough 1907:83–84].

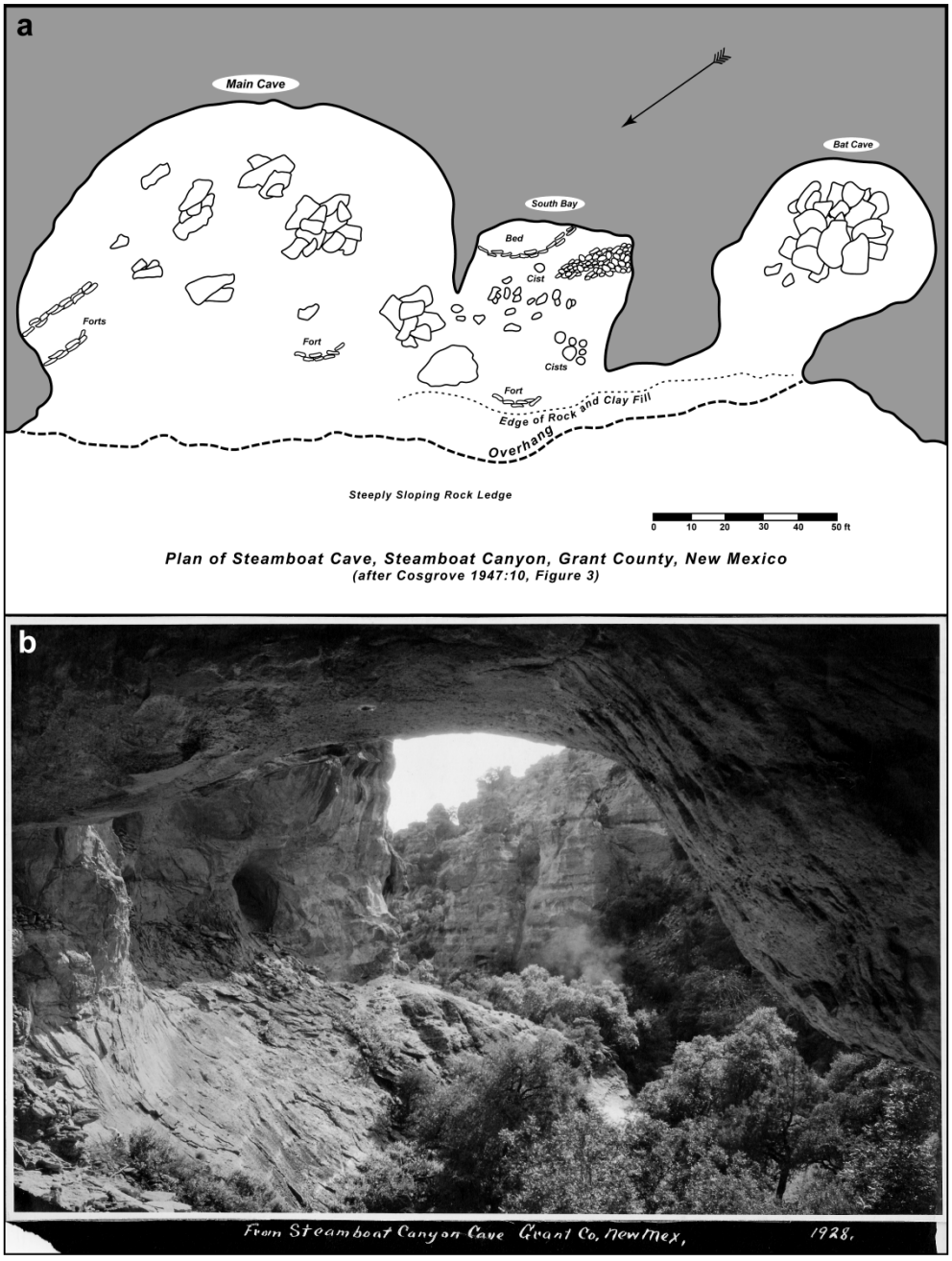
Rusby was an entomologist, apparently pressed into archaeological service by Baird, but by the time of his visit, the Metcalfs, and probably others as well, had largely stripped the cave of cultural materials. The few items in the Smithsonian's collection from Greenwood Cave are all credited to either Henry Metcalf or Rusby.

The Cosgroves report recovering a few additional artifacts from Greenwood Cave that had been "overlooked in the many times the cave had been dug into," including a full-sized bow and 10 miniatures, cane cigarettes, several types of *pahos*, and *tablitas* (1947:9). They describe it as "primarily a Pueblo shrine" with "little or no evidence of Basket-maker occupation" (1947:9). One passage in the 1878 article remains intriguing: "the cave, by the work of human hand, has been divided into two compartments." This could mean either that the Mimbres people constructed some kind of wall or walls to separate the cave into inner and outer chambers, or that they tunneled these chambers out, as they appear to have done with at least one passage in Mule Creek Cave. The Cosgroves do not describe any architecture or other anthropogenic modifications to the cave, but neither do they mention the obvious marks of stone tools in Mule Creek Cave. They only describe the interior of Greenwood Cave as having "bays on the east side at front and back which give a width of 25 to 30 feet" (1947:9).

Given the enormous quantity of the original assemblage described in the 1878 article ("two wagon loads"), and by Oric Metcalf, as reported by the Cosgroves (1947:9), Greenwood Cave appears to have been one of the most important Mimbres cave shrines, and given the lack of darts or related artifacts, one whose use probably does not date earlier than ca. 500 CE. No entry exists in New Mexico's NMCRIS database for Greenwood Cave, and insofar as I am aware, no archaeologist has visited this site since

the 1926 outing by Cosgroves and Kidder. Based on the location information that they provided, it appears to be on USFS land, but present-day access to the mouth of the canyon is via a privately-owned parcel (Carolyn O'Bagy Davis, personal communication 2023).

Steamboat Cave



Plan of Steamboat Cave, Steamboat Canyon, Grant County, New Mexico (after Cosgrove 1947:10, Figure 3)

Figure 5.12. Steamboat Cave, Grant County, New Mexico: (a) plan map (after Cosgrove 1947:10, Figure 3); (b) C. Burton and Hattie Cosgrove's photo of the view from the cave (courtesy of Carolyn O'Bagy Davis).

The Cosgroves are the only source of information for Steamboat Cave, and like Greenwood Cave, it lacks any NMCRIS entry. No other archaeologist appears to have visited the site since they excavated it. They identify its location as "14 miles in a straight line northwest of Silver City in a cliff on the east side of a north fork of Steamboat Canyon, a tributary of Bear Creek, which empties into the Gila River" (1947:10). Steamboat Cave is located northeast of Greenwood Cave, and south of the junction of the Gila River and Sapillo Creek.

Steamboat Cave can be considered as three caves in one (Figure 5.12a–b). The Cosgroves describe three distinct Earth openings all under one large overhang, running from north to south a "large, well-lighted Main Cave," a shallower "South Bay," and set apart somewhat from these, "a darker and nearly circular chamber known as the Bat Cave" (1947:10). They further describe the latter accordingly: "Because of darkness…an ideal home for the animals after which it was named," which suggests that this chamber has a limited dark zone, or at least an area of deep twilight (1947:10). Unfortunately, the accumulated bat guano there led to a mining operation in 1917 which "resulted in great damage to any specimens left there by the Indians" (1947:10). They do note that a "large unbroken plain olla encased with a loosely woven yucca carrying net was found in the guano" (1947:10–11).

The depth and darkness of this chamber, and perhaps also the presence of bats, suggest that it served as the primary shrine area for any offertory activity that occurred in

Steamboat Cave, but as with so many other sites, most of that record was obliterated quickly with the arrival of Anglo-American settlers. Although the Cosgroves do not appear to have recovered the olla they described, they did recover "a reed arrow and a cached ceremonial bow, with some grass-stem and wooden pahos…under and at the back of the large rock fall" in Bat Cave, thus confirming at least the possibility that this area was a focus of ritual activity (1947:12). However, they also recovered "many painted fragments of tablitas, and several bundles of very small ceremonial bows with miniature grass-stem and stub pahos attached" from the "extreme south corner" of the South Bay (the spot closest to Bat Cave), so it appears that offerings were not limited to any one part of the cave (1947:12). Other artifacts the Cosgroves recovered from Steamboat Cave that have probable ritual associations include 49 cane cigarettes, a wooden pipe, a bone tube, beads, possible gaming pieces, and "gaming hoops or rings" (1947:13). It may be that each area of Steamboat Cave played served a distinct ritual function.

Two other aspects of Steamboat Cave deserve special notice, as they are among the characteristics that make this cave stand out within the sample. The first consists of various "roof flags," i.e. large, flat slabs of stone fallen from the cave roof, which the Cosgroves noted had been stood on end in both the Main Cave and the South Bay. They attributed a defensive function to these slabs, and identified them as "breastworks" (1947:11) (Figure 5.12a). Little, if any evidence exists for conflict during the Mimbres Classic, when population was densest in the region, although earlier pithouse villages were often constructed in locations with defensive potential, such as hilltops (LeBlanc 2018:267–268).

The other distinctive feature of this cave, which also became a focus of the Cosgroves' excavations there, was a group of seven cists located in the South Bay. Six of these were located in a tight group near the southwest corner of this chamber, with the seventh off by itself near the back. The largest of these, located in the center of the main group, was 4 ft 5 in (1.3 m) diameter, and cut 2 ft 4 in (71 cm) into the fill. All the cists were "cut into the hard clay and rock fill" (1947:11). The Cosgroves suggest that the largest cist was "used for sleeping and as a protection from the cold winds sweeping through the cave" (1947:11–12). Perhaps the "breastworks" were also intended as windbreaks—curiously, the Cosgroves suggest precisely such a function for a pile of loose rocks in Gila River Cave Site 3 (1947:14), but not here where they make specific mention of cold winds blowing through the cave. The only one of the cists that contained any significant assemblage of artifacts was the one in the back of the chamber; this cist held "27 extra-large corncobs, four of which had a stick thrust into the large end of the cob" (1947:12). Based on the evidence that the Cosgroves present, both the cists and the "breastworks" most likely predate the Late Pithouse period, perhaps significantly, and show no definite associations with ritual activity.

Recently, Miller and colleagues dated a *tablita* fragment from Steamboat Cave that bears two nucleated circles in black and green, and which likely formed part of a goggle-eye effigy (Miller et al. 2023, 2024). They obtained a 2 sigma cal 14C date of AD 980–1130, solidly in the Mimbres Clasic, suggesting that the worship of this deity continued into that time and likely until the end of Mimbres occupation of the Upper Gila (Miller et al. 2024:13, Table 1).

Site 1, Mogollon Creek Cave

The Cosgroves describe this site as "a shallow cave in the north wall" of Mogollon Creek Canyon "half a mile above the mouth of Lookout Canyon" and "125 feet above the stream" (1947:13). They do not provide specific numbers for the quantities of most of the artifacts they recovered, but the possible offertory items they list include "broken reed arrows…grass-stem *pahos*; 2 painted stub *pahos*; miniature ceremonial bows." Nonetheless, they unequivocally identify this cave as a shrine, while noting the possibility that it also could have served "as a refuge to avoid the danger of camping in the very narrow canyon" (1947:13). They also note that "the cave was much larger, but part of the floor had broken off and had slid into the canyon, leaving only a small section 8 by 10 feet, where refuse 1 to 1 ½ feet deep still remained" (1947:13). Presuming that the Cosgroves' observations here are correct, and that the collapse occurred during or after the Mimbres Classic (the cave contained sherds of Mimbres B/w, but no later ceramic types), it could have been a more important shrine than the small assemblage that they recovered suggests (their collection also seems small for the 120 ft^3 of refuse that their measurements identify in the site).

Gila River Cave Site 3

Although the Cosgroves do not identify this small site as a shrine ("The only practical use for the place was as a camp for hunting parties on their way out of the deep canyon to timbered and grass-covered parks above" [1947:14]), the modest assemblage

they recovered there nonetheless meets the minimum criteria specified above for identification as a shrine, as it included the foreshaft of a composite arrow, 2 Type 11 sandals, split-stick wands, and "fragments of wooden tablitas, decorated with burned lines or painted solid color" (1947:14–15). Despite its small size, only 6 by 10 ft (1.82 m x 3.05 m), this cave contained rock art: "faded red pictographs, one or two in the form of a human being or lizard" (1947:14). This is one of only two caves with rock art from the sample set located in the Gila drainage, and one of only three overall. However, the figurative motifs that the Cosgroves report suggest a later date for the clearly Archaic rock art from the Doolittle Cave Complex and the Saddle Mountain Cliff Ruin. Nonethelesss, the combination of rock art with the other artifacts, particularly the *tablitas*, justifies the inclusion of Gila River Cave Site 3 in the sample.

Site 6, Cave in Water Canyon

The Cosgroves identify this site exclusively as a shrine: "The place had not been lived in. The material it contained and its almost inaccessible location in a gloomy rough canyon strongly indicate that both Pueblo and Basket-makers used it as a shrine on their way up the canyon from the Gila River" (1947:15). The "few specimens" they recovered here included "4 complete arrows; 7 broken reed arrows…1 Type 11 sandal…3 reed cigarettes; fragments of wooden tablitas" and most notably: "macaw feathers; macaw feather ornament, base of quill wrapped around and attached to cotton cord" (1947:15). Although they are not common, macaw and parrot remains and iconography are an important part of the Mimbres archaeological record, and any occurrence thereof

deserves attention. This cave is the only one in the primary dataset from which macaw feathers have been reported, although U-Bar Cave, a post-Classic site in the New Mexico Bootheel, also contained macaw feathers (Schaafsma 2007). It is also worth noting that the Cosgroves do not mention any of the multiple types of objects they identify as *pahos* in this cave, a reminder of the variability of shrine assemblages.

The Cosgroves also record that three years prior to their visit to the site, "cowboys had taken out numbers of small pottery vessels and arrows" (1947:15). As their inventory of the materials they recovered from this cave does not include any ceramics, this information helps provide a picture of what intact assemblages contained in some of the Mimbres cave shrines. References such as this and the uncredited 1878 news article on the looting of Greenwood Cave suggest that the first items that Anglo-American settlers removed from these shrines were whole ceramics and basketry, painted effigies and *tablitas*, and full-sized bows and arrows.

Cave in Cave Canyon, Site 2a

This cave stands out in the sample for several reasons. First of all, its location, only 300 yards from the confluence of Sapillo Creek and the Gila River, places it close to one of the three possible locations of the unidentified cave where two men removed the large and complex painted bird effigy that is now in the Northwest Museum of Arts and Culture in Spokane (cf. Chapter 7). It is interesting that two shrine caves would be located so close together, although it is entirely possible that the cave where the effigy was found was used only for the storage and/or terminal deposition of powerful

ceremonial objects, rather than as a site where offerings were made over an extended period of time. The Cosgroves seem unlikely to have failed to notice the components of that effigy. More likely, that assemblage came from a much smaller and less obvious cave in that area or one of the other two locations identified as its source. The next two chapters examine this assemblage and its provenience in more detail.

A second point of importance is that this cave was not strictly a shrine, although it did contain arrow foreshafts, painted sticks, a painted twig *paho*, 9 stub *pahos*, and miniature ceremonial bows (Cosgrove 1947:16). It also contained extensive architecture—at least seven rooms "some of good size" (1947:16). As cliff dwellings are not documented for the Mimbres Classic, the rooms in the cave very likely belonged to a subsequent Tularosa phase or Salado occupation. Evidence for this interpretation comes from ceramic types that postdate the Mimbres Classic, including several Tularosa types, and a fourth identified as "Zuni, white slip, black glaze, red matte decoration" (1947:16). Thus, the people who built the rooms either chose not to disturb earlier offerings in other parts of the cave, or the offerings date to this later period. A third possibility is that the locus of the ceremonial assemblage is a multicomponent feature representing continued use by at least two different groups during different phases.

One final aspect of this site deserves mention. The Cosgroves report that "Excavations below the floor of 1 room uncovered a disturbed infant burial and scattered adult bones" (1947:16). Human remains were reported from only four of the sites in the sample set, and in all but one of those cases, the remains included those of an infant (in this case in conjunction with adult remains, but in the other two sites, only infant remains were reported). Unfortunately, the Cosgroves' brief description does not make it clear

whether these remains represented a subfloor burial or whether they might have preceded the construction of the rooms. Given the heavily disturbed nature of the cave deposits, they possibly could not make that distinction themselves.

Middle Fork of the Gila River Cave 2

Although the Cosgroves describe this site only briefly, and they list only a minimal assemblage, the artifacts they recovered there do meet the minimum criterion for identifying this site as a shrine: the nock end of a reed arrow, "part of a Type 14, 10-warp sandal," and "fragments of wooden tablitas" (1947:20). As scant as this collection is, it accounts for almost half the materials they recovered here: the remaining artifacts consisted only of "squash rind," "knots of shredded yucca," and "2 small flake scrapers," along with sherds of various Mimbres wares, including Mimbres B/w. The latter could be either Style II or Style III, as the Cosgroves only distinguished Style I within the B/w sequence, identifying it as "Mimbres Boldface" (1947:20).

The Cosgroves did not provide a plan map of this site, but they locate it between their campsite on the east side of the Gila River's Middle Fork and an extensive area of pictographs on the cliff face below their camp, which also was located on the east side of the canyon, "3 miles [1.6 km] above its junction with the West Fork" (1947:17, 20). These pictographs, located "100 feet [30.5 m] above the stream," included "broad zigzag lines in red, straight wide bars outlined with yellow, a sun symbol (?) in red composed of a circle with angular points around the circumference, concentric circles in red, and the typical lizard" (1947:17, 20). They note also that "numbers of other pictographs were too

faded to be traced" (1947:17, 20). The heavily geometric nature of many of these pictographs suggests that they belong to the Archaic period.

Middle Fork of the Gila River Cave 1

The Cosgroves describe this site as "a large shallow cave, or overhang, 55 feet (16.76 m) long, situated high in the east wall of the canyon reached by a hard climb of 200 feet [61 m] from the river" and located north of their camp (1947:17, 20). The materials they recovered from this site meet the criterion for identification as a shrine on their own, and the difficulty of access for this site further supports the hypothesis of a ritual rather than a domestic or utilitarian use. Stevenson described a shrine cave at Zuni "which symbolized the Middle of the world to the A'shiwi when they lived at To'wa yäl'länně…in the rocky wall just above Hälon kwa'ton. It appears impassable, but it can be reached by expert climbers" (1904:234, Plate L). As this cave faces 11 cliff dwellings on the opposite side of the canyon, perhaps it served a similar, but more modest role for the inhabitants of those dwellings. If so, this cave could belong to a later phase that postdates the Mimbres Classic. With this in mind, one additional artifact from this cave deserves notice: the single ceramic sherd that the Cosgroves reported from the cave, which they identify as an "Upper Gila Black-on-white sherd" (1947:20). Although the Harvard Peabody Museum's website has an entry for this sherd, it does not provide a photo. The text of the entry describes it as "Ceramic rim sherd, painted design, black on white, incised." This is likely a modified sherd of Gila Polychrome (Thatcher Rogers,

personal communication 2021). This is the only sherd reported from the site, and this cave is one of only two in the sample that contained ceramics that might be Salado types.

Artifacts from this cave which could represent ritual activity include arrow foreshafts and arrow points, a Type 11 sandal, two miniature ceremonial bows, cylindrical gaming sticks or counters, five reed cigarettes, looped twig *pahos*, unpeeled twig *pahos*, quartz crystals, and a blackened tubular bone (stone and bone tubes are ethnographically used by medicine men and women to "suck out" malevolent foreign objects inserted into the human body by witches, a practive I have personally witnessed on the Diné Nation). The Cosgroves also found two spur ends of darts and a dart foreshaft, suggesting that this site is among the earliest and longest-utilized caves in the Primary Dataset (1947:20). If some of the nearby rock art in the canyon belongs to the Archaic period, these sites could be associated.

***West Fork, of the Gila River, Cave 1**

Although this cave does not meet the full criteria for shrine identification described above, as the Cosgroves report only ceramics, they do write that it contained "a small circular shrine of piled rocks" (1947:21), so I include it in the sample set provisionally. Notably, they report not only both Mimbres B/w Style I ("Boldface") ceramics as well as Classic B/w, which could be Style II and/or Style III, but also "Three Rivers Red-on-terracotta" and "Tularosa plain red-paste (polished black interior)" (1947:21). The latter type postdates the Mimbres Classic and thus suggests later use, something rare in the cave shrines of the Upper Gila. Three Rivers Red-on-terracotta was

also one of a suite of types used during the post-Classic Black Mountain phase. Because this cave does not meet the criterion set herein for the identification of a cave shrine, and because it yielded no ritual artifacts or other perishables, it is not otherwise included in the Primary Dataset. However, I still describe it here so as to preserve its geographic relation to other sites and features that potentially formed part of a larger ceremonial landscape, and because of its potential chronological implications.

West Fork, of the Gila River, Cave 2

The Cosgroves describe this site as "a large cave, 70 to 80 feet [21 to 24 m] deep" contiguous "on the north with the group containing the cliff houses of the Gila National Monument." The site is unusual morphologically, with the only floor area being a "sloping shelf along the back wall" (1947:22). Most of the materials recovered here by the Cosgroves appear to have come from pack rat nests around and under a few boulders on this shelf. Behind one of these boulders, they encountered the disturbed remains of an adult. Identification as a possible shrine is based on the presence of the following artifacts reported by the Cosgroves: broken reed arrows, arrow foreshafts, fragments of five Type 14 (four and six warps) sandals, a miniature ceremonial bow, cylindrical gaming sticks or counters, reed cigarettes, a knotted twig *paho*, and an unpeeled twig *paho* (1947:22). One artifact unique to this site was a "pink shell gorget." The only decorated ceramics recovered from this cave were sherds of Tularosa fillet-rim and Tularosa Black-on-white, so this site possibly was not a Mimbres shrine, but one affiliated with their neighbors to the north. Moreover, these types largely postdate the Mimbres Classic, and potentially

indicate continued use after the primary depopulation of the Mimbres region ca. 1130–1150 CE. However, the cave also contained elements of darts, which point to use during or prior to the seventh century CE (1947:22).

Saddle Mountain Cliff Ruin/Hough's Site #64 (LA 21160)

This cave is the northernmost site in the sample set, as it is located far up the San Francisco drainage on Pueblo Creek. It was excavated both by Walter Hough in 1905 (1907:57–58) and by the Cosgroves more than two decades later (1947:23–25). Based on its location and the recovered ceramic types, its cultural affiliation was almost certainly with northern Mogollon populations (Reserve and/or Tularosa) and/or later Salado occupants of the area, rather than the southern Mogollon Mimbres. I include this site here first of all in order to define the northern extent of the Mimbres tradition, as well as to demonstrate the similarity between the offertory assemblages of both Mogollon groups, as the items that meet the criterion for identification as a shrine belong to the same categories as those in the recognizably Mimbres cave shrines. These materials include: "6 fragments of painted and unpainted large bows," "fragments of reed arrows," "5 miniature ceremonial bows," "painted twig pahos," "12 reed cigarettes," and "wooden tablitas" (Cosgrove 1947:25). Although Hough does not report collecting any materials from this site, he reports that "it was entered some years ago by John Cosper, who found bows, arrows, painted tablets, and other objects arranged, according to his description, in orderly manner around the walls of the cavern" (1907:57). This information is especially valuable and corroborates the reported spatial disposition of artifacts in the various

sources for Greenwood Cave to the south. Alas, it is only from these brief and fleeting descriptions of the intact assemblages glimpsed by early visitors prior to the onset of looting that we acquire any idea of the spatial data lost to archaeology.

Hough, who saw many cave shrines in the early twentieth century, states that, although Cosper thought the site was an armory, there is "no reason to believe that the cave was used for other purpose than for sacrificial offerings" (1907:58). The Cosgroves partially disagree based on the nature of the architecture in the site: "Even though the cave is almost inaccessible, with living water 1200 to 1300 feet (365 to 396 m) below, the carefully built masonry pierced by portholes seemed to indicate that at times it was used as a place of refuge as well as a shrine" (1947:25).

Saddle Mountain Cliff Ruin was also one of only three sites in the Primary Dataset with associated rock art. In "a small cave to the east, and under the same overhang," Cosgrove describes and illustrates "trail-like patterns, 4 human footmarks, what appeared to be bear tracks, and some turkey tracks" (1947:25, Figure 52b). Both the motifs in this panel and the association of bedrock mortars and cupules are similar to Map Cave and Beehive Cave, which I discuss in Chapter 8. The primarily geometric style suggests that all or most of the rock art in this site dates to the Late Archaic, as with the Doolittle Cave Complex, Map Cave, and Beehive Cave.

Kelly Cave

This site is located on the east side of the San Francisco River proper, about 16 km southwest of Saddle Mountain Cave. According to the Cosgroves, it is actually a

complex of earth openings, with a series of small west-facing shelters and one large cave with a southern exposure, the latter being "60 feet wide by 33 feet [18 m by 10 m] deep, with a 12-foot [3.65 m] ceiling and with sides sloping to a central pit in the floor" (1947:26). A photo in the Harvard Peabody Museum's archives shows a group of openings in a single large outcrop on what was then the Kelly Ranch (2004.24.18867). They report that the "shelter," by which they appear to mean the large cave, had been looted by Richard C. Eisele of Fort Bayard, who took from the site "part of a large twined-woven Basket-maker bag" and "3 large, bundle-weave baskets, similar to Pima storage baskets, one of which contained 92 pounds [almost 42 kg] of small white beans" (1947:26, Figure 79g). Eisele was one of the most prodigious looters operating in the Mimbres region during the early twentieth century (Dinwiddie 1982). The Harvard Peabody Museum has three photographs of one of these baskets in their archives (2004.24.18863, 2004.24.18864, and 2004.24.18865), all of which are attributed to the Cosgroves (with the provenience assigned to "Kelley Cave" but all other descriptors reading "Kelly Cave"). Along with these photos is one photo of a pair of leather sandals, also attributed to the Cosgroves and provenienced to Kelly Cave (the sandals are represented by one photo that has two entries, 2004.24.18866A and 2004.24.18866B). The leather sandals resemble Basketmaker II examples from the Ancestral Puebloan area to the north, while the basket appears to be of late prehistoric origins, and resembles ethnographic examples made by O'odham basket weavers in historic times (Laurie Webster, personal communication 2021). Thus, it is possible, even likely, that neither the baskets nor the leather sandals actually came from Kelly Cave and that Eisele found them in other sites, and for some reason chose to use the Cosgroves to "reprovenience" them.

As per the passage quoted above, the Cosgroves did recognize the similarity of these baskets to Pima (Akimel O'odham) storage baskets (1947:26), although this apparently did not lead them to suspect Eisele's attributed provenience.

Identifiable ritual artifacts that the Cosgroves found in the Kelly Cave Complex included fragments of reed arrows; foreshafts of composite arrows; "sandals of the following types: 6 Type 9a, 2 Type 11, 1 Type 12, and 1 Type 13"; a fragment of a miniature bow; a fragment of a stone plaque; and "twig pahos, feather of fiber cord still attached." They also recovered a fragment of a *Glycimeris* shell bracelet and "3 dart foreshafts, two of them with broken stone points" and the spur end of another dart (1947:26). Kelly Cave is one of only three caves in the sample that contained stone plaques (though only a fragment), and one of only six that contained atlatls, darts, and/or fending sticks.

Notably, this site also yielded sherds from several vessel forms (bowls, ollas, and *tecomates*) and a wide variety of ceramic types, including both Mimbres and Tularosa wares. The Cosgroves did not record any Salado wares from Kelly Cave, however, as with some of the other caves that also contained Tularosa types. Noting the temporal range of the ceramic and perishable assemblage, the Cosgroves write: "The large amount of accumulated refuse containing fragile Pueblo specimens, Tularosa sherds, early Mimbres sherds, which are representative of a culture preceding that of the San Francisco River district and, finally Basket-maker artifacts point to this site as a domicile of long standing" (1947:26). Although the ritual assemblage from this site is small, and did not contain *tablitas* or cane cigarettes, this cave does appear to have seen at least some use as a shrine. Most likely, Kelly Cave was both a multiuse and a multicomponent site that

hosted different activities for different groups over the span of a millennium or more. It also provides some indication as to the northern extent of Mimbres shrine caves in relation to sites utilized similarly by Reserve populations, which in turn might have taken over the site after the Mimbres depopulation of the Upper Gila.

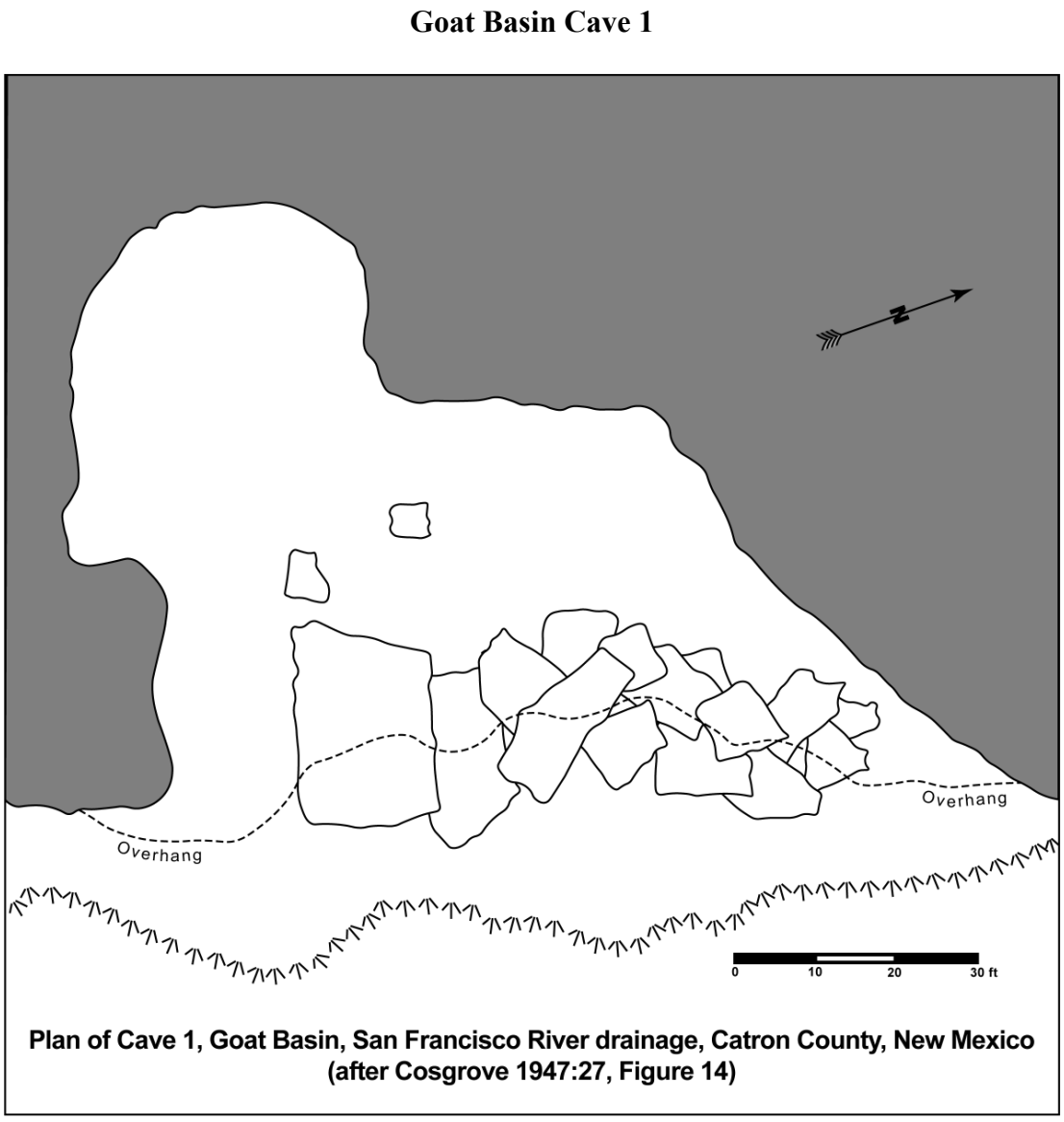


Figure 5.13. Plan map of Cave 1, Goat Basin, Catron County, New Mexico (after Cosgrove 1947:27, Figure 14).

This cave is one of eight that the Cosgroves report for Goat Basin. They assigned numbers to only half of these sites, as the other four contained "no signs of occupation" (1947:26). Goat Basin Cave 1 is the southernmost of the three numbered caves on the west side of the canyon. They identify these caves as located "in a red volcanic stone cliff facing southeast, and at the top of a steep talus slope, 150–200 feet above the bottom of the canyon," and they further describe the difficulty of accessing them from any direction. The positioning and difficulty of access of these sites recall Bear Creek Cave on the Blue River, Walter Hough's "Great Ceremonial Cave" that is the subject of the next chapter.

The Cosgroves provide a plan map for Goat Basin Cave 1, which along with their description of the site and its dimensions, suggests that it possesses a limited dark zone, or if not full dark, that much of its interior is certainly in deep twilight, making it a likely choice for a shrine (Figure 5.13). Their reference to extensive guano mining in the cave, which means that it supported a significant bat colony, supports this conclusion (1947:27). According to the Cosgroves' description, the original 106 ft [32 m] entrance to the 70 ft [21 m] deep cave collapsed some time in distant prehistory, possibly before any human use, and the resulting rockpile left only two entrances to the interior: a 15 ft [4.5 m] wide passage in the south, and a narrower one in the north (1947:26–27). Unfortunately, the aforementioned guano mining inevitably destroyed most of the cave's archaeological record, resulting in the "complete churning up of the fill and no doubt the destruction of many valuable specimens" (1947:27). The Cosgroves recovered what materials they could from the guano miners' backfill, which had subsequently been sealed over with fresh cattle manure.

Regarding the use of this site, the Cosgroves write "from the number of ceremonial bows and pahos found, it seems to have been used primarily as a shrine" (1947:27). Altogether they recovered 13 complete and 61 fragmentary ceremonial bows, six pieces of large bows, 191 fragmentary reed arrows, arrow foreshafts, one Type 9a and three Type 14 sandals, grass-stem *pahos*, painted twig *pahos*, 52 painted stub *pahos*, 10 unpeeled stub *pahos*, crook staff *pahos*, and two arrow *pahos*, and one dart foreshaft (1947:27). This site illustrates well how bow-and-arrow offerings left in cave shrines were preceded by darts (and sometimes atlatls themselves and/or fending sticks). The only ceramics they report are plainwares.

The final sentence of the Cosgroves' comments on this cave is of great importance: "The absence of fragmentary wooden tablitas among the offerings here and in other caves on the north side of the San Francisco was peculiar, since so many were found on the south side of the stream" (1947:27). Here they refer primarily to Mule Creek Cave, located just a few miles south of the Goat Basin caves on the other side of the San Francisco River, which yielded some of the most intact and spectacular *tablitas* that the Cosgroves recovered anywhere. *Tablitas* were also absent from the assemblage recovered from Tularosa Cave, a Reserve Mogollon shrine further north in the San Francisco drainage, but were present in nearby Cordova Cave (Grange 1952:371-372). The picture is further complicated, however, by the *tablitas* they reported from the Saddle Mountain Cliff Ruin (Hough's site 64), which is over 60 km north of the Goat Basin caves. Possibly however, these *tablitas* in the Saddle Mountain Cliff Ruin and Cordova Cave postdate the Mimbres Classic, as these sites appear to belong to the subsequent Tularosa phase and a more northern population—albeit one that likely absorbed Mimbres emigrants.

Interestingly, despite the limited assemblage that the Cosgroves recovered from Goat Basin Cave 1, as well as the lack of *tablitas*, they nonetheless place this site alongside Mule Creek Cave and Greenwood Cave as one of the most important cave shrines in the region (1947:168).

Goat Basin Cave 4

The Cosgroves make only a brief mention of this cave, which is located on the east side of the canyon, across from their Cave 3, with a southern exposure. The assemblage they recovered was minimal, but included fragmentary reed arrows and three painted stub *pahos*, which suggests use as a shrine even though it does not meet the full criteria set earlier in this chapter. The site also contained sherds of both Mimbres and Tularosa wares (1947:28).

Sipe Canyon Cave 5

This cave continues the Cosgroves' numbering of the Goat Basin Canyon caves. Sipe Canyon is an earlier tributary of the San Francisco River, located east of Goat Basin Canyon, also on the north side of the river. In their brief, single-paragraph description of this site, the Cosgroves note that this "was the only cave discovered that was apparently undisturbed, and it proved to have been a camping place of both the Mimbres and Tularosa people" (1947:28). Alas, the site held only a meager assemblage: "Some sandals were scattered on the rock floor, and in a small amount of rubbish among the rocks at the

north end a few specimens were found" (1947:28). In addition to these sandals (three of Type 9a and six of Type 9b), they also recovered fragmentary reed arrows and two painted stub *pahos* (1947:28), and as there is nothing among the remainder of their collections from this site that does not occur as an offering, their "camping place" hypothesis seems questionable. Sherds from Sipe Canyon Cave 5 included corrugated and plainwares from both the Mimbres and Tularosa sequences, as well as some plainwares (1947:28). Technically then, Sipe Canyon Cave 5 could qualify as the only cave shrine in the Mimbres region encountered in an intact state by archaeologists, but its meager assemblage suggests only limited use, some of which potentially postdates the Mimbres Classic, so the site unfortunately did not offer any of the complex spatial data that more important shrines in the region retained prior to looting and vandalism.

The archives of the Harvard Peabody Museum hold photos of most of the perishable artifacts the Cosgroves removed from this cave, but unfortunately the entries for the ceramics and the stone tools lack images. Two unpublished photos also are identified as depicting the cave itself. The first image (2004.24.18870) shows a single anthropomorphic pictograph to the right of what is either a cave entrance or a narrow entryway to an interior portion ("north end") of the cave. The second (2004.24.18871) shows two people standing in front of what is clearly the exterior entrance of the cave. As the Cosgroves do not mention any rock art associated with this cave, or with any of the caves in the Goat Basin-Sipe Canyon cluster, and they do not provide a plan map of this cave, it is not possible without a site visit to determine whether the pictograph is in Sipe Canyon Cave 5 or one of the photographs is misattributed. The petroglyph does not resemble anthropomorphic forms from Mimbres iconography, and according to rock art

researcher Margaret Berrier, similar images in the area are still very bright (i.e. recent), and thus are likely of Apache origin (personal communication 2021).

Although none of the other caves in this cluster fully meet the criterion for identification as shrines (excluding Mule Creek Cave, which is on the south side of the San Francisco River, a few miles west of its great bend toward the Gila), two of them deserve some mention in relation to Sipe Canyon Cave 5 and the two Goat Basin caves. The Cosgroves identify San Francisco Drainage Cave 6, "a tapering hole 4 feet [1.2 m] in diameter at the mouth and 12 feet [3.7 m] deep," as "one of the most important in the district" (1947:28). This is because they recovered "Pueblo articles"— including two reed arrows, a small turtle shell, and a "small rod made from a tree branch, scored its entire length with zigzag and cross channels"—from the upper fill, while on the exposed rock floor of the cave, they found two hardwood darts, three battered dart foreshafts, and two fragments of a grooved fending stick (1947:28). In Table Top Mountain Cave 7, they found "a plain brown sherd and a stub paho," and from Table Top Mountain Cave 8, they removed a broken reed arrow. The Table Top Mountain Caves are situated between Goat Basin Canyon and Sipe Canyon, "in a slightly location [sic] overlooking the San Francisco…900 feet [274 m] above the water…suitable only as camps for hunting parties" (1947:28). Figure 59b in the Cosgrove's report is a photo showing the view from the Table Top Mountain Caves looking south at the San Francisco Canyon. The reported materials suggest that some or all of these sites saw limited use as shrines.

Mule Creek Cave

For multiple reasons, Mule Creek Cave is probably the most important cave that the Cosgroves excavated in the Mimbres region, or at least, it represents their most successful data recovery. It yielded by far the largest archaeological assemblage that they recovered anywhere there, rivaled in their cave research only by Ceremonial Cave, the Jornada Mogollon shrine (with a significant Archaic component) that they had excavated earlier in the Hueco Mountains northeast of El Paso, and in the SW/NW overall by Walter Hough's work at Bear Creek Cave—although available information suggests that the mostly lost collections from Greenwood Cave and Cave 1 in Goat Basin were on a similar scale, as were probably also those from Doolittle Cave and Steamboat Cave.

Cosgrove's unpublished field notes from 1929 (*Mimbres Valley Expedition/Field Notes/Season 1929/Gila Valley and Duck Creek*) describe work at Mule Creek Cave from Sept. 17–21. Cosgrove's original plan map of Mule Creek Cave occurs on page 9 of the field notes, and the description of his actual work in the cave begins on page 10. It is not clear whether Hattie Cosgrove accompanied her husband to this remote and difficult-to-access site. Mr. Marion George does appear to have accompanied him and led his pack horses. C. B. Cosgrove and Marion George camped together near the Bradbury Ranch on the night of Sunday, September 15, 1929. Cosgrove's next entry, for September 16, reads simply "Packed horses and got in the vicinity of the cave down Mule Creek at 4 p.m. Made camp" (1929:10).

Cosgrove's remaining entries for the Mule Creek Cave fieldwork differ significantly from the published report and contain important details related to artifact provenience. His first note upon reaching the cave after a difficult cliff descent describes it as:

> …in a coarse conglomerate formation and the mouth is partially filled with material washed from above. As a result the water has seeped back through the refuse at the front and has rotted and destroyed large numbers of large bows and other wood objects. The cave has been terribly dug over by treasure and curio seekers. It is situated in a picturesque and very rough country, and there are no signs it was used as a domicile. It was, however, a very popular shrine, as there are hundreds of painted stub pahos and equal numbers of broken reed arrows that have been tramped on as they were spaded up by the vandals [10].

Cosgrove's notes over the several days of the excavations in Mule Creek Cave alternate between descriptions of the large amounts of objects he recovered—especially arrows, ceremonial (votive) bows, and a variety of *pahos*, some of them of uncommon types—and his discouragement over the damage already done to the cultural deposits by vandals, looters, and water damage. He encountered all the items mentioned above in the hundreds, and specifically notes that "There are no signs of permanent occupation of this place" (10). He also expresses doubt that any of the materials belong to the earlier "Basketmaker" phase, at least until the penultimate day of his work, when he found a mat with "two bear grass bags, a yucca sandal, and a part of a fur cloth blanket," which he suggests might be earlier than the other materials he had already recovered there. These items all came from a single pit feature near the mouth of the east tunnel, so it is entirely possible they predate us of the cave as a shrine (10–11).

Cosgrove is clear throughout his notes that Mule Creek Cave exhibited evidence only of ritual use: "From the immense amount of broken ceremonial objects still

remaining in the cave it must have been used as a shrine. There are no signs of permanent occupation of this place" (10). On Sept. 21, the final day of his excavations in Mule Creek Cave, Cosgrove uncovered a fully intact Mimbres Style II bowl (11) (Figure 5.14a). This is the only intact full-sized vessel reported from any of the caves in the Mimbres region (Hough recovered only miniature vessels from Bear Creek Cave), although it is likely that complete vessels were removed by early looters.

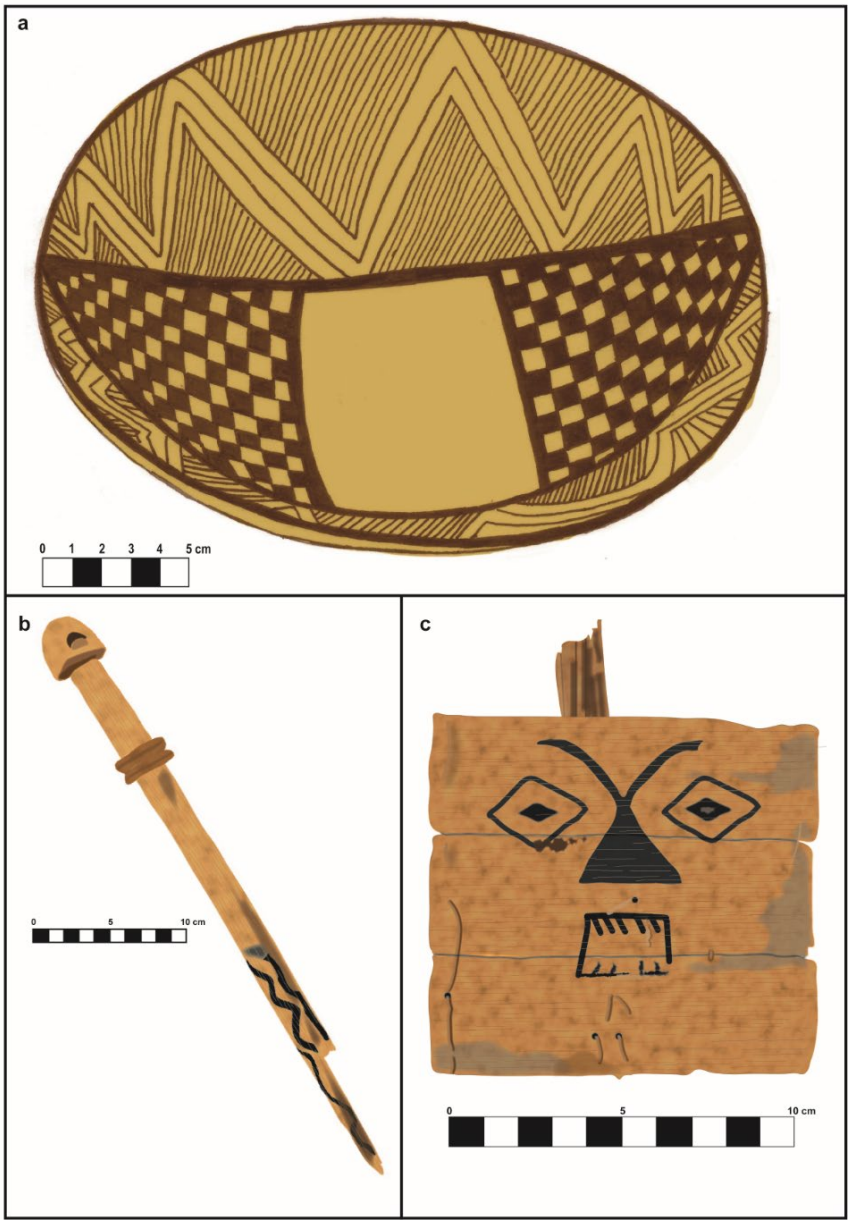


Figure 5.14. Artifacts from Mule Creek Cave: (a) Mimbres Style II "Brown-on-buff" bowl (no database #); (b) "roundel *paho*"; (c) *tablita* with *Katsina*-like face (drawings by Scott Nicolay).

Cosgrove's notes make clear that this bowl was also a rare example of what appears to be an obscure Brown-on-buff variant of Mimbres ceramics. Several other sherds and whole vessels of this type are known from the same area (Christopher Adams, personal communication 2022; Patricia Gilman, personal communication 2022). The yellowish slip of these bowls recalls that of the Jeddito Yellow Wares, the unique coal-fired ceramics produced on the Hopi mesas after ca. 1300 CE. This small cluster of buff or yellow Mimbres ceramics deserves closer study, as it suggests the possibility that one potter, or family of potters, briefly experimented with coal-firing over a century before this technology took hold in northern Arizona.

Figure 5.15. Unique anthropomorphic mat from Mule Creek Cave (photo courtesy of the Panhandle-Plains Historical Museum).

Almost 30 years before C. Burton Cosgrove excavated Mule Creek Cave, a local rancher named Henry Crain removed various items from the site, including a remarkable

anthropomorphic mat (Figure 5.15), which he donated to the Panhandle-Plains Historical Museum in Canyon, Texas in 1942 (Hughes 1956). According to Hughes, Mr. Crain, who had moved to Canyon by the time he donated the mat, found it:

> in a multiroomed cave about ½ mile above the mouth of Mule Creek, a tributary of the San Francisco River in the Mogollon Range of southwestern New Mexico, not far from Clifton, Arizona. He and several hunting companions removed the mat and other archaeological materials from the cave in 1899, when he was ranching in the Mogollon region. Other items included 2 small brown pottery bowls, 2 wooden bows 4 or 5 feet long, and a number of obsidian-tipped arrows. Smaller bows and poorly preserved arrows were left in the cave. Mr. Crain recalls that the cave was later investigated by someone from New Mexico College of Agriculture and Mechanical Arts at Las Cruces [Hughes 1956:412].

Brief as it is, Crain's description of the cave suffices to identify Mule Creek Cave as the find-site for this artifact.

Although the construction technique of this mat is not unusual, its design is unique in the SW/NW, and perhaps in all of North America. According to Hughes, this mat originally had a rectilinear head which has since been lost (1956). I suggested in a SAA 2008 paper that the missing square head suggested that this effigy was either a proto-*Katsina* ancestor figure or a representation of the goggle-eyed "Tlaloc" of the southern Mogollon region. A small square wooden object of *tablita* construction that was recovered from this same site by Cosgrove has exactly such a face painted on it, with the characteristic peg-toothed mouth of early *Katsina* iconography (Figure 5.14c). I will

discuss representations of this type and this object in particular in more detail in later chapters. Both early *Katsinam* and the goggle-eyed "Tlaloc" figure were often depicted with rectilinear heads in Jornada Style rock art and on Mimbres ceramics. Cosgrove also recovered another mat from the same cave of similar size and construction but of unremarkable morphology.

Five years after Crain's donation, in January 1946, the Texas Memorial Museum received from the estate of one George Doughty a large collection of artifacts looted from sites around New Mexico and Texas, including over 100 objects taken from Mule Creek Cave. All or most of the Mule Creek materials were transferred to the Texas Archaeological Research Laboratory in Austin in 1996.

After encountering the peculiar morphology of Bear Creek Cave during a visit to the site in 2006 (discussed in the following chapter), I reexamined the plan maps of other shrine caves of the Upper Gila drainage in early publications, primarily those of Hough and the Cosgroves. Mule Creek Cave leapt out due to its even more unusual morphology. Neither Bear Creek Cave nor Mule Creek Cave is a "true" karstic or solutional cave (i.e., a passage formed by the action of acidified groundwater in carbonate rocks such as limestone, gypsum, or marble). The geology of the Mimbres area is almost entirely volcanic, and Mule Creek Cave occupies a formation of compressed volcanic tuff (Cosgrove identifies it as "course conglomerate" [1947:29]). This material is relatively easy to carve and/or excavate with tools made from harder stone such as basalt (for instance, most of the famous *moai maea* of Easter Island were carved from similar material). The complex layout of this site resembles no other cave in the SW/NW in

either sedimentary karst or volcanic formations, suggesting that its speleogenesis might be at least partially anthropogenic.

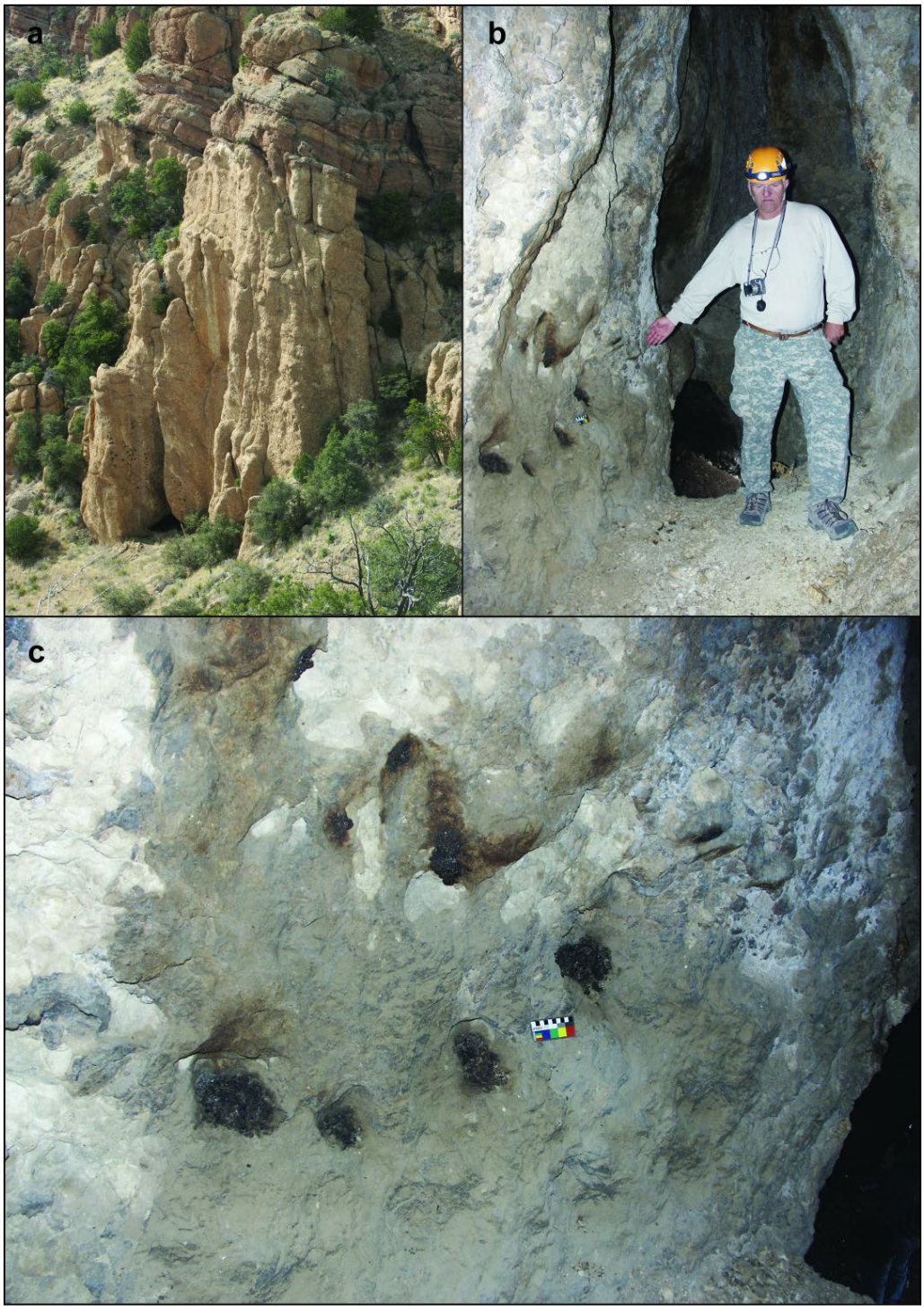


Figure 5.16. Mule Creek Cave: (a) entrance in a side canyon to Mule Creek Canyon; (b) caver Michael Bilbo in the pulpit above the main chamber of the cave, pointing to marks made by stone tools; (c) closeup of stone tool marks in second entrance (photos by Scott Nicolay).

In order to confirm or rule out this possibility, I organized a small expedition to Mule Creek Cave in 2008, including archaeologist Craig Williams, caver Richard Bohman, BLM cave specialist Michael Bilbo, and wildlife biologist David Winnet. An unexpected discovery was an upper passage entering the cave from the southeast and opening in a sort of pulpit several meters above the main entrance chamber. I observed distinct tool marks both inside this passage and on the cliff face around its entrance, suggesting that at least this portion of the cave was anthropogenically modified, if not entirely artificial (Figure 5.16a–c). Unfortunately, close examination of all the internal passages proved impossible during this visit due to active bat colonies, deep guano deposits, heavy patination of the walls, and time limitations. A few fragmentary artifacts remained in the cave at that time (Figure 5.17a–b).

No other cave shrines with comparably modified interiors have been documented in the SW/NW, although Indigenous groups throughout the region do continue to visit many cave shrines. Cushing notably confirmed the ritual nature of the assemblages recovered from caves in the Mogollon region because he recognized these materials as similar or even identical to offertory assemblages in actively used ceremonial caves he visited as an initiated member of the Zuni tribe (Cushing 1990:143–146).

Miller and colleagues (2023, 2024) recently attempted to date three *tablitas* from Mule Creek Cave. Those results are reported and discussed in later chapters.

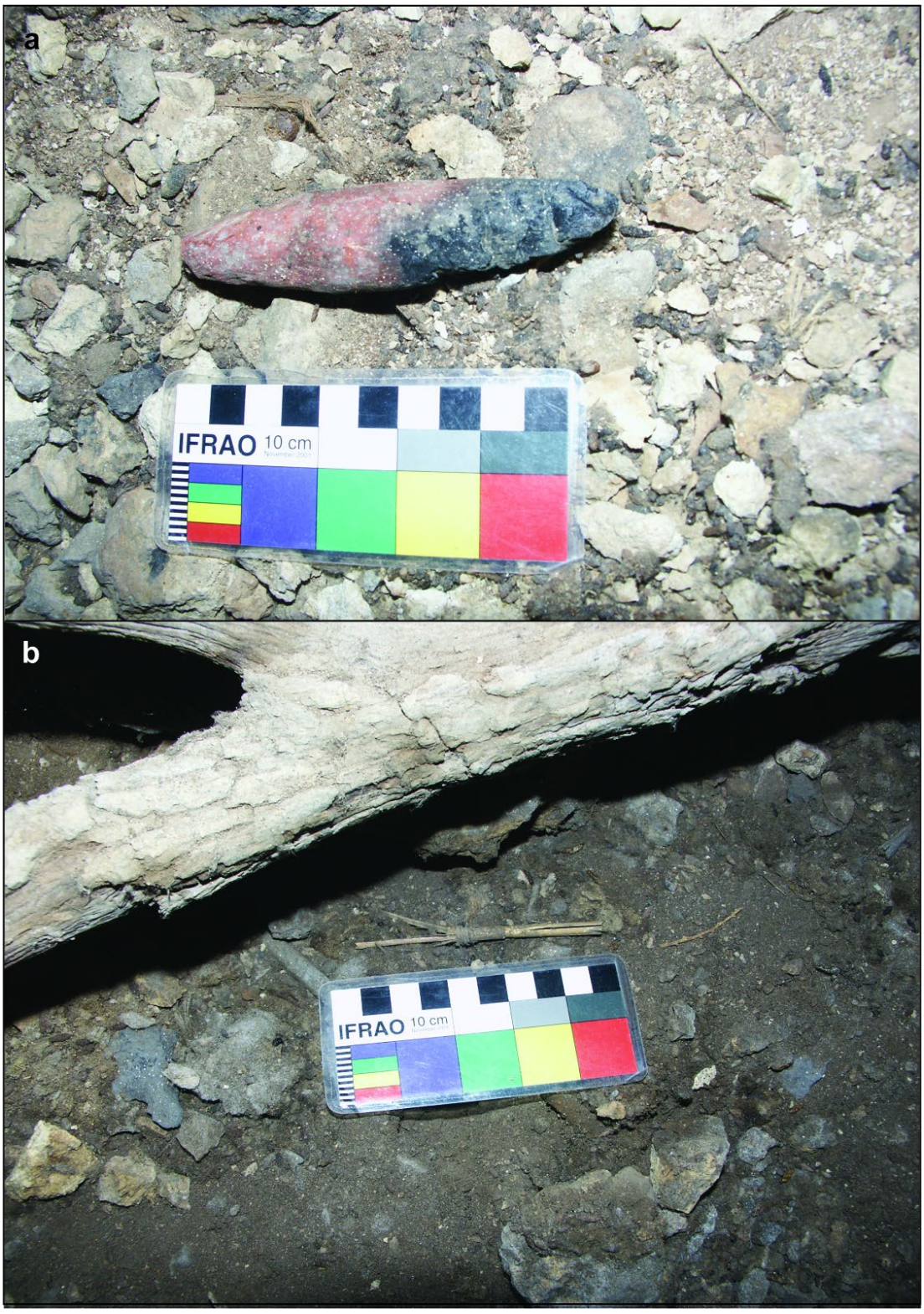


Figure 5.17. Fragmentary artifacts in Mule Creek Cave: (a) stub *paho*; (b) reed arrow (photos by Scott Nicolay).

Hough Site #3, "Cliff House & Cave"

This site appears to be the earliest cave shrine in the Primary Dataset to have actually been visited by an anthropologist. During the Wheeler survey of 1874, ethnologist Henry Wetherbee Henshaw and his assistant recorded only as "Mr. Howell" climbed up to a cliff dwelling they observed from the valley of the "Diamond River" (apparently an earlier name for the West Fork of the Gila River), approximately 13 km west of its confluence with the Middle Fork of the Gila, and thus only a few kilometers upstream from the Gila Cliff Dwellings. They did not discover the cave until they reached the cliff dwelling, some 9 m above the river. I include Henshaw's brief description of this cavern below in its entirety, as it probably represents the earliest scientific documentation of a cave shrine in the SW/NW, predating even the reports of Cushing and Bandelier:

> To the right of this structure, which had the appearance of having served as a permanent habitation, and perhaps 20 feet [6 m] above, was the entrance to a large open cavern, and on making our way up to this we found that the rock had been broken into the semblance of rude steps. The floor of the cavern was inclined at an angle of fifteen or twenty degrees, and covered to the depth of probably 2 feet [0.6 m] with the excrement of rats. Near the head we noticed a large pile of broken bows and arrows, upon which some heavy stones had been placed. An effort was made to dig through this in the expectation of finding skeletons, but, having only our hands and the small pieces of sticks composing the pile, we were

> compelled to desist without being able to satisfy ourselves whether the cave had been used as a burial place or not. The arrows were made of reeds, with sharpened points of hard wood inserted into the ends. The points, however, of a few were slotted and wound with sinews, showing that regular heads had been used, one of which, of obsidian, was found united to its shaft. It is safe to say that there were over a thousand arrows broken into fragments of various sizes. (Henshaw 1879:370–371)

An online search of artifacts at the Smithsonian collected by Henshaw did not reveal any bows and/or arrows, so it remains unclear whether he actually removed any artifacts from the cave. His description does not describe any collecting activities; rather, it suggests that he was only interested in human remains and associated grave goods.

Hough cites Henshaw but does not add any details to his description, and he does not mention any artifacts recovered from this site. He writes only: "To the right [of the cliff dwelling], 20 feet above, is an open cavern, access to which can be had by rude steps" (1907:30). Whether Hough visited this site himself is unclear. In addition to citing Henshaw, he also quotes a lengthy passage from Bandelier, who visited many cliff dwellings on the Diamond River/West Fork. Bandelier briefly mentions some ritual offerings from these sites:

> Among the many objects taken from these ruins, I mention particularly sandals made of strips of the yucca. It may be remembered that similar foot-gear was found at the Tzé-yi. I have been informed that the Tarahumares of Southwestern Chihuahua still wear the same kind of sandals. In addition, I saw many baskets or fragments of baskets; also

> prayer-plumes and plume-sticks. Such remains indicate that their makers were in no manner different from the Pueblo Indians in general culture [1892:362].

Bandelier is clearly not referring to the same site as Henshaw, as he immediately follows this passage with a reference to Henshaw's site, which he identifies as located "higher up the several branches through whose union the Gila River is formed" (1892:362). I note therefore that the sites in this area meet the criterion for shrine identification only collectively. I include this site not solely because the massive accumulation of broken arrows (and bows) described by Henshaw can only be the product of ritual deposition, but also in order to establish the parameters of Mimbres cave ritual, in space, time, and internal variations, and finally in order to establish whether these offerings derive from later populations (Tularosa and/or Salado). Finally, this site also offers an important comparison to a cave where Frank Hibben removed dozens of broken bows in the 1930s, which I will discuss at greater length in Chapter 7. According to Hibben, the "entire surface of the cave floor was littered with the remains of the shafts, foreshafts, and nocks of some four thousand compound arrows, broken without exception" (1938:36). At least one other Upper Gila arrow shrine cave with deposits of comparable size was looted in recent decades (Doug Achim, personal communication 2023).

Hough Site #32 "Cave Shrine"

Hough's description of this site is brief:

> In a cliff on the south bank of the San Francisco, about 1 mile below the Stockton ranch, there is a shallow two-story cave formed by erosion. The upper story of the cave contains a large quantity of broken and decayed arrows, bows, and other relics of ceremonial deposits, but the lower story is washed by the river during high water, and therefore contains no artifacts [1907:46].

According to Hough's map, this site is located a few kilometers east of the confluence of the San Francisco River and the Blue River, and only a few more kilometers west of Mule Creek Cave. Although little if any research has been conducted in this area since the Museum-Gates Expedition, Danson's regional survey (1957:27) suggests that this area was culturally affiliated with Mimbres populations.

Hough Site #35, Two Caves

The site that Hough identifies as Number 35 consist of several caves on the west side of the Blue river, opposite the J. S. Johnson ranch, and 5 mi [8 km] above his Site 34, which was a pueblo with (a number of rooms built around a court (1907:46–47). According to his description, only two of these caves exhibited evidence of prehistoric use. He describes these two briefly, with emphasis on the upper cave:

> The upper cave has a small, inconspicuous opening of circular shape looking out on a narrow ledge hundreds of feet in the air above the stream bed. The opening is just large enough for the passage of a person wriggling through, and the sides are worn smooth by the struggles of those who entered at former times. The cave consists of a number of low

> chambers extending 50 feet [15.24 m] into the rock. Beneath the rear chamber is a room which is ventilated by means of a chimney built on the floor of the upper chamber. The interior of the cave is blackened with smoke and the floor is strewn with large rocks, between which have been placed great numbers of bows, arrows, carved staffs, cigarettes of cane, and beads, such as are found in ceremonial caverns of this region.
>
> This cave was discovered two years ago by a prospector, and sub-sequently[*sic*] thoughtless persons took from it quantities of painted bows and arrows, which they abandoned on the ledge to be destroyed by the elements.
>
> Beneath the cave described is another, which was discovered by the Museum-Gates expedition of 1905. It consists of a single chamber piled almost roof high with red dust and the droppings of rodents. Many artificial objects of great interest were found in these caves." (1907:47–48)

Hough's description of the upper cave is of particular interest as it strongly suggests that this cave, although small, was deep and narrow enough that its interior constituted a true dark zone. Despite the presence of a "chimney" and the evidence of its repeated use, the dimensions of the cave and the materials Hough describes make it clear that the upper cave at least served exclusively as a ritual space. As he offers no description of the materials recovered from the lower cave, a similar determination cannot be made for that space.

According to Danson, who conducted the most extensive survey of the lower Blue River and lower San Francisco regions, the territory "Near Clifton, Arizona, where the

lower Blue River and the San Francisco join, the cultural remains were closely linked with those of the Mimbres Valley to the east" (1957:27). This would place the last two sites within a poorly understood western extension of the Mimbres region, along with Mule Creek Cave and possibly Bear Creek Cave, which is the subject of the next chapter. The latter remains the greatest enigma: it lacks Mimbres ceramics, but the available 14C dates fall during the Mimbres Classic. Unfortunately, Danson's survey was limited by vehicular access and included only the upper and lower portions of the Blue River, and ignored the middle Blue. To this day, no road passes through the middle Blue, and Swanson and I appear to be the only archaeologists to revisit Bear Creek Cave since the Museum-Gates Expedition in 1905. Sadly, neither this site nor any of the others in the region have escaped the predations of looters.

One of the greatest questions posed by the caves in this dataset is which groups used which caves. Given that the majority of the cave shrines appear to be in the Gila drainage (including its tributaries the San Francisco River and the Blue River), rather than the Mimbres Valley and its extended drainage, were the people of the Mimbres Valley (and perhaps even the eastern Mimbres area, east of the Black Range) visiting shrines located west of the Continental Divide? Or did cave ritual simply form a greater part of the ceremonial life of the Gila Mimbres people than it did for their relatives to the east? The western Pueblos (Hopi, Zuni, and Acoma) all have primary emergence shrines located in the west, so it is possible that sites in the Upper Gila have served populations in the Mimbres Valley as pilgrimage destinations. Geology alone cannot entirely explain the differential distribution of these cave shrines, although there are clearly more rockshelters in the rugged country and many canyons of the Upper Gila. The artificial

modifications to Mule Creek Cave also suggest that people were capable of expanding or perhaps even creating earth openings to serve cosmological purposes. If the cave shrines of the Gila drainage were used primarily or exclusively by the inhabitants of that region, then the intensification of cave ritual in prehistoric southwest New Mexico and adjacent regions was potentially an even more spatially and temporally localized phenomenon than previously considered, although the use of cave shrines obviously has considerable antiquity in the SW/NW overall, as established in previous chapters.

The dataset presented here reveals several distinctive patterns. Every one of these caves contained arrows, sometimes numbering in the hundreds or even thousands, while slightly over half of the sites also yielded bows, either full-sized or miniature. The majority of the arrows, to the extent that this data is available, bore only sharpened wood foreshafts rather than stone points. Stone points did not replace sharpened wood foreshafts until at least a century after the end of the Mimbres Classic, around the same time that sinew-backed bows replaced the earlier form. No bows of that type have been reported from any Mimbres caves. Well over half of the cave contained *pahos* of some type, and both *tablitas* and cane cigarettes exhibit a similar distribution, with these three obviously ritual artifact classes displaying presence/absence in almost the same set of caves, with the noted exception of the Goat Basin caves. In contrast to the extensive presence of arrows, only seven of the caves contained darts. This is significant, as 14C dates from both Ceremonial Cave and *wahaniak shukuk shtuitauw* show significant use of darts as offerings in cave/Earth opening shrines well over 4,000 years BP (Geib et al. 2017; Miller et al. 2023, 2024).

Researchers reported human remains from only four of the caves in this dataset, and these burials were primarily infants. Notably, the Doolittle Cave complex contained almost every type of artifact associated with ritual use and was one of only three sites in the sample with associated rock art. The presence in this site of darts, the fragments of an infant's femur, and rock art, despite the fact that the Cosgroves report it had been heavily "churned" (1947:7), suggests that it was one of the oldest cave shrines in the Mimbres region. Margaret Berrier identified the rock art at the Doolittle Cave complex as dating to the Archaic (personal communication 2019). This site also contained the largest number of sandals from any of the caves in the dataset (39 Type 9 sandals), which together with the rock art and the possibility that it served as a *Chicomoztoc*-type emergence site (as discussed in Chapter 4), suggests a similarity to certain caves in the neighboring Jornada region. Three of the caves in the dataset have morphologies that support identification as *Chicomoztoc* shrines, but Mule Creek Cave and Bear Creek Cave represent one morphological cluster (multiroom cave), while the Doolittle Cave complex groups with Ceremonial Cave and Picture Cave in the Jornada Mogollon region (multiple openings in a single scarp). I will examine this possible phenomenon further in the following chapters.

Chapter 6: Bear Creek Cave, Walter Hough's "Great Sacred Cave in Eastern Arizona"

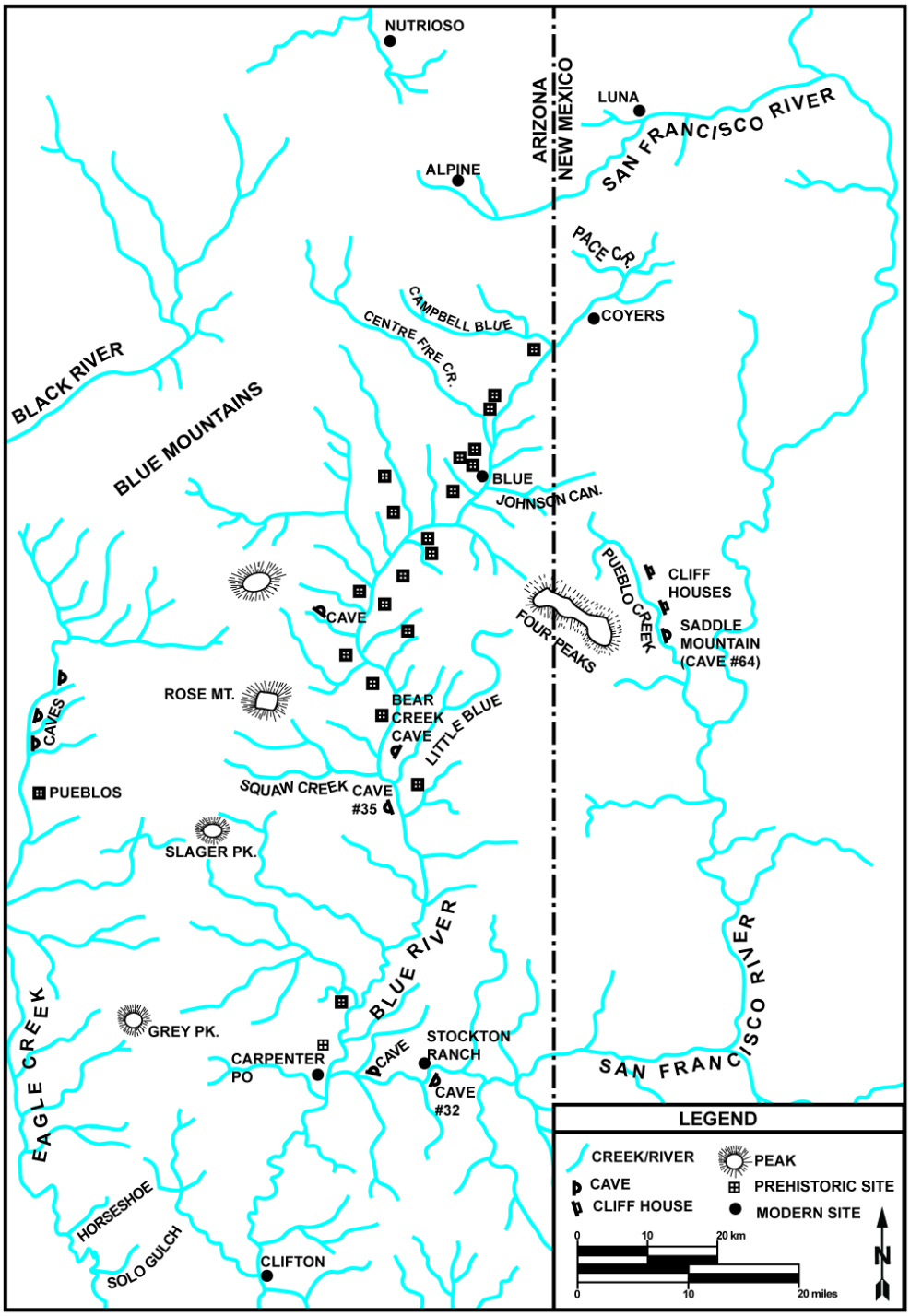


Figure 6.1. Map of the Blue River drainage, showing caves (after Hough 1907:Figure 9).

