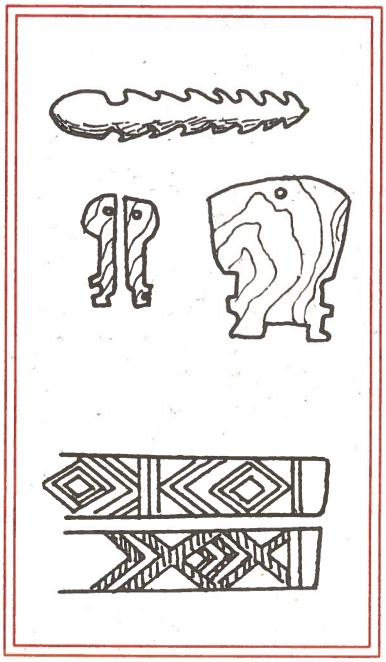
Toward a New Taxonomic Framework for Central California Archaeology



Essays by

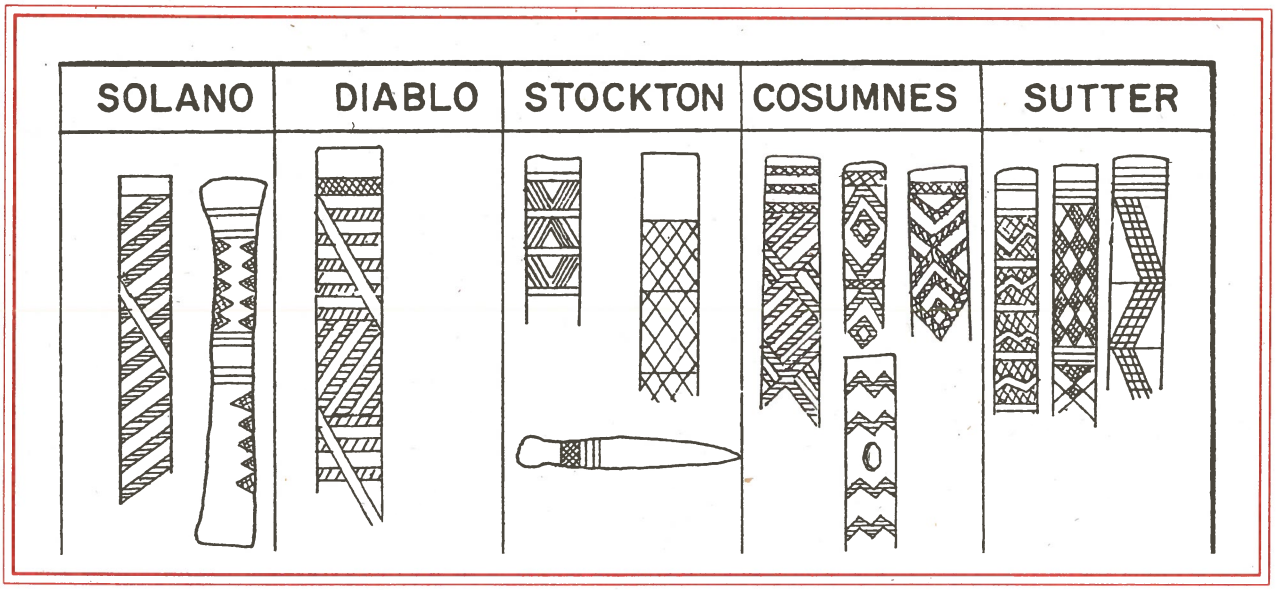
James A. Bennyhoff

and

David A. Fredrickson

Assembled and Edited by

Richard E. Hughes



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ERRATA

TOWARD A NEW TAXONOMIC FRAMEWORK FOR CENTRAL CALIFORNIA ARCHAEOLOGY — CHAPTER 6

The illustrations to figures 6.1 and 6.2 have been transposed. The illustration on page 68 should have been placed on page 70, and the illustration on page 70 should have been placed on page 68.

Editor's Preface

I BEGAN ASSEMBLING THE essays that appear in this volume in early 1991. Over the past three years, several individuals provided information and assistance that helped shape the final versions. Elaine Sundahl generously sent me a copy of an unedited transcript of an oral presentation by Bennyhoff from which chapter 6 was revised and edited. Michael Moratto granted permission to reproduce the Napa District phase chart (which appeared as figure 10.13 in Moratto [1984]), and provided the original artwork for reproduction here. This figure (4.2 herein) appears by permission of Academic Press, Inc., Orlando. Scotty Thompson is responsible for the outstanding illustrations of phase charts and maps that appear in chapters 1, 4, and 6. The artifact photographs (figures 1.1, 1.2, and 1.3) were taken by Gene Prince; they appear courtesy of the Phoebe A. Hearst Museum of Anthropology. Tanya Smith, editor for the "Contributions" series, provided much appreciated editorial assistance throughout the lengthy production phase, in addition to skillfully rendering figures 4.1 and 6.4. Review comments and suggestions by Randy Milliken and Kent Lightfoot helped me to better organize the volume, and prompted me to provide additional background on the Central California Taxonomic System (see Editor's Introduction). I extend special thanks to Randy Milliken for help with a myriad of details; I especially appreciate his review of the phase chart illustrations and artifact descriptions in figures 6.1 and 6.2 which Bennyhoff was unable to complete.

All California archaeologists know by now that James Bennyhoff died in August 1993. He was actively working on chapters in this volume right up to the time of his death, though he was unable to complete chapter 10. Jim would no doubt have objected to my including this chapter in its unfinished state, but I feel that all archaeologists interested in these taxonomic issues will benefit from having his opinions on record. I know he had so much more to say; I only wish he could have been here in person to see the finished product and to actively debate the issues with others.

Richard E. Hughes
Rancho Cordova, California
February 14, 1994

Editor's Introduction

FOR TWENTY-FIVE YEARS, James Bennyhoff and David Fredrickson have been at the forefront of cooperative attempts to forge a new taxonomy for California archaeology that would be more sensitive than previous classification systems to local prehistoric cultural continuity and change. Despite this, the formal documentation of their efforts has, until now, existed largely in their class lecture notes and unpublished papers. As a consequence, a generation of archaeologists exists today who know about Bennyhoff and Fredrickson's work only from secondary sources. Never having read the original papers, students and many professionals are uninformed about the historical developments that shape contemporary archaeological thought in California—particularly views on archaeological taxonomy. Why was a new taxonomy needed? What was wrong with the existing one? The essays in this volume address these questions in detail, but to fully appreciate the answers and proposed solutions it is appropriate to provide a background context for the developments of the taxonomic system which Bennyhoff and Fredrickson refined and revised.

Background on the Central California Taxonomic System[1]

Bennyhoff and Fredrickson's collaborative work was precipitated by the widespread dissatisfactions in California archaeology which attended the acknowledged shortcomings of the tripartite Bulletin 2 sequence of Early, Transitional (later Middle), and Late horizons (Lillard, Heizer and Fenenga 1939; Heizer and Fenenga 1939; Beardsley 1948, 1954).

Until the early 1930s California archaeology was noteworthy primarily as an example of what Kroeber (1936:115) described as "conservative stability" and at that time there seemed no reason to dispute the appraisal that: ". . . the upshot of the correlation of the findings of archaeology and ethnology is that not only the general Californian culture area, but even its subdivisions or provinces, were determined a long time ago and have ever since maintained themselves with relatively little change" (Kroeber 1925:926).

1 Although archaeologists routinely attribute formal naming of the Central California Taxonomic System (CCTS) to Lillard, Heizer, and Fenenga (1939), Heizer and Fenenga (1939), and/or Beardsley (1948, 1954), I can find no evidence that any of these archaeologists ever used this term (CCTS)— they employed the modifiers *culture, period, culture sequence,* or *culture horizon.* Gerow appears to have been the first to refer explicitly to the threefold culture/period/horizon scheme as the CCTS (Gerow with Force 1968:5).

Based on excavations conducted between 1933-1935 at sites near Deer Creek and on the Cosumnes River about 20 miles southeast of Sacramento, J. B. Lillard and William Purves (1936) of the Sacramento Junior College announced that they had recognized three successive cultural levels—Early, Transitional, and Recent—distinguished from one another primarily on the basis of burial mode and typological contrasts among associated grave goods. Although Kroeber (1936:115) at first gave this report a lukewarm reception because Lillard "appears to have derived them [conclusions about significant culture change] from valid evidence but has not yet set this forth so that it can be controlled" he subsequently appraised the work more positively, stating that Lillard and Purves's "differentiation between the two older levels is, as always in California, not particularly striking, but seems definite" and that "the Sacramento College findings are important. The work on which they rest appears competent and sound" (Kroeber 1937:144).

Just three years later[2] two separate publications appeared which elaborated, in much greater detail than Lillard and Purves (1936), the three-part sequence of Early, Transitional, and Late "culture horizons."[3] Although brief by contemporary standards, Lillard, Heizer and Fenenga's (1939) monograph presented a relative wealth of detailed information on changes in burial mode and in shell, stone, and bone artifact types from a number of physically and culturally stratified sites to buttress the changes in "culture type" recognized only in dim outline by Lillard and Purves (1936). From a taxonomic standpoint their monograph (Lillard, Heizer and Fenenga 1939:79-81) was considerably more sophisticated and self-conscious than the 1936 work, and introduced a newly defined Late period with three sequential phases. (Phases 1 and 2 were purely prehistoric, while Phase 3 represented the post-contact period.)[4] Perhaps equally important, they specified which artifact types and burial complex were characteristic of each period (i.e., "culture type"), which meant that when such configurations of artifacts and burials were encountered at sites elsewhere in California, they could be placed in time by appeal to the stratigraphic and cultural successions documented in the Sacramento-San Joaquin Delta. Richard Beardsley (1948, 1954) added further refinements to the three-horizon sequence, formally substituting Middle Horizon for Transitional "to avoid unwarranted implications" (Beardsley 1948:3).

However, as sites outside the Sacramento-San Joaquin Delta were found that contained either non-cemetery assemblages (lacking diagnostic Horizon-specific artifacts) or burial complexes different from those considered typical of the Early, Middle, and Late horizons in the Lower Sacramento Valley, interpretive and taxonomic problems quickly arose (see chapters 2, 3, 8, and 9 herein for discussion; also Bennyhoff [1986:67]; Bickel [1981:8-11]; Gerow with

2 The first announcement of the Early-Transitional-Late cultural horizon sequence appears to have been made by Heizer (1939a), who sketched the contrasts presented in greater detail later that year by Lillard, Heizer and Fenenga (1939) and Heizer and Fenenga (1939).

3 Although published in the same calendar year, in-text citations (Lillard, Heizer, and Fenenga 1939:74, 85) indicate that Bulletin 2 appeared *before* Heizer and Fenenga (1939). This is of interest because, although the term *horizon* appears occasionally in their monograph, the final, summary section ("Analysis of Cultures") of their work (Lillard, Heizer and Fenenga 1939:74-82) is organized by *period*, not *horizon*. The transposition of the three-part (Early, Transitional, Late) sequence from period *to* horizon thus appears largely to have been the work of Heizer and Fenenga, not Lillard, since Heizer (1937:39) remarked on "the existence of two mutually distinctive cultural horizons, the so-called Early and Late" two years before the publication of Bulletin 2. Nonetheless, Heizer and Fenenga (1939) freely alternated between the use of period and horizon when describing the threefold culture sequence.

4 Heizer and Fenenga (1939:379-80), referring to Lillard and Purves's (1936) monograph, wrote that: "Their [Lillard and Purves] conclusion was that an Early and Late culture period were distinguishable, the Post-contact or historic period forming the final phase of the Late." There is no reference anywhere in Lillard and Purves to a Late period, only to Early, Intermediate, and Recent culture levels (Lillard and Purves 1936:9, 19-20). The confusion is unfortunate, though largely terminological; on the basis of similarities in assemblage composition, Heizer and Fenenga (1939:23) equated Lillard and Purves's Intermediate level with their newly defined Late culture, which would later come to be known formally as the Late Horizon (Heizer and Fenenga 1939; Beardsley 1948).

Force [1968:1-14, 124-26]; Meighan [1987:34-35]).

Because the original threefold Bulletin 2 sequence was derived largely from Lower Sacramento Valley grave lot assemblages it was perhaps inevitable that difficulties would arise when it was projected into areas where *some* of the same artifact types were shared (either manufactured or obtained through exchange), but burial practices varied. For example, by extrapolation of the Bulletin 2 sequence it was believed that sites along San Francisco Bay were occupied later in time than Early Horizon sites of the Lower Sacramento Valley (Heizer 1949: 39) because, despite acknowledged similarities in certain artifact types, the Bay sites contained *flexed* burials, a hallmark of the *Middle Horizon* in the Valley. As Heizer (1949:39, footnote 126) observed: "no Bay site has produced evidence of occupation by the distinctive Early culture horizon group. A few of the specific Early culture elements occur, but not as a well-knit complex." Since the Bulletin 2 system combined burial mode and artifact types in a single "package" any variability observed, for example, in burial mode, could not be easily reconciled with the Lower Sacramento Valley sequence (e.g. Heizer 1939b: 55).

To a certain extent, problems of this sort were anticipated by Beardsley (1954:6); in evaluating the culture classification scheme he helped to create he wrote that:

> We [Beardsley, Heizer and Fenenga] are agreed that this is neither the final classification nor the only one possible even now. It should be profitable to devise classifications of several sorts, each stressing one or another of the three significant factors, time, space, and culture content. We have not yet been able to be equally solicitous of all three factors in a single scheme.

It was recognition of the importance of keeping separate the dimensions of time, space and culture that inspired Bennyhoff and Fredrickson to propose the taxonomic refinements and modifications detailed in the essays in this volume.

The Intervening Years

Despite a shared dissatisfaction with the Bulletin 2 taxonomic system, which can be traced back to their student days at the University of California, Berkeley, in the years following World War II, events transpired which made it difficult for them to collaborate immediately to propose a solution. After completing graduate course work, Bennyhoff joined the anthropology faculty at Yale University for two years (1958-1960), then spent most of the next six (from 1960-66) in Mesoamerica working with René Millon on the Teotihuacan Mapping Project. He returned to California in 1967 to accept a post at the Department of Anthropology, University of California, Berkeley, during which time (1967-1970) he and Fredrickson were able to return to joint discussion of taxonomic issues. These discussion continued during the years (1973-1986) Bennyhoff held faculty appointments at Sonoma State University (see Hughes [nd] for more detail on Bennyhoff's career).

After leaving graduate school in 1952, Fredrickson spent the next ten years outside academia and archaeology, but was enticed back to archaeology in 1959 when his wife, Vera-Mae, went back to school at U.C. Berkeley. From 1961-1965, Dave completed and wrote up the results of major excavation projects he had undertaken in Lake, Napa, Kern, and interior Contra Costa counties. Then, in 1967 he accepted a position on the anthropology faculty at Sonoma State College (later, Sonoma State University) where he remained until his retirement from teaching in 1992 (see White [1993] for more detail on Fredrickson's career).

The Structure of this Volume

To capture as faithfully as possible the unfolding and development of the ideas and taxonomic refinements proposed by Bennyhoff and Fredrickson, the essays have been arranged chronologically, proceeding from the early trial formulations and applications of the late 1960s through the more recent rethinking and modifications proposed at the end of the 1970s - early 1980s up to the present. The date each essay was originally drafted and, if applicable, revised appears in parentheses below the authors name at the beginning of each chapter. The authors were asked specifically *not* to rewrite or extensively revise any sections of their papers in the belief that the reader will gain a clearer appreciation and understanding of developments by reading the essays largely as they were

originally written. In this spirit, I have kept my own editorial intrusion to a bare minimum and have attempted to increase clarity— not to effect content.

Several of these essays have achieved almost mythical status in California archaeology, and information from them is featured prominently in several sections (especially chapters 5, 6, and 10) of Moratto's (1984) *California Archaeology*.

Chapter 1, Benny-hoff's "Delta Intrusion to the Bay . . .," was first delivered in April 1968 at the joint annual meetings of the Southwestern Anthropological Association and the Society for California Archaeology. During this time he and Fredrickson were meeting on taxonomic issues. Fredrickson's notes document that he and Bennyhoff met at least six times between August 19 and November 1, 1968 in intensive discussions which laid the groundwork for the paper that follows— chapter 2, "A Proposed Integrative Taxonomy for Central California Archaeology." This paper was begun by Bennyhoff and Fredrickson at the very end of 1968 and completed in 1969. The reader will notice that Bennyhoff's "Delta Intrusion . . ." paper was written slightly earlier during this same period, and that it introduces taxonomic issues elaborated more fully in Bennyhoff and Fredrickson's "Proposed Integrative Taxonomy . . ." essay.

Just after Bennyhoff delivered his "Delta Intrusion . . ." paper in early 1969, he drafted a paper entitled "The Need for a New Taxonomic System in Central California Archaeology." This paper was, in effect, the position paper from which Bennyhoff and Fredrickson's "A Proposed Integrative Taxonomy . . ." essay was elaborated. Bennyhoff's "The Need for . . ." manuscript is not reproduced here because the major points and definitions, with one exception (see chapter 2, p. 23, note 1. Ed.), were discussed at greater length jointly with Fredrickson in "A Proposed Integrative Taxonomy. . ."

Chapter 3, Fredrickson's "Cultural and Spatial . . ." paper, is excerpted, with revision, from chapters five and six of his 1973 doctoral dissertation "Early Cultures of the North Coast Ranges, California." The taxonomic scheme advanced in this paper is clearly elaborated from the groundwork laid by his collaboration with Bennyhoff, and it has had— and continues to have—a profound influence in Northern and Central California archaeology.

Chapter 4, Bennyhoff's "Napa District . . ." paper was first presented in 1977 at a symposium on the archaeology of the North Coast Ranges, California, sponsored by the Center for Archaeological Research at Davis. This paper continues to be influential in North Coast Ranges archaeology but carries particular significance here because it provides an empirical example of how archaeological *districts* are actually identified and defined employing the taxonomic framework advocated by Bennyhoff and Fredrickson.

Fredrickson's "Changes in Prehistoric Exchange Systems in the Alamo Locality . . ." appears as chapter 5 and was first presented in outline form at a symposium on the archaeology of the Central Valley, held at Cosumnes River College in 1977; the version that appears here was revised and expanded in late 1980. Chapter 6, Bennyhoff's "Central California Augustine . . .," was first delivered in December 1982, at a symposium on current research in northern California archaeology held at California State University, Chico. The slightly revised and expanded version of this paper includes a previously uncirculated codification (figure 6.4 herein) of Bennyhoff's revision of the CCTS.

Chapter 7, Fredrickson's "Central California Archaeology . . ." was first presented in 1982 (with slight revision in 1984) at the same symposium as Bennyhoff's in the preceding chapter. Chapter 8, Bennyhoff's "Variation within the Meganos Culture," was delivered in 1987 at the annual meeting of the Society for California Archaeology in Fresno.

Finally, Bennyhoff and Fredrickson were asked to write a closing retrospective essay on their earlier papers which would provide a forum for them to correct the errors and/or shortcomings they might perceive today in their original work, and to comment on recent abuses (or misunderstandings) of their taxonomic scheme. Chapter 9, "Archaeological Taxonomy in Central California Reconsidered," written by Fredrickson in 1992, and chapter 10 "Recent Thoughts on Archaeological Taxonomy," written by Bennyhoff in 1993, resulted from that request.

The taxonomic modifications proposed formally by Bennyhoff and Fredrickson were important be-

cause they allowed researchers to keep separate the dimensions of time and culture which had been inextricably wed in the Bulletin 2 system. But perhaps of equal importance, the criticisms they made of the Bulletin 2 system prompted in their classification an explicit awareness of why time, adaptive mode, burial mode, and exchange media must be treated as independent variables in any comprehensive taxonomy. In this respect, the taxonomic system they proposed is clearly better suited than its predecessors to the aims of contemporary archaeology.

In my view, the essays in this collection not only exemplify scholarship and careful attention to detail but, taken as a whole, they aptly illustrate two longstanding concerns in California archaeology—linking archaeology and ethnography though application of the direct historical approach, and devising a flexible taxonomic framework capable of integrating the concerns of both culture historical and processual archaeology.

References to Introduction

Beardsley, Richard K.
1948 Cultural Sequences in Central California Archaeology. *American Antiquity* 14 (1):1-28.
1954 *Temporal and Areal Relationships in Central California Archaeology*. University of California Archaeological Survey Reports 24 and 25. Berkeley.

Bennyhoff, James A.
1986 The Emeryville Site, Viewed 93 Years Later. In *Symposium: A New Look at Some Old Sites* organized by Francis A. Riddell. Coyote Press Archives of California Prehistory 6:65-74. Coyote Press, Salinas.

Bickel, Polly McW.
1981 *San Francisco Bay Archaeology: Sites Ala-328, Ala-13 and Ala-12*. Contributions of the University of California Archaeological Research Facility 43. Berkeley.

Gerow, Bert A., with Roland W. Force
1968 *An Analysis of the University Village Complex with a Reappraisal of Central California Archaeology*. Stanford University Press, Stanford.

Heizer, Robert F.
1937 Baked-Clay Objects of the Lower Sacramento Valley, California. *American Antiquity* 3:34-50.
1939a Some Sacramento - Santa Barbara Archeological Relationships. *Masterkey* 13 (1):31-35.
1939b Archeology of Site C.141. In *An Introduction to the Archeology of Central California* by Jeremiah B. Lillard, R. F. Heizer, and Franklin Fenenga. Sacramento Junior College, Dept. of Anthropology, Bulletin 2:54-56.
1949 *The Archaeology of Central California, I: The Early Horizon*. University of California Anthropological Records 12 (1).

Heizer, R. F., and Franklin Fenenga
1939 Archaeological Horizons in Central California. *American Anthropologist* 41 (3):378-99.

Heizer, R. F., and J. B. Lillard
1939 Archeology of Site C.107. In *An Introduction to the Archeology of Central California* by Jeremiah B. Lillard, R. F. Heizer and Franklin Fenenga. Sacramento Junior College, Department of Anthropology, Bulletin 2:23-31.

Hughes, Richard E.
nd Memorial to James Allan Bennyhoff (1926-1993). *Journal of California and Great Basin Anthropology*. In press.

Kroeber, A. L.
1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78.
1936 Prospects in California Prehistory. *American Antiquity* 2 (2):108-116.
1937 Review of: "The Archaeology of the Deer Creek - Cosumnes Area, Sacramento Co., California." *American Anthropologist* 39:144.

Lillard, Jeremiah Beverly, and William K. Purves
1936 *The Archaeology of the Deer Creek - Cosumnes Area, Sacramento Co., California*. Sacramento Junior College, Department of Anthropology, Bulletin 1.

Lillard, Jeremiah B., R. F. Heizer and Franklin Fenenga
1939 *An Introduction to the Archeology of Central California*. Sacramento Junior College, Department of Anthropology, Bulletin 2.

Meighan, Clement W.
1987 Reexamination of the Early Central California Culture. *American Antiquity* 52 (1):28-36.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press, Orlando.

White, Greg
1993 The Accidental Scholar: Notes on an Archaeologist's Career. In *There Grows a Green Tree: Papers in Honor of David A. Fredrickson* (G. White, P. Mikkelsen, W. R. Hildebrandt, and M. E. Basgall, eds.), Center for Archaeological Research at Davis Publication 11:1-18.

1

A Delta Intrusion to the Bay in the Late Middle Period in Central California

James A. Bennyhoff

(1968)

THE PURPOSE OF THIS PAPER is to briefly outline a distinct archaeological culture in Central California which has received little attention in the published literature. All sorts of problems still obscure this culture, particularly the lack of adequate excavation. In addition, however, it is not possible to incorporate the available data in the current taxonomic framework formalized by Beardsley (1948). The Early, Middle, and Late horizons of Beardsley are more comparable to what Willey and Phillips (1958) have termed *traditions*; Beardsley's *phases* represent Willey and Phillips's *horizons*; and Beardsley's *facies* constitute *phases* in the Willey and Phillips scheme. As Willey himself has recently recognized, a still more elaborate framework of cultural units is often needed, particularly in California where small groups of independent tribelets adapted to particular ecological niches which changed through time. I feel that some elaboration of the Willey and Phillips taxonomic scheme is needed in California, but the particular form and terminology will require group effort. For the purposes of this paper, I will merely state that the Bay and Delta regions can be divided into five districts in the historic to late Prehistoric period. Inadequate data often obscure earlier relationships. Shell beads and ornaments provide successive integrative horizons.

For the moment, I will label the traditions after the sites where they were first recognized. Thus the Early Horizon will be termed the Windmiller Pattern; the Middle Horizon will be termed the Berkeley Pattern; and the Late Horizon will be termed the Augustine Pattern. Each of these may have lasted for some 2000 years, and are divisible into a number of sequential phases. This paper is concerned with a probable fusion of the Windmiller and Berkeley patterns which resulted in a distinct culture of long duration which, for now, I will term an *aspect*. An alternative term would be subtradition or sector, but this vexing problem of systematics must be dealt with elsewhere.

The subject of this paper is what I will term the Meganos aspect. The few published sites referable to the Meganos aspect (e.g., CCo-141 [Lillard, Heizer and Fenenga 1939]; CCo-146 [Cook and Elsasser 1956]) have previously been included in the Middle Horizon, but it is felt that the cultural configuration (in particular the mortuary complex) is sufficiently divergent from the contemporaneous Berkeley Pattern to justify the definition of a new aspect. The name *meganos* is derived from the Spanish word for sand dune or sand mound and is pertinent because a favored practice of this group was the interment of the dead in non-midden cemeteries in the elevated crowns of sand mounds scattered around the mouths of the Sacramento and San Joaquin rivers. It appears to have

developed first in the Stockton District sometime between 2000-1500 B.C., then to have spread westward to the Walnut Creek drainage, and probably reached the actual bay shore along San Pablo and Rodeo creeks, displacing the resident population. Withdrawal and a return to the Stockton District may be indicated around the beginning of the Christian era during the transition from the Berkeley to the Augustine Pattern. The fate of this long-lasting group is obscured by lack of data, but local amalgamation into the Augustine Pattern seems probable.

Analysis of this culture is hampered by a series of problems. We know almost nothing about the archaeology of a broad strip of territory between the Tuolumne and Merced rivers, and only a skeletal framework is appearing farther south in the San Joaquin Valley. Hence our view of wider relationships is very limited. None of the shellmounds directly on the north shore of San Francisco Bay were excavated, and our knowledge of the adjacent shores to the north and west is virtually nil. While a number of sites can be placed in this aspect (see table 1.1), all but three represent salvage excavations or small test pits with minimal sampling. Additional problems (rarity of mortuary offerings, incomplete notes, incomplete analysis) also introduce serious interpretive obstacles. The Garwood (SJo-147) and Simone (CCo-139) sites, both of which were extensively excavated, are now represented by inadequate notes only. Eight of the sites represent non-midden cemeteries with an artifact inventory largely confined to very rare mortuary offerings. The frequency of grave offerings is notoriously low, even by standards of the Berkeley Pattern. The midden of the village sites also has a very poor yield. A test pit 54" deep in CCo-2 did not yield a single artifact.

No attempt has been made to reconstruct the environment of the Delta from 2-4000 years ago despite various suggestions that differences in rainfall, drainage patterns, and vegetation may well have affected local settlement patterns. The sand mounds provide some evidence for significant change. They represent wind deposited sand now so indurated that they are difficult to dig with a pick, let alone a digging stick. The oldest one, CCo-146, yielded burials at 5-6 feet depth. Such depths indicate that these burials must have been interred while the sand mound was still being formed, and imply a drier climate. A number of contemporaneous midden sites of the Berkeley Pattern in the Walnut Creek District were subsequently buried by excessive erosion, implying a wetter cycle. Interments at Sac-104 were made from the stabilized surface of the indurated Piper sands, while the terminal Meganos burials at CCo-20, as well as burials of the Augustine Pattern, appear to be buried in later, non-indurated Oakley sands which may indicate another dry cycle. The effect of the still continuing subsidence, a change from reed to tule, and evidence for submergence and uplift provided by peat beds within the Piper sands all remain uninvestigated at the present time. Only one of the Meganos sites is on a main channel of the San Joaquin River, while most sites of the Augustine Pattern are clustered on the riverbank. In short, our understanding of the Stockton District will always be incomplete until multiple disciplines unravel the pre-levee history of the Delta. Despite these inadequacies, I will assume that the available sample is representative, but must emphasize that additional excavation is needed to clarify the relationships proposed herein.

What follows is a general description of the Meganos aspect, omitting the Terminal phase which was transitional to the Augustine Pattern and witnessed radical changes. I will conclude with a brief historical outline of this aspect as dimly viewed at present.

The most distinctive characteristic of Meganos is the mortuary complex, which stands in sharp contrast with contemporaneous behavior in all adjacent districts. The burial position is non-standardized, and every phase reveals a contemporaneous practice of ventral extension, dorsal extension, and tight flexure with a complete rejection (absence?) of cremation. Full extension on the side, semi-extension, and semi-flexure occur rarely. The most common position is ventral extension; all 500 burials from the Garwood site (SJo-147) are reported to have been ventrally extended; and four other sites have yielded only prone burials, but a larger sample from the same sites would probably reveal variation. In the late phase at Simone (CCo-139) and in the terminal phase at Orwood (CCo-141) and Dal Porto (CCo-20), there is a shift to *dorsal* extension nearly equalled by flexure.

TABLE 1.1

Archaeological Sites in Alameda, Contra Costa, Sacramento, and San Joaquin Counties with Components Attributable to the Meganos Aspect

Ala-413 (Livermore)[a]	CCo-311[a]
CCo-2 (Bernardo)[a]	Sac-66 (Morse)[a]
CCo-3[a]	Sac-104 (Tyler Island #3)[a]
CCo-18 (Marsh)[a]	SJo-17[a]
CCo-19[a]	SJo-66[a]
CCo-20 (Dal Porto)[a]	SJo-82 (Walker Slough)[b]
CCo-31 (Hall Ranch)[a]	SJo-87 (Martin)[a]
CCo-139 (Simone)[b]	SJo-91 (French Camp Slough)[b]
CCo-141 (Orwood)[b]	SJo-106 (Castle)[a]
CCo-146[a]	SJo-139 (Bagley)[a]
CCo-147[a]	SJo-147 (Garwood Ferry)[a]
CCo-148[a]	SJo-154 (Cardinal)[a]
CCo-151 (El Sobrante)[b]	

[a], salvage or small test excavation; [b], excavated.

Burial position thus provides striking evidence in support of distinct districts—contemporaneous phases in the Cosumnes District to the north reveal over 90% tight flexure with a minor occurrence of cremations; the Alameda District to the west reveals 95% flexure, a scattering of extensions, and no cremation. Equivalent data to the south are unavailable, but no emphasis on *ventral* extension is yet apparent until one reaches Buena Vista Lake. One can suggest that this variability in burial position may reflect family lineages. The ventral extension would appear to represent a holdover from the older Windmiller Pattern, while the flexure was possibly introduced through intermarriage with foreign groups of the Berkeley Pattern. At present, the available data do not support any age, sex, or status differentiation in burial position.

Another linkage with the Windmiller Pattern *only* is provided by the contemporaneous practice of burial within the village and also interment in isolated non-midden cemeteries away from the village. These cemeteries pose a host of problems yet to be resolved. No village sites lacking burials have yet been excavated anywhere in this region. The frequent isolation of these cemeteries suggests that the associated village sites are now buried under sterile flood deposits. Less likely alternatives would include differential choice by certain lineages, or seasonal variation, with winter burial in the villages and cemetery burial during other times of the year. The latter possibility is suggested by the fact that none of the Meganos cemeteries have as high a density of burials as that found in Windmiller cemeteries.

Two other characteristics of the mortuary complex, orientation and frequency of mortuary offerings, relate to the Berkeley Pattern rather than the Windmiller Pattern. The Windmiller emphasis on westerly orientation is replaced by the lack of interest in directional placement of the corpse typical of the Berkeley Pattern. Although a westerly trend is still evident, a northern emphasis occurs in the western sites, and any large sample reveals all directions of the compass. Once again, it is possible that certain lineages maintained their own family customs in this matter. As mentioned earlier, the rarity of grave goods with Meganos burials is even more extreme than the low frequency typical of the Berkeley Pattern.

The settlement pattern differs markedly from that exhibited by the Berkeley Pattern, as well as that revealed by sites of the following Augustine Pattern in the Stockton District. Midden depths of Meganos sites are relatively shallow and few sites as yet reveal continuous occupation through more than two successive phases. A semi-sedentary pattern would seem to be represented, with greater emphasis on seasonal movement and much more frequent shifts in village locations than is typical of either the Berkeley or Augustine pattern. A small population and less permanent architecture are implied.

Economic activities are more closely related to the Berkeley Pattern, but with significant differences. The bowl mortar and pestle are clearly dominant and indicate primary reliance on the acorn. At least one chisel-pointed pestle indicates knowledge of the wooden mortar typical of the Cosumnes District, but dominance of the stone mortar serves to differentiate the Stockton District. Despite the need to transport these heavy basic implements into the stoneless delta, this difference between the Stockton and Cosumnes districts persists through the Augustine Pattern. Milling stones and handstones are rarer and confined to four Delta sites. This suggests a greater emphasis on seeds and may reflect a drier climate during the earlier phases.