Archaeologist Walter Hough spent 10 days in 1905 excavating a remarkable cave shrine in a side canyon of the Blue River in eastern Arizona. Of the many sites that Hough visited during this expedition, none impressed him more profoundly than Bear Creek Cave. Hough felt that he had arrived "not a moment too soon," as vandals and looters had begun destroying and removing artifacts from the site over a decade earlier. This chapter synthesizes Hough's published data together with new information from more recent site visits, unpublished material from Hough's archival papers, and other comparative data that suggests at least some of the people who used the site came from Mimbres populations in the Blue River, the York-Duncan Valley, and possibly the Upper Gila. Much of the information contained herein derives from a presentation I gave at the 2022 Mogollon Conference in Tucson, Arizona, and the expanded version of that paper that subsequently appeared in the proceedings volume of that conference (Nicolay 2023:77–94.

Bear Creek Cave is a deep rockshelter/shallow cave in southeastern Arizona, located just over the border from New Mexico in a short but deep and narrow side canyon of the Blue River (Figure 6.1). The Blue River runs from just south of Alpine to just south of Clifton, where it then joins the Gila River. The San Francisco River feeds into the Blue about two thirds of the way down its length. The area roughly between this confluence and that with Bear Creek is the Middle Blue River, which remains the most remote and inaccessible portion of the Blue. This portion of the Blue River drainage is managed by the USFS as part of the combined Apache-Sitgreaves National Forests and includes the Blue Range Primitive Area, which is off-limits to vehicular traffic.

Bear Creek Cave is one of approximately two dozen caves and/or rockshelters in the Upper Gila drainage recorded by Hough (1907, 1914, 1915) and the Cosgroves (1947) that exhibit clear evidence of having served prehistoric populations primarily or even exclusively as shrines (cf. Table 5.1). However, even among this large sample, Bear Creek Cave stands out as remarkable in several ways. Hough described it as "the greatest of all known sacrificial caves in the Southwest" (1907:52), and Hough was uniquely qualified to make this statement, having excavated several such sites. Despite more than a decade of commercial looting and wanton destruction of artifacts prior to his work there, he still encountered deposits of widely varied offerings averaging 2 ft (0.6 m) in depth (Hough 1907:51).

Hough reported that Bear Creek Cave contained no hearths, and nothing in the assemblage he recovered suggests domestic use of the site. The cave's archaeological record also lacks any elements that might point to use during the Archaic or at any time prior to the Late Pithouse period, such as human remains, rock art, atlatls, darts, or fending sticks (all of which are components of earlier assemblages in the neighboring Jornada Mogollon and Trans Pecos regions, where the ritual use of caves probably dates back at least four millennia [Dial and Creel 2001; Miller et al. 2023:5; Miller et al. 2024:Table 1; Nicolay and Beresh 2023]). The absence of such elements makes the enormous artifact assemblage recovered from Bear Creek Cave even more extraordinary in comparison to other major earth opening shrines in the SW/NW, especially Ceremonial Cave (Cosgrove 1947:33–39; Creel 1997) and *wahaniak shukuk shtuitauw* (Geib et al. 2017; Parsons 1918; Sandberg 1950). In all these sites, offerings were left for several thousand years and display a distinct emphasis on hunting ritual (Nicolay

2023:77). The implication of Bear Creek Cave's material record is that the deposition of offerings there entirely postdates the regional transition to the bow and arrow.

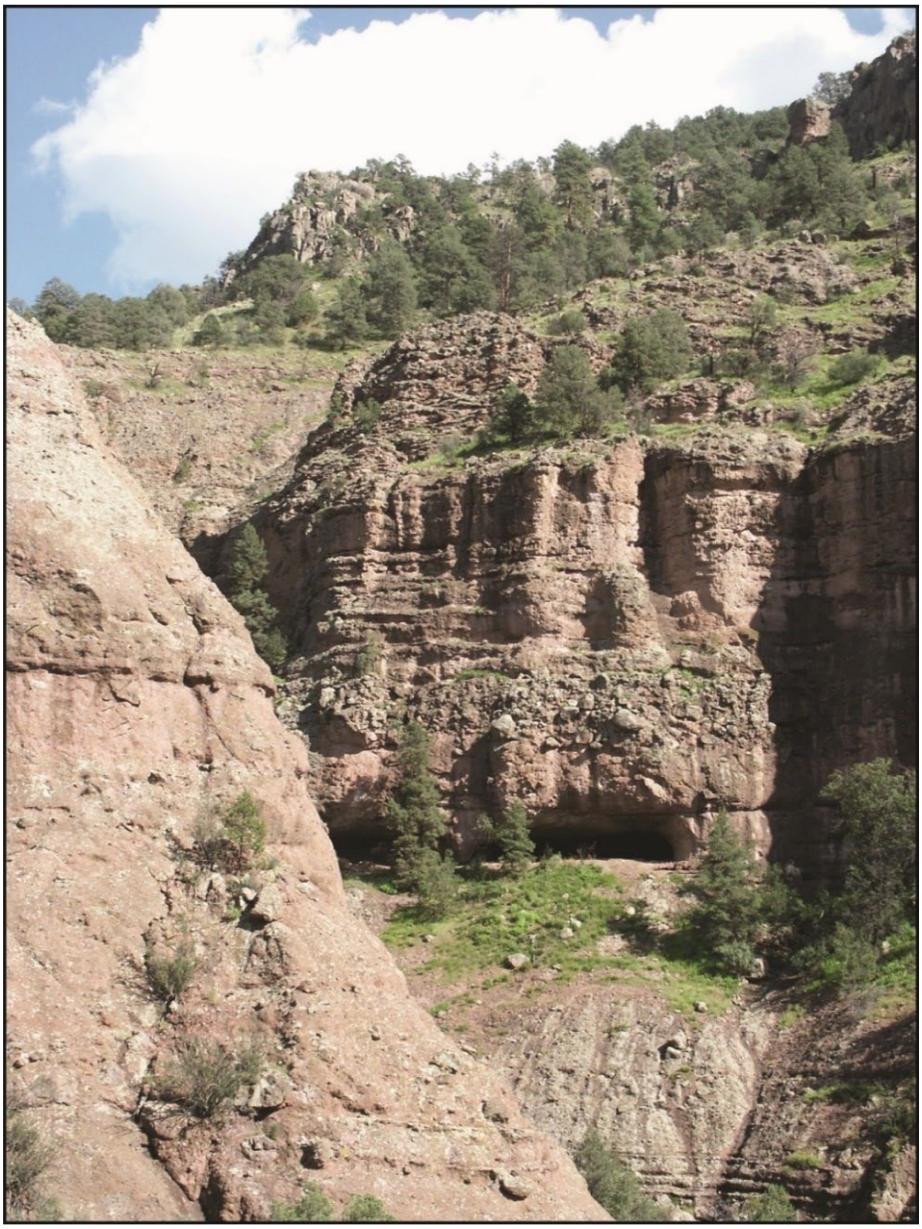


Figure 6.2. Entrance to Bear Creek Cave (photo by Scott Nicolay).

The site itself is a deep rockshelter of somewhat unusual morphology high up the south wall of Bear Creek Canyon approximately 2 km from where it feeds into the Blue

River (Figure 6.2). Bear Creek Cave is not a solutional cave in carbonate rock, but a large cavity in brecciated tuff formed by the turbulent action of the creek at a time when its bed was much higher. This process gave the cave's interior a distinctive morphology defined by the appearance of multiple and discrete domed rooms (Figure 6.3a). Although Bear Creek Cave lacks a true dark zone, its depth and northwest-facing orientation mean that its most remote portions possess areas of deep twilight, dark enough to accommodate a seasonal, possibly permanent colony of Townsend's big-eared bats (*Corynorhinus townsendii*). Several small seeps in the back of the cave probably added to its ceremonial significance, given the widespread sacrality of water among agricultural societies in the SW/NW.

The cultural features of Bear Creek Cave are even more remarkable than its unusual natural aspects. Altogether, this evidence fully supports the devotion of an entire chapter to this site, even if its full affiliation with the Mimbres region remains unclear, and was probably limited to one component of a period of activity that likely continued well past the end of the Mimbres Classic. Over a century after Walter Hough's work at Bear Creek Cave and his subsequent publications, his estimation of this site as preeminent among cave shrines in the SW/NW remains valid.

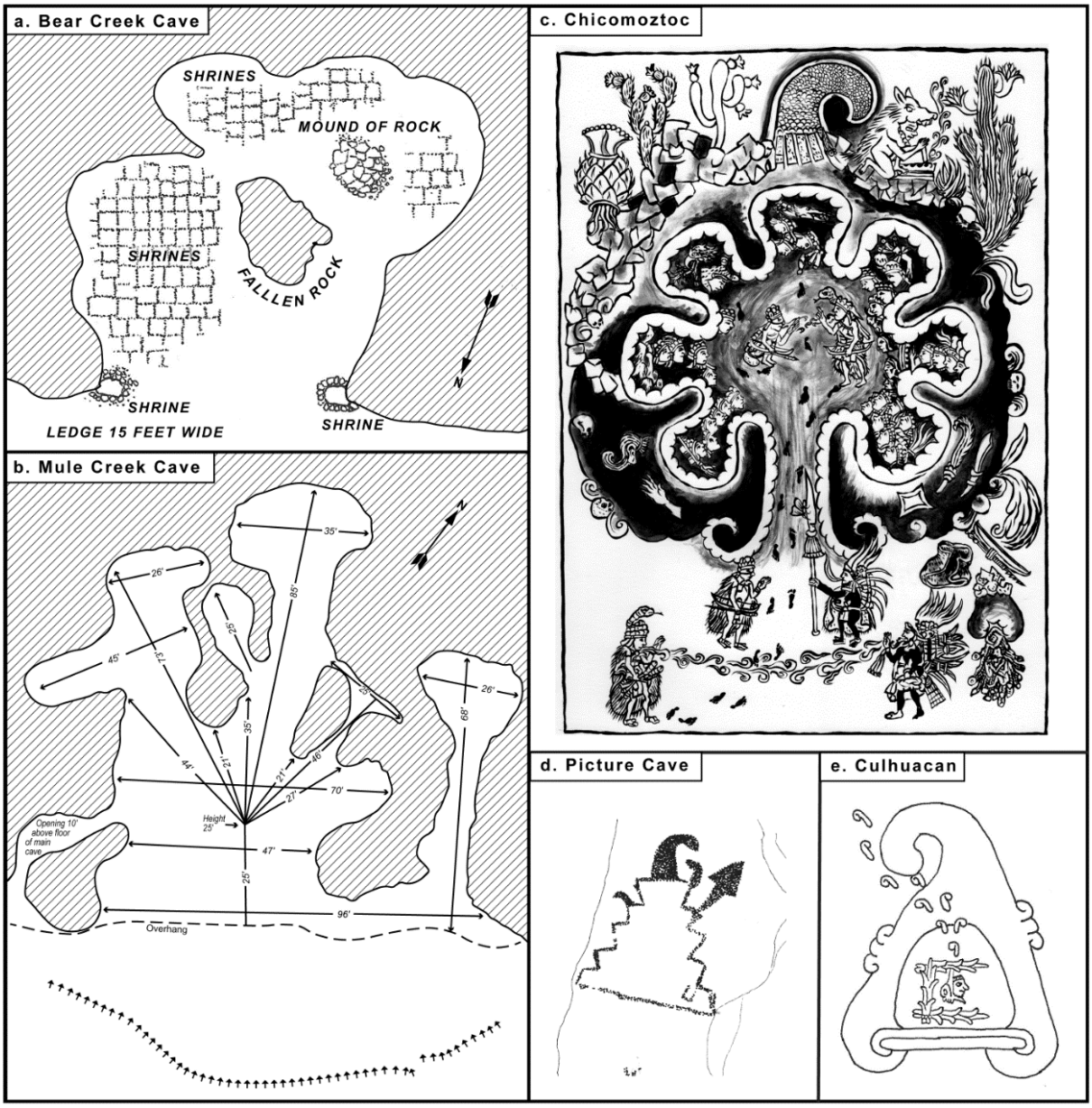


Figure 6.3. (a) Plan map of Bear Creek Cave (after Hough 1907:Figure 17); (b) plan map of Mule Creek Cave (after Cosgrove 1947:Figure 15); (c) Chicomoztoc (after the Historia Tolteca-Chichimeca, Kirchhoff et al. 1976; drawing by Nickolas Gucker); (d) possible Culhuacan pictograph from Picture Cave in west Texas (drawing by Margaret Berrier); (e) Culhuacan, from page 1 of the sixteenth-century Codex Boturini (drawing by Margaret Berrier).

The 1905 Museum-Gates Expedition

The Second Museum-Gates Expedition, led by Smithsonian archaeologist Walter Hough, spent over a week in 1905 excavating Bear Creek Cave (Hough 1907:50–52). The results of this expedition are reported in two bulletins of the Smithsonian Institution (Hough 1907, 1914). Other unpublished documents in the Manuscript and Pamphlet File of the National Museum of Natural History contain additional details of investigations at this cave (Hough 1905, 1906, 1915). Hough's work at Bear Creek Cave came approximately 15 years after its modern rediscovery, ca. 1890, by "Henry Jones, a rancher on the Blue" (Hough 1905:1; Nicolay 2023:81–82).

After the Second Museum-Gates Expedition, Bear Creek Cave does not appear to have received attention from archaeologists for nearly a century, although looting clearly continued. Edward B. Danson's survey of the Blue River, conducted between 1947–1949 as the basis of his dissertation research, was largely constrained by vehicular access and stopped short of the Middle Blue and Bear Creek Cave (Danson 1957; Christopher Adams, personal communication 2021). Danson assigned the southern Blue to the Mimbres Mogollon and the northern Blue to what he termed the "Alpine" phase, a peripheral branch of the Reserve phase. It was not until almost a century after Hough's work that members of the Blue River Archaeological Project under Steve Swanson visited the site on June 8, 2002 (Swanson 2002) (Figure 6.4). By this time the cave had suffered decades of additional looting, and Swanson reported that looters had even brought logs into the cave to lever up breakdown boulders so that they could dig beneath them (Figure 6.5a; Steve Swanson, personal communication 2005). Nonetheless, his team

was able to recover approximately 100 fragmentary artifacts from the site, primarily cordage (Steve Swanson, personal communication 2005), but also groundstone, a category that Hough did not report (Nicolay 2023:81–82).

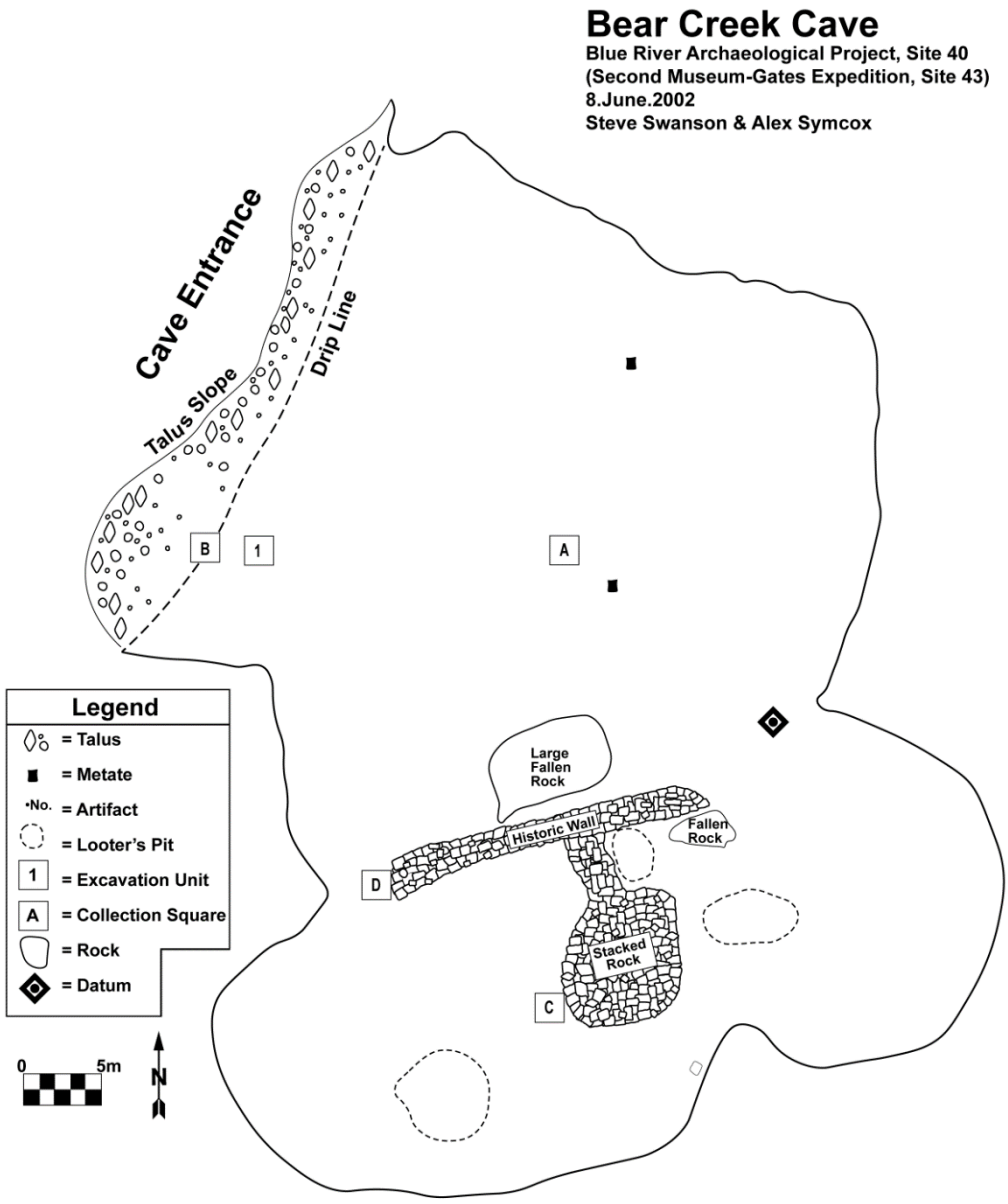


Figure 6.4. Plan map of Bear Creek Cave (after Swanson and Symcox, 2002, courtesy of Steve Swanson).

In 2006, the author visited Bear Creek Cave with two Arizona cavers, Richard Bohman and Anel Avila, in order to conduct a noninvasive archaeological reconnaissance. At that time, the final report from the Blue River Archaeological Project had not yet been published, and when it was, it primarily addressed research questions related to prehistoric land use and environmental impact, rather than cultural affiliations or aspects of cave ritual. Evidence of looting was apparent throughout the site, and in the entrance area, a looter's pit was visible in which a homemade wire mesh screen was buried a few centimeters deep, with one corner protruding through the surface (Figure 6.5b).

Although the outline of the cave as Hough depicted it remained clearly recognizable, the interior features of his map, with the exception of the circular shrine at the eastern corner of the entrance, were no longer visible. The elaborate grid of rectangular shrine structures documented by Hough in the interior (Figure 6.3a) had been completely obliterated, although many of the pebbles that cover the floor of the cave probably once provided the matrix of this feature. Interestingly, these pebbles appear not to be spall, but rather rounded river cobbles, most likely from the Blue River, approximately 2 km away (Figure 6.6a). Waterworn cobbles have been reported as components of ritual cave assemblages in both the SW/NW and Mesoamerica (Devereux 1966; Mirro 2002).

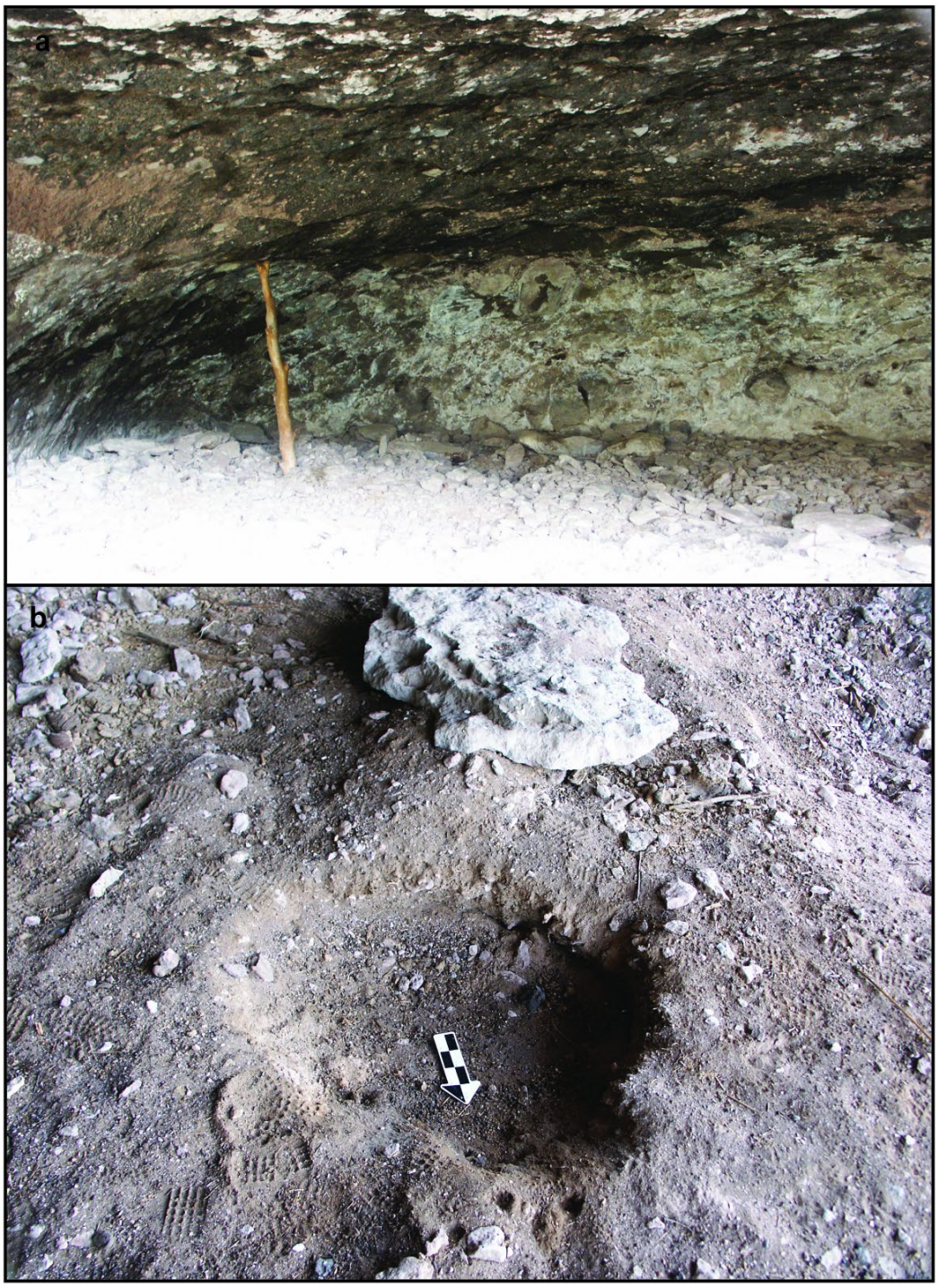


Figure 6.5. Evidence of looting in Bear Creek Cave: (a) “kleptoport” log in Bear Creek Cave, used by looters to lever up breakdown boulders in order to dig beneath them; (b) looter’s pit near the entrance of Bear Creek Cave with buried homemade screen (photos by Scott Nicolay.)

The obliteration of these rectangular shrines is most unfortunate, as no similar features have been documented in any of the dozens of prehistoric cave shrines known in the SW/NW, or in any other region. Bear Creek Cave appears to have been unique in this regard. The layout of these shrines resembles a Puebloan waffle garden in both form and scale (Laurie Webster, personal communication 2006), as well as the Safford Valley Grids, and given the important links between cave ritual and agricultural fertility (Nicolay 2012; Schaafsma and Taube 2006), this resemblance might be deliberate. The text of Hough's 1915 address supports this conclusion:

> the cliffs on the north side of the canyon . . . reflect when the sun is high a chastened light into the main cave. By this illumination it was discovered that the greater portion of the cave floor, which consists of small pebbles, was covered with small pits close together, giving it the appearance of a plot laid out in squares. Here was the secret of the cave, the pits were offering places of the ancient worshippers and remained as they had been formed in the gravel centuries before [Hough 1915:8].

The same document also reveals another important feature of the rectangular shrines not noted in either of the published volumes. According to Hough, contiguous "pit-shrines" contained significantly different assemblages:

> In one pit would be small painted baskets strung on smooth dressed rods, miniature bows and arrows, torch bundles, ceremonial flutes, gaming reeds, joints of reed with strings of shell beads encircling them, twigs with shining black bark bearing cotton cords to which feathers had been tied, incense tubes tied with red, brown, white or blue cords dyed with native dyes and many other attractive

> objects whose discovery was heralded with freshened enthusiasm. In a neighboring shrine perhaps miniature pottery vessels of fine workmanship would take the place of baskets; there would come forth models of women's dresses of gayly dyed cords, bits of cloth whose ornamentation resembles drawnwork, painted strips of thin wood fashioned to represent the rhombus, feathers, birds, frog spawn, eggs and so on [Hough 1915:12–13].

This remarkable detail suggests that different rectilinear pit-shrines each probably served different families, clans, or communities, or that they were used for different ceremonial events, or during different periods of activity in the cave. Alas, it remains unlikely that we will ever be able to do more than speculate as to the nature of their distinctions, as Hough does not appear to have recorded any information regarding the spatial distribution of artifacts in the pit-shrines. He does at least offer a few other intriguing details about the location of artifacts and artifact categories elsewhere in the cave. Based on information from Henry Jones, who saw the cave in its undisturbed state, Hough wrote that "bright painted bows, arrows, staffs, and rods" were "placed upright against the back wall" (1915:6). This observation is consistent with other reports of intact cave shrines, especially Greenwood Cave (Cosgrove 1947:9) and the Saddle Mountain Cliff Ruin (Hough 1907:57), and provides us with important information about the original spatial distribution and provenience of artifact classes within the Bear Creek Cave assemblage. It also suggests some divisions both between offerings related to agricultural fertility and those related to hunting and/or warfare, an arrangement documented in Feather Cave (Ellis and Hammack 1968), and/or a distinction between ritual offerings and ceremonial objects discarded at the completion of their use-lives. As limited as this information is

about the original spatial distribution of materials in Bear Creek Cave, it is more than is available for most cave shrines in the SW/NW.

Hough also describes two circular shrines on either side of the cave entrance that contained "myriads of small reed tubes filled with incense which have been loosely called cigarettes" (1915:6). Cane cigarettes, or tubes, have been documented from many cave shrines in the SW/NW. Ferg and Mead present an excellent overview of this topic in their report on Red Cave, a Hohokam or San Simon Mogollon shrine in southeast Arizona (1993:22–28). Hough speculates that cane cigarettes were left as initial offerings by "the suppliant" prior to entering the cave (1915:6). The remains of the circular shrine in the eastern corner of the entrance are still visible, but its twin to the west has been entirely obliterated. Possibly these circular shrines at the cave's entrance also functioned as symbolic caves or cave rooms, effectively adding two additional "rooms" to the five natural internal domes and creating a seven-roomed cave, reflecting a cosmological model known as the *Chicomoztoc* ("seven caves" or "seven-roomed cave"), the Mesoamerican version of the Southwestern *sipapu* (Aguilar et al. 2005; Heyden 1975 (Figure 6.3c).

What makes this argument more compelling is that nearby Mule Creek Cave, on the New Mexico side of the San Francisco drainage, appears to have been deliberately tunneled out to create seven internal chambers (Figure 6.3b). Further evidence for the possible existence of this concept in the SW/NW comes from Picture Cave, in the neighboring Jornada Mogollon region, which contains several pictographs (Figure 4.3a–b, d, Figure 6.3d) that appear to depict *Culhuacan*, the "bent mountain" (Figure 6.3e), a mythical location closely associated with the *Chicomoztoc* in Nahua emergence

narratives (Figure 6.3c). The combined evidence from the Mimbres and Jornada Mogollon regions suggest that certain caves held special importance because they possessed either multiple internal chambers (Bear Creek Cave and Mule Creek Cave in the Upper Gila) or multiple openings in a single cliff face (Doolittle Cave in the lower Mimbres Valley, Feather Cave, Ceremonial Cave and Picture Cave in the Hueco Mountains; Nicolay and Beresh 2023). Tate has further suggested that prehistoric peoples of the Trans Pecos cultural area southeast of the Jornada region also recognized some of the large and heavily decorated rockshelters there as manifestations of *Chicomoztoc* (Tate 2022:75–111). The resemblance of Bear Creek Cave to the image of Chicomoztoc as depicted in the *Historia Tolteca-Chichimeca* (Kirchhoff et al. 1976; Figure 6.3c) was striking during the author's 2006 visit and enhanced by the "curves which merge into the ceiling and have the appearance of massive groining" (Hough 1907:51), giving the cave's interior the appearance of a natural cathedral with separate domed rooms.

Although Bear Creek Cave has no true dark zone, faint light being visible in all areas of the cave during the day, the cave is at least deep enough in its southeasternmost room to host a colony of bats—specifically, Townsend's big-eared bat (*Corynorhinus townsendii*; Figure 6.6b). A heavy scatter of moth wings, primarily from large underwing moths (*Catacola* sp.) in the northwesternmost room suggests that the bats roost in other areas of the cave as well, at least while feeding at night.

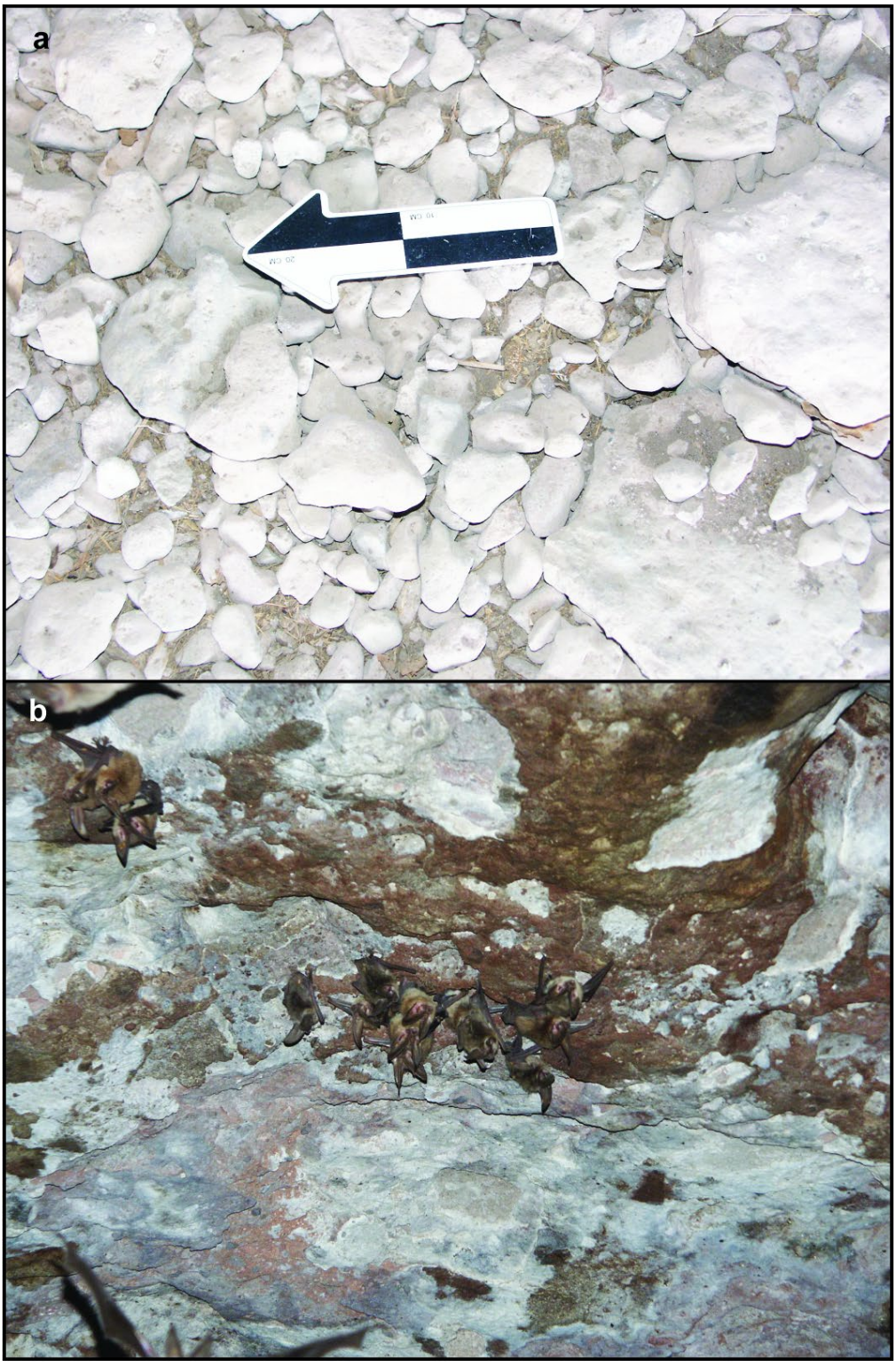


Figure 6.6. Interior features of Bear Creek Cave: (a) river cobbles from the Blue River in Bear Creek Cave; (b) colony of Townsend's big-eared bats (*Corynorhinus townsendii*) in the far southeast room of Bear Creek Cave (photos by Scott Nicolay).

Several of the more realistically-portrayed bats depicted on Mimbres Classic B/w Style III bowls display similar long, rabbit-like ears; however, these images lack the uropatagium, the section of webbing that connects the legs and the tail on this species. This absence suggests that the bats depicted on Mimbres ceramics are instead Mexican free-tailed bats (*Tadarida brasiliensis*), one of the most common species in the region. This species is the only one in the southern SW/NW without the uropatagium, and although the ears of these bats are not as prodigious as those of the Townsend's big-eared bat, they are still long. It is quite likely the Mimbres did not distinguish between these species in their emic taxonomy and combined details of two or more bat species. Although the presence of these bats supports a possible Mimbres connection with Bear Creek Cave, as it was certainly a location where ancient peoples could have observed living bats at arms-length, I have observed both species in other cave shrines in the region.

Hough speculated that Bear Creek Cave was a "ceremonial center which drew worshipers from pueblos throughout a large region" (1907:52), and the immense volume of the materials that his excavations recovered supports this conclusion. Unfortunately, the large and diverse assemblage that Hough collected has received only limited attention in the almost 120 years since the 1905 Second Museum-Gates Expedition, and the unique nature of many of the artifacts in this overall assemblage makes determining the site's cultural and temporal associations difficult. Although Bear Creek Cave contained all the typical markers of a Mogollon cave shrine assemblage, including *tablitas*, *pahos*, cane cigarettes, roundel staffs, bows and arrows, and sandals, other items, particularly

miniature “votive” ceramics, are known primarily from other categories of offertory sites, such as springs (Hough 1914:117–120), rather than from cave shrines. Additionally, some objects that Hough reported were entirely unique to this site, such as miniature baskets pierced by prayer sticks (1917:Plate 24, 123–125), components of a “basketry mannequin” (1917:Plate 14, 63), and “flute pahos” decorated with basketry (1917:125–126). Hough did not report any diagnostic pottery from the site.

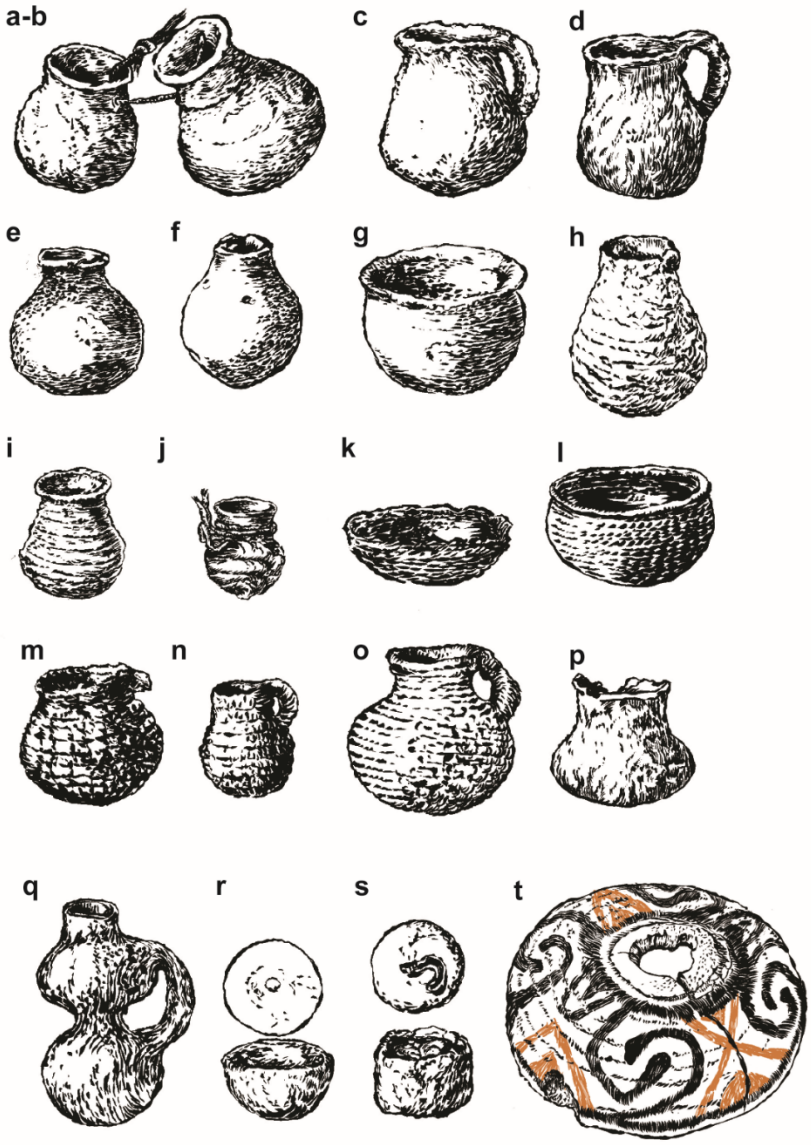


Figure 6.7. Ceramics from Bear Creek Cave, as reported by Walter Hough (1914): (a–d) miniature/votive ceramics from Bear Creek Cave (after Hough 1914:Figures 303–305); (e–g) miniature/votive ceramics from Bear Creek Cave (after Hough 1914:Figures 306-308); (h) mini miniature/votive ceramic vessel from Bear Creek Cave (after Hough 1914:Figure 286); (i–j) miniature/votive ceramics from Bear Creek Cave, (after Hough 1914:Figures 297–298); (k–l) miniature/votive ceramics from Bear Creek Cave (after Hough 1914:Figures 309–310); (m–p) miniature/votive ceramics from Bear Creek Cave (after Hough 1914:Figures 299–302); (q–s) miniature/votive ceramics from Bear Creek Cave (after Hough 1914:Figures 311–313); (t) miniature/votive ceramic vessel from Bear Creek Cave (after Hough 1914:Figure 315a) (all drawings by Nickolas Gucker).

Since 2003, Kelley Hays-Gilpin, Edward Jolie, and Laurie Webster have all examined the Bear Creek Cave collections (several times in Webster's case, most recently in 2017). Their original consensus was that that all or most of the materials postdate the Mimbres Classic phase (ca. AD 1000–1130) by a century or more and show a more northern cultural affiliation (Webster 2007:316–317, n8; Laurie Webster, personal communication 2006; Edward Jolie, personal communication 2021). However, this conclusion could have been affected by the fact that perishable artifacts near the bottom of Hough's excavations had deteriorated and portable artifacts positioned along the walls of the cave—such as ceramics, painted figures, and full-size bows and arrows—had probably already been looted by the time of the Second Museum-Gates Expedition (Hough 1905:1, 1907:51; Nicolay 2023:86–87).

The problem of determining the cultural affiliation of this site is compounded by the general lack of diagnostic ceramics reported from the site. Hough reported only miniature, votive ceramics from Bear Creek Cave, and these were almost entirely unpainted (1917:118–121) (Figure 6.7a–q). Although some of these appear to represent miniatures of full-sized utilitarian wares, others were unusual, including vessels pierced with a basal hole and strung on cordage (Figure 6.7r–s), and a miniature double-globed jar with a stirrup spout (Figure 6.7q).

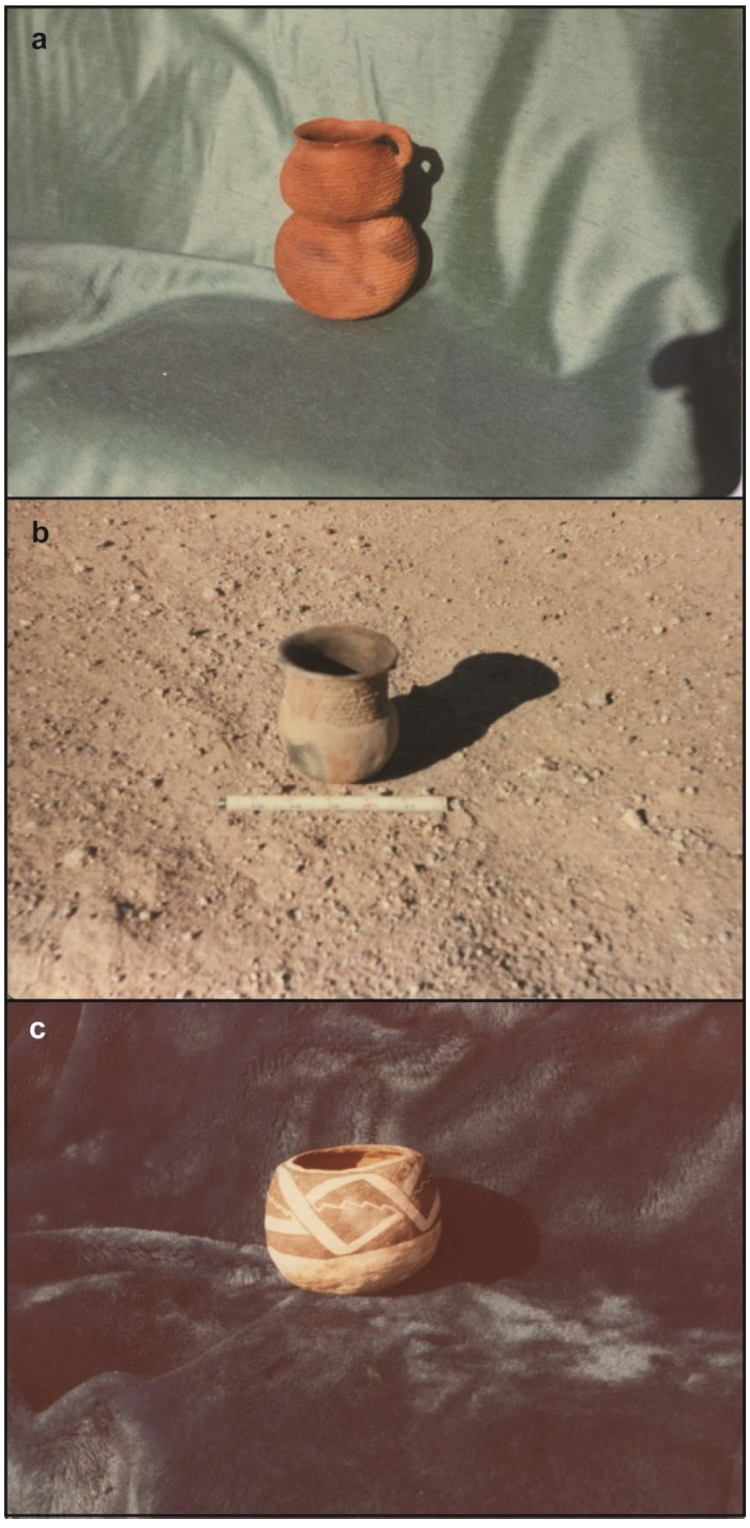


Figure 6.8. Votive/miniature vessels from the York-Duncan Valley, including a double-globed and handled vessel (a) similar to the one Hough reported from Bear Creek Cave (photos courtesy of Mary Whisenhunt).

Dixon reports that double-globed vessels (with both globes of similar size) first appear in the Black River Mogollon region ca. AD 400–600 (Dixon 1956:106). However, these examples apparently lacked the stirrup spout, which Dixon (1956:129) reports as first appearing in both the San Juan and Mimbres regions as early as AD 500. None of the specimens he describes combine the double-globed body with the stirrup spout. Recently however, Whisenhunt reported a double-globed vessel almost identical in form to the one from Hough's collection (Figure 6.8a). This specimen came from a looter's collection that originated in the York-Duncan Valley, a Mimbres periphery located just south of the Blue River (Mary Whisenhunt, personal communication 2023). Other miniature vessels similar to those from Bear Creek Cave came from the same subregion (Figure 6.8b–c).

The few painted polychrome ceramics that Hough depicted were anomalous, even aberrant (1917:122). At least one of these appears to have been intended as a ceramic effigy of the miniature baskets that Hough also recovered from this site (Edward Jolie, personal communication 2022; Figure 6.7t). Both the miniature basket *pahos* and the miniature painted ceramics were manufactured with holes in their bases, probably for inserting a prayer stick. These unusual specimens possibly represent offerings by pilgrims from scattered populations returning to leave offerings in an ancestral site several generations later, a well-documented practice at other sites of comparable antiquity in the SW/NW even today. However, Webster reports sherds of several northern ceramic types from Bear Creek Cave (based on analysis by Hays-Gilpin), including Tularosa B/w, Snowflake B/w, St. Johns B/r, St. Johns Polychrome, and Kwakina Polychrome, but no Mimbres Classic B/w (2007:316n8). She also points out that the site exists at the

collective boundaries of the Mimbres, Black River, and Reserve branches of the Mogollon, and that it could have been used by all three of these groups either simultaneously or in succession (Webster 2007:316n1). If so, this would enhance our understanding of Bear Creek Cave's prehistoric importance, as little evidence exists for any of the other dozens of cave shrines in the SW/NW being used by multiple groups. The major documented exception is *wahaniak shukuk shtuitauw*, which historically served visitors from Laguna, Acoma, and Zuni (Parsons 1918:381).

Fortunately, Jolie obtained several dates from Bear Creek Cave basketry for his 2018 University of New Mexico dissertation, and these include a direct AMS date on one of the Bear Creek Cave basket *pahos* that Hough collected, which yielded a calibrated age of AD 898–1154 (2018:Table 5.3). Jolie has since received two more AMS date results on two other baskets from the same assemblage (including a date on a second basket *paho*). Although these latter two determinations remain unpublished, when taken as a unit they yielded calibrated age ranges statistically indistinguishable from the published date, and they derived from stylistically diverse basketry, an important detail (Edward Jolie, personal communication 2022). These dates give more weight to the proposition that at least some of the offerings in Bear Creek Cave date to the Mimbres Classic or slightly earlier. Notably, the passage quoted above from Hough's 1915 paper reveals that the miniature basketry *pahos* and the related ceramic effigies were deposited in separate rectangles of the cave's internal grid, and in association with different assemblages, which implies the possibility that at least some of the activity in these features was chronologically distinct.

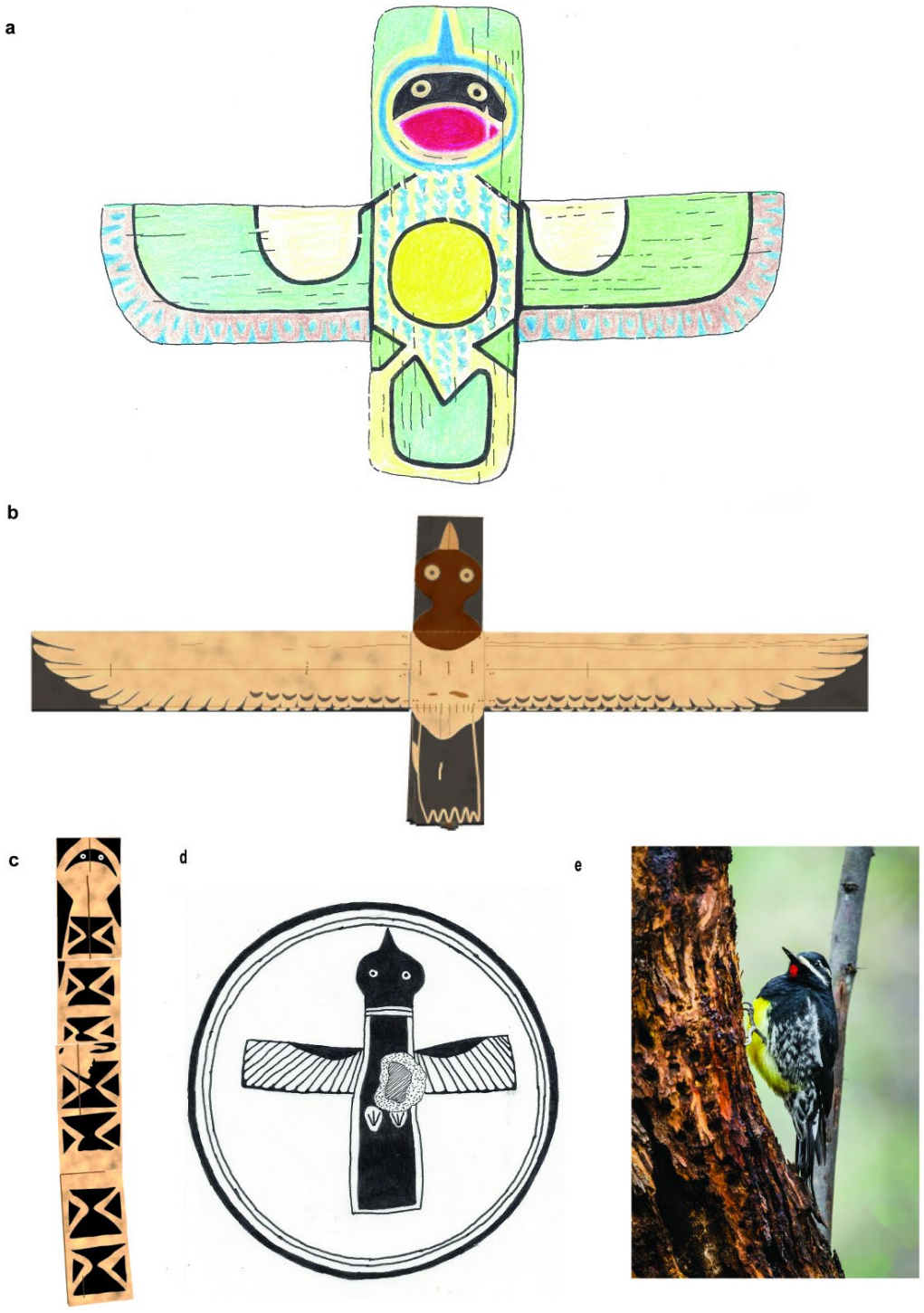


Figure 6.9. Zoomorphic effigies from Bear Creek Cave and the Upper Gila region: (a) lost bird effigy from Bear Creek Cave (after Hough 1914:Plate 21; drawing by Margaret Berrier); (b) Mimbres bird effigy from the Upper Gila drainage (digital drawing by the author); (c) effigy of western diamondback rattlesnake (*Crotalus atrox*) from same assemblage as (a), showing

"crescent-eye motif" (digital drawing by the author); (d) Mimbres Classic B/w Style III bowl (MimPIDD #2576) excavated by the Cosgroves at the Swarts site (drawing by Margaret Berrier, after Cosgrove and Cosgrove 2012:Plate 214b); (e) Williamson's sapsucker (*Sphyrapicus thyroideus*) (photo by Jason Holzworth).

Ceramic styles and perishable technologies are not the only means of identifying cultural associations, however. Iconography also offers great potential in this regard, especially in the southern Mogollon region, where Mimbres ceramics and Jornada rock art represent an enormous combined dataset of stylistically related images. In his discussion of the assemblage recovered from Bear Creek Cave, Hough describes a unique artifact that was taken from the cave "at the time the Museum-Gates exploration was in progress" (1914:105, Plate 21). This item was an elaborate painted bird figure made of wooden slats sewn together with yucca fiber. Hough published a hand-tinted photograph of the bird figure, one of only two color plates in his 1914 report, but he explains that "an attempt to secure the specimen failed" (1914:105; Figure 6.9a). Although Hough provides information on the construction and coloration of this figure, he does not offer any measurements. Wood grain visible in the tinted photo suggests that the wingspan of this piece is somewhere between 0.5–1 m across, but this estimate cannot be made with any certainty.

The Bear Creek Cave bird effigy has received only limited mention in the archaeological literature, notably in a discussion of zoomorphic effigies (Walt 1978:40) and a survey of wooden ritual artifacts (Vivian et al. 1978:26–27). Hough discusses it in terms of smaller, three-dimensional bird effigies, of which several complete and partial examples survive, both from cave contexts and from Great Houses in Chaco Canyon, including Pueblo Bonito and Chetro Ketl. Portions of flat wooden bird effigies were also

recovered from Aztec Ruins (Laurie Webster, personal communication 2006) and from the Main Chamber of Feather Cave (Ellis and Hammack 1968). Another possibility is that this figure was a component of one of the zoomorphic "mobiles" or "standards" that were sometimes depicted on Mimbres ceramics (Cosgrove and Cosgrove 2012:Plate 228; Moulard 1984:Plate 1, 105–106).

One point that deserves fresh emphasis here is Hough's identification of the Bear Creek Cave effigy as a woodpecker seen in flight (1914:105). This identification has particular merit; in fact, the effigy has at least five distinct features that suggest the adult male of a particular species, Williamson's sapsucker (*Sphyrapicus thyroideus*): (1) red chin, (2) yellow belly, surrounded by: (3) white flanks with black hachuring, (4) black face mask, and (5) white patches on wings (Robbins et al. 1966:184–185; Figure 6.9e). No other North American bird shares more than three of these attributes. Possibly the elements that do not match with this species represent conflation with other ceremonially significant bird species: the overall green coloration of the effigy possibly derives from the Green kingfisher (*Chloroceryle americana*), which is a rare intruder in southeast Arizona today (Robbins et al. 1966:178–179), or the Broad-tailed Hummingbird (*Selasphorus platycercus*), which also shares the red chin patch (Robbins et al. 1966:172–173). The salmon-tipped wing feathers of the effigy could reference another western woodpecker species, the Redshafted Flicker (*Colaptes cafer*), whose feathers have been in the past and are still today widely used in ceremonial contexts by many tribes in the SW/NW and adjoining regions. Walt (1978:53) observes that woodpeckers "drum" on trees and cactus, which would have added to their ritual significance (Nicolay 2023:87–90).

Although Hough never acquired the Bear Creek Cave bird effigy for the Smithsonian, the museum's archives contain a *returned* letter sent by Hough to the person who took the effigy from the cave. In this letter, Hough reminds one Mrs. J. E. Thompson of Jerome, Arizona, of her commitment to make the artifact available for study (Hough 1906). Some subsequent communication must have occurred and led to the loan of this figure, as Hough eventually published his tinted photo of the effigy in 1914. However, any successful communication did not end up in the Smithsonian archives, so had this original letter not been returned, the chain of provenance for the effigy would have ended with Hough's published work.

"Mrs. J. E. Thompson" was Elizabeth Boner (1978–1954), the wife of J. E. Thompson (1875–1950), a once-famous copper mining magnate stationed out of Clifton and Phoenix, Arizona, and the sister-in-law of William Boyce Thompson (1869–1930), who was one of the wealthiest people in the world at one time. I was able to contact the Thompson family, but they say that no documents or artifacts survive in their possession from the J. E. Thompsons (Boyce Thompson, personal communication 2018). Possibly the effigy was destroyed when the Thompsons' lodge in Greer, Arizona, burned to the ground, although the lodge had already left the family's ownership by that time, so this would depend on whether they sold it furnished (Applewhite 1979:60–61). Some slim possibility remains that the Bear Creek Cave bird effigy survives in the possession of another local family in that area, or that it might one day reappear on the antiquities market.

The lost Bear Creek Cave bird effigy is not the only one of its kind, however. Another example currently resides in the Northwest Museum of Arts and Culture in

Spokane, though it was previously housed at another institution in the same city (Figure 6.9b). The late Joe Ben Wheat analyzed the Spokane bird effigy for an IRS case in 1986, and he obtained an unpublished radiocarbon date of ca. 435–785 CE, an astonishingly early date for an object of such complexity (Shepard 2015). This effigy has wooden flaps that can be moved to change it between four different species, at least one of which is not clearly identifiable. The "top" species appears to be a red-headed woodpecker *(Melanérpes erythrocéphalus*; Figure 6.9b). Alternatively, it might represent a canvasback duck (*Aythya valisineria*), although this species has a black bill and a distinctive zone of black plumage encircling the reddish-brown head, features that are not compatible with the effigy. Moreover, one of the other levels clearly depicts a duck, possibly a mallard (*Anas platyrhynchos*), and the bill on this representation is distinctly duck-shaped. The full assemblage also includes three other zoomorphic effigies—two fish and a rattlesnake. All of these appear to be the sort of mobiles or standards depicted on Mimbres B/w ceramics and in Jornada rock art. Two ranchers, Clint Johnson and Ralph "Tink" Burris, found this assemblage (which also included a unique replica of an atlatl dart with a *wooden* point) in a cave somewhere in the Gila River drainage in 1972. Despite the author's ongoing investigations of its provenience and provenance, the precise location of this cave remains unclear. These artifacts potentially came from the Gila National Forest, the Gila Wilderness, or even private land (Nicolay 2023:90–91). I will discuss the Spokane effigy further in the next chapter.

Additional evidence for the Mimbres origins of these bird effigies comes from a Mimbres Classic B/w Style III bowl (MimPIDD #2576) excavated by the Cosgroves (Cosgrove and Cosgrove 2012:Plate 214b; Hegmon 2012; Figure 6.9d). This bowl, which

the Cosgroves recovered from an infant burial at the Swarts site, clearly depicts not an actual bird, but a bird effigy like those recovered from caves, as evidenced by the squared ends of the wings and tail. This resemblance becomes even more obvious in comparison to naturalistic depictions of other birds portrayed in flight on Mimbres ceramics.

The systematic study of prehistoric iconography in the SW/NW has received only sporadic attention in the area's archaeology, primarily within rock art research. This neglect is especially unfortunate in the southern Mogollon region, where both the Mimbres (in their ceramics) and the Jornada (in rock art) developed extensive and elaborate (and interrelated) visual traditions. The creation of the Mimbres Pottery Images Digital Database (MimPIDD) has made almost 10,000 Mimbres vessels available for study, of which approximately 20% display representational images (Hegmon 2012). This dataset allows for comparison of images on Mimbres B/w ceramics with the painted wooden figures from the two caves. Both the bird effigies, the rattlesnake effigy, and the bird effigy depiction on the bowl from the Swarts site all share a specific motif that appears on a variety of animals portrayed on Mimbres figurative ceramics: what I call the "onion-dome head." In addition, the Bear Creek Cave bird effigy and the rattlesnake effigy share a second, related motif—the "crescent eye mask" (Figure 6.9c). Both motifs are very specific to Mimbres ceramic iconography, where they appear infrequently but distinctly across a variety of zoomorphic representations, including birds, a tadpole, and various chimeras. However, given that northern and western Mogollon groups did not develop comparative figurative traditions in their ceramics, bird effigies of this sort could have been known beyond the Mimbres region strictly via perishable technologies, and neither such effigies nor the related stylistic motifs have survived. Nonetheless, we see in

these effigies a very specific and elaborate technology, tied to equally specific stylistic motifs, and this evidence points squarely back to the Mimbres region and to both the Mimbres and Gila drainages.

One other aspect of the Bear Creek Cave assemblage deserves special mention here. Hough reports a specimen of blue-dyed cordage from this site that tested positive for *Indigofera anil*, the indigo plant common in Mexico and South America (1914:83). According to Webster (personal communication 2023), Bear Creek Cave contains more specimens of indigo-dyed cordage and textiles than any other site in the SW/NW. Obviously, differential preservation played a role in this distribution, given that such materials rarely survive in open sites, but Bear Creek Cave stands out in this regard even among other dry caves. Use of indigo as a dye occurs in South America as early as 6200–6000 BP, predating its first documented use in the Old World, in Egypt, by some 1,500 years (Splitstoser et al. 2016), but it does not appear in the SW/NW until the thirteenth century CE. The question remains as to whether indigo-dyed materials in Bear Creek Cave were imported from Mexico, or indigo dying occurred locally in the SW/NW. Webster hopes to address this question with future analyses, but it remains unresolved as yet (Nicolay 2023:91).

Bear Creek Cave yielded one of the largest perishable assemblages ever recovered in the SW/NW, and Hough makes it clear that this level of recovery was due not only to the relatively low level of disturbance at the time of his excavations, but also to the extent of the deposits, which he considered to derive from a wide region (1907:51–52). The quantity and the uniqueness of many components of the assemblage, along with unusual features such as the “waffle garden” pit-shrines, support Hough’s conclusions. Indeed,

most of Hough's insights regarding this site hold up as accurate today, which is impressive given that he worked at a time when archaeology still focused on museum stocking and had barely begun to develop a coherent body of theory.

Despite the extensive archaeological record from this site, we still cannot conclusively determine its cultural affiliations. Various clues point not in one direction, but in several. It is entirely possible that Bear Creek Cave is a multicomponent site that was shared by southern Mogollon (Mimbres), northern Mogollon (Reserve or "Alpine"), and perhaps even communities from the Black River Mogollon region to the northwest. The unusual grid structure of the cave's interior shrines, if it points to the Safford area, even suggests the possibility of use by populations from southwestern Arizona. Perhaps this remarkable cave served as a site of common cosmological importance to multiple groups who marked out its interior spaces and shared them peacefully. Alternatively, control of Bear Creek Cave could have shifted over time, even changing during or prior to the Mimbres Classic.

Nonetheless, Jolie's dates (2018:Table 5.3; personal communication 2022) and the iconographic and stylistic evidence described herein suggest that the Mimbres were among the first to deposit offerings there, perhaps during the Mimbres Classic. The lack of early ceramic types, darts, rock art, human remains, and other elements indicative of the Archaic and Early Pithouse periods suggest that this cave might not have begun use as a shrine until fairly late in the regional sequence, perhaps even after 1000 CE. Additional dating and isotopic sourcing have the potential to shed some light on the answers to these questions and, in so doing, to further our understanding of both ritual

cave activity in the Upper Gila specifically and, on a broader scale, of social organization in the western Mogollon region (Nicolay 2023:91–92).

Ultimately, the words of Hough's 1915 address to the California Academy of Sciences still resonate: "This gash in the earth alone among the throngs of canyons that come down from the mountains on either side into the Blue River, would be selected for something at first unexplainable, tantalizing, provocative a little of awe—but finally coming out to consciousness as a mystery. . ." (1915:3). Bear Creek Cave remains an especially important example of a cave shrine in the SW/NW, but we still do not know just how it fits into the area's larger pattern. Nonetheless, at least some evidence points to Mimbres use—most likely by communities in the southern and middle Blue River and the York-Duncan Valley to the south, but possibly also by populations located further east and south of the San Francisco River.

Chapter 7: Alienated Assemblages from Caves in the Gila Drainage

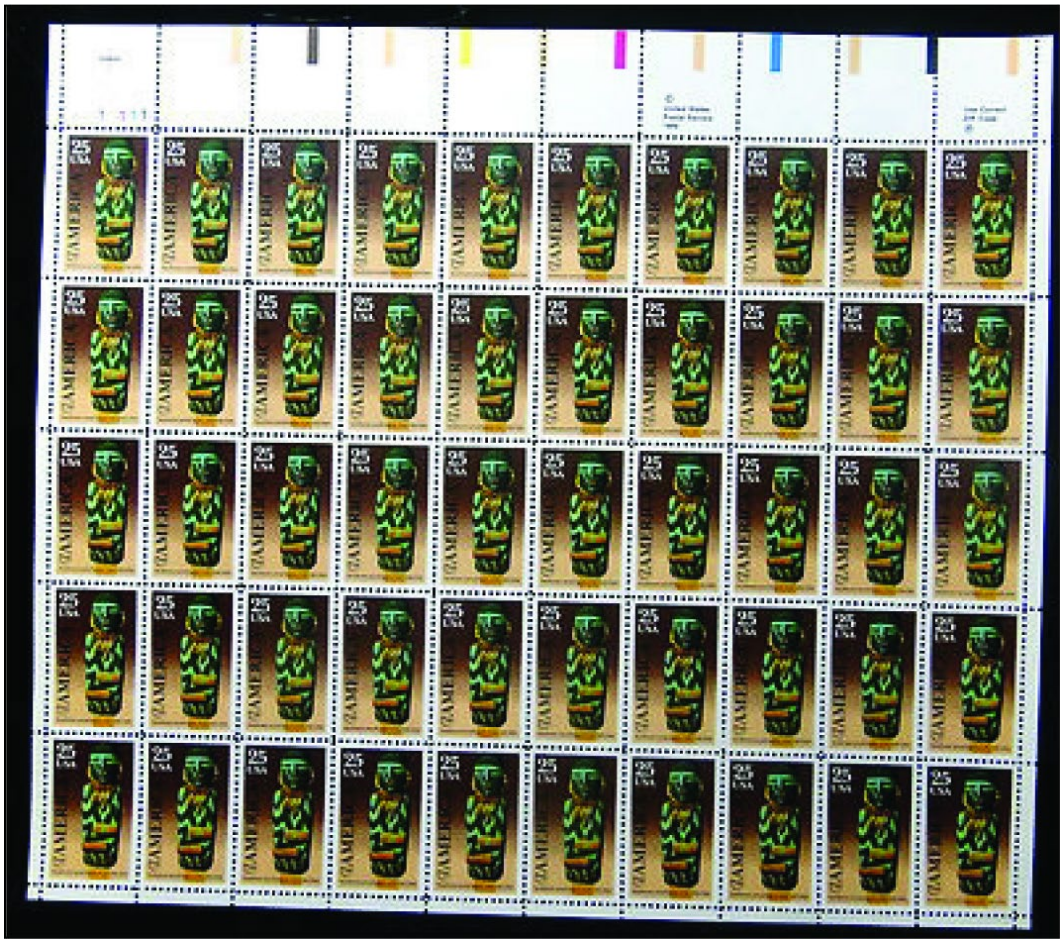


Figure 7.1. 25 cent US postage stamp with image of the largest of two effigies from the Cliff Valley Cache.

In addition to the materials recovered from the caves described in the previous chapters, various museums and private collections currently hold other recognizably ceremonial objects and assemblages from the Mimbres region. Although the specific provenience of some of these objects remains unknown, their perishable nature makes it obvious that they came from dry caves or rockshelters. Most of these objects have received minimal publication at best, although one, an effigy from the Cliff Valley Cache, appeared on a 25 cent US postage stamp in 1989 (Figure 7.1). This chapter

focuses on five such instances that deserve particular attention, all of which offer some possibility of identifying the original provenience of the artifacts and reconnecting the full chain of provenance. If these connections can be made, the scientific value of these materials will increase significantly. Nonetheless, even without this information, these artifacts can still provide important information about patterns of cave ritual in the Mimbres and Gila drainages, as well as in the SW/NW overall.

The Spokane Mimbres Bird Effigy

The Northwest Museum of Arts and Culture in Spokane, Washington holds in its collections a spectacular artifact, a painted wooden bird effigy whose moveable elements allow the "operator" to flip sections over and to change the species depicted five times (Robbins et al. 1966:184–185) (Figure 7.2c; Figure 6.9b). This effigy displays stylistic characteristics similar to the lost bird effigy from Bear Creek Cave documented by Walter Hough (1914:105) and described in the previous chapter. Hough was able to depict this effigy in a tinted photo but not to recover it for the National Museum of Natural History (1914:105, Plate 21). Although the Bear Creek Cave bird effigy was apparently smaller and less complex than the Spokane effigy, both show the same perspective from below/in-flight, and the "onion-dome head," along with other common characteristics such as squared ends of their wings and tails. These shared characteristics are important, as they potentially connect Bear Creek Cave with Mimbres communities in the Gila drainage and even the Mimbres Valley. The cultural affiliations of Bear Creek Cave have heretofore remained in question due to the lack of Mimbres ceramics. Though

far from conclusive, these shared characteristics suggest that some of the people who left the plentiful offerings in Bear Creek Cave came from the Mimbres region. However, no information available at this time rules out the possibility that two or more groups shared the cave, and its use as a shrine probably continued after the end of the Mimbres Classic.

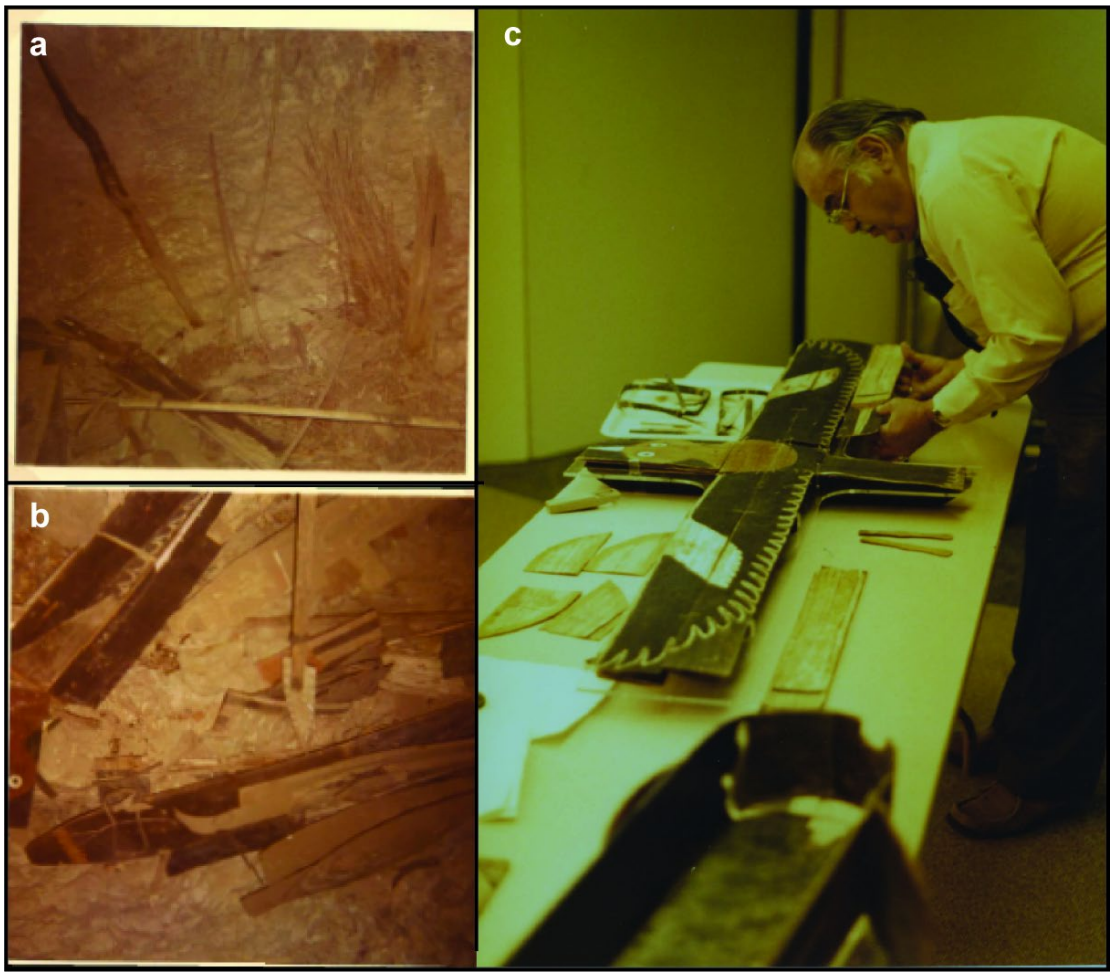


Figure 7.2. The "Spokane Mimbres Bird" effigy: (a–b) photos of the assemblage in situ in an unknown cave in the Gila drainage (probably by Clint Johnson, author's files); (c) Joe Ben Wheat analyzes the effigy and other components for an IRS case (photo courtesy of the University of Colorado Museum of Natural History).