Projectile points are relatively rare, as in the Berkeley Pattern, but the hunting of deer, tule elk, and smaller game was important. Dart points, spear points, and knives are usually made of obsidian, and leaf-shaped forms predominate. Rare basalt and chert dart points occur, while there is a late emphasis on white chert and chalcedony, especially for large ceremonial points. All chipped stone is rarer than in other patterns. Presence of the atlatl is assumed, but no spurs have yet been found. Bird bone and fish bone are of minor importance, in sharp contrast to the succeeding Augustine Pattern. Only two sets of fish spears have been found, although sites of the transitional terminal phase have yielded over 100 specimens. No positive evidence of warfare has been found, although several possible group burials may reflect conflict. The bone industry is less developed than in the Berkeley Pattern and largely confined to awls, fish spears, and hair pins. The polished stone industry is not developed, being represented by a single charmstone and one cup-like cloud blower (the latter is decorated with appliqué Olivella saucer beads set in asphaltum). In the late phases there is an emphasis on stone earspools; while steatite was preferred, sandstone, baked clay, bone, and wood also were used. Aside from these rare clay earspools, there is no baked clay industry in Meganos sites in the stoneless south Delta.

Ceremonial life is poorly documented. Meganos sites have yielded only one charmstone of local type. Most distinctive is an emphasis on large ceremonial points made of white chert and obsidian. One burial from CCo-311 yielded several such points (figs. 1.1 - 1.3 herein); similar chert specimens were found at Ala-413, CCo-2, and CCo-151, and as trade items with a flexed burial at the Berkeley Pattern site Ala-307 (Wallace and Lathrap 1975: pl. 3q, r). Variant forms in obsidian were made near Stockton. Long bird bone whistles are very rare. Shamanism may be represented by one small cloud blower decorated with Olivella saucer beads set in asphaltum.

The presence or absence of certain aspects of technology may be of great importance. Basketry awls, so important in the Berkeley Pattern for the manufacture of coiled basketry, are so far absent in both the Windmiller Pattern and the Meganos aspect. Similar relationships are indicated by the paucity of bone tools and ornaments. No atlatl spurs, wedges, sweat scrapers, mesh gauges, or perforated pins and ornaments have yet been found in Meganos sites. Pointed serration of ceremonial points in both chert and obsidian may represent the prototype for the

Augustine Pattern of square serration which probably began, and certainly reached its climax, in the Stockton District. Trade was relatively undeveloped. Obsidian was imported into the Stockton District, but local chert was more important in the Walnut Creek District. Shell beads and ornaments, as well as red ochre, are remarkably rare.

Despite acknowledged deficiencies in available data, the following summary of the Meganos aspect can be offered. Meganos spans the entire Upper Archaic period and, as presently understood, is coterminous with the Stockton District. The heartland is the south Delta region including the network of sloughs at the mouth of the San Joaquin River. The culture represents a coalescence of the earlier Windmiller Pattern and the Berkeley Pattern which intruded into the north Delta. The resultant fusion produced a unique combination of cultural traits which persisted until replacement (with limited fusion) by the Augustine Pattern of the Emergent period. Increasing acculturation to the Berkeley Pattern seems evident through time.

During the later portion of the Upper Archaic period the Meganos aspect (and the Stockton District) expanded westward through the Walnut Creek Valley and down San Pablo Creek to reach the shores of San Francisco Bay. At the end of the Upper Archaic period the acculturated bearers of the Meganos aspect withdrew to the south Delta heartland, while a splinter group may have moved to the Sacramento Valley. After a brief attempt to expand into the north Delta (Sac-66), the boundaries of the Stockton District contracted to those occupied by the historic Northern Yokuts. (See chapter 8, pp. 81-87, figures 8.1-8.5, where these changes are discussed and elaborated in greater detail, Ed.)

Dramatic changes took place near the end of the Meganos aspect, involving the appearance of the Augustine Pattern. Unfortunately, the two earliest phases of the Augustine Pattern are poorly represented in the Stockton District so the nature of transition to the Augustine Pattern remains clouded. Likewise, the significance of the appearance of Meganos traits in the Sacramento Valley during the Upper Archaic-Emergent period transition (e.g., at Yol-13 and Col-3) must await more complete analysis.

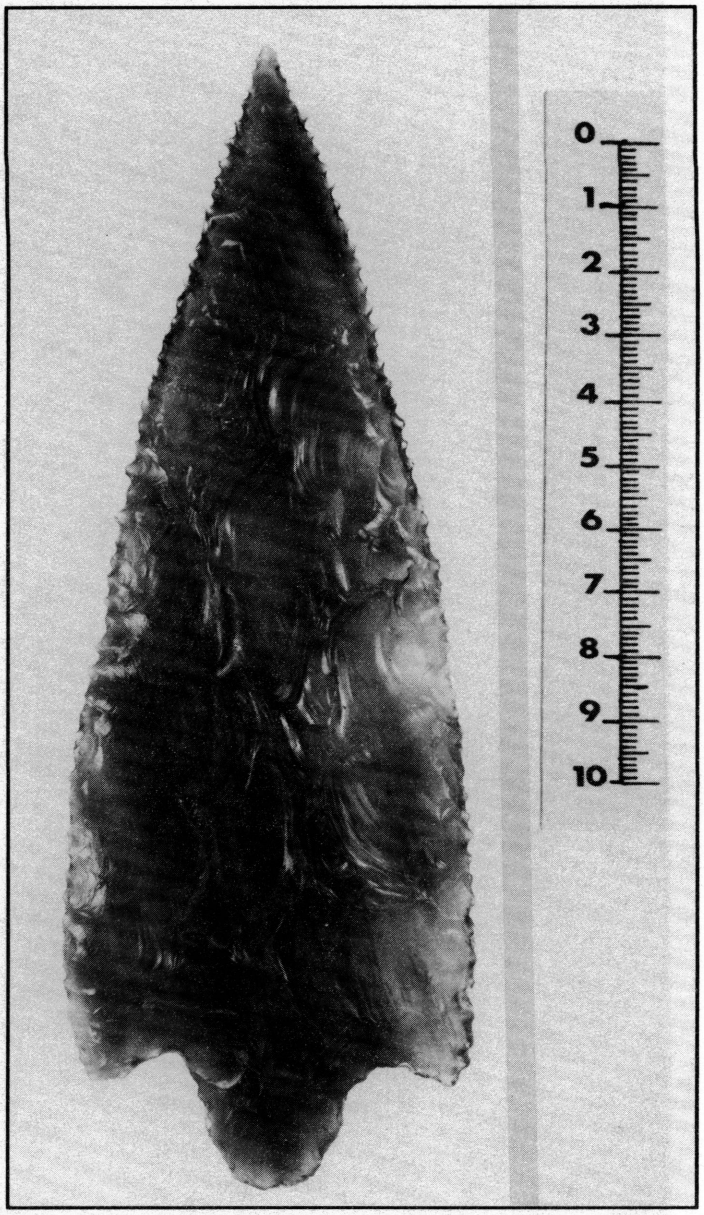


Figure 1.1 Ceremonial obsidian point from Burial 3, CCo-311. RHLMA cat. no. 1-174993 (weight = 93.7 gm). Scale in centimeters. Richard Hughes used x-ray fluorescence spectrometry to determine that this specimen was manufactured from Queen obsidian. Photo by Eugene R. Prince, courtesy of the Phoebe A. Hearst Museum of Anthropology, University of California at Berkeley.

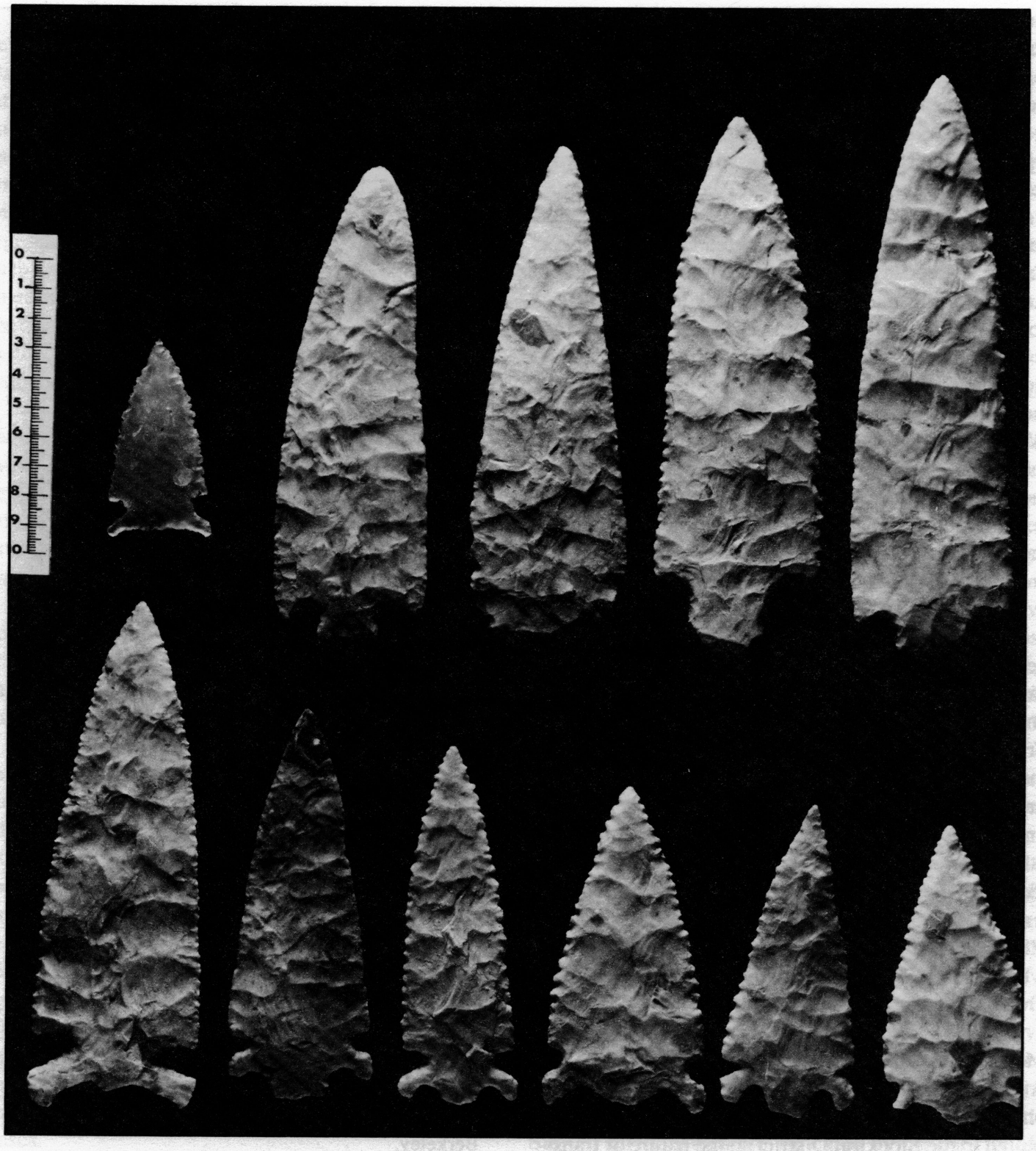


Figure 1.2 Ceremonial white chert points from Burial 3, CCo-311. Top row, left to right: RHLMA cat. no. 1-174984 (weight = 14.3 gm), 1-174975 (weight = 60.0 gm), 1-174974 (weight = 76.6 gm), 1-174986 (weight = 83.9 gm), 1-174985 (weight = 78.8 gm). Bottom row, left to right: RHLMA cat. no. 1-174979 (weight = 67.3 gm), 1-174977 (weight = 36.2 gm), 1-174983 (weight = 30.7 gm), 1-174976 (weight = 42.6 gm), 1-174982 (weight = 24.0 gm), and 1-174981 (weight = 35.3 gm). Scale in centimeters. Photo by Eugene R. Prince, courtesy of the Phoebe A. Hearst Museum of Anthropology, University of California at Berkeley.

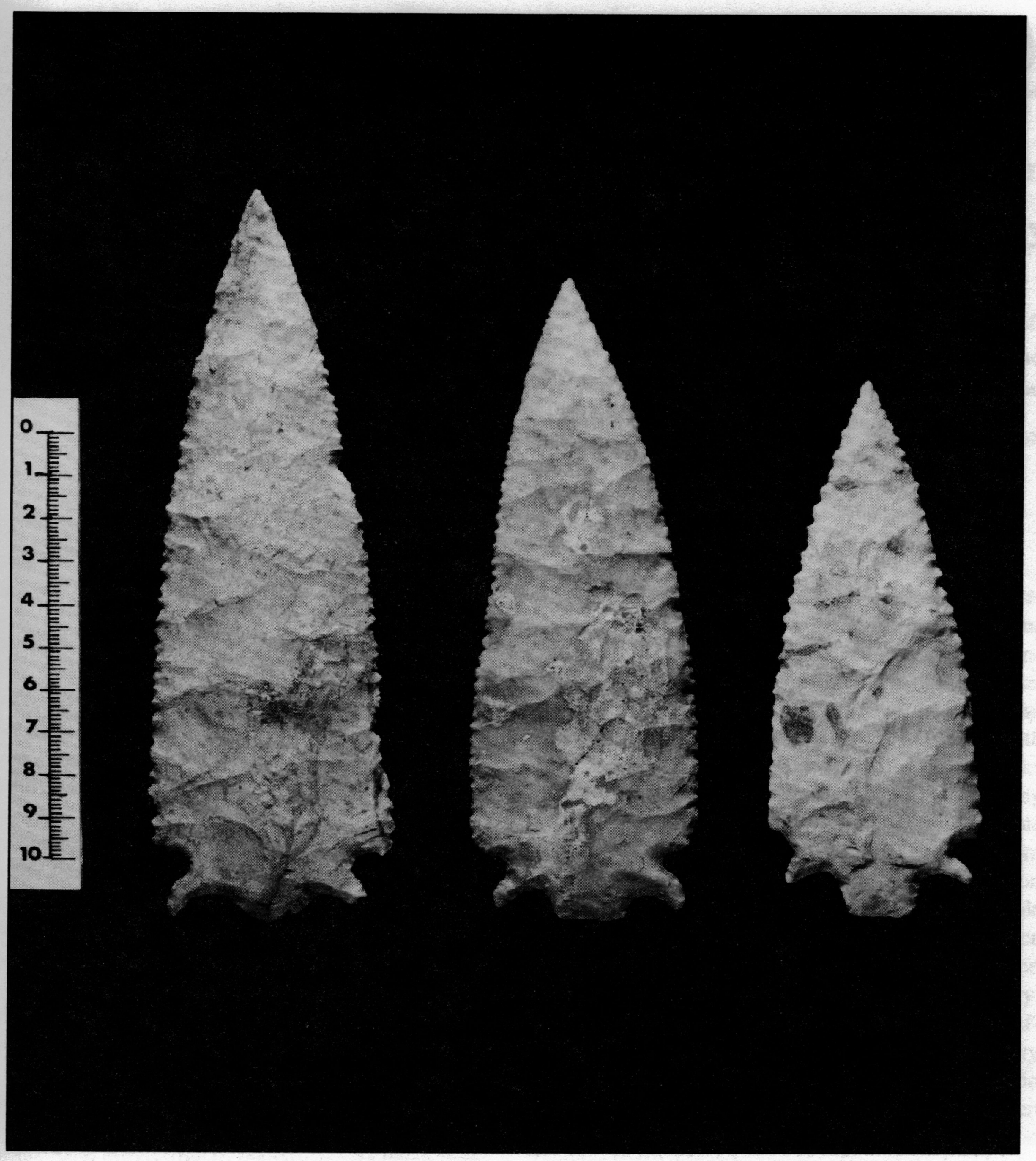


Figure 1.3 Ceremonial white chert points from Burial 1, CCo-311. Left to right: RHLMA cat. no. 1-189817 (weight = 67.2 gm), 1-189818 (weight = 54.5 gm), and 1-189820 (weight = 41.3 gm). Scale in centimeters. Photo by Eugene R. Prince, courtesy of the Phoebe A. Hearst Museum of Anthropology, University of California at Berkeley.

2

A Proposed Integrative Taxonomic System for Central California Archaeology

James A. Bennyhoff
and
David A. Fredrickson

(1969)

Introduction

Workers in California archaeology have long discussed among themselves dissatisfactions concerning the conceptual framework used to encompass the diverse archaeological manifestations in the state. Such workers have also expressed dissatisfaction with the quality of field data as it has been presented in published form. Detailed questions of provenience and even of artifact description and type cannot be answered by reference to publications. The status of archaeology in California today, in terms of mass of excavated material, number of workers, and the wide dispersal of these workers, makes it impractical to visit museum collections and catalogues whenever questions cannot be answered simply because of incomplete reporting.

California archaeologists also have expressed among themselves considerable dissatisfaction with the presentation of field data in site reports. It has usually been impossible to reanalyze data taken from published materials in order to answer many of our current questions. For example, the senior author recently attempted a survey of the distribution of magnesite and steatite beads in archaeological sites in Central California, as reported in the literature. He began with Bulletin 2 (Lillard, Heizer and Fenenga 1939) which at the present time is more a historic document than a source of currently useful data. One problem of interest was the possible priority of one form of magnesite bead over another in terms of time, that is, was the disc magnesite bead earlier in time than the cylindrical? Bulletin 2 lists occurrences of both kinds of beads but does not indicate, for example, when they occurred in the same site whether they occurred in the same grave lot. It was also impossible to determine whether historic material deriving from contact with European culture occurred in association with one or another or both forms of bead. While this lack of information can be excused in Bulletin 2 (since the distinctions being attempted were fine-scale and Bulletin 2 was explicitly described as a summary, preliminary report), other more recent reports suffered from the identical flaw. Significantly, thirty years after the publication of the preliminary report in the form of Bulletin 2, no further site data has been published except for a summary of the Early Horizon (Heizer 1949) which has many of the same drawbacks as Bulletin 2. In essence, what was designed as a preliminary report became the final report, and the cultural taxonomy proposed in Bulletin 2, with subsequent modifications and refinements by Beardsley (1948, 1954), remains, despite its inadequacies, in widespread use in the state.

We propose that the existing taxonomic system utilized in Central California, most fully explicated by Beardsley (1948, 1954), but initially deriving from field investigations reported by Sacramento Junior College (Lillard, Heizer and Fenenga 1939), should be thoroughly revised for three basic reasons. First, to allow substantive inclusion of data not now encompassed in the present system; second, to allow interpretive statements free from the sequential temporal denotation of "Early," "Middle," and "Late;" and third, to reduce terminological confusion by employing terms more widely used in the rest of the New World. In the pages that follow we discuss our criticism of the existing taxonomy, introduce an alternative system, and suggest concepts which are most meaningful for different levels of analysis and synthesis.

In Central California recognition of the three-part cultural sequence of Early, Middle, and Late horizons was achieved in January 1938, when the then-named Transitional period (later to be designated the Middle Horizon) was named and described in field notes (Lillard, Heizer and Fenenga 1939:77). Recognition and identification of this cultural sequence in the lower Sacramento Valley marked a new era in Central California archaeology in that prehistoric cultures were no longer conceptualized in such large-scale units as Paleolithic and Neolithic (Kroeber 1909:15). Beardsley (1948, 1954), in the most detailed presentation of the Central California Taxonomic System (CCTS), introduced the concepts of horizon, province, and facies and identified variants of the Middle and Late horizons in the San Francisco Bay region and along the Marin-Sonoma ocean frontage.

Beginning in the post-World War II era, as archaeological research gained momentum after the lull of the war years, there were increasing attempts by various workers in Central California to extend the three-horizon sequence beyond the immediate geographic region where it had been identified. A number of these attempts created considerable controversy. For example, Heizer (1952:7) identified the artifacts deriving from the Tranquillity site in Fresno County (Hewes 1943, 1946), from which bones of extinct Late Pleistocene mammals were also recovered, as belonging to the Middle Horizon of the Central California cultural sequence. In this example, although Heizer suggested that more work should be done at the site, he stated that if he properly identified the artifacts as to cultural horizon, they were too late in time to be associated with Upper Pleistocene mammals. In a parenthetical aside, Heizer granted the possibility that his Central California sequence was in error. Angel (1966), in a recent study of human skeletal material from Tranquillity, evaluated the chemical evidence presented by Heizer and Cook (1952) as supporting the inference of contemporaneity between the extinct Late Pleistocene mammals and the human bone. The chemical evidence, which indicates a close similarity in content of fluorine, carbon, nitrogen, and water between *Camelops*, *Equus*, and *Bison* and human bone from the Tranquillity site, is part of the same evidence Heizer utilized in the discussion cited above. Angel (1966:2) stated that he could not follow Heizer's arguments in regard to Tranquillity artifact similarities with Middle Horizon assemblages, since in his opinion the published descriptions suggest that the Tranquillity artifacts represent "a somewhat substandard version of those of the Early horizon and that the only major difference is in Tranquillity's semiflexed rather than extended and prone burial position."

Similarly, in terms of suggesting an extension of the Central California cultural sequence as an alternative to other interpretations of the Borax Lake site (Harrington 1948), Meighan (1955:26-27) observed in his synthesis of North Coast Ranges archaeology that artifacts recovered from the site, including the metate and concave-base obsidian projectile points, show several specific similarities to sites of the Middle Horizon in the Sacramento Valley. Nonetheless, he considered the Borax Lake assemblage to be sufficiently distinctive that it could not be fitted into any specifically known Middle Horizon assemblage. Meighan (1955:27) concluded that the site represented the oldest culture so far discovered in the North Coast Ranges and that it "probably dates somewhere in California's long and inadequately defined Middle Horizon." Heizer (1964:129), at one time a proponent of Middle Horizon assignment for the Borax Lake site, more recently acknowledged that Clovis type projectile points have been recovered from the site. While Heizer made the qualification that its "proper position in time has never been satisfactorily agreed upon," by implication he placed the site on an earlier time level than the Middle Horizon when he accepted

such a placement for Nap-131 while pointing out the similarity between the Nap-131 and Borax Lake assemblages.

The two examples discussed above are particularly instructive because of the controversy created by the alternate explanations, that is, Middle Horizon affiliation as contrasted with affiliation with a more ancient cultural stratum (not necessarily Early Horizon). Other examples of attempts to extend the Central California cultural sequence beyond the limits of the San Joaquin-Sacramento Delta region are not as dramatic, but the difficulties encountered by the various workers have encouraged: a) the dropping of the horizon concept as a large-scale integrative concept, b) the development of the archaeological complex as a basic regional unit, c) the use of the horizons of Central California in the same sense as the complexes of other regions, and d) an additional use of the horizons as chronological periods with emphasis upon specific time markers attributable to each horizon. Olsen and Riddell (1963:52-54), for example, in their discussion of the archaeology of the Oroville region, do not attempt to fit their local sequence into the large-scale use of horizon but compare their complexes with the Central California horizons, using the horizon on the same level of integration as the complex. The following statement illustrates this: "Present evidence suggests that relationships [of the Mesilla Complex] are with the Martis Complex to the east and with the Central Valley Middle Horizon to the west." Other workers have on occasion referred to the Central Valley Early Horizon as the "Windmiller Complex." Olsen and Riddell also used the horizon concept with emphasis on time markers.

> The latest period (the Oroville Complex), represented by But-90A, is directly equatable with the Late Horizon Phase II occupation in the Sacramento Valley. Diagnostic trade items include clam shell disc beads and thick lipped Olivella shell beads (Type 3a1). The thin rectangular Olivella beads (Type 2a2) with terminal perforation may have been retained into Phase II times. The shell beads indicate trade relationships with the Central Valley during both late Phase I and Phase II times. (Olsen and Riddell 1963:53).

The original topic for Bennyhoff's doctoral dissertation was to be an analysis of the Late Horizon in Central California. In order to understand this cultural unit, he also re-evaluated the Early and Middle as well as the historic horizons. Unfortunately only one chapter, the ethnogeography, was completed (Bennyhoff 1977). In the early phases of his analysis Bennyhoff attempted to fit his data into the Beardsley framework, dealing with all the excavated Delta sites as a single ecological unit. Anyone who has seen the Hotchkiss (CCo-138, near Antioch) and Hollister (Sac-21, on the Cosumnes River) collections cannot fail but be impressed by the cultural similarity. Nonetheless, when trait lists were prepared for the refined "Facies" which were evident, the differences were as striking as the similarities. Although CCo-138 is ecologically in the Delta, it is culturally aligned with the Coast Ranges and Bay, as evidenced by the absence of baked clay objects, emphasis upon show mortars and carved pestles (in contrast to the wood mortars and chisel pointed pestles of the northern Delta), and emphasis on piled charmstones (in contrast to their near absence in the north Delta). A host of other differences left no doubt that different groups had occupied CCo-138 and Sac-21.

Even more startling was the emergence of still another configuration around Stockton. Although situated in the heart of the Delta, with a baked clay industry barely distinguishable from that on the Cosumnes, the former occupants preferred to import stone mortars and pestles (different from CCo-138 types) rather than use the "ecologically determined" wood mortar. Harpoons, shell ornaments, incised bone, and many other traits were consistently distinguishable from those found in the northern Delta or at CCo-138.

When plotted by site, three discrete and consistent geographic units emerged which, in 1961, Bennyhoff termed the Diablo, Cosumnes, and Stockton localities (now termed districts [cf. Bennyhoff 1977]). It was considerably later, after resolving the cultural boundary problem, that he noted that the available archaeological data had linguistic correlates—that the Cosumnes locality fell within the distribution of the Plains Miwok tribelets, that the Stockton locality coincided with the known Northern Yokuts tribelets, and that the Diablo locality could be assigned to the newly discovered Bay Miwok tribelets. Comparative study of the available, though deficient

in sample-size, collections allowed less definite correlation of archaeological locality and linguistic group in regions to the west and north.

In short, Bennyhoff submits that our cultural units should ultimately be defined inductively by cultural content, not deductively imposed by ecological determinants. Furthermore, when adequate collections are available, typological or stylistic minutiae will be significant guides in the identification of the specific cultural groups which, unfortunately, the ethnographers named in terms of the language spoken. By means of the direct historical approach, these linguistic/cultural groups can be projected backwards in time, and, with proper analysis of adequate data, the history of specific groups hopefully may be revealed.

The complexity now evident in the heart of Central California requires a new conceptual framework. Without citing further examples of the difficulty of utilizing the existing CCTS, we propose here that the existing taxonomic system be revised to allow substantive inclusion of data not now comprehensible and to reduce the terminological confusion by employing terms more widely used in the rest of the New World.

Sufficient information has accumulated to suggest that the terms Early, Middle, and Late are analytically misleading. Cultures which conform to the "Middle" category have been forced into a post-Early temporal position, when, actually, increasing evidence suggests that several "Early" and "Middle" cultures are contemporaneous.

The term "horizon" is employed in the CCTS with a different and less useful meaning than that currently in use in various other New World areas. Beardsley (1954:5-8) never clearly defined the meaning of *horizon*, but he did employ it as the largest unit of archaeological integration.

The time periods are called 'horizons,' because they are definable in terms of culture content, like the smaller units, and are cultural entities, not simply chronological or geographical divisions. Their sequential stratigraphic relationship to each other, independent of culture content, happens to give them a proven time value as well that is recognized in the names applied to them: Early, Middle (in place of Transitional), and Late.The term horizon is employed widely in the New World in a quite different sense (Willey and Phillips 1958:31-34), that is, to denote the time and space occupied by an artifact style or cultural trait which is widely diffused through space, usually by means of trade relations, and at the same time is short-lived in temporal duration. Such a horizon "occupies a great deal of space but very little time" (Willey and Phillips 1958:32). What Beardsley termed a "phase" is more commonly called a "horizon" elsewhere, which compounds the confusion in comparative studies.

In addition, all of Beardsley's "facies," that is, groups of intimately related components comparable to the "foci" of the Midwestern Taxonomic System, can now be refined into smaller units. In the process, substitution of the term "phase" for "facies" would reduce terminological discrepancies. Beardsley's zone-province geographical divisions are also in need of revision; and adoption of the more generally employed Willey and Phillips (1958:18-21) terminology would reduce the confusion which results from employing different names for the same thing.

In Central California for the past year [1968] a number of archaeologists from over a dozen institutions and agencies have been wrestling with substantive and taxonomic problems common to the area. There have been five workshop meetings at the University of California at Davis with a sixth scheduled for February 1969. There have also been numerous meetings of two or more individual archaeologists attempting to resolve some of these problems. The taxonomic system described within this paper is one of the products of the Davis workshops. It should be made clear, however, that the proposal does not represent a consensus but is predominantly the effort of the authors, who were stimulated by the workshops to produce the present work and who gained considerably from the discussions of ideas and substantive issues which constituted the workshops.

Spatial Units

We accept five formal units proposed by Willey and Phillips (1958) and add a sixth, the district, but we do not agree with several of their theoretical interpretations of these units. We will deal with our different view of the equivalence of the archaeological-ethnographic units as each one is discussed below. One general problem needs to be discussed first. Willey

and Phillips (1958), Rouse (1955), and many other anthropologists who accept the culture area concept prefer *static boundaries through time*. Such culture areas as California, the Southwest, the Plateau, the Plains, are delimited primarily by physiographic determinants and cultural distributions during the "ethnographic present." Thus Willey (1966) presents single maps for each area and summarizes the total archaeological record for the territory included within fixed geographic boundaries.

We agree that this is the simplest way to handle broad syntheses but submit that it obscures cultural dynamics on any analytic level. In our opinion, a much clearer view of prehistory is obtained if spatial boundaries fluctuate in synchrony with cultural change. A series of maps for specific time periods is needed to document the already established ebb and flow of southwestern culture into the southern Great Basin and its protohistoric expansion to the Pacific Coast ("Yuman" - Diegueno). A static Basin-Plateau-Plains boundary obscures a similar though more complex fluctuation of the Desert, Riverine, and Bison Hunting cultures. While much more excavation and analysis are needed, the hypothesized early unity of the California-Great Basin-Southwest areas merits serious consideration; reassessment of available data and comparisons *beyond* "established" borders must be a constant method of analysis.

The same problem of static boundaries applies to districts, regions, and subareas. Since our primary concern is with cultural units, we believe that spatial boundaries should follow cultural variation and not break at physiographic boundaries. In Central California the expansion and contraction of the Stockton District across three physiographic provinces can be outlined; a series of maps showing these cultural fluctuations is preferable—at least on the analytical level—to the maintenance of fixed ecological boundaries throughout the time period involved.

In the absence of a detailed sequence, it is customary to project the ethnographic present backwards and include such regions as the Sierra and the San Joaquin Valley in the Central California subarea, but such a placement should not blind us to the possibility that at various earlier times these regions were *culturally* part of the Great Basin or Southern California. Once such possibilities can be demonstrated, our maps and special assignments should be changed. In short, we believe that all too often the spatial unit boundaries defined ethnographically, physiographically, or arbitrarily in the absence of adequate cultural data become entrenched and preserved beyond usefulness. Projected forever into the past, these once-adequate divisions become a hindrance and obscure more meaningful cultural relationships.

Turning to the formal units, we suggest that there is a need for six spatial units. Arranged in ascending order of increasing generality these are *site*, *locality*, *district*, *region*, *subarea*, and *area*. For analytical purposes the most basic unit is the district (within which phases are confined), while the region is usually more important for synthetic purposes.

The Site

We agree with Willey and Phillips (1958:18) that "a site is the smallest [geographical] unit of space dealt with by the archaeologist and the most difficult to define." We insert the term "geographical" here to distinguish the total site from such specific excavation units as components within stratified sites, rooms within structures, and similar units.

An archaeological site can be defined as a discrete area fairly continuously covered by remains of former human occupation or providing evidence of human activity. Of primary concern for our classification system in California are village and campsites, supplemented where possible by cemeteries, workshops, trails, rock art, and whatever clues to former behavior remain. Without minimizing the many problems which still plague the uniform definition of a "site" (in particular, those involving dispersed settlement), the basic concept is obvious and noncontroversial.

The Locality

The locality is a geographical space which exhibits complete cultural homogeneity at any given time (Willey and Phillips 1958:18). These authors suggest that it generally is not larger than the space that might be occupied by a single community or local group. Evidence already available indicates that complete cultural uniformity was often shared by several local groups, which in California can meaningfully be called tribelets (autonomous social units intermediate in size

between bands and tribes). We suggest the locality usually reflects *cooperative groups* of tribelets. This can be documented ethnographically and archaeologically in the Cosumnes District where three to five tribelets each can be grouped into the American River, Cosumnes River, and Mokelumne River localities. Differences between these three localities involve only percentage frequencies—the total culture can be considered "completely uniform." Two localities, each with several tribelets, can be defined for the Diablo District, while six or more localities can be outlined for the Alameda District. It can even be proposed that sublocalities will be needed to deal with tribelets.

A special ethnographic relationship between the Muqueleme Miwok and Chilamne Yokuts can be documented archaeologically (flexure instead of extension at SJo-105). The district language of the Karkin Costanoan tribelet may be reflected by certain differences in the limited archaeological sample from their territory, while differential utilization of local shellfish will allow the identification of several other Costanoan tribelets in the Alameda District. The culturally variant Wolwon Nisenan tribelet is reflected archaeologically by a unique incised bone style at Sut-11, their tribelet center. While these detailed identifications are of extreme importance for the study of group interaction, we believe that such data can best be handled verbally in terms of components of larger units, the district phases.

The District

The district is a geographical space, normally larger than a locality but smaller than a region, which exhibits a significant degree of total cultural uniformity among its constituent components. It is the basic spatial unit of analysis in that phases—the basic temporal unit—are coterminous with district boundaries. Normally, only one phase exists in one district at any one time, and it is the district boundaries which change when necessary—the phase is not extended into multiple districts. In ethnographic terms, we suggest that the unity exhibited is possibly related to the ease of linguistic communication plus other factors such as dance and ceremonial exchanges documented for the Kuksu and Ghost Dance.

Ideally districts are defined in contrast to adjacent districts where cultural differences are already apparent. Most districts appear to have distinctive ecological *core*, but the peripheral boundaries often fluctuate—sometimes radically—into adjacent physiographic provinces. Various reasons can be offered, such as climatic change, acculturation to adjacent groups, and population expansion. The nature of these factors often remains hypothetical unless a large body of analyzed data is available. In California, an area of reasonably stable population, we believe there is already evidence available to equate districts with *language groups* in the Protohistoric and late Prehistoric period. The significance of more ancient districts, as always, becomes an interpretive problem, largely because of lack of data.

In practice it is often necessary to define phases on the basis of excavation in a single site or small cluster of isolated sites. We suggest that ethnographic boundaries be used in such cases for the Late period; if not available, of if older periods are involved, physiographic districts can be defined on the descriptive level, to be modified as needed on the analytical level.

Cultural Units

The Pattern

The cultural units which in Central California have been known as the Early, Middle, and Late horizons are regional representatives of three basic patterns, as defined here. One difficulty in utilization of the horizon concept as an integrative unit is that each horizon was defined with excessive specificity. The basic definitions were based upon regional detail and thus were applicable only to a few of the cultures which actually participated in the pattern. The terms Early, Middle, and Late, applied as labels to the three patterns, have been dropped to remove any necessary association of temporal priority of one pattern as contrasted to another. While such priority may exist, it is not involved in the general definition of pattern.

The pattern is generally the broadest integrative unit employed operationally, although it is middle-range in regard to overall synthesis, being narrower than stage, period, and tradition. A pattern is conceived as a configuration of basic traits representing a cultural adaptation. Pattern as a concept has similari-

ties to the ethnographic culture area, but it is not as broad in application. Applied ethnographically, the distinction Oliver (1962) drew between the social organization of Plains Indians with foraging as contrasted with horticultural backgrounds is the distinction between two patterns [n.b.: or is it the distinction between two aspects?]

An archaeological pattern, as defined here, represents a basic adaptation generally shared by a number of separate cultures over an appreciable period of time within an appreciable geographic space. The pattern is characterized by: a) similar technological skills and devices (specific cultural items), b) similar economic modes (production, distribution, consumption), including especially trade and wealth practices (often inferential), and c) similar mortuary and ceremonial practices.

A single pattern will not be specifically uniform throughout the geographic space which it occupies. Regional variation, sometimes extreme, will occur depending on factors such as: a) abundance and nature of environmental resources, b) regional specializations and elaborations, sometimes resulting from unique historical events, c) degree of cultural and geographic marginality, and d) influences of neighboring patterns.

A specific pattern should be defined in such a way as to make the identifying characteristics as generalized as possible, yet any two patterns should clearly contrast with one another. It should be noted that a pattern is based upon a configuration of characteristics. Individual characteristics may be shared mutually between two or more patterns, but the overall configurations of each pattern should differ.

All localities which participate in the same pattern can be hypothesized to have had some historic relationship, such as common ancestry, mutual influences, and common external influences. Two or more patterns may exist within any given area or subarea at any given time. Such coexisting patterns may be hypothesized to correlate with major linguistic differences, despite the obscuring of the linguistic relationships by factors such as cultural coalescence and extreme borrowing. No *a priori* assumption can be made in regard to the nature of the historical relationship between two succeeding patterns. Aside from the temporal sequence itself, only intensive analysis of adequate data can determine whether the later pattern may or may not have derived from the earlier one.

New patterns can emerge from the physical displacement of cultures practicing the older pattern, from coalescence, such as when new configurations or traits enter an area and are integrated into the existing pattern, and from assimilation, when the preexisting pattern loses its identity by accepting the newly introduced configuration in its entirety.

Once a pattern has been defined, investigations can be formally planned in terms of hypotheses formulated concerning regional and local variation. In stoneless alluvial regions, for example, the absence of certain stone implements could be predicted, or their presence predicted based upon hypotheses concerned with trade. In remote mountainous regions, where resources are often not as abundant as in more open regions and where access to trade routes is limited, hypotheses concerning economic modes can be formulated; wealth and trade complexes in these areas can be expected to be simple.

At this point in the development of the taxonomy, labels for the different patterns are obtained through the general principle of utilizing the name of the first site at which the pattern was recognized. This does not imply any kind of cultural or historical priority for the site thus used. The priority relates only to recognition by archaeologists, not to elaborateness of culture content or to time. If such a label proves ambiguous, for example, if it is already in use in some other context, an alternate label should be chosen. Attempts were made in the development of the concept to apply a label which related to the basic adaptation itself, or to one or more of its significant cultural traits (e.g., milling stone pattern, cultist pattern), but so far such efforts have not been successful. Any suggestions in this regard would be welcomed.

The Aspect

An aspect is a district variant of a pattern. It is differentiated from other aspects by the individuality of its adaptation related to factors such as environmental resources, regional specializations, marginality, and extra-pattern influences. An aspect is made up of a sequence of phases, defined by Willey and Phillips (1958:22) as "an archaeological unit possessing traits sufficiently characteristic to distinguish it from all

other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time." The phase is the smallest integrative unit in the taxonomy, and experience in Central California indicates that it can be differentiated at the district level. The localities defined by Bennyhoff, mentioned previously (now renamed districts), are occupied by cultures which are aspects of the Augustine Pattern (Cosumnes, Stockton, and Diablo districts).

Criteria for Several Patterns in Central California

Windmiller Pattern. The Windmiller Pattern of the Lower Archaic period includes the cultures previously included within the Early Horizon. The criteria for the Windmiller Pattern are as follows:

a) Technological skills and devices: Mano and metate, although rare, are accompanied by small mortars (possibly meat or paint grinding implements). The dart and atlatl, as well as the spear occur; atlatl spurs are rare, late, and of polished stone. Bone industry is not elaborate, while the polished stone industry is. Non-obsidian, stemmed projectile points are dominant.

b) Economic modes: The relative number of projectile points as contrasted with the relatively small number of grinding implements suggests a hunting emphasis. Trade appears to be focused primarily upon the acquisition of ceremonial and ornamental objects, which were probably obtained as finished specimens rather than as raw material.

c) Burial and ceremonial practices: Interment occurs, both in intravillage grave plots and in non-midden off-village cemeteries. The mortuary complex has a ceremonial emphasis with abundant, deliberate grave furnishings relatively common. The most common burial posture is westerly oriented ventral extension, although westerly oriented dorsal extension also occurs. One site yielded rare flexure and secondary cremation.

d) Variations in the Windmiller Pattern: The cluster of sites, predominantly on the Mokelumne River, involved in the definition of the original Early culture or Early Horizon, form the nucleus of the present definition of the Windmiller Pattern. The elaborateness of the mortuary practices suggest that this may be a regional specialization due to favorable economic resources allowing a relatively large population density (as compared with hunters and collectors in the Great Basin, for example) with an accompanying elaborateness of the ceremonial practices. If this is assumed, then it can be hypothesized that areas geographically marginal to the Mokelumne cluster of sites will present an abbreviated version of the ceremonial complex (cf. Olsen and Wilson 1964).

Berkeley Pattern. The Berkeley Pattern predominantly of the Upper Archaic period includes those cultures previously included within the Middle Horizon. The earliest phases of the Berkeley Pattern appear to be contemporaneous with late phases of the Windmiller Pattern. The name Berkeley rather than Emeryville (where this pattern was first recognized) has been used to avoid ambiguity, since Beardsley (1954) previous employed Emeryville as the name for a basic Late Horizon facies. The criteria for the Berkeley Pattern are as follows:

a) Technological skills and devices. The minimally shaped mortar and cobble pestle are employed as the virtually exclusive milling implements. Manos and metates are rare. The dart and atlatl are present; the atlatl being represented by rare engaging hooks usually of bone or antler. Chipped stone tools are less frequent, and non-stemmed forms occur in greater proportion than in the Windmiller Pattern. There is a growing emphasis upon the bone industry during the temporal span of the pattern; mammal bone is more commonly used than bird. Polished stone industry is present.

b) Economic modes: The pattern has a collecting emphasis, as indicated by a high proportion of grinding implements in relation to projectile points, probably emphasizing the acorn. The population appears larger than in the Windmiller Pattern based on depth of deposit, the large numbers of sites, and the regional shell accumulation. There is no apparent emphasis upon either trade or wealth. The use of local material predominates. Trade goods, when they appear, are finished specimens rather than raw material.

c) Burial and ceremonial practices: The mortuary complex is rarely elaborated. Flexed burials with variable orientation occurs in village sites. Burial goods are mostly restricted to a few utilitarian items or

to ornamental objects which are compatible with an interpretation of being part of a relatively unelaborate burial costume. Ceremonialism is indicated predominantly by shamanism, that is, by the presence of single graves with objects compatible with "shaman's kits," e.g. quartz crystals, charmstones, bone whistles. Graves are sometimes accompanied by bird and animal bone, sometimes articulated portions of skeletons. Birds and animals occasionally occur as ceremonial burials.

d) Variations in the Berkeley Pattern: Regional specializations reflect at times differing environmental resources. For example, along the San Francisco Bay shoreline and the Marin-Sonoma coast, Berkeley Pattern sites emphasize the collection of shellfish. Notched stones, probably net weights, are common in these localities, while rare or absent in interior sites. Archaeological components in the northern San Joaquin Valley show a blending of the Windmiller Pattern with the Berkeley Pattern, although it appears that the Windmiller Pattern has historical priority in the region.

Augustine Pattern. The Augustine Pattern of the Emergent period includes those cultures previously included within the Late Horizon. The Augustine Pattern appears to be a coalescent pattern merging the previous Berkeley Pattern with many new traits and involving a change in the general economic complex.

a) Technological skills and devices: Well-shaped mortars and pestles are common. The bow and arrow are present, as evidenced by a growing increase in the number of small projectile points beginning in the earlier phases of the pattern. Use of, and work in, shell is common. Fishing implements, while rare in absolute terms, occur more commonly and in different types than in the Berkeley or Windmiller patterns. The harpoon is introduced during early phases of the pattern. Bone awls, probably indicative of a coiled basketry industry, are common. Polished stone now includes tubular pipes as well as charmstones.

b) Economic modes: Fishing appears to be added to a strong collecting emphasis, while hunting (inferred by greater numbers of points found in middens) may be more important than during the Berkeley Pattern. The acorn is the dominant staple, as judged in part by charred specimens found in middens. There is high development of trade, beginning with finished specimens serving as trade items and developing by the addition of raw materials involved in trade. Gradually more trade items that can be identified as coming from relatively great distances appear. Social differentiation in regard to wealth is evidenced by considerable variation in grave furnishings.

c) Mortuary and ceremonial practices: Cremation and preinterment grave pit burning of burial furniture co-occur with flexed burial. Cremation is apparently reserved for relatively wealthy individuals, judging from the differential distribution of grave goods often found with the two kinds of graves. Ceremonialism, possibly indicative of widespread secret societies, is evidenced in the artifactual complexes, markedly emphasizing shell beads and ornaments, found with graves.

d) Variations in the Augustine Pattern: Due to the developing elaborateness of the trade networks, localities which are unfavorably situated in regard to trade routes show considerably less elaboration of the Augustine Pattern than localities which are more favorably situated. Nonetheless, more trade is evident in the marginal localities than in comparable sites following the Berkeley Pattern. The importance of fishing in the Augustine Pattern implies also that localities favorably situated in terms of fish resources will have a more elaborate cultural development than those not so favorably situated. Thus, greater differentiation will be manifest between riverine and shoreline cultures than those in mountainous areas.

Stockton Aspect of the Augustine Pattern[1]

The archaeological-ethnographic continuum strongly supports identification of this aspect as ancestral Northern Yokuts. Several historic tribelet centers

[1] The defining characteristics of the Stockton aspect of the Augustine Pattern appear here as they were originally made by Bennyhoff in 1969 in an unpublished paper entitled "The Need for a New Taxonomic System in Central California Archaeology." This was the position paper from which the present chapter was developed and elaborated. Although this section was not incorporated in chapter 2 as completed in 1969, it seemed appropriate to reintroduce it here because, despite its outline form, it provides a clear example of the way an aspect was then defined, and because, to my knowledge, this description has not appeared in print anywhere else. Compare this section with chapter 6, pp. 69-73, fig. 6.3, Ed.

have been tested. Unfortunately, this continuum can be traced back only through the prorohistoric and later prehistoric—the two earliest expressions of the Augustine Pattern are essentially missing as yet. While the mortuary tradition implies at least some continuity from the antecedent Meganos aspect of the Berkeley Pattern, the geographical distribution of components suggests severe disruption during the earliest part of Augustine. Extensive excavation in the southern San Joaquin Valley will be needed before we have any understanding of Yokuts history. Districts to the east and south are virtually unknown archaeologically.

Ecology: stoneless Delta representing climax of Central California food resources.

Marker traits of the Stockton Aspect: * = diagnostic (i.e., not found in any other district). Characterized by portable stone mortars, simple stone pestles imported mostly from the east (contrast with wood of Cosumnes, different types in Diablo). Individual ownership (contrast with communal ownership in Cosumnes). Baked clay industry (linkage with Cosumnes, contrast with Diablo).

* Emphasis on elk bone artifacts (especially elk ulna awl, punch).
* Distictive simple harpoons in late prehistoric.
* Grass-bundle coiled baskets.
* Open cross-hatched style of incised bone ear tubes.
* Incised elk bone hair pin.
* Distinctive effigy ornaments in late prehistoric.
* Toloache cult (steatite vessels) in protohistoric.

Borax Lake Pattern. What is here referred to as the Borax Lake Pattern was first identified as a distinctive type of cultural manifestation at the Borax Lake site (Harrington 1948), in the vicinity of Clear Lake. Sites, including those subsumed by Meighan (1955), are found predominantly in the North Coast Ranges, with some indication that they may also be found in the South Coast Ranges (Wallace 1954) and the Sierras. It has been suggested that what is here called the Borax Lake Pattern of the Lower Archaic period is historically related to the Windmiller Pattern (Baumhoff 1957; Baumhoff and Olmsted 1963, 1964), although the degree of difference in basic adaptation is sufficient to justify subsuming them under two distinct pattern headings. The criteria for the Borax Lake Pattern are as follows:

a) Technological skills and devices: Mano and metate occur with greater frequency than in the Windmiller Pattern; mortar and pestle are common and co-occur with mano and metate in later phases. Atlalt (inferred) and dart occur, as well as the spear. Stemmed, nonstemmed, and concave base points (occasionally with basal edge grinding), predominantly of local materials (either obsidian or chert) are present.

b) Economic modes: The relative number of milling implements as compared with stone projectile points suggests a generalized hunting-collecting economy, with neither emphasized over the other; no evidence for fishing has been preserved. The use of local materials predominates, and trade does not appear to be particularly well-developed, although in later phases contacts with other cultures appear to increase. There is no evidence of any wealth emphasis.

c) Mortuary and ceremonial practices: No interments have been found in habitation sites in the earlier phases, although in one late phase site burials do occur in the midden. No non-midden burials have yet been identified. Utilitarian objects, mainly pestles and projectile points, were found with the late phase burials. Polished stone items suggestive of ceremonial purposes include rare ovoid perforated charmstones and a single occurrence of a small, tabular, centrally side-notched ground stone object, possibly representing a form ancestral to the "painted tablets" of the Napa and Berryessa valleys.

d) Variations in the Borax Lake Pattern: At present two aspects of the Borax Lake Pattern have been identified, distinguished by the stone materials employed and the forms of the projectile points utilized. There is a northern aspect focused in Mendocino County and extending to the east side of the Coast Ranges, and a southern aspect, focused in Lake County and extending southward into Napa and Solano counties.

3

Spatial and Cultural Units in Central California Archaeology

David A. Fredrickson

(1973)

The Central California Taxonomic System and the Culture-Area Concept

THE CULTURE SEQUENCE that forms the foundation for the Central California chronology is at best a regional sequence, rather than an areal or subareal one. It appears that the underlying logic of assuming that the cultural sequence of the lower Sacramento Valley could legitimately be extended to other regions of Central California was intimately connected with the ethnographic concept of the culture-area. It is worthwhile to review this concept and to point out some of the consequences of its application to archaeological materials.

Basic to the culture-area concept is the finding that particular culture traits, both material and nonmaterial, tend to be associated with one another in given regions, and that this association tends to be confined to such regions. The ethnographic findings of Wissler (1926) in regard to culture-areas were that the various groups within a given culture-area each possessed to a greater or lesser extent the trait elements characteristic of the area. Wissler presented the notion that each culture-area had a center and that culture elements diffused outward from the center, subject to limitations of natural boundaries. Groups situated near the center of the culture-area were found to have all or nearly all of its characteristic traits, and their cultures were considered to be typical, in the normative sense, of the area. Groups situated some distance from the center, or the "climax" region as Kroeber (1936, 1939) referred to it, have fewer of the characteristic traits of the area. Such groups were often called "marginal." Groups situated at the borders of the area have traits which are derived from more than one climax region. It has often been pointed out that culture centers, or climax regions, are relatively easy to determine, but that the borders of culture-areas tend to be indeterminate with sharp boundaries between culture-areas quite rare (Kroeber 1939; Driver 1962).

Although several archaeologists have observed that their coworkers rarely make explicit use of the culture-area concept, Jennings (1968:5) pointed out its implicit use. "When the archaeologist describes or delineates an archeologic region on the basis of many sites with similar technology and subsistence, he is in effect establishing a prehistoric culture area, although the term is rarely used by archaeologists." Chang (1967:118) suggested a reason why:

> the culture-area concept has not been used in archaeology too explicitly or vigorously. The archaeologist, I think, in general terms tends to resist the concept because in the archaeological scale of time cultures move and macro-environmental changes occur, and cultural types and macro-environments do not associate stably

> with fixed ethnographic boundaries. Therefore, archaeologists often focus their eyes on the culture, together with the environment with which it interacts, but not on fixed geographic areas. The co-tradition concept, said to be 'culture areas in time depth,' is an eloquent example (Bennett 1948; Rouse 1954).

Willey (1966:5), in his synthesis of North and Middle American archaeology, makes explicit use of the culture-area concept, and also discussed circumstances prompting the resistance referred to by Chang.

> The archaeological culture areas, as employed here, are extensions of the traditional ethnographic culture area concept. It is, however, much more difficult to delineate archaeological areas than those which are projected for a single ethnographic horizon, because archaeological culture boundaries change through time. Occasionally, such changes are drastic. Such phenomena usually coincide with the inception or introduction of a new major cultural tradition. A prime example would be the differentiation of the Southwest United States area from the nearby Great Basin area which partially surrounds it. At an early period the two areas were one, with the whole characterized by the Desert cultural tradition. Later, with the rise of village farming patterns and the beginnings of the Southwestern cultural tradition, the Southwest area came into existence. Often, however, the 'hearts' or 'cores' of culture areas remain relatively fixed, with only the borderlands expanding or retracting with the passage of time. Sometimes this is true even in spite of major cultural traditional shifts. Thus, the Eastern Woodlands of North America maintained an integrity as a culture area, as the homeland of the earlier Archaic tradition and of the two later traditions which succeeded it—apparently a testimony to the powerful conditioning factors of natural environment in culture development, at least under certain conditions. In sum, archaeological culture areas must be compromises which will embrace a significant cultural unity through a significant span of time.

Jennings's (1968:4-5) brief comment on the relationship between ethnographic and archaeological culture areas is appropriate to the present concern with Central California archaeology:

> . . . Kroeber does emphasize the variation in cultural intensity from area to area and notes that in areas of greatest intensity, climaxes or cultural richness and complexity can be recognized. His identification of cultural climax areas is derived from ethnographic data but tends to agree with archeologic findings, so that some ethnographically delineated culture areas are also fairly accurate demarcations of culture difference and similarity in the prehistoric periods. For example, the climaxes observed archaeologically in the Southeast and Southwest were identified by Kroeber from ethnographic data.

In his early summaries of California's position in regard to culture-areas, Kroeber (1920, 1925) included the bulk of California, the area usually referred to as Central California, with the Great Basin to form a single culture-area. Northwestern California was included with the North Pacific Coast culture-area and Southern California was included with the Southwestern culture-area. In his later work, however, Kroeber (1936, 1939:53-54) isolated a separate California culture-area:

> Otis T. Mason made his California area include Oregon. Wissler makes it coterminous with California, except for excluding the southeastern corner of the state and including western Nevada. My classification gives southern California to the Southwest, the northwestern corner to the Northwest Coast, the northeastern. . . to the Great Basin, the eastern or trans-Sierra fringe also to the Basin. This leaves to the California area only the region which in earlier classifications, made with a local rather than continental view, I called Central California. Essentially, this area consists of the Great (or Interior) Valley of California with the Coast Ranges and Sierra Nevada that flank it.

Driver and Massey (1957), employing detailed statistical analysis, also distinguished California as a separate culture-area, but differed from Kroeber in that Southern California and the northwestern corner of Baja California were included as part of the California area rather than the Southwest area. Willey (1966:361ff.) utilized a demarcation of the California area similar to that of Driver and Massey in his summary treatment of archaeological culture-areas, but added Northeastern California, which Driver and Massey had placed in the Plateau area.

The changes in status of California vis-à-vis its culture-area assignments are in large part measures of

the diversity of its cultures and the strength of influences from the surrounding culture-areas, both of which factors are closely related to the physiographic diversity of the state. Kroeber (1920:151), recognizing this complexity, was explicit in emphasizing that the divisions he had made of California did not imply identity of culture:

> . . . any map of this nature creates an erroneous impression of internal uniformity and coherence. Thus, all in all, it is true that the 'central' Yokuts are probably more similar to the 'central' Wintun in the totality of their life than to the 'southern' Gabrielino. But innumerable cultural elements have reached the Yokuts from the south, and they themselves have very likely developed local peculiarities of which some have filtered across the mountains to the Gabrielino. Consequently, any statement which tended to create the impression that the Yokuts and Wintun belonged to a block of nations in which certain traits were standard and exclusive, would mislead.

In his later work Kroeber (1939:55) recognized three subdivisions within Central California, including the climax regions, which he extended from "the lower Sacramento to the Russian River." Klimek (1935), on the basis of his comprehensive statistical analysis, made even more internal distinctions.

Within the Central California subarea the existing archaeological sequence was established from excavations conducted primarily within what was the ethnographic territory of the Plains Miwok, located in the lower Sacramento Valley. Although it has not been expressly stated, the assumption appears to have been that the archaeology of this region adequately represented the climax region of Central California. Thus, following the implications of the culture-area concept, marginal or border regions were not important to the understanding of the cultural development of the area under consideration, since their cultures derived from traits which spread from one or more climax regions.

It is illuminating to analyze a portion of Heizer's (1964:126) recent review paper from this perspective. He defined Central California as follows:

> Central California, defined here as the region lying between Tehachapi (where the Sierra Nevadas join with the Coast Range) in the south to the head of the Sacramento Valley in the north, and the ocean coast on the west to the Sierra Nevada crest on the east, may be divided into three zones: (1) coastal (i.e., shore plus Coast Range section), (2), interior valley (the combined Sacramento and San Joaquin valleys), and (3) Sierran (western slopes of the Sierra Nevada).

Although not stated explicitly, Heizer's "zones" are physiographic divisions, and he appears to imply that the zones can also be treated as separate cultural units, with each showing variation from the basic regional sequence according to environmental influences. "Generally speaking, allowing for local ecologic adjustments to tidal shore (as against valley riverine locale), the Middle and Late sequence on the bay conforms to that already sketched for the Interior Valley [read: for the lower Sacramento Valley]" (Heizer 1964:129). The idea that border or marginal areas can be referred to climax regions is also illustrated in the following statement by Heizer (1964:130): "Just west of the head of the Sacramento Valley, in the Coast Range section, salvage archaeology in reservoir areas has yielded an abundance of later materials that are basically central Californian in type [read: basically similar to the lower Sacramento Valley in type] but are modified by influences reaching southeast from the distinctive culture development of northwestern California."

The emphasis upon the prehistory of culture climax regions, based upon the assumption that the significant cultural developments of the area had their origins in such regions, not only produces a difficulty in the classification of marginal or border region cultures (which could be considered simply a mechanical procedure), but more importantly serves to obscure cultural processes, some of which may be unique to marginal or border regions and some of which may strongly influence the course of development of climax cultures. For example, evidence of population movement or territorial expansion may be recovered archaeologically only in marginal or border regions.

Heizer's definition of Central California also carries the implicit assumption that a cultural unit with a predictable degree of homogeneity is contained within the geographic space included in the definition. When data are available to demonstrate that the

geographic space is *not* predictably culturally homogeneous, there is no corresponding change made in the definition of the space. Thus, the culture-area model serves as a principle from which propositions concerning the nature of specific marginal cultures can be deduced. These deductions should be tested as hypotheses and subjected to modification when data warrant.

For example, the southern San Joaquin Valley, included in Central California by Heizer, was briefly characterized as follows:

> In the southern San Joaquin Valley...[there is] a long sequence of cultures that go back to the same period as the Early Horizon culture [of the lower Sacramento Valley] and continue into the historic period. The Late period shows influence from the Santa Barbara coast, as well as from the Colorado region (Heizer 1964:128).

It is of interest that, despite placing the region within the Central California subarea, no claim for identity or relatedness of southern San Joaquin Valley materials with the lower Sacramento Valley is made, only a temporal connection. Examination of archaeological materials from the southern San Joaquin Valley (Gifford and Schenck 1926; Fredrickson 1964; Wedel 1941) reveals virtually no direct relationship with lower Sacramento Valley materials; instead, the similarity with Santa Barbara coastal materials is quite clear. It is evident that the southern San Joaquin Valley does not belong culturally with the Central California subarea, regardless of its physiographic characteristics, but instead should be included with the Southern California Coastal subarea. This suggestion is compatible with Kroeber's (1959) discussion of Yokuts geographic movements (based upon linguistic relationships), wherein he suggested that the movement of Yokuts into the northern San Joaquin Valley is relatively recent, probably beginning no more than 500 years ago, and that the major late expansion of Yokuts "has almost certainly been toward the delta, not from it" (Kroeber 1959:277).

Kroeber's discussion in itself is provocative in regard to our understanding of the prehistory of the Interior Valley. In the discussion here so far, problems of dealing with marginal and border archaeological manifestations in terms of the lower Sacramento Valley have been emphasized. If we move to a region immediately adjacent to the lower Sacramento Valley, namely, the northern San Joaquin Valley, which presumably should have undergone the same development as its neighbor region to the north, we find at least one significant difference, which has been little noticed until quite recently. This difference occurs in the mortuary practices found within the northern portion of the San Joaquin Valley as contrasted with the practices reported for the three-part cultural sequence of the lower Sacramento Valley.

Each of the three cultural units in the Central California sequence has characteristic or modal mortuary practices (Heizer 1949; Beardsley 1954). The Early Horizon is characterized by fully extended burials, face down, most frequently oriented to the west. Flexure and cremation also occur, but rarely. During the Middle Horizon, the prone burial position is rather abruptly replaced by the flexed burial position along with variable burial orientation. Occasional cremation also occurs. During the Late Horizon both flexed burial and cremation take place, with cremation becoming more important as the Late Horizon continues. Orientation continues to be variable.

Until quite recently occurrences of extended burials (whether prone or supine, regardless of orientation), which lacked clear-cut artifactual linkages to defined cultural units, were often referred to the Early Horizon simply on the basis of extension. A brief unpublished report on Fre-373, in Fresno County, evaluating the dating of the site on the basis of burial position, illustrates the point. "The belief that the undisturbed burials in block 22 might be Early Horizon was based on the fact that the burials were all extended, and regularly oriented west..." The report continued with an alternative temporal placement, showing the influence of finds in nearby Merced County (Olsen 1968; Riddell 1968): "However, recent information suggested that the burials might be from the early phases of the Late Horizon. This theory had its origin in the fact that the Yokuts apparently returned to extended burial during that time" (Milner 1964).

The apparent return to extension noted above refers to findings from site Mer-14 in Merced County where both supine and extended burials and flexure were recovered from a context clearly dated by artifactual similarities as contemporaneous with the early

portion of Phase 1 of the Late Horizon (Riddell 1968; Olsen 1968). Additional evidence is accumulating, however, which allows the working hypothesis that the occurrence of extended burials in the San Joaquin Valley during temporal periods more recent than the Early Horizon is not necessarily a *return* to extension, but possibly a continuation and modification of a mortuary tradition which had its origins during the period represented by the Early Horizon. Extended burials found at Buena Vista Lake in the southern San Joaquin Valley (Wedel 1941) are acknowledged as being in all probability coterminous with the Early Horizon of the lower Sacramento Valley.

Although no radiocarbon dates have been obtained for the Buena Vista extended burials, the presence of milling stones and handstones links the complex to the early milling stone horizon. No burials identifiable with this horizon have yet been reported from the San Joaquin Valley north of Buena Vista Lake, but it seems likely that such burials may yet be found. Extended burials representative of later time periods have been found in the San Joaquin Valley, however, in localities from the central to the northern portion of the valley. Foote (1964) in a brief unpublished communication reported dorsal and ventral extension, as well as flexure, from site Sta-133 in Stanislaus County. Recovered with these burials were full saddle Olivella beads (type 3b) which are middle Middle Horizon time markers in Central California (Bennyhoff and Heizer 1958). King (1968) also reported dorsal and ventral extended burials, as well as loose flexure, from site Mad-117 in Madera County, which he dated on the basis of artifactual analysis as "roughly contemporaneous with the Brazil and Need phases [of the Middle Horizon] in the Cosumnes Locality . . . in the 2-3000 year B.P. time slot."

In Contra Costa County, in a district adjacent to the northern San Joaquin Valley, unexplained ventrally and dorsally extended burials were reported from site CCo-141 (site C.141) from a Middle Horizon context. Of this occurrence, Lillard, Heizer, and Fenenga (1939:55) wrote:

> It is impossible to account for the variety of burial positions—the ventrally extended posture has heretofore been noted only in the Early period; dorsal extension may occur in Late period sites (e.g., site S.1, S.3) though it seems localized in its manifestations. It is possible that the Transition horizon of site C.141 is closely connected with the Early period and derives the extended burial position from it, yet the material culture speaks against this since there are few Early artifact types present. Probably the situation is this—in this Delta area is a local specialization in the mortuary complex, the development of which was more or less independent of the Mokelumne-Cosumnes region further north and east.

More recently, dorsally extended burials have been recovered from site CCo-31 near Pleasant Hill in Contra Costa County in association with type 3b2 modified saddle Olivella beads (Kemnitzer 1968), which are late Middle Horizon time markers (Bennyhoff and Heizer 1958).

This distribution in time and space of extended burials, while not by any means conclusive of the working hypothesis suggested earlier, can be taken to support the argument that the culture history of the San Joaquin Valley differs significantly from the culture history of the lower Sacramento Valley and that a priori application of the lower Sacramento Valley three-part cultural sequence to all of Central California is not warranted. Although evidence has been presented here in support of the working hypothesis that the peoples of the San Joaquin Valley followed a cultural pattern different from that of the lower Sacramento Valley, it seems quite clear that the cultures of both regions were variants of the Archaic pattern. It is on this higher level of generalization that the culture-area concept seems useful. That is, during the chronological period in question, all the cultures of Central California appear to have been at the Archaic stage of development.

While the classification of prehistoric California groups as Archaic is a valid procedure, the long time span encompassed by the Archaic stage itself obscures the fundamental processes and differences between groups so classified. Significant processes and differences expected on the basis of the large area and great ecological diversity within the Central California subarea are blurred. As a step toward rectifying this situation, the existing practice of dropping the horizon concept as used in the Central California system and substituting sequences of locally or regionally defined complexes, while perhaps satisfactory for

local interests, does not suffice for synthesizing or integrative efforts. In the following pages modifications which have already been made in, or suggested for, the Central California Taxonomic System (CCTS) are discussed, and a proposal is offered for integrative units which seem appropriate for the current state of knowledge in Central California.

The Central California Taxonomic System and Recent Modifications

I have previously discussed the basic organization of the CCTS, the definitions and concepts employed in it, and some of the reasons why it should be at least partially abandoned. I suggested that several factors contributed to this situation, among them the absence of any discussion as to the minimum number of specific features that are diagnostic of each of the horizons and also the failure to separate the cultural from the temporal dimensions, confounding cultural horizon markers with temporal horizon markers. Apart from the operational modifications which seem to have developed without any explicit formulation, there have been a number of changes explicitly suggested for the system. Bennyhoff (1977), for example, grouped "sites which were occupied by culturally related people into localities which have been named after some feature of the local geography." Bennyhoff's localities, which appear to be somewhat but not completely concordant with the provinces of the Central California scheme, were found to correlate with the territories occupied by language groups—Cosumnes locality: Plains Miwok language; Sutter locality: Valley Nisenan language; Solano locality: Southern Patwin language; Diablo locality: Bay Miwok language; Stockton locality: Northern Yokuts language. More recently Bennyhoff has substituted the term *district* for locality. Both terms are discussed in more detail below.