A Mimbres Classic Style III B/w bowl from the Swarts site (MimPIDD #2576) also appears to depict one of these effigies rather than an actual bird (Cosgrove and Cosgrove 1932:Plate 214b) (Figure 6.9d). The wings and tail of the bird image on this bowl are painted with square ends, and it also exhibits the "onion-dome head," a feature of both the Bear Creek Cave and Spokane effigies. Moreover, it is the only example out of hundreds of recorded Mimbres bird-bowls that displays these features, so it does not represent a standard form of avian representation in the corpus of Mimbres ceramic iconography. This attribute suggests that whatever ceremony to which these effigies belonged was enacted from the western edge of the Gila Mimbres occupation all the way east to the central Mimbres Valley. Cosgrove speculates that a *tablita* from Doolittle Cave "undoubtedly" formed part of a similar effigy (1947:135, Figure 126a).

I have investigated the provenience of the Bear Creek Cave and Spokane bird effigies for over 15 years. That research has extended knowledge of both objects considerably, and in the latter case, I believe I am close to completing the chain of provenance altogether and identifying the find-site for this assemblage.

As discussed at length in Chapter 6, in both cases I have been able to identify the specific people who removed the artifacts from the caves. The Bear Creek Cave bird effigy was taken by Mrs. J. E. Thompson, the wife of a mining magnate then based in Clifton, Arizona, and the sister-in-law of the famous copper tycoon William Boyce Thompson. The Spokane bird effigy allegedly came from a cave either: (A) near the junction of the Gila River and Sapilla Creek; (B) in Cave Canyon northwest of Pinos Altos; or (C) just north of Mogollon Falls. I received this information from several longtime residents of the Mimbres Valley. Location A seems somewhat questionable as

the Cosgroves investigated in this area, and their report included other sites in that vicinity (Cosgrove 1947:14–16, Figure 5). However, it remains possible that they missed this particular cave, perhaps because the cave is hidden particularly well and their investigations were rushed. The two ranchers who removed the bird effigy from the cave (whatever its location) on March 18, 1972, were Ralph "Tink" Burris and Clint Johnson. Burris later took the items from Johnson, and they eventually came into the possession of Matthew Shelton, an El Paso businessman who had previously purchased antiquities from the Gila. Johnson and Shelton are now deceased, but Burris is still alive. However, several sources suggest that he would be hostile to any discussion of this matter, perhaps because it became a legal matter. Fortunately, Clint Johnson's daughter is still alive, and she is the source for Location B, although this is partly guesswork.

Since I originally became aware of the existence of the Spokane bird effigy in 2008 (thanks to Roger Anyon and Darrell Creel), I have acquired copies of several sets of polaroid photos that portray it and other objects from the accompanying assemblage in various stages of recovery and reconstruction, beginning with the supposedly in situ objects leaning against the back wall of the cave, and continuing through their analysis by archaeologist Joe Ben Wheat at the museum of the University of Colorado in Boulder (Figure 7.2c). The earliest photos reveal that the effigy was recovered in a fragmentary state and later reassembled (Figure 7.2a–b). They also show that the assemblage included two fish effigies, one rattlesnake effigy, and a wooden spear or dart (not just the shaft but the point of the spear itself are clearly recognizable as wooden in the photos) (Figure 7.2b). This assemblage was originally curated at Gonzaga University's now defunct Museum of Native American Culture (MONAC), which closed in 1991. The collection

then passed to the Northwest Museum of Arts and Culture, where all these artifacts are currently curated.

Most likely, the bird effigies, as well as the fish and snake effigies, were altar items and/or components of the "mobiles" or "standards that appear on multiple Mimbres vessels, as well as in Jornada Mogollon rock art. These were zoomorphic or geometric figures that were suspended from a wooden framework held by a single individual (sometimes by two people in the rock art examples). Such mobiles appear to have been employed in performative rituals, probably in at least semipublic settings, such as plazas (although the date on the Spokane effigy predates the widespread appearance of plazas in the Mimbres region during the tenth century). Sometimes the individual holding the framework with the figures appears to be participating in a ceremonial procession of some kind, although most of the bowls that depict such activities come from private collections and appear to have been embellished to varying degrees, so the authenticity of these images and their various components remains in doubt. The best example, however, is MimPIDD #32696 from the Swarts site, for which the provenience is fully reliable, as it was excavated by the Cosgroves (Figure 7.3).

None of the images of people carrying mobiles or standards show them carrying bird or snake effigies, however. Instead, the figures depicted on vessels are either dogs, fish, or geometric motifs. Conversely, no effigies of canids, the most common figures in these images, have been recovered from caves. Partial geometric "*tablitas*" have been recovered from several caves, and these could represent portions of the objects shown on bowls, although they are mostly smaller than the "placards" appear to be. Several images depict people carrying fish effigies, two of which did accompany the Spokane Bird,

although based on the available photos, neither appears to have additional holes for attachment to any kind of suspension armature.

Figure 7.3. Image of a Mimbres ceremonialist carrying a "mobile" with canid and fish effigies, from MimPIDD #32696, a bowl from the Swarts site (drawing by Margaret Berrier).

Images of probable ceremonialists carrying poles bearing zoomorphic figures also appear in Jornada Mogollon rock art, but in most of these cases, the suspended figure is either a dragonfly or a geometric device. No dragonfly effigies have been recovered from cave shrines in either the Jornada or the Mimbres regions. The lack of various figure types in the archaeological record probably reflects a differential disposal pattern: perhaps certain figures, such as dogs and dragonflies, were required to be buried in a riverbed, as are *Katsina* masks today. They could also have been deposited in graves (or

cremated) as part of mortuary ritual, in which case these perishable items would not have survived in the archaeological record. I have suggested earlier that the "mobile/standard" procession itself potentially represented part of the predominant Mimbres mortuary ritual (Nicolay 2018). I based this suggestion on the role of the dog as a psychopomp among some Indigenous American societies, including Uto-Aztecan speaking groups in Mesoamerica. I recognize however, that the data to support this conclusion are tenuous and limited to a few burials in the Mimbres region accompanied by dogs. One possibility is that the dog effigy in the procession depicted on the bowls substituted for an actual dog as a burial companion—or that this procession belonged exclusively to cremations, and that the dog effigy was cremated along with the human body. All these ideas remain highly speculative, but they do suggest possible reasons why no wooden dog effigies have been reported from the archaeological record.

Except for a brief online piece from Archaeology Southwest (Shepard 2015), no published documentation exists regarding the Spokane bird effigy. Joe Ben Wheat obtained one radiocarbon date from the effigy during his analysis, but he never published it, perhaps because the results were unexpectedly early: an uncalibrated range ca. 435–785 CE. This date now seems more plausible in light of a date obtained more recently by Miller and colleagues (2023:Figure 8; 2024:Table 1) from a similarly-constructed goggle-eyed "Tlaloc" effigy probably from Feather Cave, as well as the even earlier dates from other painted wood artifacts from Yellow Deer Cave and Ceremonial Cave, two Jornada Mogollon cave shrines in the Hueco Mountains of west Texas (discussed in Chapter 4).

If the date from the Spokane bird effigy is valid, it is particularly interesting as its construction suggests that the tradition of and technology for making and using the most

elaborate of such effigies must have already been in place for several generations before the construction of this example. This dating would place the original usage of these complex effigies at least as far back as Haury's Georgetown phase (ca. 550–650 CE) and the beginning of the Late Pithouse Period. The unique wooden dart/spear that was also part of this assemblage supports this date-frame, as evidence suggests that the bow and arrow replaced the atlatl/dart/fending stick complex in this area during the seventh century CE (Roth et al. 2011). Its presence in this assemblage suggests that darts continued to play a role in ritual for at least another century, albeit in replica form only.

Frank Hibben's Bow Cache

While still a graduate student, the future University of New Mexico archaeologist Frank Hibben published a very brief paper in *American Antiquity* about a cache of bows he claimed to have found in a cave in the Gila drainage while hunting a mountain lion (1938). Hibben provided very little information about the site where he encountered the bows beyond identifying it as "just to the south of the Gila Cliff Dwellings National Monument" (1938:26). He claimed that he encountered a "small and unimposing cliff house there," which was "perched in a hidden niche invisible from above or below" (1938:36). Within this structure he supposedly found a cache of 94 wooden bows, although the accuracy of this number is questionable given that all but two of the bows were broken (Figure 7.4a–b). Hibben attributes their fragmentary state to "disintegration by insects and the lairing of bears" (1938:36), but it seems more likely that they were ritually "terminated," as were many other ceremonial objects left in caves and/or graves

in this region. To his credit, Hibben did indeed recognize the possibility of such deliberate breakage and compared it to the ceremonial "killing" of Mimbres Classic ceramics associated with burials (1938:37). This is not to say that his original hypothesis of bioturbation as the source of breakage for these items is not at least partially correct. As a big game hunter, Hibben was probably qualified to recognize a bear's lair, and indeed, he is explicit in this regard, stating that "there is no doubt, judging from their tracks and signs, that bear have augmented the breaking process" (1938:37). Moreover, Hibben was almost certainly not hunting alone; instead, he likely accompanied Homer C. Pickens, the official mountain lion hunter for the state of New Mexico at the time.

Unfortunately, because Hibben neglected to plot the cave on any existing map, and he neither photographed nor sketched the cache *in situ* or provided any location information other than the cave's directional relationship to the Gila Cliff Dwellings National Monument, we have only his limited verbal description upon which to rely. Although the bows Hibben collected are still curated at UNM's Maxwell Museum, none of them have been dated, so we cannot be certain whether they belong to the Mimbres occupation of the Upper Gila or a later period. Given the proximity of the site to the Gila Cliff Dwellings, and the association of the bows themselves with what he describes as a small cliff dwelling, Tularosa or Salado use might seem more likely. However, Hibben also notes the presence of "[s]everal large sherds of typical classic Mimbres pottery" (1938:38).

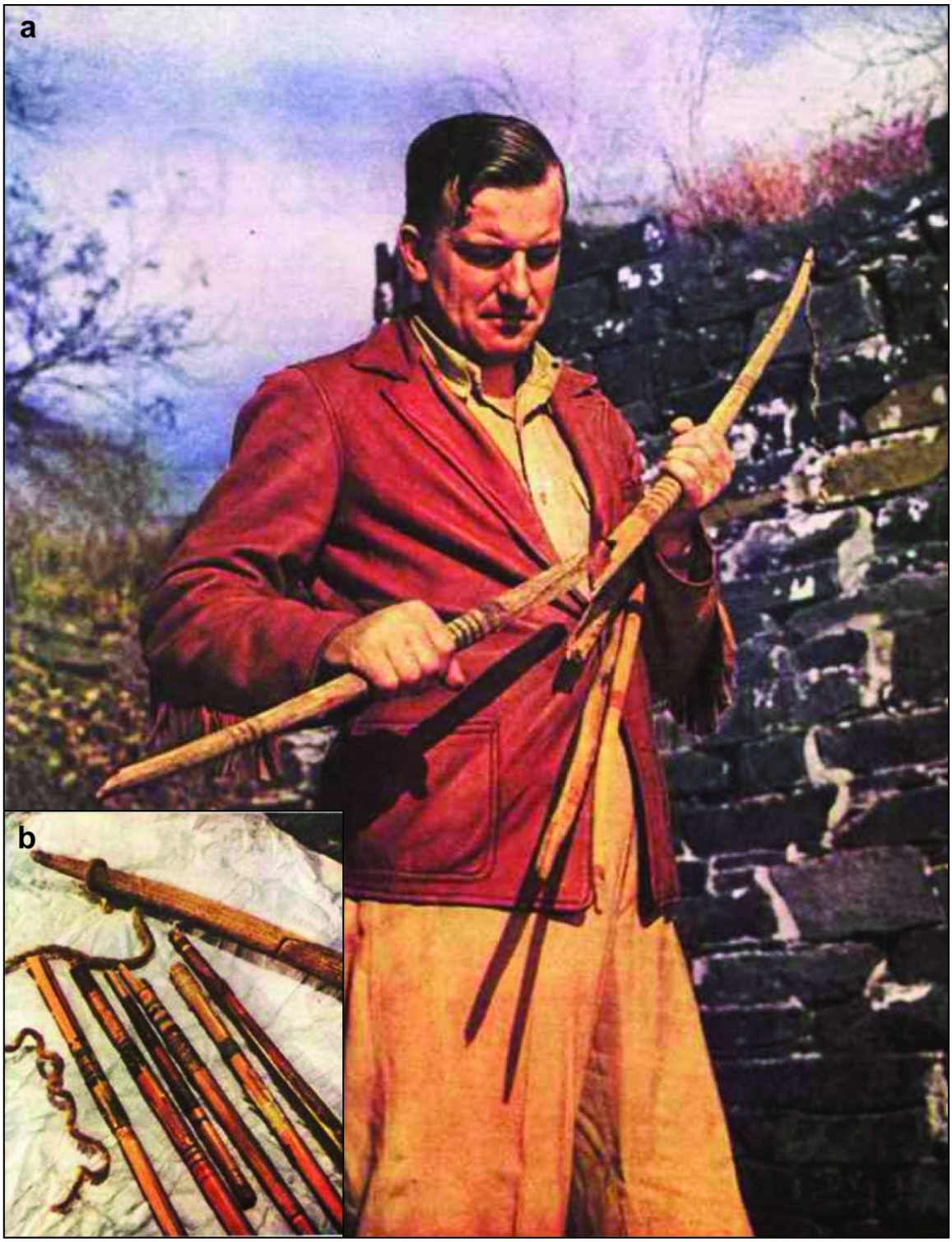


Figure 7.4. (a) Archaeologist Frank Hibben pretends to refit a broken bow for a photoshoot; (b–inset) reed arrows and a partial bow taken from an unknown cave by Hibben ca. 1935 (photos from the 1946 *Saturday Evening Post* 218[29]:42–46).

This find suggests the potential for earlier use, but in no way does it provide conclusive evidence thereof. Further support for deposition during the Mimbres occupation comes from the nature of the bows and arrows themselves: Hibben reported that all the bows were self-bows and all the arrows were composite reed arrows with wooden foreshafts (1938:37–38). After the Mimbres Classic, sinew-backed recurved bows and arrows with fully wooden shafts replaced these earlier forms throughout the SW/NW. If the bows Hibben found belonged to a later occupation, then they must have come from a very early post-1200 CE cultural phase, in which case their large number becomes problematic, as they would had to have been deposited just as bow and arrow technology was changing. This throws Hibben's claim to have found these artifacts inside a cliff dwelling into question.

An additional problem is that Hibben did not provide enough information to determine whether the "cave" itself served as a shrine for any purpose other than the terminal deposition of deliberately broken bows, so either the cache represented a limited shrine feature in association with a habitation feature, or shrine use separate from the occupation of the site. Whether the shrine use occurred before or after the occupation remains a difficult question. One possibility is that populations postdating the Mimbres Classic recognized and continued an earlier type of offertory ritual that they shared with their Mimbres predecessors, resulting in the continuation of a single depositional pattern. However, in that case one would expect the assemblage to include sinew-backed bows and arrows with stone points.

Hibben also claimed that "[t]he entire surface of the cave floor was littered with the remains of the shafts, foreshafts, and nocks of some four thousand compound arrows, broken without exception" (1938:36). Although the accuracy of Hibben's count of arrows seems questionable, as it almost certainly represents only a rough estimate, this information is particularly important because of the similarity of this assemblage of broken bows and arrows with the thousand or more broken arrows reported from Walter Hough's "Site 3." Both sites are located in the Gila drainage close to the Gila Cliff Dwellings, and both also contained or were associated with small cliff dwellings. The presence of cliff dwellings suggests that both sites might significantly postdate the Mimbres occupation of the Gila drainage, in which case both would also demonstrate the continuity of at least one major element of Mimbres cave ritual: the deposition of bows and arrows. As mentioned above, Hibben claimed the cave where he found the bows was located "just to the south of the Gila Cliff Dwellings National Monument" (1938:36), while all the several available sources on Hough's Site #3 place it several miles upstream from the Gila Cliff Dwellings on the West Fork of the Upper Gila River.

One possibility is that Hibben altered the location of the site in his description because he was engaged in big game hunting at a time or in a location where it might not have been legal. As he almost certainly accompanied Homer C. Pickens, the official New Mexico mountain lion hunter, this scenario seems unlikely. Although he could have omitted any mention of hunting, beginning a story with a dramatic element of that type is entirely in character for Hibben. If anything, he might have manufactured that portion of his brief paper. This was probably not so, however, as mountain lion hunting was the reason for his graduate research and his presence in the Gila in 1935 (Hibben 1937). One

possibility is that Hibben was hunting on his own but with Pickens' specially-trained dogs. The text of both his 1938 and 1946 publications implies that this was indeed the case, and he mentions one of Pickens' dogs by name ("Trailer") at the very end of the latter article (1946:46). The value of these dogs was such, however, that Pickens probably would not have loaned them to Hibben for a hunt (Brandon Jones, personal communication 2024).

Another difference between the sites is that Hibben seems to describe the bows and arrows as located *inside* the small cliff dwelling in the cave he visited (1938:36), whereas Henshaw clearly states that the bows and arrows in the site he visited were located in a second cave located *above and to the right* of the one containing the associated structure (1879:370–371). Archaeologists in the SW/NW have long since recognized the suspect nature of any information provided by Frank Hibben, and thus the full provenience of the bows he recovered potentially remains beyond confirmation. Either he was the last of several documented visitors to Hough's Site #3, or he encountered a similar site in the same area where an almost identical pattern of ritual deposition occurred. Doug Achim claims that looters removed approximately 1,000 arrows from another shrine cave in the Upper Gila in recent decades (personal communication 2023).

Additional information exists, however, which further problematizes the interpretation of Hibben's claimed provenience for the bow cache, as vague as it is. A decade after his *American Antiquity* article, Hibben published a book entitled *Hunting American Lions* (1948). The fifth chapter of this volume, "The Killer of the Tonto Rim" (1948:60–73) describes a hunt in Arizona, during which Hibben and his companion,

Giles Gostwick, who was Pickens' counterpart in Arizona, encountered another arrow shrine cave (1948:70–72). In the brief passage describing this incident, Hibben writes "I had heard of such ceremonial places, but never seen one before" (1948:71). If this claim is accurate, than the Arizona encounter must have occurred prior to Hibben's discovery of the similar site in the Upper Gila. That one archaeologist might encounter two separate arrow-shrine caves in the 1940s is not altogether remarkable: it appears that the practice of leaving arrows in caves was widespread in the prehistory of the SW/NW, and the looting of such sites was not so complete then as it is now. Although it is possible that Hibben transposed the Arizona cave into the Upper Gila (or vice versa), his *American Antiquity* paper and *Saturday Evening Post* article are consistent enough in their description of the Upper Gila site to suggest that the latter cave was a real place. Moreover, there is no way that Pickens would have loaned his dogs to Hibben for a hunt over 100 miles away in Arizona, especially for a hunt with Giles Gostwick, who had his own dogs.

Ultimately, these interpretations rely on an estimation of the veracity of one of archaeology's most infamous fabulists. Nonetheless, the consistency of the details in the various documents, including Pickens' biography (1980), support the reliability of Hibben's two accounts of the bow cave. Here, the problem is not with the reliability of the information Hibben included but with his omissions.

The Cliff Valley Cache

Figure 7.5. The Cliff Valley Cache on exhibit at the Art Institute of Chicago.

Sometime in the 1970s, Dustin Hunt, a rancher from Cliff, New Mexico, removed one or more carved anthropomorphic and zoomorphic effigies from a small cave in that part of the Gila drainage (Figure 7.5). Hunt originally attempted to sell these effigies to the Maxwell Museum at the University of New Mexico, where J. J. Brody assigned a master's student named Henry Walt to analyze the collection (Walt 1978). Brody eventually declined to purchase the collection from Hunt, who ultimately sold these materials to the Art Institute of Chicago (ARTIC) for an undisclosed six-figure sum believed to have been at least $300,000 (Bennett 1980:26; Friedman 1979:6–7). This sale occurred shortly before the passage of the Archaeological Resources Protection Act (ARPA) in 1979. Considerable controversy surrounds these objects, their provenience, and the sale itself. In a remarkable step, Walt's committee added a pair of disclaimer pages to his MA thesis asserting that his analysis of the objects was legitimate and remained unaffected by Dustin Hunt's changing stories about their origin (Walt 1978:unnumbered frontispieces).

The Cliff Valley Cache, as it currently appears on exhibit at ARTIC, comprises two large painted anthropomorphic effigies, the smaller one carved from stone and the larger from cottonwood, one wooden zoomorphic effigy with turquoise-inlay eyes that probably depicts a mountain lion, two wooden snake effigies, four wooden L-shaped throwing sticks, and a woven container that supposedly held the stone effigy and one of the wooden snakes. The disclaimer pages in Walt's thesis call into question whether all these objects were part of a single cache found in a single cave. I have suggested in another paper that the mountain lion effigy might not belong with the anthropomorphs, and could even be a modern forgery (Nicolay et al. 2019:89). The turquoise inlay eyes of

the mountain lion are very suspicious and are more typical of forged effigies that were sold in Santa Fe and Aspen art galleries around this time. No similar quadruped effigy appears anywhere else in western New Mexico, Arizona, or northern Mexico. Snake effigies of the kind included in this assemblage are also rare in the archaeological record, limited largely to one reported by Hough (1914:129, Figure 337), and a much simpler version purportedly from a cave near Duncan, Arizona, currently in the Owens collection (Owens 2018:101).

Additional doubts arise due to the involvement of the infamous looter Clarence "Frank" Turley, who along with Aspen art dealers Jon and Phil Holstein, brokered the sale of the cache to ARTIC for Hunt, presumably for significant shares of the final payment (Bennett 1980:27). The Holsteins also moved some suspect effigies through their Aspen art gallery (Nicolay et al. 2022:89-90), and Turley was responsible for bulldozing several major Mimbres sites into oblivion, including Galaz and Rock House, in his efforts to acquire Mimbres ceramics for sale. Widespread rumors in the archaeological community suggest that Turley also maintained a "workshop" in Tucson, Arizona where Mimbres ceramics were repainted and/or "embellished" with figures not part of their original design. Many vessels in the Mimbres Pottery Images Digital Database (MimPIDD) that passed through Turley's hands show evidence of heavy repainting and/or suspicious motifs.

The paint on these effigies is also very bright, and although this level of preservation is plausible in the dry caves of the SW/NW, it is also possible that someone embellished the figures after Hunt removed them. The eyes of the larger, cottonwood effigy are contained within a strip of blue paint that appears like a mask against the black

background. As this face resembles those of certain figures on Style III Mimbres Classic B/w ceramics, it allowed for Evan Maurer, the curator of the ARTIC, to identify the cache as Mimbres (1977, 1979). This identification probably enhanced both the sale value of the artifacts and the prestige of the purchase for the museum, but it conflicts with the later radiocarbon dates obtained by Walt. If any further study of the Cliff Valley Cache has occurred since its accession at ARTIC, the results thereof have not been published.

The Owens Goggle-Eye/Tlaloc Effigy

During the 2018 Annual Meeting of the Society for American Archaeology in Albuquerque, New Mexico, a local private collector named Jim Owens shared images of objects from his large collection of perishable artifacts with several senior scholars who attended the meeting, including Steve Lekson and Laurie Webster. Among the objects in the images he showed these scholars was a wooden "*tablita*-style" effigy of the Goggle-Eyed rain deity widely known from Jornada rock art and Mimbres B/w ceramics (Figure 7.6). Most researchers, myself included, believe this figure to be a northern version of the Mesoamerican rain deity known in Nahuatl as Tlaloc, one which potentially survives as the contemporary *Hemiskatsina* of the Western Pueblos. Three other effigies of this figure from the SW/NW are already known: two are wooden "*tablita*-style" constructions, and the third is made of sandstone (Figure 3.4). All three of these come from caves (Lambert and Ambler 1965:77–78, Figure 50; Nicolay 2012:174, Figure 11.5; O'Laughlin 2003:143, Figure 5; Schaafsma 1999:180, Figure 12.6a–b). A few months

later, Owens self-published a book about his collections (Owens 2019). Thanks to an introduction by Laurie Webster, I was able to visit Owens at his Corrales home between stretches of fieldwork at sites in both southern and northern New Mexico, and serendipitously the copies of his book were delivered during my visit. I was also able to observe his collection, including the Goggle-Eye effigy.

Figure 7.6. Goggle-Eye "Tlaloc" effigy head and other ceremonial artifacts from an unknown cave in the York-Duncan Valley (photo courtesy of James Owens, from Owens 2019:101, Figure 6.3).

According to Owens, the effigy came from a cave on a ranch located slightly over the border from New Mexico near Duncan, Arizona (Unsurveyed sec.6 T4N range 30 East of the Gila and Salt River base Greenlee County, Arizona), on land purchased in February 1969. The rancher's son-in-law allegedly found the effigy and other artifacts in March 1969 (Jim Owens, personal communication 2021). Recent research by Mary Whisenhunt has demonstrated that the York-Duncan Valley should be considered part of the Mimbres Mogollon region and was probably part of the larger settlement pattern that included the Lower and Middle Blue River, populations that likely used Bear Creek Cave, which is the subject of Chapter 6.

The Owens effigy is similar in shape and size to the example from Feather Cave. Both of these have trapezoidal heads with the larger side on top, and both have narrow, ruler-like bodies, although the body of the Feather Cave effigy has a distinct bend to it, while the body of the Owens effigy is largely straight. The major difference between the two lies in the decoration: the body of the Feather Cave effigy, like the examples from U-Bar Cave and Chavez Cave, is divided with one side of the body red and the other green. The body of the Owens effigy is decorated with a series of six to eight featherlike designs on an unpainted background (the exact number is difficult to ascertain because the pigment fades toward either end of the piece). This aspect is distinctly different from the other three known Goggle-Eye effigies, as well as from any of the hundreds of images of

this figure that appear in Jornada Mogollon rock art or the approximately two dozen representations on Mimbres B/w ceramics. Although some of the latter do display avian characteristics, none show this kind of body design. This piece appears instead to be a portion of a bird effigy such as Spokane Bird, described above, and the example from Bear Creek Cave, discussed in Chapter 6 (Figures 6.9 and 7.2),

An additional reason to question the relationship between the two parts of the Owens effigy is the nature of their attachment. In both the Feather Cave and the U-Bar Cave effigies, the head is tightly and neatly attached to the body by a set of stitches. Based on the available photo, the two parts of the Owens effigy do not appear to have had any physical connection. Although the head is drilled and threaded, no corresponding holes are visible on the body, and the holes that are visible do not align. Therefore, it is most likely that these two *tablita* sections were placed in juxtaposition for the purposes of sale. Owens insists that the person who sold him these items could not have been aware of the Feather Cave effigy and thus could not have assembled these pieces in order to create a resemblance to it, but Schaafsma published a drawing of the latter in 1999 (180, Figure 12.16b), and both the Feather Cave and U-Bar Cave Goggle-Eye effigies were on display for several years as part of a permanent exhibit at the Museum of Indian Arts and Culture in Santa Fe, New Mexico. Therefore, although the "head" and the "body" of the Owens effigy likely represent objects used in the same ceremonial context, they probably did not belong to the same original figure. Nonetheless, to the extent that we can trust its provenience, the head of the Owens effigy represents the furthest westward extension of locally-produced Goggle-Eye iconography (although imported copper crotals of Type IA5a, which depict a highly stylized image of the Mesoamerican Tlaloc, appear at

Wupatki, Paquimé, and Cerro de Trincheras, and these most likely originated in West Mexico, probably somewhere in Nayarit).

The Stailey Cave Cache

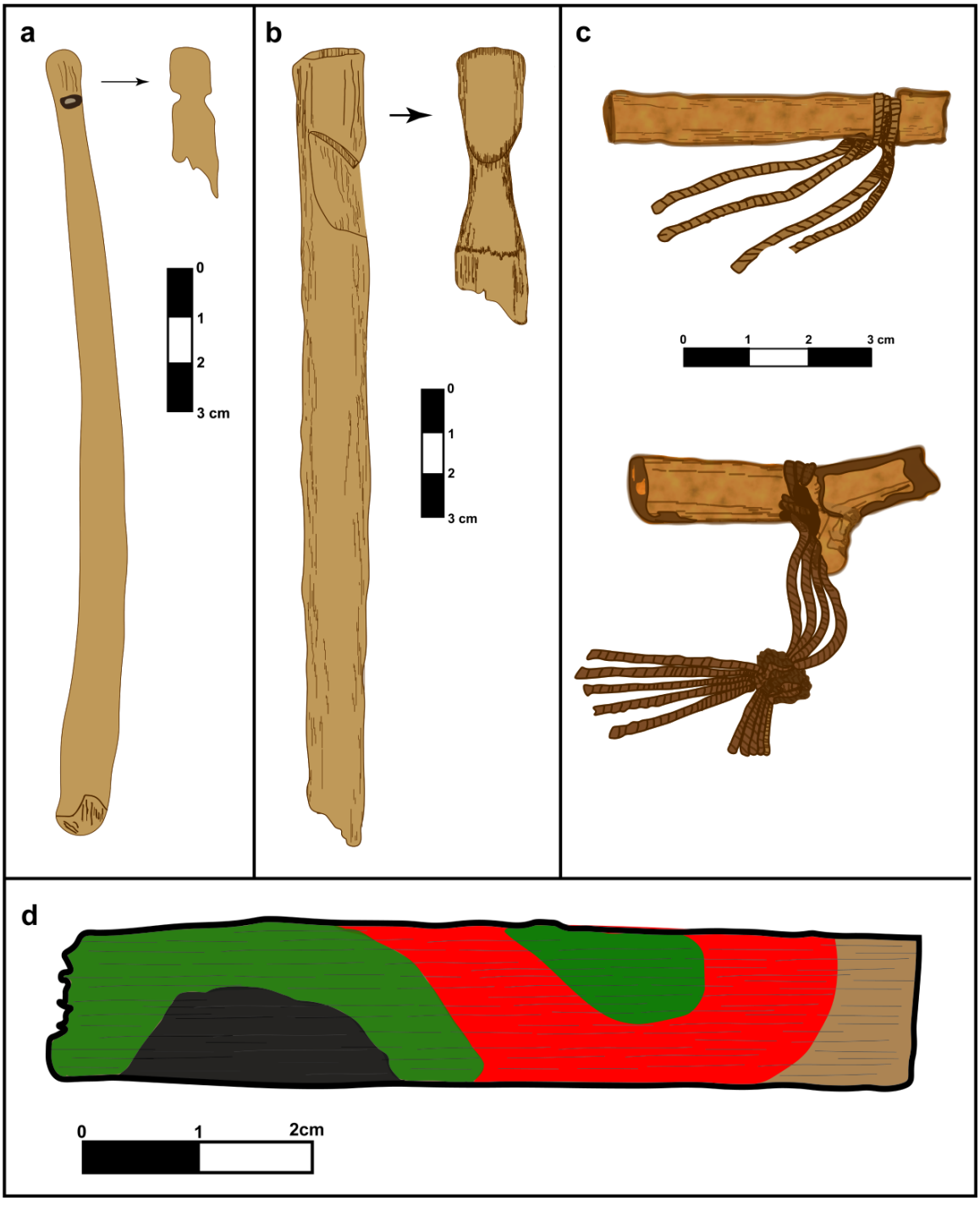


Figure 7.7. Artifacts from the Stailey Cave Cache: (a) partial bow showing nock (after Lekson et al. 1971:11, Figure 5a); (b) "roundel *paho*" or stub *paho* (after Lekson et al. 1971:9, Figure 3b); (c) cane cigarettes (after Lekson et al. 1971:18, Figure 8a–b); (d) *tablita* fragment, possibly of a Goggle-Eye figure (after Lekson et al. 1971:11, Figure 5c).

In January 1971, Stephen Lekson was working on excavations at several sites in the Cliff Valley area of the Gila drainage under Principal Investigator James E. Fitting. During this project, several local residents served as volunteer excavators, among them one Dennis Stailey. At some point, Stailey invited Lekson and others to view his personal collection, which included an assemblage of materials that allegedly came from a cave in Greenwood Canyon, nearby to but separate from the site visited by the Cosgroves and Kidder and described in the previous chapter (Lekson et al. 1971:4). Stailey agreed to allow Fitting's students to take this collection back to Case Western University in Cleveland, Ohio, where they examined it at length and then returned it in June 1971 (Lekson et al. 1971:3). The assemblage is described in a brief report published shortly after, with simple line drawings by Lekson, several of which I have reproduced in Figure 7.7 with color added according to the original descriptions. Stailey's collection contained many of the items that typify the offertory assemblages of other cave shrines in the Gila drainage, including *pahos*, fragmentary *tablitas*, cane cigarettes, arrows and darts, and both full-size and ceremonial bows (Figure 7.7). Notably, Lekson and colleagues do not report any sandals from this collection, although that does not mean they were not present at the site.

Although the specific provenience of this assemblage remains unavailable, the possibility that it came from Greenwood Canyon, near one of the most important of all Mimbres ceremonial caves, potentially increases the significance of these materials, as

Greenwood Cave was looted in the 1870s, and most likely repeatedly after, with its very large assemblage almost completely lost (see Chapter 5). Indeed, it is entirely possible that Dennis Stailey's collection came from Greenwood Cave itself—perhaps he even obtained these pieces from Metcalf's collection. Experience shows that local residents often confuse or deliberately obfuscate cave locations when discussing them with archaeologists.

The dimensions that Lekson and colleagues report for this cave, as received from Dennis Stailey, would make it recognizably smaller than Greenwood Cave, although the documented assemblages from both sites are broadly similar. Notably Lekson and colleagues (1971:7–8) report an atlatl dart foreshaft and an atlatl dart mainshaft in Stailey's collection, and no artifacts from the atlatl/dart/fending stick complex are listed for Greenwood Cave. Nor do any sources describe any rock art or human remains at Greenwood Cave; i.e. all the likely markers for Archaic shrine use are absent there. If this information represents an accurate representation of depositional practices at the two caves, possibly Stailey's cave saw earlier use than the larger Greenwood Cave. However, it is important to remember that Greenwood Cave was heavily looted in the 1870s, so only a fraction of its original assemblage has been reported. Greenwood Cave could also have contained items from the atlatl complex, as well as other objects dating to the Late Archaic or Early Pithouse periods, but Metcalf and/or other early visitors likely removed any such evidence. Nor has that cave been examined for rock art using modern techniques.

Lekson reports that Fitting indeed went on to excavate the Stailey Cave; Lekson himself claims to have worked on this project for a single day and found it extremely

unpleasant due to airborne dust. It is possible that Lekson worked instead on the excavations in The Cave of the Ollas in Dark Thunder Canyon, which Fitting reported the following year (Fitting et al. 1972), a steep, dangerous, and very dusty cave in which the excavators had to hold on to a safety line during their work (I discuss this site in the next chapter). The assemblage from this site was anomalous among Mogollon shrines, consisting primarily of whole ollas buried in the sediments of the cave. However, Fel Brunett, who led some excavations under Fitting and possibly conducted others on his own afterward, excavated at least one other cave in the region that yielded a perishable assemblage more like those from sites described in Chapter 5 (Jakob Sedig, personal communication 2023). The location(s) of Brunett(s) cave excavation(s) are unknown, so it may be that he dug in the same cave from which Stailey acquired his collection.

The Importance of Alienated Cave Assemblages

Both the Spokane Bird and the Cliff Valley Cache demonstrate a special kind of prehistoric cave use which is distinct from the annual, seasonal, or otherwise regular deposition of repeated offerings such as prayer sticks, arrows, sandals, and cane cigarettes/tubes: the terminal deposition of sacred objects. These objects potentially represent what Walker originally termed “ceremonial trash” (1995:67–79) and others have subsequently and more felicitously reframed as “ceremonial discard” (Bayman 1995:37–63; Van Keuren and Roos 2013:615–625). Objects that have undergone ceremonial discard represent sacred artifacts that were deposited in a liminal space—such as a cave, rockshelter, or riverbed—at the end of their cultural biographies and use-lives.

This disposal can occur because their physical condition has deteriorated in such a way that they are no longer usable in ceremonies, or because the last ceremonialist who understood their use passed away without imparting knowledge of the particular ceremony to an apprentice or heir. This pattern of behavior can explain the presence of other unique objects in caves of the Mimbres region (and elsewhere in the NW/SW).

An alternative possibility is that such objects were cached in caves by a ceremonialist with the intent of retrieving them for ceremonies that occurred annually, seasonally, or on an as-needed basis, and that ceremonialist passed away without revealing the location of the objects—or of the medicine bundle that contained them. This situation appears to be the case with four stone effigies from Pecos Pueblo recovered by Kidder (1932:86–91) and a fifth found by Lambert (1957: 93–108). So much of the population of Pecos died during plagues and/or raids by Plains groups that in 1720, the handful of survivors expatriated to Jemez Pueblo, which was the only other Towa-speaking community remaining at that time.

Either way, this practice represents a depositional pattern distinct from the regular deposition of offerings in caves, which is so clearly evidenced in the Mimbres region. It also demonstrates strongly the emic regard for caves (and rockshelters) as liminal spaces which were both accessible by beneficent supernaturals of the underworld and spiritually removed from people living under the sun. Such placements would prevent powerful objects from bringing harm to those uninitiated in their appropriate uses.

Reconstructing Provenience and Provenance

Museum collections contain many unique objects from the SW/NW that lack provenience and/or complete provenance. Although these artifacts do not present the ethical barriers to analysis and publication that objects in private collections do, artifacts without provenience, no matter how visually spectacular or appealing to museumgoers, retain limited archaeological data and rarely become the subjects of systematic study. Conversely, other artifacts and even entire collections from identifiable sites have been lost to private collectors and the antiquities market. Although most archaeologists consider these to be "lost causes," it is often possible to extend and sometimes even to complete the chain of provenance and to reestablish the relationship between an artifact and its find-site. Even when we cannot fully reestablish provenience, such efforts can still enhance our knowledge of the archaeological record, and any additional information obtained in the process potentially holds special value for tribes working to preserve their cultural heritage.

The embedded theoretical foundations of our discipline, as well as its practical and financial limitations in both academia and Cultural Resource Management, quietly but powerfully circumscribe the subjects of our research, especially in terms of scale. Research decisions always represent compromises, and it does not take long in the field before every archaeologist accumulates an array of interesting and worthwhile topics large enough to equip a legion of graduate students with the material for dissertations and theses, only to have to relegate them to the backburner. Many of these research-topics-less-pursued involve artifacts and/or assemblages snatched from the purview of scientific study by looters, and/or the sites from which recovered artifacts were stolen.

In the SW/NW, Indigenous communities and Spanish settlers alike left most archaeological sites undisturbed from the time of the first entradas through the Treaty of Guadalupe Hidalgo in 1848. Only with the large-scale forced removal of Athapaskan groups from much of New Mexico and Arizona in the latter half of the nineteenth century did Anglo-American settlers obtain access to many sites in the region. The commoditization of prehistoric materials and concomitant wholesale looting proceeded quickly afterward, with massive damage to and outright destruction of sites preserved for centuries, including many sacred locations actively visited or even still in regular use by descendant communities. Nonetheless, partial records of some of these sites survive, even if only in the memory of Indigenous elders, longtime residents, and/or veteran archaeologists. Experience shows that even the smallest trace, though it does not always lead to a complete chain of provenance, will, if pursued, almost always allow for at least the partial reconstruction of that record. The additional data recovered in this way can expand our knowledge of the original condition of sites and artifacts. When the chain can be completely reestablished, the increase in the scientific value of these artifacts for potential study can be significant.

In a conference presentation several years ago, I reported varying levels of success in extending the chains of provenance for several unique artifacts and assemblages (Nicolay 2018). These cases fall into five categories or scenarios, which are outlined in Table 7.1 below.

Table 7.1. Scenarios for the Reconstruction of Provenience/Provenance.

Type	Site/Provenience	Provenance	Artifact(s)	Current Location	Formula
1	unknown	incomplete	documented	unknown	**S?→A?**
2	known	incomplete	documented	unknown	**S→?A?**
3	unknown	incomplete	documented	known	**S?→?A**
4	known	incomplete	documented	known	**S→?A**
5	known	complete	documented	known, privately held	**S→[A]**

One can proceed either from the artifacts or the site, but all these scenarios depend on some knowledge of the artifacts, or at least of their existence, whether or not any knowledge of their original provenience survives. Obviously, the looting and/or outright destruction of many sites has occurred without the preservation of any information regarding their archaeological records. In such cases the initial recovery of some knowledge about the artifacts themselves, even if their current location is unknown, becomes the starting point for the potential reconstruction of provenience and provenance.

The five examples discussed in this chapter all belong to the third category of Table 7.1, in that their original provenience—i.e. the cave from which the artifacts were taken—remains unknown, but the artifacts themselves are documented and potentially accessible for study. Moreover, in each of these cases, at least some information remains available regarding the find-sites for these materials, meaning that the potential exists to reconstruct their full provenience and provenance. Alternately, virtually all the caves in Chapter 5—as well as Bear Creek Cave (Chapter 6) and the Jornada Mogollon cave shrines discussed in Chapter 4—belong to the second category, as significant quantities of cultural materials were taken from these sites prior to any systematic archaeological

excavations, and the locations of these materials remain unknown. The most important of these is probably Greenwood Cave, from which James K. Metcalf removed the reported equivalent of “two wagon loads” of artifacts, including such potentially diagnostic objects as “carved images” and “crockery” (Anonymous 1878). Efforts either to locate artifacts estranged from their provenience, or forgotten and/or unrecorded find-sites, are important and should continue. Experience has shown that regardless of whether it is possible to complete the chain of provenience and provenance in these cases, it is *always* possible to add additional links thereto, a process that can eventually provide researchers with the final clues.

Chapter 8: Outside the Paradigm: Anomalous Caves and Related Landscape Features of Cultural Significance in the Mimbres Mogollon Region

This chapter considers three additional caves and three related landscape features that exhibit characteristics outside the general paradigm of cave shrine use in the Mimbres Mogollon region, yet which still exhibit possible evidence of shrine use or at least general cosmological significance. A fourth cave included here, U-Bar Cave, clearly *does* fit the pattern employed in Chapter 5 for the identification of cave shrines, but its use as a shrine largely appears to belong to periods before and after but not during the Mimbres Classic, and its location is far in the southern periphery of the Mimbres region. Prehistoric utilization of the other three cave sites either appears to belong to the Late Archaic and/or Early Pithouse periods (Map Cave and Beehive Cave), or simply does not fit any identifiable pattern (The Cave of the Ollas). Despite the potential significance of all these sites, most of them—with the exception of U-Bar Cave—have received little attention from archaeologists.

The remainder of this chapter examines three other sites that were clearly part of the sacred landscape of the Mimbres Mogollon region: Faywood Hot Springs, Canador Peak, and Cookes Peak. All these sites likely played roles in Mimbres cosmovision at least partly analogous to the cave shrines described in Chapter 5, and comparison of the archaeological records of both groups of sites has the potential to expand our understanding of these cultural phenomena. Ultimately these additional sites help to extend and define the parameters of Mimbres cave ceremonialism in both time and space.

Part 1: Anomalous Caves of the Mimbres Mogollon Region

Map Cave (LA 19134)

Figure 8.1. Map Cave, Grant County, New Mexico: (a) the Map Cave outcrop; (b) rock art panel in the shelter, painted with white shoe polish by an amateur photographer (cupules and mortars visible at lower left); (c) outline-cross "Venus" motif on far right of panel; (d) cupules and bedrock mortars (photos courtesy of Marc Thompson).

Map Cave has long been well known to residents of the Mimbres region, but the site has received little scientific attention, and although the Cosgroves apparently visited it, they did not include it in their published survey (Carolyn O'Bagy Davis, personal

communication 2023). Unfortunately, any recorded visits there from archaeologists came too late to recover much data on any features other than the rock art (Russell et al. 1998).

The cave itself, actually a shallow rockshelter, is located near the town of Hanover, approximately 12 km southwest of Silver City and about 100 km south of the confluence of Lampbright and Rustler Canyons. Waterflow in the adjacent canyons is seasonal and significant during wet years. Map Cave occupies an isolated outcrop of Sugarlump Tuff (Russell et al. 1998) (Figure 8.1a).

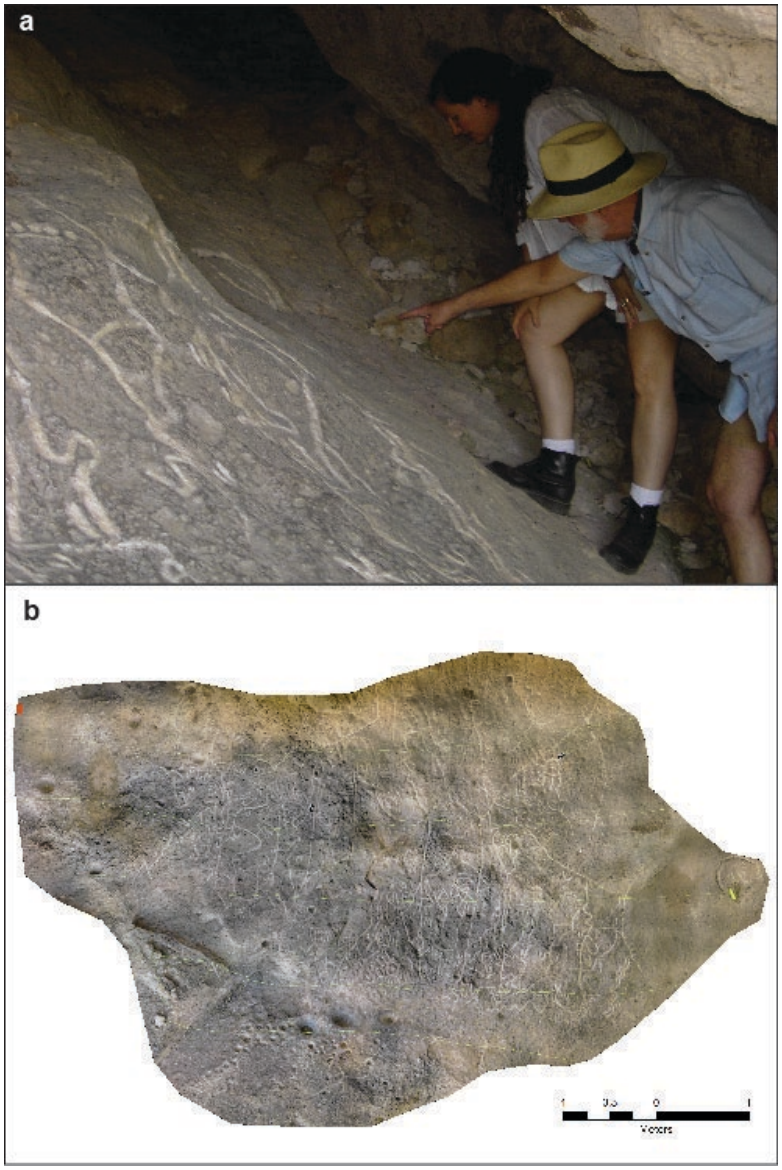


Figure 8.2. Map Cave rock art: (a) archaeologists Lora Jackson and Marc Thompson examine the rock art panel in Map Cave (photo by Marc Willis); (b) photogrammetric reconstruction of Map Cave rock art panel, including cupules and bedrock mortars, by Marc Willis.

The main feature of this site is an elaborate and unique petroglyph panel that covers a sloping area of the cave floor "about 7.5 m east–west by 5.5 m north–south" (Thompson and colleagues 2006) (Figure 8.1b, Figure 8.2a–b). This panel incorporates "a bewildering array of human stick figures (3), footprints (3), U-shaped symbols (ca. 25), and many connecting lines" (Thompson et al. 2006). The style of this panel is unusual but its largely abstract nature suggests that it mostly belongs to the Late Archaic period. However, Thompson and colleagues (2006) identify an outline-cross motif on the far right side of the panel, commonly recognized as a Venus symbol, as a later addition (Figure 8.1c). Three bedrock mortars and several dozen cupules are also present along with some *huecos* (basins in the rock surface that hold water)—the latter probably natural (Figure 8.1d, Figure 8.2b).

The branching and interconnected nature of the motifs in the large petroglyph panel have led to the site's name. Some local residents have interpreted this panel as a map to buried gold, which has led to extensive digging in front of the site (Russell et al. 1998). Between these activities and natural erosion that occurs during flood years, few portable artifacts remain, and any associated stratigraphy has been destroyed. Thompson and colleagues report three sherds in front of the panel, one each of Alma Plain, San Francisco Red, and Mimbres B/w Style I (2006). Usage of the site probably dates to the Late Archaic and possibly also the Early Pithouse period, but the limited associated artifact assemblage makes it difficult either to assign the chronological context of Map

Cave with more specificity, or to hypothesize the nature of its prehistoric use. Nonetheless, the presence of an elaborate rock art panel and cupules in an Earth opening site point to some cosmological importance and possible use as a shrine. The bedrock mortars, and potentially also the cupules, potentially point to use by women. However, comparison to other sites with Late Archaic rock art, including the Doolittle Cave Complex, Saddle Mountain Cliff Ruin, and the next site, Beehive Cave, suggests some similarities and the possibility of a pattern for Late Archaic cave use in the region.

Beehive Cave, a.k.a. Beehive Rock (LA 131326)

Slightly more data is fortunately available for Beehive Cave. Like Map Cave, this site is an isolated bedrock outcrop, in this case of the Gila Conglomerate formation, but larger and more complex than Map Cave, with more cultural features. Also, at least at the time of its recording by Meade Kemrer and Wade Corder between August 29 and September 2, 2000, its archaeological record remained more intact (Figure 8.3a–b). Located northwest of Virden in Hidalgo County, just north of the Gila River near the contemporary New Mexico-Arizona border, Beehive Cave incorporates multiple rockshelters, grottos, alcoves, and cliff dwellings (Kemrer and Corder [2000] use some of these terms interchangeably). Several of these features contain small, walled-off areas at their backs, suggesting that they served as shrines similar to some of those discussed in Chapters 3 and 4, such as Feather Cave, Chavez Cave, and Red Bow Cliff Dwelling, as well as in U-Bar Cave, which I discuss later in this chapter. Pictographs, petroglyphs, cupules, and bedrock mortars are all present at Beehive Cave (Figure 8.4a–b).

Figure 8.3. Beehive Cave, Hidalgo County, New Mexico: (a) Beehive Rock, an isolated outcrop of the Gila Conglomerate; (b) main shelter, Beehive Cave (photos courtesy of Chris Turnbow).

Based on the lithic and ceramic types present, Kemrer and Corder (2000) identify use of Beehive Cave as extending from the San Pedro phase of the Archaic (ca. 1200–800 BCE) at least through the end of the Mimbres Classic (ca. 1130 CE). However, ceramics at the site, predominantly Alma Plain and San Francisco Red, belong primarily to the Early Pithouse period. They also report a Shumla projectile point from one of the alcoves (Kemrer and Corder 2000:4). This point is a distinctive Middle Archaic (ca. 3000–2200 BCE) type, known primarily from Coahuila and adjacent regions of southwest Texas, including Val Verde, Hudspeth, and Culberson counties. Shumla points have been reported from the Jornada Mogollon region, but if this identification is correct, it could be the only reported example of this type from the Mimbres Mogollon. However, Kemrer and Corder do not provide a photo of this point, so it might be a similar local type from the Late Archaic.

The multiple rockshelters and alcoves that Kemrer and Corder report from this site suggest that it served a variety of purposes in prehistory. The presence of bedrock mortars opens the possibility that one or more of the site's Earth openings served as women's retreats (for menstruation, birthing, and/or other gender-exclusive activities). The presence of grinding features is one of several elements that compose the paradigm that Claassen (2011) has proposed for rockshelters that served in this way in the southeastern United States. Although women's retreats have received little attention in the SW/NW, Guernsey and Kidder reported "great numbers" of "aprons" found "in all dry caves which had been occupied by the Basket-maker III people" in northern Arizona

ca. 500–750 CE (Guernsey 1931:75–76; Guernsey and Kidder 1921; Kidder and Guernsey 1919).

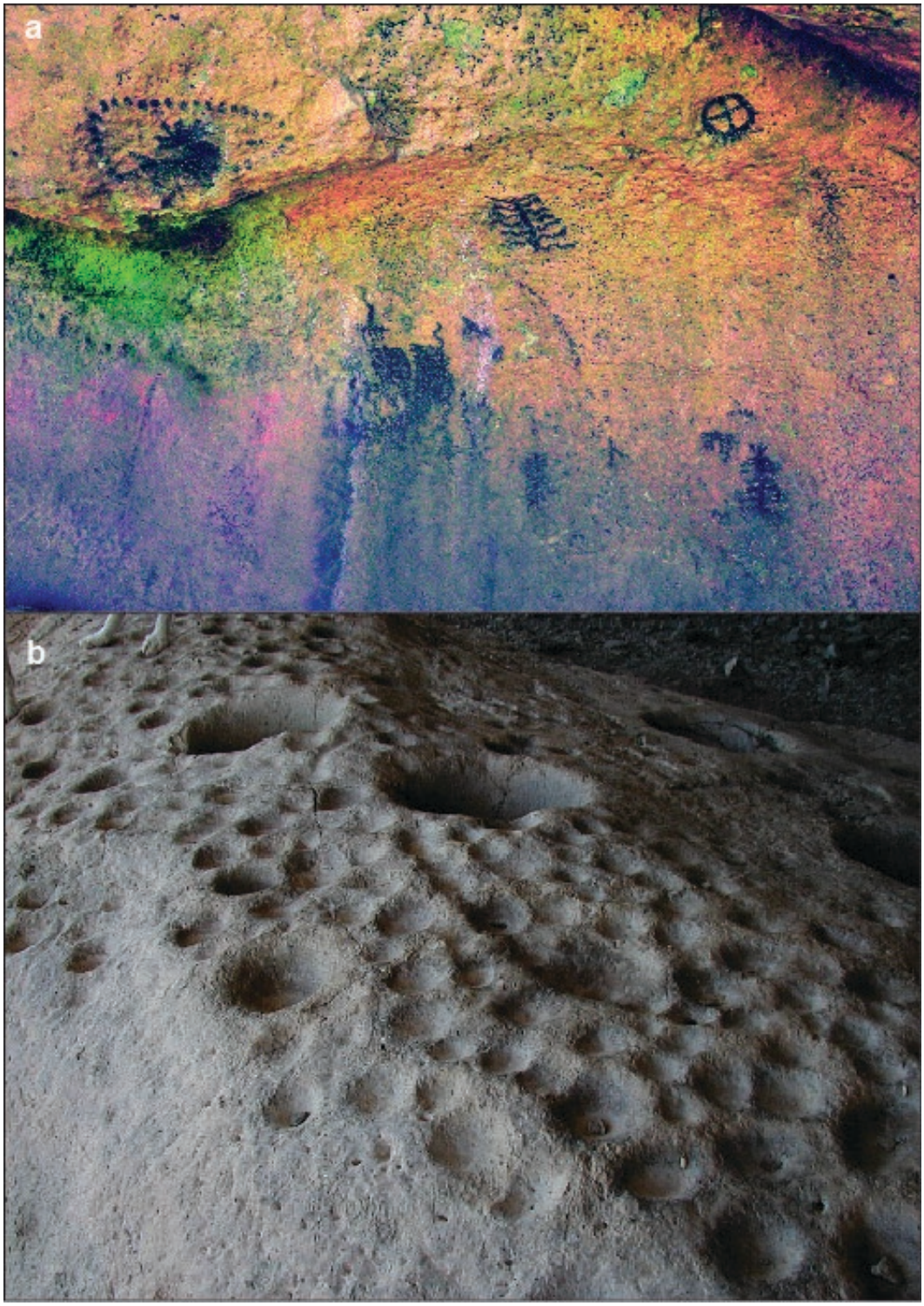


Figure 8.4. Beehive Cave, Hidalgo County, New Mexico: (a) geometric/abstract rock art motifs, DStretch ybk; (b) bedrock mortars and cupules (photos courtesy of Margaret Berrier).

According to Guernsey, almost all of these aprons "bear evidence of use as menstrual pads" (1931:76). In the Mimbres region, Room 91 at the NAN Ranch contained an unusual number of randomly-distributed small pits that could have been utilized for the burial of umbilical cords (Barbara Roth, personal communication 2011; Shafer 2003:49, Figures 4.11 and 4.12; Shafer, personal communication 2011). Shafer also suggests that NAN Ranch Room 39 was devoted to the "ritual activities of women" (2003:80), and that another feature in the east room block courtyard at that site served as "a temporary birthing or menstrual site" (2003:82). Although the available data does not allow for the full consideration of Claassen's paradigm for Beehive Cave, Kemrer and Corder report another interesting feature from Alcove 10, "a 1 x 1.3 m cluster of stone slab and cobbles" which they suggest "may represent a hearth or roasting feature, but its functional nature remains uncertain" (2000). This could be a steam bath feature for postpartum women.

Map Cave, discussed above, also has three bedrock mortars, which are located in front of the petroglyph panel in front of the shelter. The archaeological records of both caves point toward use primarily during the Late Archaic and/or the Early Pithouse periods. Two of the three sites in the Primary Dataset with associated rock art, the Doolittle Cave Complex and the Saddle Mountain Cliff Ruin, also show evidence of use predating the Late Pithouse period.

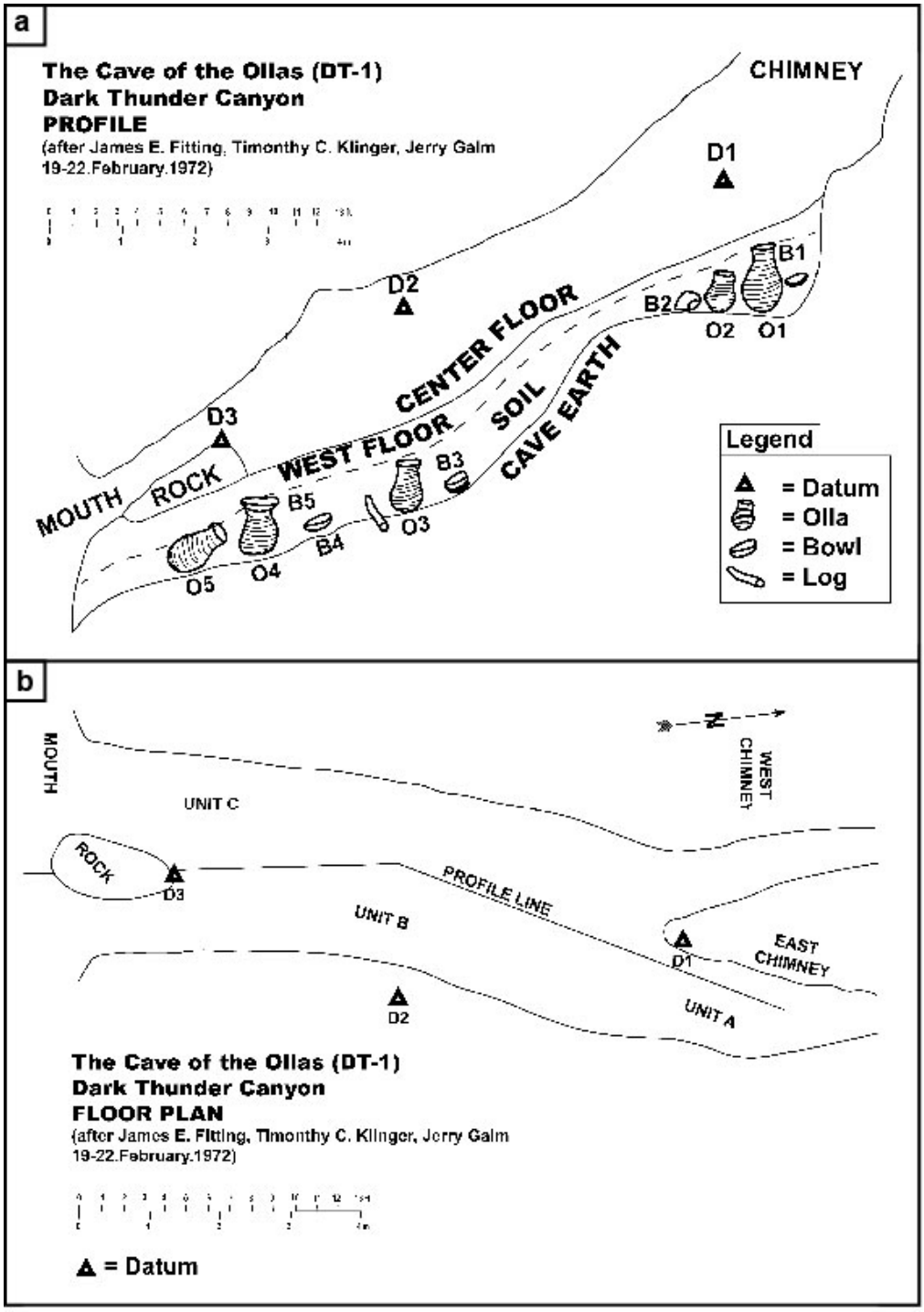


Figure 8.5. The Cave of the Ollas in Dark Thunder Canyon, Catron County, New Mexico: (a) profile; (b) plan (after Fitting et al. 1972).

The Cave of the Ollas presents as the most extreme outlier of all the sites discussed herein. Its precipitous morphology—an internal 25-degree slope—eliminates any possibility that it ever served domestic purposes, even as a temporary camp, but its unique archaeological record does not resemble that of any other cave shrines in the Mimbres Mogollon region. The site is located in Dark Thunder Canyon, on the southern slope of Yellowjacket Peak, approximately 30 km west of the modern town of Cliff and 5 km from the Arizona border. Its proximity to the York-Duncan Valley to the west opens the possibility that people who used it in prehistory came from that subregion of the Mimbres Mogollon, but the available evidence is currently inadequate to confirm that hypothesis.

James E. Fitting, then with Case Western University, excavated this site with his team in February 1972, after it was reported the previous September by two USFS agents who had removed "a complete corrugated olla and noted several others" (Fitting et al. 1972:3). Due to the extremely steep internal profile of the cave and a drop of nearly 11 m down the cliff face beyond the lower entrance, Fitting and his team employed a safety line run through the cave, which they clung to throughout their excavations (Figure 8.5a–b). They describe the cave itself as "more of a chimney than a true cave. It had been formed by errosion [*sic*] and shifting of large blocks of conglomerate" (Fitting et al. 1972:24).

Fitting's team recovered four additional ollas from the cave, making a total of five together with the one removed earlier by the USFS rangers. Each of the ollas was accompanied by a bowl that probably served as its cover, suggesting that they were not empty when deposited in the cave but instead contained some contents that required a

degree of protection. One olla rested on the remains of a yucca mat that was attached to what could have been a carrying frame (Fitting et al. 1972:29, 49–50). Aside from a coiled basket found inside another olla, these vessels contained only "oak leaves, cave earth, and rodent droppings" (Fitting et al. 1972:29). All the ollas were unpatterned corrugated wares; although Fitting and colleagues do not identify them to type, they were probably Reserve Plain Corrugated, a type used (and locally manufactured) throughout the Mimbres region during the Mimbres Classic and for a century or more afterward in the Tularosa region to the north. The bowls were either plainwares or similar corrugated types; one was recycled from the base of a corrugated vessel (Fitting et al. 1972:45-50). The only other significant artifact recovered from the cave was a small "log," which could have been employed in two-person transport of the jars.

Altogether, Fitting's team surveyed 58 rockshelters of varying size in Dark Thunder Canyon. Although they identified as many as 23 of these sites as showing evidence of prehistoric use (including simple rock art in several of the shelters), few contained any significant portable artifacts, and none displayed an archaeological record remotely comparable to The Cave of the Ollas (Fitting and colleagues 1972:23). This extremely steep cave, with five covered ollas embedded in its substrate, seems to be unique not only in the Mimbres region, but also in the SW/NW overall. Fitting and colleagues observe that this site "differs from both habitation sites and typical shrine caves" and ultimately suggest that it "was probably used for storage although…we do not know what was stored there" (Fitting et al. 1972:31), and I agree with their conclusions. However, Davis and Humble published a photo of six ollas of similar size "found by 'Young' Wells in Yellowjacket Canyon near Mule Creek" (2013:15). The condition of

these ollas, especially the fact that at least one still has cordage wrapped around its neck, means that they almost certainly also came from a cave—and the location given is very close to the Cave of the Ollas. This means that Fitting's cave had at least one twin, and both were in the vicinity of Yellowjacket Peak. The Cosgroves also recovered a single olla with a "loosely woven yucca carrying net" from the Bat Cave chamber of Steamboat Cave (1947:10–11). As that site had been heavily disturbed, it is possible that it too contained multiple ollas at one time.

The question then becomes "*What* was stored in the five ollas in this cave?" Caves and rockshelters are terrible places for grain storage, as they are frequently home to rodents. One unusual possibility presents itself however: evidence from both the NAN Ranch and Harris Village suggests that the Mimbres engaged in production there of fermented beverages based on both corn and agave, and possibly also wild grapes (Roth and Baustian 2015:456–458; Shafer 2003:76). The number of ollas recovered by Fitting's team is consistent with a fermentation project. Vessels employed in this process exhibit distinctive internal pitting, but unfortunately Fitting's collections are lost, and his report does not describe the interiors of the vessels his team recovered, making confirmation of such use impossible.

Although this precarious and difficult to access cave seems an unusual location for making corn beer, it would have presented the same challenges to the people who deposited the five ollas within it, regardless of their contents. As even small caves and rockshelters maintain a relatively constant temperature year-round and stay cooler than the outside air, one possibility is that already-fermented maize or agave beer was stored in the cave, rather than that the cave was used for active fermentation. Another possibility

is that tradition required the disposal and/or storage of fermentation vessels and their lids in such a liminal space, in which case they could have been placed in the cave in an empty state as either a temporary or a terminal deposition. Thus, if the selection of this site had any cosmological aspect, perhaps that was determined by its nature and location. Nonetheless, The Cave of the Ollas does not seem to have served as a shrine, at least not in any way similar to the dozens of others recorded in the SW/NW.

U-Bar Cave (LA 5869)

Figure 8.6. Entrance to U-Bar Cave, Hidalgo County, New Mexico, showing damage by guano miners who enlarged the cave entrance with dynamite (photos by John and Mavis Greer, courtesy of Greer Services).

U-Bar Cave is one of the best-known and most important cave shrines in the SW/NW. Moreover, it is a genuine dark zone cave, formed by solutional processes in a

limestone outcrop “on the northwest side of the Alamo Hueco Mountains” of the New Mexico Bootheel in Hidalgo County (Lambert and Ambler 1965:11). Although not a large cave by speleological standards, at almost 90 m long, it is the deepest reported cave shrine in the Mimbres region (Figures 8.6 and 8.7). Its archaeological record contained all of the artifact categories employed herein to identify cave shrines, along with several other rare and/or unique objects that reflect its considerable prehistoric importance (Lambert and Ambler 1965). Table 8.1 shows the temporal range of activity, both prehistoric and historic (including archaeological research), in U-Bar Cave.

Table 8.1. Timeline for U-Bar Cave Activity.

	Dates/Date Ranges	**Activity Type**
BCE	**ca. 35,000–11000**	accumulation of Pleistocene faunal remains
CE	**ca. 720–980**	calibrated date on culturally burned wood (Greer and Greer 1999:13)
	ca. 1185–1275	calibrated date on goggle-eyed “Tlaloc” effigy (Miller et al. 2023:15)
	1934	modern rediscovery; removal of arrow shrine components by Phoebe Carter
	1951–1952	reconnaissance and surface collection by Paul Reiter and students (UNM)
	July 27-September 1, 1960	systematic excavations by Lambert and Ambler; report published in 1965
	Ca. 1965–1982	extensive guano mining and blasting of original entrance
	1984–1986	paleontological research by Arthur Harris
	March 1984 and April 1986	archaeological excavations by Curtis Schaafsma
	1996	rock art study by John and Mavis Greer

The first published record of U-Bar Cave comes from an article in *The Deming Headlight* (McGraw 1960:9). Although this publication identifies the site as “Lost Boy Cave,” multiple aspects of its description of the site, its location, and its archaeological

record make it easy to recognize the cave as the same one Lambert and Ambler identified as "U-Bar Cave" a year later, due to its association with the U-Bar Ranch, approximately 4 km to the south (1965:11). Most notably, this early article describes both the modern rediscovery of the cave in 1934 and what was then its most distinctive feature: "a couple dozen arrow shafts sticking up like porcupine quills around a rock formation" (McGraw 1960:9). This information is not present in Lambert and Ambler's book, although they included a photo of the feature, which appears to contain at least two unworked sticks that are not arrows, possibly *pahos* in addition to the arrows (1965:16–17, Figure 10). The "rock formation" was actually a repositioned speleothem, although it is not clear whether it was a stalagmite or a stalactite, or whether it even came from the same cave. Lambert and Ambler also note that arrows were found inserted into many cracks in the roof and walls of the cave, but that these had all been removed by the time of their excavations (1965:16).

Although all elements of that primary arrow shrine were long gone by the time of Lambert and Ambler's excavations, the news article identifies a Mrs. Clyde Watson (*née* Phoebe Carter) as the person who removed its components and states that she or her family eventually donated them to the Texas Western College Museum (McGraw 1960:9), in which case they should now be at the University of Texas at El Paso Museum. Unfortunately, attempts to locate any collections from U-Bar Cave at the latter institution have been unsuccessful thus far. McGraw also reports baskets, three gourd rattles, and an atlatl. The presences of an atlatl suggests that the cave also experienced use as a shrine during the Early Pithouse period or even the Late Archaic—and if that identification is correct, it would make it only the second atlatl reported from the greater Mimbres region

(along with the partial example from Chavez Cave, near the Rio Grande, which is discussed in Chapter 4). Lambert and Ambler report that no evidence of the arrow shrine remained at the time of their excavations (1965:16–17, Figure 10).

UNM archaeologist Paul Reiter and his students conducted a brief reconnaissance in U-Bar Cave in the early 1950s, around the same time he supervised the excavations of Feather Cave and *wahaniak shukuk shtuitauw*, but no publication resulted from these efforts (Lambert and Ambler 19651:13). Lambert and Ambler conducted systematic and extensive excavations in U-Bar Cave from July 27 to September 1, 1960, and their work is the source of most of the available archaeological data on this important site (Lambert and Ambler 1965:13). U-Bar Cave is also a significant paleontological site that has yielded remains of many Pleistocene vertebrates, some of them extinct (Greer and Greer 1999:12–13; Harris 1985). The left femur and tibia of a 19–20 year-old male were also found near the west wall of the cave, along with other, more fragmentary remains apparently of the same individual (Lambert and Ambler 1965:98). The presence of human remains likely points to Late Archaic activity.

Lambert and Ambler (1965:13–18) report a general "ceremonial area" near the entrance of this cave that yielded many significant objects, including *pahos*, a necklace, and a small painted *tablita* depicting the goggle-eyed "Tlaloc" figure (1961:16–17, 77–78). This effigy is colored identically to the one described in Chapters 3 and 4 that almost certainly came from Feather Cave, but its overall morphology is different, and it has spots painted on its back that may represent raindrops and/or jaguar spots (Figure 3.4a–b). Only four such effigies have been recovered from the SW/NW, and the U-Bar example has the best provenience. Miller and colleagues recently obtained a 14C date for this

figure of cal 1185–1275 CE (2024:15), placing its deposition sometime after the end of the Mimbres Classic. The Bootheel Several was host to several major communities during this time, including the Pendleton and Joyce Well sites. Thatcher Seltzer-Rogers suggests that this effigy was probably placed in the cave by Black Mountain phase people (personal communication 2023).

Only a few meters to the west of this assemblage, Lambert and Ambler uncovered a cache that included the most intact rabbit net ever recovered in the SW/NW, 46 m (151 ft) long and 1.5 m (5 ft) wide and made with human hair, and a large burden basket that contained two pelts of the ringtail "cat" (*Bassariscus astutus*), an animal whose remains have rarely been recovered from archaeological contexts in the SW/NW (Lambert and Ambler (1965:18–19).

The ceramics that Lambert and Ambler report from U-Bar Cave appear to form two clusters: one during the Early Pithouse Period and the other from the Mimbres region's post-Classic occupation. The earlier group includes Alma Plain (10 sherds) and San Francisco Red (eight sherds), while the later cluster included Playas Red Incised (eight sherds) and El Paso Polychrome (25 sherds) (1965:8, Table 3). This bimodal distribution suggests the possibility of a hiatus in use during the Late Pithouse period and the Mimbres Classic phase. However, there remains the ca. 720–980 CE date that Harris obtained from a piece of culturally-burned wood (Table 8.1), which suggests that some site use continued at least into the Late Pithouse period. The absence of ceramics from the Mimbres B/w sequence does not necessarily mean a lack of use during the Mimbres Classic, only the lack of identified diagnostic artifacts from this time. Nonetheless, the possibility of a decrease or full hiatus in use during the Mimbres Classic is intriguing in

light of the apparent intensification of cave shrine use in sites to the north. The best interpretation of the available evidence at this point is that use of U-Bar Cave as a shrine languished during the Mimbres Classic and did not achieve its peak until the post-Classic Black Mountain phase, and that its importance potentially ended with that phase, despite ongoing settlement activity in the Bootheel.