Ragir (1972), in her monograph on the Early Horizon, did not continue Bennyhoff's usage but retained the term *province* apparently unchanged from its original application despite Bennyhoff's findings. Ragir's (1972:table 1) chart on Central California culture classification showed the Delta Province occupied by Plains Miwok, Southern Patwin, and Nisenan, with no mention of the finer distinctions offered by Bennyhoff. Ragir did make two significant changes, however. First, she discarded the terms "Early," "Middle," and "Late," substituting for them "Windmiller," "Cosumnes," and "Hotchkiss," respectively. Second, she replaced the term "horizon" with the term "culture."

Referring to "growing evidence of very early cultures in Southern California," Ragir (1972:9) made the following cogent comments:

> Given the present system of naming groups which are typologically and temporally related, one would have to call an earlier culture, the 'Earlier Early Horizon.' Furthermore, the tripartite system in a local sequence invariably causes confusion when one compares sites from one area to those of another which has either temporarily or permanently classified its local sequence in a similar fashion. Thus, one finds the Early Lovelock culture coeval with the 'Middle Horizon' in Central California and the Late Phase of the Desert Archaic... 'Early', 'Middle', and 'Late' designations limit pre-history to three phases despite the fact that evidence sometimes suggests four or more changes important enough to warrant equivalent classificatory recognition.

Ragir (1972:9) went on to state that "archaeological cultures ought to be named after the type localities or, where adequately excavated type localities do not exist, after geographical regions where large numbers of sites occur and there is a possibility of further work." She chose, however, to "classify the temporal-cultural division defined by California archaeologists as cultures named after the type sites or regions important in their early history." Thus, Windmiller culture was selected for Early Horizon, Cosumnes culture for Middle Horizon, and Hotchkiss culture for Late Horizon.

Ragir's reasoning for substituting the term "culture" for the term "horizon" is , however, not directly related to the criticism of the concept which I have developed. She (Ragir 1972:8, my addition) wrote that:

> Based on considerable evidence that several 'Early' sites represent more than just burial complexes, this [study] introduces some modifications of Central Californian archaeological nomenclature. The combination of village and cemetery had long been recognized in 'Late' and 'Middle' period sites in the Central Valley. With the presence of 'Early' sites of

> both habitation midden and cemeteries, a record of the major portion of the cultural activity taking place would exist, and the settlements would deserve the status of a cultural tradition. Although the designation of 'Culture' to archaeological materials had not yet come into use, Heizer implied such a status in his paper on the 'Early Horizon.'

Ragir did not define "culture," nor did she elaborate further as to how the two terms might differ.

In the fall of 1967 the Center for Archaeological Research at Davis, in conjunction with the Society for California Archaeology, issued invitations to a number of archaeologists to attend an evening workshop at the University of California, Davis to discuss current problems in California archaeology. Individuals representing at least fourteen institutions and organizations attended this highly successful meeting, which turned out to be the first of six such workshops held over the next two years (Nov. 22, 1967; Feb. 10-11, Mar. 31, Nov. 9-10, 1968; Feb. 22, Oct. 25-26, 1969 [the October 1969 meetings were held at Sacramento State College, the remainder at Davis]). Among many diverse topics brought up during these meetings was the CCTS and proposed revisions in it.

The workshops were initially quite successful. The concept of *locality* (as utilized by Bennyhoff [1977]) was tested in a series of subsequent presentations by regional specialists, with general agreement that local assemblages could be distinguished on the basis of stylistic differences. Evidence also was presented regarding apparent contemporaneity of the Middle Horizon culture-type in the Littoral Zone of Central California with the Early Horizon culture-type of the Interior Valley Zone. There appeared to be general agreement that the CCTS was outmoded, and a number of suggestions were made in regard to terminological revision. For example, it was suggested that the terms Early, Middle, and Late be replaced by terms which do not imply temporal sequence. It was also suggested that the term "horizon" be dropped and replaced by either "culture," "tradition," or "pattern." A conceptual suggestion was made that stylistic factors not be included as diagnostic criteria in the taxonomic scheme and be kept separate from techno-economic factors. Ultimately, however, no general agreement was reached as to details of revision.

Throughout the discussions it was reiterated that individual workers try utilizing some of the proposed revisions in order to test their usefulness, but refrain from employing them in publication until a definite consensus had been achieved. Unfortunately, no consensus was achieved, but publication did occur. Following the March 1968 workshop, Gaumer (1968) published a note in the Newsletter of the Society for California Archaeology in which he reported that "tradition" had been selected as a basic term to replace "horizon" and that the following changes in terminology had been agreed upon: Augustine Tradition for Late Horizon; Emery Tradition for Middle Horizon; and Windmiller Tradition for Early Horizon. Gaumer stated that "All present agreed to use this new terminological system in their own areas, and have set Fall of 1968 as the date for another colloquium for presentation of progress reports." Later workshops rendered Gaumer's announcement premature when alternate revisions were suggested, including substituting Berkeley for Emery and pattern for tradition, but with no final agreement reached. Terminology reported by Gaumer has since appeared in print. King (1968:116), for example, employed "Emery Tradition" for "Middle Horizon," as well as other terminology introduced in the workshop context, and Schulz (1970:187) published "Windmiller Tradition" for "Early Horizon," stating that "While this concept will undoubtedly undergo considerable redefinition in the future, as used here it is only a modification of the 'facies' concept (Beardsley 1948:3)."

So it was with the CCTS: agreement that the original framework was no longer workable, lack of consensus on revisions, and *de facto* introduction of terminology which was in the discussion phase. In the discussion to follow I offer a revision of the CCTS, incorporating what I believe to be some of the basic agreements arrived at during the Davis workshops and taking into account the modifications already suggested by such workers as Bennyhoff and Ragir. I begin the discussion with spatial units, then move on later to consider cultural units.

Spatial Units

The units I employ here to designate the geographic space occupied by various cultural units are essentially those of Willey and Phillips (1958). These

are the site, locality, region, subarea, and area. An important additional spatial unit, midway between the locality and the region, is the district (Lehmer and Caldwell 1966). One of the major reasons for employing these terms, rather than those presented by Beardsley (1948, 1954; see also Heizer 1949), is that the Willey and Phillips terms are more generally used throughout the New World. It should be emphasized that the boundaries of the various spatial units may shift through time, as the different cultural units which occupy their geographic spaces shift their boundaries. Definitions of spatial units which rest solely or primarily on geographic or physiographic criteria are not adequate for archaeological analysis. For example, the inclusion of the southern San Joaquin Valley with the Central California prehistoric culture area (as defined by Heizer 1964:126) is not justified on the basis of archaeological material so far recovered. In regard to spatial units smaller than the area, Bennyhoff (chapters 1 and 8, this volume) has demonstrated the expansion and contraction of the Stockton District across three physiographic provinces at the end of the Middle Horizon in Central California.

Site, Locality, and District. An archaeological *site* was described by Willey and Phillips (1958:18) as "the smallest unit of space dealt with by the archaeologist and the most difficult to define." Without minimizing the many problems involved in the uniform definition of a site, and pointing out that the same site may be assigned to differing larger spatial units at different times in its history, it can be defined as "a discrete area fairly continuously covered by remains of former human occupation or providing evidence of human activity" (chapter 2, p. 13).

According to Willey and Phillips (1958:18) the *locality* is "generally not larger than the space that might be occupied by a single community or local group." They stated that "In strictly archaeological terms, the locality is a geographical space small enough to permit the working assumption of complete cultural homogeneity at any given time." Evidence already available indicates that complete cultural uniformity was often shared by several local groups, which during the ethnographic period in California are called tribelets, that is, autonomous social units intermediate in size between bands and tribes (Kroeber 1962). In chapter 2 Bennyhoff and I suggest that the locality usually reflects cooperative groups of tribelets. Since differences between tribelets within the locality often involve only percentage frequencies, the total culture can be considered "completely uniform."

Bennyhoff (1977) has employed the term district to Central California materials utilizing highly detailed comparisons of cultural inventory. He states that in California, an area of reasonably stable population, there is sufficient evidence available to allow the equation of districts with language groups in the Protohistoric and later prehistoric periods. Bennyhoff's Diablo District, for example, includes the Bay Miwok tribelets of Saklan, Chupan, Wolwon, Julpun, and Ompin. Bennyhoff divides the Diablo District into two localities (Oakley and Walnut Creek), each with two or three tribelets.

The district is the geographic space, normally larger than a locality but smaller than a region, which exhibits a significant degree of total cultural uniformity among its constituent components. The district is the basic spatial unit of analysis in the phases, the basic temporal units which are coterminous with district boundaries. Only one phase exists in one district at any one time. In ethnographic terms in California the unity exhibited within districts is possibly related to the ease of linguistic communication plus factors such as dance and ceremonial exchanges documented for the Kuksu and Ghost Dance.

Ideally districts are defined in contrast to adjacent districts where cultural differences are readily apparent. Most districts appear to have a distinctive ecological core, but the peripheral boundaries often fluctuate, sometimes radically, into adjacent physiographic provinces. Various reasons can be offered for the fluctuation, such as climatic change, acculturation of and by adjacent groups, and population expansion, but such reasons often remain hypothetical unless a large body of analyzed data is available.

Region, Area, and Subarea. The *region* of Willey and Phillips (1958:19) "is roughly equivalent to the space that might be occupied by a social unit larger than the community, a unit to which we may with extreme trepidation apply the term 'tribe' or 'society.'" In Central California, where tribes in the sense conveyed by Willey and Phillips were absent, the cultural similarities would appear to be due to both direct and indirect interaction (including trade net-

works) and to tribelet environments which resembled each other enough to allow the development of similar subsistence activities. A region in Central California, then, could include speakers of different languages, for example, Bay Miwok, Plains Miwok, and Southern Patwin.

The region in some respects is similar to Beardsley's (1954:6-7) concept of *province*, which has both geographic and cultural significance, being defined as a geographic grouping of several facies formed on the basis of cultural resemblances. Beardsley recognized that the boundaries of a province can change from one period to the next and accounted for the possibility by naming the provinces of each successive time period separately.

The *area*, following Willey and Phillips (1958:20) "corresponds roughly to the culture area of the ethnographer." The identical difficulty applies to the archaeological culture area as to the ethnographic culture area: although both may have general physiographic integrity, the boundaries are not easy to define as those of the smaller region. In each case, examination of cultural inventories is necessary to determine areal boundaries. California as an archaeological area would include several *subareas* (Willey and Phillips 1958:20), that is, "territories of geographical extent intermediate between the region and the area which possess qualities and degrees of cultural unity." During different cultural periods, subareas may differ as well. For the Protohistoric period Central California would be one such subarea, the Southern California Coast another. As has been mentioned, the boundaries of any one subarea may intrude into the physiographic space of another subarea, as in the example of the southern San Joaquin Valley relating culturally to the Southern California Coastal subarea, rather than to the Central California subarea, despite physiography.

In practice, with the exception of the site, each of the spatial units, from the locality to the area, may be conceived in terms of an ecological core, becoming more generalized as one proceeds from the locality to the larger geographic units. It is at the borders of each of the territories that the assignment of the space occupied by a particular culture becomes dependent upon cultural factors, rather than ecological ones. In the final analysis, the assignment of a particular geographic space to one district or another, or to one subarea or another, is dependent upon cultural rather than strictly ecological or environmental factors. The nature and extent of any particular spatial unit cannot be assumed a priori but must be determined by cultural analysis and comparison. To illustrate the above discussion, a classification of some of the spatial divisions in California, adapted from chapter 2, appears in table 3.1.

Cultural Integrative Units in Central California Archaeology

In general, my use of cultural units follows Willey and Phillips (1958:21-40), but two additional concepts are introduced which appear useful for understanding the Central California materials. These two concepts, discussed in greater detail below, are the *pattern* (cf. chapter 2), used to integrate materials from one or more regions, and the *aspect*, a district integrative unit, similar but not identical in meaning to its use in the Midwestern Taxonomic System (McKern 1939).

Component and Assemblage. The archaeological *component* was defined by Beardsley (1954:6) as the "archaeological record of human occupancy at a single locality at a specific time." Although Beardsley's definition is essentially identical with the Willey and Phillips (1958:21-22) definition of the same term, the word "locality" is not used with the precise meaning of Willey and Phillips. Concordance can be achieved by replacing the "single locality" of the Beardsley definition with the phrase "specific site." Heizer (1949:2) introduced the term "settlement," favoring it over the equivalent term "component," which was already in use in the Midwestern system. Later, however, Beardsley (1954:6) selected component since, although components might well be "entire settlements or communities," they "need not necessarily be so." Although the term *assemblage* is sometimes used to refer to the totality of artifacts from a given site, in this essay the assemblage is the totality of artifacts found in any one component. Thus a stratified site containing three cultural components would also contain three artifactual assemblages.

One of the first tasks of the archaeologist as fieldworker is the definition of the various components represented by the site under investigation. In

TABLE 3.1

Some Archaeological Spatial Units in California

- California Area
  - Southern California Coastal Subarea
    - Southern San Joaquin Valley Region
  - Central California Subarea
    - San Francisco Bay Region
      - Alameda District
        - Carquinez Locality
        - Oakland Locality
        - Newark Locality
        - Livermore Valley Locality
        - Santa Clara Valley Locality
        - Peninsula Locality
      - Marin District
    - Delta Region
      - Diablo District
        - Oakley Locality
        - Walnut Creek Locality
      - Cosumnes District
        - American Locality
        - Cosumnes Locality
        - Mokelumne Locality
      - Solano District
      - Stockton District
    - North Coast Ranges Region
      - Mendocino District
      - Clear Lake District
    - Northeastern California Region
    - South Coast Ranges Region

some cases, such as in a deep, physically homogeneous site, this cannot be achieved completely until excavations have been completed and careful analysis of the distribution of all recovered cultural materials has been made. In many cases, however, a fieldworker can distinguish between the various cultural components on the basis of observed physical stratigraphy in the field and later analysis will usually confirm and add greater detail to the initial working hypothesis.

Phase and Aspect. The concept of *phase* employed here is identical to that of Willey and Phillips (1958:22ff.). Since the term "phase" is in wide usage throughout the New World, it is preferred to the equivalent terms *focus* of the Midwestern Taxonomic System (McKern 1939) and the *facies* of the existing Central California cultural classification system (Beardsley 1954:6). Willey and Phillips (1958:22) described *phase* as, "an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time." The phase is the smallest cultural unit recognizable in space and time in Central California (see chapter 2). The use of the term "phase" in Beardsley's Central California framework, as in Phase 1 and Phase 2 of the Late Horizon,

includes much greater geographic space than even the region suggested by Willey and Phillips, and in use is more closely equivalent to the period concept, discussed below.

Although Willey and Phillips designated the phase as "the practicable and intelligible unit of archaeological study," it must be pointed out that the phase, as conceptualized here, can only be defined precisely after a considerable amount of comparative analysis of larger, more generalized units has been carried out. In practice larger prehistoric cultural units are not "built up" out of phases, the smallest discernible unit, but phases are analyzed out of the larger units. Thus, to a large degree, phase distinctions involve recognition of cultural differences comparable to those made between two adjacent societies within a common environmental setting. In regard to technology, economy, social and political organization, and ceremonial practices, such societies will probably be quite similar, but in language and many nuances of culture they may be quite different. Most importantly, they experience themselves as different peoples. The recognition of phase differences, then, involves recognizing cultural nuances, often expressed as stylistic differences, which distinguish two similar societies from one another. I have employed the term "societies" here, rather than cultures, since archaeological cultures usually are not isomorphic with discrete ethnographic cultures but are comparable to groupings of cultures such as those found in culture areas (cf. Rouse 1965). This problem is discussed in more detail in the section on "district markers."

The definition of phases and their temporal and spatial relationships with one another allow the recognition of many processes, ranging from those involved in the interaction of two adjacent societies, to those accompanying alterations in the environment, to those hypothesized on the basis of systems theory (Boulding 1956; Hall and Fagan 1956; both cited in Hole and Heizer 1969:378ff.). For example, elsewhere (Fredrickson 1974b) I have developed the working hypothesis of a growing importance of social ranking in the Walnut Creek locality of the Diablo District on the basis of systematic differences in burial practices during successive phases of the Emergent period (Late Horizon) beginning perhaps 2000 years ago and culminating in the Protohistoric period.

In the earlier discussion of the *district*, it was stated that only one phase existed in one district at any one time, and that the cultural uniformity found within a district during any phase was possibly related to the ease of verbal communication plus factors such as dance and ceremonial exchange. A sequence of phases within a single district is referred to herein as an *aspect*. Both phases (during a single time interval) and aspects (usually covering several time intervals) are district representatives of a *pattern*, a generalized cultural configuration usually encompassing one or more regions. These are discussed in greater detail below.

The aspect is often discernible in the archaeological record before its constituent phases can be isolated, but like phases the aspect is analyzed out of a larger, more generalized unit, the pattern. Procedurally, the pattern is the most readily identified configuration in an archaeological component. As spatial data come under control, the pattern can be broken up into a number of aspects. As temporal data come under control, the aspects can be subdivided into constituent phases. In this scheme, patterns themselves are not broken up into phases, but rather the temporal dimension is subdivided on the basis of *time markers*, technically artifacts or stylistic details on the order of the horizon-style of Willey and Phillips (1958:29ff.), which are limited in temporal distribution.

The analytic isolation of the aspect is greatly dependent upon what are called district markers here (cf. Bennyhoff 1977), that is distinctive artifacts, qualities of workmanship, or stylistic details which are limited in spatial distribution. Some district markers may persist through time for a short while, and others may persist for a prolonged period. District markers may also serve as time markers within the districts in which they occur. The definition of the phase, then, is dependent upon the intersection within an assemblage of district markers and time markers.

District Markers and Time Markers

Archaeological workers in Central California have placed a great emphasis upon certain artifact forms and stylistic detail, such as the forms of shell beads and ornaments and the ornamentation on bone and shell artifacts, because of their proven value in

showing temporal relationships between assemblages in different regions. Bennyhoff and Heizer (1958), for instance, discussed the value of California shell beads for the cross-dating of Great Basin archaeological sites, while Baumhoff and Byrne (1959) and more recently O'Connell (1967) have suggested the utility of employing certain forms of projectile points as temporal markers. With the exception of Bennyhoff's (1977) study, rather little attention has been focused upon cultural characteristics which assist the analyst in distinguishing between one community or group of communities and another. These characteristics, combined under the heading of *district markers*, may vary from the quality of workmanship exhibited in the manufacture of fish spears to the characteristic designs incised upon bone tubes (Bennyhoff 1977).

Beardsley's (1954:76ff.) comparative discussion of the Late Horizon in the Cosumnes (Delta in Beardsley's table 1) and Colusa provinces included itemization of traits helpful in the cultural differentiation of one province from the other. His interpretation refers to the cultural detail of a specific cultural group:

> Areal differentiation is brought to attention... by the appearance of traits in an earlier facies of one province than of another. Traits of Hollister Facies, for example, which are absent from Sandhill Facies components but appear well marked in Miller Facies of Phase 2 include: fully flexed burial in dug grave pits; pre-interment burning in the grave pit; deep, angular serrations on obsidian points; incised bird bone tubes; single-piece, bilaterally barbed fish spears; banjo-shaped ornaments of Haliotis shell...; general elaboration in forms and decorative styles of abalone ornaments . . .; and Olivella bead type 3e . . . In the reverse direction come relatively few traits: tubular and disc magnesite beads are found in Sandhill Facies (Miller B Component) as well as Miller Facies, but do not arrive in the Cosumnes Province until Mosher Facies develops. The regularity with which the southern traits occur in Phase 2 Howells Point Component in the north, in contrast to their spasmodic appearance in associated sites of the Miller Facies, has led Heizer [1941:109] to suggest northward migration of a Delta group as a cause rather than simple spread of elements.

Hole and Heizer (1969:43) expressed a common archaeological view when they stated that:

> We expect that people who occupy a common territory and share a common material culture will also share such things as language, ideas about right and wrong, preference in art, religion, and other intangible traits. These elements of nonmaterial culture are not recovered by prehistoric archaeologists, but every effort is made to make inferences about the social and nonmaterial aspects of the remains they examine.

We may add to this that data are also available which inform us that material products themselves often are invested with nonmaterial meaning related to cultural identity. Dawson (1963), for example, has pointed out that cultural standardization in mush boiling baskets (and presumably other basketry forms as well) is accomplished through mutual criticism of the makers, that is, by ridiculing deviations from the norm. Thus, Whilkut mush boiling baskets can be consistently differentiated from the mush boiling baskets of the neighboring Yurok, who exhibit and reinforce a different standardization: "the shape was different and the weave of the lateral reinforcement was different." Dawson added that in the teaching of the young, instructions include "not only technical manipulations but also the tribal ethos and style precepts about baskets."

Food preferences show that cultural identity may have at least partially an ecological basis. DuBois (1935:6-7) reported that various subgroups of the Wintu ridicule one another in regard to food preferences: "The Upper Sacramento Wintu were called derisively 'mussel eaters' and ridiculed by the McCloud Wintu for grinding deer bones into flour, to which the Upper Sacramento people responded that the McCloud people ate salmon-bone flour and 'besides they stank of salmon and bear.'" If we can expect actual food preferences to parallel the food prejudices, we can hypothesize that an abundance of "mussel" shells in archaeological sites in one Wintu district as contrasted with another would reflect not only local availability but also the identity of the specific Wintu subgroup. Further, we could hypothesize that there would be a relative abundance of mussel debris in Upper Sacramento Wintu sites where local availability would not support this prediction. In this regard, I (Fredrickson 1969) have inferred movement or expansion of a bayshore-oriented society into the interior Walnut

Creek locality partly on the basis of changes in dietary practices, including a change marked by an abundance of marine molluscan remains where previously such remains were virtually absent.

DuBois's data are particularly interesting in that she "lays stress upon behavior and attitudes of minds" rather than simply "presenting what may be called the type culture" (DuBois 1935:1). Unfortunately, most of the existing ethnographic accounts of California Indian groups do not contain the wealth of attitudinal information that DuBois's work on the Wintu contains. There are occasional references, devoid of the affective implications, that cultural traits, including decorative elements, are related to cultural identity. Gifford (1965:56) for instance, stated:

> The tattooing on the women's faces was different among each tribe or group in this general region, and the Coast Yuki show that they form no exception to this rule. They used fine marks in considerable quantities on the cheeks and chin, but did not employ heavy wide chin-tattooing as did some other tribes.

On the basis of these kinds of data, it can be postulated that when two cultures are closely related to one another in total organization and content, the identity of each group may be projected into what might appear to be minor cultural detail. This detail may be invested with emotional significance not necessarily corresponding to its seemingly minor significance to the culture generally. It can be further postulated that at least a portion of the concept of district markers themselves may be the equivalent of material symbols of cultural identity.

Earlier in this essay the concept of *horizon* as used in Central California was criticized on the grounds that the binding of time and culture into a single concept was unduly limiting. The Central California usage can also be contrasted with widespread New World usage of the term horizon. Willey and Phillips (1958:29ff.) defined horizon as "a primarily spatial continuity represented by cultural traits and assemblages whose nature and mode of occurrence permit the assumption of a broad and rapid spread." They emphasized that:

> The archaeological units linked by a horizon are thus assumed to be *approximately* contemporaneous. The word is italicized because it is recognized that horizons based on cultural criteria unsupported by independent dating may have considerable temporal depth and that the assumed correlation is not necessarily horizontal but may, and probably does, have a 'slope' depending on the amount of time required for the spread of the elements used as horizon markers.

This definition is similar to the use of horizon in the Central California cultural sequence except that in the Willey and Phillips concept the horizon would occupy a very short time span (cf. Deetz 1967:59ff.) rather than the thousand years or more of each of the California horizons. The example given above, wherein certain traits occur initially in the Cosumnes Province during Phase 1 of the Late Horizon and then later in the Colusa Province during Phase 2 of the Late Horizon, would seem to fit the Willey and Phillips definition but for several shortcomings. The criterion of "broad and rapid spread" is not clearly met; the two facies concerned here are not approximately contemporaneous; and in chronometric terms, Phase 1 lasted perhaps 1000 years and can now be divided into a number of smaller temporal units while Phase 2 lasted close to 300 years and can also be divided into smaller temporal units.

The above example highlights the difficulty of applying even the Willey and Phillips concept of horizon in Central California archaeology. The more valuable concept for Central California is not the horizon, but the *horizon-style*, which, according to Willey and Phillips (1958:32),

> may be roughly defined as a specialized cultural continuum represented by a wide distribution of a recognizable art style. On the assumption of historical uniqueness of stylistic pattern, coupled with the further assumption that styles normally change with considerable rapidity, the temporal dimension is theoretically reduced to a point where the horizon-style becomes useful in equating phases or larger units of culture that are widely separated in space.

It is apparent that the horizon-style of Willey and Phillips is simply another formulation of the well-known concept of cross-dating on the basis of artifact similarities, but with emphasis upon art styles rather than upon just artifacts in general and with the implicit assumption that the horizon-style is representative of the horizon assemblage.

Because of the emphasis upon formal art style, Willey and Phillips (1958:32) state that the "horizon-style concept has limited application, since it presupposes a level of aesthetic development that many archaeological cultures in the New World failed to reach." Rowe (1959) has introduced analytic concepts which make the horizon-style concept broadly applicable, including within Central California, the cultures of which are not noted for elaborate artistic development, as contrasted, for example, with the Andean cultures of Peru. Rowe's contribution shows that the great importance of the horizon-style is not so much its potential for demonstrating culture contact, as emphasized by Willey and Phillips, but its potential for allowing precise relative dating of phases. Rowe (1959:317) aptly stated:

> Patterns of cultural change begin to appear in the archaeological record as soon as the evidence can be arranged in any kind of chronological order. With increasingly precise relative dating it becomes possible to study the circumstances under which the known changes took place and to observe others. Any development in archaeology which makes possible more precise relative dating, therefore, increases the opportunities for studying cultural process.

Rowe was concerned with changes that occur within a tradition as defined by Willey and Phillips [1958:37]—"a temporal continuity represented by persistent configurations in single technologies or other systems of related forms." He focuses in particular upon ceramic traditions in Peru. The fine distinctions possible employing the method suggested by Rowe can form the basis of horizon-style traits in synchronic interpretation. Rowe (1959:318) observed one of the handicaps of the typological concept in general use among both American and European archaeologists (cf. Willey and Phillips 1958:12-13):

> Since cultural change is normally a gradual process, it takes relatively long periods for enough change to accumulate in the appearance of a given kind of object so that it no longer qualifies as descriptively similar to the type specimen. Consequently, types set up in this way have relatively long spans of existence in time, rarely less than 200 years.

In Central California the time span of recognized artifact types may extend for literally thousands of years. Rowe (1959:320) recommended that shortcomings of typological dating can be avoided "by using significant features as the unit of study instead of types." A feature is "any characteristic or detail of an object which can be observed and isolated, whether of material or workmanship or decoration." With respect to relative dating, Rowe (1959:320) pointed out:

> The most useful features for dating purposes are those which occur frequently during a relatively short span of time and are not found earlier or later. Features which occur at the beginning of the record being analyzed, have a continuous existence, and go out before the end of the record are also useful, as are features which come in after the beginning of the record and last until the end. Features which do not occur in one of these patterns are of no use in making chronological distinctions, no matter how prominent they may be or how useful they may become in the study of other problems. They are not significant features for relative dating.

In Central California, Bennyhoff (chapter 1, 1977; Bennyhoff and Heizer 1958) has employed Rowe's method of feature analysis to define horizon-styles which have been utilized both for extensional dating and for more precise division of the existing Central California horizons into numerous phases. Bennyhoff has examined fluctuations in various features, or attributes, of shell beads, for instance, and has found that the location of the perforation in small, rectangular Olivella beads is an important temporal indicator during the Late Horizon. Similarly, during the Middle Horizon, the size of the central perforation in shell beads is a feature with temporal significance.

Thus, morphological feature analysis of various traditions, which by definition are presumed to have temporal continuity, allows the recognition of significant attributes, often attributes that appear to be minor stylistic details. This recognition allows more precise division of the aspects into phases to which the traditions belong than otherwise would be possible. Further analysis and comparison can identify those elements of the tradition which are spatially restricted to the district under consideration, (thus making them *district markers*) and those which are widely spread through space, presumably by means of trade or other similar means of transport (thus serving as *time*

markers, or horizon-styles). The horizon-style should receive the name of the style which characterizes it in order to emphasize the distributional and synchronic nature of the cultural relationship and to avoid unwarranted implications of cultural identity.

In field investigations known horizon-styles can be employed as aids in the assessment of the temporal standing of a given site or cluster of sites. No implication of *cultural* identity then need be present when a site component is temporally identified by horizon-style. Horizon-styles may also be employed by field workers as aids in the assessment of direction and intensity of cultural influences which derive from outside the locality of the site or sites under investigation.

Period and Pattern

Period and Stage. Willey and Phillips (1958: 65) have pointed out that it is only recently that formal acknowledgment has been given to the distinction between an archaeological *stage* and an archaeological *period*, citing Krieger (1953) as presenting the "first adequate developmental scheme for North America as a whole. . . [containing] the clearest discrimination between the concepts of stage and period that we have yet seen in print." It is relevant here to repeat Krieger's (1953:247-48) formulation:

> For present purposes, I will consider a 'stage' to be a segment of a historical sequence in a given area, characterized by a dominating pattern of economic existence. The general economic life and outlines of social structure of past peoples can often be inferred from archaeological remains and can be related to similar phenomena, whether the dates are known or not. The term 'period', on the other hand, might be considered to depend upon chronology. Thus a stage may be recognized by content alone, and, in the event that accurate dates can be obtained for it in a given area, it could be said that the *stage* here existed during such-and-such a *period*. Further, the same stage may be said to appear at different times or periods in different areas and also end at different times. A stage may also include several locally distinctive culture complexes and minor time divisions. A great deal of discussion is needed on these points.

Periods in California Prehistory

I suggest that California's prehistory be divided into four major chronological *periods*, with each period being named for the dominant stage. We would thus have a hypothetical "Early Lithic period," a little-investigated "Paleo-Indian period," and the firmly established "Archaic" and "Emergent" periods. Further, I suggest that the current status of substantive knowledge allows us to place the periods within a chronological framework specific for the California area. Although precise time boundaries between the periods will be subject to change, it seems less likely that radical change in the overall chronology will be necessary. I have tentatively divided the Archaic into Lower and Upper periods. The Lower Archaic is dominated by the Early Milling Stone cultures with a relatively simple and uniform culture-type, although subareal variations occur. The Upper Archaic, the beginning of which I have made more or less coterminous with the beginning of the Medithermal, would include the Middle Horizon of the traditional Central California cultural sequence and the "Intermediate" cultures of southern California (Wallace 1955). I have suggested earlier in this essay that this period should be characterized by considerable diversity and irregularity of pattern.

I have also divided the Emergent into a Lower and an Upper. In Central California the Lower Emergent period would be represented by Phase 1 of the Late Horizon and the Upper Emergent representative would be Phase 2. During the ethnographic period, which would be coterminous with the Upper Emergent period, geographically and culturally marginal groups, such as the Yana, Atsugewi, and Coast Yuki, would have cultures of the Archaic Stage of cultural developmental but would be assigned to the Emergent period on the basis of chronology. The proposed periods, provisional dating, and examples of archaeological sites and units assigned to each period appear in table 3.2.

Two additional terms, the use of which is already established in California, are protohistoric and historic. The original use of protohistoric, a term coined by the French (Hole and Heizer 1969:37), was in relation to the study of peoples who were without writing themselves, but who must be studied with

reference to the history of a literate society. Following this meaning, the 1542 voyage of Cabrillo along the California coast can be taken as marking the beginning of the Protohistoric period in California. The 1492 contact of Columbus with the West Indies could also be taken as marking the beginning of the Protohistoric period, taking into consideration that diseases brought by the Columbus voyages conceivably could have spread widely and quickly throughout the New World (S. T. Brooks, personal communication).

The more commonly applied meaning for protohistoric as applied to Californian materials, and the one recommended here, is for the designation of the cultural period immediately prior to historic contact. In this sense the terms seems best applied to local and regional sequences. In the lower Sacramento Valley and San Francisco Bay regions the Protohistoric period is equivalent to the Upper Emergent period (Phase 2 of the Late Horizon). Different dating for the Protohistoric period is found in some other regions. For example, King (1968:115) assigned the upper component at Mad-117 in the San Joaquin Valley to "an entirely protohistoric date, suggesting a time depth probably not exceeding 700 years."

Bennyhoff (1977) placed the beginning of the historic period in California concurrent with the arrival of the Spanish on the California coast in 1769. It is obvious that many groups were not affected by European contact until considerably later, thus it may be more useful to cite local or regional dates for the commencement of the historic period. Use of the terms should be specified.

Employing the above framework fieldworkers, on the basis of horizon-styles and other known, widely spread cultural characteristics, would have a substantial likelihood of accurately assigning a given site to a specific period, but, once again, without necessarily identifying the culture under investigation with some reference point culture, such as one of those located in the lower Sacramento Valley.

Pattern. The division of California prehistory into major periods functions much the same as the traditional horizon framework, except for the crucial difference that the temporal dimension is kept separate from the cultural one. It follows, then, that the assigning of a particular phase or aspect to a particular period indicates little about the actual cultural content of the units or their relationship with comparable units. What must be introduced now is an integrative concept that fulfills the cultural function of the horizon concept, but without the temporal implications. I have chosen to refer to the concept by the term *pattern* and will discuss the choice of this term below.

The pattern is the archaeological unit out of which different phases and aspects are abstracted. The concept is similar to the concept of "culture" in its "culture-area" usage. That is, inherent in the concept are a number of separate, coexisting societies, each of which possesses to a greater or lesser extent similar characteristics. The pattern, then, is a way of life shared by a number of different peoples residing in a particular geographic space. The pattern differs decisively from the culture-area concept in that the territory in which it is manifested is considerably smaller in extent than the territory included in the spatial unit of the area, and is also smaller than the unit of the subarea, at least as these units are found in California. The closest parallel in respect to cultural groupings are the "cultural provinces" of Klimek (1935), which were arrived at inductively through statistical analysis. Thus, a number of separate, but inter-related archaeological patterns exist within the Central California subarea. A single pattern may be restricted spatially to a single region, although several regions may be included. A sequence of patterns in one region may not be identical with the sequence of patterns in another region, even though both regions may be included within the same subarea. There is no necessary temporal sequence implied by terminology.

An archaeological pattern, as defined here, represents an adaptive mode shared in general outline by a number of analytically separable cultures over a particular period of time within a comparatively large geographic space. Following Kroeber (1936, 1939), the pattern of a climax region is likely to differ from the pattern of adjacent marginal regions, despite the probability of shared historic origins of the cultures of the two kinds of regions. Cultures that share a pattern can be assumed to interact more with one another, both directly and indirectly, than with cultures exhibiting different patterns. Relationships which can be discerned between different patterns can be indicated by descriptive commentaries, since inclusion in the same culture-area implies fundamental relationships.

TABLE 3.2

Archaeological Periods in Central California

Period and Dating	Archaeological Site/Unit
Upper Emergent A.D. 1500	Phase 2, Late Horizon
Lower Emergent A.D. 300	Phase 1, Late Horizon
Upper Archaic 2000 B.C.	Middle Horizon Intermediate Cultures
Lower Archaic 6000 B.C.	Early Horizon Early San Francisco Bay Early Milling Stone Cultures
Paleo-Indian 10,000 B.C.?	San Dieguito Western Clovis
Early Lithic ?	Farmington ? Santa Rosa Island ?

Note: The temporal boundaries of any one archaeological culture may not correspond precisely with the dates given, e.g., Early Horizon (Windmiller Pattern) perhaps begins as late as 3000 B.C. and may persist until 500 B.C. (Ragir 1972).

A pattern is characterized by (a) similar technological skills and devices (specific cultural items); (b) similar economic modes (production, distribution, consumption), including especially participation in trade networks and practices surrounding wealth (often inferential); and (c) similar mortuary and ceremonial practices.

A single pattern will not be specifically uniform throughout the entire geographic space which it occupies. Regional and local variation, sometimes extreme, will occur, depending upon factors such as (a) abundance and nature of specific environmental resources; (b) regional specializations and elaborations, sometimes resulting from unique historic events; (c) degree of cultural and geographic marginality; and (d) influences of neighboring patterns. It is hypothesized that some patterns may have specific linguistic correlates in regard to origins, but such correlates must be demonstrated rather than assumed. During any one style-horizon, representatives of diverse language families may share the identical pattern.

A specific pattern should be defined in such a way as to make the identifying characteristics as generalized as possible, yet any two patterns should clearly contrast with one another. It should be emphasized that the definition of a particular pattern is based upon a configuration of trait elements. Individual characteristics may be shared mutually between two or more patterns, but the overall configuration of each pattern should be distinctive. Within a single culture-area or subarea, several patterns should be distinguishable. Although sharp boundaries between

patterns may not be discernible, the units themselves should be more easily manageable than larger units encompassing the entire area. It can be expected that during any given period in Central California there will probably exist a climax region pattern border region patterns which are strongly influenced by more than one climax culture, marginal region patterns where influence from two or more culture-areas is manifest, and coalescent patterns where characteristics from an earlier period strongly influence newer patterns. (See chapter 2, pp. 20-21, for further discussion of pattern variability, Ed.)

Within Archaic and Emergent cultures in Central California, the milling complex will always be present. The dominant or exclusive use of the mortar and pestle can *usually* be contrasted with the dominant or exclusive use of the handstone and milling stone. Projectile points will always be present, with forms being more conservative in marginal localities and the quantity of points in any single locality closely related to the economic adaptation. Marginal localities will have fewer trade items and will thus have smaller numbers of imported objects, such as beads, ornaments, stone pipes, and charmstones. Climax regions and tribelet centers will generally be richest in regard to artifact inventory and will show a greater variety of artifacts, more types of any given artifact, and more complex ceremonial indications than sites in marginal or subsidiary regions.

The term pattern was selected from several which have been suggested in recent years for this level of integration: horizon, culture, tradition, and pattern. The continued use of the term horizon (Beardsley 1954; Heizer 1949), without the temporal dimension, is not satisfactory for several reasons. Not only would continued usage imply the traditional Central California meaning, linking time with culture when only culture is desired, but this linkage would be reinforced by the general New World denotation of the temporal dimension of the term. There is also a conflict with the use of horizon-style as defined earlier in this essay.

Ragir (1972) has substituted the term culture for horizon in her recent modification of the Central California Taxonomic System. Although she did not define her use of the term, the context implied compatibility with definitions such as that of Childe (1950:2):

> an assemblage of artifacts that recur repeatedly associated together in dwellings of the same kind and with burials by the same rite. The arbitrary peculiarities of implements, weapons, ornaments, houses, burial rites and ritual objects are assumed to be the concrete expression of common social traditions that bind together a people.

This usage would seem more appropriately applied to the concept of phase than to that of pattern as discussed above, since it is the phase (in this essay) which comes closest to approximating a discrete ethnographic culture. Krieger (1964:26) proposed a much broader use for the term culture, suggesting it be applied to "similar material that is found over great regions." The primary objection to the use of the term culture for the present context is that the word is thoroughly entrenched in anthropological vocabulary with a broad spectrum of meanings, and it does not seem advisable to restrict this range. Culture ranges in meaning from the ways of life practiced by members of a particular society, through the ways of life common to broader groupings of particular societies (such as those found within culture-areas), to the ways of life common to all humankind.

As noted earlier, the term *tradition* was one of the alternatives to horizon discussed during the Davis workshops. The fact that the term has already appeared in print several times (Gaumer 1968; King 1968; Schulz 1970) argues in favor of its adoption, since to introduce yet another term would seem to add even more complexity to the literature. The term has much to recommend it, especially in the sense employed by Goggin (1949:17, cited in Willey and Phillips 1958:36ff.), which closely approximates the concept now being explicated:

> My concept of Florida cultural traditions is similar in theory but more inclusive in content than a ceramic tradition. A cultural tradition is a distinctive way of life, reflected in various aspects of the culture; perhaps extending through some period of time and exhibiting normal internal cultural changes, but nevertheless throughout this period showing a basic consistent unity. In the whole history of a tradition certain persistent themes dominate the life of the people. These give distinctiveness to the configurations.

Willey and Phillips, while recognizing the virtue of

this usage, reject this use of tradition, preferring to restrict it to "single technologies or other systems of related forms." Willey (1966:4), in his synthesis of North and South American prehistory, employed the term to refer to:

> major cultural groupings as these can be discerned in geographical space and in chronological time. In every instance these dimensions of space and time are appreciable. Each major cultural tradition also probably had a definite ideological pattern or world view. This can be demonstrated for some of them in their thematic arts, evidences of religious practices, and intellectual pursuits. For others, however, particularly the earliest of the New World traditions, the data are inadequate to allow such reconstructions.

Thus, just as the term culture had a broad series of meanings, so does tradition. I consider it advisable to retain the flexibility of both terms rather than to restrict their meaning to a single dimension.

The term pattern can be similarly criticized in that it has a range of increasingly broader meanings. I have selected it primarily because it is not widely employed in the archaeological literature in any of its meanings (but see Warren 1968:26-27, Ed.), contrasting in this respect with both culture and tradition.

As a general principle, I suggest that a pattern be given the name of the first site at which it is recognized. This does not imply any archaeological priority for the site thus employed. The priority relates only to the recognition by archaeologists, not to elaborateness of culture content or to temporal priority for the site in a chronological sequence. If such a label proves to be ambiguous, for instance, if it is already in use in some other context, an alternate label should be chosen.

With respect to the archaeologist in the field, I suggest that the pattern is the unit, along with the period, which is most generally recognized. I emphasize once again that in practice *the pattern is not built up of aspects, but that aspects and their constituent phases are analyzed out of the more general pattern.* Thus, a pattern is defined in terms of generalized forms and types, whereas aspects and phases are defined in terms of certain distinctive features which characterize these general forms and types.

Criteria for Several Patterns in Central California[1]

Windmiller Pattern. The Windmiller Pattern, which appears to have its origin in the Lower Archaic period and to have persisted into the Upper Archaic period (Ragir 1972), includes the components previously included with the Early Horizon of the lower Sacramento Valley. It has recently been renamed by Ragir (1972) as the Windmiller culture. Windmiller components are restricted to the Cosumnes District of the Delta region. Criteria for the Windmiller Pattern are as follows:

a. Technological skills and devices. Mano and metate, although rare, are accompanied by small mortars (possibly meat or paint grinding implements). The dart and atlatl, as well as the spear occur. Atlatl spurs are rare and are of polished stone. Non-obsidian, stemmed projectile points are dominant and numerous flaked points have basal edges smoothed by grinding. While the bone industry is not elaborate, the polished stone industry is, including the biconical drilling of stone tubes and shell bead appliqué, but no true inlay occurs. Impressions on baked clay document close twined basketry.

b. Economic modes. The relative number of projectile points as contrasted with the small number of grinding implements suggests a hunting emphasis. Inferentially, neither the acorn nor other seeds are too important. Trade appears to be focused primarily upon acquisition of ceremonial and ornamental objects, which appear to have been obtained as finished specimens rather than as raw material.

c. Burial and ceremonial practices. Interment occurs both in intravillage grave plots and in nonmidden, off-village cemeteries. The mortuary complex has a ceremonial emphasis, with abundant, deliberate grave furnishings relatively common. The most frequent burial posture is westerly oriented ventral

1 Compare the additional detail in this section, pp. 43-47, with the outline developed by Bennyhoff and Fredrickson (chapter 2, pp. 22-24) six years earlier, Ed.

extension, although westerly oriented dorsal extension also occurs. One site yields rare flexure and secondary cremation. There is some work in human bone and evidence of head-taking. The use of red pigment and the paint palette is documented.

d. Variations in the Windmiller Pattern. The cluster of sites, predominantly on the Mokelumne River, involved in the definition of the original Early culture or Early Horizon, forms the nucleus of the present definition of the Windmiller Pattern. The elaborateness of the mortuary practices suggest that these practices may be a regional specialization due to favorable economic resources. The culture represented appears to have been at a climax point, possibly related to the favored environment. If this is assumed, then it can be hypothesized that the areas geographically marginal to the Mokelumne cluster of sites will present an abbreviated version of the ceremonial complex. The Bear Creek site (SJo-112; Olsen and Wilson 1964), believed to be a Windmiller Pattern site, located more than ten miles to the south of the Mokelumne site cluster, shows a significantly smaller number of charmstones and chipped stone tools as grave furniture. Although this is not necessarily indicative of a significant difference in the ceremonial complex, it is suggestive of such a difference.

Berkeley Pattern. The Berkeley Pattern, predominantly of the Upper Archaic period but with possible Lower Archaic antecedents, includes those components previously included within the Middle Horizon, renamed by Ragir (1972) as the Cosumnes culture and referred to by Gaumer (1968) as the Emery Tradition. The earliest phases of the Berkeley Pattern appear to be contemporaneous with the late phases of the Windmiller Pattern (Fredrickson 1966; Gerow with Force 1968; Ragir 1972). The name Berkeley rather than Emery (for Emeryville where this pattern was first recognized) has been selected in order to avoid ambiguity, since Beardsley (1954) already used Emeryville as the name for a basic Late Horizon facies. Cosumnes is also unacceptable since Bennyhoff (1977) used the word to refer to a district of the Delta region. Berkeley Pattern components are more numerous than Windmiller Pattern components and are found in the Delta and San Francisco Bay regions. The criteria for the Berkeley Pattern are as follows:

a. Technological skills and devices. The minimally shaped cobble mortar and cobble pestle are employed almost exclusively as the milling implements. Manos and metates, while sometimes present, are rare. The dart and atlatl are present, the atlatl being represented by rare engaging hooks usually of bone or antler. Chipped stone projectile points are less frequent than in the Windmiller Pattern, and nonstemmed forms predominate. There is a growing emphasis upon the bone industry during the temporal span of this pattern. Mammal bone is more commonly employed than bird bone. The polished stone industry does not appear to be as highly developed as it is with the Windmiller Pattern.

b. Economic modes. As indicated by a high proportion of grinding implements in relation to projectile points and by the regional accumulation of large shell heaps, the Berkeley Pattern has a collecting emphasis. The acorn is probably the dominant staple. The large number of sites and great depths of deposit suggest a larger population than that supported by the Windmiller Pattern. There is no apparent emphasis upon either trade or wealth. The use of local material predominates. Trade goods, when they appear, are finished specimens, rather than raw material.

c. Burial and ceremonial practices. The mortuary complex is rarely elaborated. Flexed burial with variable orientation occurs in village sites. Burial goods are mostly restricted to a few utilitarian items or to ornamental objects which are compatible with an interpretation of being part of a relatively unelaborate burial costume. Ceremonialism is indicated predominantly by shamanism, that is, by the presence of single graves with objects compatible with known ethnographic "shaman's kits," e.g., quartz crystals, charmstones, bone whistles. Graves are sometimes accompanied by bird and animal bone, occasionally by articulated portions of skeletons. Birds and animals sometime are found as ceremonial burials.

d. Variations in the Berkeley Pattern. Regional specializations reflect at times differing environmental resources. For example, along the San Francisco Bay shoreline and the Marin-Sonoma coast, Berkeley Pattern sites emphasize the collection of shellfish. Notched stones, presumably net weights, are common in these localities, while absent in interior sites. Archaeological components in the northern San Joaquin Valley show a blending of the Windmiller with the

Berkeley Pattern, although it appears that the Windmiller Pattern has historical priority in the region. With additional information it may prove necessary to distinguish the components in this region as part of a separate pattern.

Augustine Pattern. The Augustine Pattern of the Emergent period includes those cultures previously included within the Late Horizon (named the Hotchkiss culture by Ragir [1972]). The Augustine Pattern appears to be a coalescent pattern merging the previous Berkeley Pattern with many new traits and involving a change in the general economic complex. Augustine Pattern components occur in many regions of the Central California subarea, although further analysis is necessary before its precise distribution can be determined. Augustine Pattern criteria are as follows:

a. Technological skills and devices. Well-shaped mortars and pestles are common. The bow and arrow are present, as evidenced by a growing increase in the number of small projectile points beginning in the earlier phases of the pattern. The dart and atlatl appear to drop out of use early during the pattern. Fishing implements, while rare in absolute terms, occur more commonly and in different types than in the Berkeley or Windmiller Patterns. The harpoon is introduced during early phases of the pattern. Bone work is not as extensive as with the Berkeley Pattern, but bone awls, probably indicative of a coiled basketry industry, are common. Polished stone now includes tubular pipes as well as charmstones, which often are not as well made as those of the Berkeley and Windmiller Patterns. Use of and work in shell is common.

b. Economic modes. Fishing appears to be added to a strong collecting emphasis, while hunting (inferred by greater numbers of projectile points found in middens) may be more important than during the period of the Berkeley Pattern. The acorn is the dominant staple, as judged in part by charred specimens found in middens. There is high development of trade, beginning initially with finished specimens serving as trade items, and developing by the addition of raw materials involved in trade. Gradually, more trade items appear that can be identified as coming from relatively great distances. During the Upper Emergent period the Augustine Pattern appears strongly influenced by trade and wealth items deriving from the North Coast Ranges, a region which in earlier periods did not appear to participate to any great extent in the patterns so far discussed. Social differentiation in regard to wealth in the Augustine Pattern is evidenced by considerable variation in grave furnishings.

c. Mortuary and ceremonial practices. Cremation and preinterment grave pit burning of burial furnishings co-occur with flexed burial, with cremation apparently reserved for relatively wealthy and prestigious individuals, judging from the differential distribution of grave gods often found with the two burial modes. Grave orientation is variable. Ceremonialism, possibly indicative of widespread secret societies documented during the ethnographic period, is evidenced in the artifactual complexes, markedly emphasizing shell beads and ornaments, found with graves.

d. Variations in the Augustine Pattern. Due to the developing elaborateness of the trade networks, localities which were unfavorably situated with respect to trade routes show considerably less embellishment of the Augustine Pattern than localities which are more favorably situated. Nonetheless, more trade objects are evident in the marginal localities than in comparable localities which follow the Berkeley Pattern. The importance of fishing in the Augustine Pattern implies that localities favorably situated with respect to fish resources will have a more elaborate cultural development than those in mountainous regions. In the northern San Joaquin Valley the presence of extended burials in components which tentatively can be classified as participating in the Augustine Pattern may reflect a continuing influence from earlier Windmiller Pattern cultures.

Borax Lake Pattern. What is here referred to as the Borax Lake Pattern was first identified as a distinctive cultural manifestation at the Borax Lake site (Harrington 1948) in the vicinity of Clear Lake. The pattern, which includes sites subsumed by Meighan (1955) as belonging to the Borax Lake and Mendocino complexes, is characteristic of the Lower Archaic period and has regional representatives persisting into the Upper Archaic period. It has been suggested (Baumhoff 1957; Baumhoff and Olmsted 1963, 1964; Wallace 1954) that what is here referred to as the Borax Lake Pattern is historically related to the Early

Milling Stone cultures of the Southern California subarea as well as to the Windmiller Pattern of the Delta region. The spatial distribution of Borax Lake Pattern components is not compatible with these possibilities. Borax Lake components are found throughout the North Coast Ranges, with strong indication that the same or a related pattern may also occur in the South Coast Ranges (Pilling 1955). Despite the possibility of a direct historical relationship between the Borax Lake and Windmiller Patterns, the extent of difference in economic mode and ceremonial behavior gives sufficient justification for establishing two distinct patterns. Criteria for the Borax Lake Pattern are as follows:

a. Technological skills and devices. Mano and metate occur with greater frequency than in the Windmiller Pattern. Mortar and pestle commonly occur along with mano and metate in later phases. Atlatl (inferred) and dart occur, as well as the spear. Stemmed, nonstemmed, and concave base projectile points, predominantly of local materials (either obsidian or chert), are present. There is some evidence of a burin technology. Polished stone items are found, but are quite rare. No evidence of a significant bone industry has yet turned up, although this may be due to differential preservation resulting from soil conditions. Similarly, no evidence of a shell industry has been found.

b. Economic modes. The relatively large number of milling implements as contrasted with the relatively small number of stone projectile points suggests a generalized hunting-collecting economy, with collecting given an edge over hunting in importance. No evidence for fishing has been preserved. The use of local materials predominates; trade does not appear to have been particularly well developed, although in later phases contact with other patterns appears to increase. There is no evidence of any wealth emphasis.

c. Mortuary and ceremonial practices. No interments have been found in habitation sites in earlier phases, although in one late phase site burials do occur in the midden. No non-midden burials have yet been identified. Utilitarian objects, mainly pestles and projectile points, were found with the late phase burials. Polished stone items suggestive of ceremonial purposes include rare ovoid perforated charmstones and a single occurrence of a small, tabular, centrally side-notched, ground stone object, possibly representing a form ancestral to the "painted tablets" of the Napa and Berryessa valleys.

d. Variations in the Borax Lake Pattern. At present two aspects of the Borax Lake Pattern have been identified, distinguished by the stone materials employed and the forms of the projectile points utilized. There is a northern aspect focused in Mendocino County and extending to the east side of the Coast Ranges, and a southern aspect, focused in Lake County and extending southward into Sonoma, Napa, and Solano counties. No regional specializations have yet been found, unless the "inscribed stones" of the Redding District (Edwards 1969) can be so considered. If the Borax Lake Pattern were related to the Windmiller Pattern, it would represent both a culturally and geographically marginal variant.

Houx Pattern. The cultural assemblage which makes up what is referred to here as the Houx Pattern has not been previously described. The pattern is described at this time on the basis of materials obtained through stratigraphic excavations at a single site, Lak-261 (the Houx site), supplemented with comparative materials from neighboring localities. The Houx Pattern, found at this time only in the North Coast Ranges, is assigned to the Upper Archaic period, but it appears significantly different from the Berkeley Pattern which dominates this period in the Delta, San Francisco Bay, and Marin-Sonoma County coastal sites. Criteria for the Houx Pattern are as follows:

a. Technological skills and devices. The mortar and pestle dominate the milling industry. The atlatl (inferred) and dart occur, but the bow and arrow are absent. Nonstemmed projectile points predominate, but broad, triangular, stemmed projectile points also occur. Well-flaked scrapers of various shapes and sizes are common. Locally available obsidian and basalt are the raw materials for virtually all chipped stone tools. Technical and possibly functional burins are relatively common. No polished stone objects have yet been recovered. The bone industry does not appear to be particularly well developed, but this may be due to soil conditions which act against preservation of bone. Work in shell is present in the form of beads, probably obtained by trade.

b. Economic modes. Projectile points are ex-

tremely numerous, both in absolute number and in relation to number of milling implements. Although this would strongly support a hunting emphasis, relatively little bone debris was recovered from the single stratigraphically excavated Houx component. Charred acorns were recovered from the site matrix. Poor preservation of bone may be responsible for this anomaly. Local materials predominate with little development of trade except as suggested by the presence of shell beads. There is no evidence of any wealth emphasis.

c. Mortuary and ceremonial practices. Flexed and semi-flexed interments occur within the habitation site. Although few burials have been recovered, those which were found show an undeveloped ceremonial complex with few associations. They are suggestive neither of a ceremonial nor of a utilitarian emphasis to the mortuary complex.

d. Variations in the Houx Pattern. While the Houx Pattern may prove to be a specialized adaptation based upon the Berkeley Pattern, at this time it appears significantly different from the latter to warrant classification as a separate pattern. So far, Houx Pattern sites appear to be focused in Lake and Sonoma counties, but similarities in projectile point types provocatively suggest connection with Berkeley Pattern components on the Marin-Sonoma coast and with components assigned to the Berkeley Pattern in Napa County. Projectile point types and the burin technology also suggest connections with Borax Lake Pattern sites of the earlier Lower Archaic period and with one or more as yet undefined patterns (Martis Complex) of the Sierras. Further excavation must be carried out to determine in more detail relationships of the Houx Pattern to other patterns in both space and time.

4

The Napa District and Wappo Prehistory

James A. Bennyhoff

(1977, with revision in 1986)

AS THE SOUTHERN OUTLIERS of the Yukian stock, the Wappo of Napa Valley have posed intriguing interpretive problems ever since Powers (1877:197) suggested a Russian River Valley homeland for the Yuki-Wappo, with later displacement by intruding Pomo. It has long been recognized that archaeology could contribute crucial insight on the prehistory of this most ancient (?) of surviving linguistic stocks in California, but the published results to date have been so deficient that we are faced with more questions than answers. In this paper, after a brief review of the problems, I will summarize the available archaeological sequence and suggest certain marker types which serve to distinguish the Napa District from neighboring districts. Despite inadequate data, I will conclude with a series of hypotheses for future testing as to when the Wappo first entered Napa Valley.

Unresolved Problems

The major problem facing the prehistorian who seeks to link the ethnographic Wappo with the archaeological Napa District is the lack of established ethnic boundaries as of A.D. 1770. The "standard" maps (Barrett 1908; Kroeber 1925; Heizer 1966:map 4) are not in agreement and clearly reflect post-1830 changes. As documented by McClellan (1953:map 2) and Gifford (1967), the Lile'ek of Clear Lake and the Alexander Valley Wappo represent post-Contact movements. Mission documents and archaeology indicate that Southern Patwin (Pooewin) claims to Sonoma Valley and Suscol (Nap-15) reflect post-Secularization shifts. While Powers's (1877:196) restriction of the Wappo to the Geysers-Calistoga locality is too extreme, I suggest that Merriam (Heizer 1966:map 5) was correct in placing the southern Wappo boundary near Yountville, with an expanded Napato-Nanutawe group (Hill dialect of Southern Patwin) occupying the mouth of the Napa Valley and the Soda Creek drainage. In addition to the fact that the Valley was named after the Napato Patwin, the burials and primary cremation found at Nap-14 provide links with Sol-2 in Patwin territory. Moreover, preliminary analysis of female personal names support Merriam's dialect separation of the Napato. Finally, I suggest that the Wilikos Wappo did not occupy the headwaters of Sonoma Creek aboriginally; Sonoma Valley was deserted when Mission Solano was founded in 1823, and the late baptismal dates for Guiluc (first contacted by Mission San Rafael) indicate a more distant location in 1822-23. Thus, in addition to more archaeology in border localities, more intensive analysis of mission records, place names, and linguistics is needed to define aboriginal Wappo boundaries. For

present purposes, my definition of the Napa District includes only the watershed of the Napa River north of Yountville.

With minor exceptions, our ethnographic view of Wappo culture is derived from Alexander Valley informants; no Culture Element Distribution list was attempted. The archaeological record at present does not support the universal opinion of ethnographers that Wappo culture was indistinguishable from that of Pomo. Rather, it would appear that the remnant Western Wappo group was forced to acculturate to the more integrated Russian River and Clear Lake Pomo tribelets as pressure from white settlement in the Napa Valley increased.

The deficient archaeological record is well known. Such major sites as Nap-1 and Nap-32 were excavated by shovel in foot levels without screening; and no adequate horizontal or vertical samples from either site were obtained. Few recorded grave lots are available to establish contemporaneity of types found scattered in multicomponent middens and in the large undocumented collections obtained by amateurs. The major work (Heizer 1953) was written by beginning students in 1949 who failed to incorporate crucial information. My recent reanalysis of this material revealed numerous errors (e.g., the location of Nap-37; confusion of Burials 1 and 7 in table 3; "clam disc beads" reported in table C, app. IV, Bur. 3), omissions (e.g., three burials were omitted in the Nap-32 analysis; points with cremations were omitted in table 3; no tabulation of the artifacts with cremations was provided; no depth analysis was provided for the bone tools), inadequate typologies (e.g., stemmed and corner-notched points both lumped in Type 25; serrated and non-serrated forms were not separated; willow-leaf points mixed with drills at Nap-131), and meaningless tables (e.g., table 4 [shell beads]; table A, app. III [lumped arrangement of traits from Nap-129, -131]; tables A, B, app. IV [the Late occupation at Nap-32 is largely confined to the northeast edge, but Middle and Late horizon traits are a mixed jumble in this single depth table]). Hence, significant details of a skeletal framework remain concealed to this day, and a complete and repetitious reanalysis will have to be done. I will merely attempt to indicate major gaps in the available data on the basis of an extremely preliminary and incomplete survey. While the existing collection in the Lowie [now Phoebe A. Hearst] Museum of Anthropology should be large enough to be representative of the later periods, most specimens lack provenience. Hence, many problems of phasing and function can only be resolved by new, carefully controlled excavations in addition to rigorous typological and laboratory analyses. The full significance of most types will remain quite uncertain until more grave lots become available. Both radiocarbon and obsidian hydration dating pose problems too numerous to mention herein. The cultural sequence, as currently conceived, appears in figure 4.1; site locations appear in Heizer (1953:map 1).

Cultural Phases

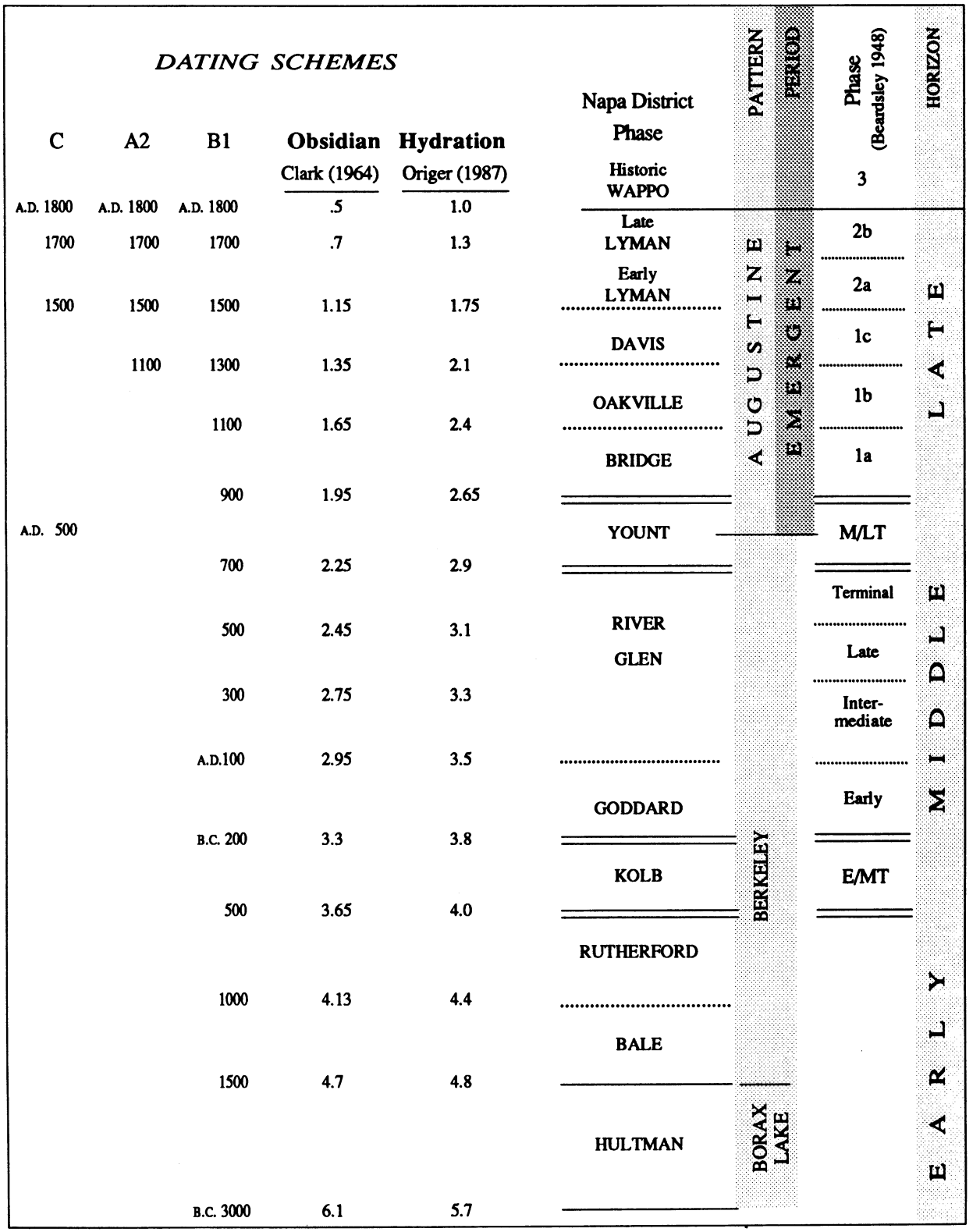
Heizer and Elsasser (1953:23, note 6) suggested that a basalt-using culture might have occupied the Napa Valley prior to the shift to the use of obsidian. If correct, a Merriam phase (type component Nap-129D), characterized by the use of basalt core tools, might be defined as the oldest remains yet recognized in the Napa District. However, Fredrickson (1973) found that the occasional use of basalt is typical of the later Borax Lake Pattern, and handstones/milling slabs were associated with the abundant basalt tools that characterize the Oakshores assemblage (Berryessa I:True, Baumhoff and Helen 1979). The scattered distribution of artifacts and near-absence of projectile points associated with the Oakshores assemblage suggest that specialized procurement activities, rather than temporal factors, account for the basalt emphasis. Hence, until stratigraphic evidence demonstrates the priority of basalt core tools over milling equipment, the Merriam/Oakshores assemblage (6000-3000 B.C.) will be assigned to the early phase of the Borax Lake Pattern.

The Hultman phase (type component Nap-131A) appears established as a late component of the Borax Lake Pattern (Fredrickson 1973). The unpublished 1960 excavations presumably strengthened the small number of reported handstones (and milling stones?), but Borax Lake wide-stem points have yet to be reported.

The next two phases (Bale and Rutherford) must remain tentative until a detailed analysis has been

FIGURE 4.1

Napa District Cultural Sequence



Dating schemes C, A2, and B1 are from Bennyhoff and Hughes (1987:147, fig. 10); obsidian hydration rim thickness expressed in microns (μ).

completed. Both phases are represented by stratigraphic layers below Kolb phase burials at Nap-32. Since the Kolb phase can be firmly placed in the Early/Middle Horizon Transition, both Bale and Rutherford must be contemporaneous with the Windmiller Pattern of the Delta region. However, both phases feature exclusive use of the mortar and pestle, so they represent early phases of the Berkeley Pattern. Movement from the south is inferred, where older relatives are known (SMa-77, Ala-307, Mrn-152, Mrn-138, Mrn-266). Assignment to the Houx aspect must remain quite tentative until more analysis of the Marin material has been completed.

The Bale phase (type component Nap-32G) is represented by artifacts from the basal yellow loam layer (ca. 3 feet thick) at Nap-32 (Heizer 1953:figs. 2, 3; app. IV). Traits include mortars and pestles, bipointed spears, "Type 17" points, and ulna awls and flakers. Whether steatite and Olivella split drilled beads are intrusive remains to be determined. It can be proposed that dependence on an acorn staple is established in this phase and persists, along with an emphasis on ulna tools, to historic times in the Napa District.