Schaafsma and Schaafsma presented a paper on U-Bar Cave at a session on cave ritual in the SW/NW that I organized during the 2007 SAA Meeting. They based this presentation on fieldwork conducted in the cave by Curtis Schaafsma during 1984 and 1986. Although cultural deposits in the site had undergone serious attrition by that time due to ongoing looting, previous excavations, and guano mining, Schaafsma still managed to recover a variety of significant materials, and he identified an additional sealed shrine area and a blowhole at the back of the cave, where he recovered multiple feathers of the scarlet macaw (*Ara macao*), along with objects similar to those employed on contemporary Pueblo altars.

Greer and Greer visited U-Bar Cave in 1996 in order to search for evidence of dark zone rock art there (1999:14–15). Their findings place this site among a small handful of New Mexico caves that exhibit this phenomenon: Feather Cave, Surratt Cave, Slaughter Canyon Cave, and Black Cave. I discussed the first two sites at length in Chapter 4; the latter two caves are in the Guadalupe Mountains and rock art there appears to derive from Archaic hunter-gatherer populations. These caves receive brief mention in Chapter 4.

The rock art that Greer and Greer recorded in U-Bar Cave is less complex than that reported from the aforementioned sites, especially that from Feather Cave and Surratt

Cave, both of which present complex and diverse (but mutually similar) assemblages of pictographs. Most of the U-Bar Cave motifs were simple charcoal marks made with fingers and torches (Greer and Greer 1999:15–17). The Greers do mention a handprint and a stylized bird near the entrance, motifs that recall those present in Feather Cave and Surratt Cave (1999:15–16). Most importantly, they describe a "Tlaloc mask petroglyph just outside the left side of the original entrance (as facing the cave) with the mask composed of two round circles pecked into the rock" (1999:14). Guano miners dynamited the cave's entrance in order to enlarge it sometime between 1976 and 1986, destroying this petroglyph and possibly others. This motif is especially significant, as "Tlaloc" eyes are also inscribed near the entrance to Surratt Cave, in the adjacent Salinas region to the east, as described in Chapter 4 (cf. Figure 4.8a). This makes U-Bar Cave the only site in the SW/NW where both exterior "Tlaloc" rock art *and* an effigy of this deity have been reported, although other caves could also have contained similar effigies that were removed by looters prior to any archaeological attention.

Given the presence of an arrow shrine, discrete ceremonial areas, and dark zone rock art, U-Bar Cave more closely resembles Jornada Mogollon cave shrines such as Feather Cave and Ceremonial Cave, but this similarity is to be expected somewhat from its later date as well as its deep cave morphology, which afforded opportunities for features not necessarily possible in the smaller rockshelters of the Gila and Mimbres drainages.

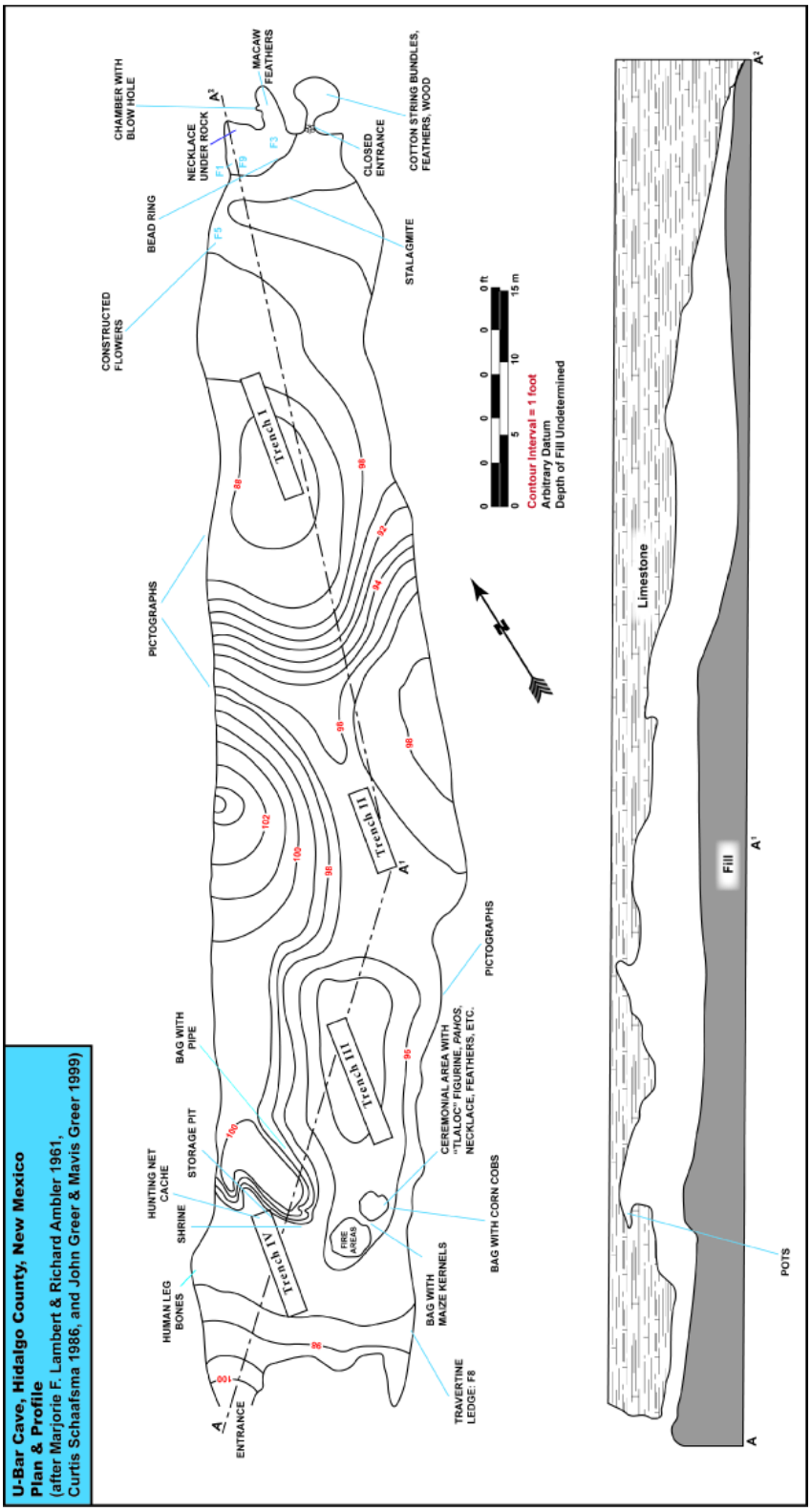


Figure 8.7. U-Bar Cave plan and profile (after Lambert and Ambler 1961, Schaafsma 1986, and Greer and Greer 1999).

Part 2: Other Landscape Features of Likely Related Cosmological Importance

Faywood Hot Springs (LA 5156)

Figure 8.8. “Pleasant Days at the Faywood Hot Springs,” August 4, 1915 (photo by Thomas K. Todsen, Faywood Hot Springs, New Mexico, courtesy of “Curative Powers: New Mexico's Hot Springs,” exhibition, New Mexico History Museum, Santa Fe).

Researchers recognized early on that springs held a special importance in Puebloan cosmovision. Ellis and Hammack are explicit regarding this significance and its connection to contemporary *Katsina* traditions: "Specific caves and small lakes are revered by various pueblos as the Shipap opening, and all springs are assumed to connect with that underworld lake whence emerge the katcina rain spirits" (1968:31). Writing half a century earlier, Hough (1914:117) reports that "In clearing out springs the settlers of the Southwest have often found small pottery, beads, shells, etc. in the debris, showing that the custom of offering to springs had been quite common." He goes on to note that the practice of "spring worship" continued into ethnohistoric times and is "very important now as it was in ancient times" (Hough 1914:117). He identifies miniature pottery vessels, like those from Bear Creek Cave and sites in the York-Duncan Valley depicted in Figures 6.7 and 6.8, as representing the most frequently encountered offerings in springs, but he also observes that perishable objects were almost certainly offered as well, although they would rarely have survived, and that beads were also very common in these sites (Hough 1914:117–118). He concludes that "spring worship is part of the general attitude held by the Pueblo Indians toward water in its several forms" (Hough 1914:118).

In the Mimbres region, the spring best known for its cultural deposits is the Faywood Hot Springs site, which is located in the southern Mimbres drainage just south of City of Rocks and close to the Eby sites and the Doolittle Cave Complex, Rock House, and Old Town. This site, also once known as the Hudson Hot Springs, became a popular resort in the early twentieth century (Figure 8.8). Most of the available information about the material culture of the Faywood Hot Springs comes from Fewkes (1914:18–19), who

illustrates two stone cloud blower pipes and an unusual (and probably early) handled mortar from the springs in the collection of one Dr. Swope (Figure 8.9). Swope's collection was on exhibit at Deming High School for many years, but sometime prior to World War II it was removed therefrom, and its location thereafter remains a mystery (Doug Achim, personal communication 2023). Fewkes also reports spearpoints and a double-bladed axe recovered from the site (1914:18). Interestingly, he does not mention any votive ceramics such as Hough described, but this omission could simply mean that the local collectors with whom he interacted had not acquired those objects. An earlier report suggests that the assemblage from the site did indeed include pottery.

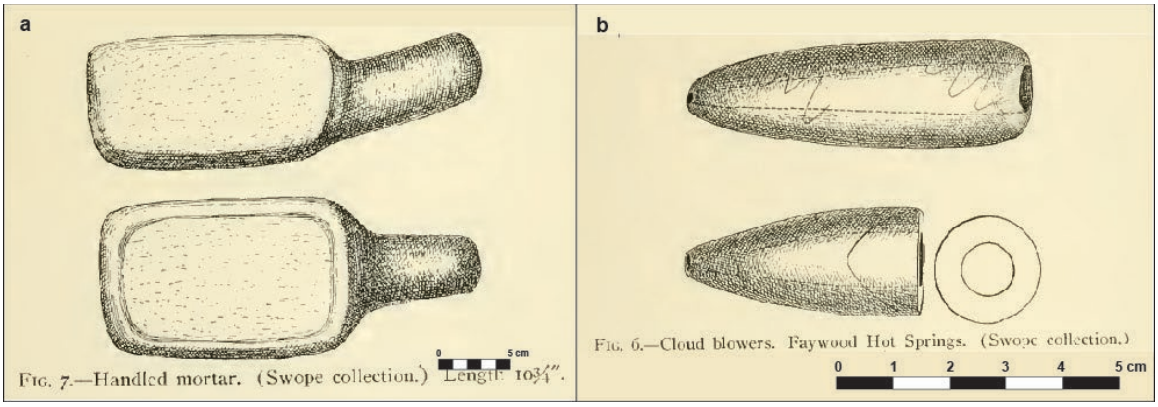


Figure 8.9. Artifacts from Faywood Hot Springs: (a) handled mortar; (b) stone cloud blower pipe (from Fewkes 1914:19, Figures 7–8).

Drawing on more direct knowledge of the dredging of the springs, Jones reports the original recovery of "several stone hammers, flint and bone implements, copper spoons, and earthen vessels . . . and last but not least, the bones of human beings" (1904:295). He also identifies one set of human remains as belonging to an Apache man who was thrown into the hot springs by a US soldier while still alive. This event occurred

ca. 1850. The soldier who committed this murder "was court martialed for this cruel offence, but was acquitted" (Jones 1904:297). This atrocity only explains one set of human remains, however, and Jones explicitly describes an NMI of >1. Unfortunately, the current location of the bones of these individuals, along with that of all other cultural materials from the Faywood Hot Springs, remains unknown. Jones' reference to "copper spoons" is intriguing. Copper crotals (tinkler bells) are known from multiple sites in the Mimbres region. If these had been deliberately "killed" or "terminated" by splitting and twisting them, they might resemble spoons.

Holmes provides additional data on this site, courtesy of a January 18, 1902 letter from one A. R. Graham of Ferro, New Mexico, which he quotes at length (1902:126–127). Graham initiated the excavation of the springs, then known as the Hudson Hot Spring, after purchasing the site from its previous Euro-American owner, Richard Hudson, in 1894 (Holmes 1902:126). Graham reports that at "the depth of twenty-six feet" he "found the spring enclosed by a wall of 'red marlite stone,' round and symmetrical as man could build." Here he "began to find Indian remains and relics of Indian art" (Holmes 1902:126–127). He reports three burials, each accompanied by "war-clubs of stone, spearpoints, arrowheads, one wooden bow, almost complete, beads, mortars, etc." (Holmes 1902:127). The presence of respectful burials so far down in the spring points to a dryer period, but the wooden bow, if Graham's identification is accurate, suggests a date no earlier than 500 CE.

Ultimately, Faywood Hot Springs clearly served as an important shrine, but its reported archaeological record reflects significant differences from other known shrine sites (human remains, copper artifacts [?], stone axes), and all this material is

unfortunately long-lost and unavailable for study. Barring the relocation of some of these objects, we have only the early descriptions of Fewkes, Jones, and Graham to go on. The alienation of the reported human remains is especially concerning, as these obviously deserve repatriation and reburial. Along with the human remains, Graham reports "over fifty stone spearheads and arrowheads of every shape and style of workmanship…nine large war-clubs, made of stone…ten stone pipes, from four to seven inches in length" and a "flint hatchet and a stone hammer" (Holmes 1902:127). If Graham's identification of both spearpoints and arrowpoints is correct, it would place these burials somewhere ca. 500–700 CE, when bow and arrow technology was replacing darts and atlatls. His reports of large stone war-clubs is even more intriguing, as such objects are unknown from elsewhere in the Mimbres region, which seems to have been unusually free from violence, at least during the subsequent Mimbres Classic. However, since the location of all these materials remains a mystery, we cannot place full confidence in Graham's account, which differs noticeably from that of Jones (1902:295–297).

Canador Peak (LA 72654)

Canador Peak is an unusual and significant site in the Mimbres region, and although it remains impossible to say with any certainty whether it represented or incorporated any shrine(s), it clearly deserves mention here among other distinctive landscape features and for its unusual rock art. This large and isolated formation is both the only *cerro de trincheras* site in New Mexico and the only one known from the Early Pithouse period (Roney 1999) (Figure 8.10a). Other *cerros de trincheras* form two

clusters: those in Chihuahua, which date to the Late Archaic, and another group in Sonora and Arizona that belong to the Late Prehistoric. Canador Peak is important because it partly bridges the gap between these two otherwise-isolated temporal clusters.

Figure 8.10. Canador Peak, Hidalgo County New Mexico: (a) Canador Peak, the only recorded *cerro de trincheras* in New Mexico.

Cerros de trincheras are isolated hills or buttes that exhibit extensive architectural modification by terraces and walls of dry-laid stone. The most famous example, known simply as "Cerro de Trincheras," is located beside the Rio Magdalena in the Mexican state of Sonora (McGuire and Villalpando 2011). This site was the preeminent example from the Late Prehistoric period and was depopulated ca. 1450 CE. The largest of the Late Archaic sites of this type was Cerro Juanaqueña in northwest Chihuahua, which

dates back at least to 1200 CE (Hard and Roney 2020). Cerro Juanaqueña and other Late Archaic *cerros de trincheras* represent an important manifestation of early agriculture in the SW/NW.

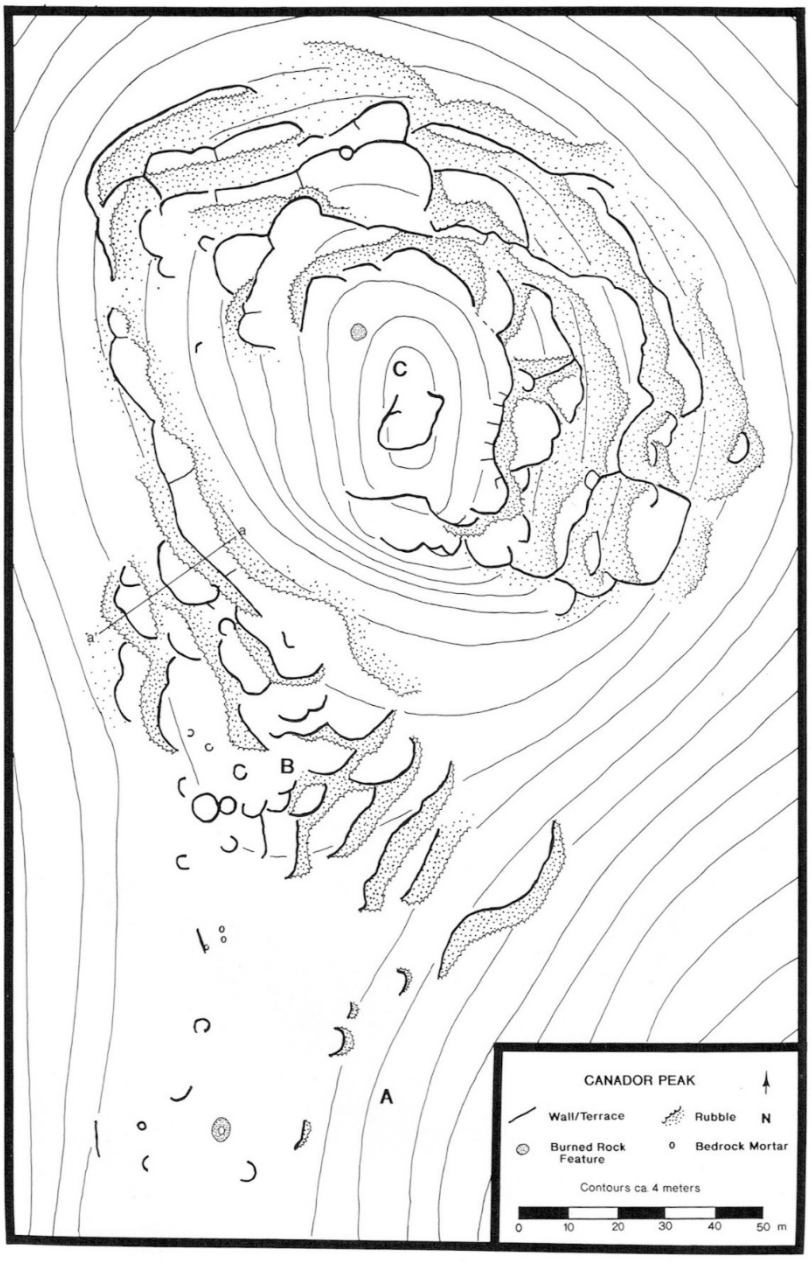


Figure 8.11. Canador Peak plan map (from Roney 1999:175, Figure 2, courtesy of John Roney).

Canador Peak itself is "a large hill or small mountain near Virden, New Mexico," an isolated "outcrop of the Tertiary Datil formation" that rises 300 m above the Gila River floodplain (Roney 1999:173) (Figure 8.10a). A complex of prehistoric features that surmounts this hill includes "approximately 1 km of terrace walls, a dozen stone circles, midden deposits, and extensive petroglyphs" (Roney 1999:173). Canador Peak was first recorded only as a rock art site, and it was not until a decade later, as awareness of the *cerro de trincheras* model became more widespread, that its significance became understood (Roney 1999:173).

As with U-Bar Cave, ceramics from this site cluster into two temporal groups, one contemporary with the Early Pithouse period in the Mimbres, and the other dating to the Mimbres Classic and/or later. Ceramics from the first group were recovered in association with stone circles and midden deposits. Examples from the latter category came only from "a small area at the very summit" (Figure 8-11) (Roney 1999:178). The latter pattern of deposition suggests offerings at an ancestral shrine. Notably, although Cerro Juanaqueña was absolutely a preceramic site, Hard and Roney report prehistoric pottery from four discrete areas on the hill, including two sherds of Three Circle Red-on-white, one of the earliest Mimbres painted wares, from a focus area near the top of the site, which is also suggestive of post-occupation shrine offerings (2020:136–137, Table 6.20).

Canador Peak is also remarkable for its extensive rock art assemblage, and for the fact that the petroglyph panels documented there bear no clear resemblance to any reported rock art style in the SW/NW (Margaret Berrier, personal communication 2023). Most of the panels consist entirely of simple but continuously repeated geometric motifs,

especially rows of tringles and meshes of dots in squares (Margaret Berrier, personal communication 2024). Webster and colleagues (2006) examined the "dot-in-a-square" motif in considerable depth, and determined that it was a pattern of Mesoamerican origin related to tie-dying technology, serpents, maize, and associated ceremonialism (Figure 8.10b-d).

A few handfuls of sherds and some unusual rock art panels, no matter how abundant, are not enough to place Canador Peak among the Mimbres region's other more definitive shrines, especially the caves in this dissertation's Primary Dataset. Nonetheless, the site's visual uniqueness and its implicit level of higher social complexity during the Early Pithouse period likely made it stand out in the region. Whether or not its inhabitants contributed to the ancestral population of the Mimbres Mogollon remains uncertain, but the evidence does suggest that it persisted in social memory enough that at least some people during the Mimbres Classic remembered it and felt its ancient importance and landscape prominence justified at least a few basic offerings. Even if Canador Peak did not incorporate a shrine during the period of its occupation, it appears that it did serve as one to some degree centuries later.

Cookes Peak (LA 50096)

Although archaeological reports in New Mexico's ARMS database describe only historical Euro-American features associated with Cookes Peak, this mountain remains by far the most prominent geographical feature in the Mimbres Mogollon region, and it clearly must have held major cultural significance in prehistoric times as well. The peak

is the highest point in the Cookes Range, over 2560 m tall. Cookes Peak is located in the southern Mimbres drainage, over 27 km north of the modern town of Deming. Although no one has reported any kind of shrine from its peak, it is visible throughout most of the region, even into present-day Arizona and Chihuahua, and all the way to the Jornada Mogollon region in the east. Pilgrims and other travelers could easily have oriented themselves by it (Figure 8.12a).

The Cookes Range contains at least two of the largest and most important Mimbres rock art sites: Frying Pan Canyon and Pony Hills. The former is close to a spring, while the latter incorporates a prominent *tinaja*, a natural water retention feature similar to a *hueco*. Stokes has noted that when viewed from the west, especially from the vicinity of Faywood Hot Springs and City of Rocks, the north side of Cookes Peak presents a curvature suggestive of the horned serpent, while the south edge of Table Mountain offers a similar profile from the same perspective, with the two mountains appearing almost identical in size due to their respective distances (2019). During a 2019 excavation of an isolated kiva at City of Rock, I personally witnessed Cookes Peak grow dark beneath the shadow of a cloud while the sun shone brightly on Table Mountain, a striking binary opposition that made Stokes' argument more compelling (Figure 8.12b). The frequency with which this phenomenon probably occurs not only offers a possible explanation for the location of the City of Rocks Kiva, as a lookout for a person or person whose role it was to observe the successive occultations of these two features; it also gives a sense of the complexity of the prehistoric sacred landscape of the Mimbres Mogollon.

Ultimately, despite the lack of an archaeological record reported directly from its peak and/or slopes, multiple compelling reasons remain to believe that Cookes Peak was an important sacred site of the first order for the Mimbres Mogollon and other populations that occupied southwestern New Mexico both before and after the Mimbres Classic.

Figure 8.12. Cookes Peak, Luna County, New Mexico: (a) Cookes Peak as seen from the Harris Pithouse Village (photo by Barbara Roth); (b) Taylor Mountain and Cookes Peak as seen from

the City of Rocks State Park, near Faywood Hot Springs (photos courtesy of Robert Stokes and Joseph McConnell).

The caves and other landscape features described in this chapter help to define the parameters of Mimbres cave ceremonialism in both space and time, and to illustrate the broader context of a sacralized landscape within which cave shrines would have functioned. The handful of sites included here merely represent some of the most obvious and best documented examples outside of the major surveys; obviously within the region, many more springs, hilltops, rock art sites, and other less obvious landforms were also important during the Mimbres occupation of southwestern New Mexico and adjacent regions, as well as dozens of other cave shrines that escaped the notice of archaeologists before they were stripped bare of material culture.

The sites in this chapter, however, particularly the caves, suggest the possibility of a somewhat different pattern of cave ceremonialism during the Late Archaic and Early Pithouse periods, one in which abstract rock art was a component. Beehive Cave, Map Cave, the Doolittle Cave complex, and possibly also U-Bar Cave suggest that this pattern predominated during the early centuries of agriculture and primarily involved sites south of what were to become the dense population areas of the Mimbres Valley and Upper Gila, with a shift in focus sometime in the latter half of the first millennium CE to the northern and western portions of the Mimbres region. Meanwhile, we also see evidence for other cave activities that might or might not have incorporated cosmological elements, including the possible use of rockshelters as women's retreats and perhaps for the temperature-stable storage of fermented beverages. I will return to the significance of these sites, and to these ideas, in later chapters.

Chapter 9: The Material Culture of Mimbres Mogollon Cave Shrines

"Judging from the time spent relatively in the manufacture and consecration of prayer emblems, it might well be concluded that these objects are essential features of every considerable Hopi ceremony. As it rarely happens that any rite is complete without the introduction of these objects, their correct interpretation is a key to the meaning of the ceremony. Their form and character vary in different rites, as can be seen by consulting descriptions of different festivals. Appendages to these objects are significant, each type has a prescribed form and pigmentation. Although varied in shape, color, and the materials of which they are made, prayer emblems fall into several types, among which may be mentioned prayer sticks, clay images, miniature bowls, artificial eggs, meal, tobacco, and food of various kinds. It would be an important contribution to science to describe all the forms they assume, but the present article considers more especially where these offerings are deposited and incidentally certain inclosures where sacred objects are kept" [Jesse Walter Fewkes 1906:349].

During my opening remarks to a 2007 SAA session on cave ritual in the SW/NW, I presented the first definitions of a "Mesoamerican Ritual Cave Paradigm," which Kieffer and Scott (2017) later acknowledged, tested, and codified. I framed this paradigm, which at the time had not been formally expressed by the researchers working in that region, in order to provide context to similar practices that were not only visible in the speleo-archaeological record of the SW/NW, but also which had been recognized by

researchers there as early as the late nineteenth century (see Chapter 3). Based both on my readings in the discipline and my fieldwork in cave shrines of the Belize Valley under the late Cameron Griffith in 2003, part of my claim for a consistent paradigm was my observation of a pattern in cave shrine assemblages that Maya archaeologists prior to James Brady's seminal 1989 dissertation had largely overlooked. Before Brady's study, which focused on the cave known as Naj Tunich, the general perspective on Maya caves was that these sites were marginal habitation spaces. This conclusion was based on the presence of large amounts of un-slipped and monochrome-slipped ceramics and other *apparently* utilitarian items such as manos and metates. Building on the work of Brady, Moyes, Griffith, and others, I pointed to three distinct trends in cave shrine assemblages that were also apparent in the SW/NW:

1. Differential Assemblages: specific artifacts generally classified as "utilitarian" and/or "domestic" can be present, but in unusually high numbers and out of proportion to their usual presence in domestic assemblages from established habitation sites: ceramics, metates, and manos in Mesoamerica; in the SW/NW, sandals and weapons.
2. Ceremonial "termination": deliberate breakage of artifacts that is not the product of normal use-wear.
3. The presence of votives or miniatures.

Brady and Peterson later incorporated some of these ideas into a paper focused on Mesoamerican cave assemblages (2008). The application of this paradigm varies in its

specifics between the two cultural areas, given that cave shrine assemblages in the SW/NW consist primarily of perishable items, while those in Mesoamerica, which have usually undergone exposure to wet-cave taphonomic processes, consist primarily of ceramics, lithics, groundstone, and bone. Nevertheless the principles are consistent. These criteria allow for the identification of cave shrines without reliance on artificial distinctions between "ritual" and "utilitarian" artifact categories, which is important because archaeologists working in the SW/NW can no longer readily identify cave shrines based on their archaeological record, given that little beyond fragmentary artifacts remains in most sites today. For this reason again, the established Mimbres cave dataset (and to some extent the Jornada cave dataset as well) is so valuable, as early researchers were able to recover significant portions of the assemblage from many sites, something that is no longer possible a century later, and these assemblages did contain large quantities of artifacts with exclusively ritual functions.

The relative wealth of early ethnographic data from the SW/NW also provides insight into the types and even the purposes of artifacts deposited in shrines. The epigraph from Fewkes that opens this chapter gives some sense of both the variety and the abundance of objects offered by the Hopi during ethnohistoric times. Obviously, drawing only on Hopi ethnographic sources provides limited insight into the Mimbres, given that a gap of at least seven centuries separates the ethnographic record of the former from the material culture of the latter. Nonetheless, this passage provides a context and a basis for comparison, and is consistent with practices and material culture reported from other Pueblos. Most importantly, Fewkes's approach of eschewing categorical description in favor of context establishes a precedent relevant to this

dissertation. With similar intent, this chapter presents analyses of the context and distribution of those elements of Mimbres Mogollon material culture employed to identify cave shrines in the Primary Dataset presented in Chapter 5:

1. *pahos* (prayer sticks)
2. *tablitas* (painted boards)
3. cane/reed cigarettes
4. votives (miniatures) of any kind, including miniature bows and arrows
5. weapons (full-sized bows and/or arrows, darts, atlatls, and fending sticks)
6. sandals

In addition to these categories (note that #4 is essentially a "meta-category" composed of miniature versions of objects from other categories), I will also examine several other categories that cannot be employed as definitive of shrine use but which still have relevance to my research questions. These categories include stone plaques and rock art, which occur in less than 30% of the recognizable shrines and thus cannot be considered representative of an overall pattern. I also examine the distribution of ceramics, which are too ubiquitous in the region for their presence in caves to be considered diagnostic of ritual. Ceramics nonetheless remain an excellent diagnostic tool for relative dating and determining cultural affiliation. I also disaggregate one especially important category, the elaborate staffs that early researchers called "roundel *pahos,*" and I suggest an alternate definition and context for their use and presence in cave shrines. Finally, I also will address briefly the human remains reported from several sites and consider the significance of their presence in a few cave shrines from the Mimbres region.

Nota bene once more that the purpose of this chapter is not to present detailed analyses of the assemblages recovered from the caves in the Primary Dataset. That information is already available in Cosgrove (1947) and Hough (1914). Although fresh analyses of their collections would almost certainly provide many new insights, such an undertaking would represent an entirely different dissertation. Herein, it is only necessary to establish that key artifact categories are diagnostic of ritual activity and that their presence in a cave can establish its use as a shrine. For four of the six key artifact categories, this role is implicit and supported by extensive ethnographic data: *pahos*, *tablitas*, cane cigarettes, and votives. Only two categories, sandals and the successive complexes of weaponry (bows, arrows, darts, atlatls, and fending sticks), require additional discussion, and Chapters 3 and 4 have largely established their context already, as these two categories are abundant—even ubiquitous—in cave offerings in the Jornada Mogollon region as well, and even beyond, and all occur in sites that clearly served exclusively as shrines. The emphasis here is on examining the significance of the chronological and geographical distribution of each category within the Primary Dataset in order to correlate those variations with the major cultural shifts in the Mimbres Mogollon region during the Late Pithouse period and the Classic phase.

Pahos (Prayer Sticks)

Figure 9.1. Crook pahos from Bear Creek and Johnson Caves (from Hough 1914:Plate 19).

No other artifact category in the SW/NW is more clearly indicative of a site's use as a shrine by its presence than prayer sticks, which are referred to most frequently in the early literature by the anglicized spelling of their Hopi name, "*paho*" (from Hopi, *paaho*: prayer stick or prayer feather [Hopi Dictionary Project 1998:368]). This word choice serves as an important reminder of how familiar the founders of Southwest archaeology were with Hopi ceremonialism and its material correlates, but it also offers a caveat as to a certain Hopi-centric tendency in early ethnographic interpretation. In addition, it illustrates the importance of feathers in these objects, to the extent that the simplest versions consist of feathers only. I retain "*paho*" in the discussion of artifact assemblages, as both Hough (1907, 1914) and Cosgrove (1947) use that term extensively, but I employ "prayer stick" in this ethnographic discussion, as the data presented herein come from throughout the Pueblo world.

Hough applied this term to a wide variety of objects he recovered from Bear Creek Cave and other shrines in the Upper Gila drainage, and he justifies its application as follows:

> The proceeding in offering to the gods who are believed to be in all respects like men in their desires and inclinations is entirely normal. The paho stands for the human supplicant, and is formed in accordance with this idea, painted, dressed, furnished with food, money, medicinal plants, etc., and feathers that, by the *orenda* or magic power, of flying creatures carry petitions to the gods. The paho is thus the central feature of the sacrifice, and may be of any form or material or any object thought to be pleasing to or appertaining to a particular supernatural being whose

> characteristic personal offerings have been determined and fixed by the traditional usage of the religious organization [Hough 1914:91].

Parsons (1996:276–291) provides an excellent summary of prayer stick production and usage throughout the Puebloan SW/NW. As she makes clear, prayer sticks and prayer feathers are the *sine qua non* of much of contemporary and ethnohistoric Puebloan religious practices: "There is no ceremonial, as far as I know, outside of Tiwan or Tewan towns in which, in some connection, prayer-sticks are not offered or used. Indeed, it can be said that Pueblo ceremonial consists of prayer-stick-making and offering together with prayer and other ritual" (1996:270). In the same paragraph she identifies caves as one of the primary locations for the deposition of these special objects.

Although the essential nature of a prayer stick is simple: a branch or twig taken from a living tree with one or more feathers attached, Parsons' summary describes an almost infinite array of variations in the types of wood, types of feathers (varying both in species and from the part of the bird whence they came), painting, carving, attachments, and size (1996:276–291). Pueblo people consider their prayer sticks to be animate beings comparable to people (Parsons 1996:281), which places them in a special class of sacred objects that includes masks and effigies. Prayer sticks are offered in almost every context in which a Pueblo person might also deliver a verbal prayer—hence making them to some extent the material residue of verbal performance. Most importantly for this dissertation, Parsons emphasizes that they are offered both to the dead and "Kachinas," and that the Kachina-impersonators themselves sometimes "plant" prayer sticks (1996:270–271). I will examine the significance of this association further in subsequent

chapters. Although simple in concept, prayer sticks are often complex, elegant, and genuinely beautiful in execution, as illustrations in early publications reveal (cf. Parsons (1996:273, Figure 1). Those that survive in caves, however, generally consist only of the stick itself, sometimes with a remnant of cordage attached, as feathers are a primary target of cave crickets.

Both Hough (1907, 1914) and Cosgrove (1947) identify a wide variety of objects as *pahos*, not all of which definitely deserve this designation. Overall, they tend to use this term for any otherwise unidentifiable object that appears to have been left as an offering. Additionally, some categories they probably identify correctly as *pahos*—such as the "dart pahos" that Cosgrove reports from Ceremonial Cave (1947:128–129), or the "basket pahos" and "flute-pahos" that Hough describes from Bear Creek Cave (1914:123–127, Plate 24, Figures 317–331)—could well have been *pahos* but represent forms that no longer occur—or at least have not been described—in the ethnographic record. For this reason, I focus on three categories reported from many of the caves in the Primary Dataset that also most closely resemble ethnographic prayer stick categories: twig *pahos*, crook *pahos*, and stub *pahos*. One or all of these types occurred in all but six of the caves in the Primary Dataset (Table 9.1). Of those sites from which no *pahos* of any type were reported, one, the Royal John Mine Cave, is a wet cave in which the preservation of perishable objects is unlikely (for this reason, I will omit this cave from discussions of all artifact categories in this chapter other than ceramics); and the one reported by Hough, his Site #35, appears to rely on secondhand data from non-archaeologists, so it cannot be fully ruled out in this regard (1907:47–48). The remaining four sites, all from Cosgrove (1947), yielded only scanty assemblages and also lacked

other diagnostic items. Thus, *pahos* of these three categories occur in all the major cave shrines in the dataset, as well as some of the less prominent sites.

Table 9.1. Distribution of *Pahos* in Mimbres Cave Shrines.

Cave	Twig *Pahos*	Crook *Pahos*	Stub *Pahos*
Doolittle Cave	28/7	0/11	11
Greenwood Cave	#		12/0
Steamboat Cave	#		80/2
Lone Mountain Cave	#		
Site 1, Mogollon Creek Cave			2/0
Site 3, Cave, Gila River			
Site 6, Cave in Water Canyon			
Site 7, Cliff Ruin in Sapillo Creek Canyon	1		9
Cave 2, Middle Fork, Gila			
Cave 1, Middle Fork, Gila	#		
Cave 2, West Fork, Gila	#		
Kelly Cave(s)	#		
Cave 1, Goat Basin	#	#	>55/10
Cave 4, Goat Basin			3/0
Cave 5, Sipe Canyon			2/0
Cave 6, San Francisco Drainage			
Mule Creek Cave	#	1	310/2
Bear Creek Cave	#	#	#
Royal John Mine Cave			
Hough Site #3, "Cliff House & Cave"	#		
Hough Site #32 "Cave shrine"	?		
Hough Site #35 [several] "Caves"			
Hough Site #64 (Saddle Mountain Cliff Ruin)	#/0		

Note: "/" indicates "whole/fragmentary"; # = identified as present, but quantity not specified.

Of the three varieties of *pahos* listed in Table 9.1, twig *pahos* might appear to be the most similar to contemporary prayer stick types, but in fact, they represent a cruder form of prayer stick than the elaborate types reported from the ethnographic record today, employing largely unmodified twigs. Parsons provides specific information about the

purposes of crook *pahos*, identifying those where the wood makes a complete circle "as something for the Spirits to come down on" or, at Jemez, "to pull down the rain" (Parsons 1996:280). The latter interpretation is especially interesting in the context of this dissertation. Figure 9.1 reproduces Plate 19 from Hough (1914), which presents an array of crook *pahos*. Cosgrove describes the quantities of stub *pahos* recovered from Mule Creek Cave, Steamboat Cave, and the Goat Basin caves as "outstanding" (1947:127). Figure 9.2 shows a collection of stub *pahos* recovered by C. Burton Cosgrove from Mule Creek Cave in 1927; the burned fragment of a stub *paho* from the same site, painted red, can be seen in Figure 5.17a. Cosgrove notes also that these ancient examples are longer than contemporary versions and, most importantly, that none were found in the caves of the Hueco area, the Big Bend, or Coahuila (1947:127). Due to the extremely sacred nature of prayer sticks in contemporary Pueblo society, this dissertation does not include any images of ethnographic objects identified as prayer sticks.

Figure 9.2. C. Burton Cosgrove's photo of stub *pahos* recovered from Mule Creek Cave (courtesy of Carolyn O'Bagy Davis).

Sandals

Chapters 3 and 4 already addressed the probable religious contexts for the deposition of sandals in cave shrines. The presence of sandals in *wahaniak shukuk shtuitauw* and Ceremonial Cave, sites that were never utilized as anything other than shrines, makes a compelling case that they served as offerings. However, the apparent time-depth and geographical distribution of this practice deserves some additional discussion.

Sandals occur in both Jornada and Mimbres Mogollon cave shrines, but distinct clines occur between the two regions in both type and quantity. Whereas quantities of sandals

numbering in the hundreds or even a thousand or more have been reported from Jornada caves, the highest number of complete sandals from the Mimbres region is 39, from Doolittle Cave, which is also the only Mimbres site from which Jornada sandal types have been reported. This location is intriguing, since the archaeological record of Doolittle Cave, more than any other site in the Primary Dataset, suggests not only use extending into the Late Archaic but also activity comparable to Jornada cave shrines. Given that Cosgrove describes Doolittle Cave as "churned up by previous digging" (1947:7), it is entirely likely that this cave once contained a hundred or more sandals, a quantity consistent with assemblages reported from Jornada cave shrines. Overall, sandals were reported from nine of the caves in the Primary Dataset.

Table 9.2. Distribution of Sandals in Mimbres Cave Shrines.

Cave	Sandals
Doolittle Cave	39 Type 9, 1 Type 1a, 1 Type 5a
Greenwood Cave	#
Steamboat Cave	9 Type 10, 9 Type 11
Lone Mountain Cave	
Site 1, Mogollon Creek Cave	
Site 3, Cave, Gila River	2 Type 11
Site 6, Cave in Water Canyon	1 Type 11
Site 7, Cliff Ruin in Sapillo Creek Canyon	
Cave 2, Middle Fork, Gila	1 Type 14, 10 Warp
Cave 1, Middle Fork, Gila	1 Type 11
Cave 2, West Fork, Gila	5 frag Type 14 (4&6 Warp)
Kelly Cave(s)	6 Type 9a, 2 Type 11, 1 Type 12, 1 Type 13
Cave 1, Goat Basin	1 Type 9a, 3 Type 14
Cave 4, Goat Basin	
Cave 5, Sipe Canyon	3 Type 9a, 6 Type 9b
Cave 6, San Francisco Drainage	
Mule Creek Cave	7 Type 9a, 5 Type 9b, 1 Type 11
Bear Creek Cave	#
Royal John Mine Cave	
Hough Site #3, "Cliff House & Cave"	#
Hough Site #32 "Cave shrine"	
Hough Site #35 [several] "Caves"	
Hough Site #64 (Saddle Mountain Cliff Ruin)	

Note: # = identified as present, but quantity not specified.

Arrows and Bows; Darts, Atlatls, and Grooved Fending Sticks

Schaafsma (2007) suggests the need to reevaluate the significance of the arrows widely reported from cave shrines across the Mogollon region, including every dry cave in the Primary Dataset. She argues that the arrows found in these caves did not relate simply to hunting, but functioned instead as votive arrows, similar to *pahos*. These qualities are associated with votive arrows used today by the Huichols (Schaafsma 2007). Geib and colleagues expanded this idea to include darts, arguing "that darts represented the original form of feathered prayer sticks, followed in time by arrows that served a similar purpose" (2017:355). The capacity of darts and arrows to serve as prayer-offerings is implicit in Cosgrove's report, as he describes both "dart *pahos*" and "arrow *pahos*" (1947:128–130). He reports the former only from Ceremonial Cave, and the latter almost exclusively from the caves of the Upper Gila region.

This class of artifacts is especially important for the relative dating of cave shrine use in the Mimbres Mogollon region. Given that the bow and arrow complex did not arrive in the Mogollon region until sometime ca. 500–600 CE (Roth et al. 2011), any cave where darts were recovered likely belongs to a time period prior to ca. 600 CE. This dating also applies to caves with grooved fending sticks, which are generally recognized as accompanying the atlatl-dart complex (Geib et al. 2017). Although these objects are generally recognized as having been used to "fend" off relatively slow-moving darts, they clearly also had religious significance, as evidenced by their presence in cave shrines in offering, stencil, and votive forms (see Figure 3.6 for a fragmentary specimen in Craven's Cave, a large dark zone cave on the White Sands Missile Range). Only three of the caves

in the Primary Dataset contained complete or fragmentary fending sticks, and all of these also yielded darts. None of the Mimbres caves contained atlatls, but Cosgrove does report examples from Ceremonial Cave and Chavez Cave (1947:48). However, Grange also reports several fragmentary atlatls from Tularosa Cave, a site located in the Pine Lawn Valley and the upper San Francisco drainage, close to the most northern sites included in Chapter 5 (1952:371), and in the previous chapter I noted the unverified report of an atlatl from U-Bar Cave in the New Mexico Boothell. The proximity of these sites to the study area makes their absence in Mimbres cave shrines even more significant.

Table 9.3 illustrates the frequency of artifacts from the earlier or later weapons complexes in the Mimbres region. Arrows are the only artifact class (weapons or otherwise) reported from all caves in the Primary Dataset. Conversely, only seven caves yielded darts. The extremely low frequency of artifacts from the earlier weapons complex in cave shrines suggests that the use of these sites largely postdates the Early Pithouse period. Conversely, arrows occurred in some of the sites in quantities in the hundreds or even 1,000 or more, numbers comparable to the frequency of sandals in Jornada caves. Despite these numbers, arrows reported from Mimbres caves consist almost entirely of reed nock ends with sharpened wood foreshafts, with very low percentages bearing stone or obsidian points. Bows, either full-size or votive miniature, were recovered from over half of the caves in the Primary Dataset, as well as from Hibben's Bow Cave, which is discussed in Chapter 7. As these are all "self-bows," and recurved bows with stone-tipped arrows did not supersede this original technology in the southern SW/NW until sometime ca. 1200 CE or later, bows and arrows recovered from cave shrines in the region appear to date no later than the Mimbres Classic (LeBlanc 1999:99–103). Additionally, all bows

depicted on Mimbres ceramics are only self-bows (LeBlanc 1999:103). Many of the arrows recovered from Mimbres cave shrines exhibited elaborately painted nock ends, which possibly aided in the reidentification of arrows by their owners, but which also could have enhanced their significance as offerings. Hattie Cosgrove provides several detailed drawings of these designs (1947:Figures 20–22).

Table 9.3. Weapons from Mimbres Cave Shrines.

Cave	Darts	Fending Sticks	Bows (Full)	Bows (Min)	Arrows
Doolittle Cave	1f	4,3	10	10	>301
Greenwood Cave			>1/5	10	#
Steamboat Cave	#	1	0/7	16/196	#
Lone Mountain Cave			1	3	#
Site 1, Mogollon Creek Cave				#	#
Site 3, Cave, Gila River					1
Site 6, Cave in Water Canyon					>4/7
Site 7, Cliff Ruin in Sapillo Creek Canyon				#	#
Cave 2, Middle Fork, Gila				N/A	0/1
Cave 1, Middle Fork, Gila	#			2	#
Cave 2, West Fork, Gila	#			1	#
Kelly Cave(s)	3/1			fragment	#
Cave 1, Goat Basin	0/1		>0/6	>13/61	>191
Cave 4, Goat Basin					#
Cave 5, Sipe Canyon					#
Cave 6, San Francisco Drainage	5	0/2			2
Mule Creek Cave			>2/7	>63/111, 38 sets	>365
Bear Creek Cave			#	#	#
Royal John Mine Cave					
Hough Site #3, "Cliff House & Cave"			#		>1000
Hough Site #32 "Cave shrine"			#		#
Hough Site #35 [several] "Caves"			#		#
Hough Site #64 (Saddle Mountain Cliff Ruin)			>0/6	5	#

Note: # = identified as present, but quantity not specified.

Figure 9.3. *Tablitas* (and wooden bird effigy) from Mogollon Cave Shrines: (a, d–f) Doolittle Cave; (b, c, g–j, l, o) Mule Creek Cave (k) Lone Mountain Cave; (m) Cave 7, Hueco Mountains, (n) Cave 5, Hueco Mountains (drawings by Margaret Berrier, after Cosgrove [1947:Figure 126]).

The category of *tablitas* refers here to flat, painted wooden objects created from the blossom stalks of desert succulents (agaves, yuccas, and sotols). Figure 9.2 depicts an array of the *tablitas* recovered from various caves by the Cosgroves (based on Cosgrove 1947:Figure 126). As C. B. Cosgrove points out, this name "has been rather arbitrarily restricted to objects made from thin strips of wood assembled to make miniature or full-sized headdresses, similar to those of the present-day Pueblos" (1947:134). Due to their size, many of the objects identified as belonging to this category were unlikely to have served as headdresses; instead, most or all of them were probably altar items and/or were carried during ceremonies. I include here also those related objects designated by Cosgrove as split-stick wands (1947:132), which were almost certainly carried in ceremonial dances or processions. These objects display considerable time-depth; Chapter 4 presents very early 14C dates on split-stick wands from the Jornada Mogollon region and examines the possible evolution of this artifact class there. Although Apache *Gaan* (Mountain Spirit) dancers employ headdresses of similar construction to *tablitas*, all of the pieces reported from Southern Mogollon cave shrines appear to belong to earlier Mimbres or Jornada ceremonial traditions.

Tablitas are especially important because most of the 14C dates from objects found in caves in the Primary Dataset derive from artifacts of this class, with the exception of three dates on basketry from Bear Creek Cave. These dates are reported in Chapter 6; all came from the Mimbres Classic. C. B. Cosgrove makes a special point of noting the absence of *tablitas* from the cave shrines on the north side of the San Francisco River, which was especially noticeable in comparison to the large number recovered from Mule Creek Cave on the south side (1947:27). Interestingly, in the Reserve region just to

the north of the study area, Martin and colleagues (1954) report 43 *tablita* fragments from Cordova Cave but none from the much larger assemblage in Tularosa Cave; conversely, the latter contained fragments of atlatls (which were not recovered anywhere in the Mimbres region), while the former had none (Grange 1952:371–372). Miller and colleagues (2023, 2024) attempted to date three *tablitas* from Mule Creek Cave. One small figure bearing a face I identify as a "proto-*Katsina*" dated to the Mimbres Classic (Figure 9.2o). This object and its significance are discussed in more detail in Chapter 11. A second piece from Mule Creek Cave, in the form of a cloud terrace with green malachite paint, yielded a late date of ca. 1430–1620 CE (Miller et al. 2023:10). I will discuss this anomalous date later.

Cane Cigarettes

Cane cigarettes, also known as "reed cigarettes" (Cosgrove 1947:121–122) or "ceremonial cigarettes" (Hough 1914:107–110), are sections cut from the stems of *Phragmites australis* (a.k.a. *Phragmites communis*), the familiar wetland reed that grows worldwide. These were not cigarettes in the contemporary sense, as although they were often packed with the Native wild tobacco of western North America (*Nicotiana attenuata*), they were not smoked. Instead, a hot coal or torch was pressed to one end of the tube, which was then left as an offering. Although cane cigarettes once had a wide distribution in the SW/NW, including in the Hohokam region, according to Cosgrove (1947:122), only the Zuni people still use them today (Cosgrove defers to Hough as his authority here, but he does not provide a citation). Illustrations of two cane cigarettes

from the Stailey Cave collection appear in Figure 7.7c. As with the examples in that figure, cane cigarettes were often decorated with cordage that held beads and/or shell (Cosgrove 121–122). Sometimes they were also attached to prayer sticks or other offerings.

Although some cane cigarettes were offered without ever being lit, the symbolic association between smoke and rain clouds nonetheless suggests that they could be one signature for the religious change that swept the Mimbres region during the first half of the tenth century. However, Cosgrove also reports 22 examples from Ceremonial Cave, and the use of that site probably ended by the eighth century, as discussed in Chapter 4 (Cosgrove 1947:121). Martin and colleagues report cane cigarettes from the Pine Lawn phase levels (ca. 200 BCE–500 CE) at O'Block Cave in the Reserve Mogollon region (Martin et al. 1954:209). Table 9.4 shows the distribution of cane cigarettes and cane tubes in the caves of the Primary Dataset. Notably, like *tablitas*, these objects also appear to be absent from assemblages on the north side of the San Francisco River (although both artifact categories were present in the caves of the Reserve Mogollon region only slightly to the north). Hough reports that the two circular shrines at either corner of the entrance to Bear Creek Cave contained only cane cigarettes, which he reads as evidence that these artifacts were employed as offerings for permission to enter the shrine (1915:6). Included in the counts for this category are "cane tubes," which are similar artifacts generally longer than cane cigarettes. Their purpose is even more obscure, but some contained materials that would produce colored flames when burned. I group the two categories together here because they tend to co-occur and are not always clearly distinguishable.

Table 9.4. Distribution of Cane Cigarettes and Cane Tubes.

Cave	Cane Cigarettes and Tubes
Doolittle Cave	48
Greenwood Cave	#
Steamboat Cave	49
Lone Mountain Cave	2
Site 1, Mogollon Creek Cave	
Site 3, Cave, Gila River	
Site 6, Cave in Water Canyon	3
Site 7, Cliff Ruin in Sapillo Creek Canyon	
Cave 2, Middle Fork, Gila	
Cave 1, Middle Fork, Gila	5
Cave 2, West Fork, Gila	#
Kelly Cave(s)	
Cave 1, Goat Basin	
Cave 4, Goat Basin	
Cave 5, Sipe Canyon	
Cave 6, San Francisco Drainage	
Mule Creek Cave	40
Bear Creek Cave	#
Royal John Mine Cave	
Hough Site #3, "Cliff House & Cave"	
Hough Site #32 "Cave shrine"	
Hough Site #35 [several] "Caves"	#
Hough Site #64 (Saddle Mountain Cliff Ruin)	12

Note: # = identified as present, but quantity not specified.

Votive Objects

The two primary categories of votive objects, or miniatures, from caves of the Mimbres region are miniature ceremonial bows and miniature ceramic vessels. Discussion of the former is incorporated into the section on weaponry above, and the latter are largely addressed in Chapter 6, as most of the reported examples from cave shrines came from Bear Creek Cave, which is the subject of that chapter. Figure 6.7 shows votive ceramic vessels recovered from Bear Creek Cave. Hough identifies similar miniature ceramics as one of the most common offerings recovered from springs, and he also reports that this practice continued at least into the early twentieth century (1914:117). Hough also reports miniature garments from Bear Creek Cave (Hough 1915:12–13). According to Ellis and Hammack, "Miniature offerings of any type are believed to enlarge to correct size for use of the supernatural who receives them" (1968:32).

Roundel "*Pahos*"

Both Hough (1914:96–97, Plate 20) and Cosgrove (1947:128, Figure 120a–o) identify these objects as roundel or roundel-staff *pahos*. In the Primary Dataset, they occur only in the most important shrines: Doolittle Cave, Greenwood Cave, Steamboat Cave, Mule Creek Cave, and Bear Creek Cave. Approximately two dozen Mimbres Style III B/w bowls display images of roundels, and of these, about half have reasonably reliable provenience (Figure 9.4a).

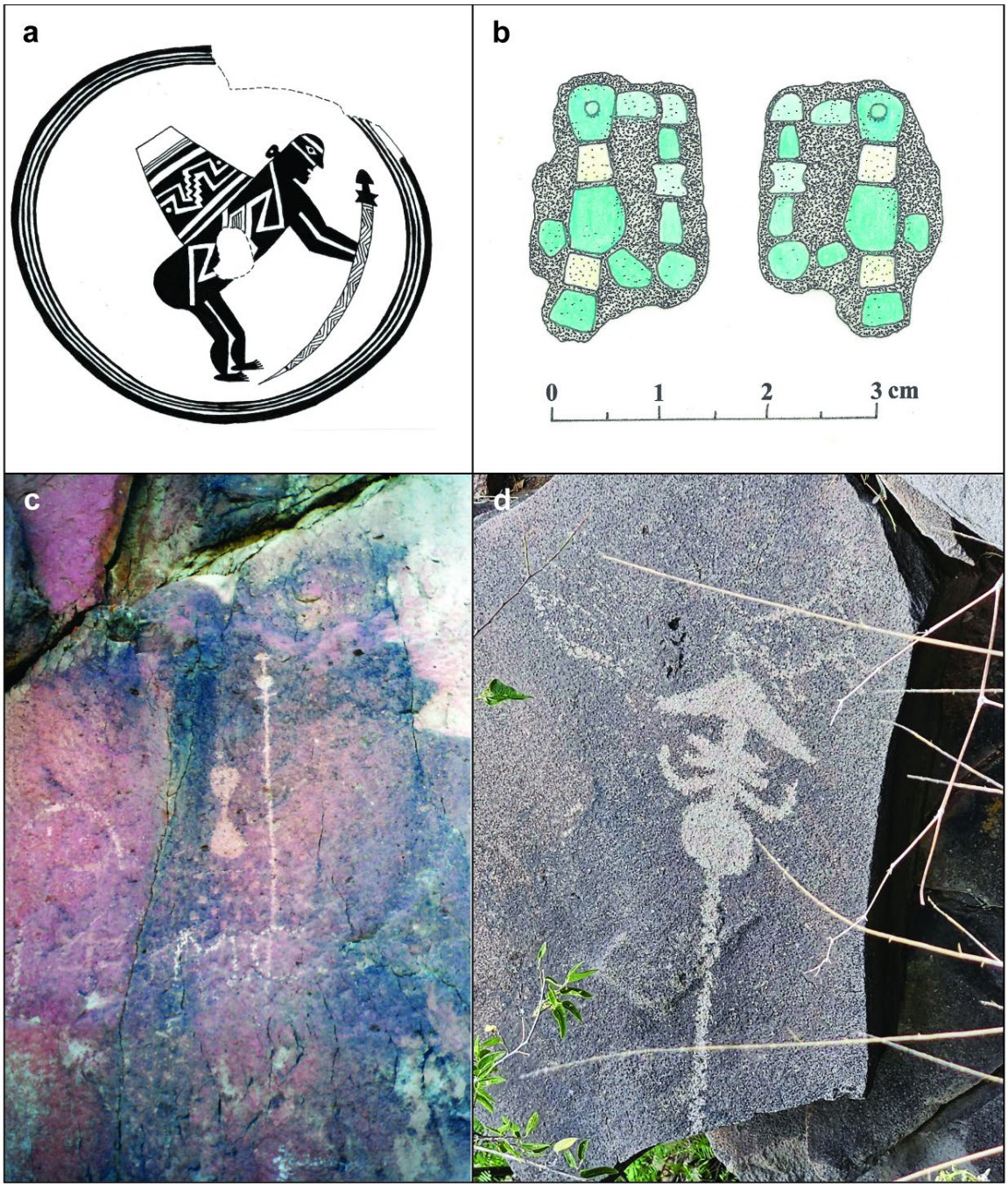


Figure 9.4. “Roundel *paho*” iconography from various media: (a) Mimbres B/w Style III bowl from the Mesa site, MimPIDD #874 (drawing by Margaret Berrier); (b) turquoise inlay earrings from the NAN Ranch, showing birds holding roundel *pahos* (drawing by Margaret Berrier); (c) petroglyph of a roundel *paho* from Lion’s Bluff, in the Gila Box (photo by Margaret Berrier); (d) petroglyph of a roundel *paho* from Foote Canyon, Arizona (photo by Deni Seymour).

MimPIDD categorizes these objects as “swords,” and LeBlanc (1999:104–106) suggests that similar staffs with scimitar-like wooden blades could have been swords. Several such objects were recovered from a small cave north of Grants, New Mexico, where they were cached with a group of baskets and a perfect double-ear of corn (Jolie and Schaafsma 2008). Neither these examples nor any of the dozens of other reported from the SW/NW exhibited use-wear consistent with either digging or combat (LeBlanc 1999:105). This is also true for roundel staffs, which were often deliberately broken prior to being placed in cave shrines. One Mimbres bowl, MimPIDD #8769, displays half a dozen individuals wielding objects of the former sort around a small agricultural plot (Moulard 1984:Plate 5). Unfortunately, this vessel lacks provenience and has likely been subject to heavy restoration.

Roundel staffs also appear in other media from the Mimbres region. Figure 9.4b offers an illustration of an elaborate pair of turquoise-inlay earrings, which depict blue birds holding such staffs, easily recognizable by their finials and the spool-shaped elements on their shafts. Figures 9.4c and 9.4d show distinct images of roundel staffs from Mimbres rock art. Notably, both of these petroglyphs come from the western periphery of the Mimbres region: the one in Figure 9.4c comes from Lion’s Bluff, in the Gila Box, while the second, in Figure 9.43d, comes from Jack Wood Canyon in Arizona, approximately 10 km over the border from New Mexico.

Figure 9.5. “Roundel *pahos*” from Bear Creek Cave (from Hough 1914:Plate 20).

Roundel staffs have been reported from elsewhere in the SW/NW, including from major sites in the Ancestral Puebloan region, such as Mesa Verde, where they were plastered into the walls of Mummy Cave Tower (Morris 1941), and Pueblo Bonito in Chaco Canyon, where a group was recovered from Rooms 32 and 33, adjacent to Room 28, which contained the now-famous cylinder jars with cacao residue (Pepper 1996[1921]:112–183). Room 33 held the burials that appear to have been the subject of elite specific ancestor veneration (Kennett et al. 2017). However, roundel staffs from other regions never display the elaborate decoration exhibited both by examples recovered from caves and in depictions on Mimbres B/w Style III ceramics. This difference suggests either that whatever tradition these staffs belonged to disseminated from the Mimbres region, or that the Mimbres elaborated on a tradition they acquired from elsewhere—or that all regions acquired this tradition from Mesoamerica, and subsequently developed it along different trajectories. Regardless, this geographical distribution strongly suggests that Mimbres roundel staffs were not associated with the early form of the *Katsina* tradition, as this ideology clearly did not exist at Chaco during the Bonito phase. Figure 9.5 shows roundel "*pahos*" that Hough recovered from Bear Creek Cave (Hough 1914:Plate 20). His number 8 is virtually identical to the examples from Pueblo Bonito. This similarity deserves more attention, as evidence for shared religious traditions between the Chaco Interaction Sphere and the Mimbres region are almost nonexistent.

Figure 9.6. Ethnographic Chumash digging sticks made by Juan Esteban Pico from the National Museum of Natural History: (a) USNM E168803-0; (b) USNM E168857-0; (c–d) closeups of stone weights.

Although Pueblo societies still employ a wide variety of ceremonial staffs, the roundel does not appear in the ethnographic record. However, roundel staffs—or something very like them—do appear, in the cultural repertoire of the Chumash of southern California. In an obscure 1971 paper, Heizer reported on two traditional stone-weighted Chumash digging sticks from the ethnographic collections of the National Museum of Natural History (Figure 9.6). Both of these objects had been fabricated by

Juan Esteban Pico (1841–1901), a well-educated member of San Buenaventura's Chumash community, and acquired for the museum by ethnologist Henry Wetherbee Henshaw (cf. the discussion of Hough Site #3, "Cliff House & Cave" in Chapter 5 for a report of Henshaw's activities in the SW/NW). These elaborately-decorated Chumash digging sticks, or "dibbles," display tremendous similarities to the Mimbres examples, including the knobbed finial and the stone or ceramic "donut" weight that appears on a few of the Mimbres B/w Style III bowls that depict the staffs. A group of similarly-constructed but shorter examples came from Bowers Cave in Los Angeles, California, a Chumash shrine looted in 1885 (Elsasser and Heizer 1963:24-26, Plate 5c-d).

Plaques

Stone plaques, also known as palettes or tablets, occurred in low numbers in three sites from the Primary Dataset: Doolittle Cave (3), Kelly Cave (1 fragment), and Lone Mountain Cave (2). This artifact is most-closely associated with the neighboring Hohokam region, where evidence suggests that they were used to melt lead carbonate and produce a striking color transformation from white to red (Haury 1976: 286–289). While Hohokam palettes were elaborately decorated and sometimes produced in effigy form, Mimbres examples are more simple and appear to be the product of local manufacture. Nor does any evidence suggest that they were employed for the same purpose as in the Hohokam region. One such palette with a handle came from the Faywood Hot Springs (Figure 8.9a).

Rock Art

Only three caves in the Primary Dataset contained rock art: Doolittle Cave, Saddle Mountain Cliff Ruin, and Site 3, a cave on the Gila River. However, rock art was also present in three additional caves considered in Chapter 8: Beehive Cave, Map Cave, and U-Bar Cave. In all cases except Site 3 and U-Bar Cave, the rock art was of the geometric/abstract type that belonged to the Archaic—although notably the style of rock art in or associated with each of these sites varied widely. Rock art reported from U-Bar Cave includes examples that potentially belong both to the Archaic and a period of use that postdates the Mimbres Classic (Greer and Greer 1999). From the back wall of Site 3, Cosgrove reports "faded red pictographs, one or two in the form of a human being or lizard" (1947:14). With this possible exception, which Cosgrove suggests was used only "as a camp for hunting parties on their way out of the deep canyon to timbered and grass-covered parks above" (1947:14), rock art appears to be a diagnostic feature of Archaic cave use.

Human Remains

The Cosgroves reported human remains from only four caves in the Primary Dataset contained (Table 9.5, below). In addition to these, Lambert and Ambler (1965) report the partial skeleton of a male, aged 19–20 years, from inside the entrance of U-Bar Cave. Of these sites, two also yielded darts (Doolittle Cave and Cave 2 on the West Fork, Gila), and two contained rock art (Doolittle Cave and Saddle Mountain Cliff Ruin). U-

Bar Cave also contained rock art, some of which potentially dates to the Archaic or at least the Early Pit Structure period. These correlations suggest that human remains can be another diagnostic indicator for Archaic use. Also worthy of note is that the remains in three of the four sites: Doolittle Cave, Site 7, Cliff Ruin in Sapillo Creek Canyon, and the Saddle Mountain Cliff Ruin, included the remains of an infant. This suggests the possibility that these sites might have once served as women's retreats, as infant burials are one characteristic of Claassen's paradigm (2011). As only one site contained the remains of more than one individual, it does not seem likely that cave burial was a focus of Mimbres cave use during any phase. Although no human remains from caves in the Mimbres region have been dated, the association between burials and darts suggests that all reported human remains belong to the Early Pit Structure period or earlier, and probably point to an earlier focus on cave use for purposes other than hunting or fertility shrines. However, it could be that the very presence of human remains and Archaic material culture in caves might have led to their association with ancestors during later Mimbres phases.

Table 9.5. Human Remains from Caves in the Primary Dataset.

Cave	Human Remains
Doolittle Cave	2 fragments, infant femur
Site 7, Cliff Ruin in Sapillo Creek Canyon	disturbed infant burial, scattered adult bones
Cave 2, West Fork, Gila	disturbed adult skeleton
Hough Site #64 (Saddle Mountain Cliff Ruin)	infant

Ceramics

Ceramic data from Mimbres cave shrines is limited. Hough did not report ceramic data for most caves, nor were typologies in place by then, and the Cosgroves relied on typologies that were incomplete in their time and are now obsolete; for instance, without fresh analyses, it is not clear whether the types that they classified as part of the Tularosa series include earlier Reserve wares. Unfortunately, these collections are not available for analysis and the Harvard Peabody Museum has removed online photos of ceramics from these sites. Table 9.6 below shows the available data, sorted from those caves that contained only Mimbres ceramic types, to those that contained both Mimbres and Northern Mogollon ceramic types (Tularosa or Reserve, Salado Polychromes, and Zuni Glazewares), and finally to those that contained only the Northern Mogollon types and those for which no data is available. This data should be considered very provisional, not only for the reasons described above, but because whole ceramic vessels were among the first objects removed by looters when a cave was found. Thus for some sites, such as Greenwood Cave and Site 6, Cave in Water Canyon, we have only secondhand reports of whole vessels that lay undisturbed for centuries only to be removed a few decades before the arrival of archaeologists.

Table 9.6. Reported Ceramic Types from Caves in the Primary Dataset.

Cave	Ceramic Types			
	Early / Undecorated	Mimbres	Reserve / Tularosa	Other
Doolittle Cave	"Mimbres Rubbed Corrugated"	Style III, Mimbres Poly		
Lone Mountain Cave	brown-paste sherds	worked Style I sherd		
Royal John Mine Cave		Style III *tecomate*		
Steamboat Cave	plainware, "Mimbres Rubbed Corrugated," "Mimbres Sharp Corrugated"	San Francisco Red, full Mimbres B/w sequence		
Greenwood Cave	Cosgrove 1947 does not report any ceramic data, but 1878 news article mentions "crockery"; Rusby accession records include "four discs of broken pottery"; thumbnails show Mimbres B/w Style III			
Mule Creek Cave	"small black olla"	Style II bowl, Style III sherds		
Cave 1, Goat Basin	brown-paste sherds only			
Site 1, Mogollon Creek Cave		San Francisco Red, Style III		
Site 3, Cave, Gila River	"Mimbres Sharp Corrugated," plain red olla			
Cave 2, Middle Fork, Gila	plainware, "Mimbres Rubbed Corrugated"	Style III		
Site 6, Cave in Water Canyon	"cowboys had taken out numbers of small pottery vessels" (Cosgrove 1947:15)			
Site 7, Cliff Ruin in Sapillo Creek Canyon	plainware, "Mimbres Rubbed Corrugated," "Mimbres Sharp Corrugated," "Mimbres Waved Indented Corrugated," "Mimbres Rubbed Incised Corrugated"	San Francisco Red, Full Mimbres B/w sequence, Mimbres polychrome	Tularosa Polished, Tularosa Corrugated, Tularosa B/w	Zuni "white slip, black glaze, red matte decoration"
Kelly Cave(s)	plainware, "Mimbres Rubbed	Full Mimbres B/w sequence	Tularosa smooth brown-paste,	

	Corrugated," "Mimbres Sharp Corrugated,", "Mimbres Rubbed Indented Corrugated," "Mimbres Rubbed Corrugated red-paste"		polished black interior, Tularosa Corrugated, Tularosa B/w	
Cave 4, Goat Basin	Plainware, "Mimbres Sharp Corrugated,"	Full Mimbres B/w sequence	Tularosa Fine Corrugated	
Cave 5, Sipe Canyon	plainware	Full Mimbres B/w sequence	Tularosa Corrugated, Tularosa Fine Corrugated	
Cave 6, San Francisco Drainage			Tularosa fillet-rim	
Bear Creek Cave	unpainted votives	"No Classic Mimbres"	Tularosa B/w	Snowflake B/w, St. John's Poly, St. John's B/r, Kwakina Poly
Cave 1, Middle Fork, Gila				"Upper Gila B/w" (Gila Polychrome?)
Cave 2, West Fork, Gila	plainware	San Francisco Red	Tularosa fillet-rim, Tularosa /w	
Hough Site #64 (Saddle Mountain Cliff Ruin)	plainware		Tularosa fillet-rim, Tularosa Sharp Corrugated, Tularosa Waved Corrugated,	St. John's Poly, White Mountain Redware
Hough Site #3, "Cliff House & Cave"	no ceramic data in Hough 1907			
Hough Site #32 "Cave shrine"	no ceramic data in Hough 1907			
Hough Site #35 [several] "Caves"	no ceramic data in Hough 1907			

What these data do show is that only local Mimbres ceramics appear in caves in the Mimbres Valley and in the Upper Gila south of the San Francisco River. Figure 9.7 shows the area of overlap as well as the area where only Northern types appear in cave shrines. If the Cosgroves are correct in reporting Tularosa series ceramics only, not

earlier Reserve wares, it would appear that sites in the overlap area probably were not used by northern groups until after the Mimbres Classic. Conversely, Martin and colleagues report Mimbres sherds as trade wares from Tularosa Cave and Cordova Cave (1952:67–68, 89, Figure 21), along with two whole vessels that they identify as Mimbres from Cordova Cave (1952:Figures 29 and 30), although the latter two vessels appear to have been locally made (Thatcher Seltzer-Rogers, personal communication 2024). These caves are located just beyond the study area in the Upper San Francisco River drainage. *Nota bene* that Figure 9.7 does not show the extent of non-Mimbres ceramic types in the Mimbres region overall, but only in cave shrines. The southern distribution of some of these types in open sites of the Mimbres Mogollon region is greater than what is reported from cave shrines.

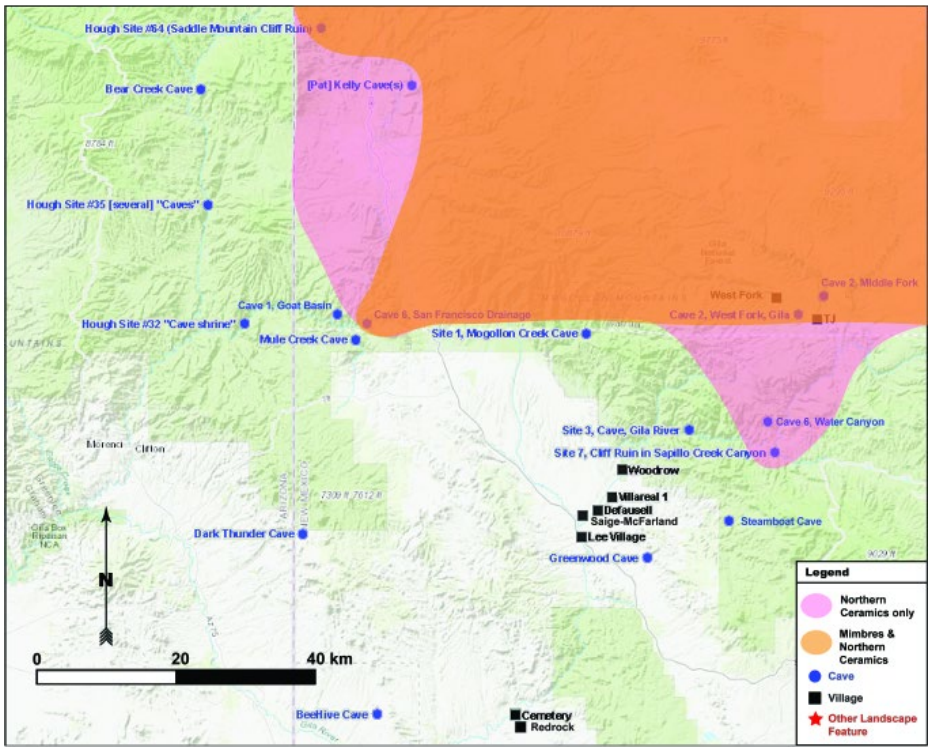


Figure 9.7. Extent of northern ceramic types in Mimbres caves shrines (map by Adrianna Nicolay and Scott Nicolay).