The Rutherford phase (type component Nap-32F) is represented by artifacts from the brown midden layer and the grave associations of Burials 2, 6, and 7. In addition to flexed burial, new traits include leaf-shaped points, Excelsior points, one concave-base point, cannon bone awls, a gorge hook, and painted slabs (not to be confused with the shaped tablets of protohistoric and historic times). Mortars, pestles, ulna awls and flakers, and exclusive use of obsidian for points continue from the Bale phase. The brown midden suggests seasonal occupation. Heizer and Squire (1953:319) suggest that two slab mortars were used with a basketry hopper, but I have not yet found these specimens in the Phoebe A. Hearst Museum collection.

The Kolb phase (type component Nap-32E) is defined on the basis of six flexed burials (nos. 1, 3-5, 8, 9), the graves for which were dug from the upper black midden. In association were Olivella bevelled beads and oval saddles, marker types for the Early/Middle Horizon Transition as established by occurrence with Windmiller types at SJo-142 and SJo-91; bevelled beads occurred with Macoma clam discs (another marker type) at Lak-261. Additional traits include Olivella ring beads (typically early Middle Horizon), unique abalone ornaments (Heizer 1953:app. IV, pl. Bp, q), triangular abalone ornaments (all *H. rufescens*), bone spatula, incised bone, a bird-bone whistle, ulna tools, Excelsior and leaf-shaped points, and small mortars. Only one of thirty-eight ornaments was made from *H. cracherodii*, but the punctation on the three wide triangulate ornaments should be related to the similar decorative technique found on abalone ornaments in the terminal Windmiller components at SJo-112 and Cal-237 as well as similar decoration on bone in the early Middle Horizon at Ala-309. Sedentary occupation is inferred at Nap-32 on the basis of the black midden.

The Goddard phase (type component Nap-1H) can be defined from the burials at Nap-1 and the deeper midden. Olivella saucers and rings place the burials in the early Middle Horizon. Excelsior points and ulna tools continue from the Kolb phase. The brown midden may indicate seasonal occupation.

A major problem in the Napa District concerns the definition of later Middle Horizon phases. Despite the large Lillard and Davis collections, only two square saddle beads from mixed deposit are known at present; no fish spears, rectangular ornaments, or other later Middle Horizon diagnostics have been reported. Grave lots will be needed to clarify what appears to be a very stable point sequence. The Yount phase (Nap-1G) is based on four earspools without provenience and may represent the terminal Middle Horizon, rather than the Middle/Late Horizon Transition.

Most of our evidence for Phase 1 of the Late Horizon (Augustine Pattern) is based on point types obscured by faulty typology and badly mixed midden deposit. The Bridge phase (Nap-1F) is defined on the basis of one scored abalone ornament and one infant burial with Olivella thin rectangles from Nap-1, and three thin rectangles from Nap-32 (all might represent the early Oakville phase). Since no later burials occur, one may hypothesize that cremation had become normal, but the earliest datable cremation represents Late Phase 1.

The widespread Oakville phase (Middle Phase 1, Nap-1E) is defined by the occurrence of straight-stemmed arrow points with many square serrations

("Type 30"); the expanding stem variant has yet to be separated from "Types" 29 and 26. Serrated scapulae appear for the first time. Faulty typology also obscures late Phase 1 at present (Davis phase, Nap-1D:cremation 6), but it should be noted that no bead lots with Olivella cupped beads or end-perforated thin rectangles have yet been reported.

The protohistoric Lyman phase (Phase 2, Nap-348A,B) is abundant all over Napa Valley, but grave lots of the earlier portion remain rare. Likewise, only minimal data are available for the complex historic period.

Marker Traits of the Napa District

With such a skeletal outline available, it may seem preposterous to attempt to distinguish a Napa District. Sonoma Valley (historic Coast Miwok) remains virtually unknown, as does the northern border occupied historically by Pomo and Lake Miwok. The Solano District (Historic Southern Patwin) has a fair sequence but remains unanalyzed in detail. In addition, we are dealing with a sub-regional diffusion sphere (marked by painted stone tablets and an abalone ornaments complex in Protohistoric/Historic times) which blurs the distinctiveness of the Napa District; clarification can only come from detailed percentage frequencies. Nonetheless, the following is offered as a beginning attempt to follow the ethnographic Wappo into the past (cf. figure 4.2).

Historic burials and identifiable tribelet centers (Nap-1 = Callajomanus; Nap-4,5 = Eaimus) allow one to equate the Lyman phase (Protohistoric) with ancestral Wappo, while differences observable at Patwin centers (Nap-15 = Suscol, first occupied after secularization; Nap-59 in Berryessa Valley = Topaito; Nap-39 = Tulukai) and Coast Miwok centers support the definition of the St. Helena aspect as ancestral Wappo. Marker traits in the Lyman phase (starred traits occur in historic burials) include:

*1. Solid band style of painted stone tablets (Heizer 1953:fig 2, b-e). (The Patwin style is polychrome with crisscross designs; the center for this protohistoric cult is Nap-57, Wooden Valley Patwin, but tablets have been found as far away as the historic Nisenan site Sac-16).

2. Hatched triangle style on incised bird-bone ear tubes (Heizer 1953:fig. 11 e).

*3. Absence of Desert Side-notched and side-notched leaf-shaped arrow points.

*4. Low frequency of simple leaf-shaped arrow points.

*5. Absence of chert drills; use of "Type 40" obsidian drills in the manufacture of clam disc beads. (Strongest contrast with Sonoma Pomo.)

6. Magnesite pipes without double flange (probably historic).

*7. Little emphasis on abalone ornaments (strongest contrast with Berryessa and Wooden Valley Patwin).

Positive traits which distinguish the prehistoric phases of the St. Helena aspect ("Phase 1") will require metrics. While Napa Valley knappers almost equalled the square serration skill of Delta knappers, I believe Napa Valley serrated points are thicker with a higher frequency of pointed serration; shorter points and miserable serration distinguish Sonoma and most Marin points. More emphasis on leather may be a Wappo legacy from a northern homeland, evidenced archaeologically by special bone beamers (Heizer 1953:298). The late sample is large enough to emphasize such notable absences as simple harpoons and effigy ornaments (especially banjos) which sharply differentiate the Napa District from the Solano District. The problem of cremation is too complex to warrant discussion herein, but one may hypothesize that the Wappo entered Napa Valley practicing secondary cremation at the beginning of the Late Horizon[1] and this practice later spread to the Coast Miwok (middle Phase 1), Pomo (Phase 2), and Costanoan (Phase 2). Otherwise, the absence of gravepit burning (strong among the Patwin) is difficult to explain.

The sample of components for the Houx aspect is too limited to emphasize, but two ornament types from Nap-32E have not been found elsewhere, while the absence of split-rib strigils, fish spears, mesh

[1] By this hypothesis, the single infant burial in the Oakville phase at Nap-1 represents an individual too poor to merit cremation.

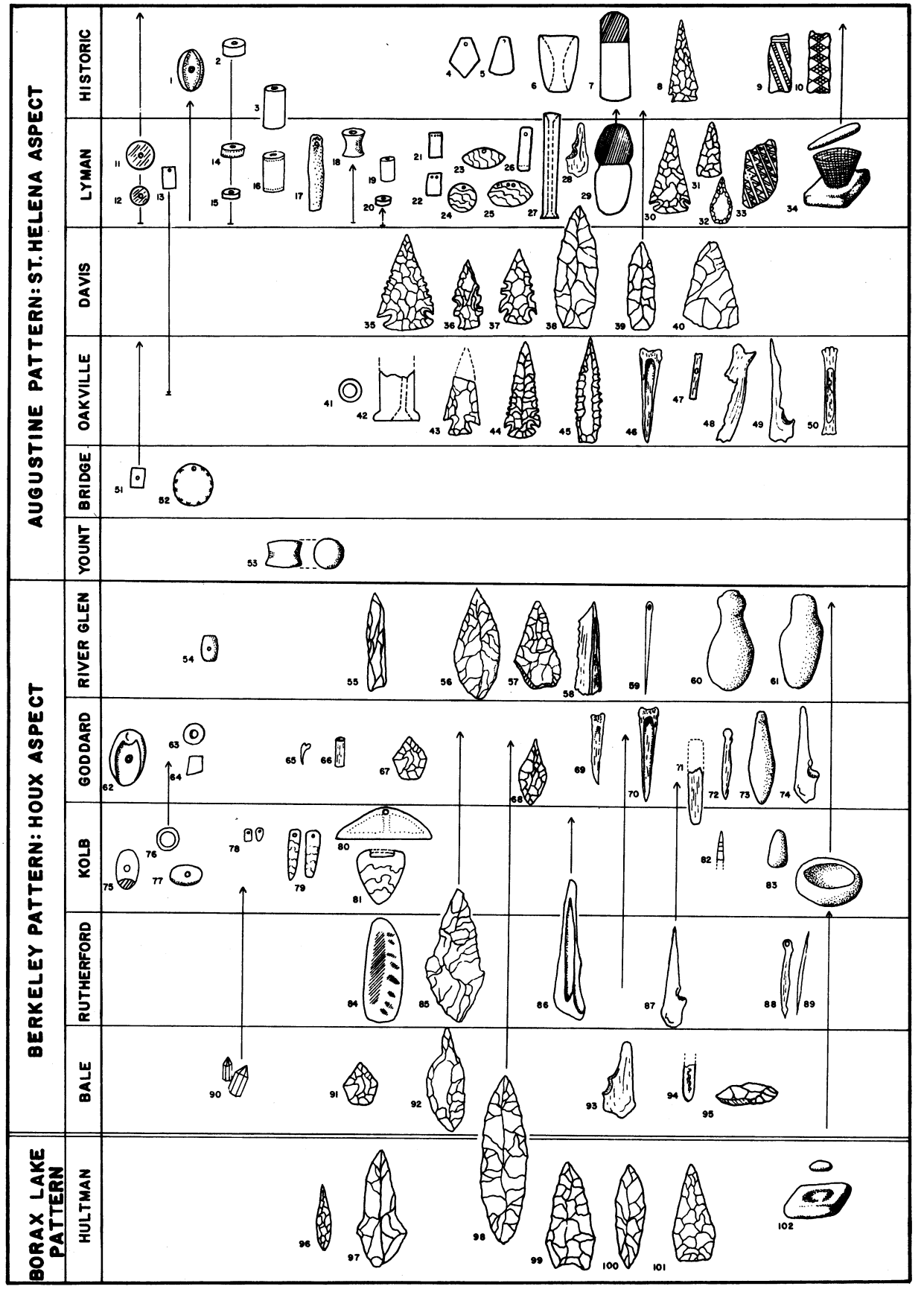

AUGUSTINE PATTERN: ST. HELENA ASPECT
BERKELEY PATTERN: HOUX ASPECT
BORAX LAKE PATTERN
HISTORIC
LYMAN
DAVIS
OAKVILLE
BRIDGE
YOUNT
RIVER GLEN
GODDARD
KOLB
RUTHERFORD
BALE
HULTMAN

FIGURE 4.2

Napa District: Significant artifact types. Relative scale attempted for related groups. Position of specimens shown within phases has no chronological significance. Approximate length or diameter of artifacts is provided in caption where available. Reproduced courtesy of Academic Press, Inc.

1. Olivella lipped bead; **2.** Magnesite disc bead; **3.** Magnesite cylinder; **4-5.** Haliotis ornaments, 2.9 cm.; **6.** Steatite pipe, 2.8 cm.; **7.** Decorated stone tablet (hatched area is painted red), 6.2 cm.; **8.** Obsidian corner-notched arrow points, 5.1 cm.; **9-10.** Incised bone tube fragments; **11-12.** Clam shell disc beads; **13.** Olivella thin rectangle bead (pendant); **14.** Magnesite disc bead with drilled decoration; **15.** Magnesite disc bead; **16.** Magnesite cylinder with drilled decoration; **17.** Slate pendant, 6.4 cm.; **18.** Steatite hourglass bead, 7 mm. (average length); **19.** Steatite tubular bead, 1.1 cm.; **20.** Steatite disc, 1.5 cm.; **21.** Haliotis ornament, 3 cam.; **22.** Haliotis ornament, 2.2 cm.; **23.** Haliotis ornament, 4.7 cm.; **24.** Haliotis ornament, 2.7 cm.; **25.** Haliotis ornament, 3.3 cm.; **26.** Haliotis ornament; **27.** Steatite pipe, 41.8 cm.; **28.** Ulna flaker, 9 cm. (average length); **29.** Decorated stone tablet (hatched area is painted red), 2.54 cm.; **30.** Obsidian corner-notched projectile point, 3.9 cm.; **31.** Obsidian projectile point, 5.4 cm.; **32.** Obsidian drill, 4.4 cm.; **33.** Incised bone tube fragment; **34.** Hopper mortar and pestle; **35.** Obsidian serrated, corner-notched projectile point, 4.7 cm.; **36.** Obsidian stemmed projectile point with square serrations, 3.3 cm.; **37.** Obsidian corner-notched projectile point with square serrations, 3.3 cm.; **38.** Obsidian biface, 9 cm.; **39.** Keeled obsidian tool 6 cm.; **40.** Obsidian knife, 5.7 cm.; **41.** Steatite ring bead; **42.** Steatite pipe fragment; **43.** Obsidian expanding-stem projectile point, 2.2 cm.; **44.** Obsidian corner-notched projectile point with square serrations, 5.6 cm.; **45.** Obsidian serrated projectile point, 5.4 cm.; **46.** Metapodial awl (Type A1bII); **47.** Bird-bone whistle; **48.** Despined scapula grass cutter; **49.** Ulna matting tool; **50.** Metapodial beamer; **51.** Olivella thin rectangle bead; **52.** Haliotis pendant with scored decoration, 4.35 cm.; **53.** Steatite ear plug, 2.85 cm.; **54.** Olivella square saddle bead; **55.** Obsidian bangle; **56.** Obsidian biface; **57.** Obsidian burin faceted biface fragment; **58.** Scapula saw fragment; **59.** Bone needle, 8.8 cm.; **60.** Charmstone, 6.7 cm.; **61.** Charmstone, 6.1 cm.; **62.** Olivella split-drilled bead; **63.** Olivella saucer bead; **64.** Mica ornament; **65.** Bear claw; **66.** Bone bead; **67.** Obsidian projectile point, 3.1 cm.; **68.** Obsidian drill, 5.2 cm.; **69.** Metapodial awl (Type A1bI); **70.** Metapodial awl (Type A1bII); **71.** Bone knife fragment; **72.** Perforated bone splint, 5.98 cm.; **73.** Plummet charmstone, 9.9 cm. (average length); **74.** Ulna fiber tool, 12 cm. (average length); **75.** Beveled Olivella bead; **75.** Olivella ring bead; **77.** Olivella oval saddle bead; **78-79.** Haliotis ornaments; **80.** Haliotis ornament with punctate decoration, 9.3 cm.; **81.** Haliotis ornament, 6.7 cm.; **82.** Incised bone; **83.** Bow mortar and pestle; **84.** Decorated sandstone tablet (hatched area is painted red), 15.24 cm.; **85.** Obsidian shouldered projectile point, 6.5 cm.; **86.** Cannon bone awl; **87.** Ulna awl; **88.** Perforated bone splint; **89.** Bipointed bone pin; **90.** Quartz crystals; **91.** Obsidian projectile point, 3.1 cm.; **92.** Obsidian drill, 6.7 cm.; **93.** Ulna flaker, 9 cm. (average length); **94.** Bone punch fragment; **95.** Chert chopper; **96.** Obsidian drill, 5.5 cm.; **97.** Keeled obsidian tool, 6.4 cm.; **98.** Obsidian biface, 10.4 cm.; **99.** Obsidian projectile point, 5.9 cm.; **100.** Obsidian projectile point, 5.7 cm.; **101.** Obsidian projectile point, 5.7 cm.; **102.** Milling slab and handstone.

gauge, tibia 'wands', atlatl spurs, and other bone tools serves to distinguish the Napa District from neighboring districts to the east and south. The emphasis on ulna tools is a Napa District marker trait as far back as the Bale phase, while the emphasis on obsidian (with the non-importation of chipped stone artifacts) extends back to the Hultman phase. Exportation of finished points into the Delta can be documented from at least 3000 B.C. (SJo-68); even when this trade was briefly interrupted in early Middle Horizon times, exportation continued to the Sutter District (Sac-99).

Wappo Prehistory

On the basis of current evidence, I favor the view that the Wappo entered Napa Valley at the beginning of the Late Horizon, separating Lake and Coast Miwok. The Houx aspect represents ancestral Lake Miwok, the McClure aspect represents ancestral Coast Miwok, while the Morse aspect represents ancestral Bay-Plains Miwok. Miwok continuity was broken by intrusive Patwin, bringing key elements of the Augustine Pattern taken over from intrusive Algic. This suggestion, however, conflicts with the linguistic reconstruction of Callaghan (1964) who proposed a *Sierra* homeland for Miwok. I also suggest that the Houx aspect represents ancestral Yukian, with movement of the Yuki proper northward. The distinctive Yuki physical type and culture developed after the separation from Wappo. The main evidence for this is the importance of obsidian and obsidian ceremony (absent in Round Valley) in Yuki culture. At present, a Clear Lake hearth for Yuki-Wappo seems preferable. Greg White (1984; White and Fredrickson 1992), however, has hypothesized that the Yukian ancestors entered California relatively late, ca. 3000 B.C., as the Willits Pattern.

5

Changes in Prehistoric Exchange Systems in the Alamo Locality, Contra Costa County, California

David A. Fredrickson

(1977; revised 1980)

Introduction

In recent years, archaeologists have become increasingly aware that trade and exchange systems constitute important measures of cultural complexity. Exchange provides one very effective means of stabilizing resource availability and redistributing those resources which are unequally distributed in space and time. This process somewhat resembles agriculture in that to some extent it frees human groups from the natural limits of given environments. While agriculture and what is sometimes called protoagriculture (or resource management) at their best increase the productivity of given environments, exchange systems allow use of neighboring environments. Thus agriculture, protoagriculture, and exchange systems all help stabilize the amount of resources available throughout the seasonal cycle and to some extent counter annual fluctuations in resource availability.

Another important perspective for viewing exchange systems has been provided by Yehudi Cohen (1970, 1975). Cohen postulated that every society, by virtue of living in contact with other societies, is characterized by two sets of processes. One set Cohen referred to as "inside culture," the other he termed "boundary culture." Inside culture corresponds to the traditional anthropological concept of culture and need not be developed further here. Boundary culture, on the other hand, represents the processes involved in the interactions between interdependent societies, and is conceived as being organized to regulate, control, or administer the flow of energy, the movement of goods and ideas, between societies (cf. Rathje 1972).

In the model, relations between societies are mediated by designated individuals; and, to the degree that resources outside the group territory are important to a society, these individuals will carry out roles that tend to become specialized and differentiated from the roles of inside culture. A postulate of the model is that centrally administered exchange is more effective in maintaining and regulating an orderly flow of ideas and materials than exchange that is carried out on what I call an ad hoc basis. Thus, once centrally administered exchange systems emerge, positive feedback will tend to emphasize its importance over time as well as emphasizing the importance of the administrative roles. To the extent that boundary culture is important to the successful adaptation of a society, boundary personnel, through their administrative function, will tend to gain social influence and political power. I suggest that since roles of social influence and political power frequently carry with them material representations such as wealth or status

objects, it is possible archaeologically to observe the parallel development of exchange systems and social differentiation based upon wealth.

Cohen's proposal can be effectively applied to Central California exchange systems in that groups within the area were linked together through a complex arrangement of exchanges, some involving direct trade, some involving the exchange of gifts, and some involving direct harvest of surplus resources or the gathering of abundant resources by neighboring groups. In addition, California's ethnographic data suggest that chiefs, or headmen, of the village-community appear to have been the dominant boundary personnel, although their importance in this regard was generally not recognized in the literature. Since data are lacking for the present study area, it is not possible to evaluate the applicability of this suggestion there, but the ethnographic data on the Wappo, situated in Napa, Sonoma, and Lake counties to the north of the current area of concern, does provide support. Driver (1936:211) described the Wappo chief as follows:

> The so-called chief was little more than a natural leader, one with excellent physical, mental, and moral qualifications. He had little authority over the rest of the group and no means of enforcing his commands or wishes other than his own physical prowess and that of his relatives and immediate following.

Moreover, when the duties of the chief are spelled out, it is found that the Wappo chief (1) decided when the group should hunt and fish, (2) set dates for "big times," that is, exchange festivities, and (3) carried out negotiations with other groups. Also, a Wappo individual was required to obtain permission from the chief when he wished to visit another community or to undertake any important activity, especially those requiring the individual to leave the home community. Although the Wappo chief did not have coercive power as Driver understood the concept, he was an important administrator and had a significant boundary role.

Calling upon the archaeological record, it can be stated that more and more goods were moving greater and greater distances as time went on. By the time of initial European contact, the Indians of California not only participated in complex exchange systems but also were characterized by sociopolitical systems where wealth differences existed, where social ranking was important, and where alliances were made between elites of different groups, including intergroup marriages among elites (cf. Bean and King 1974).

During the ethnographic period, and by extension during Phase 2 of the Augustine Pattern in the Prehistoric period, exchanges in Central California frequently involved the use of clam shell disk beads, which functioned as a standardized medium of exchange (cf. Vayda 1967; Chagnon 1970). Paraphrasing from Bohannon (1963:231-65), a distinction can be made between resource wealth and created wealth. Created wealth involves articles usually of non-utilitarian significance, such as beads, ornaments, feathers for decoration, and other items that appear to have little value with respect to subsistence technology. Created wealth, including the clam shell disk beads of Central California, can serve a banking function in that subsistence surplus can be converted through exchange into created wealth and vice versa. Processes described by Lowell Bean (1972) for the Cahuilla of southern California provide a concrete example.

At the time of European contact, the Cahuilla occupied an arid portion of southern California, in the region around the Salton Sea, that was highly variable with respect to resource distribution. A storm might bring rain to one valley resulting in an abundance of new plant growth while leaving another valley quite dry and relatively barren. Natural exigencies of this sort served to randomize the spatial distribution of natural resources at any one time. One locality might have abundant food resources at a given moment while another was low on food. At another time the locality which previously had abundant resources might have a shortage of food, while the locality which had been low might have a surplus. The Cahuilla were organized into tribelets, each with its own territory. Periodically tribelets would, in turn, hold feasts to which they would invite their neighbors. While the host group furnished some food, the guests brought gifts as well. Those guests whose localities were low in food brought created wealth. At the conclusion of the feasts a food surplus always remained. From this surplus and from the gifts of created wealth, the host group gave farewell gifts to their departing guests: created wealth objects were

presented to those who had brought food, food was presented to those who had brought created wealth. Thus, through an exchange system that was not actually a trading system, resources were redistributed in Cahuilla territory in a manner more equable than that provided by nature. As with many other native Californian social events, the feasting of the Cahuilla had religious functions and motivations as well as secular ones. Thus, the Cahuilla example illustrates another process, the role of religious or spiritual motivation in the movement of goods.

The exchange systems as they existed in the ethnographic period did not always exist in prehistoric California and, in fact, the complexity of ethnographic California implies a long and rich period of cultural development. Data from a series of Contra Costa County sites suggest that six different temporal and cultural periods were represented by at least four different types of exchange systems. As exchange characteristics changed, sociopolitical characteristics, as inferred from the archaeological record, also changed.

The Site Sample from Contra Costa County

During the 1960s several archaeological sites in the Walnut Creek and Alamo areas of Contra Costa County, California were investigated in conjunction with highway, housing, and commercial construction. These sites—CA-CCo-30 (Fredrickson 1968), CA-CCo-308 (Fredrickson 1966), CA-CCo-309 (Curtis and Fredrickson 1964; V. Fredrickson 1968), and CA-CCo-311 (Moss and Mead 1967)—yielded an almost continuous chronological sequence that extended from possibly 2000 B.C. to A.D. 1700, as determined by a series of fifteen radiocarbon dates with support from artifactual cross-dating (table 5.1). Comparative and stratigraphic analyses of artifacts from the sites; of bone, shell, and stone debris from the occupational deposits; and of mortuary patterning at the sites showed significant changes in technology, demography, exchange, and social organization during this long time span (Fredrickson 1965, 1969, 1974b).

CCo-30, located on San Ramon Creek in the town of Alamo, contained two cultural strata which were separated by a stratum of culturally sterile soil. The earlier cultural component (Component B), buried under alluvial sediments, was attributable to the Berkeley Pattern of the Central California cultural sequence. The later cultural component (Component A) was attributable to Phase 1 of the Augustine Pattern with major occupation occurring during the middle and late portions of Phase 1. A few early Phase 1 and a few Phase 2 traits occurred as well. Four radiocarbon dates from the upper component suggest most intensive use between about A.D. 1200 and A.D. 1500.

CCo-308, the earliest of these sites, also located on San Ramon Creek in the town of Alamo, contained three distinct cultural components, each identifiable with a discrete physical stratum. The site is noteworthy in that artifacts and burials occurred to a depth of over six meters below the surface of the surrounding flood plain. The deepest and earliest stratum (Component C) has been assigned to the early portion of the Berkeley Pattern on the basis of burial mode and artifact forms. Three radiocarbon dates from the deep component support an initial occupation as early as 2000 B.C., a date contemporaneous with the Early period, or Windmiller Pattern, of the Delta region of the lower Sacramento Valley. Wallace (1978) has suggested affinities of Component C with West Berkeley (CA-Ala-307; Wallace and Lathrap 1975) and other sites of the San Francisco Bay region. The Windmiller and San Francisco Bay sites exhibit major differences in their mortuary practices. In the former, elaborate grave goods accompany the extended burial. In the contemporaneous Berkeley Pattern sites (including CCo-308), few mortuary offerings accompany the flexed burials. In addition, Wallace (1978) pointed out that the paucity of hunting implements and the abundance of mortars, pestles, and bone implements in the Bay region contrast with Windmiller where hunting implements are plentiful and mortars, pestles, and bone implements are relatively rare or absent.

The middle cultural component at CCo-308 (Component B) can be assigned to the middle to late portion of the Berkeley Pattern. Although two radiocarbon dates from this cultural stratum provide conflicting ages, occupation sometime during the first millennium B.C. is likely (see table 5.1). The uppermost cultural stratum (Component A) is assignable to the transition phase between the Berkeley and Augustine patterns with occupation continuing into Phase 1

TABLE 5.1

Radiocarbon Dates from Several Archaeological Sites in Interior Contra Costa County, California

Site	Location	C^{14} years B.P.	Laboratory number
CA-CCo-309	Cremation	285 ± 50	I-1193
CA-CCo-30	18-24"	365 ± 50	UCLA-1793c
	18-24"	440 ± 50	UCLA-1793a
	36-42"	465 ± 50	UCLA-1793d
	42-48"	585 ± 50	UCLA-1793b
CA-CCo-308A	Burial, 51"	470 ± 120	UCLA-1786a
	30-36"	865 ± 50	UCLA-1792a
	42-48"	940 ± 50	UCLA-1792b
	48-54"	980 ± 50	UCLA-1792c
	66-72"	1185 ± 125	UCLA-1792d
CA-CCo-308B	144-150"	1250 ± 230	UCLA-1792e
	Burial, 144"	2860 ± 120	UCLA-1786b
CA-CCo-308C	162-168"	3125 ± 230	UCLA-1792f
	Burial, 186"	4450 ± 400	UCLA-259
	Burial, 214"	2870 ± 335	UCLA-1786c

Note: Except as noted all dates are based upon unassociated midden charcoal; other dates based upon burial associated charcoal. Dates B.P. (before present) have not been corrected. See Ericson (1981) for further discussion of these dates.

of Augustine. Initial occupation of this stratum occurred as early as A.D. 700, and final occupation may have overlapped the initial period of occupation of Component A at CCo-30.

The period between the abandonment of the B component and initial occupation of the A component at CCo-308 is represented by remains found at CCo-311, also located on San Ramon Creek in Alamo. CCo-311 contained points considered diagnostic of the Meganos aspect of the Berkeley Pattern (chapter 1, this volume), whose focal area was the Stockton District. Bennyhoff has proposed that the Meganos aspect intruded from the Stockton District into Contra Costa and Alameda counties (the Diablo and Alameda districts, respectively) in the final portion of the Berkeley Pattern. During the Berkeley/Augustine Transition Phase, Meganos retreated and ancestral Karkin and Saclan groups are believed to have entered their

ethnographic territories (Bennyhoff 1977:134ff.; also Fredrickson 1969).

CCo-309, located on Tice Creek in the city of Walnut Creek, contained a single cultural component assignable to Phase 2 of the Augustine Pattern. Most intensive occupation of the site appears to have been during the earlier portion of Phase 2, dated between A.D. 1500 and A.D. 1700, an age assignment supported by the single radiocarbon date obtained from the site (table 5.1).

The Development of Local Exchange Systems

THE BERKELEY PATTERN

Although the B and C components at CCo-308 appear to represent two distinct time periods which encompass the first two millennia B.C., the cultures of the two time periods appear to have been quite similar. Mortuary and community patterning discussed elsewhere (Fredrickson 1974b) suggest a semi-sedentary settlement pattern with no evidence of status differences based upon wealth distinctions. While there is no need here to present the full argument or the data, the social inferences, based upon mortuary assemblages from the two components, can be summarized as follows.

> The mortuary patterning of the CCo-308 Middle Horizon components is consistent with the patterning predicted for egalitarian societies in the following ways. First, assuming that burial associations are marks of social position, it can be observed that such marks do reflect most strongly involvement with subsistence and technological activities. Second, technomic artifacts are found predominantly with older rather than younger persons. Third, relatively few sociotechnic artifacts occur as grave associations. Fourth, marks of social position are of a sort attainable by individual rather than group activities. . . In sum, it is suggested here that the Middle Horizon components at CCo-308 represent an egalitarian sociopolitical organization, with social influence gained by individual achievement rather than ascription, with a high degree of voluntarism correlative to obtaining prestige through achievement (Fredrickson 1974b:62-63).

The religious sphere appears to have been compatible with these characteristics as well, in that the bulk of all ideotechnic artifacts which occurred as grave furnishings within the two components were recorded with a single individual, inferentially, a person of distinctive ritual status, possibly a shaman. Animal ceremonialism was also evidenced in the form of a grizzly bear burial with which was recorded a mammal bone tube manufactured from the femur of a second grizzly (Fredrickson 1966:47). In addition, one of the artifacts recorded with the possible shaman described above, a large decorated bone whistle, represented a femur of yet a third grizzly bear (Fredrickson 1966:46-47). There was no evidence for group-oriented religious expression in the mortuary patterning of the two components, as contrasted with the patterning described below for CCo-308A (Fredrickson 1974b).

Exchange relationships between different groups during the period of the Berkeley Pattern did not appear to have been highly developed and may have been ad hoc in nature. Projectile points, never abundant, provide some insight into the nature of exchanges. Points lacked standardization, with no single form dominating. However, they were quite commonly manufactured from nonlocal materials and many appeared to have been brought ready-made to the site locations, since flaking waste that could be attributed to point manufacture was rare. While about two-thirds of the points were manufactured from obsidian, flaking waste contained only about 2% obsidian. In addition, no two obsidian points were of the same form. The overall pattern suggested that the points were obtained on an individual basis from a number of different directions and not through processes of regularized group exchanges (Fredrickson 1966).

Insufficient data were obtained from CCo-311, representing the Meganos culture intrusion from the Stockton District, to allow characterization of the exchange pattern or other cultural attributes.

THE BERKELEY/AUGUSTINE TRANSITION

During the transition between the Berkeley and the Augustine patterns, a shift in exchange relationships was evident, as were shifts in social attributes. Projectile points continued to be rare, but obsidian

points increased from about two-thirds to more than 90%. Obsidian flaking debris was still rare. Point form became standardized with Napa Valley the sole source for obsidian. The point form was morphologically similar to the shouldered lanceolate Excelsior form, common in the southern North Coast Ranges (Fredrickson 1973). Thus, not only was the Alamo obsidian obtained from the Napa Valley, but the point forms at Alamo were identical with forms from the Napa vicinity. One inference is that the Alamo peoples during the Berkeley/Augustine Transition obtained North Coast Ranges points as a result of formalized relationships between particular communities.

Shell beads also gained in significance and number during this period. Such beads frequently occurred in appliqué ornamentation. Shell beads not only an indicate exchange relationships since their occurrence in inland sites implies interaction with coastal groups, but they may be representative of wealth. It may be that beads of this period could have served not only decorative and possibly a religious function, but also a banking function in the redistribution of basic resources, assisting in optimizing the distribution of resources which were unequally distributed in space.

There is some evidence that the Kuksu religious system of ethnographic Central California may have had its origin as far back as the transition phase, as suggested by Bennyhoff (1977) on the basis of other data. Mortuary patterning in the Alamo locality during the transition phase suggested the occurrence of a ceremonial organization with participation open to both male and female. Although no direct evidence can be brought to bear on the significance of a group-oriented religious organization, a relationship between the ceremonial and exchange systems can be postulated in which an exchange of ceremonies between groups may have been accompanied by an exchange of material goods by means of reciprocal gift giving, similar to the process described above for the Cahuilla.

The Augustine Pattern

During Phase 1 of the Augustine Pattern, obsidian trade underwent yet another shift. Alamo continued to obtain its obsidian from the Napa Valley, but it was now in the form of raw material rather than the finished product. Evidence in the form of markedly increased amounts of chipping debris indicates that points were manufactured locally in the Alamo locality. The form of the points now resembled those from the Delta region rather than from the North Coast Ranges.

Evidence of differences in social status became increasingly common as cremation, in the form of preinterment grave pit burning, was introduced at the beginning of Phase 1. Initially cremation was relatively rare and almost invariably associated with grave offerings of created wealth, while the more common primary interments lacked associated goods or contained mostly utilitarian items. By the Protohistoric period, cremation, now in the form of complete cremation, dominated with a few primary interments usually lacking grave goods.

The bow and arrow were introduced during Phase 1 and perhaps through technological advantage eventually replaced the earlier dart and atlatl. Territorial boundaries are postulated to have been fairly well established by the beginning of Phase 1, and the archaeological remains in the vicinity from this time on probably represent the ancestral Bay Miwok (see Bennyhoff 1977). Evidence of differences in social status grew as Phase 1 progressed, with mortuary accompaniments indicative of wealth presumably marking high-ranking individuals. Evidence for group-oriented religious expression continued. Exchange relationships may have been linked to the spread of religious movements which dated back to the period of the shift between the Berkeley and Augustine patterns, as well as to increasing centralization of political authority.

Phase 2 of the Augustine Pattern concludes the development within the Alamo exchange system. The outstanding characteristic of Phase 2 in Central California was the development of clam shell disk beads as a standardized medium of exchange. More groups appeared to enter the exchange system at this time, including important groups within the North Coast Ranges. The Pomo not only controlled the magnesite bead production, but with neighboring groups dominated the manufacture of clam shell disk beads. In the Alamo locality, it is of interest that while burials still

showed evidence of social distinctions based upon relative wealth, evidence of group-oriented religious activities dropped out of the mortuary complex. This is perhaps a sign of the specialization of Kuksu into its ethnographic form. Employing knowledge of the ethnographic period in Central California generally, it also can be suggested that by Phase 2, chiefs were firmly established as administrators of boundary relations.

Summary of Local Exchange Development

In summary, the initial pattern of exchange in the Alamo locality was likely to have been based upon ad hoc, individual, one-to-one transactions and not of such significance that the social unit was heavily dependent upon them. The presumed semi-sedentary settlement pattern allowed the acquiring of resources by changing habitat rather than by regularizing exchange relations. In Alamo, it was not until the transition from Berkeley to Augustine that exchange relations began to develop significantly in complexity, becoming marked by regular exchanges between particular groups, as suggested by the importation of Napa Valley obsidian in the form of ready-made artifacts. It is probably not coincidental that along with the development in exchange systems were the development of social distinctions based upon wealth and the rise of a group-oriented religious organization. The shift from importation of ready-made obsidian points to the importation of raw material may also mark a significant shift in the nature of exchanges. With respect to the changes in the obsidian exchange system of the Alamo area, Ericson (1981:160) has commented that:

> . . . these three sites form only a single node within a much larger and complex exchange system. Most likely the rate of consumption of [Napa Valley] obsidian is quite different if viewed from other points in space. Nevertheless, it does appear that a *general* diachronic view of the [Napa] exchange system can be obtained from data derived from these sites.

Finally, the introduction of a standardized money system added even greater complexity to an already complex network of exchange processes. There can be little doubt, however, that exchange alliances were severely disrupted by sustained contact with Europeans. It is likely that by the time information on native Californian ethnographic cultures was systematically collected, much of the organizational complexity that inferably was linked to these alliances had been lost in practice. Also, pertinent information was not elicited or recognized as important when systematic ethnographic investigation was conducted.

6

Central California Augustine: Implications for Northern California Archaeology

James A. Bennyhoff

(1982, with revision in 1993)

ALL ARCHAEOLOGISTS WORKING IN California are familiar, to a greater or lesser extent, with the Central California Taxonomic System (CCTS) developed formally by Richard Beardsley (1948, 1954). Beardsley arranged three sequential horizons (Early, Middle, and Late) and recognized the similarities between the Bay and Delta for the Late Horizon, but had insufficient material from West Berkeley (CA-Ala-307) to realize that it contained an Early Horizon occupation. The work since Beardsley in the North Coast Ranges, especially what Fredrickson and I (chapter 2, this volume) call the Borax Lake Pattern which will not fit into this sequence, and my work with the Meganos aspect (see chapter 1) in the Stockton District, has prompted Fredrickson and me to propose an alternative system utilizing the concepts of *pattern* and *aspect.*

Our dissatisfaction with Beardsley's system, particularly his use of the term *horizon*, became apparent when contrasted with the one proposed by Willey and Phillips (1958). The horizon, in Willey and Phillips's (1958) usage refers to a spatial continuity of cultural traits or assemblages which spread rapidly over wide areas, while Willey and Phillips defined areal traditions as temporal continuities of persistent cultural systems. Unfortunately, Willey and Phillips also combined two different processes in their term *tradition.* They argued that all we need are *traditions* and *horizons* but later, Willey (1966) was forced to employ the term *subtradition.* I find that term awkward. I use the term *aspect* to specify a regional variant of a pattern.

Most archaeologists agree that there is an Anasazi Tradition, and that it begins with Basketmaker II derived from an older Oshara Tradition, and develops into the Pueblo cultures. However, Basketmaker II had no pottery, used the bow and arrow, lived in pit houses, and yet we put all of that into a single tradition. This is totally different from most of our other so-called traditions. They are actually patterns, based more on diffusion than on continuity through time. In the eastern United States, the difference between Archaic and Woodland is the introduction of pottery. There are at least two different sources of pottery, but the cultures become Woodland if they have pottery. Mississippian is a mess, but it's basically a religious movement that influenced totally unrelated cultures. Archaic, Woodland, and Mississippian are not traditions, but patterns (cf. Bennyhoff 1986:67).

I see an analogous situation in California. That is why Fredrickson and I introduced the term pattern. With the excavation of University Village (Gerow with Force 1968) and of West Berkeley, it became clear that the Bay region was occupied at a time contemporaneous with Early Horizon in the Central Valley. What I call the Windmiller Pattern is the old

Early Horizon of Beardsley. Windmiller features include a ventral extension burial mode, few bone tools, rare manos and metates, and non-midden cemeteries (see Ragir 1972). We now know on the basis of trade items (shell bead and ornament types, traded charmstones, etc.) that lower West Berkeley, the lower twelve feet, is contemporaneous with Windmiller but is a different culture. The Berkeley population had 100% flexed burial mode, many bone tools, used the mortar and pestle exclusively, and buried their dead within the village midden. I hypothesize that the lower twelve feet of West Berkeley is ancestral to Beardsley's Middle Horizon and submit that the early part (the Stege aspect) is without question ancestral to the Ellis Landing aspect as defined by Beardsley. What emerges is a movement from the north Bay region into the Cosumnes District at the beginning of the Middle period. This is the intrusion of the bearers of the Morse aspect (Bennyhoff 1978:figure 4) which derives many of its traits from the Ellis Landing occupants on the Bay.

I hypothesize that the Morse intrusion pushed the Windmiller people south into the Stockton District (already occupied by Windmiller people at such sites as SJo-112 and SJo-147). Stimulated by intermarriage, these migrants borrow Berkeley Pattern traits to form the Meganos aspect of the Berkeley Pattern. The Meganos culture is actually a hybrid. They retain Windmiller ventral and dorsal extension and semi-extension as important mortuary traits, but add semi-flexure and flexure, while rejecting western orientation. The Windmiller emphasis on non-midden cemeteries remains a dominant Meganos feature. Lack of interest in grave furniture is a Berkeley trait. Bone tools remain rare, and four sites yield more manos and metates than the borrowed mortars and pestles. A rarity of projectile points is also a Berkeley trait, in contrast to their abundance at Windmiller sites. So far the Windmiller baked clay industry is absent at Meganos sites in the south Delta. The extensive Early period shell bead trade from Southern and Central California out into Utah (Hughes and Bennyhoff 1986; Bennyhoff and Hughes 1987) is broken at this time of disruption. Early Meganos sites yield few shell beads and ornaments.

This Morse intrusion was a population movement, with abandonment of most Windmiller sites, and the founding of new sites closer to modern water sources. Newman (1957) proposes a mixture of an older population with new physical types.

In contrast, I hypothesize that the entire cultural sequence from 3000 B.C. to historic times in the Alameda District (San Francisco peninsula and East Bay) represents a single population changing through time. The physical type does not change and numerous cultural traits persist throughout this time span (spined serrated scapulae, type A1bII awls, wedges, cobble bowl mortars, and cobble pestles, etc.). In this district we have the Micos Tradition persisting through the Berkeley and Augustine patterns. The Micos Tradition (from Miwok-Costanoan) represents the ancestral Utian occupation of the San Francisco Bay region, displacing and pushing to the south an earlier Esselen population. If the Berkeley Pattern was brought in by ancestral Miwok and Costanoans before they split (the Stege aspect), the Upper Berkeley Pattern (Ellis Landing aspect) represents the split of Costanoan and Miwok: McClure aspect in the Marin District, Morse aspect in the Cosumnes District, Houx aspect on Clear Lake, etc.

I would now like to define basic traits of the Augustine Pattern, the Late Horizon of Beardsley (1948, 1954). We know that the Augustine groups are ancestral to the people in their respective territories. We know that: 1) the acorn provides the staple food, with mortar and pestle as the dominant grinding implement; 2) that hunting is significant, with bow and arrow as the major weapon; 3) fishing is significant, with harpoons as a major implement; 4) roundhouses made from variable materials are the dominant dwelling while the ceremonial dance house and sweat house were semi-subterranean; 5) the tule balsa was the major boat form inferable archaeologically by the absence of woodworking tools needed to make dugout canoes; 6) shamanistic religion was dominated by males, which featured the use of charmstones; 7) smoking of tobacco with tubular stone pipes, later replaced by wooden forms among some groups; 8) an exchange network which featured the use of distinctive beads and ornaments made of magnesite, steatite, and varied shells, notably clam, *Olivella*, and abalone; 9) a basketry complex which featured both coiling and twining; and 10) a host of material cultural items, such as the cocoon rattle, flicker quill headband, men's hair

net, acorn granary, and foot drum to name only a few. These traits are found among nearly all Central California groups.

I suggest that the Augustine Pattern begins in California with the introduction of a series of intrusive traits that come from the north, not from the south as Heizer (1937:39) once suggested. As outlined by Whistler (1977), I hypothesize that the Wintuan or specifically ancestral Patwin peoples moving from Oregon brought in a series of traits derived from the Macro-Algonkian (Algic) peoples, the ancestral Yurok and Wiyot, who displaced the Patwin from Oregon as they moved into California. The major traits are the simple harpoons which could not have come from any place to the south; they must be northern, probably from the Columbia River. What I call collared pipes (see figure 6.1 herein), the oldest ones in Central California, have an enlarged base which would not come from the simple conical forms of the American Southwest; the oldest Gunther Island pipes are similar. These are definitely smoking pipes. Since the tobacco that is grown and planted by some Plains groups is a California species, there has to have been interchange at this time involving tobacco and pipes. Non-illustrated pipes are dated to ca. 1000 - 1500 B.C. on the Columbia River by Butler (1959). What we call grave pit burning, in which the corpse is set afire and then the fire is smothered before burning is complete, is dominant in Central California beginning in this Middle/Late Period Transition but it also occurs on Gunther Island and one site on the Columbia River. Symmetrical perforated stone discoidals probably represent spindle whorls for making string for fish nets, indicative of an increasing emphasis on fishing. Another indication of a northern connection is brachycephally. Algonkian peoples were brachycephalic, and Newman (1957) suggested that there was an actual genetic introduction to the Central Valley population in the Late Horizon. The Patwin were able to penetrate an already settled California because they had a new weapon—the simple (self) bow and arrow, superior to the local atlatls. Arrows were tipped with Gunther Barbed points. All three base variants (contracting stem, straight stem, and expanding stem) are found at Yol-13 ca. A.D. 700, where many burials reveal points embedded in bones—clearly a conflict situation. With this new weapon the ancestral Patwin quickly passed down the Sacramento Valley to displace, and borrow terms for unfamiliar vegetation from, the resident Miwok. Patwin intrusion broke the original Miwok continuity from Marin County into the Delta, for they clearly pushed the Bay Miwok out of the Solano District south across Suisun Bay into the Diablo District. Evidence for this displacement includes a distinctive atlatl spur found at Sol-15 and CCo-308, the appearance of multi-perforated abalone ornaments, and the abandonment of Meganos aspect sites in the Diablo District as new Hotchkiss aspect sites are founded. To summarize, then, I see the beginning of the Augustine Pattern as a reflection of new traits being brought in by the intrusive ancestral Patwin peoples, followed by subsequent diffusion of these traits from them to all surrounding areas. There was, of course, differential acceptance of these various traits.

I will now contrast the Augustine Pattern with the Gunther Pattern, typical of northwest California, which I believe the available archaeology indicates was first introduced by the Macro-Algonkian immigrants from the Columbia River. The principal traits of the Gunther Pattern are: 1) salmon provided the staple food, taken with distinctive harpoons and weirs (several of the harpoon types can be traced to the northwest coast); 2) land hunting was significant, with the simple bow and arrow as the major weapon (the Gunther Barbed projectile point series was brought in by the Macro-Algonkians and diffused from them southward); 3) a coastal emphasis on sea mammal hunting with distinctive harpoons; 4) the rectangular plank house, with a distinctive woodworking assemblage; 5) the dugout canoe reflected archaeologically by the adze, gouge, and maul, 6) exclusive dorsal extension burial mode; 7) shamanistic religion dominated by females who did not use charmstones; 8) a distinctive wealth emphasis which featured inheritance of property; 9) an exchange network which emphasized dentalia, glycymeris, and pine nut beads; 10) a basketry complex which featured twining only; and 11) varied material culture items, such as antler spoons, elk horn purses, incised head scratchers, lamprey slitters, and eyed thatching needles. The aspects are merely regional variants of this overall pattern.

I will illustrate the sharper contrasts (i.e. how aspects can be identified within patterns) by using just

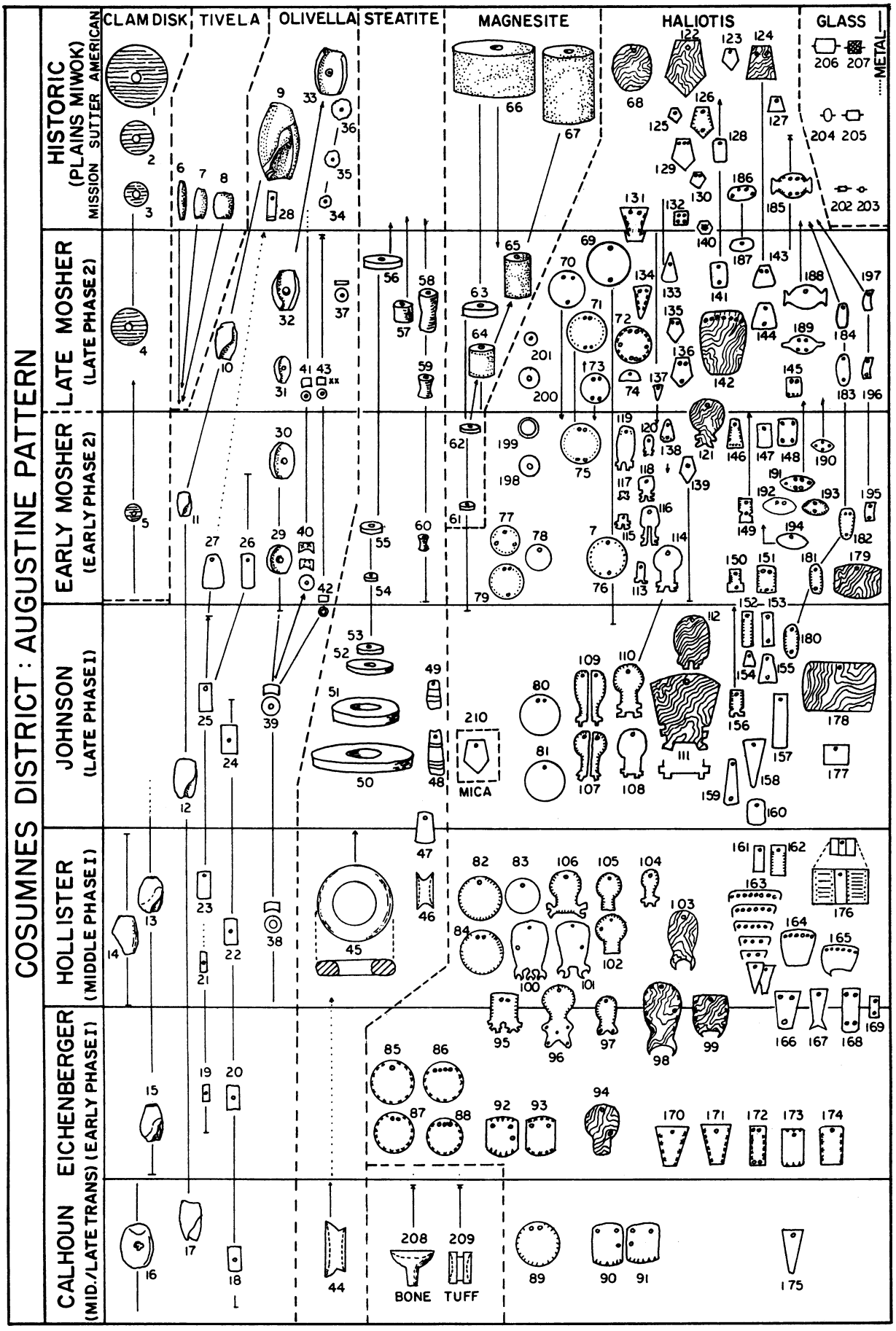

COSUMNES DISTRICT: AUGUSTINE PATTERN
HISTORIC (PLAINS MIWOK) MISSION SUTTER AMERICAN
LATE MOSHER (LATE PHASE 2)
EARLY MOSHER (EARLY PHASE 2)
JOHNSON (LATE PHASE 1)
HOLLISTER (MIDDLE PHASE 1)
EICHENBERGER (EARLY PHASE 1)
CALHOUN (MID./LATE TRANS)
CLAM DISK
TIVELA
OLIVELLA
STEATITE
MAGNESITE
HALIOTIS
GLASS
METAL
MICA
BONE
TUFF

FIGURE 6.1 Late period, Augustine Pattern, Hollister aspect, Cosumnes District: Significant artifact types and temporal changes in stone and bone artifacts from Calhoun phase (Middle/Late Period Transition) through Mosher phase (Phase 2). Relative scale approximated only for projectile points. Position of specimens within each phase has no chronological significance except for arrow points. M= trait persists from Middle period.

1-59, **Chipped stone**: 1-18. Spear points (all obsidian except 4, 18): 1. Corner-notched; 2. Side-notched, pointed serration; 3. Stockton serrated, corner-notched; 4. Desert Side-notched ceremonial (chert, obsidian, bone); 5. Side-notched straight-base; 6. Contracting stem barbed, pointed serration; 7. Stockton serrated, shouldered, straight stem; 8. Desert Side-notched, ceremonial; 9. Barbed, straight stem dentate serration; 10. Shouldered, expanding stem; 11. Stockton serrated shouldered round stem; 12. Stockton serrated corner-notched; 13. Stockton serrated shouldered straight stem; 14. Leaf-shaped; 15. Straight stem, wavy serration; 16. Leaf-shaped wavy serration; 17. Side-notched, concave base; 18. Corner-notched, chert; 19. Shouldered, chert; 20-22. Shouldered dart points (all non-obsidian). 23-58. Arrow points (all obsidian except 26, 31-33, 56, 58). 23-24. Stockton Leaf-shaped; 25. Stockton Triangular; 26. Shouldered straight stem, chert; 27-28. Shouldered, straight stem; 29-30. Shouldered, expanding stem; 31-35. Desert Side-notched; 31-33. Non-obsidian; 31. Panoche variant; 32-33. Delta variant; 34. Denticulate serration; 36-37. Stockton Side-notched; 38. Barbed, straight stem; 39. Shouldered, straight stem; 40-55. Stockton Serrated (SS) series, all obsidian. Number of serrations becomes fewer through time. 40-43. SS Bipointed; 44. SS Side-notched; 45-49. SS Shouldered, expanding stem; 50-53. SS Corner-notched; 54, 55. SS Shouldered; 56. Corner-notched, one serration, chert; 57-58. Gunther Barbed, non-obsidian; 59. Barbed, straight stem, dentate serration; 59A. Stockton serrated obsidian claw; 60. Fired clay bird effigy; 61-68. **Polished and ground stone**; 61-62. Charmstones (rare occurrences); 63. Show mortar (type A3) rare; 64-66. Stone pestles. 64. Type B2, rare; 65. Type B1, rare; 66. Type D3, used in wooden mortar, typical through Late period; 67. Wooden mortar; 68. Perforated stone discoidal; 69-73. **Bird-bone whistles**; 69-71. Central stop on concave side; 72-73. Central stop on convex side; 74. Antler shaft straightener; 75-87. **Steatite tubular pipes** with bird bone mouthpiece; 75. Double-flanged base; 76. Double-flanged shaft; 77. Single-flanged shaft; 78. Flared base, single flange; 79, 80. Triple-flanged base; 81. Single-flanged base; 82. Narrow collared base; 83. Flared base; 84. Wide collared base; 85-87. Collared; 85. Wide false-collared base (white sandstone); 86. Bell collared base; 87. Constricted collar base; 88. Girdled clay net sinkers in graves; 89. Wooden fish hook (barb and shank); 90. Toggle harpoon; 91-96. Simple harpoon, antler (bone); 91-95. Bilateral line shoulders; 91. Triple opposed barbs; 92. Triple-staggered barbs; 93. Multiple opposed barbs; 94. Four opposed, enclosed barbs; 95. Four opposed isolated barbs; 96. Unilateral line shoulder, multiple opposed barbs; 97. Composite fish hook (bone barb, wood shank); 98-103. **Incised bird-bone tubes and whistles**; 98. Double-line style, ladder design; 99. Double-line style, zig-zag design; 100. Double-line style, open diamond design; 101. Double-line style, chevron design; 102. Triple-line style, diamond design; 103. Triple-line style, triangle design; 104. Incised solid pin. NOTE: All captions are those of J. A. Bennyhoff except 11, 75-87, 99-104, provided by R.T. Milliken.

a few traits from the Central California Delta region. I will contrast the Hollister aspect of Cosumnes District which was clearly ancestral Plains Miwok (see figures 6.1 and 6.2 herein) with the Stockton District which was clearly ancestral Northern Valley Yokuts and the Hotchkiss aspect of the Diablo District which also was clearly ancestral Bay Miwok (cf. Bennyhoff 1978:figure 6).

First of all, the mortars differ among all three groups: wooden mortars with communal ownership in the Cosumnes District, small stone mortars owned individually (they were buried with the female dead) in the Stockton District, while the Diablo District had what we call elaborate "show" mortars, again owned individually (any wealthy woman was buried with at least one of them). The pestles also differ. In the Cosumnes District

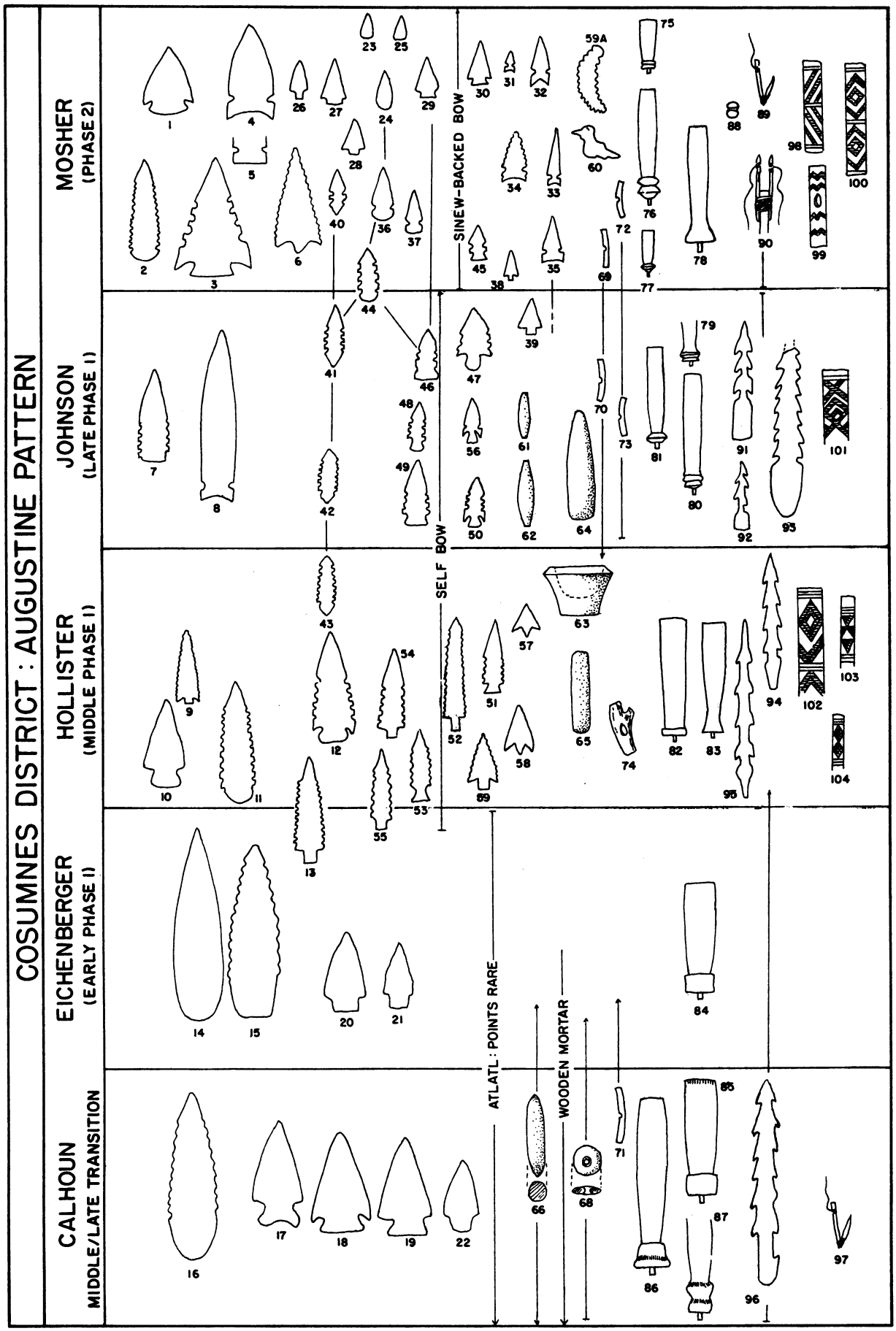

COSUMNES DISTRICT : AUGUSTINE PATTERN
MOSHER (PHASE 2)
JOHNSON (LATE PHASE I)
HOLLISTER (MIDDLE PHASE I)
EICHENBERGER (EARLY PHASE I)
CALHOUN MIDDLE/LATE TRANSITION
SINEW-BACKED BOW
SELF BOW
ATLATL : POINTS RARE
WOODEN MORTAR

FIGURE 6.2 Late period, Augustine Pattern, Hollister aspect, Cosumnes District: Significant artifact types and temporal changes in beads and ornaments from Calhoun phase (Middle/Late Period Transition) through Historic. Beads drawn to scale (averages shown), but ornament size only approximated. Position of specimens within each phase has no chronological significance.

1-5, **Clam disk beads**: 1, Type A3 (>16 mm); 2, Type A2 (9-16 mm); 3, Type A1 (3-8 mm); 4, Type A2; 5, Type A1. 6-8, Tivela beads: 6, tube; 7, ovoid; 8, globe; 9-43, **Olivella beads**: 9, Type A1c "large spire-lopped" predominates, with A1b, A1a present; 10, Type A1b "medium spire-lopped" and A1c predominate, with A1a present; 11, Type A1c "small spire-lopped" with A1b present; 12, Types A1c and A1b predominate, with A1a present; 13, Type B2 "end-ground"; 14, Type B1 "side-ground"; 15, Type B2; 16, Type D "split punched"; 17, Types A1b and A1c "spire-lopped" predominate, with A1a present; 18, Type M1a "normal sequin"; 19, Type M1c "narrow sequins"; 20, Type M1a; 21, Type M1c; 22, Type M1a; 23, Type M2a "normal pendant"; 24, Type M1a; 25, Type M2a; 26, Type M2a; 27, Type M4 "trapezoid pendant"; 28, Type M3 "elongate pendant"; 29, Type E1a "round thin lipped"; 30, Type E1b "oval thin lipped"; 31, Type E2a, "full lipped"; 32, Type E2b "deep lipped"; 33, Type E3 "large lipped"; 34, Type H1b "semi-ground disk"; 35, Type H2 "rough disk"; 36, Type H3 "chipped disk"; 37, Type H1a "ground disk"; 38, Type K1 "cupped"; 39, Type K1; 40, Type K1; 41, Type K2 "bushing"; 42, Type K3 "cylinder"; 43, Type K3; 44-60 **Steatite**: 44, earspool; 45, thin ring bead, includes cross-section; 46, earspool; 47, pendant, trapezoidal; 48-49, incised pendants; 50-51, thin ring beads; 52-56, disk beads; 57, cylinder bead; 58-60, "hourglass" beads; 61-67 **Magnesite**: 61-63, disk beads; 64-67, cylinder beads; 68-197 **Haliotis ornaments**: 68-70, circular; 71, circular, punctate decoration; 72, circular, scored incision; 73, circular; 74, semi-circular; 75-77, circular, punctate decoration; 78, circular; 79, circular, punctate decoration; 80-81, circular; 82-84, circular, scored incision; 85-88, circular, heavy scored incision; 89, circular, scored incision; 90-91, "shield", scored incision, often paired; 92-93, "shield", heavy scored incision; 94, "spoon"; 95, "square-clawed", incised; 96-97, "claw" variants; 98, "horn", scored incision, often paired; 99, "horn" variant, scored incision; 100-101, "claw" variants, often paired; 102, "spoon", scored incision; 103, "horn"; 104, "banjo" variant; 105, "spoon", scored incision; 106, "claw" variant; 107, split "banjo" variant, scored incision; 108, "banjo"; 109, split "banjo" variant, scored incision; 110, "banjo", scored incision; 111, "banjo" gorget, from whole shell (140 x 118 mm); 112, incipient "banjo" gorget; 113, "key" variant; 114, "banjo"; 115-20, "banjo" variants; 121, "banjo" gorget variant; 122, pentagonal gorget, made with file; 123, pentagonal, made with file; 124, trapezoidal, made with file; 125-30, various ornaments; 131, triangulate, scored incision; 132, square; 133, triangular; 134, triangulate, scored incision; 135-137, various ornaments; 138, triangular, punctate decoration; 139-41, various ornaments; 142, gorget, rounded trapezoid; 143-44, truncate; 145, square, with punctate decoration; 146, truncate, with scored incision and punctate decoration; 147-48, rectangular; 149, "key", side-slotted, scored incision; 150, "key", t-shaped, with scored incision; 151-52, rectangular with scored incision; 153-55, various ornaments; 156, "key", side and basal slotted with scored incision; 157-62, various ornaments; 163-65, triangulate, various sizes, including multi-perforated and squared tip variants (worn as girdle); 166-69, various ornaments; 170-74, various ornaments with heavy scored incision; 175, triangulate; 176, rectangular with scored and punctate decoration (32 x 55 mm); 177, rectangle; 178, rectangular gorget; 179, curved rectangular gorget; 180-82, oval with scored incision; 183-84, oval; 185, eared lenticular, scored incision; 186-187, broad oval; 188, eared lenticular; 189, tabbed lenticular; 190-94, simple lenticular; 195-97, rim segments; 198-201 **Haliotis beads: 198**, nacrous disk; 199, nacrous ring; 200-201, epidermis disks (H. rufescens); 202-205 **Glass beads**: 202, small tubular; 203, small oblate-spheroid; 204, large oblate-spheroid; 205, large tubular; 206-207 **Metal beads**: 206, rounded steel; 207, faceted steel; 208-210 Miscellaneous materials: 208, bone labret or earplug (also steatite); 209, volcanic tuff earspool; 210, mica pendant. NOTE: Captions provided by R. T. Milliken from notes of J. A. Bennyhoff.

they were bipointed stone pestles used with wooden mortars. In the Stockton District they were simple stone forms, essentially conical, probably obtained from the Sierra foothills, while in the Diablo District they were elaborate carved forms despite the fact that the Hotchkiss site is in the stoneless Delta. The Hotchkiss women had to carry all of this stone at least twenty miles from the Diablo Hills into the Delta. The extensive baked clay industries of the stoneless Stockton and Cosumnes districts are quite similar, but Hotchkiss has no such industry even though it is located well into the Delta. Each district also has its own distinctive style of incised bone tubes and whistles: openwork style in Cosumnes (figure 6.3 herein), crisscross style in

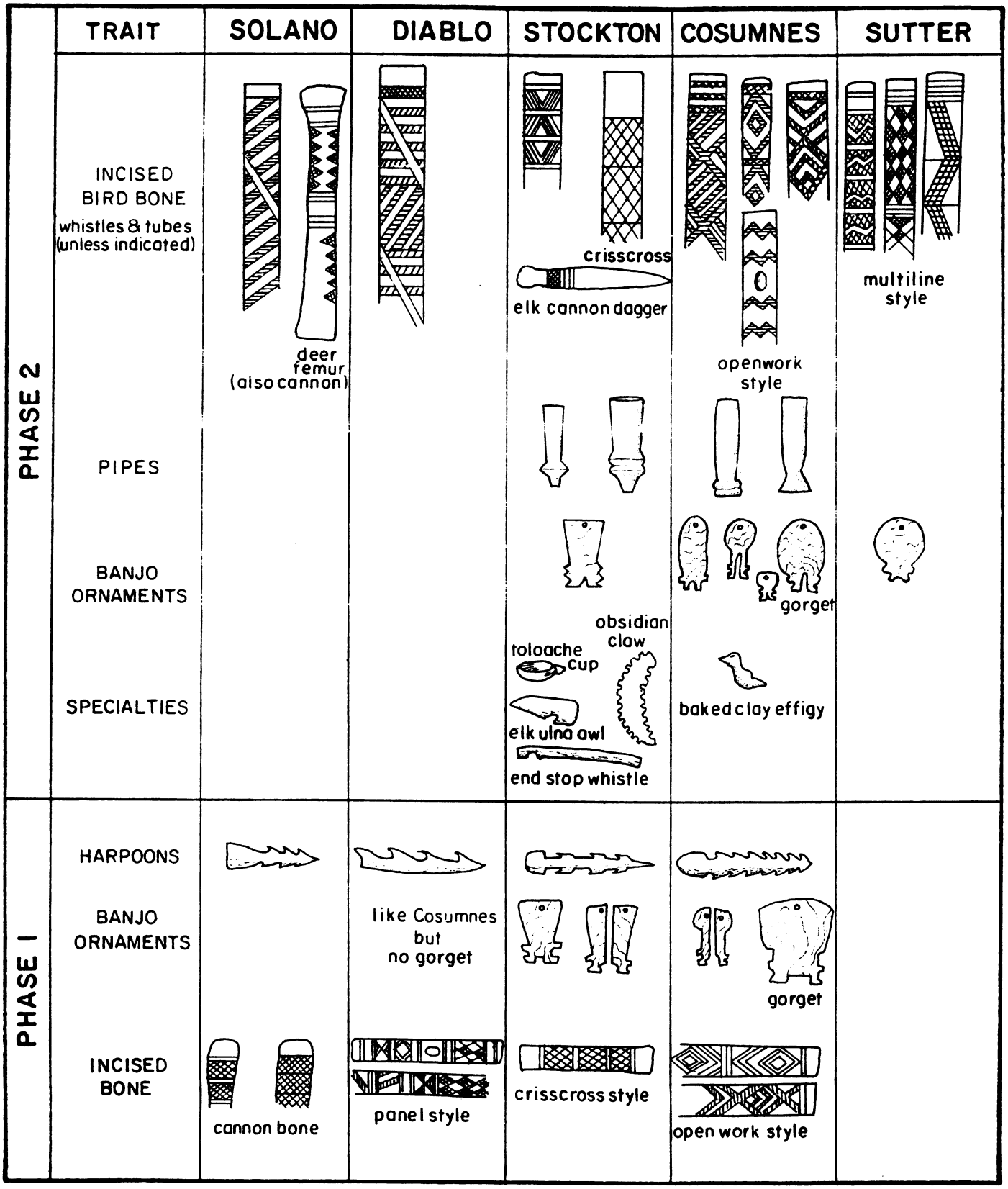


FIGURE 6.3 Selected artifact types and incising styles diagnostic of the Solano, Diablo, Stockton, Cosumnes, and Sutter districts during the Late period.