The two major shrines in the New Mexico-Arizona borderlands, Mule Creek Cave and Bear Creek Cave, are especially interesting in this regard. The former yielded an intact Style II bowl of unusual coloration (described in Chapter 5), but absolutely no ceramics of any types that postdate the Mimbres Classic, despite extensive post-Classic Salado occupation of the Mule Creek drainage. For some reason later populations appear not to have reused this shrine. The opposite appears true for Bear Creek Cave, which, according to Hays-Gilpin (Webster 2007:316–317, n8), contained no Classic Mimbres ceramics but a wide variety of later types.

Ultimately, it is difficult to determine the role of ceramic vessels in the offertory complex of Mimbres cave shrines. Sherds do occur, and some whole pots were clearly

present, but the evidence does not suggest that pottery was as an important part of cave ritual in the SW/NW as it was in the Maya region, where ceramics are ubiquitous in caves. The ceramic components of these assemblage do become useful, however, in assigning relative date ranges to the use of these sites. Here the evidence is strong that only a few cave shrines in the Mimbres region were used by any groups after the end of the Mimbres Classic, and these are limited to a few caves in the Upper Gila and San Francisco River drainages in the north, and U-Bar Cave in the south. What is especially interesting is that with the sole exception of U-Bar Cave, none of the "post-Classic" types used by later Black Mountain phase inhabitants of the Mimbres drainage, such as Chupadero Black-on-white and El Paso Polychrome, appear in cave shrines. For some reason, these populations appear to have avoided the cave shrines of the Mimbres Classic, just as they largely avoided reoccupying the Classic roomblocks, building new villages alongside them instead.

Chapter 10: Ancestor Veneration and Social Memory in the Mimbres Region

"Residential burial connects the domains of the living and the dead in a unique landscape that forces archaeologists to consider the *entanglements* of the living and their deceased forebears" [Adams and King 2011:7; italics mine].

This chapter moves from the material record of Mimbres Mogollon cave shrines, the assemblages they contained, and their context in a sacred landscape, to the immaterial: the ideological underpinnings of Mimbres cosmovision evidenced in the archaeological record. Although we cannot reconstruct the thoughts of prehistoric people who left no phonetic written records, Mimbres material culture offers us a combination of cave offerings, village planning, domestic architecture, burial patterns, and ceramic iconography that allows us to approach an emic understanding of their beliefs about the structure of the universe and the afterlife.

The archaeological record suggests that ancestor veneration existed contemporaneously but in different forms among the Classic Mimbres (Shafer 2003; Spreen 1983; Stokes 2003), Sedentary Phase Hohokam (Rice 2015), and Bonito Phase Chacoans (Kennett et al. 2017). In each case, burial patterns provide the primary evidence for this practice: subfloor intramural burial in the Mimbres, cremation in the Hohokam, and centuries of offerings to elite lineage founders at Pueblo Bonito in Chaco Canyon. However, ancestor veneration no longer exists in the SW/NW in any of the forms described in those studies, nor do these specific practices appear to have survived even up until the time of European contact. The Mimbres Classic phase, with its

extensive practice of subfloor intramural burial, so strongly indicative of a continued relationship between the living and the [selected] dead, presents an especially extensive and valuable laboratory for the study of this phenomenon in the area's past, as well as providing particular clues as to its eventual transformation and possible continuity into the present day in the *Katsina* tradition.

Mimbres mortuary patterns were not unique in the SW/NW in their employment of subfloor intramural burial; they were however unique in the intensity and consistency with which this practice was implemented during the Mimbres Classic (ca. 1030–1130 CE). This configuration parallels the intensification of cave ritual in the same region, although both practices likely have roots in earlier phases (and perhaps other places). The question remains as to whether the intensification of cave ritual preceded or accompanied the shift to intramural burial as the dominant mortuary tradition in the Mimbres region. The available evidence shows that the inception of cave ritual in the Mimbres and Gila drainages predated the Mimbres Classic, but that initially, it probably focused on hunting-related offerings, just as Middle and Late Archaic cave ritual did elsewhere in the SW/NW. Other types of offerings, such as prayer sticks and cane cigarettes, which become more abundant later, point toward petitions for weather-control and fertility. Whether or not this set of practices proliferated to a significantly greater extent during the terminal phase of occupation in the region, and to what degree, if any, this proliferation coincided with the major regional drought of the early twelfth century, remains unclear.

Given the widespread association in both the SW/NW and Mesoamerica between caves, the underworld, ancestors, rain, and water in general, such a hypothesis seems plausible however. Notably, the confluence of these elements met, in Mesoamerica, in a

single deity, the Nahua “Tlaloc.” Compelling evidence exists for the presence of this same figure in the southern Mogollon region, possibly as early as the seventh century (Hyman et al. 1999; Miller et al. 2023, 2024; Rowe 2005). The next chapter examines this figure in greater depth.

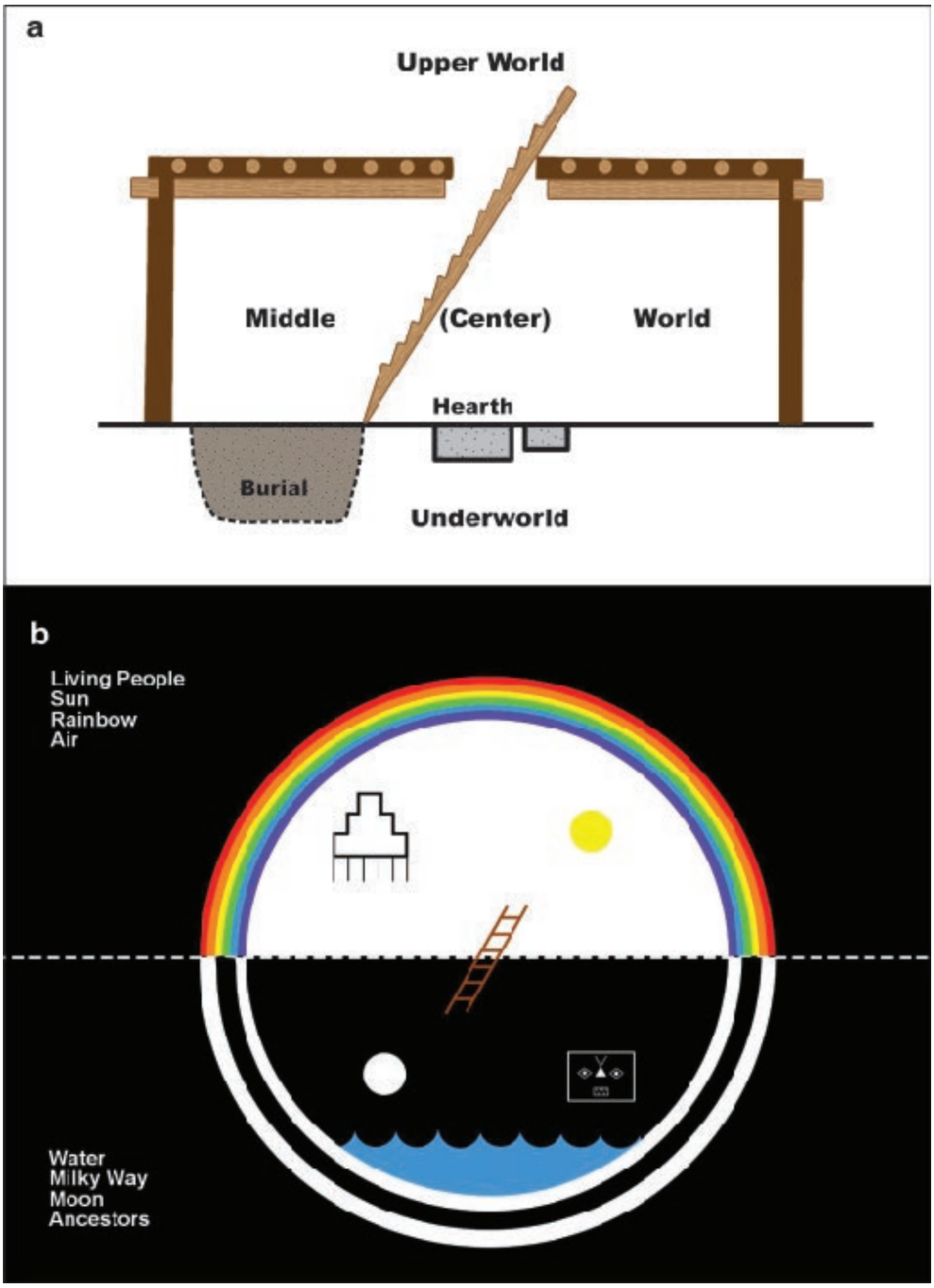


Figure 10.1. Proposed Mimbres cosmograms, showing (a) tiered cosmovision, after Shafer (2003:213, Figure 12.1); (b) bipartite cosmovision (Nicolay 2008).

Although multiple studies of prehistoric mortuary practices are available for the SW/NW, and they address these practices on multiple scales, ancestor veneration has seen limited systematic discussion thus far, either under that name, or under its earlier, obsolete formulation, "ancestor worship." Rice's 2016 volume on Hohokam mortuary practices remains the standard in this regard, but several substantial works have developed the concept of Mimbres ancestor veneration, especially in regard to the probable role of this practice in the maintenance of land tenure (Shafer 2003; Spreen 1983; Stokes 2003). Roth (2016, 2021) and Roth and Baustian (2015) have further explored these relationships in the context of social memory formation, as evidenced in the Mimbres practice of layering habitations of successive phases on top of each other, culminating in the construction of surface rooms on top of pithouses in the tenth and eleventh centuries. Shafer has also pointed to the role of this practice and the accompanying adoption of subfloor intramural burial as the predominate (but not exclusive) Mimbres funerary practices, describing it as the architectural manifestation of a tiered cosmovision (1995, 2003) (Figure 10.1a). Thus, the household would have become one point of access to the Underworld, with caves and springs as another (Figure 10.1b). Such a chthonocentric focus remains strong in contemporary Pueblo belief system, as evidenced by Indigenous Tewa anthropologist Alfonso Ortiz's assertion that: "…whatever a person is returning, and to whatever category of spirit, it only returns after journeying through the entire Tewa underworld" (1969:23-24).

Neither ancestor veneration nor subfloor burial is exclusive to the Mimbres; in fact, both practices are well-documented in Mesoamerica and South America, where they were often woven into the fabric of state level societies (Gillespie 1999, 2010; Gow 1995; Headrick 1999; Helms 1979, 1988, 1991; Jordan 2013; Joyce 2001; King 2010; Nielsen 2008). Especially important is Patricia McAnany's seminal 1995 volume *Living with the Ancestors*, which examined the role of ancestor veneration in the prehistoric Maya civilizaation. Shafer worked in the Maya region prior to undertaking the NAN Ranch excavations, and he was familiar with McAnany's ideas, which helped him to recognize evidence for ancestor veneration at the NAN Ranch (Harry Shafer, personal communication 2022). Beyond this handful of key works on ancestor veneration in the SW/NW and Mesoamerica however, it becomes necessary to turn to sources that examine the Old World for ethnographic analogies, especially those providing data on ancestor veneration practices in Asia, Africa, and Island Oceania, where the literature is most robust and includes extensive ethnographic data (Fortes 1961; Freedman 1966, 1970; Hill and Hageman 2016; Metcalf and Huntington 1991; Middleton 1987; Potter 1970; Toren 1995; Źrałka et al. 2017).

Three key points regarding ancestor veneration practices become immediately clear from a cross-cultural study, and all these points appear directly applicable to the Mimbres:

1. Ancestor veneration is predominantly (though not exclusively) a feature of agricultural societies.
2. Ancestor veneration tends to be closely linked to land tenure, and often serves as a means of maintaining lineage-based claims to land and other resources.

3. Ancestor veneration integrates social, political, and economic concerns into a larger cosmological framework.

McAnany describes the third point eloquently: "rituals of ancestor veneration knit the political and economic spheres together with the ideological sphere in a way that very few social practices have the capacity to do" (1995:20). Although she was addressing the Classic Maya, a society defined by a much higher degree of social complexity than the Mimbres Mogollon, ethnographic examples from the Old World suggest that this proposition is not limited to state societies (see, for instance Middleton 1987 and Toren 1995, who examine the pervasiveness of ancestor veneration in the less-stratified agrarian societies of Uganda and Fiji, respectively). Ancestor veneration thus could have offered precisely the sort of mechanism needed during the Mimbres Classic to support processes of population expansion and integration (Eckert and Huntley 2016:62).

McAnany's primary definition of ancestor veneration also has special value and relevance to the Mimbres case: "*rituals and practices surrounding the burial and commemoration, by name, of apical ancestors of kin groups*" (1995:11). This formulation is concise and focused enough to serve as a yardstick for comparison to the Mimbres archaeological record, and it is not framed in such a way as to limit its applicability to state societies.

Burial practices of the Mimbres Classic provide distinctive evidence for ancestor veneration during this phase, demonstrating a program for maintaining relationships between the living and the dead via burial within the home. In addition to subfloor burial, Shafer (1995:23) also identifies hearth type, entrance location, and ceramic style variability as evidence for the full-fledged emergence of this tradition. He makes special

note of double-hearths with floor-vaults associated with burial rooms and suggests these were used for offerings (Shafer 2003:213). The duration of the Mimbres Classic was brief enough that its entire extent could have remained largely within living memory of the oldest inhabitants, meaning that the names of those ancestors buried beneath floors, and even the precise locations of their remains, in most or at least many cases, likely remained known to their descendants who continued to occupy those homes.

Mimbres subfloor intramural burial thus deserves attention as the probable marker in the archaeological record for ancestor veneration because it demonstrates an emphasis on maintaining familial relationships with the deceased. According to Byrd and Rosenthal (2016:254): "mortuary practices cannot be studied in isolation but must be interpreted in the broader ideological, social, and economic contexts of a prehistoric society." This statement has immediate relevance to the Mimbres Classic.

However, Shafer's discovery that the plaza of at least one site, the NAN Ranch, also contained multiple cremation burials, suggests the presence of two distinct funerary traditions. If subfloor burials represent member of local matrilines, the cremations potentially represent affinal relations, who could not pass on inheritance rights to agricultural fields and other resources. Nonetheless, the practice of cremation, which converted the body into clouds, suggests that these individuals also had the potential to become rainmakers in the afterlife, albeit via different processes (Shafer 2003:213). Cremation dominated the mortuary traditions of the nearby Hohokam (Rice 2015).

In the absence of written records, the primary mechanisms for the maintenance of genealogical information among the Mimbres would have been social memory, architecture, and "genealogy of place." If so, then perhaps only members of founding

matrilines were buried in the more durable intramural cemeteries, and exogamous spouses were consigned to cremation and plaza burial (cf. Freedman 1966, 1970). Notably the adoption of subfloor intramural burial as the primary mortuary practice occurred more-or-less simultaneously with the local pithouse-to-pueblo transition (Shafer 2003:40–44, 212–213). Both processes began during the tenth century, were largely complete by the early eleventh century, and appear to have been regionwide, suggesting that they became fundamental to the shared identity of the Mimbres Classic. Gow describes the relationship between kin groups and houses in a way that fits the Mimbres archaeological record:

> The most radical implication of kinship in landscape is the act of house-building. Kin help each other to build houses so that they may live together. Living together is the supreme act of kin, for it implies the ceaseless acts of generosity which constitute "life's dull round." The village is at once the scene of kinship and the product of kinship [Gow 1995:52].

Evidence suggests that during the Classic, extended families occupied suites of rooms within larger room blocks, which composed in turn the structural elements of villages.

This is not to say, however, that house societies ("*sociétés à maison*," sensu Lévi-Strauss) became the defining social structure of the Mimbres Classic, although that possibility is arguably compatible with the archaeological record. Although various scholars have applied this model fruitfully to the SW/NW (e.g., Heitman 2007; Heitman and Plog 2006; Mills 2008, 2015; Plog and Heitman 2010), the possibility of its operation in the Mimbres Mogollon region requires further research. Nonetheless, the existence there of house societies would not be incompatible with ancestor veneration. The

archaeological record suggests that the structure of kinship during this phase was not so important as was the continuity of the deceased within kinship systems and their capacity to maintain relationships, not only between the living and the dead but also between both these categories and the land and land-based-resources such as agricultural fields, irrigation headwaters, clay deposits, and marketplace rights. Thomas (2001:177) describes what is essentially a form of entanglement (*sensu* Hodder) in this regard: "If kinship is a means of expressing relationships among human beings, it is instructive that it is so often embedded in landscape. Land, place, people, and material substances may all be fundamentally linked rather than constituting entirely separate classes of things."

Comparison of the Mimbres archaeological record with the global ethnographic literature regarding ancestor veneration further suggests the presence of multiple commonalities as well as at least one major point of difference:

1. Residential burial is a common marker for ancestor veneration.
2. Ancestor veneration is frequently tied to land tenure.
3. Control of remains equals inherited control of resources.
4. Not everyone who died became a venerated ancestor.
5. Generalized ancestor veneration places the dead into social memory.
6. Structures with cemeteries would themselves have been part of an inheritance.
7. Residential burial is one axis of ancestor veneration. In the Mimbres archaeological record, caves are another.

What is atypical about Mimbres ancestor veneration in a global context is the general absence of secondary burial and post-mortem manipulation of human remains. A

few examples do point to the possibility that crania were curated in isolation. The first comes from Fewkes, who quotes a letter from E. D. Osborn: “In one case a bowl was found with a skull under it and under that skull was another bowl and another skull” (1914:10). Anyon and LeBlanc (1984:180–181 report both burials lacking crania and isolated crania from the Galaz site. They suggest some of these occurrences could reflect taphonomic processes and/or historic looting activities. Only one of the five isolated crania they reported could clearly be dated to the Mimbres Classic (1984:182). As with Fewkes’ report, the Galaz data all derived from excavations conducted in the early twentieth century, and the actual remains were unavailable for study. The Cosgroves report “disturbed burials” from the Swarts site—both bodies lacking crania and isolated crania, but they too describe a range of taphonomic processes that might have caused these conditions (2012:25). Thus, the possibility exists for post-mortem manipulation of human remains including cranial curation (and/or human trophy-taking), but none of the evidence is conclusive and it all derives from early twentieth century excavations whose details can no longer be verified and human remains that are no longer available for analysis. Although this practice appears to represent a significant deviation from the general pattern of ancestor veneration as practiced worldwide, subfloor burial could have obviated the need for the post-mortem manipulation of ancestral remains due to the extreme proximity of the dead to the living. Moreover, the relatively brief timespan of this practice and the limited complexity of Mimbres Classic society might not have necessitated or even allowed for the partibility of the ancestral person, as again, the living and the dead retained a spatial relationship throughout this phase.

Roth and Baustian (2015) describe evidence for the formation of this tradition, and its integration into social memory, during the Late Pithouse period at the Harris Pithouse Village (see Figures 5.1 and 5.2). This site is one of the few major pithouse communities that does not have a superimposed Classic community—instead, the people of the Harris village potentially migrated to the nearby Mattocks site, one of the few major Mimbres Classic villages not constructed over an earlier pithouse community. Roth and Baustian suggest "that extended family corporate groups developed during the Three Circle Phase" (2015:452), something that became evident during initial research at Harris (Roth 2012). They further "argue that certain kin groups had significant social power in Late Pithouse-period society, which they reinforced using social memory, and we suggest that this power was related to the maintenance of lineage ties and land tenure" (Roth and Baustian 2015:453). This would mean that the ideology that framed the subsequent practice of intramural subfloor burial represented only an adaptation of existing beliefs, rather than a novel characteristic of the Mimbres Classic. This argument for the potential longevity of ancestor veneration will become important in the next chapter.

Roth and Baustian (2015) further compare the use of architecture to reinforce social memory in the Mimbres region to the concept of "history houses" proposed by Hodder and Pels (2010) at Çatalhöyük, the large Neolithic and Chalcolithic proto-city settlement in the Near East, which was occupied from ca. 7500 to 6400 BCE. There, too, "the placement of burials in house floors, was tied to the maintenance of social memory by corporate kin groups" (Roth and Baustian 2015:454). They go on to argue that the apparent lack of social hierarchy in the Mimbres region "does not negate the possibility of differences in social power within communities, especially if that social power was

tied to control over household production, land, and possibly rituals" (Roth and Baustian 2015:454). Thus, as perpetuated through burial traditions, social memory becomes the mechanism for the maintenance of social structure—specifically, land tenure and the control of resources. An ethnographic analogy to the beliefs of the Hopi, a contemporary group often described as lacking social hierarchy, is readily apparent: "Hopi do not regard their deceased ancestors as outsiders but as powerful members of society whose sphere of activity has been changed from the physical to the spiritual realm" (Ferguson et al. 2001:14)

This relationship between ancestors and land tenure rights is not abstract; as Toren describes it: "Land may be connected with ancestry in various ways: ancestors may have formed the land, or emerged out of it, or cleared the wilderness and created the fields and gardens (1995:178). Toren's framing immediately recalls both McAnany's discussion of the role of fallow fields in Maya land tenure, as well as the essential role of "footprints" in Hopi society (Hopi: *kukveni*), which include not only literal footprints, but all the traces left by the people on the land, among them architecture, rock art, and artifacts. The emic Hopi concept of footprints essentially comprises the entire etically defined archaeological record (Ferguson and Colwell 2018:ix). Notably also, it directly invokes feet, footwear, and images thereof, including the drawings of footprints on Mesoamerican codices, and thereby reveals important connections to other key elements under discussion herein, especially the ubiquitous placement of sandals in cave shrines (Chapters 4 and 9) and the Mesoamerican association of footprints with emergence and migration narratives.

We can see in these elements that entanglement includes the relationships between ancestors and landscape, which constitute a THING-SPIRIT-HUMAN dependency (cf. Figure 1.1b), as it is through prayers and material offerings that humans engage with spirits. Thomas illustrates this further: “In each case, the landscape provides a continuous reminder of the relationship between the living and past generations, and consequentially of lines of descent and inheritance” (2001:177). As caves are among the most distinctive landscape features, they could have come to serve as sites for interaction with ancestors. This use would have been even more likely if Mimbres ancestor veneration was rooted in Mesoamerican traditions that involved the storm god known in Nahuatl as Tlaloc, a possibility explored in greater depth in the next chapter, as this deity presided over a paradisical afterlife realm known as *Tlalocan* (Miller and Taube 1993:166–167).

Although cross-cultural evidence supports the link between Mimbres ancestor veneration and the tenure of agricultural land, maintaining relationships with the deceased probably also legitimized the inherited control of irrigation systems, fallow fields, traditional hunting grounds, clay deposits and other mineral resources, markets, springs, and cave shrines, as well as the custodianship of certain ceremonial objects (including masks). Gow describes how such features, even if not in active use, maintain their importance: “For instance, in western Amazonia the pattern of houses and gardens gradually falling into decay and decrepitude within the forest is recognized as a physical record of residential history, which can be directly related to genealogical lore” (1995:48).

Additional aspects of ancestor veneration derived from the global literature survey also have potential relevance to Mimbres prehistory, even if they have not been incorporated into previous discussions:

1. Land tenure privileges based on ancestor veneration can include rights to fallow fields as well as actively cultivated lands.
2. Ancestor veneration potentially confers control of market villages; i.e. families with founding/ranking ancestors may have possessed hereditary control of markets just as they would have maintained land tenure.
3. In addition to extending blessings, ancestors also can act in a punitive manner, withholding blessings and inflicting punishments such as drought and disease.
4. Ancestors derive their power from kinship and eldership, not deification.
5. Mimbres villages were likely "communities of both the living and the dead" (*sensu* Kopytoff 1971).

Ancestor veneration is an extremely widespread practice in human history/prehistory, and its close associations with agricultural societies and land tenure suggests the operation of something approaching a nomothetic law. Importantly, the practice arose in the Americas even in societies where no Old World connections could have existed at the time of their respective instantiations of the Agricultural Demographic Transition; e.g. New World agriculture significantly postdates the arrival of the hemisphere's first inhabitants and predates the first European contacts. The worldwide consistency of ancestor veneration practices suggests that ethnographic analogies and archaeological data from other cultural areas, even those in the Old World, nonetheless offer considerable explanatory capacity for the study of similar practices in the prehistory

of the SW/NW. This is not to say that ancestor veneration in a different form did not continue up until the arrival of the first Spanish entradas, and even afterword—even into the present day. This continuing practice, which survives to varying degrees among almost all the contemporary Pueblos, is best known under the Hopi name for the spiritual entities at its center: *Katsinam* (Hopi: *Katins|a ~am*: spirit being [Hopi Dictionary Project 1998:134]). The origins of the *Katsina* tradition, and its possible Mimbres roots, are a focus of the next chapter.

Chapter 11: *El Tlaloc del Norte*, the *Katsina* Tradition as Generalized Ancestor Veneration, and the Possible Mogollon Origins Thereof

"More generally, in nearly all ceremonial dances the wearers of masks represent 'ghosts,' that is, in most cases, the spirits of the dead. Lévy-Bruhl has stressed that the word 'represent' must be understood here in its literal etymological sense: meaning to re-present, to cause to reappear that which has disappeared…To wear a mask is to have immediate and direct contact with beings of the unseen world; during the time of such direct contact the individuality of the actor and the spirit he represents are one. For as long as the actors and dancers wear these masks, and from the fact that they cover their faces, they are not representatives of the dead, they actually 'become' ancestors whom these masks portray—for the time being, they actually 'become' the dead and their ancestors. In such archaic rituals gestural repetition enacts the idea of bi-presence: the inhabitants of the other world can reappear in this one without leaving their own…" [Connerton 1989:69].

Portions of this chapter and the data it contains come from a paper entitled "Tlaloc and Chicomoztoc in the North: Evidence for Mesoamerican Chthonic Cosmovision in the United States Southwest and Northwest Mexico," which I coauthored with Margaret Berrier and Myles Miller. That paper is scheduled to appear in a 2024 volume of papers on Mesoamerican cave ritual edited by James E. Brady, entitled *New Approaches to the Subterranean Realm: Studies in the Archaeology of Ritual*. Berrier contributed most of the data (including drawings and photographs) related to goggle-eye iconography in the SW/NW, and Miller provided the recent 14C dates and contextual

data that have since appeared in two papers he coauthored with Darrell Creel and Phil Geib (2023, 2024). All that material is incorporated here with express permission from Berrier, Miller, and Brady.

Ethnographer Leslie White was the first to address the relationship between the Katsinam and the dead across the Pueblo world. Drawing on available ethnographic sources, he concluded that for both the Hopi and Zuni the dead equated with the *Katsinam* (or *Kokko*, at Zuni), but that as one moved eastward, the relationship became less definite (White 1935:198–199). It is, however, at the western Pueblos where the *Katsina* tradition remains the strongest, where it has suffered the least oppression from colonial governments, and where the most extensive ethnographic data are available (C. Schaafsma 2000:122–124). Thus, despite my previous caveat as to relying on Hopi sources too heavily for the interpretation of Mimbres prehistory, when examining ancestor veneration in present-day and ethnohistoric Pueblo society, and its potential relationships to much earlier Mimbres ancestor veneration practices, Hopi and Zuni models are the most relevant.

At Hopi, the *Katsinam* are framed within the same sort of bipartite cosmovision that I have proposed operated during the Mimbres Classic, as represented in Figure 10.1b (Hieb 2000:25; Titiev 1944:173). John Loftin further ties the *Katsinam*, as ancestors, to water (even more precisely, water in the form of rain clouds): “The spiritual source of all life and forms issues from the land of the dead, the underworld, where it appears as life-giving water. Indeed, the Hopi petition their villages in the form of clouds to bless them with the sacred gift of rain. Thus, death is understood by the Hopi as a return to the spiritual realm from which comes more life” (1991:11–12). This equation of “ancestors =

Katsinam = rain" offers a model that fits the archaeological evidence that Shafer (1995, 2003) has emphasized, as well as the additional aspects that I have previously proposed for the role of Mimbres ancestors as rain-bringers (Nicolay 2008). The question, however, is whether a connection exists between the forms and practices of Mimbres ancestor veneration and the *Katsina* tradition that remains vibrant in the Pueblo world today, almost a millennium after the end of the Mimbres Classic.

Archaeologists still struggle to identify the chronological and geographical origins of the *Katsina* tradition in the SW/NW, but increasingly, informal recognition of the significance of the southern Mogollon region (both Jornada and Mimbres) has become more widespread. However, the most recent major *published* attempts to identify the geographic and chronological locus of this tradition's origin focus primarily on either the Little Colorado River basin in the thirteenth century (Adams 1991, 2000; Cole 1992) or the Jornada Mogollon region after ca. 1000 CE (P. Schaafsma 1997, 2000; Schaafsma and Schaafsma 1974). In both cases, rock art provides the primary line of evidence. However, both camps remain vague on the specific mechanisms for the rise of the *Katsina* tradition from any earlier tradition involving masked impersonators; nor do they point confidently to any specific extra-regional point of origin, although such an origin, somewhere in Mesoamerica, is a central component of the latter hypothesis. Both Beals (1932, 1944) and Brew (1944) had previously proposed a Mexican origin in masking traditions associated with the Mesoamerican rain and storm deity "Tlaloc."

The challenges facing archaeologists in this regard are manifold. These include the problem of an archaeological record that offers abundant iconography in rock art, kiva murals, and painted ceramics but not a single *Katsina* mask from an archaeological

context, as well as a relative paucity of good ethnographic data from early Spanish sources (Anderson 1955; but see P. Schaafsma 2000). Parsons first suggested that the origins of the tradition derived from Spanish clown masks rather than from any Indigenous source, then later proposed that the tradition had its roots in dances shared by Indigenous Mesoamerican who accompanied the original Spanish entradas, many of whom deserted and remained to live with the Pueblos (Parsons 1930:347fn, 1939). The question becomes further problematized by the vast diversity of *Katsina* types, the differences in how the tradition is interpreted in different Pueblos, particularly between the western Pueblos (Hopi and Zuni) and the eastern Pueblos of the Rio Grande, where the public masked dances were most vigorously repressed by the Catholic church (C. Schaafsma 2000:122–124).

Other scholars have also argued for the presence of *Katsina* traditions in the Mimbres region prior to 1130 CE, including Carlson (1982, 2005), and Eckert and Huntley (2016). Although Adams (1991) recognizes potential contributions of the Mimbres to the Katsina tradition, primarily through later Salado inhabitants of the Mimbres region, he stops short of identifying anything comparable to the modern *Katsina* tradition prior to the early fourteenth century. He associates these elements with a "Mexican" origin and notably describes a "cult of the dead" during the Mimbres Classic (Adams 1991:93–95). Importantly, he also points to the appearance of plazas in the Mimbres region during the mid-tenth century as a possible marker for large public dances, and recognizes the presence of iconography resembling *Katsinam* (1991:93–95). Although Carlson only emphasized the presence of a *Katsina*-compatible cosmovision during the Mimbres Classic, the extensive iconographic record left by the Mimbres also

offers what appear to be depictions of *Katsinam*, or at least proto-*Katsinam*, and in some cases relative and even absolute dates are available for these depictions (Miller et al. 2023, 2024; Nicolay 2008). One of these dates, from a small, painted wooden image, comes from Mule Creek Cave, perhaps the most important cave discussed in this dissertation (see Figures 5.14c and 9.2o). Adams also deserves credit for recognizing the resemblance of this figure to *Katsina* depictions in rock art (1991:26).

Similar images occur on a handful of Mimbres ceramics. Figure 11.1a shows one such image, a small bowl from Rock House (Peckham 1990:Figure 23), and this example is especially significant because it portrays a figure with a skeletonized spinal column, suggesting a dead person, and because it includes a motif that I believe is diagnostic for proto-*Katsina* representations: the rectangular or oval peg-toothed mouth. The same motif appears on the *tablita* from Mule Creek Cave (Figures 5.14c and 9.2o), as well as on a handful of other Mimbres bowls, beginning with Style II bowls, although unfortunately most of these lack good provenience data.[1] The overall evolution of anthropomorphic representations in the Mimbres B/w ceramic sequence provides some potential insight into the development of masking traditions. This pattern first manifests itself in the iconographic corpus of Style I ceramics, where the *only* anthropomorphs are representations of the goggle-eyed figure that Schaafsma and others identify as a northern analog of the central Mexican storm god Tlaloc (Figures 11.1b–k). Schaafsma argues that the *Katsina* masking tradition in the SW/NW originated in an earlier "Tlaloc" masking tradition (1972, 1999, 2000, 2022; Schaafsma and Schaafsma 1974; Schaafsma and Taube 2006). Miller and colleagues recently obtained 14C dates from masks in Jornada Mogollon rock art that date as early as ca. 600–900. However, none of the dated images

incorporated the peg-toothed mouth motif that I have proposed is diagnostic for early or "proto-" *Katsina* representations, such as those from the Mimbres region (Myles Miller, personal communication 2023).

Figure 11.1. Mimbres Black-on-white ceramics: (a) Style III bowl with Katsina-like figure (after Peckham 1990:Figure 23) (no MimPIDD #); (b) Style I sherd from Swarts with two goggle-eyes anthropomorphs (after Cosgrove and Cosgrove 1932:Plate 232:l; three additional sherds probably from the same vessel appear in MimPIDD as #10076 and #10077); (c) Style I bowl, #1731, with two goggle-eyes anthropomorphs and Hohokam-style geometric motifs (after Fewkes 1923:28:12); (d) Style I/Style II ladle, #7867, from the Pruitt Ranch site with intermediate anthropomorphic/aviform goggle-eye figure; (e) Style II bowl, #2071, from Swarts, with two aviform goggle-eye figures (after Cosgrove and Cosgrove 1932:Plate 119:e); (f) Partial Style III plate, #1266, from Warm Springs with aviform goggle-eye figure; (g) Style III bowl, #486, possibly from Gonzales, with aviform goggle-eye figure (after Fewkes 1923:33:28; cf. Fewkes 1923:9); (h) Style II bowl, #2662, from Swarts, with two heavily stylized aviform goggle-eye figures (after Cosgrove and Cosgrove 1932:Plate 119:d); (i) Style II/Style III sherd from the Villareal Ranch in the Gila River drainage, with head of goggle-eye figure (Peabody Museum 29-20-10/97580.2); (j) Style III bowl, #2683, from Swarts, with goggle-eyes "kenned" as a burden basket; (k) partial Style III bowl with possible anthropomorphic goggle-eye figure, from Elk Ridge (after original photo courtesy of Danielle Romero); (l) Style I bowl, #572, from Cameron Creek, with possible anhingas/cormorants similar to aviform goggle-eye figures of later styles (all drawings by Margaret Berrier; numerical designations refer to records in the Mimbres Photographic Image Database [MimPIDD; https://core.tdar.org/collection/22070/mimbres-pottery-images-digital-database-with-search]).

"*El Tlaloc del Norte*"

Images of the purported Tlaloc figure occur in both the Jornada and Mimbres Mogollon regions. These images have been the subject of previous study, primarily within the community of rock art researchers (Berrier 2013; Crotty 1990, 1999; Schaafsma 1972, 1980, 1999, 2015; Sutherland 1996). Use of the Nahuatl name *Tlaloc* to designate this goggle-eye figure remains controversial, given the near certainty that peoples of the prehistoric SW/NW would not have known it by its ethnohistoric Mexica name. Deities of similar appearance and with similar associations (rain, lightning, caves, hill and mountaintops, ancestors, and the underworld) are known by a variety of names from multiple regions of Mesoamerica, including the Mayan *Chaac*, the Zapotec *Cocijo*, and the Miztec *Dzahui.* (Covarrubias 1957:60–63, Figure 22; Miller and Taube 1993:59–

60, 64–65, 166–167; Pasztory 1974:15–16). Scholarly convention has long assigned the name “Tlaloc” to the abundant images of this deity at Teotihuacán, but we do not know the primary language spoken in that multiethnic polity either. Anderson and Helmke (2013:167) question the use of the name for this purpose and thus also any precedent for its broad application to prehistoric iconography, although the continuity of the actual deity and its attributes from the Classic onward is not in dispute. Schaafsma, who has written extensively on these images in the SW/NW, identifies them as “Southwestern Tlalocs” (2015:8–9). Although Schaafsma offers compelling support for this usage, I identify here only those examples from Mesoamerica as Tlaloc (qualified by quotation marks unless they refer to the ethnographically documented Mexica deity) and primarily refer to occurrences in the SW/NW by the purely descriptive term “goggle-eyes,” following the usage established by Berrier (2013), except where I focus on the possibility of a direct relationship between the forms in the SW/NW and Mesoamerica.

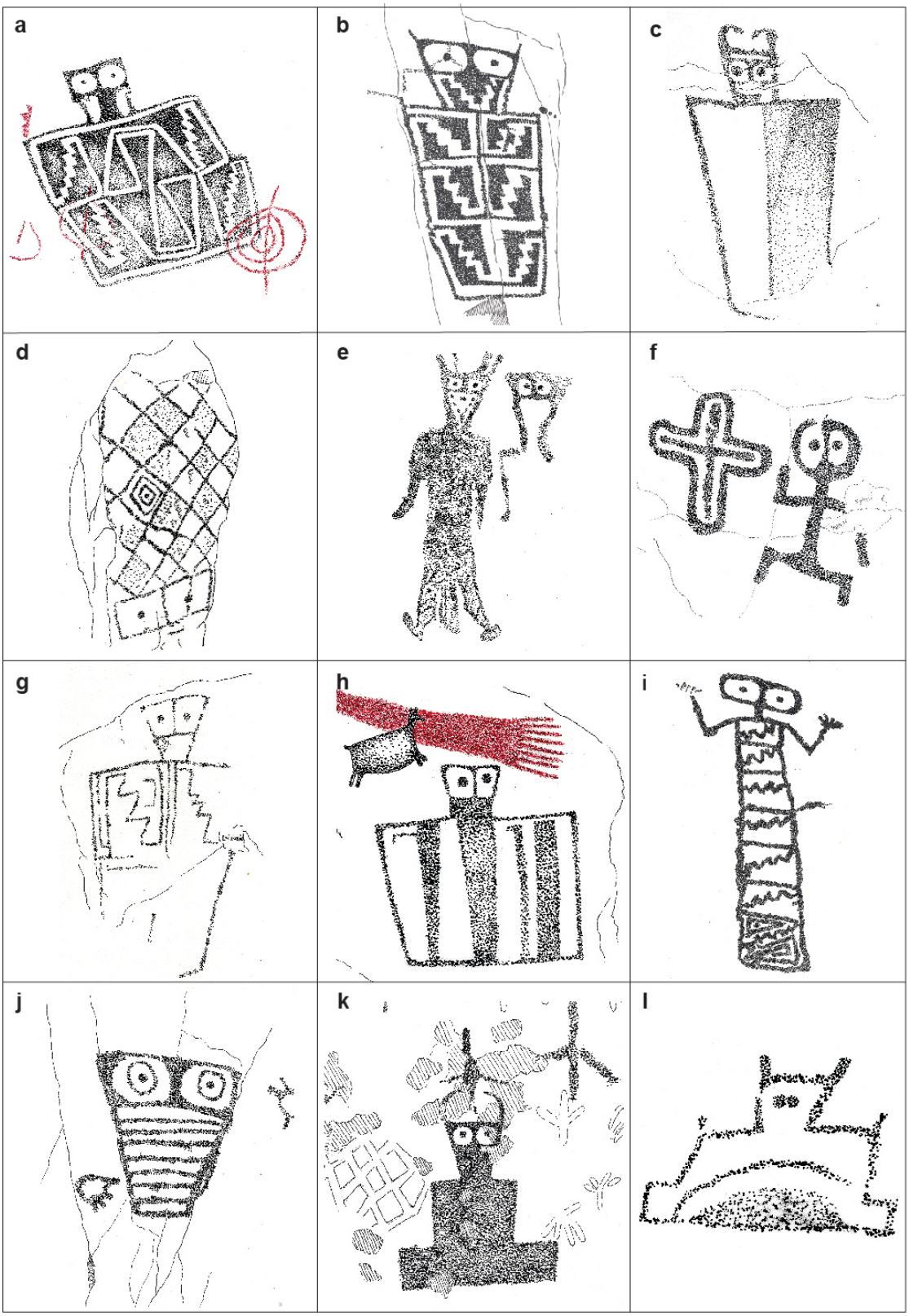

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Figure 11.2. Goggle-eye rock art images from the Southwest/Northwest: (a) Hueco Tanks, Site 20; (b) Alamo Mountain; (c) Rincon; (d) Three Rivers; (e) Centipede Cave; (f) Sacaton Draw; (g) near Ascension, Chihuahua, Mexico (southern extent of goggle-eye images in rock art); (h) Delaware Mountains, West Texas (furthest east documented goggle-eye); (i) Lion's Bluff, Gila River drainage; (j) Alamo Mountain; (k) Chloride Canyon; (l) Hueco Tanks. All drawings by Margaret Berrier, from photos. A printed copy of each image was placed on a light table and the images traced onto vellum. The tracing was done in front of a computer in order to be able to zoom in and out on the photos and other photo enhancements of the images. Tracing eliminates some of the subjective tendencies of field sketches and insures more accurate proportions. Caution was taken to make the tracing as objective as possible.

Berrier has documented over 500 images of the goggle-eyed entity from the combined rock art corpus of the southern SW/NW, primarily in western Texas, southern New Mexico, and northern Chihuahua, but also including a handful of possible examples reported from southeastern Arizona and northwestern Sonora (Figure 11.2). Over half of these images are concentrated at three sites in the Jornada Mogollon region: Alamo Mountain, Three Rivers, and Hueco Tanks (Berrier 2013). All three of these sites are isolated outcrops that attract lightning during storms (as observed by Berrier, personal communication 2021). Hueco Tanks is also notable for its many small grottos and *tinajas* that hold water.

Goggle-eye figures are so ubiquitous at these and other rock art sites throughout the Jornada Mogollon area that Schaafsma identified this image as a marker for the Jornada rock art style when she originally defined the latter (1972:95). Approximately 15% of goggle-eye figures that Berrier documented occur in the smaller rock art corpus of the Mimbres area (see also Creel 1989; Shafer 2003:53–54), and a handful of examples are known from sites outside the combined Jornada and Mimbres Mogollon areas (Schaafsma 2015:37–38). In her identification of the Jornada Style, Schaafsma

recognized goggle-eye figures not only as shared between these two areas, but also as extending into the iconography of Mimbres Black-on-white ceramics (1972:95).

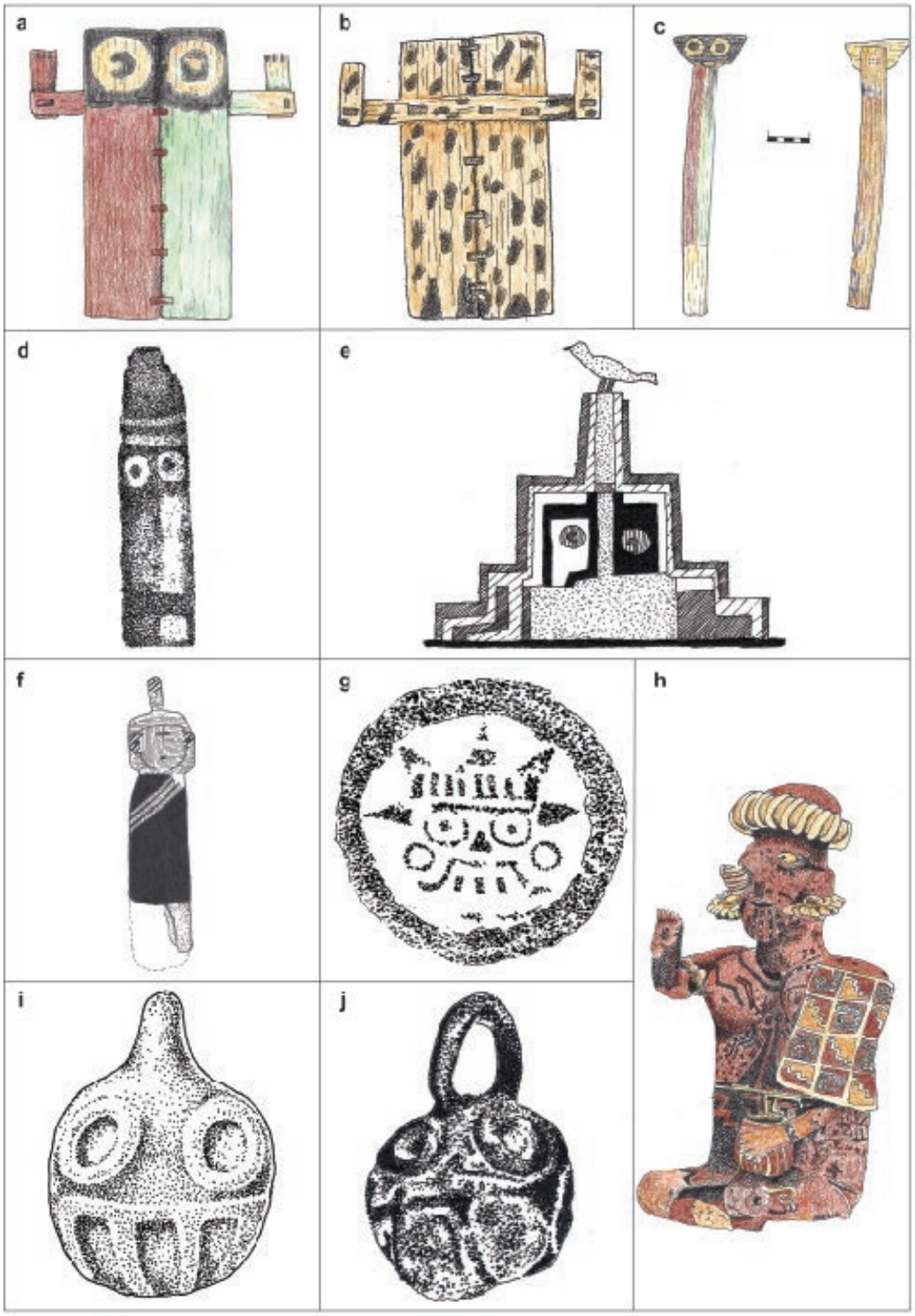

Figure 11.3. “Tlaloc” representations and related iconography in other media: (a, b) front and back of goggle-eye effigy from U-Bar Cave, Hidalgo County, New Mexico Bootheel (after Lambert and Ambler 1965:77–78; Nicolay 2012:174); (c) front and back of goggle-eye effigy probably from Feather Cave, Lincoln County, New Mexico (after Nicolay 2012:174); (d) sandstone goggle-eye effigy from Chavez Cave, Doña Ana County, New Mexico (after O’Laughlin 2003:142–143; Nicolay 2012:174); (e) goggle-eye cloud terrace from Kiva C at Picuris Pueblo (after a drawing by Deborah Kelley in Crotty 1999:165); (f) possible *Hemiskatsina* Effigy from Double Butte Cave, Maricopa County, Arizona (after Haury 1945a:199–200); (g) Teotihuacan-style “Tlaloc” image on locally made earspool from El Piñón in Jalisco (after Cabrero G. 2015:8); (h) ceramic effigy from a shaft tomb in or near Ixtlán del Río, currently in the collection of the Museo Amparo, Nayarit (https://museoamparo.com/colecciones/pieza/2157/dignataria-con-ademan-expresivo); (i) Type IA5a copper crotal from Paquimé (after Di Peso 1974:565); (j) Type IA5a copper crotal from Amapa, Nayarit (after Meighan 1976:414, Plate 108a).

In addition to ceramics (Figure 11.1) and rock art (Figure 11.2), the goggle-eye figures that help define the Jornada style also appear on painted effigies recovered from four cave shrines (Lambert and Ambler 1965:77–78; Miller 2018; Nicolay 2012:174; O’Laughlin 2003:142–143; Owens 2019:101, Figure 6.3; Schaafsma 1999:179–181) (Figure 11.3a–d, f; see also Figure 3.4), on copper crotals from at least three sites (Di Peso 1974:2:565; Di Peso et al. 1974:8:Figures 640-7 and 664-7, 526; Fewkes 1904:50; Watson et al. 2015:347–349) (Figure 11.3i), and possibly also as part of a kiva mural at Picuris Pueblo, a Northern Tiwa community (Crotty 1999:158–160, 171, Figure 9.9; Schaafsma 1999:181) (Figure 11.3e). However, the number of rock art images of this entity exceed representations in all other media by a factor of at least 20:1. Depictions of goggle-eye figures in the rock art corpus also provide the greatest variety and detail, though examples in other media still have much to contribute to our understanding.

The most extensive and important work on the goggle-eye figures comes from Berrier (2013), Crotty (1990), Schaafsma (1999, 2015), and Sutherland (1996). Although both Berrier (2013) and Schaafsma (1999) discuss depictions in other media, most of this

research has focused on the rock art corpus. I examine goggle-eye imagery across all media in this chapter, which allows for an expanded consideration of its temporal and spatial distribution. Combining the small but growing set of chronometric dates from rock art and portable effigies with the relative dating sequence possible with Mimbres ceramics demonstrates the importance of synthesizing data from various media across the regional archaeological record.

Goggle-eye images in the SW/NW exhibit considerable variability even without comparison across media, yet the majority of these figures are readily recognizable because they share a distinctive set of characteristics. Berrier (2013) has identified four primary attributes common to the majority of goggle-eye images in rock art:

1. A square, rectangular, or trapezoidal head (when the latter, the head is always an isosceles trapezoid with the shorter base at the bottom).
2. Eyes that are either large nucleated circles or rectangles.
3. Eyes that extend across most of the upper part of the head or fill the head entirely.
4. In full figures the head is attached to a rectangular or trapezoidal torso (as with the head, when the torso is trapezoidal, it is always an isosceles trapezoid with the shorter base at the bottom).

Examples that diverge in one or two of these attributes usually participate in the rest. Nonetheless, iconography generally exists on a spectrum or continuum, and although large datasets allow for the identification of statistically "typical" examples of any image (i.e., exemplars that conform to measures of central tendency and lend themselves to provisional employment as "types"), one will inevitably encounter examples that blur the

boundaries between categories. Some images in both Jornada rock art and Mimbres ceramics conform to the first of Berrier's three characteristics, but with heads attached to the bodies of various insects, birds, and reptiles. In these cases, evidence suggests that certain categories of zoomorphic depictions participated in the emic significance of the goggle-eye entity while retaining their own, at least partly independent, meanings. Sometimes the eyes remain the only salient feature, especially as one travels north up the Rio Grande Valley from the Mimbres and Jornada Mogollon regions. Otherwise, these four attributes characterize goggle-eye depictions across all media.

As stated above, most study of these figures has taken place within the rock art research community, which is not surprising considering the extent to which rock art images outnumber depictions in all other media. Some scholars, led by Schaafsma (1972, 1980, 1999, 2015) and Sutherland (1996), argue for their Mesoamerican origin. Crotty (1990) suggests instead that the images have a local origin in the Jornada Mogollon area, while Farmer (2001) makes the case for a relationship with Barrier Canyon Style rock art of southeastern Utah.

Farmer's argument reflects one of the more common problems with iconographic studies, in that it relies on cherry-picking individual images rather than the comparison of full datasets. Although anthropomorphs in the Barrier Canyon Style often have trapezoidal bodies, only a handful have the prominent eyes that are the dominant—and sometimes the *only*—identifying feature of the "Southwestern Tlalocs." Choosing a few Barrier Canyon figures with large eyes from a much larger pool of images presents an unrealistic basis for comparison. Once again, because iconography exists on a continuum, it is often possible to find a few examples from any sizable corpus that resemble a few

from another corpus, but such juxtapositions inevitably ignore the preponderance of available data. Moreover, the temporal gap between the disappearance of the Archaic Barrier Canyon Style and the appearance of goggle-eye imagery in the Jornada Mogollon area is significantly greater than that between the latter and the proliferation of Tlaloc iconography in central Mexico (although see Pederson et al. 2014 on the dating of Barrier Canyon Style rock art). However, the possibility exists that the tendency to depict supernatural entities as elongated trapezoids reflects a shared and enduring aesthetic preference, perhaps one associated with populations whose primary spoken language belonged to the Uto-Aztecan family. Although determining languages spoken prehistorically by specific populations is essentially impossible in archaeology, we can say with some confidence that based on historical settlement patterns, the people of both regions were at least "Uto-Aztecan adjacent," i.e., if they themselves did not speak languages from this widespread family, some of their near-neighbors did.

An obvious concern with arguments for the Mesoamerican origins of this figure is the extensive territory between the southernmost goggle-eye images in the SW/NW and the northernmost manifestations of "Tlaloc" in Mesoamerica. Much of this territory belongs to the region Kirchhoff identified as "Arid America" (1954; reformulated by Nabhan [1985] as "Aridoamerica"), a region unfavorable to agriculture and primarily inhabited by potentially warlike hunter-gatherers whom the Mexica characterized as "Chichimecs" (Figure 11.4). Nonetheless, the Chalchihuites civilization of Zacatecas and Durango and the later Aztatlán tradition in West Mexico each reached within a few hundred kilometers of the SW/NW at their respective apogees, with sites such as Guasave

in Sinaloa and La Ferrería and Cañón del Molino in Durango almost on the very "doorstep" of the SW/NW.

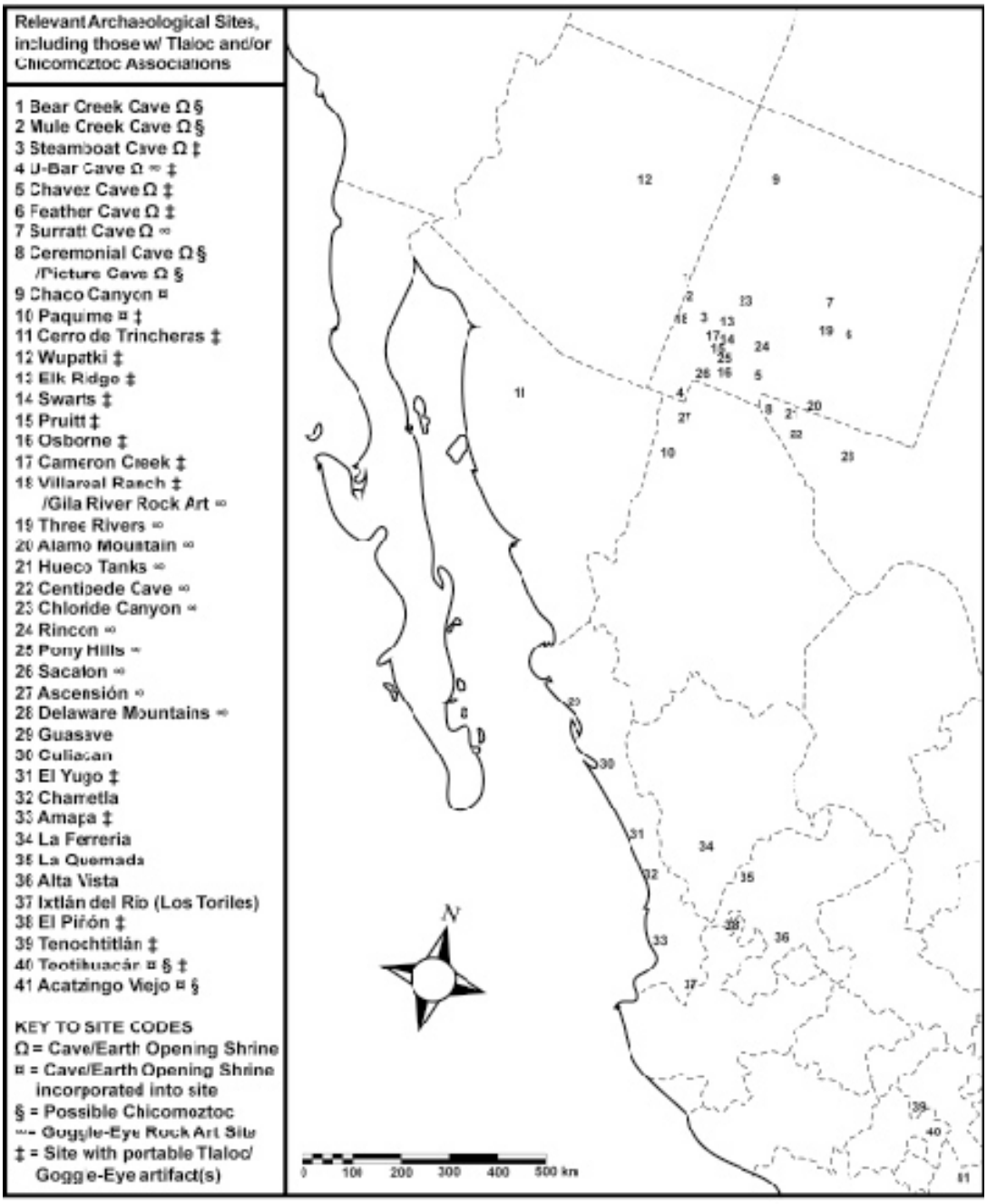

Figure 11.4. Sites discussed in the text with "Tlaloc" and/or Chicomoztoc representations.

However, no locally produced “Tlaloc” iconography has been reported from any of those sites, nor from the major Chalchihuites centers of La Quemada or Alta Vista. As Figure 11.4 demonstrates, all the Mesoamerican traits and materials discussed earlier are absent from the archaeological record of Aridoamerica, and most are unknown from Mesoamerican sites east of the Sierra Madre Occidental. Although Ganot and Peschard Fernández report a single IA5a “Tlaloc” crotal from Cañón del Molino in the Guatimapé basin of Durango, located even farther north than La Ferrería, Punzo identifies copper artifacts from these and other sites in the larger Guadiana area as evidence of extensive tramontane contact with West Mexico, rather than products of local manufacture (Ganot and Peschard Fernández 1995:161, Fig. 8-13; Punzo Díaz 2018:280, 2019:229). These accumulating data suggest we look toward West Mexico, rather than at any of the central or northern Mexican polities, for the origins of goggle-eye iconography in the SW/NW.

The goggle-eyed storm god was emblematic of Mesoamerica’s greatest city, Teotihuacán (Couvreur 2017:104, 108), and later experienced a resurgence among the Toltecs of Tula during the Early Postclassic. The Toltecs codified “Tlaloc” into a pantheon later inherited by the Mexica (Peter Jimenez Betts, personal communication 2020). However, dates now available for goggle-eye figures in the SW/NW place their arrival during the Late Classic (Epi-Classic), prior to the rise of Tula and within living memory of Teotihuacán’s Late Xolalpan phase during the Classic Period (Table 11.1). Additional dates assign the Steamboat Cave *tablita* solidly to the Mimbres Classic and the U-Bar Cave effigy to the poorly understood early portion of the Mimbres post-Classic. It is important to note that the U-Bar Cave effigy is nearly identical to the

Feather Cave effigy in size and coloration, despite a timespan of four to six centuries between the two, suggesting an extraordinarily long continuity of this tradition.

Table 11.1. AMS Radiocarbon Dates for Sites and Artifacts Discussed in the Text.

Site	Artifact Type	Date Range	AMS Method	Reference
Hueco Tanks	Goggle-eye pictograph	AD 650–990	carbon extraction	Hyman et al. 1999
Feather Cave	*Tablita*/goggle-eye effigy	AD 660–775	plasma oxidation	Miller et al. 2023
Steamboat Cave	*Tablita* fragment with goggle-eyes	AD 980–1130	plasma oxidation	Miller et al. 2023
U-Bar Cave	*Tablita*/goggle-eye effigy	AD 1210–1280	plasma oxidation	Miller et al. 2023
Mule Creek Cave	"*Katsina*" *tablita*	AD 1030–1170	plasma oxidation	Miller et al. 2023

Relative dating is also possible with goggle-eye imagery in the Mimbres ceramic sequence. Discussion of goggle-eye imagery on Mimbres Black-on-white ceramics has been limited and usually has come only as an adjunct to the study of depictions in the rock art corpus (see however Creel 1989 and Shafer 2003:53–54). At least two dozen distinct goggle-eye images occur on Mimbres vessels, and this number is exclusive of zoomorphic forms that display the goggle eyes but lack the characteristic rectangular or trapezoidal heads and bodies that typify the rock art forms. Although fewer than half of these images appear on bowls with reliable provenience and provenance, this sample size is still large enough to draw several important conclusions (Figure 11.1b–k).

Even when the sample set is restricted exclusively to vessels with reliable provenience and provenance, the available data demonstrate that a) goggle-eye images occurred throughout the entire temporal sequence of Mimbres Black-on-white ceramics

(AD 750–1130), and b) their geographic distribution extends through the entire Mimbres Valley, from the Deming Plain in the south to the Upper Forks of the Mimbres river in the north, even including one example from the Gila drainage across the Continental Divide in the west (Figure 11.1i). Moreover, even this constrained version of the Mimbres ceramic record provides a dataset extensive enough to allow for both relative dating and a degree of seriation within the overall sequence, as examples with good provenience appear in all three temporal style divisions. Interestingly, the sample set from the Swarts site includes goggle-eye figures from the entire sequence and in all categories (Figures 11.1b, e, h, and j).

The presence of goggle-eye iconography on Style I bowls indicates that this figure was present in the Mimbres region during the ninth century and probably earlier. An important point to note is that goggle-eye figures on Style I vessels are *always* anthropomorphs with arms and legs (Figure 11.1b–d). Conversely, goggle-eye images in rock art rarely display both arms and legs, although the post-Classic U-Bar Cave effigy does. Perhaps even more significantly, goggle-eye figures are the *only* anthropomorphs on Style I ceramics (and this remains true even considering bowls *without* full provenience/provenance). The extremely limited corpus of representational imagery during this period includes only a handful of birds and reptiles, cloud terraces, a few indeterminate quadrupeds, and several goggle-eyed anthropomorphs. Although a greater variety of figurative motifs appear on Style II ceramics, realistic human figures do not appear until Style III.

The most reliable evidence for this figure in Style I iconography comes from several sherds recovered by the Cosgroves at the Swarts site that depict goggle-eye

figures with their arms crossed or intertwined (Cosgrove and Cosgrove 1932:Plate 232:l), one of which is shown in Figure 11.1b. These sherds all appear to derive from the same vessel, and might have been culturally curated after its breakage. The "wavy hachure" decorating the bodies of these figures is typical of Mimbres Black-on-white Style I ceramics, but it also occurs on Hohokam ceramics from the same time period, especially the Gila Butte and Santa Cruz Red-on-buff types.

A Style I bowl pictured by Fewkes (1923:28, Figure 12) depicts two goggle-eye figures surrounded by geometric designs (MimPIDD #1731, Figure 11.1c). Although this vessel lacks full provenience, it is one of many acquired from rancher E. D. Osborne and most likely came from Old Town, the Osborne Ranch site, or another site in the southern Mimbres Valley or Deming plain, as these locations were the focus of Osborne's collecting activities. The geometric designs on this vessel closely resemble designs on coeval Hohokam wares, especially Gila Butte Red-on-buff, as is true of many of the geometric motifs on early Mimbres decorated pottery, including the aforementioned "wavy hachure," a key marker for Style I (Hegmon et al. 2016:61; LeBlanc 1983:77). Wallace (2014) discusses the wide distribution of Middle Gila Buff Ware and its significance as a marker of ritual transformation. Interestingly however, very little overlap exists between the highly stylized figurative iconography on Hohokam wares and the limited representational designs on Mimbres Style I ceramics. Only images of reptiles and large wading birds demonstrate any real similarity between the two traditions. Mimbres Style II marked an even more complete divergence from Hohokam design motifs (Hegmon et al. 2016:61). Goggle-eye figures do not appear in the Hohokam iconographic corpus (although Patterson [1992:167–168] identified "pipettes," a common

Hohokam rock art motif, as representations of "Tlaloc"; Golio and colleagues [1995] strongly refuted this possibility and subsequent researchers have followed Golio and colleagues in this regard).

An interesting and thus far inexplicable shift in the presentation of goggle-eye figures occurs with Mimbres Style II ceramics. This style developed during a dynamic period in the Mimbres area, the time of the pithouse-to-pueblo transition. During the first half of this period, the early tenth century, many villages in the Mimbres Valley ritually terminated most of their Great Kivas in elaborate pyres, replacing them with smaller "corporate kivas" located within domestic room blocks (Creel and Anyon 2003; Creel et al. 2015; Sedig 2015, 2020; Sedig et al. 2018). Subfloor, intramural burial also began to dominate local funerary traditions during this transition. Thus, the shift from discrete subterranean housing units to contiguous cobble-walled surface room blocks occurred simultaneously with a significant and recognizable but incompletely understood religious transformation. Also importantly, plazas began to appear in Mimbres villages, presumably replacing the Great Kivas as communal spaces and pointing to an emphasis on public dances. Mesoamerican prestige goods also began to appear in some Mimbres communities around this time, primarily macaws and copper crotals. Other Mesoamerican artifact categories recovered from Chaco and Hohokam sites—such as cacao, pyrite-mosaic mirrors, conch-shell trumpets, and objects decorated with pseudo cloisonné—have not been recorded in the Mimbres area, which suggests that each group maintained its own distinct contacts in Mesoamerica, rather than receiving the products of a mercantile or military force originating in a Mesoamerican state.

Depictions of goggle-eye figures from this portion of the sequence exhibit highly stylized avian bodies (Figures 11.1e–h), possibly intended to represent specific aquatic birds such as the neotropic cormorant, *Phalacrocorax brasilianus*, the double-crested cormorant, *Phalacrocorax auritus*, or the related anhinga, *Anhinga anhinga*. This taxonomic identity is suggested by images on contemporary and earlier bowls of birds with similar body and wing shapes but with naturalistic bird heads (Figure 11.2l, MimPIDD #572). Both the purely avian images and those of aviform goggle-eyed figures usually have deep V-shaped bodies and triangular wings, often with parallel lines decorating the body. These body patterns could represent the iridescent breast of the anhinga. Cormorants and anhingas are diving birds, and a notable characteristic of the latter is its especially long and sinuous neck, leading to its alternate common name, "snake-bird." The anhinga is the "waterbird" depicted on contemporary ceremonial accoutrements of the Native American Church, a syncretistic pan-tribal religious tradition that extends far beyond the bird's natural habitat.

Both the naturalistic bird images and the avian goggle-eye figures lack the long legs that would identify them as wading birds such as cranes, herons, or egrets. Moreover, Mimbres ceramics usually depict wading birds in profile while cormorants/anhingas and aviform goggle-eye figures appear ventrally/dorsally. Although these aviform depictions dominate goggle-eye imagery in the Style II corpus, they continue through the end of the sequence (Figure 11.2g), alongside a limited but more varied array of forms on Style III vessels (Figures 11.2j–k). A few such aviform goggle-eye images also occur in the rock art of the Jornada Mogollon region. One of the clearest examples comes from Centipede Cave, a rock art site in western Texas originally

documented by Berrier (2003), where such an image occurs superimposed over the left leg of a figure that might itself represent a Mesoamerican jaguar warrior (Figure 4.4).

Of special related interest is a triangular shell pendant recovered from the El Yugo site in Sinaloa (Figure 11.5). Gibrán De la Torre Vázquez (2020:68–71) identifies the goggle-eye image on this pendant as a pelican (either *Pelecanus erythrorhynchos* or *Pelecanus occidentalis*), based on nearby petroglyphs that display some similarity. The pendant's triangular shape resembles both aviform goggle-eye images in the SW/NW and stone bundle masks from Teotihuacán, and like the latter, it has drilled ear-flares. Though barely 5 cm in width, its dimensions are within the lower limits of Teotihuacán stone masks, so it is not impossible that this artifact could have functioned as the mask of a small sacred bundle—or that it was intended to represent such a mask in miniature. Most importantly, it potentially pushes the northern boundary of Mesoamerican goggle-eye imagery much closer to the SW/NW.

Figure 11.5. Goggle-eye pendant from El Yugo, Sinaloa, Mexico (photo courtesy of Gibrán De la Torre, Instituto Nacional de Antropología y Historia, Mexico City).

Seven crotals (copper tinkler bells) from the SW/NW belong to Pendergast's Type IA5a (1962:526), which bears a simplified but recognizable representation of "Tlaloc." Five specimens came from a single burial at Cerro de Trincheras in Sonora (Punzo and Villapando 2015:182, 184–195; Watson et al. 2015:347–349). Fewkes reported one from Wupatki in Arizona (1904:50). The extensive assemblage of copper artifacts recovered from Paquimé included another (Di Peso 1974:523-525) (Figure 11.3i). USFS archaeologist Christopher D. Adams reports seeing two more IA5a crotals in private collections, one of which possibly originated in the Mimbres area (personal communication 2020). The IA5a crotals lack the fangs, moustache, and other curvilinear elements typical of the Teotihuacán storm god and are identifiable only by the eyes and teeth, just like goggle-eye images from other media in the SW/NW (Figure 11.3i).

Mountjoy identifies almost identical images at La Peña Pintada, a rock art site in coastal Jalisco as "water serpents…pouring forth from the mouth of Tlaloc" (1982:118, Figure 5d). Another very similar pictograph of this simplified form of the Mesoamerican rain god appears in Area A of Oxtotitlan Cave, in Guerrero, Mexico, a site famous for its elaborate Olmec-style paintings (Grove 1970:26, 33, Figure 27). Although this motif appears to be later than most of the other images in the cave, the earlier Olmec-style art relates to the same cosmological complex of the Underworld, ancestors, rain, water, and fertility as do the goggle-eye/Tlaloc motifs in the SW/NW (Grove 1970).

The IA5a crotals from the SW/NW are, in turn, almost identical to others recovered at the site of Amapa (Figure 11.3j), in the modern Mexican state of Nayarit

(Figure 11.4), and were probably manufactured there beginning during the Cerritos phase (Figure 11.3j) (Meighan 1976:115; Pendergast 1962a, 1962b). They provide a concrete example of the transfer of a "Tlaloc" artifact from Mesoamerica, and significantly, one displaying the simplified version of the figure without the curvilinear elements associated with its Mesoamerican iterations, similar to representations created in SW/NW. Although this sample of IA5a "Tlaloc" crotals in the SW/NW is sparse, it nonetheless demonstrates contact with a portion of Mesoamerica in which the storm god could be recognized even in a very minimal form. Most importantly, perhaps, this simplified form of the deity that appears on the IA5a crotals, also lacks the curvilinear elements that typify depictions in central Mexico but which are lacking from images in the SW/NW.

As discussed above and in previous chapters, several portable effigies of the goggle-eyed entity have also been recovered from caves in New Mexico (Figures 11.3a–d). Marjorie Lambert and Richard Ambler found one in U-Bar Cave, the cave shrine in the New Mexico Bootheel described in Chapter 8 (Figures 11.3a–b). The second example, from Lincoln County, New Mexico—also currently in the collection of the Museum of Indian Arts and Culture in Santa Fe (Figure 11.3c)—lacks full provenience information, but based on available data and the author's knowledge of caves in that area, it almost certainly came from Feather Cave, the important Jornada Mogollon shrine from the Sierra Blanca region described in Chapter 4 (Ellis and Hammack 1968; Nicolay 2007, 2023). Tom O'Laughlin (2003) recovered a painted sandstone goggle-eye effigy from Chavez Cave in the Robledo Mountains near Las Cruces, another important shrine described in Chapter 4 (Figures 11.3d). A *tablita* fragment recovered by the Cosgroves from Steamboat Cave, a site in the southern Mimbres drainage, consists of the paired

goggle-eyes only (Cosgrove 1947:Frontispiece i, 10–14, Figure 15j). A fourth, apparently partial goggle effigy, similar in shape to the example from Feather Cave, is described in Chapter 7. This example reportedly came from the York-Duncan Valley, a peripheral Mimbres region, possibly associated with Mimbres populations in the southern and central Blue River Valley to the north (Owens 2019:101).

Although identifiable representations of "*El Tlaloc del Norte*" are almost nonexistent in post-Contact media, Polly Schaafsma (2022:455–456) and I both believe an ethnographic continuity exists between the prehistoric goggle-eye figure and the contemporary *Hemiskatsina*. The name *Hemiskatsina* means that this *Katsina* originated at the Towa-speaking pueblo of Jemez. This important *Katsina* wears an elaborate cloud terrace *tablita* and is closely associated with the *Niman* (Homegoing) Ceremony at Hopi, in which multiple representatives arrive to lead the other *Katsinam* back to their home after the summer solstice and the conclusion of the *Katsina* season. This association is not entirely a new idea: Di Peso (1974:566–567, 714n.105) suggested an association between the *Hemiskatsina* and "Tlaloc" based on the rain terrace incorporated into the mask of the former, and Haury identified a wooden effigy taken from Double Butte Cave in Arizona by Frank Hamilton Cushing as a possible representation of the *Hemiskatsina* (Haury 1945a:198–200, Fig. 128c) (Figure 11.3f). Although this effigy possesses neither goggle eyes nor a cloud terrace, its face does show the divided color scheme common to the *Hemiskatsina* and the three goggle-eye effigies from other caves. The Double Butte Cave figure and a cloud terrace image with goggle eyes from a kiva mural at Picuris Pueblo in the Northern Tiwa area (Crotty 1999:158–160, 171; Schaafsma 1999:181) link the prehistoric goggle-eye figure with the ethnographic *Hemiskatsina*. On the Double

Butte Cave effigy, the Picuris kiva painting, and the *Hemiskatsina*, the color division of the older effigies—red on the left, green/blue on the right—is reversed for the eyes, while the background preserves the older pattern. The colors are also switched between the face and body (the older effigies have black faces, but the *Hemiskatsina* has a black body). Multiple "eyes-only" goggle-eye images appear elsewhere in the Northern Tiwa region, including the Taos Gorge (Severin Fowles, personal communication 2018), and a divided cloud terrace petroglyph with eyes, very similar to the Picuris image, occurs near Chaves-Hummingbird Pueblo, southwest of Albuquerque (Michael Adler, personal communication 2018).

The association between the goggle-eye figures and caves in the SW/NW receives further emphasis from cave shrines with goggle-eye rock art. First, U-Bar Cave, discussed in Chapter 8, which contained a painted goggle-eye effigy, also bore a "Tlaloc mask petroglyph just outside the left side of the original entrance (as facing the cave), with the mask composed of two round circles pecked into the rock," although this mask was destroyed when guano miners dynamited the original cave entrance to enlarge it (Greer and Greer 1996:5, 1999:14). Surratt Cave on Chupadero Mesa in west-central New Mexico, which is discussed in Chapter 4, also has a similar pair of eyes carved into the rock face across from its entrance (Greer and Greer 1996:8, Figures 6–7, 1997:27–28, Figure 4, 2002:38) (Figure 4.8a). According to Greer and Greer, who conducted the only extensive study of this site, "Centered below the eyes, in what would be the mouth area, is a substantial number of random peck marks almost certainly caused by striking the rock as a drum" (1996:8, Figures 6–7). The unpublished rock art corpus in the Main Chamber of Feather Cave also contains a small rectangular goggle-eye motif. Thus, at

least eight ceremonial caves and rockshelters in southern New Mexico and western Texas have/had either goggle-eye effigies or rock art: Centipede Cave, Chavez Cave, Feather Cave, Picture Cave, Steamboat Cave, Surratt Cave, U-Bar Cave, and an unknown cave near Duncan, Arizona.

The large spatial gap between goggle-eye images in the SW/NW and "Tlaloc" iconography in Mesoamerica pose a problem for the identification of the northern figure as depictions of the southern deity. The spatial distribution of goggle-eye imagery in the north extends southward only as far as northern Chihuahua, leaving a gap of approximately 1,500 kilometers to the northernmost appearances of "Tlaloc" in Central Mexico. However, accumulating evidence from West Mexico suggests the presence of "Tlaloc" imagery there prior to AD 550 as a direct result of interaction with the singular polity of Teotihuacán. Recent excavations at the site of El Piñón in Jalisco uncovered locally made artifacts with Teotihuacán iconography, including an earspool with a clear image of the storm god (Cabrero G. 2015:8; Jiménez Betts 2018:80, Figure 4.9, 97, Figure 4.17) (Figure 11.3g). These artifacts date prior to AD 550 and come from a site located along an important trade route between Teotihuacán and the coast, a route that likely terminated in Nayarit.

Although the large goggle eyes are usually a distinctive feature of Mesoamerican depictions, most of those images also include a "moustache" and/or fangs that curve outward from the sides of the mouth, and this aspect presents a second problem for the "Tlaloc" identification. Although some northern images depict a comb-like row of teeth, especially those in Jornada Mogollon rock art, none of these representations ever include the curved fangs or moustache. However, "Tlaloc" images with goggle eyes and straight

teeth do occur in West Mexico, in the form of the aforementioned IA5a crotals, as well as in rock art. Type IA5a crotals represent the probably transmission of "Tlaloc" artifacts between Nayarit and the SW/NW. Therefore, as early as the tenth century, a route existed for such a transfer, and the simplified form of the storm god that traveled along this route was similar to the version from Jornada Style rock art depicting only the goggle-eyes and a straight tooth-row without curvilinear elements.

I propose that the means by which "Tlaloc" traveled first from Teotihuacan to West Mexico, and subsequently from West Mexico to the Southern Mogollon region, would have been via a rainmaking ceremony accompanied by anthropomorphic medicine bundles, probably wrapped in textiles (in the next chapter, I will examine the correlation between the first dated appearances of this figure in the Mogollon region and a lengthy period of below average rainfall). Some of the more elaborate Jornada rock art images bear recognizable West Mexican textile motifs on their bodies (cf. Figure 11.3h, which depicts a West Mexican shaft tomb figure wearing a shawl with motifs very similar to some of the goggle-eye images in Jornada Mogollon rock art, for instance, those in Figure 11.2a–b). A masked impersonator tradition almost certainly accompanied the ceremony and bundle, as depicted in the anthropomorphic examples on Style I ceramics, where the goggle-eye figures appear to be dancing.

I hypothesize that the agents of this process were not Mesoamerican traders or warriors, but Mogollon pilgrims traveling to West Mexico (probably to somewhere around Amapa in Nayarit), apprenticing to a ceremonialist, assembling their own bundles, and returning with not only the bundle but also knowledge of an important weather-control ceremony. Bernardini offers an important ethnohistoric model that fits

this hypothesis: in order to migrate from the Little Colorado River to the Hopi mesas, clans had to demonstrate their ownership of an effective rainmaking ceremony (2005:73, 178). Ethnographic data show that rainmaking ceremonies retained great currency among the Pueblos throughout the historic period, and the *Katsina* tradition remains one of, if not *the* most sacred and secretive of all aspects of Pueblo esoteric knowledge. This hypothesis also fits with Mary Helms's model of the "long-distance specialist" (Helms 1988).

Although the presence of simple copper crotals (tinkler bells) in the Mimbres region by the tenth century clearly indicates some connection to West Mexico at that time, new rainmaking ceremonies would have held far more value than prestige goods such as copper or macaws. Moreover, the crotals, which make a sound associated with rain and were later manufactured with the face of "Tlaloc," might have entered the SW/NW as part of the new ceremonial tradition. In this model, the agents of influence were not Mesoamerican traders, warriors, or elites colonizing the SW/NW, but "long-distance specialists" from the SW/NW itself making pilgrimages southward in limited numbers in order to acquire new maize varieties, ceremonial knowledge, and prestige goods.

The concept of the long-distance specialist is important, and it is relevant not only to my conclusions in this dissertation but also to the greater questions of relationships between Mesoamerica and the SW/NW. Moreover, it represents a significant *shift* in our understanding of these relationships. For these reasons, it deserves further explanation here. The idea grew out of Helms's research on protohistoric Panama, where powerful chiefdoms were situated between the complex state societies of both Mesoamerica and

South America (Helms 1979). Helms first proposed the hypothesis: "that the high elite of ancient Panama, who presumably held the deepest understanding of the most esoteric sacred-secular lore and who were also most involved in long-distance contacts, were most familiar with distant geographical regions that were *terra incognita* to the less educated elite and to the 'unknowing' commoners" (1979:134). From the beginning, Helms frames her ideas in relation to constructions of sacred space.

In Helm's next book, *Ulysses' Sail* (1988), she refines these ideas, which remained somewhat incipient and specific to ancient Panamanian chiefdoms in her previous work, and extends them beyond Panama via a global survey of examples from ethnography and literature. In that work, she argues that "Not only exotic materials but also intangible knowledge of distant realms and regions can be political valuable 'goods' both for those who have endured the perils of travel and for those sedentary homebodies who are able to acquire such knowledge by indirect means and use it for political advantage" (Helms 1988:4). The social construction of sacred space takes on central importance in that second volume. A core component of Helms's argument there is that "geographical distance from a given cultural heartland may correspond with supernatural distance from that center; that as one moves away from the axis mundi one moves toward places and people that are increasingly 'different' and, therefore, may be regarded as increasingly supernatural, mythical, and powerful" (Helms 1988:4). Thus, in Helms's model, horizontal travel that extends beyond the boundaries of the sacred heartland, as defined by sacred mountains or comparable landmarks, becomes equivalent to spiritual travel either up or down along the *axis mundi*, and long-distance specialists are those

individuals who voluntarily undertake such journeys and return successfully with new and exotic—but also valuable—prestige goods and ideologies.

Although this aspect of Helms's model was already emergent in her first book: "the geographically distant and the supernaturally distant were closely related and…this association was succinctly stated by the acquisition from distant geographical regions of elite prestige items with sacred significance" (1979:107–108), it becomes the primary thesis of *Ulysses' Sail* (1988). The intersection of long-distance travel and the Indigenous cosmovision of sacred space that is central to Helms's developed hypothesis serves to flatten spiritual travel into geographical movement (1988:33). Helms further identifies the motives of long-distance specialists as ideological in nature and focused on local political goals (1988:67). This model aligns with the categories of apparent Mesoamerican traits in the archaeological record of the SW/NW: prestige, or luxury, goods such as macaws, copper crotals, cacao, pyrite-mosaic mirrors, pseudo-cloisonné ceramics, and *Strombus*-shell trumpets (only the first two of which have been reported from the Mimbres region); and ideological elements, such as "Tlaloc" and any associated ceremonial traditions, ballcourts, and possibly colonnades at Chetro Ketl in Chaco Canyon (Hewett 1936:65; Lekson et al. 2007:166–170; Nelson 2006:347–348) and Paquimé, primarily at the House of the Pillars (Di Peso et al. 1974:5:612-712). Although colonnades in the SW/NW are known only from these two locations, both communities yielded a wide variety of Mesoamerican artifacts.

Rather than culture-historical models that relied on trade or colonization driven by Mesoamerican agents traveling to the SW/NW, I suggest that available evidence better fits a model of long-distance contact driven by pilgrims traveling south from the SW/NW

into Mesoamerica to obtain prestige goods along with associated ideologies and technologies. A pilgrimage-driven model for interregional contact does not require the balanced exchange of goods. In fact, it does not require the exchange of any goods at all (though pilgrims from the north could have transported perishable items, such as buffalo robes, or provided labor for their hosts).

Such a scenario also fits elegantly with a World Systems approach, as adapted from Wallerstein's original World Systems Theory (1974) for application to noncapitalist, nonindustrial New World societies (Chase-Dunn 2006; Hall and Chase-Dunn 1996; Peregrine 1996a, 1996b; Wilcox 1986). A key element of this revised World Systems perspective is the recognition that prestige goods, disregarded by Wallerstein in his original formulation, can drive a world system. Hall and Chase-Dunn (1996:14–15) describe four levels of linkage or "nets" in core-periphery relationships, which are largely determined by distance from the core: bulk goods, political/military control, prestige goods, and ideology (Figure 11.6). The application of this approach to Mesoamerica and the SW/NW considers the two cultural areas respectively as core and periphery within a single macro-area (Feinman et al. 1996; Jiménez Betts 2018; Mathien and McGuire 1986; Whitecotton and Pailes 1986; Wilcox 1986).

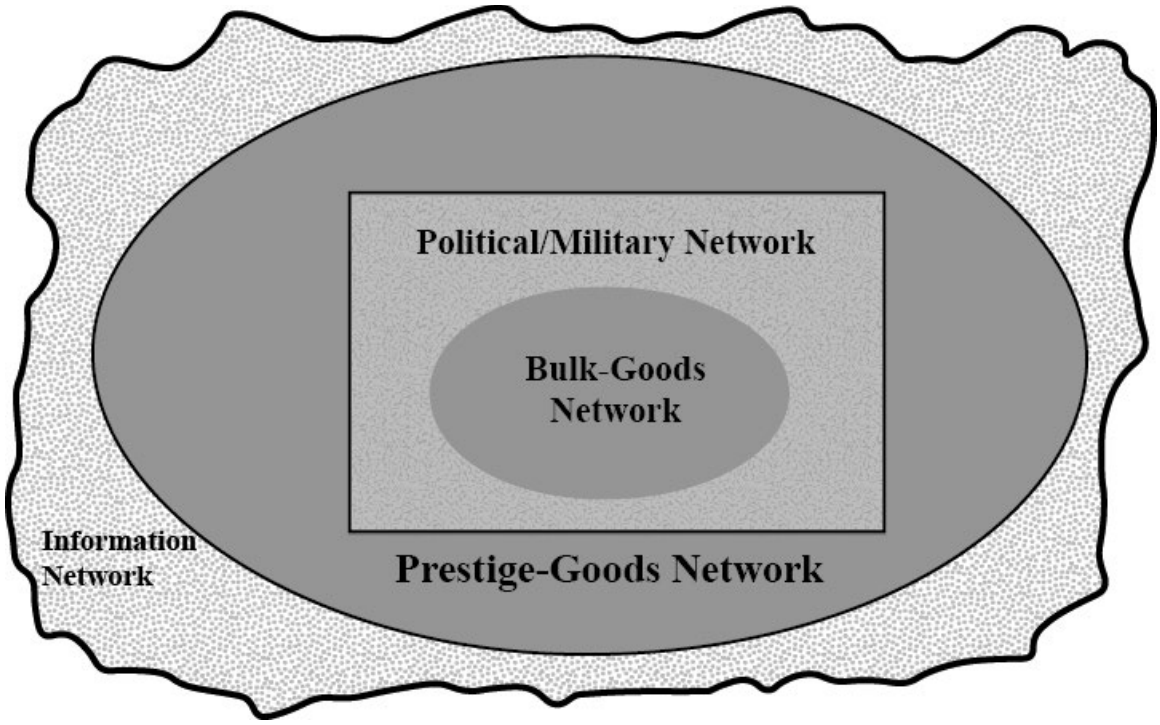

Figure 11.6. Nested networks and spatial boundaries in a world-system (after Chase-Dunn and Lerro 2014:Figure 2.2; Jiménez-Betts 2018:24, Figure 2.2).

A World Systems approach to interactions between Mesoamerica and the SW/NW recognizes that distance between the core and the periphery within this macro-area was too great to allow for the movement of bulk goods or political/military control, but evidence from the archaeological record, as described above, strongly indicates the northward movement of prestige goods and ideology. My argument here focuses on the movement of ideologies and on "core/periphery structures" that operated across considerable distance between the regions, following Hall and Chase-Dunn (1996:13–19).

As suggested above, this modified World Systems approach dovetails neatly with Helms' (1988) concept of the "long-distance specialist," whose travel outward from a

spatial center to return with material and ideological benefits from distant lands is also reckoned as a perilous journey along a spiritual *axis mundi*, thus enhancing the prestige of those who successfully competed such journeys (Figure 11.7). In this way, Helms' model flattens geographical and spiritual travel (1988:33), and she identifies the motives of long-distance specialists as ideological in nature and focused on local political goals (1988:67). This model also aligns with the categories of Mesoamerican traits in the archaeological record of the SW/NW. Interestingly, although references to Helms's work are becoming increasingly common in archaeology, one of the most significant examples is a 2019 paper by Gilman and colleagues that specifically addresses the Mimbres acquisition of Mexican macaws. Marc Thompson, the second author on this paper, has also argued for peoples from the SW/NW as the agents of contact with Mesoamerica at least as far back as his doctoral dissertation (1999), although he did not cite Helms at that time, which suggests that he was developing a version of this paradigm for long-distance contact independently.

The degree to which groups in the SW/NW adopted Mesoamerican ideologies remains a contested issue, partly because many such claims rely heavily on ethnography, iconography, and speculative associations, rather than the material components of the archaeological record. In a seminal 1980 paper, McGuire defined a major problem that affects many efforts to draw connections between Mesoamerica and the SW/NW, which is that archaeologists working in the latter region have often made comparisons based on disparate sets of Mesoamerican traits, both material and ideological, which they gather in a sort of intellectual grab-bag. These trait-lists are sometimes drawn from the entire geographic and chronological spans of Mesoamerica, and often include such widespread

characteristics as dualism and quadripartite directional symbolism, which are ethnographically documented across much of the Western Hemisphere. As McGuire rightly points out, greater specificity is needed in our discussions of interaction between these regions. Therefore, it becomes necessary to focus on specific traits, specific cultures, and specific potential routes of interaction (McGuire 1980:27).

Such an approach as I describe above also supports the idea of the SW/NW as a remote periphery of socially complex Mesoamerica, just as World Systems Analysis models describe: a region too distant for military conquest or the trade of bulk goods, but within reach of the core area's outer fringe where prestige goods and ideology might promote the agendas of even those marginal elites created by ranked lineages and/or incipient sodalities of such relatively unstratified societies as those in the Mimbres and Jornada Mogollon areas. Central Mexico was simply too far; West Mexico however was "just right," i.e., a "Goldilocks Zone" of peripheral interaction between the two cultural areas (Figure 11.7).

Further evidence for connections between the Mimbres region and West Mexico comes from the remains of a young woman from the NAN Ranch who showed a strong genetic correlation with contemporary Huichol populations (Snow et al. 2011). Moreover, although IA5a crotals with the face of "Tlaloc" only show up in the SW/NW *after* the Mimbres Classic at Wupatki, Cerro de Trincheras, and Paquimé—these bells likely came from Amapa in Nayarit, thus demonstrating that not only was "Tlaloc" more prevalent in this region than the archaeological record shows, but also that transfer of this ideology between West Mexico and the SW/NW was definitely possible.

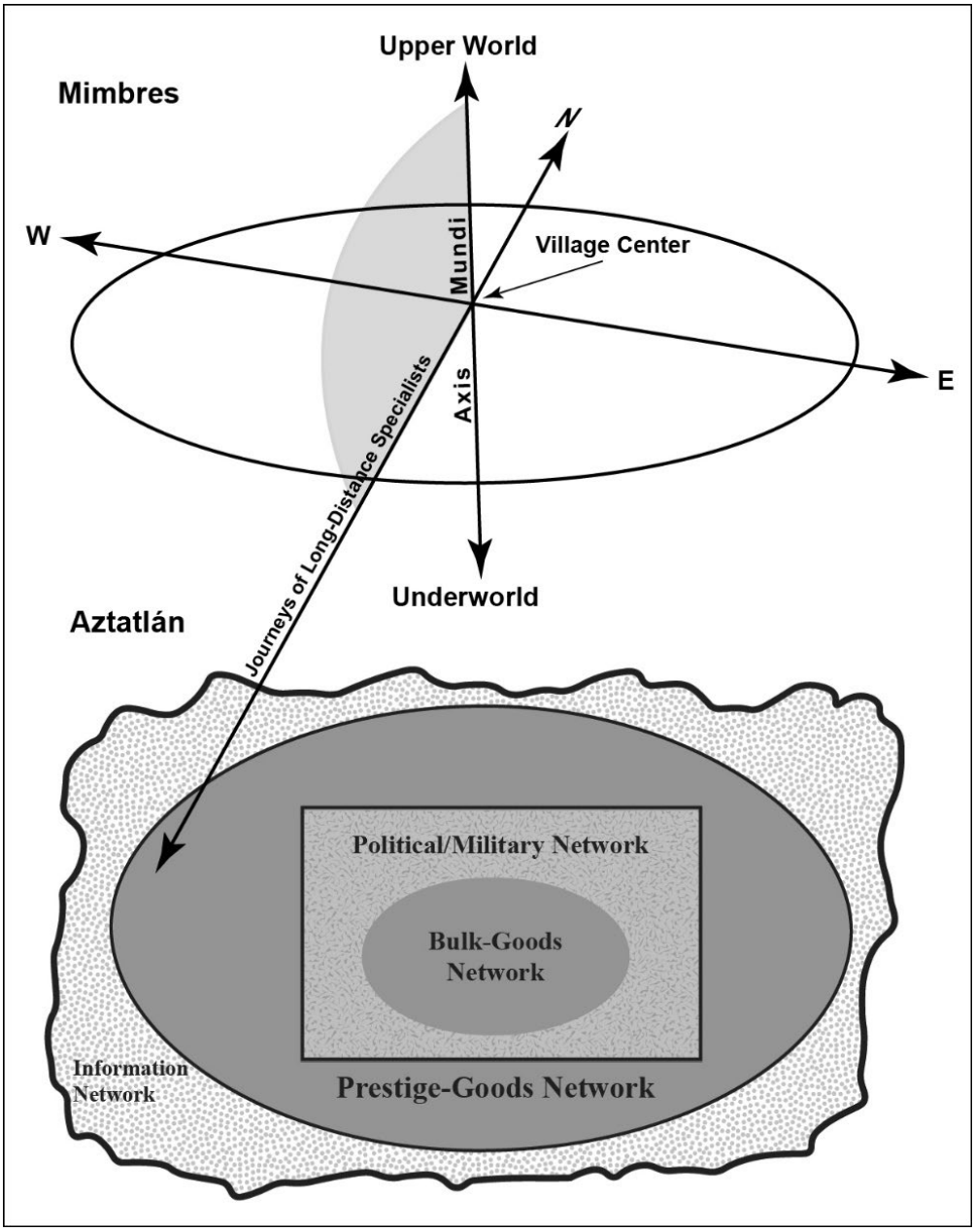

Figure 11.7. The journeys of long-distance specialists from the Mimbres region (as pilgrims) reaching the outer peripheries of the Aztatlán core in West Mexico in order to acquire prestige goods and ideology.

One curiosity in the distribution of goggle-eye imagery on Mimbres ceramics is the lack of examples from major villages with large and well-reported samples, especially Galaz, Mattocks, and the NAN Ranch. However, Creel recently obtained iNAA results

for at least one vessel with goggle-eye iconography that matched his Galaz source (2022:106, Figure 3.3b). This partial Style I vessel with an anthropomorphic goggle-eye image came from a cache of five vessels found by a rancher in the bank of Arenas Creek, near both the Treasure Hill and Cameron Creek villages (Darrell Creel, personal communication 2024). This marks the first time we can potentially point to a center of production and dissemination of this tradition, and it is interesting that Galaz appears to be at least one source, given that it was the largest village in the central Mimbres Valley.

These data do not necessarily confirm, however, that the vessel was manufactured at Galaz, although the possibility that this important site disseminated its ideology through painted ceramics distributed to other communities is intriguing. It would make perfect sense that the heart of this tradition would have been at Galaz. The idea that Galaz was a ceremonial center is widely accepted (Gilman et al. 2018:98), and it seems entirely plausible that it would have been a center for the "Tlaloc" tradition as well—perhaps it was once the home of a "first-generation" "Tlaloc" bundle. The lack of goggle-eye iconography on vessels from Galaz does not necessarily problematize this conclusion. Vessels with goggle-eye iconography plausibly would have been manufactured for *export* at Galaz rather than local consumption in order to disseminate this ideology and establish the primacy of the village's ancestors and/or ceremonialists in weather control. Gilman and colleagues "suggest that at least some people at Galaz, especially those involved with pottery production, painting, and distribution, were socially different from others in the Mimbres region" (2018:98).

In summary, the significance of goggle-eye iconography in the Mimbres Black-on-white ceramic sequence has not been fully recognized, especially for its value in

placing “Tlaloc” in the Mimbres region prior to ca. 900 CE. Several characteristics of this dataset deserve special note:

- Approximately two dozen goggle-eye images have been identified in the Mimbres B/w ceramic corpus.
- Goggle-eye iconography appears throughout the entire B/w ceramic sequence at Swarts.
- Goggle-eyes are missing as discrete images in the ceramic corpus from Galaz, Mattocks, and the NAN Ranch, which together account for a very large part of the reliable sample.
- Goggle-eyes are the only anthropomorphs in Style I ceramic iconography, but anthropomorphic examples are very rare later in the ceramic sequence.
- Goggle-eye images on Style II vessels all have aviform bodies.

Moreover, although the majority of goggle-eye iconography comes from the Middle Mimbres Valley and temporally from Styles I and II, at least one example originates from the Gila (Villareal I, from Rice 2010) (Figure 11.1i) and one from Elk Ridge in the northern forks of the Mimbres Valley (Figure 11.1k). This latter example was locally produced at Elk Ridge and remains the only identified anthropomorphic Tlaloc after early Style II.

Thus, if the entity depicted in southern Mogollon iconography is indeed a northern version of the Mesoamerican “Tlaloc,” it would have arrived in the Mimbres world at a time when the commitment to sedentary agriculture was seriously underway—but also during the first major drought that these early village-dwellers faced. This timing suggests that its arrival potentially played a role in the various social shifts that occurred

during these years, including the pithouse-to-pueblo transition and the adoption of Black-on-white ceramics. The Mesoamerican associations of "Tlaloc" (and his variants such as Chaac, Dzahui, and Cocijo) include water, rain, lightning, caves, the watery underworld, and ancestral spirits. Miller and colleagues point out that although "the Tlaloc entity embodied several interrelated concepts derived from a foundational cosmovision of mountains, caves, and a watery underworld, which in turn were related to the origins of water, ancestors, fertility, and emergence" (2023:50), all or most of these elements, particularly those related to the underworld, already existed in the cosmovision of groups in the SW/NW. The addition of a new deity, visibly manifest in an animated sacred bundle and almost certainly portrayed by masked impersonators—even if that deity had already existed in some less prominent form—would have *entangled* these concepts in a single ideological complex that could have become the basis for Mimbres ceremonialism and provided the underpinning for the development of a local tradition of ancestor veneration.

In my research, "Tlaloc" is therefore the key piece that ties together the simultaneous proliferation and intensification of cave ritual and ancestor veneration in the Mimbres region, i.e., a sort of "Grand Unified Field Theory of Classic Mimbres Cosmovision":

1. The Underworld was the ancestral home from which all people emerged.
2. The dead returned to this Watery Underworld; or at least those who received appropriate rites did.

3. “Tlaloc” ruled the Watery Underworld and was the keeper and/or guardian of the ancestral spirits.
4. Offerings to the ancestors [buried subfloor] maintained relationships with the living.
5. Offerings to the ancestors could be made via double hearths and caves.
6. The ancestors returned as rain and/or rainclouds.

All these relationships would have broken down when the early twelfth century drought struck the region. This scenario is the sort that Aldenderfer described for the emergence of new religious traditions|: “As individuals find that their expected benefits from the ritual process do not materialize or especially that the costs of cooperation begin to exceed the benefits, this would lead to the emergence of cultural variants that either reject or seek to modify existing ritual practices” (1991:13). I propose that such conditions—the combination of emerging social inequality and a short but severe drought that I will discuss in the next chapter—led to the end of the Mimbres system of specific ancestor veneration, and the emergence of a new system of generalized ancestor veneration. This new variation, in which initiation would have been near universal and not exclusive to land-holding lineages, went on to become the dominant religious tradition of the Pueblo world.

If this is the case, what would be the material signatures of the proto-*Katsina* tradition as it originated with the Mimbres Mogollon? The Mimbres did depict masks in their ceramics, but most of the trustworthy Mimbres depictions of people wearing masks, wherein the mask is clearly identifiable as distinct from a person’s face, show what Roediger (1991:163) has termed “helmet masks,” which are worn on top of the head and

do not cover the face. Masks worn by the Yaqui and Rio Grande Pueblo people during their respective Deer Dances are examples of such helmet masks. Categories of helmet masks unknown from ethnographic contexts but depicted in Mimbres and Jornada Mogollon iconography include representations not only of artiodactyls, but also of the horned serpent and macaws.

Nonetheless, a handful of late Mimbres bowls exist that show anthropomorphic figures with faces bearing features unlike most of the people on Style III Mimbres vessels yet similar both to the "masks" in Jornada rock art and to recognized *Katsina* depictions in the rock art and later ceramics of the Little Colorado River basin and the Arizona-New Mexico borderlands. Most notable are those images that display the rectilinear or oval "pegged tooth mouth" motif as in Figure 11.1, which is common on many types of *Katsina* representations in other media, primarily rock art and painted ceramics (Hays 2000:47–62). The images in rock art and ceramics (and the small *tablita* from Mule Creek Cave), most of which depict only the head, were potentially intended to represent masked impersonators, or they might depict those very supernatural beings that masks often represent. The archaeological record does not allow this distinction, however. We cannot identify whether these images represent the mask, the masked-impersonator, or the spiritual being. Ultimately, this does not matter for my purposes: within an emic perspective, they are equal. In the passage that provides the epigraph to this chapter, Connerton describes this process: the masked impersonator becomes the spiritual being for the duration of the ceremony, achieving a form of "bi-presence" (Connerton 1989:69; see also Parsons 1996:170).

If a precursor to the *Katsina* tradition did indeed exist among the Mimbres, the peg-toothed mouth motif suggests that it involved masking. Early masks probably derived from a standardized way of depicting a deceased ancestor—hence the skeletal lipless mouth—and many contemporary Katsina *masks* exhibit similar motifs.[2] The replacement of Great Kivas with plazas as communal spaces in the Mimbres Valley during the early tenth century coincides with the adoption of subfloor burial and plaza cremation as mortuary traditions, and both these practices created ancestors: the matrilineal ancestor beneath the floors returned to the Underworld, the cremated affine converted directly to clouds.

The archaeological record does not suggest that the Mimbres population relocated *en masse*, but because their scattered emigrants discontinued the distinctive Black-on-white ceramic tradition that defined their identity, they are very difficult to track. Without delving deeply into the question of where the majority of Mimbres descendants ended up, something contested by both archaeologists and contemporary Indigenous communities, it is enough to say that portions of that population traveled in multiple directions, likely based on their existing extra-regional ties. Northern and western Mogollon groups certainly absorbed some; the Jornada most definitely took in others. Some almost certainly traveled south into Chihuahua and perhaps even further.

The relatively early appearance of mask iconography in the Little Colorado basin, similar to the few datable examples from the Mimbres and Gila drainages, suggests that some Mimbres people relocated there—most likely populations from the Gila drainage. These groups would be the source of much of the western *Katsina* tradition. The appearance of informal plazas in the Jornada Mogollon region by the Late Doña Ana

phase (ca. 1150–1300 CE, if not earlier) suggests that Mimbres emigrants also played a role in the eastern Katsina tradition. However, as the earliest dates on goggle-eye iconography come from the Jornada region, it remains possible that the *Katsina* tradition first appeared among the Jornada and spread west to the Mimbres. Most likely, the entire "Tlaloc-*Katsina*" complex developed across the Southern Mogollon macro-region. As rock art, ceramic iconography, and the speleo-archaeological data make clear, the Mimbres and Jornada shared an enormous amount of cosmovision, ceremony, and iconography.

This model resolves earlier disagreements over the origins of the Katsina tradition by hypothesizing a *bimodal* origin: a western tradition that spread into eastern Arizona with Mimbres emigrants, and an eastern tradition that developed in the Jornada region and then spread north up the Rio Grande, where it was adopted by Keres, Tewa, Towa, and Southern Tiwa populations (with less impact on the northern Tiwa of the upper Rio Grande). As these traditions separately gained prominence and added new *Katsinam*, various masks and observances would have traveled east–west, through Zuni-Acoma interactions, through the massive relocations that followed the Spanish invasion, the Pueblo Revolt in1680, and the subsequent Reconquest, further obscuring the tradition's roots. The aforementioned *Hemiskatsina*, a Towa Katsina adopted in the western Pueblos, confirms the latter process at least; and it also returns us to "Tlaloc."

Whatever possible traditions the Mimbres carried into Arizona, there is no clear evidence that "Tlaloc" was among them. Goggle-eye imagery is unknown in Arizona after the Mimbres Classic (it is also absent at Paquimé, no matter how badly Di Peso tried to see it), and with the exception of U-Bar Cave, it does not reappear in the Mimbres

region after the Classic either. “Tlaloc” very clearly survived among the Jornada, however, who must have then spread it up the Rio Grande. The fact that a goggle-eyed cloud terrace appears in a kiva mural at the Northern Tiwa Pueblo of Picuris (Figure 11.3e) suggests that this process occurred prior to the fourteenth century, when Keres and Tewa-speaking villages occupied the middle Rio Grande.

The western Pueblos ultimately filled the vacuum left by “Tlaloc” with the *Hemiskatsina* (a.k.a. *Niman Katsina*), which they acquired from Towa-speaking Jemez Pueblo. The *Hemiskatsina* is the one that arrives at the end of the *Katsina* season to bring the other Katsinas (primarily ancestral spirits) back to their underworld home, which fits perfectly with the Mexican—and probably Mimbres—Tlaloc’s presiding role over the watery Underworld. Thus, the origins of the *Katsina* tradition as practiced at Hopi and Zuni, in which all initiates become rain-spirits after death, lie in the entanglement of Mimbres ancestors with the Underworld and rain. This “THING-SPIRIT-HUMAN” entanglement—and how its dissolution could have led to the transition between the specific ancestor veneration of the Mimbres Classic and the general ancestor veneration of the Katsina tradition—is the focus of the next chapter.

Notes

[1]A Style III bowl bearing this motif (MimPIDD #2795) with excellent provenience came from the Galaz site, where it was one of four bowls accompanying a child burial (Anyon and LeBlanc 1984:420–421, Plate 36E).

[2]It is important to note however, that despite the few depictions of figures with peg-toothed mouths in Mimbres ceramics, I have not been able to identify any credible depictions of figures wearing *kilts* either on Mimbres ceramics or rock art, and kilts are also a key accoutrement of most *Katsina* impersonators today. One possible post-Classic image of a figure with both the peg-toothed mouth and a kilt appears on a Ramos Polychrome jar depicted by Moulard (2005:82, Plate 42); unfortunately, this vessel lacks provenience and has likely been heavily restored and repainted.

Chapter 12: Climate, the ADT, Hinge Points, and Entanglement in the Mimbres Region

"In tracing the Mimbres back to prehistoric times, the question arises as to why there seems to have been no influence from this civilization on some later and more recent potter's work. It may be safe to say that this particular style of painting carries unpleasant memories of the former habitat of the Mimbres people, which the descendants were forbidden to continue or to revive for fear of the recurrence of the same condition which led to the tragic downfall of their earlier way of life and brought the Mimbres culture to a close" [Fred Kabotie 1949:6].

Ancestors and Rain: A Dependency

By the start of the twelfth century, the population of the Mimbres Valley had reached the highest numbers it ever has, even to this day. Villages of as much as 200 rooms (or even more) stretched from Old Town in the south to Elk Ridge in the northern forks, with few sizable gaps in the middle. Smaller villages stretched down virtually every tributary to the west, all the way to the Continental Divide. Many of these communities probably formed groups centered around the largest villages such as Old Town, Galaz, NAN, and Elk Ridge, and those core villages would have been the sites of markets held in the plazas that supplanted the Great Kivas as communal gathering spaces during the tenth century (Roth et al. 2018:12)—something else that corporate groups with ancestral land rights likely controlled (cf. Freedman 1966:90–92 for lineage-based control of market villages in China). The complications of a more rugged geography

meant that population clusters in the Gila drainage were somewhat more dispersed, but there too, large villages such as Redrock, TJ, and Woodrow anchored their own groups.[1] The Mimbres Mogollon were thriving, and the Mimbres region was arguably a "world" in the same sense that the Hohokam Ballcourt world to the west and the Chaco Interaction Sphere to the north clearly were, worlds where "people were showing that they subscribed to a shared set of ideas about religion, leadership, and belonging to a large scale social group—much larger than the villages and valleys where individuals had regular face-to-face interaction" (Schollmeyer 2020). I argue that this Mimbres world was inextricably *entangled* with the Underworld—to an extent that its neighbors probably were not, despite similar core beliefs—and with the rain-bringing ancestors who continued to live there just as their bodies continued to occupy the space beneath the floors of Mimbres homes.

Mimbres populations peaked barely a century after the pithouse-to-pueblo transition. Malthusian algorithms cannot account for the expansion of the Mimbres world at that point, and most senior scholars accept that an influx of people from the peripheries of that world were moving into the center, where many probably took on roles similar to those of tenant farmers, working land that belonged to founding lineages by ancestral rights. These immigrant families would have adopted Mimbres lifeways: living in rectilinear cobble-walled surface rooms, using Mimbres B/w Style III ceramics, attending the ceremonies and markets held in the plazas of the core villages; and at least in public, and practicing a religion that I argue was focused on ancestral spirits who returned as rain. The archaeological and ethnographic records show very similar processes of aggregation occurring on the Hopi mesas a few centuries later (Bernardini 2005).

As these newcomers would have lacked local ancestors to worship, their participation in the Mimbres system probably meant paying some degree of fealty to the ancestors of the founding lineages whose homes sometimes had the remains of several generations buried beneath their floors. If my hypothesis is correct, the ancestors of those lineages were recognized as rain-bringers just as the *Katsinam* (or *Kokko*) are in the western Pueblos today. From the perspective of rain, most of the Classic Mimbres period ca. 1000–1130 CE was a very good time, occurring during—and no doubt facilitated by—an unusually long run of very favorable long-term climate conditions: "beginning with an increase in annual rainfall ca. AD 1000, after a long period of below average conditions. Rainfall occurred at unprecedented levels based on the 1,373 year reconstruction, which may have contributed to a change in architecture from semisubterranean pithouses to above-ground dwellings" (Grissino-Mayer et al. 1997:22). If the ancestors were rain-bringers, they were doing their jobs well during the Mimbres Classic, and relationships between the living and the dead must have been perceived as positive. As long as the rains came and the crops grew, this system would have worked. But then the rain stopped coming.

Climate Data

One of the first scholars to tackle the problem of prehistoric climate in the Mimbres region was Minnis, who focused on the period ca. 600 to 1250 CE (1985). Minnis documented potential resource supplies over time with estimates of crop success, wild food productivity, and food stress using precipitation and streamflow

reconstructions. He compared these estimates to potential resource demands identified by variation in population levels. The resulting effort identified periods when population-resource imbalances and associated vulnerability to dry periods marked by soil erosion and arroyo-cutting were most likely (Minnis 1985:193-197). More detailed prehistoric climate reconstruction for the region became available in 1997, thanks to the work of Grissino-Mayer and colleagues, and their analysis allows for additional conclusions (Figure 12.1a).

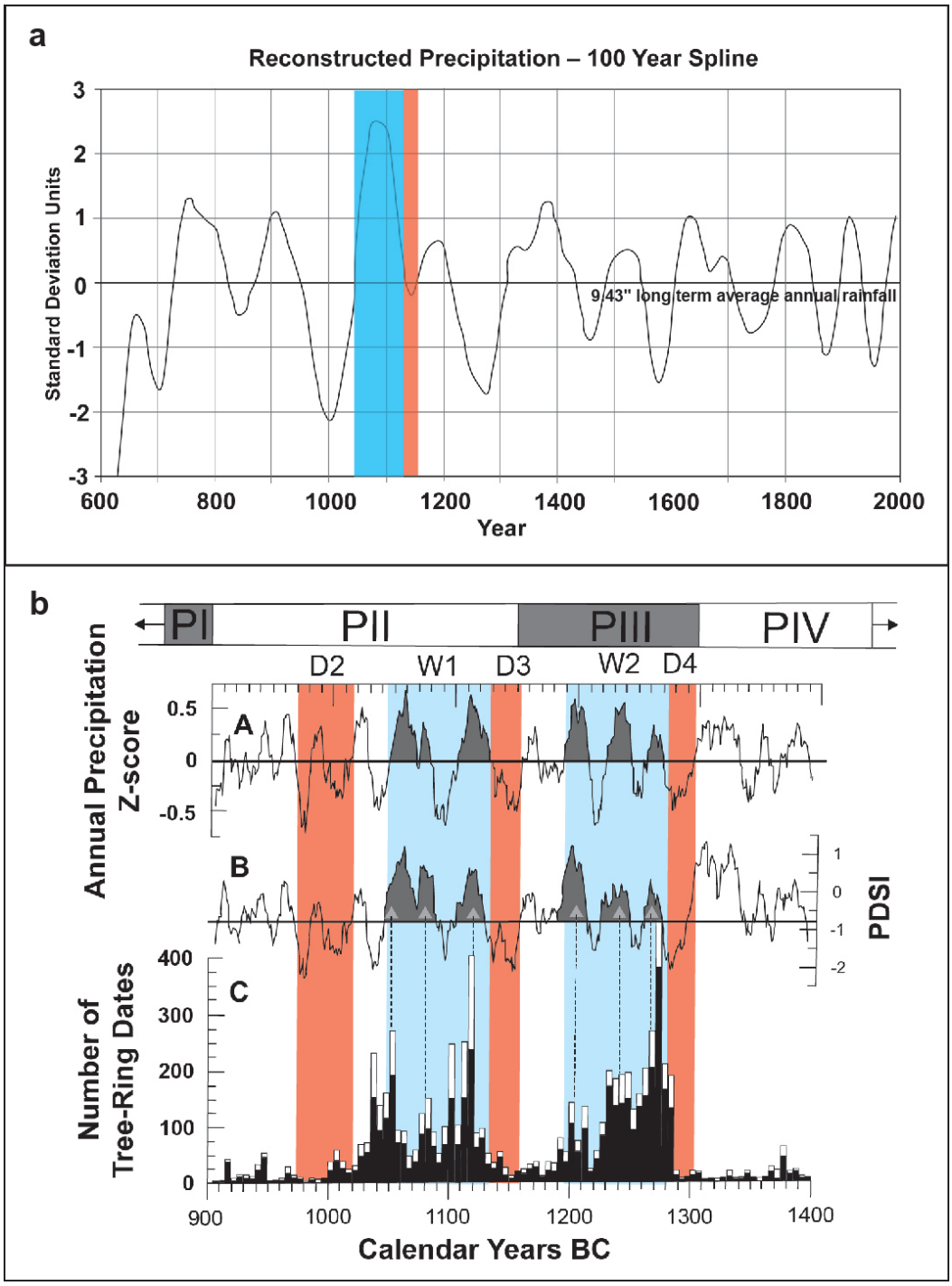

Figure 12.1. Precipitation date for the Mimbres Classic, showing period of above average rainfall ca. 1040–1125 CE, followed by ca. 1125–1140 drought: (a) reconstructed precipitation, 100-year spline (smoothed) (after Grissino-Mayer et al. 1997:56, Figure 18); (b) tree-ring cutting dates compared to precipitation regimes and the Pecos Classification (adapted by Harry Shafer and Scott Nicolay from Benson and Berry 2009:101, Figure 4).

The period ca. 1040–1125 CE was one of above average rainfall in the Mimbres region, and within this time, the decade ca. 1100–1120 CE was the wettest period recorded in the entire 1,373-year period (ca. 600–2000 CE) that Grissino-Mayer and colleagues reconstructed (1997:24). This period is highlighted in blue in Figures 12.1a and b. Conditions were ideal for immigration, population growth, and social aggregation. The first factor that Minnis lists as likely to contribute to food stress is "very high population densities in relation to the productive capacity of an economic system to generate and maintain surpluses" (1985:195). These increased populations simply could not be sustained during the subsequent drought that followed ca. 1125–1140 CE (Grissino-Mayer et al. 1997:20).

After this period of abundant and reliable rainfall, in 1125 CE, "rainfall began to fall to unprecedented low annual totals, concurrent with a change from low climate variability (and therefore reliable from one year to the next) to high climate variability (and therefore unpredictable from one year to the next)" (Grissino-Mayer et al. 1997:2). This drought, though relatively short, lasted until ca. 1140 CE. This period is marked in red on Figure 12.1a and b. It was the longest drought that the Mimbres ever experienced. (Grissino-Mayer et al. 1997:2). The latest tree-cutting date in the Mimbres region is 1128 CE, from the NAN Ranch (Anyon et al. 2017:334).

Unprecedented rainfall coupled with unprecedented population aggregation during the Classic phase would have placed the Mimbres world in a precarious position. There is no question that a 16-year drought at this point would have had a severe impact on the Mimbres, and archaeologists have long recognized that the primary depopulation of the western portion of the Mimbres region occurred during this time. Benson and

Berry propose that expansion of maize agriculture into marginal areas during wet periods would have left populations vulnerable to a series of megadroughts that struck the SW/NW during the several centuries immediately prior to European contact, leading to many people dying "in place or in transit, which in part explains the general lack of intrusive sites established during megadrought and the small number of tree-ring dates documented for the AD 1130–1177 period" (Benson and Berry 2009:112). Grissino-Mayer and colleagues suggest that "the severity and duration of the drought between AD 1125–1140 *at least contributed* to the collapse of the Mimbres culture by prompting migration to outlying areas" (1997:23; italics mine). Notably, despite the quality of their data, they leave interpretation of the Mimbres Classic's end open to other factors. In this chapter, I will consider other possible factors that also could have *contributed* to this event.

Grissino-Mayer and colleagues conclude and summarize their discussion of the impact of rainfall patterns on the Mimbres Mogollon with four key points, suggesting that a sequence of four climatic events led to the end of the Mimbres Classic:

> "(1) A long-term period of below average rainfall between AD 940–1040, unprecedented in its severity, may have contributed to keeping population densities low in the Mogollon region.
>
> (2) A period of above average rainfall that followed between AD 1040–1125 may have contributed to population increases and changes in settlement patterns that reflected greater use of peripheral areas. Food provisions were therefore plentiful.

(3) This long-term period of above average rainfall culminated with the wettest short-term period in the entire 1,373 year reconstruction between AD 1100–1120. Rainfall was abundant and stable from year-to-year.

(4) Abruptly, a 16-year period of unprecedented below average rainfall occurred between AD 1125–1140 for which the Mimbres were unprepared. By AD 1150, the Mimbres culture had collapsed completely" [Grissino-Mayer et al. 1997:24–25].

Major religious shifts such as I have proposed in the previous chapter do not come easily. *Nota bene* therefore that the first event in this sequence, the century of "period of below average rainfall between AD 940–1040" (Grissino-Mayer et al. 1997:24–25) begins around the time of the burning of the Great Kivas and incorporates the local pithouse-to-pueblo transition. This massive shift in architectural patterns also included subfloor intramural burial and the adoption of plazas, the latter presumably replacing the Great Kivas as communal gathering spaces and pointing to the adoption of collective dances. This relatively dry period ends right around the time, or shortly after, the Mimbres Classic begins.

If ancestors were seen as rain-bringers at this time, then the archaeological record suggests that they became the subject of ceremonial petitions during this period of decreased and unpredictable rainfall. If so, the ancestors began to deliver the rain reliably ca. 1040 CE. Figure 12.1b shows a composite diagram (after Benson and Berry 2009:101, Figure 4) that compares the cultural sequence of the Pecos Classification, precipitation regimes, and tree-ring cutting dates, with the very wet period of the

Mimbres Classic and the subsequent 16-year drought highlighted in blue and red respectively.

Processes of the Agricultural Demographic Transition (ADT)

The "rise and fall" of the Mimbres Mogollon as tied to maize agriculture and climate as described above is not a pattern unique to the SW/NW. Archaeologists in the Old World have argued for a model they call the Neolithic Demographic Transition (NDT), in which the commitment to sedentary agricultural lifeways leads within a few centuries to rapid population expansion and ultimate precarity and "collapse" (Bocquet-Appel 2002, 2011; Bocquet-Appel and Bar-Yosef O 2008; Downey et al. 2014). Kohler and others have reframed the NDT for the New World, where it is also apparent, as the *Agricultural* Demographic Transition (ADT) (Kohler and Glaude 2008; Kohler and Reese 2014; Kohler et al. 2008). Kohler and Glaude described the defining characteristics of the Old World version of this model as "a relatively abrupt increase in the proportions of immature (age 5–19) individuals for some 500–700 years…eventually offset by an increase in mortality" (2008:85).[2] Even without adjustment to New World populations such as the Mimbres, for whom pastoralism and animal husbandry were not major practices and who thus experienced far less exposure to zoonotic diseases, this time frame suggests an applicable model. In the Mimbres region, for instance, this processual sequence would cover a period from somewhere near the end of the Early Pit Structure period to the end of the Mimbres Classic. Although current evidence does not show "an

increase in mortality" (Kohler and Glaude 2008:85), the climatic data provided above do suggest a severe impact on survival rates ca. 1125–1140 CE.

The ADT is configured as a period of several hundred years of population growth which commences with the adoption of agriculture and sedentism, followed by increased mortality. Presented by Kohler and Glaude (2008), Kohler et al. (2008), Kohler and Reese (2014), and Wilshusen and Perry (2008), the case for a local version of the Agricultural Demographic Transition (ADT) in the SW/NW focuses on a temporal range of approximately 500–1200 CE, a period that neatly frames the combined Middle and Late Pit Structure periods and the Mimbres Classic phase. According to Kohler and Reese, "total life expectancies at 15 increased very slowly from around 35 y at ~900 BC to about 37 y at ~AD 600, and then more slowly to almost 40 y at ~AD 1000, after which they declined markedly, *bottoming out near 35 y ~AD 1150*" (italics mine; 2014:10104). They further suggest that this process in the SW/NW was stimulated by the arrival of two new technologies around the start of the seventh century CE: tightly-fitted ceramic containers and the bow and arrow (Kohler and Reese 2014:10101). As discussed in the previous chapter, this time period also appears to mark the arrival in the Southern Mogollon macro-region of a local version of the Mesoamerican storm deity "Tlaloc." If ceremonies centered on the worship of that entity arrived in the Mimbres region coeval with the earliest dates from the neighboring Jornada Mogollon and Sierra Blanca regions, then its appearance also came during a long dry period that began before the available tree-ring data. This time also correlates with the Classic-to-Epiclassic transition in Mesoamerica, which was when Mesoamerican societies moved up the eastern Sierra Madre Occidental (the Suchil and Guadiana Chalchihuites). This was also a time of

"significant changes in public architecture, mortuary customs, and both ritual and quotidian ceramics…along the northern margins of Mesoamerica from western to central Mexico" (Beekman 2105:73); i.e. a period very similar to the tenth century in the Mimbres Mogollon region. Beekman further describes this period as a time when "farmers may have intensified public ritual, with the aim of influencing rainfall and agricultural harvests, while political elites may have encouraged this strategy for their own ends. Political elites could have exploited this activity in order to insert themselves into a mediating position between humans and the supernatural, adding to their prestige and authority" (2015:79–80), which parallels the development of Mimbres ancestor veneration as both Shafer (2003) and I have described it.

New and more productive varieties of maize appear in the Mogollon region at this time (Adams 1994); if Mimbres and/or Jornada Mogollon pilgrims were the agents by which these varieties were acquired, then it is probable that they would have also learned accompanying ceremonies for planting. Taube has in fact argued for precisely such a transmission of maize-related ceremonies from Mesoamerican into the Southwest (1986, 1996). Given that the acquisition of new maize varieties occurred during a long-term period of unfavorable climate conditions, the conditions would also have been right for the acquisition and acceptance of a new rainmaking ceremony, which the evidence I shared in the previous chapter suggests was available in West Mexico at that time, having arrived from Teotihuacan as much as two centuries earlier (Jiménez-Betts 2018:79–80, 105).

Although researchers examining these processes have focused on the Ancestral Puebloan area, the ADT model seems highly applicable to the Mimbres region, and it

appears to frame the period of intensified cave ritual there almost exactly. This correlation suggests that we should examine Mimbres cave ceremonialism as the potential index for a set of new adaptations that had a significant regional impact during the terminal sequence of this model, only to lead to a societal crash and large-scale depopulation, which the ADT model suggests.

Hinge Points

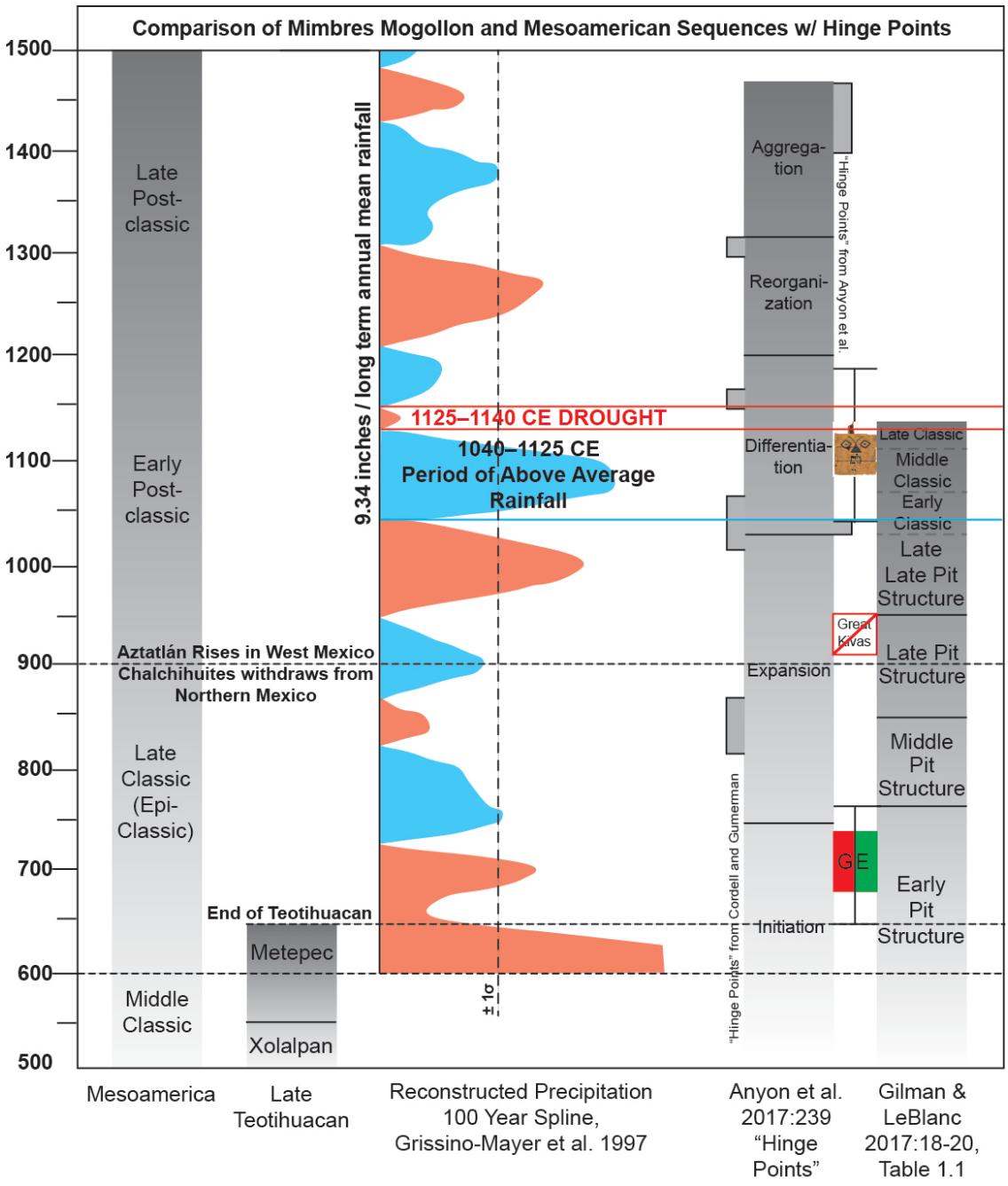

Figure 12.2. Hinge Points for the Mimbres sequence, showing period of above average rainfall ca. 1040–1125 CE, followed by ca. 1125–1140 drought, religious shifts, and Mesoamerican correspondences. Red and blue spikes represent wet and dry periods respectively, based on ± 1σ variation from 9.43 in [23.95 cm] longterm annual rainfall average.

Of course, the Mimbres region was not the only part of the SW/NW that changed radically in the twelfth century: the Hohokam and Chaco worlds underwent massive reorganizations, and their respective spheres of influence never regained their previous extents. In Mesoamerica, paramount sites such as Tula and Chichén Itzá were also depopulated. In order to address these broad trends, Cordell and Gumerman proposed an alternative chronology for the SW/NW that resolved some issues with the longstanding Pecos Classification by considering the transitions between periods as date "ranges" rather than hard demarcations (1989:6–7) (Table 2.1). This revision allowed for the integration of the Ancestral Puebloan, Hohokam, and Mogollon sequences into a single comprehensive timeline. Anyon and colleagues subsequently adopted elements of this model into their revised Mimbres chronology that appears in Figure 1.2 (2017:239). Especially when considered together with another revised Mimbres chronology presented the same year by Gilman and LeBlanc (2017:18–20, Table 1.1) (Table 2.2), their chronology facilitates the comparison of key points in the Mimbres sequence with climatic data, as well as with timelines from other regions and even Mesoamerica (Figure 12.2). This shows the early part of the date range for the arrival of the Mesoamerican storm deity in the SW/NW (at least in the Jornada Mogollon region) coinciding with the Classic-to-Epiclassic transition in Mesoamerica, and the burning of the Great Kivas in the Mimbres region commencing within one generation of the subsequent transition to the Early Postclassic ca. 900 CE. This was the time of Aztatlán's rise in West Mexico. Notably, both these hinge points in the Mimbres region coincide with especially dry periods, with the final ca. 1125–1140 drought coinciding with the primary depopulation ca. 1130 (Figure 12.2).

Overall, formerly prevalent models suggesting Toltec colonization of the SW/NW via traders (Di Peso 1974:2:290-309; Weigand et al. 1977) or military force (Turner and Turner 1999) have all proven untenable. Nelson and Minnis (2018:232–247) specifically looked for any synchronicity between major changes in Mesoamerica and the Mimbres region, only to conclude that despite "an interesting synchrony between several subregions of Aztatlán and the Late Pithouse and Mimbres Classic periods, significant connections were lacking (2018:242). However, if one focuses specifically on major religious changes in the Mimbres region—the arrival of "*el Tlaloc del Norte*" in the southern Mogollon region as early as the seventh century, the burning of the Great Kivas and the transition to plazas as communal spaces during the early tenth century—and the primary depopulation of most of the Mimbres region in the twelfth century, these events align roughly with three successive major cultural shifts in Mesoamerica. These include the transition from the Classic to the Epiclassic ca. 600 CE, the transition from the Epiclassic to the Postclassic ca. 900 CE (accompanied or preceded by the rise of Aztatlán in West Mexico), and the Early to Middle Postclassic transition ca. 1200 CE. Figure 12.2 portrays the relationships between these events and the Mimbres chronological sequence, in conjunction with the major climatic cycles described earlier and illustrated in Figure 12.1.

Entanglement

The chronological sequences of both Mesoamerica and the SW/NW reveal successive cycles of increasing social and material complexity alternating with major

depopulations of regional centers, cycles that are recognizably tied to sedentary lifeways that begin with the commitment to maize agriculture. Ian Hodder's Entanglement theory offers a model that focuses on how societies become directionally locked into increasingly dependent relationships with their material culture—with "things"—and how that can ultimately lead to the sort of cycles visible in central Mexico and the Mimbres region. I followed the implicit structure of Hodder's model to include entanglements with spirits in order to create a construction that could portray Indigenous cosmovision (Figure 1.1). This framing makes it possible to explore the role that *ideological* entanglements may have played in the increasing complexity of Mimbres society during the Late Pithouse Period and the Classic, as well as factors that contributed to the end of that system ca. 1130 CE.

Hodder describes two types of relationships between humans and things (and between things and things) (2012:17–18). The first, *dependence*, means that things are "enabling," that they provide affordances: "Human beings depend on things, both in the sense of relying on things and in the sense of being contingent on the particular things relied on" (2012:17). The second category, *dependency*, involves some form of restraint: "Humans become involved in various dependencies that limit their abilities to develop, as societies or as individuals" (2012:18). He frames dependency within both Wallerstein's World Systems Theory (1974) and the psychology of Rice (1998:18). Hodder presents his simple formula for the Entanglement model as "Entanglement = (HT) + (TT) + (TH) + (HH)," wherein, of course, H = Human and T = Thing (Hodder 2012:88). I first presented this formula in Figure 1.1a. Figure 1.1b shows the Entanglement formula

reframed as a cycle, which is both implicit in Hodder's model and appropriate to the cyclical nature of Indigenous cosmovision in the SW/NW (Allen 1976).

A critical element of Hodder's theoretical model is that entanglement tends to become directional: "the change of entanglements tends to be directional in that it is difficult to reverse human-thing dependencies" (2012:177). Ultimately, greater levels of entanglement with material culture lead to greater precarity: "I suggest that as humans and things get more entangled, and as the strands of the web get longer and denser, so there are more opportunities for things to go wrong" (2012:177). I have proposed in Chapter 1 (Figure 1.1b) that an entanglement model appropriate to the Mimbres must include spirits, especially ancestors. I believe this addition represents an accurate framing of Mimbres cosmovision, and that it is compatible with Hodder's original model.

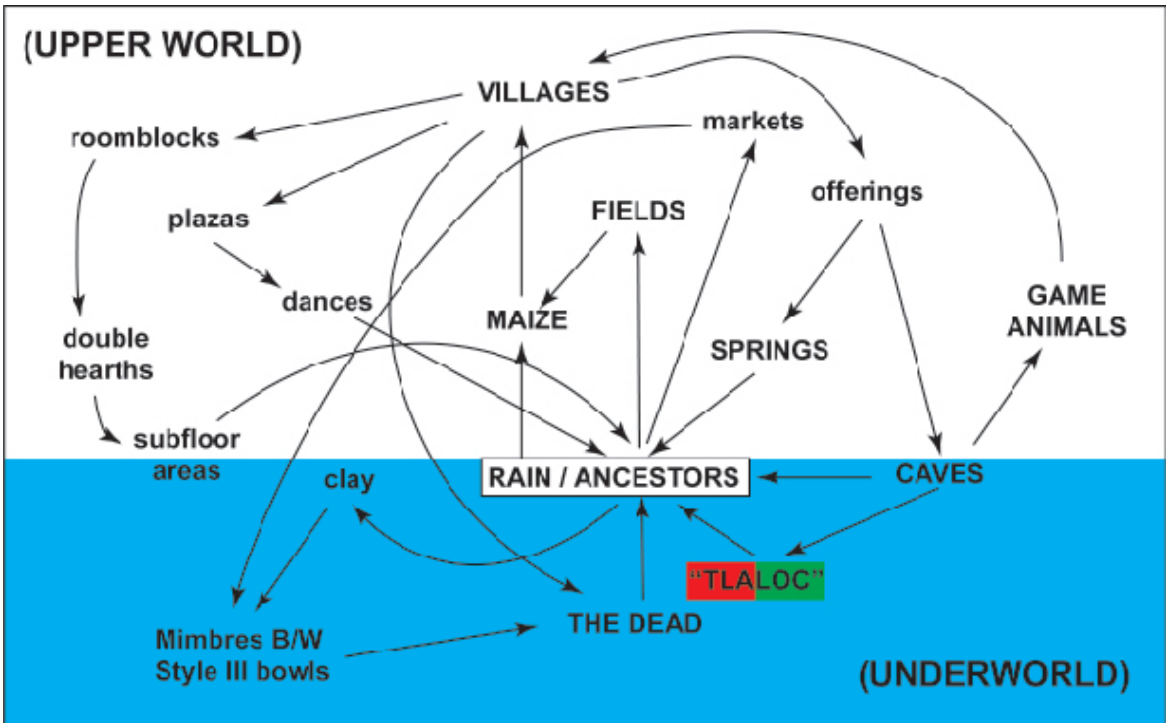

Figure 12.3. Hodder-style "tanglegram" showing hypothesized central role of ancestors.

Figure 12.3 presents a simple "tanglegram" of Classic Mimbres cosmovision. Most important in this diagram is the shared identity between "rain" and "ancestors," which is extrapolated from western Pueblo cosmovision, in which ancestors become *Katsinam*/*Kokko* and return as rainclouds and rain. Most importantly, all human relationships with rain are mediated by ancestor-spirits, making for a cosmovision in which these spirits are effectively the agents that perpetuate the rain cycle. Offerings to these spirits could be made in caves, springs, and the double-hearths of certain Mimbres rooms with subfloor burials. If the rains stopped ca. 1125 CE, the people of the Mimbres region would have taken this as evidence that relationships between living humans and ancestors had broken down—possibly even that the ancestors had become angry for some reason and were punishing the living. This interpretation is consistent with the role of ancestors in the Old World, especially in parts of Africa where their primary role appears to be inflicting harm (Middleton 1987). This assessment would help explain why returning or reaggregating populations of the subsequent Black Mountain phase (late 1110s–1300 CE, Putsavage and Taliaferro 2018:209) rarely reoccupied Classic Mimbres roomblocks (although see Creel 2022:147 for evidence of Black Mountain phase rooms built onto the South House at Swarts, and a few Classic Mimbres rooms at that site even reoccupied during the Black Mountain phase [also Darrell Creel, personal communication 2024]).

One possible ethnographic hint of such a perceived relationship with the ancestors comes from the controversial Acoma origin narratives shared by Edgar Proctor Hunt and his sons (2015).[3] In the portion of these narratives about the relationship between the Keres people and the *Katsinam*, the Hunts describe a history first of violent conflict

following a period of drought (2015:113–137). The relationship only stabilizes into the contemporary religious tradition when the practice of *Katsina*-impersonators is instituted (2015:127–137). It is important to note however, that the *Katsinam* are not described as ancestors in this account, and according to White, the association between the ancestors and the dead "does not appear distinctly among the Keres" and specifically that he found no report of such a relationship at Acoma (1935:198–199).

Nonetheless, I believe this hypothesis of a perceived breakdown in relationships with ancestral spirits as manifested in the withholding of rain is valid from an Indigenous perspective. The epigraph from Hopi artist Fred Kabotie at the start of this chapter describes a process that scholars of social memory now identify as "silencing" and/or "erasure" (Troulliot 1995:96–97), wherein aspects of social memory are deliberately erased or obliterated. Erasure is most often implemented by military conquerors and/or colonizers, but societies can also implement it themselves if they consider aspects of social memory so painful that they will militate against survival. The ultimately complete discontinuation of the Mimbres B/w ceramic sequence and the lack of reported Pueblo migration narratives that mention the Mimbres region suggest a voluntary erasure of memories from the Mimbres Classic, a time when the ancestors themselves may have turned against their children.

Notes

[1]The Eastern Mimbres region between the Black Range and the Rio Grande also had its own population centers, but again, I omit that subregion from my discussion for two reasons: (a) no cave shrines have been identified in that region, even on the eastern slopes of the Black Range, where there are deep caves; and (b) the depopulation of the Eastern Mimbres occurred two generations later than the rest of the Mimbres region. Evidence suggests that although these communities maintained a Mimbres identity, they were economically independent and suffered less directly from the Megadrought.

[2]Kohler and Glaude (2008) do not actually propose this date range to include the Mimbres region, despite its obvious aptness, but this is probably because they address the entire very complex Mogollon region as a whole. Their samples also are drastically skewed by the inclusion of several very large and late sites that were not even settled prior to the end of the Mimbres Classic: Gran Quivira, Grasshopper Pueblo, and Paquimé.

[3]See however Villela (2016:28–31) for questions as to the validity of these narratives and, even more, as to whether the Christianized Hunt family even had the right to share them—and whether Penguin had the right to publish them. This is why I reference the narratives in this chapter but do not quote from them.

Chapter 13: Discussion

"The Pueblos feel that persons more closely approach the underworld when they meet, store paraphernalia, or deposit offerings in caves" [Ellis and Hammack 1968:30].

When I began my personal paper chase, several of my longtime mentors in speleo-archaeology suggested that I focus my dissertation on a single cave, as Brady (1989) had done with Naj Tunich. My problem with this essentially-sound advice was that every cave shrine in the SW/NW—even Feather Cave, for which I already possessed a substantial dataset, having led a team that mapped the entire cave and documented previously unreported rock art (Nicolay and Bilbo 2005a–d)—had already experienced extensive looting and vandalism. I thought then of a literary analogy: in Michael Crichton's popular novel *Jurassic Park*, the scientists who recreate the genomes of the dinosaurs find themselves lacking the complete genetic profile of any one species. Therefore, they "fill in the blanks" in their dinosaur DNA with frog DNA (1990:187, 233–234). Keeping in mind that this choice led to disaster in the novel (as it provides the dinosaurs with a capacity for parthenogenesis), I nonetheless applied it to my research, confident that my decision was unlikely to lead to any comparable tragedy. Thus, lacking an intact archaeological record from any one cave shrine in the SW/NW, I expanded the focus of my research to an entire region: the Mimbres Mogollon. In this way, I could supplement the incomplete data from any one site with the collective information from the others, including some from other regions, especially the Jornada Mogollon. I could thus arrive closer to a picture of what Mimbres cave shrines looked like before the looters

and vandals found them. Of course, I apply this principle only in terms of interpretation; nowhere do I alter the original data to re-provenience artifacts and/or features between sites as Crichton's genetic engineers might have done.

Deposition and Site Formation Practices

Despite the overall pattern of Mimbres Mogollon cave ritual that was immediately obvious even to the earliest researchers (Hough 1907, 1914, 1915; Cosgrove 1947), significant variations clearly do exist between the archaeological records of individual caves, as well as between regions and subregions. Several caves stand out as places of special importance: Bear Creek Cave, Doolittle Cave, Greenwood Cave, Mule Creek Cave, Steamboat Cave. The Cosgroves felt that Cave 1 in Goat Basin belongs on this list as well, and despite the lack of data, I believe that Lone Mountain Cave is an additional candidate, primarily because of its association with Cameron Creek village and other nearby sites. Almost a century after the Cosgroves' fieldwork, it also becomes more possible at least to make some preliminary assertions about which of these caves served specific communities or community groups.

The variety of artifacts left in Mimbres cave shrines also points to multiple practices of discard and deposition; i.e. not all materials left in caves arrived by the same anthropogenic processes, nor were they placed there for the same purposes or even the same categories of purpose. I do not refer here to the variations in assemblages between caves either, but to the varieties of practices evident in the formation of assemblages in each individual shrine. I propose that the materials that compose these assemblages and

the processes that led to their deposition are best understood on a spectrum, with repeatable prayer offerings on one end and terminal discard on the other (Figure 13.1). The former would include those objects that were brought or made specifically to be offered with prayers in return for some sort of blessing; the latter category would describe those objects that had reached the end of their use-lives but which required special disposal in a sacred place because of their inherent sacrality and spiritual power.

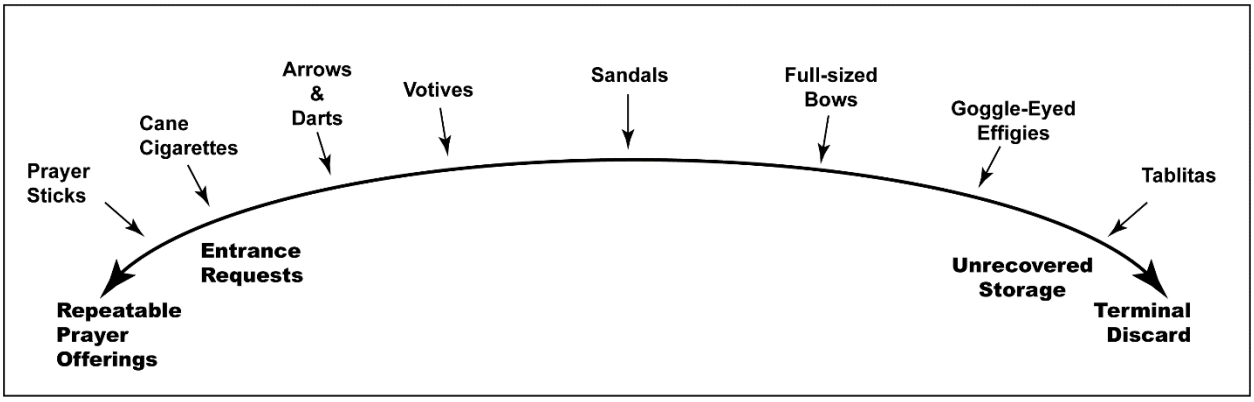

Figure 13.1. Spectrum of depositional practices and artifacts in Mimbres cave shrines.

The most obvious examples of "repeatable prayer offerings" are prayer sticks or *pahos*, and arrows (the latter probably preceded by darts in some sites). These were objects left—and in the case of prayer sticks, specifically made—as offerings in exchange for rain, game animals, and other blessings, and accompanied by a verbal prayer whose echoes are beyond the reach of archaeology. The intended recipients of such offerings almost certainly included ancestors as well as chthonic deities such as the ubiquitous Underworld Gamekeeper and the goggle-eyed entity I refer to as *El Tlaloc del Norte*. Whether these offerings were left seasonally, annually, or at any time of the supplicant's choosing, we do not know, but the important thing was that they were all

repeatable. This very fact makes them a defining element of ritual assemblage, as they occur in disproportionate numbers to the sort of assemblages one might find in even a long-term occupation site.

Next on the spectrum are the cane cigarettes, most closely associated with the Pueblo of Zuni today. Hough's description of how "myriads" of these were left in the two circular shrines at either corner of the entrance to Bear Creek Cave suggests that, at least at that important site, these served as offering for permission simply to enter the cave (1915:6). According to Parsons, cane cigarettes were offered at Isleta to both spirits and shamans, as requests for ceremonies or services, and "generally a cigarette should accompany a ceremonial request" (1996:297–298). Cane cigarettes were often tied to the prayer sticks and arrows left as offerings. Interestingly, Minnis reports that the common reed (*Phragmites australis americanus*), from which cane cigarettes were made, is now extinct in the Mimbres Valley (1985:92).

All votives would belong to the category of repeatable offerings. In the Mimbres region, these consist primarily of the miniature "ceremonial" bows, sometimes with miniature arrows attached. Bear Creek Cave also contained votive ceramics, which more commonly occur as offerings in springs. This characteristic is one more that demonstrates the unique nature of this site.

I discuss sandals in depth in Chapter 4 in the context of Jornada Mogollon cave shrines, where their disproportionate abundance more clearly demonstrates some type of ritual practice. There I hypothesized that later accumulations of sandals in cave shrines likely represented a form of mortuary ritual, in which the sandals of the dead were left in the Underworld—either to facilitate a tie between the living and the dead, in a way

similar to the Black-on-white bowls buried with the dead by the Mimbres, or to protect them from witches. An additional possibility is that sandals were left by pilgrims visiting these sacred sites—moreover, none of these hypotheses are mutually exclusive.

Earlier deposition of sandals in caves might not have had an expressly religious function, but the presence of accumulated sandals in certain caves could have led later populations to associate these sites with ancestors and to initiate a ritual practice of leaving sandals in caves. Although sandals occur in most Mimbres cave shrines, the practice I describe does not seem to have approached the scale there that it did in the Jornada Mogollon region—perhaps because the bowls buried with the dead assumed that role for the Mimbres. Only Doolittle Cave contained sandals in numbers and types approaching the Jornada cave shrines. If my hypothesis is correct, sandals occupy an intermediary position on the spectrum, representing a type of terminal discard but also one that could be repeated, just not for the same ancestor. However, an alternative possibility that would place sandals firmly in the category of repeatable prayer offerings, is suggested by an account of an annual ceremony conducted at the sacred Blue Lake by the people of Taos Pueblo:

> The initiates remove their moccasins, made for them the previous March. Placing wild turkey feathers and sacred meal offerings into each moccasin…they cast them into the lake with prayer to kwò+łówna, Old Ax, and to the moon and sun gods. The initiated offer these sacrifices with anxiety and fear, for if the moccasins fail to sink at once, the heart of the initiate is not good [Bodine 1988:96].

Blue Lake is the place "where the dead descend into the nether worlds" (Bodine 1988:95).

The position of full-sized bows is less certain. They may have been offered together with arrows, but I feel they more likely were "retired" in cave shrines at the end of their use-lives. Hibben's report that most of the bows he found had been deliberately broken supports this conclusion (1938:37). The two possibilities are not mutually exclusive. No atlatls have been reported from Mimbres cave shrines, but if they were present prior to the attention of archaeologists, they presumably would have represented the same patterns of discard as full-sized bows.

Tablitas represent the opposite end of the spectrum: terminal discard. I consider it highly unlikely that these objects were left in cave shrines as offerings. Instead, their presence indicates several possible practices that are categorically related. Firstly, most of them probably represent sacred objects that reached the end of their use-lives and had to be retired in a liminal space, especially a sacred cave. This process represents one category of what Walker (1995) called "ceremonial trash": objects that could no longer be used, but whose discard required special conditions. Most *tablitas* were probably objects used in dances and/or other public ceremonies, or which composed part of altars.

The placement of *tablitas* in caves could have occurred for a variety of related reasons. Such objects might have become worn in such a way that they could no longer be used in the ceremonies for which they were made. Alternatively, they might have suffered some form of spiritual contamination that rendered them unusable. Another possibility is that the ceremonialist or impersonator who used them passed away. An ethnohistoric example of this type is a wooden mobile of Hopi origin depicted by Fane

and colleagues (1991:74, Figure 19). This object was the property of a Hopi ceremonialist who lived among the *Diné* in Cañon de Chelly. When this person died, the *Diné* placed the object in the cave, presumably to protect people from its power by storing it in a liminal space. A final possibility, related to the previous, is that some of these objects represent "unrecovered storage," i.e. sacred objects stored in caves but never recovered by their caretakers either because they died without passing on knowledge of these locations or because of rapid migration. The effigies of the Cliff Valley Cache, discussed in Chapter 7, probably represent this type of unintended discard, as do similar effigies from Pecos Pueblo and other sites (Nicolay et al. 2022). The goggle-eye effigies reported from several caves in the Southern Mogollon region might represent an exception, however. The description of the example from U-Bar Cave, and its context, suggest that it was deliberately placed in order to create a special offertory area within the cave (Lambert and Ambler 1965:16–17, 77–78). This may have been the case with other caves as well, but available provenience data lacks the necessary detail to make such determinations.

Overall, these assemblages are comparable to others reported from both the Jornada Mogollon region and from cave shrines in the Reserve region and the sky islands of Arizona, although data is more limited in the latter areas. The cultural affiliations of Mimbres cave shrines are mainly identifiable by their location and the presence of ceramics from the Mimbres Black-on-white sequence. However, very few of these sites show great time depth, as they lack evidence of early traits, such as darts, burials, and rock art, and few show evidence of use after the Mimbres Classic, such as arrows with stone points, later ceramic types, or moccasins (which replaced sandals in the US

Southwest, but not in northwest Mexico, sometime after ca. 1300 CE). This suggests a relatively narrow window of ca. 750–1130 CE for the bulk of Mimbres cave ritual.

Ultimately, it is difficult to identify material correlates in the cave archaeological record that correspond to major shifts in village life, including the pithouse-to-pueblo transition, the burning of the Great Kivas, and factors leading to depopulation ca. 1130 CE. Ceremonial dibbles (roundel *pahos*) are one possibility, but none have been dated. They first appear, however, on Style III ceramics. These objects also occur, albeit in simpler forms, in neighboring regions that otherwise show little-to-no evidence of contact with the Mimbres region. They probably represent the index of a tradition that spread through much of the SW/NW in the tenth or eleventh century and lasted only a short time, as they are absent from the ethnographic record. Despite their distribution, the elaborate examples from the Mimbres region—and their frequent depiction on Mimbres B/w Style III ceramics—suggest that they held a special importance there. Moreover, their implied association with agriculture points to the Mimbres Classic. Because they were almost always deliberately broken before being left in caves, roundel *pahos* appear to represent examples of terminal discard.

The stub *pahos* reported the Cosgroves and Hough from multiple cave shrines—but especially from those sites that I identified in Chapter 5 as preeminent—represent and even stronger possibility for a tenth and/or eleventh century correlation. The enormous quantity of these recovered by Cosgrove from Mule Creek Cave points to a relatively rapid accumulation. Even though Cosgrove claims that the cave "was a shrine visited for centuries by Pueblo people" (1947:30), the lack of materials and features associated with either the Late Archaic/Early Pithouse periods or post-Classic phases suggests that this

cave shrine was utilized intensely for a relatively short period, perhaps corresponding only to the Mimbres Classic and the preceding century or two. The late date of ca. 1430–1620 CE obtained by Miller and colleagues (2023:10) on a cloud terrace *tablita* from this cave must either represent contamination, or unrecovered storage of an object left there at the very end of regional occupation by agriculturists three centuries after the Mimbres Classic.

Limited evidence, some of it from caves, points to Mimbres contact with Mesoamerica, primarily "Tlaloc" iconography, copper crotals, and macaws. The arrival of copper and macaws in the tenth century probably relates to the Aztatlán expansion into areas of West Mexico with which the Mimbres already had contact. Connecting changes in cave ritual to the drought that contributed to the end of the Mimbres Classic remains more difficult due to the heavy disturbance of cave assemblages, and the fact that the window between the start of the 1125–1140 drought and the probable end of this phase is shorter than any timeframe identifiable via 14C dating.

Sacred Landcape, Emergence, and Ancestors

In Chapter 8, I examined the broader scope of the Mimbres sacred landscape, which would have incorporated springs, lakes, hilltops, mountaintops, isolated outcrops, and ancestral sites: just as all Pueblos do today. The Tewa anthropologist Alfonso Ortiz provided our clearest understanding of how Pueblo cosmovision is mapped across a sacred landscape. According to Ortiz, "the Tewa classify all human and spiritual existence into a hierarchy of six categories…that…are further associated with specific

geographical points in the Tewa world" (1969:9). He depicted these relationships in a cosmogram that shows the organization of shrines into concentric circles with four sacred locations in each circle (1969:18, Figure 2). This cosmogram appears in Figure 12.2a. The outermost tetrad (A–D) represents the sacred mountains that define the Tewa world. The next tetrad is a series of hills (E–H), each of which "has a cave and/or tunnels running through it" (1969:19). The shrines of the next inner group (I–L) are the directional shrines, which are hills, stones, and middens (with burials), and the final, central group (M–P) is formed by the dance plazas of the village (1969:20). However, Ortiz adds that "There are numerous other shrines dotting the landscape around each Tewa village" (1969:20). Any archaeologist working the SW/NW who has surveyed hilltops and ridgelines in anywhere with evidence of prehistoric settlement will likely be familiar with this pattern. I personally helped record approximately two dozen such shrines around Cottonwood Spring Pueblo (LA 175) in just four days (Nov. 11–14, 2023), while surveying with Versar, Inc., archaeologists Tim Graves and Juan Arias. One of these was an elaborate figure-eight-shaped double enclosure on a hilltop that contained a 65 cm "gnomon" stone that was aligned precisely east–west along one side. This complex feature also included rock art and visible plant fossils on the surface of some of the boulders that supported it.

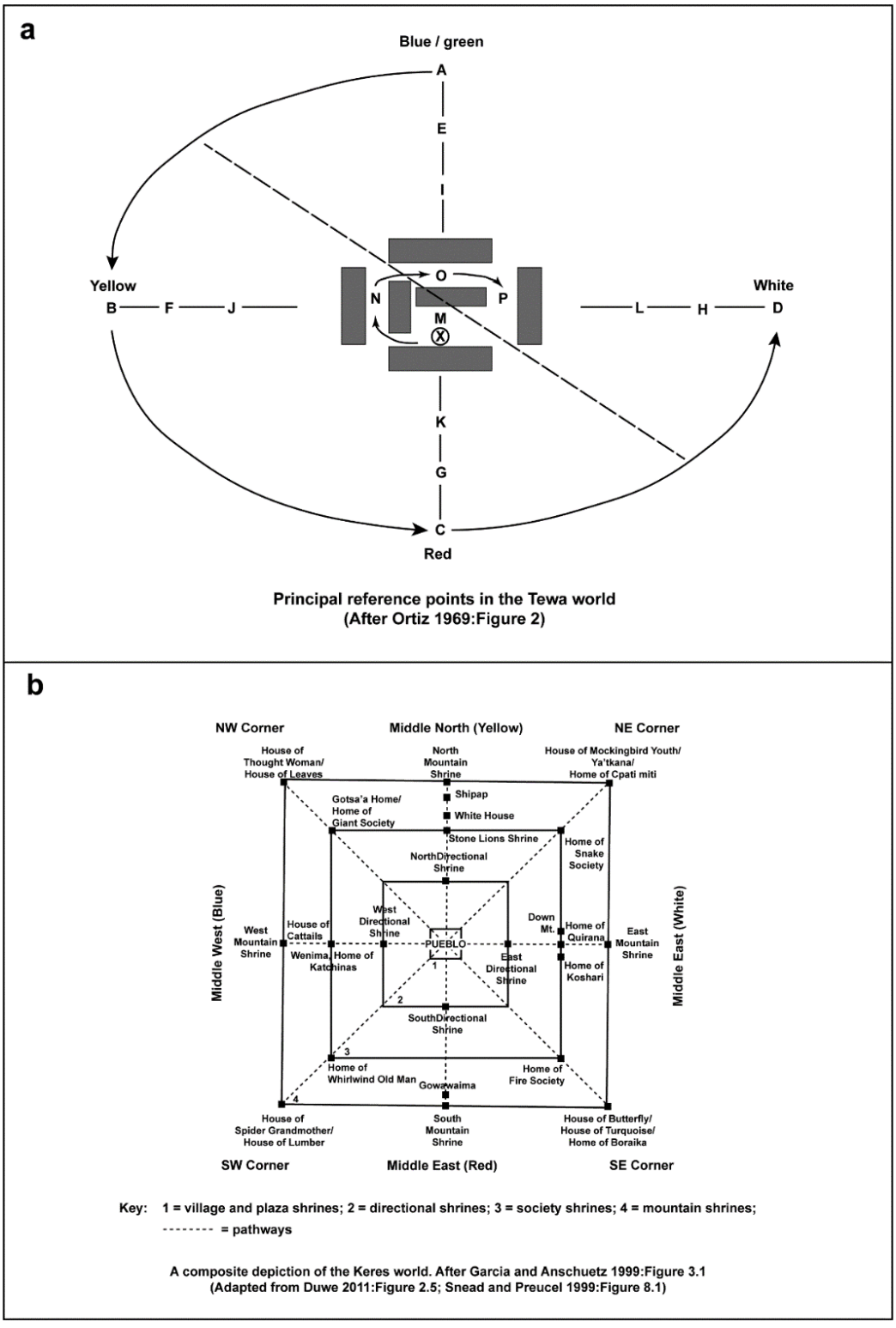

Figure 13.2. Pueblo Worlds as cosmograms: (a) the Tewa World (after Ortiz 1969:8, Figure 20); (b) the Acoma Keres World (after Garcia and Anschuetz 2019:48, Figure 1.3).

In the very center of Ortiz's cosmogram is an X that marks *Nam echu kwi nan sipu pingeh*, the "Earth Mother earth navel middle place" (1969:21). Ortiz describes this as the "center of centers, or the navel of all navels," and reports "the Tewa believe that there is a shaft or tunnel within the navel which leads straight down into the earth" (1969:21). I cite that here to emphasize the degree to which everything in this cosmovision is intimately tied to the Underworld. Along with the central navel, the middens with burials, and the hills with caves, a final, primal point of connection exists far to the north, beyond the sacred mountains. This is *Sipofene*, or "Sandy Place Lake," a spring-fed alkali lake near Alamosa, Colorado. *Sipofene* is the primal emergence place of all Tewa people. As Ortiz describes it, "the world under the lake was like this one, but it was dark" (1969:13). All pueblos have their own emergence place; for the Rio Grande Pueblos, it is usually located in the north or northeast, while Hopi and Zuni identify specific places in the Grand Canyon, west of their current homes. Archaeologists use the term *sipapu* (from Hopi: *Sípàpuuni*, Hopi Dictionary Project 1998:504) to identify the small symbolic hole in a kiva that represents this place. Figure 13.2b shows a detailed version of a similar cosmogram that portrays the Keres World as conceived at Acoma Pueblo (Garcia and Anschuetz 2019:48, Figure 1.3).

Belief in a primal emergence from the Underworld is not exclusive to the Pueblos. The Diné share it too, for instance, and have their own highly detailed cycle of narratives regarding the emergence (Zolbrod 1984). Similar beliefs extend into South America, where a connection to the primal emergence site was used to legitimize rulership, and "The Inca elite were believed to be the direct descendants of a mythical first Inca, named

Manco Capac, who emerged from a cave in a region called Pacariqtambo" (Bauer 1991:8). This belief is also widespread in Mesoamerica, and as Taube (1986:71–77) points out, many of the traits common to Mesoamerica and the SW/NW are intimately associated with the Underworld and the Emergence Cycle. This broad and fundamental ideology spans both regions and extends well beyond them, and the core belief in a primal emergence from the Underworld likely has its origins in Deep Time; i.e. as far back as the Middle Archaic, if not earlier.

The tradition of Underworld emergence is especially well-documented for the Maya and the Nahua-speaking peoples. The latter refer to the place of primal emergence as Chicomoztoc, from *chicome* (seven) and *oztoc* (cave). Like the Mexica Tlaloc, Chicomoztoc belongs to a related set of ideas regarding a dynamic underworld as the place of human origin, the abode of ancestral spirits and powerful supernatural beings, and the source of game animals and rain. The concept is best known from several sixteenth-century Mesoamerican sources, including de Sahagún (1961:10:195–197), Durán (1994:21–22, 212–216), and Chimalpahin Cuauhtlehuanitzin (1997:29–31, 69–75), all of whom describe it as a place of seven caves from which tribes ancestral to the Mexica emerged.

In Chapters 4–6, I have suggested the possibility that this specific model also applied to certain cave shrines in the collective southern Mogollon region, including Bear Creek Cave, Mule Creek Cave, and Doolittle Cave in the Mimbres region; Ceremonial Cave and Picture Cave in the Jornada region; Feather Cave in the Sierra Blanca region; and Surratt Cave in the Salinas region. As discussed in Chapter 6, the similarity is especially notable with the two westernmost sites, Bear Creek Cave and Mule Creek

Cave, as both these caves resemble in form the seven-chambered version of *Chicomoztoc* as it appears in illustrations in Indigenous documents such as the *Historia Tolteca-Chichimeca* (Kirchhoff et al. 1976) and the *Map of Cuauhtinchan 2* (Carrasco and Sessions 2007). Multiple Indigenous descriptions and representations of the *Chicomoztoc* appear in these and other documents, where it is portrayed as either a single womblike cave with seven interior chambers, or a row of seven cave openings in a hillside or cliff face. As Aguilar and colleagues point out, "within the Indigenous sources there is no consensus on Chicomoztoc's physical form" (2005:79). The other sites I propose as possible Chicomoztocs mostly belong to the "seven separate caves" group, except for Surratt Cave. Ceremonial Cave is potentially somewhat of a hybrid example.

The apparently deliberate modification of Mule Creek Cave by tunneling out seven interior chambers and a second entrance is especially significant. Brady and others have documented the presence of dozens of artificially constructed and/or partially modified pseudokarstic caves in Mesoamerica, both in Central Mexico and the Maya region (Aguilar et al. 2005; Brady 1991, 2004; Brady and Veni 1992; Pugh 2005). Properly speaking, such anthropogenic features are tunnels, not caves, but this lexical distinction remains a Western one. Evidence suggests that Indigenous Mesoamerican ontologies, i.e. emic perspectives, made no qualitative distinctions between tunnels and natural caves (Brady 1997, 2003, 2012; Brady and Ashmore 1999; Brady and Veni 1992; Moyes 2012; Scott and Little 2003). The most famous of these constructed "caves" are those beneath several major structures at Teotihuacán, including the Pyramid of the Sun, the Pyramid of the Moon, and the Feathered Serpent Pyramid. Caves beneath important

structures at Teotihuacán are all artificial tunnels; no lava tubes or other types of natural pseudokarstic caves appear in this area.

Some of these Mesoamerican caves display a morphology comparable to the images in the ethnographic documents, suggesting that they, too, were engineered specifically to participate in the *Chicomoztoc* cosmovision (Aguilar et al. 2005; Brady 1991, 2004; Brady and Veni 1992; Pugh 2005). The earliest and most distinctive example is the site of Acatzingo Viejo in Pueblo, Mexico (Aguilar et al. 2005; Brady 2004:8). There, seven artificial caves were excavated into a hillside beneath the site core (road construction unfortunately destroyed one of the caves prior to documentation, but local informants attested to its prior existence). No chronometric dates exist for this cave complex, but Acatzingo Viejo itself dates to the Mesoamerican Late Classic/Early Postclassic (Brady 2004:8).

The combination of evidence that such "caves" a) are entirely artificial, and thus *intentional*, and b) that they often extend directly beneath major surface architecture, strongly support the hypothesis that these features served as representations of the *Chicomoztoc* or some variation of the concept of a primal emergence cave. Overall, the category of artificial and artificially modified caves in Mesoamerica is extensive, with Brady estimating the numbers of such features in the hundreds and possibly thousands (2004:6).

The best known of all these artificial caves is the tunnel beneath the Pyramid of the Sun at Teotihuacán, originally described by Doris Heyden (1975). Although Heyden (1975) initially identified the cave under the Pyramid of the Sun as a natural lava tube, geophysical examination later revealed its artificial nature (Chávez et al. 2001;

Manzanilla 1994; Manzanilla et al. 1994, 1996; Sload 2015). Heyden suggested this passage was intended to represent the *Chicomoztoc*, based in part on its four terminal lobes, which in plan view closely resemble certain ethnographic depictions of the Nahua emergence place in all details other than number (1975:144). Though not all Mesoamerican artificial caves display the sevenfold nature of the *Chicomoztoc*, the central narrative of primal emergence from the Underworld underpins the cosmological importance of caves in both Mesoamerica and the SW/NW, and appears to have great antiquity in both regions.

Artificial caves are not exclusive to Nahua-speaking regions; at least one is known from the Maya region. Q'umarkaj (often known by its Nahuatl name, Utatlán) was the prehispanic capital of the K'iche' Maya. One of two manually-excavated caves extending beneath the site core at Q'umarkaj exhibits seven extensions off its main passage (Brady and Veni 1992:157–162).

Identification of caves, lakes, and springs as sites of primordial emergence is also widespread throughout the SW/NW (Devereux 1966; Ellis and Hammack 1968; Nicolay 2012; Ortiz 1969:13–25). These primary emergence sites are often located considerable distances from the communities that identify with them, for instance, Sandy Place Lake, the Sipofene of the Tewa, is located more than 150 km north of the central Tewa Pueblo, Ohkay Owingeh. Other caves and/or rockshelters located closer to communities also served as shrines, and at the two most socially complex sites in the prehistoric SW/NW, Chaco Canyon and Paquimé, the site core incorporates earth opening shrines: the cliff slump fissure caves behind the great houses of Pueblo Bonito and Hungo Pavi in Chaco

Canyon (Nicolay 2005, 2012:173) and the Walk-in-Well at Paquimé (Di Peso et al. 1974:4:376–381, 1974:5:845).

Perhaps the similarities of Bear Creek Cave and Mule Creek Cave to Mesoamerican conceptions of the *Chicomoztoc* are coincidental. However, Mule Creek Cave's resemblance to Bear Creek Cave appears to be the product of labor-intensive tunneling, with the former modified to create seven interior chambers (two of these share a narrow connection, which may represent an accidental breach) and a second entrance. Both caves have obvious prehistoric importance, demonstrated by the enormous assemblages of artifacts they each contained, the likelihood that they served large population areas as *primary* emergence shrines, and their mutual proximity. These attributes all argue for these sites' special nature within one or more regional systems and the likelihood that they may have participated in a cosmological model not otherwise operational in that specific form within the SW/NW.

A final piece of evidence supports this conclusion, at least when considered in conjunction with other aspects of the two caves. A Mimbres Style III Black-on-white bowl (MimPIDD #8312)—originally collected by Osborne and illustrated by Fewkes (1923:27, Figure 3), and now in the collection of the Museo Nacional de Antropología in Mexico City—possibly depicts a group of people completing the primordial emergence from the underworld (both Fewkes [1923:8] and Carr [1979:10–11, Plate 4] previously interpreted the image on this bowl as an emergence scene). This bowl shows seven figures climbing what may be a giant reed toward what appears to be a cave opening (Figure 13.3a). The single figure in the opening holds a crook-staff, which on other bowls is primarily associated with either the Hero Twins and/or ceremonialists (Nicolay 2018).

In some versions of the Pueblo emergence story, such as those belonging to the Hopi (Courlander 1971:17–33; Parsons 1996:236–242) and the Zuni (Parsons 1996:218–236; Tedlock 1972:225–269), the Hero Twins lead the people from the lower worlds. The seven figures in the scene on this vessel may correspond to ethnographic Mesoamerican depictions of the *Chicomoztoc* that show people emerging from either seven interior chambers of a cave or from seven separate cave openings. Equally interesting is a similar bowl from the Pruitt site in the southern Mimbres Valley and now at the Arizona State Museum (MimPIDD #11004) (Figure 13.3b) that shows a person excavating a tunnel with a stone ax, either in order to enter a passage and chamber filled with birds, or to lead the birds out.

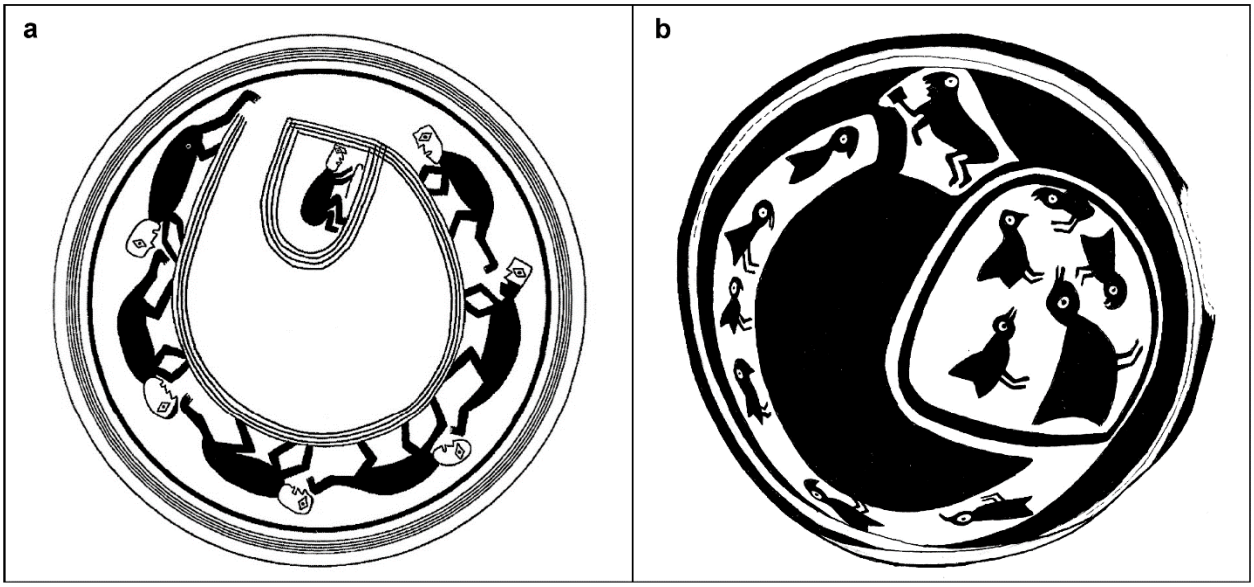

Figure 13.3. Possible Emergence scenes on Mimbres bowls: (a) MimPIDD #8312 (drawing by Hattie Cosgrove, courtesy of Carolyn O'Bagy Davis, from Davis 1995:155); (b) MimPIDD #11004, from the Pruitt site (drawing by Margaret Berrier).

Although the possibility of Mimbres cave shrines with artificial modification to resemble the seven-chambered morphology of the *Chicomoztoc* is most important here, the alternate morphology of seven caves in a hillside or cliff-face deserves mention as well. Like Bear Creek Cave and Mule Creek Cave, these two sites are located close to each other, but in western Texas: Picture Cave, a rockshelter used as a shrine in the Jornada Mogollon region (Cosgrove 1947:41, Figures 44–45; Miller et al. 2012; Roberts 1929:Figure 1), and the celebrated shrine known as Ceremonial Cave (Cosgrove 1947:34–37; Roberts 1929). At each of these sites, groups of small "caves" open in a single cliff face, possibly representing the second form of *Chicomoztoc*, as at Acatzingo Viejo. Although neither site shows signs of anthropogenic modifications, two pictographs at Picture Cave deserve special attention. Each of these images depicts a terrace with an unusual curled top (Figure 4.3a–b). These images closely resemble ethnographic depictions of *Culhuacan* ("bent," or "twisted" hill) in Nahua codices, as in the Codex Boturini (Figure 4.3d). Such images are closely associated with the *Chicomoztoc* and Nahua emergence narratives, and one can be seen atop the depiction of *Chicomoztoc* in the *Historia Tolteca-Chichimeca* (Kirchhoff et al. 1976). Although the case for these two sites as *Chicomoztoc* representations may not be as compelling as for Bear Creek Cave and Mule Creek Cave, they deserve mention here nonetheless.

The data for *Chicomoztoc* shrines suggest a different scenario altogether. Probable examples appear at considerable distance in both regions by the beginning of the Mesoamerican Postclassic, without any apparent route of transmission other than direct contact with Teotihuacán, for which no clear material evidence exists in the archaeological record. Instead, the most likely explanation for this divided distribution is

that this specific version of the Underworld Emergence narrative was once widespread through much of the macro-area, notably in areas prehistorically inhabited by Uto-Aztecan speakers or adjacent thereto. Carpenter and Sanchez (2022:26) and Carpenter and colleagues (2022) have presented a compelling case that the southern Mogollon groups, along with the prehistoric Huatabampo and Serrano in Mexico, were speakers of the Cáhitan branch of Uto-Aztecan, which survives today among the Yaqui (*Yoeme*) and Mayo.

Although belief in a primal emergence from the underworld belongs to Deep Time, possibly to the Pleistocene or even earlier, the *Chicomoztoc* may have existed as a specific motif as far back as the Middle Archaic, prior to the division of Proto-Uto-Aztecan into its northern and southern forms ca. 5000 BP. Shafer (1995:43), Boyd (1996:152–164), and Tate (2022:75–111) have already argued for the wide distribution of the general Underworld emergence myth throughout the SW/NW, Mesoamerica, and adjacent areas. Although the specific model of a sevenfold emergence cave is absent from contemporary Pueblo emergence narratives, it may have been lost when prehistoric residents of the Upper Gila relocated—either southward into present-day Mexico, or into western Pueblo communities—where they would have adopted new traditions and alternate emergence narratives linked to morphologically less complex shrines through processes of local assimilation. Leaving behind the unique and specially modified emergence shrines at Bear Creek Cave and Mule Creek Cave would have facilitated this process of assimilation, which would explain the discontinuity between the archaeological and ethnographic records of the SW/NW in this regard.

Conversely, no obvious routes of interregional transmission exist for the *Chicomoztoc*, as the earliest occurrences of modified caves that fit this model—Bear Creek Cave in Arizona, Mule Creek Cave in New Mexico, and Acatzingo Viejo in Puebla—belong to almost opposite ends of the macro-area, with no clear intermediary distribution. As this highly specific conception of the primal emergence cave holds a particular (though not exclusive) association with Nahua-speaking peoples, the presence of two major cave shrines in the Upper Gila drainage that may have been modified to represent the *Chicomoztoc* suggests not only that it may possess a considerably greater antiquity than previously recognized, but also that at least some portion of the population in the Upper Gila drainage consisted of people who spoke a Uto-Aztecan language.

Although I cannot establish conclusively that the emergence narratives of Mogollon populations of the Upper Gila incorporated the specific *Chicomoztoc* variation of the emergence myth, the evidence I have presented demonstrates a limited but distinctive pattern of cave modification and shrine use that corresponds to practices in Mesoamerica where this myth has been documented ethnographically. I suggest therefore that the Upper Gila not only represents the northern extent of an important origin narrative that defined the identities of complex societies in Central Mexico, but also that Mule Creek Cave and Bear Creek Cave may represent two of the earliest manifestations of this complex anywhere in the archaeological record of the entire macro-area. Most importantly, I argue that whereas the Chicomoztoc-like morphology of Bear Creek Cave was largely natural (other than the two circular shrines at its entrance, that may have symbolically represented the sixth and seventh rooms), Mule Creek Cave was extensively modified to replicate these aspects of Bear Creek Cave. If so, this suggests that the people

who used Mule Creek Cave had somehow been dislocated from the Blue River and sought to recreate a Chicomoztoc with seven rooms through actual tunneling of the cave's interior. In Chapter 4, I made similar suggestions regarding how Surratt Cave in the Salinas region (based on its rock art corpus) was intended as a duplicate of Feather Cave in the Sierra Blanca region, and that Picture Cave supplanted Ceremonial Cave in the core Jornada region sometime ca. 700 CE.

Most importantly, if this hypothesis is correct, it would mean that the enormous accumulation of artifacts in Mule Creek Cave, including unique objects such as the earliest-dated *Katsina* image from the SW/NW, represents not the accumulation of offerings deposited over the many centuries that Cosgrove suggested (1947:30), but the record of intense usage that probably began not much earlier than ca. 900 CE and extended only to the end of the Mimbres Classic, a period of little over 200 years, if that.

Chapter 14: Conclusions

Even considering the comparatively high quality of the available dataset for the SW/NW as a whole, the pattern of ritual cave use seems uniquely evident in the Mimbres region and adjacent areas, especially in the Upper Gila River drainage. Whereas most ritual cave use throughout the SW/NW appears to have focused for millennia on a limited number of isolated sites of the sort that hunter-gatherer groups visited periodically, people in the Mimbres region utilized dozens of caves and rock shelters as shrines, most of which appear to have been employed more or less simultaneously during the period ca. 650–1130 CE. I write "appear" because of the very few radiocarbon dates that are available from the enormous amounts of materials recovered from the caves of the Gila and Mimbres areas. However, the lack of darts and fending sticks in most of these caves—and the complete absence of atlatls, along with the limited associated ceramics, suggests that the use of most of these sites began during this timeframe and not before, and that it ended with the Mimbres Classic, as little ceramic evidence exists to suggest that these sites received offerings during the post-Classic Black Mountain, Cliff, and Animas phases, when ceramic types from neighboring regions dominated local assemblages. Other than those caves mentioned in Chapter 5 that appear to have been reused by Tularosa phase populations from the north, ceramic data and most of the few available radiocarbon dates point primarily to the Mimbres Classic (ca. 1000–1130 CE).

The presence of both full-sized and miniature (votive) bows and arrows in many of these shrines, sometimes in very large numbers, provides another relative temporal baseline. The large numbers of bows and arrows in these shrines suggest that increased

cave use in the Mimbres and Gila drainages postdates the arrival of this technology from the north around the beginning of the San Francisco phase ca. 500 CE (Roth et al. 2011) and ends before the area-wide transition from sharpened reed to stone-tipped wooden arrows and to sinew-backed self-bows sometime during the thirteenth century.

The early ca. 500–700 CE time period for the initial transition in the categories of hunting offerings is also marked by the appearance of a unique goggle-eyed deity in the iconography of the neighboring Jornada Mogollon region, and images of this deity begin to appear on Mimbres B/w Style I ceramics ca. 800–900 CE, where they are among the first figurative motifs and the earliest documented anthropomorphs (Figure 11.1). Although the origins of this figure remain contested, it shares many contextual associations (beyond the goggle eyes) with the Mesoamerican rain deity ethnographically known in Nahuatl as "Tlaloc," including caves and the underworld, ancestors, hilltops and mountains, rain, and lightning (Schaafsma 1980, 1997, 2000; Schasfsma and Schaafsma 1974; Schaafsma and Taube 2006). Several new and previously ignored radiocarbon dates place the appearance of the goggle-eyed figure and associated iconography and technologies in the Southwest as early as 650 CE, near the beginning of the Epiclassic in northern Mesoamerica and within living memory of the initial depopulation of Teotihuacán (Hyman et al. 1999; Miller 2018; Miller et al. 2023, 2024; Nicolay 2018; Rowe 2005). The arrival of this figure in the current US/Mexico borderlands thus appears to coincide with the intensification of both sedentism and ritual cave use at the start of the San Francisco Phase (ca. 650–750 CE). This was when painted ceramics first began to appear in the Mimbres region, and the correlation suggests that the goggle-eyed deity may be one archaeological marker for a new ritual complex, one

possibly linked to more complex societies to the south. If "*El Tlaloc del Norte*" is indeed a version of the Mesoamerican deity, and it retains similar associations in the Mogollon area, its appearance in the SW/NW may be an index for the initial restructuring of Mimbres society toward an emphasis on rain ritual and ancestor veneration, with the former tied to the latter, and the latter likely tied to land tenure systems, a development also linked to the ADT in many other parts of the world, including South America and Mesoamerica.

A second religious transformation appears to have swept the Mimbres region during the first half of the proposed Transitional phase (ca. 900–1000 CE) at the end of the Late Pithouse period, which was marked by the ritual closure or retirement of many of the great kivas in the Mimbres Valley and a transition to smaller, "corporate" kivas associated with public or semipublic plazas (Anyon and Creel 2010). This transition closely follows the end of the EpiClassic in Mesoamerica and the subsequent onset there of the Postclassic. During this period, complex urban societies largely withdrew from the eastern Sierra Madre Occidental, while the markers for a new cultural complex known as Aztatlán extended northward through the western coastal region of Mexico all the way to southern Sinaloa. The appearance of copper bells and scarlet macaws in the Mimbres region at this time provides evidence for both a religious transformation as well as a changing relationship with groups in the shifting and expanding northern periphery of Mesoamerica, especially in West Mexico, where copper metallurgy was first introduced from South America ca. 600 CE. These two events—the appearance of "Tlaloc" and the heightened contact between the Mimbres and Aztatlán regions—suggest specific influences of Mesoamerica on Mimbres Mogollon culture. The limited nature of these

events, which lead only to the transfer of prestige goods and ceremonial knowledge, make sense if the agents are recognized as long-distance specialists from the SW/NW (*sensu* Helms 1988), rather than Toltec elites or other actors from state-level societies in Mesoamerica.

Iconography resembling *Katsinam* begins to appear in the Mimbres as well as in the adjacent Jornada region during the Three Circle phase (ca. 750–1000 CE) and continues throughout the Mimbres Classic (1000–1130 CE), appearing afterward, but not immediately, in neighboring regions. Changes in both architecture and iconography during the Mimbres Classic point to the appearance of some form of at least "proto-*Katsinam*" during this phase, perhaps beginning with the shift in ceremonialism marked by the termination of the Great Kivas and the move toward the communal use of plazas instead. Community-accessible dances in plazas are a defining element of *Katsina* rituals in Pueblo communities today.

Most of the Mimbres Classic (ca. 1040–1130 CE) coincides with a long period of reliable annual rainfall from ca. 1040–1125 CE (Grissino-Mayer 1997:24). Sometime as early as 1130 CE, the Mimbres largely relocated from the Mimbres and Gila drainages and discontinued the Black-on-white pottery tradition that serves as the most recognizable marker for their presence in the archaeological record. The primary depopulation of the Mimbres area ca. 1130 CE precedes by less than a single generation that of both Chaco Canyon to the north and Tula Grande far to the south, as well as the contraction and reorganization of the Sedentary Hohokam phase in southern Arizona, all of which occurred ca. 1150 CE. These events are preceded by the onset of an area-wide megadrought that lasted until 1177 CE (Benson and Berry 2009:100). With populations

in much of the Mimbres region at carrying capacity by the start of the twelfth century (Minnis 1985:154), conditions would have been right for the onset of catastrophic food stress.

I have previously argued that the people who left this region may have experienced a religious schism during this time, abandoning the tradition of *specific* ancestor veneration but retaining a form of *general* ancestor veneration, wherein all initiated members of society, and not just those named and commemorated individuals buried under floors, became rain-bringing spirits in the afterlife (Nicolay 2008). This latter form is consistent with the nature of ethnohistoric and contemporary *Katsina* ceremonialism, a religious tradition that had spread throughout most of the agricultural communities of the current US Southwest by the time of Spanish contact (with the exceptions of the *O'odham* and the *Diné*, and possibly Taos Pueblo in the far northern Rio Grande) (C. Schaafsma 2000). Within a century after the Mimbres depopulation, *Katsina* iconography begins to appear in regions outside the Mimbres and Jornada territory, possibly carried by Mimbres emigrants, at least in the western portion of the Pueblo world.

Thus, I argue that the period ca. 650–1150 CE is bracketed by two major religious and demographic shifts: the initial arrival of some form of Mesoamerican ancestor veneration ca. 650 CE and the end of the Mimbres version of that system ca. 1130 CE, leading to a shift from specific ancestor veneration to an early form of the general ancestor veneration that continues in contemporary *Katsina* traditions. Approximately halfway through this period an intermediary transition occurs, marked by the burning of large communal kivas and a shift to smaller, lineage-oriented kivas associated intramural

cemeteries and public or at least semipublic plazas (Anyon and Creel 2010). This shift potentially indicates changing relationships with societies on the northern periphery of Mesoamerica in West Mexico as well as the adoption of an early form of *Katsina* ceremonialism. Multiple cave shrines continued in use throughout this transition, and materials recovered from these sites potentially contain evidence for associated shifts in religious behavior, including at least one portable artifact bearing the painted image of a "proto-*Katsina*" (Adams 1991:26; Cosgrove 1947:Figure 126o; Miller et al. 2023, 2024).

Thus, the detailed record of Mimbres cave shrines, even though it requires extensive comparison across both cave and open sites in order to interpret its significance in depth, suggests that three major religious transformations define the Mimbre sequence:

1. Early 600s = Tlaloc arrives (as medicine bundle ceremonialism), providing a common focus for elements of Mimbres cosmovision related to rain, ancestors, and the Underworld.
2. Early 900s = shift to full ancestor veneration w/ founding families controlling land and their ancestors controlling the rain. Coincides with the burning of the Great Kivas, subfloor burial, and plaza dances; stub *pahos* in caves.
3. Early 1100s = religious schism and depopulation: *specific* ancestor veneration abandoned for *general* ancestor veneration (ethnohistoric *Katsinam* tradition).

The first two shifts would have led to reformation and intensification of cave ritual as an agricultural/ancestor veneration focus was added to the previous hunting emphasis. The third and final shift likely contributed to the end of the Mimbres Classic and the primary depopulation of the Mimbres region.

The survival of a portion of this extraordinary archaeological record is largely due to the region's especially dry climate, which preserved the extensive and predominantly perishable assemblages of many shrine caves virtually intact throughout the SW/NW. The Chiricahua Apache people who subsequently occupied the Mimbres and Gila drainages do not appear to have disturbed the ancient caves much or at all, likely due to Athapaskan religious prohibitions regarding the handling of materials associated with predecessor cultures, a tradition known as "avoidance." Thus, the archaeological record of Mimbres cave shrines remained almost entirely in place until the arrival of white colonial settlers in the latter half of the nineteenth century. These newcomers almost immediately commenced the systematic and commercial looting of both caves and open sites.

Ultimately, one site stands out as a potential key to processes operating during the last centuries of Mimbres occupation in the region: Mule Creek Cave. The data and arguments I have presented in previous chapters of this dissertation suggest that this cave shrine:

1. was artificially tunneled to replicate the Mesoamerican Chicomoztoc model that was also present at Bear Creek Cave, some 30 km to the northwest.
2. accumulated an extraordinarily large of assemblage of artifacts, many of them offerings for rain, during a period as brief as two centuries.
3. contained the earliest dated representation of a *Katsina*, or at least a "proto-*Katsina*," which dated securely to the Mimbres Classic.

The intense use of Mule Creek Cave, along with its unique features and artifacts, suggests that Mimbres cave ritual was indeed both quantitatively and qualitatively distinct from

cave shrine traditions in neighboring Mogollon regions. Therefore, despite evidence for similar cave ritual in neighboring Mogollon regions, enough evidence exists to suggest that the Mimbres use of caves as shrines was indeed more intense and consistent than in the rest of Mogollon region ca. 600–1130 CE.

References

Adams, E. Charles
1991 *The Origin and Development of the Pueblo Katsina Cult*. University of Arizona Press, Tucson.

2000 The Kachina Cult: A Western Pueblo Perspective. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp. 35–46. University of New Mexico Press, Albuquerque.

Adams, Karen R.
1994 A Regional Synthesis of *Zea Mays* in the Prehistoric American Southwest. In *Corn and Culture in the Prehistoric New World*, edited by Sissel Johannessen and Christine Ann Hastorf, pp. 273–302. Westview Press, Boulder, Colorado.

Adams, Karen R., and Regge N. Wiseman
1994 Uncarbonized Zea Mays Cob Population from Beth Cave, Lincoln County, New Mexico. Artifact 32(1):7–22.

Adams, Ron L., and Stacie M. King
2010 Residential Burial in Global Perspective. *Archeological Papers of the American Anthropological Association* 20(1):1–16.

Adler, Michael A.
2002 The Ancestral Pueblo Community as Structure and Strategy. In *Seeking the Center Place: Archaeology and Ancient Communities in the Mesa Verde Region*, edited by Mark Varien and Richard H. Wilshusen, pp. 3–23. University of Utah Press, Salt Lake City.

Aguilar, Manuel, Miguel Medina Jaen, Tim M. Tucker, and James E. Brady
2005 Constructing Mythic Space: The Significance of a Chicomoztoc Complex at Acatzingo Viejo. In *In the Maw of the Earth Monster. Mesoamerican Ritual Cave Use*, edited by James E. Brady and Keith M. Prufer, pp. 69–87. University of Texas Press, Austin.

Aldenderfer, Mark
1993 Ritual, Hierarchy, and Change in Foraging Societies. *Journal of Anthropological Archaeology* 12(1):1–40.

Alexander, Herbert G., and Paul Reiter
1935 *Report on the Excavation of Jemez Cave, New Mexico*. University of New Mexico Bulletin, Monograph Series, Vol. 1, No. 3. University of New Mexico Press, Albuquerque.

Allen, Paula Gunn
1976 The Sacred Hoop: A Contemporary Indian Perspective on American Indian Literature. *CrossCurrents* 26(2):144–163.

Alves, E.
1930 Shelter Caves of the El Paso District. *Bulletin of the Texas Archeological and Paleontological Society* 2: 64–69.

1932 *Perishable Artifacts of the Hueco Caves*. West Texas Historical and Scientific Society: Publications No. 4. Sul Ross State Teachers College, Alpine, Texas.

Anderson, Frank G.
1955 The Pueblo Kachina Cult: A Historical Reconstruction. *Southwestern Journal of Anthropology* 11(4):404–419.

Anderson, Kasper W., and Christophe Helmke
2013 The Personifications of Celestial Water: The Many Guises of the Storm God in the Pantheon and Cosmology of Teotihuacan. *Contributions in New World Archaeology* 5:165–196.

Anonymous
1878 Local News. *The Herald*. Silver City, New Mexico.

Anyon, Roger, and Darrell Creel
2010 Burning Down the House: Ritual Architecture of the Mimbres Late Pithouse Period. In *Mimbres Lives and Landscapes*, edited by Margaret C. Nelson and Michelle Hegmon, pp. 29–39. School for Advanced Research Press, Santa Fe, New Mexico.

Anyon, Roger, Darrell Creel, Patricia A. Gilman, Steven A. LeBlanc, Myles R. Miller, Stephen E. Nash, Margaret C. Nelson, Kathryn J. Pusavage, Barbara J. Roth, Karen Gust Schollmeyer, Jakob W. Sedig, and Christopher A. Turnbow
2017 Re-evaluating the Mimbres Region Prehispanic Chronometric Record. *Kiva* 83(3):316–343.

Anyon, Roger, Patricia A. Gilman, and Steven A. LeBlanc
1981 A Reevaluation of the Mogollon-Mimbres Archaeological Sequence. *Kiva* 46(4):209–225.

Anyon, Roger, and Steven A. LeBlanc
1984 *The Galaz Ruin: A Prehistoric Mimbres Village in Southwestern New Mexico.* University of New Mexico Press, Albuquerque.

Applewhite, Karen Miller

1979 *On the Road to Nowhere: A History of Greer, Arizona 1879–1979*. Published by the author, Scottsdale, Arizona.

Arias, Juan, Tim B. Graves, Mark D. Willis, Lawrence Loendorf, and Myles R. Miller
2021 *Sunset Estates Survey, Hudspeth County, Texas*. Sacred Sites Research Report. Prepared for The Archaeological Conservancy, Albuquerque, New Mexico.

Art Institute of Chicago
1979 Ritual Cache, Arts of the America, Gallery 136, 1300/1400, Salado Branch of the Mogollon, Southeastern Arizona, US Reference No. 1979-17.1-11. Electronic document, https://www.artic.edu/artworks/55249/ritual-cache, accessed December 9, 2018.

Aveleyra Arroyo de Anda, Luis, Manuel Maldonado, and Pablo Martinez del Rio
1956 *Cueva de la Candelaria*. Memorias del Instituto Nacional de Antropologia e Historia V, Mexico.

Ball, Lyndsay B., Jeffrey E. Lucius, Lewis A. Land, and Andrew P. Teeple
2005 *Characterization of Near-Surface Geology and Possible Voids Using Resistivity and Electromagnetic Methods at the Gran Quivira Unit of Salinas Pueblo Missions National Monument, Central New Mexico*. US Geological Survey Scientific Investigations Report 2006-5176. US Geological Survey, Reston, Virginia.

Bandelier, Adolph F.
1892 *Final Report of Investigations among the Indians of the Southwestern United States*, Part II. Papers of the Archaeological Institute of America IV. Cambridge, Massachusetts.

Baugh, Timothy G., and Mark T. Sechrist (editors)
2001 *Protohistoric Apachean Adaptations within the Basin and Range Province of South-Central New Mexico and West Texas: A Perspective from the Fort Bliss Reservation*. Directorate of Environment Historic and Natural Resources Report No. 98-12. US Army Air Defense Artillery Center, Fort Bliss, Texas.

Bauer, Brian S.
1991 Pacariqtambo and the Mythical Origins of the Inca. *Latin American Antiquity* 2(1):7–26.

Bayman, James M.
1995 Rethinking "Redistribution" in the Archaeological Record: Obsidian Exchange at the Marana Platform Mound. *Journal of Anthropological Research* 51(1):37–63.

Beals, Ralph L.
1932 Masks in the Southwest. *American Anthropologist* 34:166–169.

1944 Relations between Mesoamerica and the Southwest. In *El Norte de Mexico y El Sur de Estados Unidos*, pp. 245–252. Tercera Reunion de Mesa Redonda de la Sociedad Mexicana de Antropologia, Mexico.

Beekman, Christopher S.
2015 Causes and Consequences of Migration in Epiclassic Northern Mesoamerica. In *Migrations and Disruptions: Toward a Unifying Theory of Ancient and Contemporary Migrations*, edited by Brenda J. Baker and Takeyuki Tsuda, pp. 73–96. University Press of Florida, Gainesville.

Bement, Leland C.
1997 The Cooper Site: A Stratified Bison Kill in Oklahoma. In *Southern Plains Bison Procurement and Utilization from Paleoindian to Historic*, edited by Leland C. Bement and Kent J. Buehler, pp. 85–99. Memoir 29. Plains Anthropological Society, Lincoln, Nebraska.

Bement, Leland C., Marian Hyman, Michael Zolensky, and Brian J. Carter
1997 A Painted Skull from the Cooper Site: A Folsom Bison Kill in NW Oklahoma. *Current Research in the Pleistocene* 14:6–9.

Bennett, Kathleen Whitaker
1980 Editorial: Mimbres Museums Madness. *Museum Anthropology* 4(2):26–28.

Benson, Larry V., and Michael S. Berry
2009 Climate Change and Cultural Response in the Prehistoric American Southwest. *Kiva* 75(1):87–117.

Beresh, Tara L.
2019 A Comparative Analysis of Sandals from Feather Cave and Similar Sites in South-Central New Mexico. Master's thesis, Department of Anthropology, University of New Mexico, Albuquerque.

Bernardini, Wesley
2005 *Hopi Oral Tradition and the Archaeology of Identity*. University of Arizona Press, Tucson.

Berrier, Margaret
2003 Centipede Cave: A Dramatic Mixed-Style Rock Art Site in Western Texas. *Rock Art Papers: San Diego Museum Papers* 41(16):17–30.

2013 Variation and Distribution of Goggle-Eyed (GE) Anthropomorphic Figures from Southern New Mexico, West Texas, and Northern Mexico. Electronic document,

https://www.academia.edu/11927334/Variation_and_Distribution_of_Goggleeyed_Anthropomorphic_Figures_from_Southern_New_Mexico_West_Texas_and_Northern_Mexico, accessed Sept. 9, 2017.

Bilbo, Barbara
1997 The Slaughter Canyon (New) Cave Pictograph Site, Carlsbad Caverns National Park, New Mexico. In *American Indian Rock Art* 23, edited by Stephen Freers, pp. 49–56, American Rock Art Research Association, San Miguel, California.

Bilbo, Michael
1997 Carlsbad Caverns Natural Entrance Pictograph Sites 1 and 2, Carlsbad Caverns National Park, New Mexico. In *American Indian Rock Art 23*, edited by Stephen Freers, pp. 41–47. American Rock Art Research Association, San Miguel, California.

Bluhm, Elaine
1952 Clothing and Textiles. In *Mogollon Cultural Continuity and Change: The Stratigraphic Analysis of Tularosa and Cordova Caves*, edited by Paul S. Martin, John B. Rinaldo, Elaine Bluhm, Hugh C. Cutler, and Roger Grange, Jr., pp. 231–330. Fieldiana: Anthropology, Vol. 40. Chicago.

Bocquet-Appel, Jean-Pierre
2002 Paleoanthropological Traces of a Neolithic Demographic Transition. *Current Anthropology* 43:637–650.

2011 When the World's Population Took Off: The Springboard of the Neolithic Demographic Transition. *Science* 333:560.

Bocquet-Appel, Jean-Pierre, and Ofer Bar-Yosef
2008 *The Neolithic Demographic Transition and Its Consequences*. Springer Verlag, London.

Bodine, John J.
1988 The Taos Blue Lake Ceremony. *Amerian Indian Quarterly* XII(2):91–105.

Boyd, Carolyn E.
1996 Shamanistic Journeys into the Otherworld of the Archaic Chichimec. *Latin American Antiquity* 7(2): 152–164

2003 *Rock Art of the Lower Pecos*. Texas A&M University Press, College Station.

2005 Tools of the Shaman or the Hunter? A Review of Material Culture in the Lower Pecos Region of Texas and Mexico. Paper presented at the 70th Annual Meeting of the Society for American Archaeology, Salt Lake City, Utah.

Boyd, Carolyn, and Kim Cox
2016 *The White Shaman Mural: An Enduring Creation Narrative in the Rock Art of the Lower Pecos*. University of Texas Press, Austin.

Bradfield, Wesley
1931 *Cameron Creek Village: A Site in the Mimbres Area in Grant County, New Mexico*. School of American Research, Santa Fe, New Mexico.

Brady, James E.
1989 An Investigation of Maya Ritual Cave Use with Special Reference to Naj Tunich, Guatemala. PhD dissertation, Department of Archaeology, University of California, Los Angeles.

1991 Caves and Cosmovision at Utatlan. *California Anthropologist* 18(1):1–10.

1997 Settlement Configuration and Cosmology: The Role of Caves at Dos Pilas. *American Anthropologist* 99(3):602–618.

2003 In My Hill, In My Valley: The Importance of Place in Ancient Maya Ritual. In *Mesas & Cosmologies in Mesoamerica*, edited by Douglas Sharon, pp. 83–91. Museum of Man, San Diego.

2004 Constructed Landscapes: Exploring the Meaning and Significance of Recent Discoveries of Artificial Caves. *Ketzalcalli* 1:2–17.

2012 Under Ground in Ancient Mesoamerica. In *Fanning the Sacred Flame: Mesoamerican Studies in Honor of H. B. Nicholson*, edited by Matthew A. Boxt and Brian Dervin Dillon, pp. 269–290. University Press of Colorado, Boulder.

Brady, James E., and Wendy Ashmore
1999 Mountains, Caves, Water: Ideational Landscapes of the Ancient Maya. In *Archaeologies of Landscape*, edited by Wendy Ashmore and A. Bernard Knapp, pp. 124–145. Blackwell, Oxford, England.

Brady, James E., and Polly A. Peterson
2008 Re-envisioning Ancient Maya Ritual Assemblages. In *Religion, Archaeology, and the Material World*, edited by Lars Fogelin, pp. 78–96. Center for Archaeological Investigations, Southern Illinois University, Carbondale.

Brady, James E., and George Veni

1992 Man-Made and Pseudo-Karst Caves: The Implications of Subsurface Features within Maya Centers. *Geoarchaeology* 7(2):149–167.

Brandt, Elizabeth
1980 The Role of Secrecy in a Pueblo Society. In *Flowers of the Wind: Papers on Ritual, Myth, and Symbolism in California and the Southwest*, edited by Thomas C. Blackburn, pp. 11–28. Ballena Press, Socorro, New Mexico.

Breuil, Henri
1979 *Four Hundred Centuries of Cave Art*. Centre d'Études et de Documentation Préhistorique, Montignac, France.

Brew, John Otis
1944 On the Pueblo IV and on the Katchina-Tlaloc Relations. In *El Norte de Mexico y El Sur de Estados Unidos*, pp. 241–245. Tercera Reunion de Mesa Redonda de la Sociedad Mexicana de Antropologia, Mexico.

Brook, Vernon Ralph
1982 Some Effigies of the Jornada Branch. In *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*, edited by Patrick H. Beckett, pp. 211–225. Acoma Books, Ramona, California.

Brown, Linda A.
2005 Planting the Bones: Hunting Ceremonialism at Contemporary and Nineteenth-Century Shrines in the Guatemalan Highlands. *Latin American Antiquity* 16(2):131–146.

2009 Communal and Personal Hunting Shrines Around Lake Atitlan, Guatemala. In *Maya Archaeology 1*, edited by Charles Golden, Stephen Houston, and Joel Skidmore, pp. 36–59. Precolumbia Mesoweb Press, San Francisco.

Bryant, Vaughan M., Jr.
2013 Diet and Coprolites of the Lower Pecos. In *Painters in Prehistory: Archaeology and Art of the Lower Pecos Canyonlands*, edited by Harry J. Shafer, pp. 112–115. Trinity University Press, San Antonio, Texas.

Byrd, Brian F., and Jeffrey Rosenthal
2016 Celebrating the Dead and Recrafting Social Identity. In *Archaeological Variability and Interpretation in Global Perspective*, edited by Alan P. Sullivan III and Deborah I Olszewski, pp. 233–265. University of Colorado Press, Boulder.

Cabrero G, María Teresa
2015 Presencia Teotihuacana en la Cultura Bolaños. *Arqueología Iberoamericana* 27:3–11.

Caperton, Thomas J.
1981 An Archaeological Reconnaissance. In *Contributions to Gran Quivira Archaeology*, edited by Alden C. Hayes, pp. 4–11. Publications in Archaeology 17, National Park Service, US Department of the Interior, Washington, DC.

Carlson, Roy L.
1982 The Mimbres Kachina Cult. In *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*, edited by Patrick H. Beckett, pp. 147–155. Acoma Books, Ramona, California.

2005 Mimbres and Zuni: Certainties and Probabilities (Review of Brody). *Review of Archaeology* 26(2):1–9.

Carpenter, John, and Guadalupe Sánchez
2022 Archaeology and Ethnohistory of the Northwestern Slope of the Sierra Madre Occidental. In *Borderlands Histories: Ethnographic Observations and Archaeological Interpretations*, edited by John Philip Carpenter and Matthew Pailes, pp. 25–49. University of Utah Press, Salt Lake City.

Carpenter, John, Matthew Pailes, and Guadalupe Sanchez
2022 Confronting the Mogollon Monster: A Perspective from Northwest Mexico. Paper presented at the 87th Annual Meeting of the Society for American Archaeology, Chicago.

Carr, Pat
1979 *Mimbres Mythology*. Texas Western Press, University of Texas, El Paso.

Carrasco, David, and Scott Sessions (editors)
2007 *Cave, City, and Eagle's Nest: An Interpretive Journey through the Mapa de Cuauhtinchan No. 2*. University of New Mexico Press, Albuquerque.

Chase-Dunn, Christopher
2006 Nested Networks and Semiperipheral Development in the Prehistoric US Southwest: A Comparative World-Systems Approach. Electronic document, https://escholarship.org/content/qt74w1p38p/qt74w1p38p.pdf, accessed January 24, 2020.

Chase-Dunn, Christopher, and Bruce Lerro
2014 *Social Change. Globalization from the Stone Age to the Present*. Paradigm Publishers, Boulder, Colorado.

Chávez, R. E., M. E. Cámara, A. Tejero, L. Barba, and L. Manzanilla
2001 Site Characterization by Geophysical Methods in the Archaeological Zone of Teotihuacan, Mexico. *Journal of Archaeological Science* 28(12):1265–1276.

Chimalpahin Cuauhtlehuanitzin, Domingo Francisco de San Antón Muñón
1997 *Codex Chimalpahin: Society and Politics in Mexico Tenochtitlan, Tlateloloco, Texcoco, Culhuacan, and Other Nahua Altepetl in Central Mexico*, Vol. 1. Translated and edited by Arthur J.O. Anderson and Susan Schroeder. University of Oklahoma Press, Norman.

Claassen, Cheryl
2011 Rock Shelters as Women's Retreats: Understanding Newt Kash. *American Antiquity* 76(4):628–641.

2012 Reevaluating Cave Records: The Case for Ritual Caves in the Eastern United States. In *Sacred Darkness: A Global Perspective on the Ritual Use of Caves*, edited by Holley Moyes, pp. 211–224. University Press of Colorado, Boulder.

Clottes, Jean (editor)
2001 *La Grotte Chauvet: L'Art des Origines*. Seuil, Paris.

Coffin, Edwin F.
1932 Archaeological Exploration of a Rock Shelter in Brewster County, Texas. *Indian Notes and Monographs*, No. 48. Museum of the American Indian, Heye Foundation, New York.

Cole, Sally J.
1992 *Katsina Iconography in Homol'ovi Rock Art*. Arizona Archaeological Society 26. Phoenix, Arizona.

Colwell, Chip, and Stewart B. Koyiyumptewa
2018 Traditional Cultural Properties and the Hopi Model of Cultural Preservation. In *Footprints of Hopi History: Hopihiniwtiput Kukveni'at*, edited by Leigh J. Kuwanwisiwma, T. J. Ferguson, and Chip Colwell, pp. 30–52. University of Arizona Press, Tucson.

Connerton, Paul
1989 *How Societies Remember*. Cambridge University Press, Cambridge, England.

Cordell, Linda S., and George J. Gumerman (editors)
1989 *Dynamics of Southwest Prehistory*. Smithsonian Institution Press, Washington, DC.

Cosgrove, C. B.
1947 *Caves of the Upper Gila and Hueco Areas in New Mexico and Texas.* Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 24, Pt. 2. Harvard University, Cambridge, Massachusetts.

Cosgrove, Harriet S., and Cosgrove, Cornelius B.
2012[1932] *The Swarts Ruin: A Typical Mimbres Site in Southwestern New Mexico.* Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 15, Pt. 1. Harvard University Press, Cambridge, Massachusetts.

Coulam, Nancy J., and Alan R. Schroedl
2004 Late Archaic Totemism in the Greater American Southwest, *American Antiquity* 69(1):41–62.

Courlander, Harold
1971 *The Fourth World of the Hopis: The Epic Story of the Hopi Indians as Preserved in Their Legends and Traditions*. University of New Mexico Press, Albuquerque.

Couvreur, Aurélie
2017 Beyond Rain and Storm: Tlaloc and His Relationship with Warfare, Earth and Territory in Teotihuacan. *Americae*, *European Journal of Americanist Archaeology*, CNRS, Teotihuacan, 2:99–112. Hal-02048424.

Covarrubias, Miguel
1957 *Indian Art of Mexico and Central America*. Alfred A. Knopf, New York.

Creel, Darrell G.
1989 Anthropomorphic Rock Art Figures in the Middle Mimbres Valley, New Mexico. *Kiva* 55(1):71–86.

1997 Ceremonial Cave: An Overview of Investigations and Contents, Appendix A. In *The Hueco Mountain Cave and Shelter Survey: A Phase I Baseline Inventory in Maneuver Area 2D on Fort Bliss, Texas*, by Federico A. Almarez and Jeff D. Leach, pp. 75–88, Archaeological Technical Reports 10. Anthropology Research Center, University of Texas, El Paso.

2006 *Excavations at the Old Town Ruin, Luna County, New Mexico, 1989–2003.* Cultural Resources Series No. 16, Vol. 1. New Mexico Bureau of Land Management, New Mexico State Office, Santa Fe.

2022 *The Production and Distribution of Mimbres Pottery.* University of New Mexico Press, Albuquerque.

Creel, Darrell, and Roger Anyon
2003 New Interpretations of Mimbres Public Architecture and Space: Implications for Cultural Change. *American Antiquity* (68)1:67–92.

Creel, Darrell, Roger Anyon, and Barbara Roth

2015 Ritual Construction, Use and Retirement of Mimbres Three Circle Phase Great Kivas. *Kiva* 81(34):201–219.

Crichton, Michael
1990 *Jurassic Park*. Alfred A. Knopf, New York.

Crimmins, M. L.
1929 An Archaeological Survey of the El Paso District. *Bulletin of the Texas Archaeological and Paleontological Society* 1:36–42.

Crothers, George M.
2012 Early Woodland Ritual Use of Caves in Eastern North America. *American Antiquity* 77(3):524–541.

Crotty, Helen
1990 Formal Qualities of the Jornada Style and Pueblo IV Anasazi Rock Art: A Comparison with Implications for the Origins of Pueblo Ceremonialism. In *American Indian Rock Art,* Vol. 16, edited by Solveig Turpin, pp. 147–166. National Park Service, Washington, DC, American Rock Art Research Association, San Antonio, Texas, and Texas Archeological Research Laboratory, University of Texas, Austin.

1999 Kiva Murals and Iconography at Picuris Pueblo. In *Picuris Pueblo through Time: Eight Centuries of Change at a Northern Rio Grande Pueblo,* edited by Michael A. Adler and Herbert W. Dick, pp. 149–187. William P. Clements Center for Southwest Studies, Southern Methodist University, Dallas, Texas.

Cushing, Frank Hamilton
1990 *Cushing at Zuni: The Correspondence and Journals of Frank Hamilton Cushing, 18791884.* Edited by Jesse Green. University of New Mexico Press, Albuquerque.

Cutrone, Daniel
2003 Cave and Ritual in the Southwest. Paper presented at the 68th Annual Meeting of the Society for American Archaeology, Milwaukee, Wisconsin.

Danson, E. B.
1957 *An Archaeological Survey of West-Central New Mexico and East-Central Arizona*. Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 44. Harvard University, Cambridge, Massachusetts.

Davis, C. Allan, and Gerald C. Smith
1981 *Newberry Cave*. San Bernardino County Museum Association, Redlands, California.

Davis, Carolyn O'Bagy
1995 *Treasured Earth: Hattie Cosgrove's Mimbres Archaeology in the American Southwest*. Old Pueblo Archaeology Center, Tucson, Arizona.

Davis, Emma Lou, and James Winkler
1975 Ceremonial Rooms as Kiva Alternatives: SOC-45 and SDV-3. In *Collected Papers in Honor of Florence Hawley Ellis*. edited by Theodore R. Frisbie, pp. 47-59. Archaeological Society of New Mexico 2. Santa Fe.

De la Torre Vázquez, Jesús Gibrán
2020 Atavíos de Mar y Tierra: Patrones de Manufactura en Artefactos Ornamentales de la Cultura Aztatlán del Sitio El Yugo en la Fase Acaponeta, con Base en su Clasificación Morfotecnológica. Masters thesis, Escuela Nacional de Antropología e Historia INAH–Secretaría de Cultura, Mazatlán, Mexico.

Devereux, Don
1966 The Relocation of a Pueblo Emergence Shrine. *El Palacio* 73(4):21–26.

Dial, Susan, and Darrell Creel
2011 Ceremonial Cave. Electronic document, https://www.texasbeyondhistory.net/ceremonial/index.html, accessed October 2, 2021.

Dick, Herbert W.
1965 *Bat Cave*. School of American Research Monograph No. 27. School of American Research, Santa Fe, New Mexico.

Dinwiddie, Douglas M.
1982 History of the Eisele Collection. In *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*, edited by Patrick H. Beckett, pp. 157–165. Acoma Books, Ramona, California.

Di Peso, Charles C.
1974 *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca*, Vols. 1–3. Amerind Foundation Series No. 9. Northland, Flagstaff.

Di Peso, Charles C., John B. Rinaldo, and Gloria J. Fenner
1974 *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca*, Vols. 4–9. Amerind Foundation Series No. 9. Northland, Flagstaff.

Dixon, Keith A.
1956 The Archaeological Significance of Certain Unusual Pottery Shapes of the Prehistoric Southwest. PhD dissertation, Department of Anthropology, University of California, Los Angeles.

Downey, Sean S., Emmy Bocaege, Tim Kerig, Kevan Edinborough, and Stephen Shennan
2014 The Neolithic Demographic Transition in Europe: Correlation with Juvenility Index Supports Interpretation of the Summed Calibrated Radiocarbon Date Probability Distribution (SCDPD) as a Valid Demographic Proxy. *PloS one* 9(8):e105730.

Durán, Fray Diego
1994 *The History of the Indies of New Spain*. Translated, annotated, and with an introduction by Doris Heyden. University of Oklahoma Press, Norman.

Eckert, Suzanne L., and Deborah L. Huntley
2016 Mimbres Katsina Cult Revisited (Again). In *History and Archaeology–Connecting the Dots: Papers in Honor of David H. Snow*, edited by Emily J. Brown, Carol J. Condie, and Helen K. Crotty, pp. 53–67. Papers of Archaeological Society of New Mexico 42. Albuquerque, New Mexico.

Ellis, Florence Hawley and Laurens Hammack
1968 The Inner Sanctum of Feather Cave: A Mogollon Sun and Earth Shrine Linking Mexico and the Southwest. *American Antiquity* 33(1): 25–44.

Elsasser, Albert B., and Robert F. Heizer, editors
1963 *The Archaeology of Bowers Cave, Los Angeles County, California and Reprints of Early Notes on Santa Barbara Archaeology*. Reports of the University of California Archaeological Survey No. 59, Berkeley.

Emslie, Steven D., Robert C. Euler, and Jim I. Mead
1987 A Desert Culture Shrine in Grand Canyon, Arizona, and the Role of Split-Twig Figurines. *National Geographic Research* 3:511–516.

Emslie, Steven D., Jim I. Mead, and Larry Coats
1995 Split-Twig Figurines in Grand Canyon, Arizona: New Discoveries and Interpretations. *Kiva* 61(2):145–173.

Epstein, Jeremiah F.
1963 Centipede and Damp Caves: Excavations in Val Verde County, Texas, 1958. *Bulletin of the Texas Archaeological Society* 33 (1962):1–130.

Euler, Robert C. (editor)
1984 *The Archaeology, Geology, and Paleobiology of Stanton's Cave, Grand Canyon National Park, Arizona*. Grand Canyon Natural History Monograph No. 6. Grand Canyon Natural History Association, Grand Canyon, Arizona.

Fane, Diana, Ira Jackins, and Lise M. Breen

1991 *Objects of Myth and Memory: American Indian Art at The Brooklyn Museum*. Brooklyn Museum, New York, and University of Washington, Seattle.

Farmer, James
2001 Goggle-Eyes and Crested Serpents of Barrier Canyon: Early Mesoamerican Iconography and the Archaic Southwest. In *The Road to Aztlan: Art From a Mythic Homeland*, edited by Virginia M. Fields and Victor Zamudio-Taylor, pp. 124–137. Los Angeles County Museum of Art.

Farmer, Malcolm F., and Raymond deSaussure
1955 Split-Twig Animal Figurines. *Plateau* 27(4):13–23.

Faulkner, Charles H.
1988 Painters of the Dark Zone. *Archaeology*. 41(2):30–38.

1997 Four Thousand Years of Native American Cave Art in the Southern Appalachians. *Journal of Cave and Karst Studies* 59(3):148–153.

Faulkner, Charles H., Bill Deane, and Howard H. Earnest, Jr.
1984 A Mississippian Period Ritual Cave in Tennessee. *American Antiquity* 49(2):350–361.

Feinman, Gary M., Linda M. Nicholas, and Steadman Upham
1996 A Macroregional Comparison of the American Southwest and Highland Mesoamerica in Pre-Columbian Times: Preliminary Thoughts and Implications. In *Pre-Columbian World Systems*, edited by Peter N. Peregrine and Gary M. Feinman, pp. 65-76. *Monographs in World Archaeology No. 26*. Prehistory Press, Madison, Wisconsin.

Ferdon, Edwin N., Jr.
1946 *An Excavation of Hermit's Cave, New Mexico*. School of American Research, Monograph No. 10. University of New Mexico Press, Albuquerque.

Ferg, Alan, and Jim I. Mead
1993 *Red Cave: A Prehistoric Cave Shrine in Southeastern Arizona*. Arizona Archaeologist 26. Arizona Archaeological Society, Phoenix.

Ferguson, Thomas John, Kurt Dongoske, Mike Yeatts, and Leigh Jenkins
2001 Hopi Perspectives on Southwestern Mortuary Studies. In *Ancient Burial Practices in the American Southwest: Archaeology, Physical Anthropology, and Native American Perspectives*, edited by Judy Brunson Hadley and Douglas Mitchell, pp. 9–26. University of New Mexico Press, Albuquerque.

Ferguson, Thomas John, and Chip Colwell

2018 Preface. In *Footprints of Hopi History: Hopihiniwtiput Kukveni'at*, edited by Leigh J. Kuwanwisiwma, Thomas John Ferguson, and Chip Colwell, pp. ix–xiv. University of Arizona Press, Tucson.

Fewkes, Jesse Walter
1898 An Ancient Human Effigy Vase from Arizona. *American Anthropologist* 11(6):165170.

1904 Two Summers Work in Pueblo Ruins. *Twenty-Second Annual Report of the Bureau of American Ethnology.* US Government Printing Office, Washington, DC.

1906 Hopi Shrines near the East Mesa, Arizona. *American Anthropologist* 8(2):346–375.

1914 *Archaeology of the Lower Mimbres Valley*. Smithsonian Miscellaneous Collections 63(910), Washington, DC.

1923 *Designs on Prehistoric Pottery from the Mimbres Valley, New Mexico*. Smithsonian Miscellaneous Collections 74(6). US Government Printing Office, Washington DC.

1971 [1898] *Archaeological Expedition to Arizona in 1895*. 17th Annual Report of the Bureau of American Ethnology, 1895–1896, Part II. Rio Grande Press, Glorieta, New Mexico.

Fitzgerald, Gerald X.
1984 Positive Evidence from Jornada Sites After the Archaic. *The Artifact, Bulletin of the El Paso Archaeological Society* 22(4):35-47.

Fitting, James E., David G. Anderson, and Timothy C. Klinger
1972 *Archaeological Survey and Excavation in Dark Thunder Canyon*. Southwestern New Mexico Research Reports, No. 9. Department of Anthropology, Case Western Reserve University, Cleveland, Ohio.

Ford, Richard I.
1975 Re-excavation of Jemez Cave, New Mexico. *Awanyu* 1(3):13–26.

Fortes, Meyer
1961 Pietas in Ancestor Worship: The Henry Myers Lecture. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 91(2):166–191.

Foster, Michael S.

1982 The Loma San Gabriel-Mogollon Continuum. In *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*, edited by Patrick H. Beckett, pp. 251–261. Acoma Books, Ramona, California.

Freedman, Maurice
1966 *Chinese Lineage and Society: Fukien and Kwantung*. London School of Economics Monographs on Social Anthropology 33. Athlone Press, London.

1970 Ritual Aspects of Chinese Kinship and Marriage. In *Family and Kinship in Chinese Society*, edited by Maurice Freedman, pp. 163–188. Vol. 1. Stanford University, California.

Friedman, Rodger
1979 Museum Purchase of Artifacts Poses Questions for the Future. *New Mexico Independent* 84(5):6–7.

Fulton, William S.
1941 *A Ceremonial Cave in the Winchester Mountains, Arizona*. Amerind Foundation No. 2, Dragoon, Arizona.

Ganot Rodriguez, Jaime, and Alejandro Peschard Fernández
1995 The Archaeological Site of el Cañon del Molino, Durango, Mexico. In *The Gran Chichimeca: Essays on the* Archaeology *and Ethnohistory of Northern Mesoamerica*, edited by Jonathan E. Reyman, pp. 146–178. Aldershot Press, Brookfield, Vermont.

Garcia, Damian, and Kurt F. Anschuetz
2019 Movement as an Acoma Way of Life. In *The Continuous Path: Pueblo Movement and the Archaeology of Becoming*, edited by Samuel Duwe and Robert W. Preucel, pp. 37–59. University of Arizona Press, Tucson.

García-Zambrano, Angel J.
1994 Early Colonial Evidence of Pre-Columbian Rituals of Foundation. In *Seventh Palenque Round Table, 1989*, edited by Merle Greene Robertson and Virginia Field, pp. 217–227. Pre-Columbian Art Research Institute, San Francisco, California.

Geib, Phil R., Carrie C. Heitman, and Ronald C. D. Fields
2017 Continuity and Change in Puebloan Ritual Practice: 3,800 Years of Shrine Use in the North American Southwest. *American Antiquity* 82(2):353–373.

Geib, Phil R., and Donald R. Keller (editors)
2003 *Bighorn Cave: Test Excavations of a Stratified Dry Shelter*, *Mohave County, Arizona*. Bilby Research Center, Northern Arizona University, Flagstaff.

Gifford, James C.
1980 *Archaeological Explorations in Caves of the Point of Pines Region Arizona*. Anthropological Papers of the University of Arizona No. 36. University of Arizona Press, Tucson.

Gillespie, Susan D.
1999 Olmec Thrones as Ancestral Altars: The Two Sides of Power. In *Material Symbols: Culture and Economy in Prehistory*, edited by J. E. Robb, pp. 224–253. Center for Archaeological Investigations, Occasional Paper No. 26. Southern Illinois University, Carbondale.

2010 Inside and Outside: Residential Burial at Formative Period Chalcatzingo, Mexico. *Archeological Papers of the American Anthropological Association* 20(1):98–120.

Gilman, Patricia A., and Steven A. LeBlanc
2017 *Mimbres Life and Society: The Mattocks Site of Southwestern New Mexico*. University of Arizona Press, Tucson.

Gilman, Patricia A., Darrell Creel, and Thomas E. Gruber
2018 Mimbres Classic Period Architecture, Ceramics, and Religion: Maintaining Social Cohesion in the Face of Social Diversity. In *New Perspectives on Mimbres Archaeology*, edited by Barbara J. Roth, Patricia A. Gilman, and Roger Anyon, pp. 88–107. University of Arizona, Tucson.

Gilman, Patricia A., Marc Thompson, and Kristina C. Wyckoff
2019 The Diffusion of Scarlet Macaws and Mesoamerican Motifs into the Mimbres Region. In *Interaction and Connectivity in the Greater Southwest*, edited by Karen G. Harry and Barbara J. Roth, pp. 82-114. University Press of Colorado, Louisville.

Golio, J. J., Susie Bradshaw, Ernest Snyder, and Mike Golio
1995 An Analysis of the Pipette Element in Hohokam Rock Art. In *Rock Art Papers*, Vol. 12, edited by Ken Hedges, pp. 95–106. Museum of Man, San Diego, California.

Gow, Peter
1995 Land, People, and Paper in Western Amazonia. In *The Anthropology of Landscape: Perspectives on Place and Space*, edited by Eric Hirsch and Michael O'Hanlon, pp. 43–62. Oxford University Press, Oxford, England.

Grange, Roger, Jr.
1952 Wooden Artifacts. In *Mogollon Cultural Continuity and Change: The Stratigraphic Analysis of Tularosa and Cordova Caves*, pp. 331–451. Fieldiana: Anthropology, Vol. 40. Chicago.

Graybill, Donald Alan
1973 Prehistoric Settlement Pattern Analysis in the Mimbres Region, New Mexico. PhD dissertation, Department of Anthropology, University of Arizona, Tucson.

Greer, John, and Mavis Greer
1995 *Preliminary Observations on Dark Zone Pictographs at Surratt Cave (LA 9045), Lincoln County, New Mexico*. Report prepared for Rick Surratt, San Antonio, Texas, by John and Mavis Greer, Archaeological Consultants, Columbia, Missouri.

1996 *Dark Zone Rock Art in Surratt Cave, A Ceremonial Site in Central New Mexico*. Report on file with the Archaeological Records Management Section, Museum of New Mexico, Santa Fe.

1997 Dark Zone Rock Art in Surratt Cave, a Deep Cavern in Central New Mexico. In *American Indian Rock Art 23*, edited by Stephen Freers, pp. 25–40. American Rock Art Research Association, San Miguel, California.

1998 Dark Zone Rock Art in North America. In *Rock Art Papers*, Vol. 13, edited by Ken Hedges, pp. 135–144. San Diego Museum Papers 35. San Diego, California.

1999 Dark Zone and Twilight Zone Pictographs in U-Bar Cave, Southwestern New Mexico. In *Rock Art Papers*, Vol. 14, edited by Ken Hedges, pp. 11–19. San Diego Museum Papers 36. San Diego, California.

2002 Dark Zone Pictographs at Surratt Cave, Central New Mexico. In *Forward Into the Past: Papers in Honor of Teddy Lou and Francis Stickney*, edited by Regge Wiseman, Thomas C. O'Laughlin, and Cordelia T. Snow, pp. 37–46. Archaeological Society of New Mexico, Albuquerque.

Grinstead, Bruce
2009 The Royal John Mine: The Life of a Mine in the United States Southwest. *Just for the Record* 15(Q2):1–5.

Grissino-Mayer, Henri D., Christopher H. Baisan, and Thomas W. Swetnam
1997 *A 1,373 Year Reconstruction of Annual Precipitation for the Southern Rio Grande Basin*. Final report submitted to the Directorate of Environment of Natural Resources Division, Fort Bliss, Texas, for the Legacy Program. Laboratory of Tree-Ring Research, University of Tucson, Tucson, Arizona

.

David C. Grove

1970 The Olmec Paintings of Oxtotitlan Cave, Guerrero. *Studies in Pre-Columbian Art and Archaeology* 6:2–36. Dumbarton Oaks, Washington, D.C.

Guernsey, Samuel James
1931 *Explorations in Northeastern Arizona: Report on the Archaeological Fieldwork, 1920–23*. Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 12, Pt. 1. Harvard University, Cambridge, Massachusetts.

Guernsey, Samuel J., and Alfred V. Kidder
1921 *Basketmaker Caves of Northeastern Arizona: Report on the Explorations, 1916–17*. Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 8, Pt. 2. Harvard University, Cambridge, Massachusetts.

Hall, Thomas D., and Christopher Chase-Dunn
1996 Comparing World-Systems: Concepts and Hypotheses. In *Pre-Columbian World Systems*, edited by Peter N. Peregrine and Gary M. Feinman, pp. 11–25. Monographs in World Archaeology No. 26. Prehistory Press, Madison.

Hamilton, Donny L.
2001 *Prehistory of the Rustler Hills: Granado Cave*. University of Texas Press, Austin.

Hard, Robert Jarrett, and John R. Roney
2020 *Early Farming and Warfare in Northwest Mexico*. University of Utah Press, Salt Lake City.

Hargrave, Lyndon L.
1970 *Feathers from Sand Dune Cave: A Basketmaker Cave Near Navajo Mountain, Utah*. Technical Series No. 9. Museum of Northern Arizona, Flagstaff, Arizona.

Harrington, Mark Raymond
1933 *Gypsum Cave, Nevada*. Southwest Museum Papers, No. 8. Southwest Museum, Highland Park, California.

Harris, Arthur H.
1985 Preliminary Report on the Vertebrate Fauna of U-Bar Cave, Hidalgo County, New Mexico. *New Mexico Geology* 7:74–77, 84.

Haury, Emil W.
1936a *The Mogollon Culture of Southwestern New Mexico*. Medallion Papers 20, Gila Pueblo, Globe, Arizona.

1936b *Some Southwestern Pottery Types*. Medallion Papers No. 19, Gila Pueblo, Globe, Arizona.

1945a *Painted Cave, Northeastern Arizona*. Amerind Foundation No. 3. Dragoon, Arizona.

1945b *The Excavations of Los Muertos and Neighboring Ruins in the Salt River Valley, Southern Arizona*. Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 24, Pt. 1. Harvard University, Cambridge, Massachusetts.

1950 *The Stratigraphy and Archaeology of Ventana Cave, Arizona*. University of Arizona Press and University of New Mexico Press, Tucson and Albuquerque.

1976 *The Hohokam: Desert Farmers and Craftsmen, Excavations at Snaketown, 1964–1965*. University of Arizona Press, Tucson.

Hays, Kelley Ann

2000 Kachina Depictions on Prehistoric Pueblo Pottery. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp. 47–62. University of New Mexico Press, Albuquerque.

Hays-Gilpin, Kelley Ann, Ann Cordy Deegan, and Elizabeth Ann Morris

1998 *Prehistoric Sandals from Northeastern Arizona: The Earl H. Morris and Ann Axtel Morris Research*. Anthropological Papers of the University of Arizona No. 62. University of Arizona Press, Tucson.

Headrick, Annabeth

1999 The Street of the Dead . . . It Really Was: Mortuary Bundles at Teotihuacan. *Ancient Mesoamerica* 10(1):69–85.

Hegmon, Michelle

2012 Mimbres Pottery Images Digital Database (MIMPidd). Electronic database, The Digital Archaeological Record (tDAR), https://core.tdar.org/collection/22070/mimbres-pottery-images-digital-database-with-search, accessed December 20, 2020.

Hegmon, Michelle, Margaret C. Nelson, and Karen Gust Schollmeyer

2016 Experiencing Social Change: Life during the Mimbres Classic Transformation. *Archeological Papers of the American Anthropological Association* 27(1):54–73.

Heitman, Carolyn C.

2007 Re-evaluating the “House” in Chaco Canyon, New Mexico. *Archaeology Southwest*, 21(2):5.

Heitman, Carolyn C., and Steve Plog
2006 Kinship and the Dynamics of the House: Rediscovering Dualism in the Pueblo Past. In *A Catalyst for Ideas: Anthropological Archaeology and the Legacy of Douglas W. Schwartz*, edited by Vernon Scarborough, pp. 69–100. School of American Research, Santa Fe, New Mexico.

Heizer, Robert F.
1971 Two Ethnographic Chumash Stone-Weighted Digging Sticks. *Masterkey* 45(2):64–68.

Helms, Mary W.
1979 *Ancient Panama: Chiefs in Search of Power*. University of Texas Press, Austin.

1988 *Ulysses' Sail: An Ethnographic Odyssey of Power, Knowledge, and Geographical Distance.* Princeton University Press, Princeton, New Jersey.

1991 Esoteric Knowledge, Geographical Distance, and the Elaboration of Leadership Status: Dynamics of Resource Control. In *Profiles in Cultural Evolution*, edited by Robert D. Drennan, pp. 333–350. Anthropological Papers No. 85. Museum of Anthropology, University of Michigan, Ann Arbor.

Henshaw, Henry Wetherbee
1879 Cliff House and Cave on Diamond Creek, New Mexico. In *Geographical Surveys West of the 100th Meridian*, Vol. 7, edited by George Montague Wheeler, pp. 370–371.

Hester, Thomas R.
1977 *An Archaeological Survey of the Radium Springs Area, Southern New Mexic*o. Center for Archaeological Research, University of Texas at San Antonio Archaeological Survey Report 26.

Hewett, Edgar L.
1936 *The Chaco Canyon and Its Monuments*. University of New Mexico Press, Albuquerque.

Hewett, Edgar L., and Bertha P. Dutton
1945 *The Pueblo Indian World*. Handbooks of Archaeological History. University of New Mexico Press, Albuquerque.

Heyden, Doris
1975 An Interpretation of the Cave Underneath the Pyramid of the Sun in Teotihuacan, Mexico. *American Antiquity* 40:131–147.

Hibben, Frank C.

1937 A Preliminary Study of the Mountain Lion: Felis Oregonensis sp. University of New Mexico Biological Series, Vol. 5, No. 3. *University of New Mexico Bulletin* 318, https://digitalrepository.unm.edu/unm_bulletin/30.

1938 A Cache of Wooden Bows from the Mogollon Mountains. *American Antiquity* 4(1):36–38.

1941 *Evidences of Early Occupation in Sandia Cave, New Mexico, and Other Sites in the Sandia-Manzano Region*. Smithsonian Miscellaneous Collections 99(23). Washington, DC.

1946 House of the Broken Bows. *Saturday Evening Post* 218(29):42–46.

1948 *Hunting American Lions*. Cornwall Press, Cornwall, New York.

Hieb, Louis A.
2000 The Meaning of *Katsina*: Toward a Cultural Definition of "Person" in Hopi Religion. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp. 23–34. University of New Mexico Press, Albuquerque.

Hill, Erica, and Jon B. Hageman
2016 The Archaeology of Ancestors. In *The Archaeology of Ancestors: Death, Memory and Veneration*, edited by Erica Hill and Jon B. Hageman, pp. 42–80. University Press of Florida, Gainesville.

Hodder, Ian
2011 Human-Thing Entanglement: Towards an Integrated Archaeological Perspective. *Journal of the Royal Anthropological Institute* 17:154–177.

2012 *Entangled: An Archaeology of the Relationships Between Humans and Things*. John Wiley & Sons, West Sussex, England.

Hodder, Ian, and Peter Pels
2010 History Houses: A New Interpretation of Architectural Elaboration at Çatalhöyük. In *Religion in the Emergence of Civilization: Çatalhöyük as a Case Study*, edited by Ian Hodder, pp. 163–186. Cambridge University Press, Cambridge, England.

Hohmann, John W. A.
1990 *Master Stabilization and Development Plan for the Casa Malpais National Historic Landmark Site*. Louis Berger, Phoenix, Arizona.

Holden, W. C.
1937 Excavation of Murrah Cave. *Bulletin of the Texas Archaeological and Paleontological Society* 9:48–73.

Holmes, W. H.
1902 Flint Implements and Fossil Remains from a Sulphur Spring at Afton, Indian Territory. *American Anthropologist* 4(1):108–129.

Hopi Dictionary Project
1998 *Hopi Dictionary/Hopìikwa Lavàytutuveni: A Hopi-English Dictionary of the Third Mesa Dialect*. University of Arizona Press, Tucson.

Hough, Walter
1905 Notes on Bear Creek Cave. Manuscript and Pamphlet File. Box 22, Folder 291. National Anthropological Archives, Smithsonian Institution, Washington, DC.

1906 Sacred Springs in the Southwest. *Records of the Past* 5(6):163–169.

1907 *Antiquities of the Upper Gila and Salt River Valleys in Arizona and New Mexico*. Bulletin No. 35, Bureau of American Ethnology, Smithsonian Institution, Washington, DC.

1914 *Culture of the Ancient Pueblos of the Upper Gila Region, New Mexico and Arizona*. Bulletin No. 87, United States National Museum, Washington, DC.

1915 Explorations in a Great Sacred Cave in Eastern Arizona. Paper presented to the California Academy of Sciences, San Francisco. Manuscript and Pamphlet File. Box 22, Folder 291. National Anthropological Archives, Smithsonian Institution, Washington, DC.

Howard, Edgar B.
1932 Caves Along the Slopes of the Guadalupe Mountains. *Bulletin of the Texas Archaeological and Paleontological Society* 4:7–19.

1935 Evidence of Early Man in North America. *University of Pennsylvania Museum Journal* 24:53–171.

Hughes, Jack T.
1956 Anthropomorphic Mat from New Mexico. *American Antiquity* 21(4):412–412.

Hunt, Edward Proctor
2015 *The Origin Myth of Acoma Pueblo*. Penguin Classics, New York.

Hurst, C. T.
1947 Excavation of Dolores Cave—1945. *Southwestern Lore*, 13(1):8–17.

Hyman, Marian, Kay Sutherland, Marvin W. Rowe, Ruth A. Armitage, and John R. Southon
1999 Radiocarbon Analysis of Rock Paintings: Hueco Tanks, Texas. *Rock Art Research* 16:75–88.

Jackson, Lora, and Marc Thompson
2005 Form and Function: A Reassessment of El Paso Polychromes. In *Archaeology Between the Borders: Papers from the 13th Biennial Jornada Mogollon Conference*, edited by Marc Thompson, Jason Jurgena, and Lora Jackson, pp. 1–7. El Paso Museum of Archaeology, El Paso, Texas.

Jeancon, J. A.
1929 *Archeological Investigations in the Taos Valley, New Mexico, during 1920*. Smithsonian Miscellaneous Collections Vol. 81, No. 12. Smithsonian Institution, Washington, DC.

Jelinek, Arthur
1952 *Pottery of the Rio Bonito Area of Lincoln County, New Mexico. Texas* Archeological and Paleontological Society Bulletin, Vol. 23. Lubbock.

Jett, Stephen C.
1962 Grand Canyon Dams, Split-Twig Figurines, and "Hit and Run" Archaeology. *American Antiquity* 33(3): 341–351.

1987 Additional Information on Split-Twig and Other Willow Figurines from the Greater Southwest. *American Antiquity* 52(2): 392–396.

Jiménez Betts, Peter F.
2018 *Orienting West Mexico: The Mesoamerican World System 200–1200 CE*. Department of Historical Studies, University of Gothenburg, Sweden.

Jolie, Edward A.
2018 Sociocultural Diversity in the Prehispanic Southwest: Learning, Weaving, and Identity in the Chaco Regional System, AD 850–1140. PhD dissertation, Department of Anthropology, University of New Mexico, Albuquerque.

Jolie, Edward A., and Curtis F. Schaafsma
2008 Ritual Cave Use in the Acoma Province: New Insights from the Grants Basket Site. Paper presented at the 72nd Annual Meeting of the Society for American Archaeology, Vancouver, British Columbia, Canada.

Jones, Fayette Alexander
1904 *New Mexico Mines and Minerals, World's Fair Edition: Being an Epitome of the Early Mining History and Resources of New Mexican Mines, in the Various Districts, Down to the Present Time. Geology of the Ore Deposits, Complete Census*

of Minerals, Mineral and Irrigation Waters, Table of Altitudes and Other General Information. New Mexico Printing Company, Santa Fe, New Mexico.

Jordan, Keith
2013 Serpents, Skeletons, and Ancestors?: The Tula Coatepantli Revisited. *Ancient Mesoamerica* 24(2):243–274.

Joyce, Rosemary A.
2001 Burying the Dead at Tlatilco: Social Memory and Social Identities. *Archeological Papers of the American Anthropological Association* 10(1):12–26.

Kabotie, Fred
1949 *Designs from the Ancient Mimbreños with a Hopi Interpretation*. Graborn Press. San Francisco.

Kelley, Jane Holden
1984 *The Archaeology of the Sierra Blanca Region of Southeastern New Mexico*. Anthropological Papers No. 74. Museum of Anthropology, University of Michigan, Ann Arbor.

Kemrer, Meade F., and Wayne Corder
2000 *Report on the Recording of Beehive Cave (LA 131326), Hidalgo County, New Mexico*. Archaeological Consulting Report 00-6 to Bureau of Land Management, Las Cruces Field Office, Las Cruces, New Mexico. PHD Archaeological Consulting, Las Cruces.

Kennett, Douglas J., Stephen Plog, Richard J. George, Brendan J. Culleton, Adam S. Watson, Pontus Skoglund, Nadin Rohland, Swapan Mallick, Kristin Stewardson, Logan Kistler, Steven A. LeBlanc, Peter M. Whiteley, David Reich, and George H. Perry
2017 Archaeogenomic Evidence Reveals Prehistoric Matrilineal Dynasty. *Nature Communications* 8(1):14–15.

Kidder, Alfred V.
1927a Southwestern Archaeological Conference. *Science* 66:489–91.

1927b *Peabody Museum Expedition to the Mimbres Valley, New Mexico, Season of 1927*. Peabody Museum, Harvard University, Cambridge, Massachusetts.

1932 *The Artifacts of Pecos*. Yale University Press, New Haven, Connecticut.

Kidder, Alfred V., and Samuel J. Guernsey
1919 *Archaeological Explorations in Northeastern Arizona*. Bureau of American Ethnology Bulletin 65. Washington, DC.

Kieffer, C. L., and Ann M. Scott
2012 The Mesoamerican Cave Paradigm: Its Historical Development. In *Heart of Earth: Studies in Maya Ritual Cave Use*, edited by James E. Brady, pp. 17–28. Association for Mexican Cave Studies Bulletin 23. Austin, Texas.

Kilby, J. David, and Elizabeth A. McNally
1994 *Cultural Resource Management Plan for Feather Cave Archaeological Complex*. Report submitted to the Bureau of Land Management, Roswell Field Office, New Mexico.

King, Stacie M.
2010 Remembering One and All: Early Postclassic Residential Burial in Coastal Oaxaca, Mexico. *Archeological Papers of the American Anthropological Association* 20(1):44–58.

Kirchhoff, Paul
1954 Gatherers and Farmers in the Greater Southwest: A Problem in Classification. *American Anthropologist* 56(4):529–550.

Kirchhoff, Paul, Lina Odena Guemes, and Lusi Reyes
1976 *Historia Tolteca-Chichimeca*. Fondo de Cultura Economica, Mexico City.

Kluckhohn, Clyde
1944 *Navajo Witchcraft*. Beacon Press, Boston.

Kludt, Trevor, Tim Church, and David Kuehn
2007a "Unseen" Ancient Paths in the Tularosa Basin. In *Viva La Jornada: Papers from the 14th Biennial Jornada Mogollon Conference,* edited by Jason Jurgena, Lora Jackson, and Marc Thompson, pp. 95–109. El Paso Museum of Archaeology, El Paso, Texas.

Kludt, Trevor, Michael Stowe, Tim Church, and Scott Walley
2007b *Pathfinding on McGregor Range: Archaeological Survey of Approximately 8,000 Acres on Fort Bliss, New Mexico.* Fort Bliss Cultural Resources Report No. 04-12, United States Army Garrison Command Directorate of the Environment, Fort Bliss, Texas.

Kohler, Timothy A., and Matt Glaude
2008 The Nature and Timing of the Neolithic Demographic Transition in the North American Southwest. In *The Neolithic Demographic Transition and Its Consequences*, edited by Jean-Pierre Bocquet-Appel and Ofer Bar-Yosef, pp. 81–105. Springer Science & Business Media, Berlin.

Kohler, Timothy A., Marr Pier Glaude, Jean-Pierre Bocquet-Appel, and Brian M. Kemp

2008 The Neolithic Demographic Transition in the US Southwest. *American Antiquity* 73(4):645–669.

Kohler, Timothy A., and Kelsey M. Reese
2014 Long and Spatially Variable Neolithic Demographic Transition in the North American Southwest. *Proceedings of the National Academy of Sciences* 111(28):10101–10106.

Kopytoff, Igor
1971 Ancestors as Elders in Africa. *Africa* 41(2):129–142.

Kurota, Alexander, Thatcher A. Seltzer-Rogers, and Lora Jackson Legare
2022 An Investigation of Diachronic Trends in El Paso Polychrome Painted Designs of the Jornada Mogollon. *KIVA* 88(3):291–326.

Lamar, Donald L.
1962 Geology of the Wupatki Blowhole System. *Plateau* 37(1):35–40.

Lambert, Marjorie F.
1957 A Rare Stone Humpbacked Figure from Pecos Pueblo, New Mexico. *El Palacio* 64(3–4):93–108.

Lambert, Marjorie F., and J. Richard Ambler
1965 *A Survey and Excavation of Caves in Hidalgo County, New Mexico*. School of American Research Monograph No. 25. School of American Research, Santa Fe, New Mexico.

Law Insider.
2024 Cosmovision. Dictionary definition. Electronic document, https://www.lawinsider.com/dictionary/cosmovision, accessed March 4, 2023.

LeBlanc, Steven A.
1983 *The Mimbres People: Ancient Pueblo Painters of the American Southwest*. Thames and Hudson, London.

1989 Cultural Dynamics in the Southern Mogollon Area. In *Dynamics of Southwest Prehistory*, edited by Linda S Cordell and George J. Gumerman, pp. 179–209. Smithsonian Institution Press, Washington, DC.

1999 *Prehistoric Warfare in the American Southwest.* University of Utah Press, Salt Lake City.

2018 Thoughts on Mimbres Archaeology. In *New Perspectives on Mimbres Archaeology*, edited by Barbara J. Roth, Patricia A. Gilman, and Roger Anyon, pp. 261–271. University of Arizona Press, Tucson.

Lehmer, Donald J.
1948 *The Jornada Branch of the Mogollon*. University of Arizona Bulletin Vol. 19, No. 2. Social Science Bulletin No. 17. Tucson, Arizona.

Lekson, Stephen H.
1988 The Mangas Phase in Mimbres Archaeology. *Kiva* 53(2):129–145.

Lekson, Steven, and Allen Rorex
1987 *The Cottonwood Spring and Indian Tank Sites, Doña Ana County, New Mexico*. Human Systems Research, Tularosa, New Mexico.

Lekson, Stephen, James L. Ross, and James E. Fitting
1971 *The Stailey Cave Collection*. Southwestern New Mexico Research Reports, No. 6. Department of Anthropology, Case Western Reserve University, Cleveland, Ohio.

Lekson, Stephen H., Thomas C. Windes, and Patricia Fournier
2007 The Changing Faces of Chetro Ketl. In *The Architecture of Chaco Canyon*, edited by Stephen H. Lekson. University of Utah Press, Salt Lake City.

Lister, Robert H.
1958 Archaeological Excavations in the Northern Sierra Madre Occidental, Chihuahua and Sonora, Mexico. University of Colorado Studies, Series in Anthropology No. 7. University Press of Colorado, Boulder.

Lockett, H. Claiborne, and Lyndon L. Hargrave
1953 *Woodchuck Cave: A Basketmaker II Site in Tsegi Canyon, Arizona*. Edited by Harold S. Colton and Robert C. Euler. Museum of Northern Arizona Bulletin 26, Flagstaff.

Loendorf, Lawrence, Myles R. Miller, Leonard Kemp, Laurie White, Mark Willis, and Nancy Kenmotsu
2013 *Rock Art at the Pintada Cave Complex, Red House Canyon, Fusselman Canyon, and Three Rockshelters on Fort Bliss*. No. 11-06. Fort Bliss Cultural Resources Report, Fort Bliss, Texas.

Loftin, John D.
1991 *Religion and Hopi Life in the Twentieth Century*. Indiana University Press, Bloomington

Long, Abijah, and Joe N. Long
1956 *The Big Cave*. Cushman Publications, Long Beach, California.

Lumholtz, Carl

1902 *Unknown Mexico*. Vol 1. Charles Scribner's Sons, New York.

Lynch, Thomas F.
1989 Current Research: New Mexico. *American Antiquity* 54(4):856–867.

MacNeish, Richard S.
1998 *Excavations of Pintada Rockshelter on McGregor Firing Range in New Mexico*. Publications in Anthropology No. 12. El Paso Centennial Museum, University of Texas, El Paso.

MacNeish, Richard S., and Jane Libby (editors)
2004 *Pendejo Cave*. University of New Mexico Press, Albuquerque.

McAnany, Patricia A.
1995 *Living with the Ancestors: Kinship and Kingship in Ancient Maya Society*. Cambridge University Press, Cambridge, England.

Manzanilla, Linda
1994 Geografía sagrada e inframundo en Teotihuacan. *Antropológicas Nueva Epoca* 11:53–65 .

Manzanilla, Linda, Luis Barba, René Chávez, Andrés Tejero, Gerardo Cifuentes, and Nayeli Peralta
1994 Caves and Geophysics: An Approximation to the Underworld of Teotihuacan, Mexico. *Archaeometry* 36(1):141–157.

Manzanilla, Linda, Claudia López, and AnnCorinne Freter
1996 Dating Results from Excavations in Quarry Tunnels behind the Pyramid of the Sun at Teotihuacan. *Ancient Mesoamerica* 7:245–266.

Marshall, Anne Lawrason
2003 The Siting of Pueblo Bonito. In *Pueblo Bonito: Center of the Chacoan World*, edited by Jill E. Neitzel, pp. 10–13. Smithsonian Books, Washington, DC.

Martin, George C.
1933 *Archaeological Exploration of the Shumla Caves*. Witte Memorial Museum Bulletin, No. 3. San Antonio, Texas.

Martin, Paul S., John B. Rinaldo, and Elaine Bluhm
1954 *Caves of the Reserve Area*. Fieldiana: Anthropology, Vol. 42. Chicago.

Martin, Paul S., John B. Rinaldo, Elaine Bluhm, Hugh C. Cutler, and Roger Grange Jr.
1952 *Mogollon Cultural Continuity and Change: The Stratigraphic Analysis of Tularosa and Cordova Caves*. Fieldiana: Anthropology, Vol. 40. Chicago.

Mathien, Francis Joan, and Randall H. McGuire
1986 Adrift in the Chichimec Sea. In *Ripples in the Chichimec Sea: New Considerations of Southwestern-Mesoamerican Interactions*, edited by Francis Joan Mathien and Randall H. McGuire, pp. 1–9. Center for Archaeological Investigations, Southern Illinois University, Carbondale.

Maurer, Evan M.
1977 *The Native American Heritage: A Survey of North American Indian Art.* Art Institute of Chicago Press, Chicago.

1979 A Mimbres Altar Group. *Bulletin of The Art Institute of Chicago* 73(4):2–6.

McGuire, Randall H.
1980 The Mesoamerican Connection in the Southwest. *Kiva*. 46(1/2):3–38.

McGuire, Randall H., and Elisa Villalpando (editors)
2011 *Excavations at Cerro de Trincheras, Sonora, Mexico*. 2 vols. Arizona State Museum Archaeological Series 204. Arizona State Museum, University of Arizona Press, Tucson.

Meighan, Clement Woodward (editor)
1976 *The Archaeology of Amapa, Nayarit*. Monumenta Archaeologica, Vol. 2. Institute of Archaeology, University of California, Los Angeles.

Mera, H. P.
1938 *Reconnaissance and Excavation in Southeastern New Mexico*. Memoirs of the American Anthropological Association, No. 51. Menasha, Wisconsin.

Merchant, Jan
2002 Fresnal Rockshelter Sandals: Descriptive Analysis and Chronological Placement. Master's thesis, Department of Anthropology and Applied Archaeology, Eastern New Mexico University, Portales.

Merchant, Jan, and Vorsila Bohrer
2006 High Rolls Sandals. In *Insectos, Burritos, y Frajos: Archaic Subsistence in Southern New Mexico: Excavations at LA 114103, Otero County, New Mexico*, edited by Stephen C. Lentz, pp. 153–158. Archaeology Notes No. 345, Office of Archaeological Studies, Department of Cultural Affairs, Santa Fe, New Mexico.

Metcalf, Peter, and Richard Huntington
1991 *Celebrations of Death: The Anthropology of Mortuary Ritual*. Cambridge University Press, Cambridge, England.

Middleton, John
1987 *Lugbara Religion: Ritual and Authority among an East African People*. Smithsonian Institution Press, Washington, DC.

Miller, Myles R.
2018 A Millennium of Identity Formation and Maintenance in the Jornada Mogollon Region. In *Life Beyond the Boundaries: Constructing Identity in Edge Regions of the North American Southwest*, edited by Karen G. Harry and Sarah A. Herr, pp. 239–272. University Press of Colorado, Boulder.

Miller, Myles R., Phil R. Geib, and Darrell G. Creel
2023 Chihuahuan Desert Shrine Caves: Refining Chronologies of Religious Iconography and Social Histories for the Jornada and Mimbres Mogollon Regions of the American Southwest. *American Antiquity* 89(1):1–21.

2024 Dating Perishables to Refine the Chronology of Shrine Cave Use, the Goggle-eye Motif, and other Jornada and Mimbres Mogollon Iconography. *Kiva* 90(4):1–30.

Miller, Myles R., Lawrence L. Loendorf, and Leonard Kemp
2012 Picture Cave and Other Rock Art Sites on Fort Bliss. *Fort Bliss Historic and Natural Resources*. Fort Bliss Cultural Resources Report No. 10-36. Fort Bliss, Texas.

Miller, Myles R., Lawrence L. Loendorf, Mark Willis, Chet Walker, and Tim Graves
2019a Remote Sensing, Shrine Caves, and Pilgrimage Trails in the Tularosa Basin of Southern New Mexico Paper presented at the 21st Biennial Jornada Mogollon Conference, El Paso Museum of Archaeology, El Paso, Texas.

2019b Remote Sensing, Shrine Caves, and Pilgrimage Trails in the Tularosa Basin of Southern New Mexico. Paper Presented at the 2019 Pecos Conference, Cloudcroft, New Mexico.

Miller, Mary, and Karl Taube
1993 *An Illustrated Dictionary of the Gods and Symbols of Ancient Mexico and the Maya*. Thames and Hudson, London.

Mills, Barbara J.
2008 Remembering while Forgetting: Depositional Practices and Social Memory at Chaco. In *Memory Work: Archaeologies of Material Practices*. edited by Barbara J. Mills and William H. Walk, pp. 81–108. School for Advanced Research Advanced Seminar Series. Santa Fe, New Mexico.

2015 Unpacking the House: Ritual Practice and Social Networks at Chaco. In *Chaco Revisited: New Research on the Prehistory of Chaco Canyon, New Mexico*,

edited by Carrie C. Heitman and Stephen Plog, pp. 249–271. University of Arizona Press, Tucson.

Minnis, Paul E.
1985 *Social Adaptation to Food Stress: A Prehistoric Southwestern Example*. University of Chicago Press, Chicago.

Mirro, Michael
2002 Manuports in Caves: A Reconsideration of Stones in Caves. Paper presented at the 67th Annual Meeting of the Society for American Archaeology, Denver, Colorado.

Morris, Earl H.
1941 Prayer Sticks in Walls of Mummy Cave Tower, Canyon del Muerto. *American Antiquity* 6(3):227–230.

Moulard, Barbara L.
1984 *Within The Underworld Sky: Mimbres Ceramic Art in Context*. Twelve Trees Press, Pasadena, California.

2005 Archaism and Emulation in Casas Grandes Painted Pottery. In *Casas Grandes and the Ceramic Art of the Ancient Southwest*, edited by Richard F. Townsend, pp. 66-97. The Art Institute of Chicago, Illinois

Mountjoy, Joseph B.
1982 An Interpretation of the Pictographs at La Peña Pintada, Jalisco, Mexico. *American Antiquity* 47(1):110–126.

Moyes, Holley
2012 Introduction. *Sacred Darkness: A Global Perspective on the Ritual Use of Caves*, editsed by Holley Moyes, pp. 1–11. University Press of Colorado, Boulder.

Moyes, Holley, Jaime J. Awe, George A. Brook, and James W. Webster
2009 The Ancient Maya Drought Cult: Late Classic Cave Use in Belize. *Latin American Antiquity* 20(1):175–206.

Moyes, Holley, and James E. Brady
2012 Caves as Sacred Space in Mesoamerica. In *Sacred Darkness: A Global Perspective on the Ritual Use of Caves*, edited by Holley Moyes, pp. 151–170. University Press of Colorado, Boulder.

Muller, Jon
1986 Serpents and Dancers: Art of the Mud Glyph Cave. In *The Prehistoric Native American Art of Mud Glyph Cave*, edited by Charles H. Faulkner, 36–80. University of Tennessee Press, Knoxville.

Nabhan, Gary Paul
1985 Native Crop Diversity in Aridoamerica: Conservation of Regional Gene Pools. *Economic Botany* 39:387–399.

Needle, Steven B.
2015 *The Sandal Canyon Cave Report*. *The Artifact* 53:iii-78. El Paso Archaeological Society, El Paso, Texas.

2017 The Sandal Canyon Cave (LA 8677) Collection. In *Recent Research in Jornada Mogollon Archaeology: Proceedings from the 19th Jornada Mogollon Conference*, edited by George O. Maloof and Jennifer McCollough, pp. 67–120. El Paso Museum of Archaeology, El Paso, Texas.

Nelson, Ben A.
2006 Mesoamerican Objects and Symbols in Chaco Canyon Contexts. In *The* Archaeology *of Chaco Canyon: An Eleventh Century Pueblo Regional Center*, edited by Stephen H. Lekson, pp. 339–371. School of American Research, Santa Fe, New Mexico.

Nelson, Ben A., and Paul E. Minnis
2018 Connectivity of Social Change in Mimbres and Points South. In *New Perspectives on Mimbres Archaeology*, edited by Barbara J. Roth, Patricia A. Gilman, and Roger Anyon, pp. 232–247. University of Arizona Press, Tucson.

Nicolay, Scott
2005 The Grand Opening: A New Perspective on the Location of Pueblo Bonito in Chaco Canyon, New Mexico. Paper presented at the 70th Annual Meeting of the Society for American Archaeology, Salt Lake City, Utah.

2007 Water from a Stone: A Reexamination of the Feather Cave Archaeological Complex in Lincoln County, New Mexico. Paper presented at the 72nd Annual Meeting of the Society for American Archaeology, Austin, TX. 2008 Caves, Agriculture, Ancestors, and Rain: Archaeology of the Mimbres Underworld. Paper presented at the 73rd Annual Meeting of the Society for American Archaeology, Vancouver, BC, Canada.

2012 Footsteps in the Dark Zone: Ritual Cave Use in Southwest Prehistory. In *Sacred Darkness: A Global Perspective on the Ritual Use of Caves*, edited by Holley Moyes, pp. 171–184. University Press of Colorado, Boulder.

2018 Offerings in the Mogollon Underworld: Big-Eyed Beings and Birds. Paper presented at the 83rd Annual Meeting of the Society for American Archaeology, Washington, DC.

2019 Cold Cases and Forgotten Caves: Reconstructing the Provenience of Unique Artifacts from the Greater Southwest. Paper presented at the 84th Annual Meeting of the Society for American Archaeology, Albuquerque, New Mexico.

2023 Out of the Blue: Revisiting Walter Hough's "Great Sacred Cave in Eastern Arizona." In *Collected Papers of the 21st Biennial Mogollon Archaeology Conference*, edited by Lonnie C. Luderman and Michael W. Diehl, pp. 77–94. Friends of Mogollon Archaeology, Tucson, Arizona.

Nicolay, Scott, and Tara Beresh

2023 Land of a Thousand Sandals: Caves and Cosmovision of the Jornada Mogollon. In *Ongoing Research in Jornada Mogollon Archaeology: Proceedings from the 22nd Jornada Mogollon Conference*, edited by Thatcher Seltzer-Rogers, pp. 124–176. El Paso Museum of Archaeology, El Paso, Texas.

Nicolay, Scott, and Michael Bilbo

2005a Feather Cave Archaeological Complex Project, Field Report on the First Session. Report submitted to the Bureau of Land Management, Roswell Field Office, New Mexico.

2005b Feather Cave Archaeological Complex Project, Field Report on the Second Session. Report submitted to the Bureau of Land Management, Roswell Field Office, New Mexico.

2005c Feather Cave Archaeological Complex Project, Field Report on the Third Session. Report submitted to the Bureau of Land Management, Roswell Field Office, New Mexico.

2005d Feather Cave Archaeological Complex Project, Field Report on the Fourth Session. Report submitted to the Bureau of Land Management, Roswell Field Office, New Mexico.

Nicolay, Scott, and James E. Brady

2004 Footsteps in the Dark Zone: Ritual Cave Use in Southwest Prehistory. Paper presented at the 69th Annual Meeting of the Society for American Archaeology, Montreal.

Nicolay, Scott, Manuel Dueñas Garcia, Margaret Berrier, and Robert Mark

2022 People of Wood and Stone: Considering the Context of the Gould Effigy, a Previously Undocumented Anthropomorphic Stone Carving from Lincoln County, New Mexico. In *Ongoing Research in Jornada Mogollon Archaeology: Proceedings from the 21st Jornada Mogollon Conferenc*e, edited by Thatcher A. Seltzer-Rogers, pp. 65–112. El Paso Museum of Archaeology, El Paso, Texas.

Nielsen, Axel E.

2008 The Materiality of Ancestors: Chullpas and Social Memory in the Late Prehispanic History of the South Andes. *Memory Work: Archaeologies of Material Practices*, edited by Barbara J. Mills and William H. Walker, pp. 207–232. School for Advanced Research Advanced Seminar Series, Santa Fe, New Mexico.

Nusbaum, Jesse L.
1922 *A Basket-Maker Cave in Kane County, Utah*. Museum of the American Indian, Heye Foundation, Indian Notes and Monographs, Miscellaneous Series, No. 29. New York.

O'Laughlin, Thomas C.
2003 A Possible Dark Area Shrine in Chavez Cave, Doña Ana County, New Mexico. In *Climbing the Rocks: Papers in Honor of Helen and Jay Crotty*, edited by Regge N. Wiseman, Thomas C. O'Laughlin, and Cordelia T. Snow. pp. 137–146. Archaeological Society of New Mexico 29. Santa Fe.

2007 Yellow Deer Cave. In *Texas and Points West: Papers in Honor of John A. Hedrick and Carroll P. Hedrick*, edited by Wiseman, Regge N., O'Laughlin, Thomas C., and Snow, Cordelia T., pp. 81–92. Archaeological Society of New Mexico No. 33. Archaeological Society of New Mexico, Albuquerque.

Ortiz, Alfonso
1969 *The Tewa World: Space, Time and Becoming in a Pueblo Society*. University of Chicago Press, Chicago.

Ortman, Scott G., and Bruce A. Bradley
2002 Sand Canyon Pueblo: The Container in the Center. In *Seeking the Center Place: Archaeology and Ancient Communities in the Mesa Verde Region,* edited by Mark D. Varien and Richard H. Wilshusen, pp. 41–78. University of Utah Press, Salt Lake City.

Owens, James W.
2019 *Prehistoric Perishables: From the Attic and Garage*. Privately published, Albuquerque, New Mexico.

Palmer, Jay W.
2001 A Basketmaker II Massacre Revisited. *North American Archaeologist*, 22(2):117–141.

Parsons, Elsie Clews
1918 War God Shrines of Laguna and Zuñi. *American Anthropologist*. 20(4):381–405.

1924 The Scalp Ceremonial of the Zuni. *Memoirs of the American Anthropological Association* 31. Menasha, Wisconsin.

1930 Isleta, New Mexico. In *Bureau of American Ethnology, 47th Annual Report*, pp. 193–466. U. S. Government Printing Office, Washington, DC.

1996 *Pueblo Indian Religion*. 2 vols. Reprinted. University of Nebraska Press, Lincoln. Originally published 1939, University of Chicago Press, Chicago.

Parsons, Mark L.
1965 Painted and Engraved Pebbles. Appendix I. In *The Archaeology of Eagle Cave*. by Richard E. Ross. Papers of the Texas Archaeological Salvage Project No 7. University of Texas Press, Austin.

Pasztory, Esther
1974 The Iconography of the Teotihuacan Tlaloc. *Studies in Pre-Columbian Art and Archaeology* No. 15. Dumbarton Oaks, Trustees for Harvard University, Cambridge, Massachusetts.

Patterson, Alex
1992 *A Field Guide to Rock Art Symbols of the Greater Southwest*. Johnson Books, Denver, Colorado.

Peckham, Stewart
1990 *From This Earth: The Ancient Art of Pueblo Pottery*. Museum of New Mexico Press, Santa Fe.

Pederson, Joel L., Melissa S. Chapot, Steven R. Simms, Reza Sohbati, Tammy M. Rittenour, Andrew S. Murray, and Gary Cox
2014 Barrier Canyon Rock Art Dated by New OSL Methods. *Proceedings of the National Academy of Sciences* 111(36):12986–12991.

Peirce, Charles S.
1955 Logic as Semiotic: The Theory of Signs. In *Philosophic Writings of Peirce*, edited by Justus Buchler, pp. 98–119. Dover, New York.

Pendergast, David M.
1962a Metal Artifacts from Amapa, Nayarit, Mexico. *American Antiquity* (27)3:370–379.

1962b Metal Artifacts in Prehispanic Mesoamerica. *American Antiquity* 27(4):520–545.

Pepper, George H.
1996[1920] *Pueblo Bonito*. University of New Mexico Press, Albuquerque.

Peregrine, Peter N.

1996a Archaeology and World-Systems Theory. *Sociological Inquiry* 66(4):486-495.

1996b World-Systems Theory and Archaeology. In *Pre-Columbian World Systems*, edited by Peter N. Peregrine and Gary M. Feinman, pp. 1–10. Monographs in World Archaeology No. 26. Prehistory Press, Madison, Wisconsin.

Peterson, Polly A., Patricia A. McAnany, and Allan B. Cobb
2005 De-Fanging the Earth Monster: Speleothem Transport to Surface Sites in the Sibun Valley. In *In the Maw of the Earth Monster: Mesoamerican Ritual Cave Use*, edited by James E. Brady and Keith M. Prufer, pp. 225–248. University of Texas Press, Austin.

Pickens, Homer C.
1980 *Tracks Across New Mexico*. High-Lonesome Books, Silver City, New Mexico.

Plog, Stephen, and Carrie Heitman
2010 Hierarchy and Social Inequality in the American Southwest, AD 800–1200. *Proceedings of the National Academy of Sciences* 107(46):19619–19626.

Potter, Jack M.
1970 Land and Lineage in Traditional China. In *Family and Kinship in Chinese Society*, Vol. 1, edited by Maurice Freedman, pp. 121–138. Stanford University Press, Redwood City, California.

Pugh, Timothy W.
2005 Caves and Artificial Caves in Late Postclassic Maya Ceremonial Groups. In *Stone Houses and Earth Lords: Maya Religion in the Cave Context*, edited by Keith M. Prufer and James E. Brady, pp. 47-69. University Press of Colorado, Boulder.

Punzo Díaz, José Luis
2018 Interregional Interaction of the Chalchihuites Culture in Northwest Mexico during the Classic and Postclassic Periods. In *Interregional Interaction in Ancient Mesoamerica*, edited by Joshua D. Englehart and Michael D. Carrasco, pp. 262–291. University Press of Colorado, Boulder.

2019 La Metalurgia y las Relaciones Entre el Altiplano y la Costa Vistas Desde la Cultura Chalchihuites en Durango. In *Aztatlán. Interacción y cambio social en el Occidente de México ca. 850–1350 d. C.*, edited by Laura Solar V. and Ben A. Nelson, pp. 221–236. El Colegio de Michoacán, Zamora, Mexico, and Arizona State University, Tempe.

Punzo, José Luis, and Elisa Villalpando

2015 Paquimé: A Revision of its Relations to the South and West. In *Ancient Paquimé and the Casas Grandes World*, edited by Paul E. Minnis and Michael E. Whalen, pp. 172–191. University of Arizona Press, Tucson.

Putsavage, Kathryn, and Matthew Taliaferro
2018 Continuity and Change in the Early Postclassic (AD 1130 to 1300) in the Mimbres Valley. In *New Perspectives on Mimbres Archaeology*, edited by Barbara J. Roth, Patricia A. Gilman, and Roger Anyon, pp. 209–231. University of Arizona Press, Tucson.

Reilly, P.T.
1973 The Refuge Cave. *Masterkey* 47(2):46–54.

Rice, Anna
2010 The Potential for Tlaloc Images on Prehistoric Pottery and Rock Art in the Mimbres Region of the North American Southwest. Undergraduate honor's thesis, Department of Anthropology, University of Oklahoma, Norman.

Rice, Glen E.
2016 *Sending the Spirits Home: The Archaeology of Hohokam Mortuary Practices*. University of Utah Press, Salt Lake City.

Rice, John Steadman
1998 *A Disease of One's Own: Psychotherapy, Addiction and the Emergence of Co-dependency*. Transaction Publishers, New Brunswick, New Jersey.

Robbins, Chandler S., Bertel Bruun, and Herbert S. Zim
1966 *A Guide to Field Identification: Birds of North Americ*a. Golden Press, New York.

Roberts, Frank H. H.
1929 Recent Archaeological Developments in the Vicinity of El Paso, Texas. *Smithsonian Miscellaneous Collections* 81(7): 1–14.

Roediger, Virginia More
1991 *Ceremonial Costumes of the Pueblo Indians: Their Evolution, Fabrication, and Significance in the Prayer Drama*. University of California Press, Berkeley.

Roney, John R.
1999 Canador Peak, An Early Pithouse Period Cerro de Trincheras in Southwestern New Mexico. In *La Frontera: Papers in Honor of Patrick H. Beckett*, edited by Meliha S. Duran and David T. Kirkpatrick, pp. 173–184. Archaeological Society of New Mexico, Albuquerque.

Roosa, William B.
1952 Sandals of Feather Cave. *Texas Archaeological and Paleontological Society, Bulletin*, Vol. 23. Lubbock.

Ross, Richard E.
1965 *The Archaeology of Eagle Cave*. Papers of the Texas Archaeological Salvage Project No 7. University of Texas, Austin.

Roth, Barbara J.
2012 Current Investigations at the Harris Site, Southwestern New Mexico. In *Collected Papers from the 16th Biennial Mogollon Archaeology Conference, October 8–10, 2010*, edited by Lonnie Ludeman, pp. 95–100. Friends of Mogollon Archaeology Press, Las Cruces, New Mexico.

2015 Archaeological Investigations at the Harris Site (LA 1867), Grant County, New Mexico. Report on file, Department of Anthropology. University of Nevada, Las Vegas.

2016 The Significance of "Permanent Places" in Shaping Regional Settlement History: The Case of the Mimbres Mogollon. In *Archaeological Variability and Interpretation in Global Perspective*, edited by Alan P. Sullivan III and Deborah I Olszewski, pp. 53–70. University Press of Colorado, Boulder.

2021 Changes in Household Organization and the Development of Classic Period Mimbres Pueblos. In *Archaeology of Households, Kinship, and Social Change*, edited by Lacey B. Carpenter and Anna Marie Prentiss, pp. 272–292. Routledge, London.

Roth, Barbara J., and Kathryn M. Baustian
2015 Kin Groups and Social Power at the Harris Site, Southwestern New Mexico. *American Antiquity* 80(3):451–71.

Roth, Barbara, Elizabeth Toney, and Leon Lorentzen
2011 The Advent of Bow and Arrow Technology in the Mimbres Mogollon Region. *Kiva* 77(1):87–109.

Roth Barbara J., Patricia A. Gilman, and Roger Anyon
2018 Introduction. In *New Perspectives on Mimbres Archaeology: Three Millenia of Human Occupation in the North American Southwest*, edited by Barbara J. Roth, Patricia A. Gilman, and Roger Anyon, pp. 3–23. University of Arizona Press, Tucson.

Rowe, Marvin W.
2005 Radiocarbon Dates of Charcoal Drawings: Hueco Tanks. In *Archaeology Between the Borders: Papers from the 13th Biennial Jornada Mogollon Conference*,

edited by Marc Thompson, Jason Jurgena, and Lora Jackson, pp. 89–94. El Paso Museum of Archaeology, El Paso, Texas.

Russell, Will, Mike Stowe, and Brian Knight
1998 Map Cave, LA 19134. Manuscript on file, Laboratory of Anthropology, Santa Fe, New Mexico

Sahagún, Bernardino de
1961 *The Florentine Codex: General History of the Things of New Spain*. 12 vols. Translated by Charles E. Dibble and Arthur J. O. Anderson. School of American Research, Santa Fe, and University of Utah Press, Salt Lake City.

Sandberg, Sigfred
1950 An Archaeological Investigation of Correo Snake Pit. Master's thesis, Department of Archaeology, University of New Mexico, Albuquerque.

Sartor, Robert A.
1964 Meteorological Investigation of the Wupatki Blowhole System. *Plateau* 37(1):26–34.

Sayles, E. B.
1930 A Rock Shelter in Coke County. *Bulletin of the Texas Archaeological and Paleontological Society* 2:33–40

1935 *An Archaeological Survey of Texas*. Medallion Papers No. 17. Gila Pueblo, Globe, Arizona.

Schaafsma, Curtis
2000 Pueblo Ceremonialism from the Perspective of Colonial Documents. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp. 121–138. University of New Mexico Press, Albuquerque

Schaafsma, Polly
1972 Rock Art in New Mexico. New Mexico State Planning Office, Santa Fe, New Mexico.

1980 *Indian Rock Art of the Southwest*. School of American Research, Santa Fe, New Mexico.

1999 Tlalocs, Kachinas, Sacred Bundles, and Related Symbolism in the Southwest and Mesoamerica. In *The Casas Grandes World,* edited by C.F. Schaafsma and C. L. Riley, pp. 164–192. University of Utah Press, Salt Lake City.

2000 The Prehistoric Kachina Cult and Its Origins as Suggested by Southwestern Rock Art. In *Kachinas in the Pueblo World*, edited by Polly Schaafsma, pp 63–79. University of New Mexico Press, Albuquerque.

2007 The Archaeology of U-Bar Cave, Hidalgo County, New Mexico, and its Regional Significance as a Landscape Shrine. Paper presented at the 72nd Annual Meeting of the Society for American Archaeology, Austin, Texas.

2015 Tlaloc and a Mesoamerican Cosmology in the American Southwest. In *Tláloc ¿Que? Boletín del Seminario de Tláloc*. Afio 5, No 17, pp. 8–51

2022 Tlaloc and a Mesoamerican Cosmology in the American Southwest. *Journal of the Southwest* 64(3):423–472.

Schaafsma, Polly, and Curtis Schaafsma
1974 Evidence for the Origins of the Pueblo Kachina Cult as Suggested by Southwestern Rock Art. *American Antiquity* 39(4):535–545.

Schaafsma, Polly, and Karl Taube
2006 Bringing the Rain: An Ideology of Rain Making in the Pueblo Southwest and Mesoamerica. In *The Pre-Columbian World: Searching for a Unitary Vision of Ancient America*, edited by Jeffrey Quilter and Mary Miller, pp. 231–285. Dumbarton Oaks Research Library and Collections, Washington, DC.

Schley, R. A.
1962 *Excavation of the Wupatki Blowhole Site. NA7824*. Rand Corporation, Santa Monica, California.

Schollmeyer, Karen Gust
2020 Life of the Gila: Was Mimbres a World? *Preservation Archaeology* (blog). Archaeology Southwest, March 13, 2020. https://www.archaeologysouthwest.org/2020/03/13/life-of-the-gila-was-mimbres-a-world/, accessed March 12, 2023.

Schollmeyer, Karen Gust, Margaret C. Nelson, and Michelle Hegmon
2018 Variability in Mimbres Food and Food Procurement. In *New Perspectives on Mimbres Archaeology*, edited by Barbara J. Roth, Patricia A. Gilman, and Roger Anyon, pp. 169–192. University of Arizona, Tucson.

Schroeder, Alan R. (compiler)
1981 The Pratt Cave Studies. Edited by G. X. Fitzgerald. *The Artifact* 21(1, 2, 3, and 4).

Schroedl, Albert H.
1977 The Grand Canyon Figurine Complex. *American Antiquity* 42(2):254–264.

Schwartz, Douglas W., Arthur R. Lange, and Raymond deSaussure
1958 Split-Twig Figurines in the Grand Canyon. *American Antiquity* 23(3): 264–273.

Scott, Ann M.
2007 The Role of the Nashville Cave Session in the Development of a Self-Conscious Subdiscipline. Paper presented at the 72nd Annual Meeting of the Society for American Archaeology, Austin, Texas.

Scott, Ann M., and Walter E. Little
2003 Contemporary Maya Beliefs and Cave Utilization: Implications for Archaeological Interpretations. Paper presented at the 68th Annual Meeting of the Society for American Archaeology, Milwaukee, Wisconsin.

Sedig, Jakob W.
2015 The Mimbres Transitional Phase: Examining Social, Demographic, and Environmental Resilience and Vulnerability from AD 900–1000 in Southwest New Mexico. PhD dissertation, Department of Anthropology, University of Colorado, Boulder.

2020 Environmental Precarity and Religious Transformation during the Mimbres Transitional Phase. *Kiva* 86(1):24–46.

Sedig, Jakob W., Stephen H. Lekson, and Barbara Roth
2018 Making the Transition: A Reassessment of Mimbres Pithouse-to-Pueblo Period. In *New Perspectives on Mimbres Archaeology: Three Millenia of Human Occupation in the North American Southwest*, edited by Barbara J. Roth, Patricia A. Gilman, and Roger Anyon, pp. 64–87. University of Arizona Press, Tucson.

Shafer, Harry J.
1995 Architecture and Symbolism in Transitional Pueblo Development in the Mimbres Valley, SW New Mexico. *Journal of Field Archaeology* 22(1):23–47.

2003 *Mimbres Archaeology at the NAN Ranch Ruin*. University of New Mexico Press, Albuquerque.

2013 *Painters in Prehistory: Archaeology and Art of the Lower Pecos Canyonlands*. Trinity University Press, San Antonio, Texas.

Shafer, Harry J., and Robbie L. Brewington
1995 Microstylistic Changes in Mimbres Black-on-White Pottery: Examples from the Nan Ruin, Grant County, New Mexico. *Kiva* 61(1):5–29.

Shelley, Phillip H., and Kristin E. Wenzel (editors)

2002 *Archaeological Variation within the Middle Rio Bonito.* Cultural Resources Series 14. Bureau of Land Management, New Mexico State Office, Santa Fe.

Shepard, Lindsey
2015 Using a Multidisciplinary Approach to Interpret Artifacts: Preservation Archaeology Blog. Electronic document, https://www.archaeologysouthwest.org/2015/07/17/using-a-multidisciplinary-approach-to-interpret-artifacts, accessed December 12, 2015.

Sload, Rebecca
2015 Primacy of the Cave at the Sun Pyramid, Teotihuacán. Paper presented at the 80th Annual Meeting of the Society of American Archaeology, San Francisco.

Simek, Jan F., Alan Cressler, and Joseph Douglas
2012 A New Overview of Prehistoric Cave Art in the Southeast. In *Sacred Darkness: A Global Perspective on the Ritual Use of Caves*, edited by Holley Moyes, pp. 195–210. University Press of Colorado, Boulder.

Snow, Meradeth, Harry Shafer, and David Glenn Smith
2011 The Relationship of the Mimbres to Other Southwestern and Mexican Populations. *Journal of Archaeological Science* 38(11):3122–3133.

Splitstoser, Jeffrey C., Tom D. Dillehay, Jan Wouters, and Ana Claro
2016 Early Pre-Hispanic Use of Indigo Blue in Peru. *Science Advances* 2(9):e1501623.

Spreen, Michelle Rodes Kennedy
1983 The Social Implications of Mortuary Remains at Two Mimbres Mogollon Sites in Grant County New Mexico. Master's thesis, Department of Anthropology, Texas A&M University, College Station.

Stein, John R., Dabney Ford, and Richard Friedman
2003 Reconstructing Pueblo Bonito. In *Pueblo Bonito: Center of the Chacoan World*, edited by Jill E. Neitzel, pp. 33–60. Smithsonian Books, Washington, DC

Stevenson, Matilda Coxe
1905 *The Zuñi Indians: Their Mythology, Esoteric Fraternities, and Ceremonies*. Twenty-Third Annual Report of the Bureau of American Ethnology, 1901–1902. US Government Printing Office, Washington, DC.

Steward, Julian H.
1937 *Ancient Caves of the Great Salt Lake Region*. Bulletin No. 116, Bureau of American Ethnology, Smithsonian Institution, Washington, DC.

Stokes, Robert J.
2003 Aspects of Land Tenure in an Ancient Southwestern Farming Society in the Mimbres Valley, New Mexico. PhD dissertation, Department of Anthropology, University of Oklahoma, Norman.

2019 Mimbres Sacred Landscapes: Preliminary Insights from City of Rocks State Park near Faywood, New Mexico. In *Collected Papers from the 20th Biennial Mogollon Archaeology Conference*, edited by Lonnie C. Luderman, pp. 21–34. Friends of Mogollon Archaeology, Las Cruces, New Mexico.

Stone, Andrea
2012 Civilizing the Cave Man: Diachronic and Cross Cultural Perspectives on Cave Ritual. In *Sacred Darkness: A Global Perspective on the Ritual Use of Caves*, edited by Holley Moyes, pp. 365–370. University Press of Colorado, Boulder.

Stubbs, Stanley
1953 Paul David Reiter, 1909-1953. Obituary. *American Antiquity* 19(1):67–68

Suina, Joseph H.
1992 Pueblo Secrecy Result of Intrusions. *New Mexico Magazine* 70(1):60–63.

Sutherland, Kay.
1978 Petroglyphs at Three Rivers, New Mexico: A Partial Survey. *The Artifact*, *Bulletin of the El Paso Archaeological Society* 16(2):1–67.

1996 Spirits from the South. *The Artifact* 34(1–2):1–100.

Swanson, Steve
2002 *Land Use History and Environmental Impact in the Blue River Watershed, Arizona: Report of the 2000 Blue River Archaeological Project*. Report submitted to the Apache-Sitgreaves National Forest, Springerville, Arizona.

SWCA Environmental Consultants
2016 Environmental Assessment Salinas Pueblo Missions National Monument Fire Management Plan. Report submitted to Marc LeFrancois Acting Superintendent, Salinas Pueblo Missions National Monument. SWCA Environmental Consultants, Albuquerque, New Mexico.

Sweet Espinosa, Nancy
2002 Five Mummies from the Miles Collection: A Problem of Provenience. Master's thesis, Department of Anthropology, Eastern New Mexico University, Portales, New Mexico.

Tate, Carolyn E.

2022 The Shape of Place: The Lower Pecos Canyonlands as a *Chicomoztoc*? In *Making "Meaning": Pre-Columbian Archaeology, Art History, and the Legacy of Terence Grieder*, edited by James Farmer and Rex Koontz, pp. 75–111. University of Houston Libraries, Houston, Texas.

Taylor, Walter W.
1972 The Hunter-Gatherer Nomads of Northern Mexico: A Comparison of the Archival and Archaeological Records. *World Archaeology* 4(2):167–178.

1988 *Contributions to Coahuila Archaeology*. Research Paper No. 53. Center for Archaeological Investigations, Southern Illinois University, Carbondale.

2003 *Sandals from Coahuila Caves*. Edited by Nicholas J. Demerath, Mary C. Kennedy, and Patty Jo Watson. Dumbarton Oaks Research Library and Collection, Washington, DC.

Taube, Karl A.
1986 The Teotihuacan Cave of Origin: The Iconography and Architecture of Emergence Mythology in Mesoamerica and the American Southwest. *Res: Anthropology and Aesthetics* 12:51–82.

1996 The Olmec Maize God: The Face of Corn in Formative Mesoamerica. *RES: Anthropology and Aesthetics* 29(1):39–81.

Tedlock, Dennis (translator)
1972 *Finding the Center: Narrative Poetry of the Zuni Indians*. Dial Press, New York.

Thomas, Julian
2001 Archaeologies of Place and Landscape. *Archaeological Theory Today* 165:167–187.

Thompson, Jessica C., and C. Vance Haynes, Jr.
2012 Radiocarbon Dating the Human Occupation at Sandia Cave, New Mexico. *American Antiquity* 77(2):303–314.

Thompson, Marc
1999 *Mimbres Iconology: Analysis and Interpretation of Figurative Motifs*. PhD dissertation, Department of Archaeology, University of Calgary, Alberta, Canada.

Thompson, Marc, Jason Jurgena, and Lora Jackson
2006 Mimbres Rock Art: Metaphors and Myths. Paper presented at 14th Biennial Mogollon Conference, Tucson, Arizona.

Titiev, Mischa

1944 *Old Oraibi: A Study of the Hopi Indians of Third Mesa*. Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 22, Pt. 1. Harvard University, Cambridge, Massachusetts.

Toren, Christina L.
1995 Seeing the Ancestral Sites: Transformations in Fijian Notions of the Land. In *The Anthropology of Landscape: Perspectives on Place and Space*, edited by Eric Hirsch and Michael O'Hanlon, pp. 163–183. Oxford University Press, Oxford, England.

Tovar, Juan de
1951 *The Tovar Calendar; an Illustrated Mexican Manuscript ca. 1585*, edited by George Kubler and Charles Gibson. Memoirs of the Connecticut Academy of Arts & Sciences, Vol. 11. New Haven.

Trouillot, Michel-Rolph
1995 *Silencing the Past: Power and the Production of History*. Beacon Press, Boston.

Turpin, Solveig
2003 Walking the Line: A Preliminary Sandal Chronology from Coahuila and Southwestern Texas. *Journal of Big Bend Studies* 15(1):27–53.

Turner, Christy G., and Jacqueline A. Turner
1999 *Man Corn: Cannibalism and Violence in the Prehistoric American Southwest*. University of Utah Press, Salt Lake City.

Van Keuren, Scott, and Christopher I. Roos
2013 Geoarchaeological Evidence for Ritual Closure of a Kiva at Fourmile Ruin, Arizona. *Journal of Archaeological Science* 40 (1):615–625.

Van Valkenburgh, Richard
1940 Tsosi Tells the Story of Massacre Cave. *Desert Magazine* 3(4):22–25.

Villela, Khristaan D.
2016 Telling Their Own Story: The Controversy over Peter Nabokov's Publication of *The Origin Myth of Acoma Pueblo*. *Pasatiempo*. 15–21 January:28–31.

Vivian, R. Gwinn
1997 *The Chacoan Prehistory of the San Juan Basin*. Academic Press, San Diego, California.

Vivian, R. Gwinn, Dulce N. Dodgen, and Gayle H. Hartmann

1978 *Wooden Ritual Artifacts from Chaco Canyon, New Mexico: The Chetro Ketl Collection*. University of Arizona Press, Tucson.

Walker, William H.
1995 Ceremonial Trash. In *Expanding Archaeology*, edited by James M. Skibo, pp. 67–79. University of Utah Press, Salt Lake City.

Walker, William H., and Gaea McGahee
2006 Animated Waters: Ritual Technology at Casas Grandes, Chihuahua. In *Precolumbian Water Management: Ideology, Ritual, and Power*, edited by Lisa J. Lucero and Barbara W. Fash, pp. 189–204. University of Arizona Press, Tucson.

Wallace, Henry D.
2014 Ritual Transformation and Cultural Revitalization: Explaining Hohokam in Pre-AD 1000 Southeastern Arizona. In *Between Mimbres and Hohokam: Exploring the Archaeology and History of Southeastern Arizona and Southwestern New Mexico*, edited by Henry D. Wallace, pp. 433–499. Anthropological Papers No. 52. Archaeology Southwest, Tucson. Amerind Foundation, Dragoon, Arizona. Desert Archaeology, Tucson.

Wallerstein, Immanuel
1974 *The Modern World System: Capitalist Agriculture and the Origins of the European World Economy in the Sixteenth Century*. Academic Press, New York.

Walt, Henry Jerome
1978 An Effigy Cache from the Cliff Valley, New Mexico. Master's thesis, Department of Art History, University of New Mexico, Albuquerque.

Wasley, William W.
1962 A Ceremonial Cave on Bonita Creek, Arizona. *American Antiquity* 27(3): 380–394.

Watson, Editha L.
1929 Caves of the Upper Gila River. *American Anthropologist, New Series* 31:299–306.

Watson, James T., Jessica I. Cerezo-Román, Silvia I.N. Maldonado, Carlos C. Guzmán, and M. Elisa Villalpando
2015 Death and Community Identity in the Trincheras Cremation Cemetery, Sonora, Mexico. In *The Analysis of Burned Human Remains*, edited by Christopher Schmidt and Steven Symes, pp. 339–353. Academic Press, Cambridge, Massachusetts.

Watson, Patty Jo

1969 *The Prehistory of Salts Cave, Kentucky*. Reports of Investigations No. 16. Illinois State Museum, Springfield.

2012 Forty Years' Pursuit of Human Prehistory in the World Underground. In *Sacred Darkness: A Global Perspective on the Ritual Use of Caves*, edited by Holley Moyes, pp. 185–194. University Press of Colorado, Boulder.

Webster, Laurie
2007 Mogollon and Zuni Perishable Traditions and the Question of Zuni Origins. In *Zuni Origins: Toward a New Synthesis of Southwestern Archaeology*, edited by David A. Gregory and David R. Wilcox, pp. 270–317. University of Arizona Press, Tucson.

Webster, Laurie D., Kelley A. Hays-Gilpin, and Polly Schaafsma
2006 A New Look at Tie-Dye and the Dot-in-a-Square Motif in the Prehispanic Southwest. *Kiva* 71(3):317–348.

Weigand, Phil C., Garman Harbottle, and Edward V. Sayre
1977 Turquoise Sources and Source Analysis: Mesoamerica and the Southwestern USA. In *Exchange Systems in Prehistory*, edited by Timothy K. Earle and Jonathon E. Ericson, pp. 15–34. Academic Press, New York.

Whalen, Michael E.
1987 The Bruton Bead Site and Pueblo Period Exchange in Southern New Mexico. *American Archeology* 6(3):173–178.

Wheat, Joe Ben
1955 *Mogollon Culture Prior to AD 1000*. Memoirs of the Society for American Anthropology No. 82. American Anthropological Association, Salt Lake City, Utah.

Wheeler, S. M.
1935 A Dry Cave in Southern Nevada. *Masterkey* IX:5–12.

White, Jim
1940 *The Discovery and History of Carlsbad Caverns New Mexico*. Jim White and Charley Lee White, Carlsbad, New Mexico.

White, Leslie A.
1935 *The Pueblo of Santo Domingo, New Mexico.* Memoirs of the Society for American Anthropology No. 43. American Anthropological Association, Menasha, Wisconsin.

Whitecotton, Joseph W., and Richard A. Pailes
1986 New World Pre-Columbian World Systems. In *Ripples in the Chichimec Sea: New* Considerations *of Southwestern-Mesoamerican Interactions*, edited by

Francis Joan Mathien and Randall H. McGuire, pp. 183–204. Center for Archaeological Investigations, Southern Illinois University, Carbondale.

Wilcox, David R.
1986 A Historical Analysis of the Problem of Southwestern-Mesoamerican Connections. In *Ripples in the Chichimec Sea: New Considerations of Southwestern-Mesoamerican Interactions*, edited by Francis Joan Mathien and Randall H. McGuire, pp. 9-44. Center for Archaeological Investigations, Southern Illinois University, Carbondale.

Wilshusen, Richard H., and Elizabeth M. Perry
2008 Evaluating the Emergence of Early Villages in the North American Southwest in Light of the Proposed Neolithic Demographic Transition. In *The Neolithic Demographic Transition and Its Consequences*, edited by Jean-Pierre Bocquet-Appel and Ofer Bar-Yosef, pp. 417–438. Springer Science & Business Media, Berlin.

Wiseman, Regge N.
1988 Report of Testing at Beth's Cave (LA 47481), Fort Stanton, Lincoln County, New Mexico. Report submitted to the Bureau of Land Management, Roswell Field Office, New Mexico.

2019 *Pruning the Jornada Branch Mogollon: Changing Perspectives Prehistory of Southeastern New Mexico*. Secord Books, Albuquerque, New Mexico.

Woodbury, Richard B.
1954 Prehistoric Stone Implements of Northeastern Arizona. Papers of the Peabody Museum of American Archaeology and Ethnology Vol. 34. Harvard University, Cambridge, Massachusetts.

Woods, Clee
1945 I Found the Cave of a Pima God. *Desert Magazine* 8(9):8–10.

Woolsey, A. M.
1936 Reconnaissance in El Paso County, March 15 to March 27, 1936. Manuscript on file, El Paso County Miscellaneous File, Texas Archaeological Research Laboratory, University of Texas, Austin.

Word, James H. and Charles L. Douglas
1970 *Excavations at Baker Cave, Val Verde County, Texas*. Bulletin of the Texas Memorial Museum 16. University of Texas, Austin.

Zolbrod, Paul G.
1984 *Diné Bahane': The Navajo Creation Story*. University of New Mexico Press, Albuquerque.

Źrałka, Jarosław, Wiesław Koszkul, Bernard Hermes, Juan Luis Velásquez, Varinia Matute, and Bogumił Pilarski
2017 From E-Group to Funerary Pyramid: Mortuary Cults and Ancestor Veneration in the Maya Centre of Nakum, Petén, Guatemala. *Cambridge Archaeological Journal* 27(3):451–478.