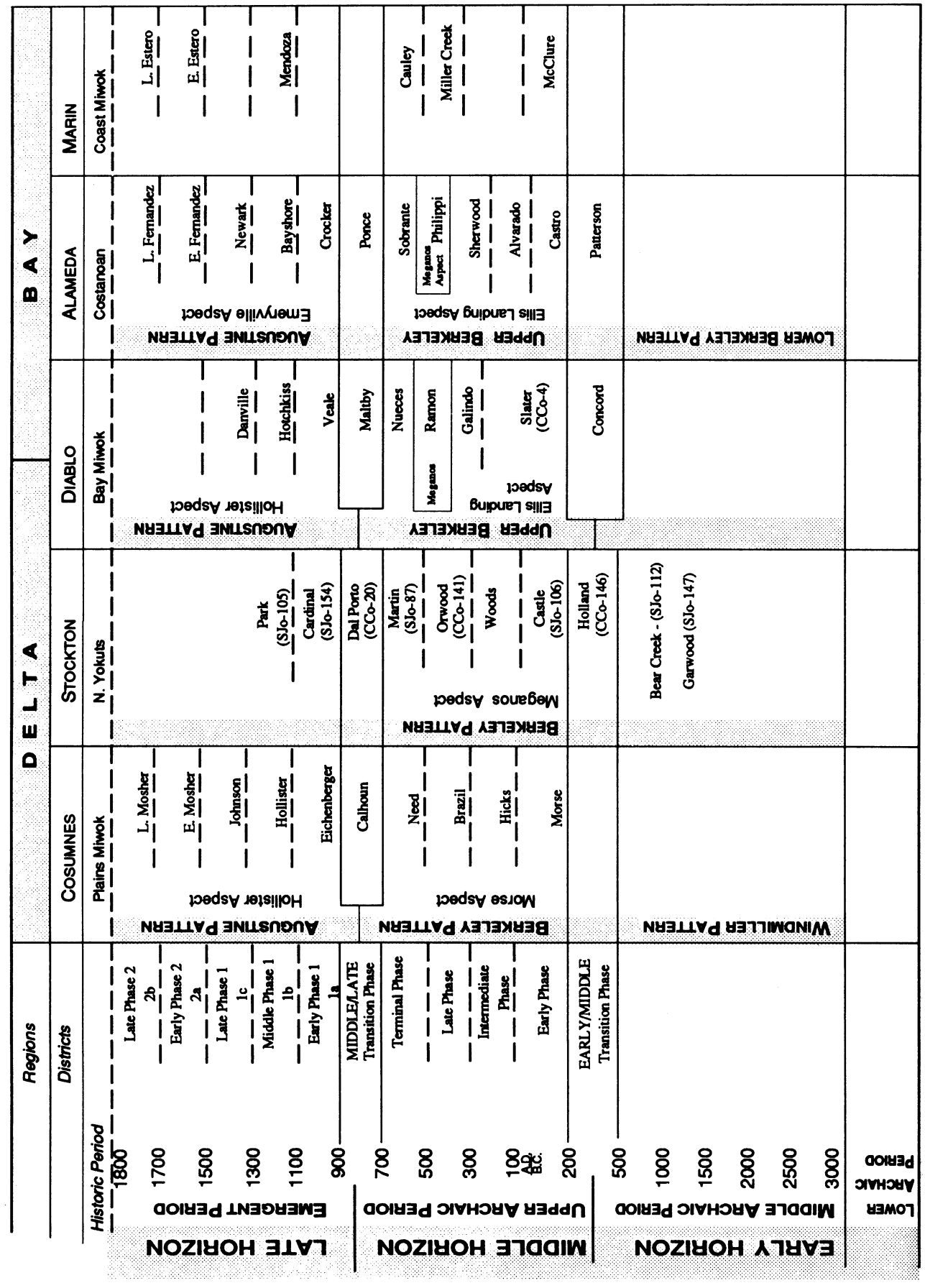
Stockton, and panel style in Diablo (cf. Bennyhoff 1978:figure 6). These contrasts are just a few that could be mentioned which set aspects and districts apart from one another. The relationship of these districts to one another, within the framework of the CCTS, appears in figure 6.4.

Aspects exhibit core areas, generally near the center of the district. Peripheral villages often show a shadow effect, reflecting borrowings from an adjacent district. Thus the Seuamne, the easternmost Plains Miwok tribelet living in the foothills on the Mokelumne River (Bennyhoff 1977:113), borrowed the bedrock mortar from their Sierran neighbors. In the Sutter District, inhabitants of the Wolok tribelet center at the mouth of the Feather River preferred to construct the grass thatch dwellings of the Delta rather than the semi-subterranean earth lodge typical of the Sutter District. Care must be taken to distinguish trade items or artifacts introduced by intermarriage. The incised elk cannon hair pin/dagger (Gifford 1940:Type B4) is a typical Yokuts (Stockton District) artifact. The single specimen found at SJo-43, a Plains Miwok village on the Mokelumne River, probably represents a Yokuts/Miwok intermarriage—no typologically similar forms have been found on the Cosumnes River (Sac-6 contained numerous bone artifacts) or American River.

So, for the Augustine Pattern, I would use the direct historical approach and invoke an ethnographic model which does provide us with all of the perishable items that we will never find archaeologically. I propose that Wintu and even Shasta do fall within the Central California culture area and that the archaeological variants that we find in these areas are merely aspects of the Augustine Pattern and not new patterns in themselves. I also object vociferously to calling the Shasta Complex by the term Shasta, because once we dig in Shasta territory we're going to find a quite different culture. Consequently, I suggest that the Shasta Complex should be called the Redding aspect of the Augustine Pattern. I find every trait listed by Sundahl (1982) for the Shasta Complex to be compatible with the Augustine Pattern. The houses are conical in shape, not rectangular. Bark covering occurs in both the Coast Ranges and the Sierra. Burials were flexed, not extended. The distinctive features that do distinguish it from Central California are those that represent influence from the Gunther Pattern. These are a late overlay and represent borrowings from the west. The Gunther Barbed series point, for example, has been traded as far south as Sonoma and Sacramento counties (Jackson and Schulz 1975). Using evidence from such sites as Yol-13 at the mouth of the Feather River, I hypothesize that the Gunther Barbed series were the first arrow points introduced into the Central Valley, that they came ultimately from the Columbia River, and were brought in by the Patwin who were being pushed south by the ancestral Yurok and Wiyot. Gunther flanged pestles appear in late complexes in the interior. Hafted knives for fishing are a typical Gunther Pattern trait. Dentalium beads obviously come from the northwest coast. These I see as representing Macro-Algonkian introductions. However, some traits must have been introduced later by the Athabascan intrusion, which I place around A.D. 1300. Specifically, the toggle harpoon is later than the simple harpoon, and it replaces the simple harpoon in the Sacramento Valley and Delta areas. Athabascan intrusion was possible because they, too, had a superior weapon—the sinew-backed bow—as did the Navajo-Apache. The arrow shaft smoothers were probably brought in by the Athabascan intrusion. To judge from one Del Norte County coffin burial, entering Athabascans buried the dead in a semi-flexed position, and adopted the Algic dorsal extension in the historic period.

In conclusion, much more excavation and analysis are needed to resolve these taxonomic problems. In particular, the contemporaneity and greater meaning provided by grave lots are essential to 'aspect' definition. As defined by Willey and Phillips (1958), there should be few patterns; variation can be handled by multiple aspects.

FIGURE 6.4 CENTRAL CALIFORNIA TAXONOMIC SYSTEM



7

Central California Archaeology: The Concepts of Pattern and Aspect

David A. Fredrickson

(1982, revised 1984)

Introduction

THE CLASSIFICATION OF archaeological assemblages is now and always has been one of the most troublesome tasks for the scholar, and yet dealing with the theoretical bases of such classification is a task that most of us tend to side-step or put off until another day. Randy Milliken reminds me that we tend to forget that we are anthropologists and, because of this, we often treat archaeological materials as objects apart from the people who were responsible for their deposition. We seem rarely to draw upon our anthropological knowledge of human behavior and cultural complexity.

The work of Willey and Phillips (1958), in my estimation, is still the most useful exploration of concepts employed in archaeological classification. I see no problem in accepting the bulk of their basic definitions, and indeed urge for the sake of more explicit communication that these definitions be accepted by others as well. According to Willey and Phillips (1958:22-24), the "phase" is:

> an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived, whether of the same or other cultures or civilizations, spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time.

Problems do occur in operationalizing the concept. The absence of specific criteria for defining phases is shown by the comment that:

> a phase may be anything from a thin level in a site reflecting no more than a brief encampment to a prolonged occupation of a large number of sites distributed over a region of very elastic proportion (Willey and Phillips 1958:22-24).

Further, as additional data are compiled, phases may be subdivided into smaller units, which themselves may be either equivalent phases or groupings of subphases. Again there is an absence of explicit criteria for such subdivision.

We are familiar with the construction of local sequences, often based upon the excavation of a single complex site or a number of related sites in a single locality. Local sequences are most commonly the product of a single worker, or a small group of cooperating individuals, who have firsthand knowledge of the materials which they place into the local sequence. By contrast, the regional sequence, such as ones in the North Coast Ranges or the upper Sacramento Valley and environs, requires correlations between various local sequences. It is instructive to

again review at length the comments of Willey and Phillips (1958:26-29) on this issue:

> Ideally, the archaeologists of a region come together in a harmonious session where a careful matching of local sequences produces a new sequence of larger scope. Actually this happy event occurs but rarely. What more often happens is that phases and local sequences gain in scope by a sort of osmosis. They flow outward, so to speak, often propelled by their originators, uniting to themselves their weaker correlates over a widening circle. The process is necessarily accomplished by a progressive generalization of definition until much of the original usefulness to research is impaired.

I provide these citations from an earlier generation to remind us that the classification of archaeological assemblages has never been an easy task and, implicit in the Willey and Phillips analysis, there is seldom agreement among researchers who are separately (or even cooperatively) attempting to organize archaeological data into meaningful spatial or temporal units. The Central California sequence identified in Bulletin 2 of the Sacramento Junior College (Lillard, Heizer and Fenenga 1939), and later refined and extended by Richard Beardsley (1954), is a good case in point. Gerow (1954; Gerow with Force 1968), Ragir (1972), and Fredrickson (1973, 1974a), as well as others from time to time, have offered critiques of the Central California classification.

Clearly disagreements occur for a number of different reasons. On the formal level we can see from the Willey and Phillips definition of a phase that there is no standard established for defining the minimum degree of similarity between assemblages to warrant grouping them together. There is no definition of the nature of the differences which would warrant the separation of assemblages into different units. If archaeological assemblages are examined employing the direct historical approach, with reference to known ethnographic data, the logical problem of specialized assemblages of the same community occurring at different locations and otherwise incomplete assemblages comes to light. In formal terms such assemblages could be grouped into separate phases representing different archaeological "cultures." It is also evident that when we attempt to correlate local sequences (often incompletely and poorly defined) within a region, the absence of adequately defined criteria impedes the process and hinders agreement between different workers. Even when workers accept the same taxonomic framework, which they rarely seem to do, questions such as the one above remain, i.e., do contrasting assemblages represent different activities of the same group or the basic assemblage of contrasting communities? In the transition zone between adjacent regions, regardless of how criteria are established, it often appears arbitrary as to whether a particular phase is grouped with one regional sequence or another.

Archaeologists are dealing with the same kinds of problems that ethnologists attempted to deal with in refining the culture area concept. Unfortunately in archaeology, small sample sizes, the lack of comparable materials, and the uneven quality of the data make meaningful statistical correlations difficult if not impossible, so that work analogous to that done by Driver and Coffin (1975), and during an even earlier generation by Klimek (1935), is not feasible in most archaeological regions, at least in California. Critiques applied to the culture area concept in general anthropology apply many times over in archaeology.

Binford (1965) has discussed some of these problems within the contrasting frameworks of the normative and processual approaches. He rightfully points out that culture is not shared but is a system in which persons participate. "Individuals and social units are articulated by means of various institutions into broader units having different levels of corporate inclusiveness" (Binford 1965:205). Since culture is not a univariate phenomenon, it is methodologically unsound to simply group assemblages together with respect to numbers of similarities and differences. For example, if shell beads and ornaments dominate the known assemblage, such groupings would not identify communities in the discrete sense but rather a portion of an exchange network that may include a wide range of separate communities. Binford (1965:208-209) suggested that there are at least three major types of "broad cultural alignments" that may vary independently of one another—the *tradition*, *interaction sphere*, and *adaptive area*.

For Binford, *tradition* refers to "demonstrable

continuity through time in the formal properties of locally manufactured craft items," or "stylistic variability." *Interaction spheres* are "areal matrices of regular and institutionally maintained intersocietal articulation," which may crosscut both traditions and culture areas. An *adaptive area* is one "which exhibits the common occurrence of artifacts used primarily with coping directly with the physical environment." Binford (1965:209) relates the adaptive area to the culture area concept, excluding stylistic attributes from the definition. He argues that these three spheres should be studied as independent variables if we are to understand more fully the operation of cultural processes.

While Binford's critique of the normative approach has heuristic value and the formulations discussed above have considerable value, the major problems in classification of assemblages are still not addressed. General concepts that appear to make sense are suggested, but no clue has been offered with respect to operationalizing them. For example, how do we compare the stylistic traditions of one local sequence with those of another sequence? Binford appears to ignore the problem, and, indeed, the "spheres" suggested by Binford are themselves multivariate phenomena. It is likely that an "interaction sphere," for example, consists of a variable number of subsystems none necessarily covarying with the others. Recent ethnographers have emphasized the variability in individual behavior within communities, thus adding more doubt regarding the bases for taxonomic grouping of archaeological materials.

Nonetheless, we archaeologists must deal with the problem of organizing massive amounts of information into groupings which have meaning to us, despite apparent lack of congruence with the real world. In my doctoral dissertation (Fredrickson 1973), drawing heavily on the work of Jim Bennyhoff, I suggested a series of concepts to deal with temporal and spatial classification in California. These concepts were based upon those of Willey and Phillips (1958) but with some alterations that attempted to reconcile normative and processual approaches. The reconciliation was not explicitly done, and, upon review with the benefit of hindsight, I did not fully recognize the multivariate nature of culture. The system which I proposed has been most extensively used in the North Coast Ranges, but it has recently gained currency throughout the state (e.g. Moratto 1984).

In this essay, I focus on the concepts of "pattern," "aspect," and "period," all of which were first introduced to northern California archaeology in 1973 (Fredrickson 1973). At that time, I (Fredrickson 1973:118-19) wrote that a pattern was characterized by: "(a) similar technological skills and devices (specific cultural items); (b) similar economic modes (production, distribution, consumption), including participation in trade networks and practices surrounding wealth (often inferential); and (c) similar mortuary and ceremonial practices." I stated that local variation in a pattern may sometimes be extreme depending upon "(a) abundance and nature of specific environmental resources; (b) regional specialization and elaborations; (c) degree of cultural and geographic marginality; (d) influence of neighboring patterns."

I originally conceived of both pattern and aspect as representing different levels of interaction spheres. The aspect represented direct community interaction, and the pattern represented more widespread interaction, perhaps comparable to what might be called an "effective interaction sphere," as contrasted with the "minimum interaction sphere" represented by the aspect and the "maximum interaction sphere," represented, for example, by trade horizons, which may cut across the boundaries of adjacent archaeological areas. While I still hold this view, I believe we can further refine the concepts, borrowing from Binford.

At this time, I offer a refinement in the definition of pattern, more in keeping with the "adaptive sphere" of Binford. I retain criteria of similar technological skill and devices but reject as a necessary criteria the similarity of mortuary and ceremonial practices. This is not to say, however, that such linkages do not occur from time to time. The concept of economic modes which I employed in 1973 is far too broad and, in fact, represents a series of distinctly separate activities and processes. I would retain similarity with respect to the means of production (and probably consumption), but distribution, especially as it relates to exchange systems and wealth practices, must be kept apart from the pattern concept. Although I keep

exchange outside of the pattern concept, I think it likely that there is a level of exchange, or interaction, which is represented within a pattern. I see no need for any significant change in the qualifications regarding local and regional variation with a pattern.

North coastal California patterns identified to date include Gunther (of Northwest California) and Augustine (of Central California), both of the Emergent period; Berkeley (of Central California, emanating from the Bay Area and with historical origins possibly from the south coast); Borax Lake; and the still-provisional Post (see Fredrickson 1984; Fredrickson and White 1988). Discussion is still underway regarding the nature and definition of assemblages that appear to represent one or more patterns intermediate between Borax Lake and Gunther and Borax Lake and Augustine. Each pattern can be conceived as representing an adaptive sphere strongly marked by the common occurrence of artifacts used primarily in coping directly with the physical environment. We should recall that although culture is indeed a multivariate phenomenon, independent variables may indeed (but not necessarily) covary simultaneously. Thus, we do at times observe burial modes changing simultaneously with extractive technology. The pattern concept can be seen to represent a "lumper's delight." The phase and subphase, by contrast, are each a "splitter's delight," and, since each is ideally based upon detailed analyses of stylistic elements, each represents an equivalent of Binford's "tradition sphere."

Having now borrowed from Binford, we are still left with the problem of dealing with variation in the pattern, or adaptive sphere. Such variation can be identified on the basis of stylistic elements (Binford's traditions). However, phases and subphases represent the smallest archaeological units that can be identified and may, if we are fortunate, actually represent the equivalent of a community. Following Willey and Phillips (1958), the geographic space through which a given phase or subphase can be traced would be a locality. In practice, however, we can rarely distinguish one locality (in the sense of a local tribelet territory) from another. For purposes here—acknowledging Jim Bennyhoff as the originator of the idea—I refer to the space encompassed by a phase or subphase that can be traced and can be referred to as a "district." As a working hypothesis, Bennyhoff (see Bennyhoff 1977), has proposed that districts equate with linguistic communities. While ideally every politically autonomous community should be represented in the archaeological record by a distinct sequence of phases, in practice—based on ethnographic and protohistoric parallels—the district is most commonly made up of a series of interacting communities, communities that are probably linked through intermarriage and kinship. If we examine Yellen's (1977) data from Africa, and data recently generated by Randy Milliken from Mission Registers, such communities may be actively and constantly exchanging personnel.

As we view the archaeological data from the California culture area, the major exchange networks themselves allow the suggestion that we are in need of a taxonomic grouping to deal with variability not expressed within the pattern and aspect concepts. We can observe a level of assemblage similarity that appears to fall between these two concepts as they have been applied to date. Conceiving of the aspect as a "minimum interaction sphere," as noted above, has limited our synthesizing ability. It may be better conceived of as an "intermediate interaction sphere." In 1973 I defined an aspect as being equivalent at any one time to a phase, and over a longer period of time by a sequence of phases. With the aspect expanded to the intermediate level, at any given time slot, it can be made up of perhaps several synchronous but somewhat contrasting phases. A specific phase, then, is situated within a specific locality. Several similar phases in adjoining localities would be grouped into an aspect, with the localities grouped into a district.

To facilitate communication prior to definition of specific phases and aspects, I further suggest a concept that I refer to as a "style-area" be adopted to deal with this mid-range variability. How the concept is to be employed to distinguish the multivariate nature of archaeological materials remains to be worked out. I can conceive of the concept being employed in each of two major ways: (1) by a qualifier expressing geographic spread, best applied to assemblage similarities on a level intermediate between pattern and aspect (but not necessarily limited to this level), and (2) by a stylistic qualifier representing the geographic distribution of a particular stylistic element. For example, the "Tehama" materials discussed by Elaine Sundahl and similar materials discussed by Bill Dryer

might be grouped together into a "Southern Cascade style-area." On the other hand, the geographic area in which the indented base, wide-stemmed projectile point (spear point or knife) is found could be referred to as the "indented base, wide-stemmed point style area," or more simply, the "wide-stem style-area." This practice could reduce our tendency to equate the wide-stem point necessarily with the Borax Lake pattern. Further discussion regarding this concept, or an alternative method of referring to the middle level of cultural grouping, could prove productive.

I do suggest that we pay more heed to the multivariate nature of culture, adding such focus to the synthesizing tasks in which we are already involved. Although I have pointed out the lack of satisfactory criteria for defining the several taxonomic units, I have not attempted to deal with the problem. Overcoming the problem may well take us back to an "old-fashioned" approach, that of plotting geographic and temporal distributions of discrete artifact types and subtypes, rather than focusing all our energies upon the assemblage alone. We might call this the testing of the multivariate hypothesis. Such an approach may help us refrain from reifying our constructs, and of assuming similarities when we apply the same name to assemblages from different locations. Our state of knowledge should now encourage us to entertain multiple working hypotheses. I cannot overemphasize my perception that we are at an ideal place in data collection and analysis. We may now take a step back and be critical (and subsequently creative) regarding methodological issues. Our comparative skills and methods, for sure, need honing.

I have recently been made aware of yet another dimension of assemblage distribution which is not encompassed by the taxonomic system as originally conceived or as it might be modified according to the suggestions above. Greg White has informed me of the apparent coexistence of contemporaneous but contrasting assemblages within the same locality. What appears to be persistence of the milling stone assemblage in Lake County is found coterminously in localities containing Houx assemblages. Brian Wickstrom has noted the identical phenomenon in the Santa Rosa locality, with a milling stone assemblage co-occurring with Berkeley assemblages. Both of these examples could be similar to the "Tehama Pattern" as described by Clewett and Sundahl (1990).

It may be that archaeology must lose the unity of the California culture area as defined on the basis of ethnographic traits. In that event, Augustine and Shasta would become synchronous patterns and Tehama, then, would become an aspect of Shasta or Augustine, or even be elevated to the pattern level itself. In the North Coast Ranges, Houx would become a pattern separate from Berkeley. The major problem with this approach is that it encourages classificatory fragmentation, but perhaps that cost is in keeping with the benefits that might be accrued.

As for the second problem, we know on the basis of ethnographic data that contrasting cultures can indeed occupy different niches within the same habitat (i.e. within the same or overlapping geographic ranges). It is clear to me that the Central California taxonomy as I have discussed it is inadequate in treating this circumstance.

8

Variation within the Meganos Culture

James A. Bennyhoff

(1987)

Introduction

In 1939, HEIZER NOTED that the older component at the Orwood site (CCo-141) was an *atypical* Transitional Horizon representative because ventral extension was still the burial mode (Lillard, Heizer and Fenenga 1939:55). When Beardsley (1948:4, 9) formalized the Central California Taxonomic System, he also separated an Orwood Facies from other interior facies within the Middle Horizon. During my years as archaeologist with the University of California Archaeological Survey, my associates and I salvaged two sand mound cemeteries in the Delta—CCo-20 and SJo-106—which closely resembled the Orwood Facies. Also, I recorded similar sites (CCo-19, CCo-31) near Walnut Creek. University of California archaeological field classes, under my direction, continued excavations begun by Heizer at CCo-151 in El Sobrante, where Middle Horizon *ventrally extended* burials occurred in the midden above flexed burials placed in pits into the subsoil.

In 1968, I termed a collection of seventeen similar sites Meganos (see chapter 1 herein) and over the years many other sites have been added. Jerry Johnson salvaged SJo-91 south of Stockton; Jean Moss and Ruth Mead salvaged CCo-311 near Alamo; Frank Fenenga salvaged SJo-17 southwest of Stockton; Miley Holman rescued Ala-413 in the Livermore Valley; and Richard Hughes and I salvaged SJo-154 at Stockton. Most recently, three sites were salvaged in the south Bay—Ala-453 in Union City, Ala-413 in Fremont, and SCl-327 in San Jose. Despite much more variability today than when I first defined this culture in 1968 (chapter 1), I still view the Meganos culture as a *hybrid* of a Windmiller population intermarrying with Berkeley neighbors. The result, especially in later phases, was a divergent aspect—the Meganos aspect of the Berkeley Pattern. "Meganos" means sand mound, and Cook and Elsasser (1956) called attention to these non-midden cemeteries found in the sand mounds of the Delta islands. I feel that the Meganos culture was always centered in the San Joaquin Valley but spread into parts of the Bay region during the late and terminal phases of the Middle Period.

Overview

In the Early period, roughly 3000 - 500 B.C., two very different cultural patterns are found in the Bay and Delta regions (see figure 8.1). The Windmiller culture, found in the Delta region between Sacramento and Stockton, is characterized by a rigid mortuary pattern dominated by ventral extension and westerly orientation, with burial sometimes in the village midden and sometimes in non-midden cemeteries. Mortuary offerings are customary, with an emphasis on ground stone including perforated

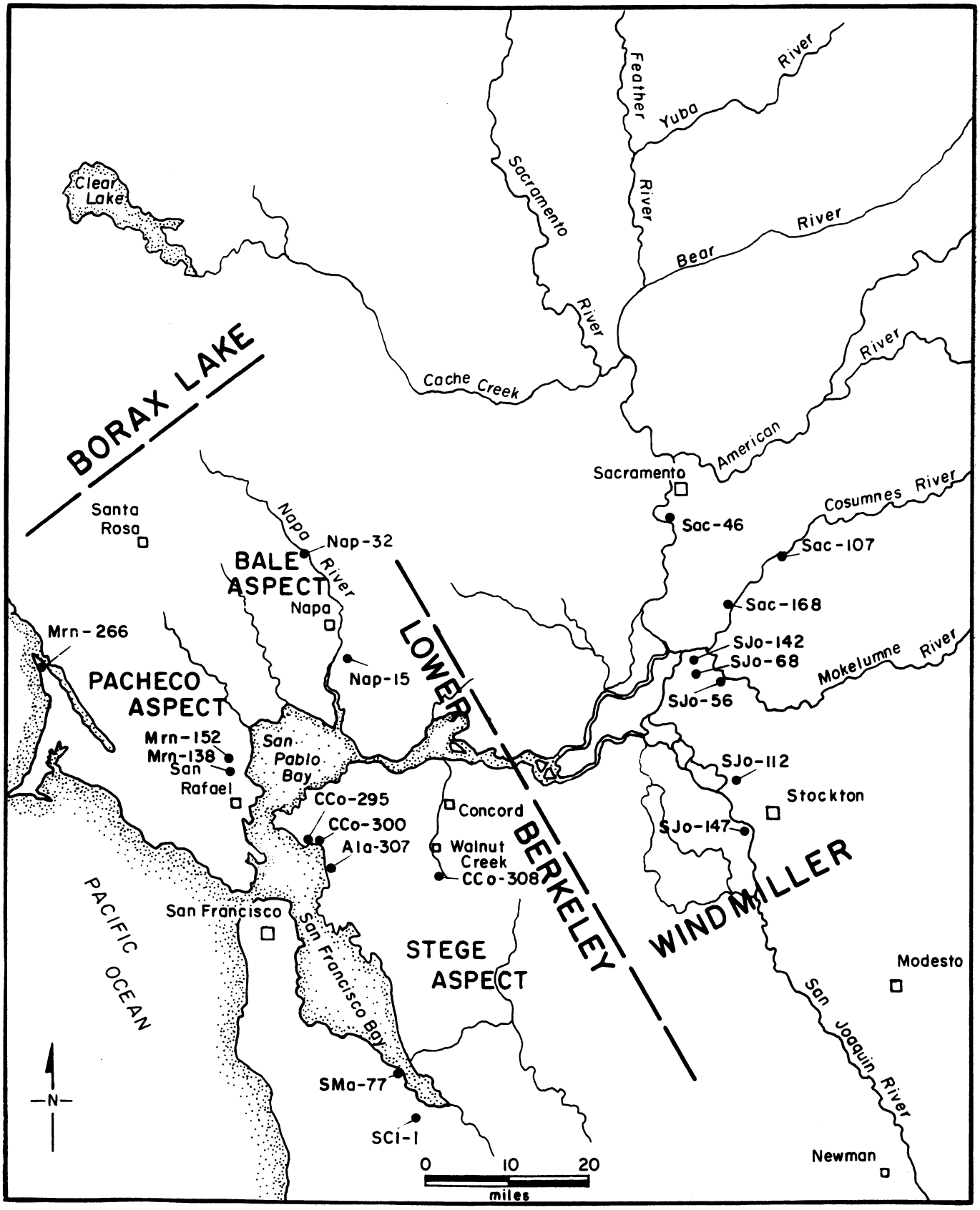


FIGURE 8.1 Pre-Meganos patterns and aspects in the Bay and Delta regions during the Early period, 3,000 - 500 B.C.

charmstones and ground slate. Bone artifacts are of relatively minor importance. In contrast the Berkeley Pattern, centered around the San Francisco Bay, is characterized by burials with *flexure* 90-100% of the time, usually found in the midden, and having no rigid orientation. Grave goods were usually sparse, but a wide variety of bone tools were emphasized. Different physical types also distinguish the two patterns, so I cannot regard Lower Berkeley as a mere variant of Windmiller as suggested by Moratto (1984:207ff.)—two distinct cultures and populations are represented. The Meganos variant emerged during the Early/Middle Period Transition (E/MT)—roughly 500 - 200 B.C. (see figure 8.2). The Windmiller population in the Cosumnes District is largely displaced southward into the Stockton District by the intrusive bearers of the Morse aspect of the Berkeley Pattern. Most Windmiller sites are abandoned, and many new sites are first occupied and will continue to be occupied through the Middle period. The Morse aspect represents a new cultural orientation which shares traits (use of the mortar and pestle [acorn economy], exclusive flexed burial within the village, and abundant bone tools) with the Stege aspect. Phasing problems obscure the earliest movement into the Livermore Valley. Randy Wiberg proposes that the oldest component at Ala-413, dating to the E/MT, is characterized by flexure. However, two of the six so-called flexed burials are actually semi-extensions, and flexed and extended burials overlap by depth. Artifact types and radiocarbon dates do support a dominant occupation during the early phase of the Middle period.

Meganos expansion into the Walnut Creek Valley and down San Pablo Creek took place within the Late phase of the Middle period (see figure 8.3). Such Berkeley Pattern sites as CCo-308, CCo-259, and CCo-14 were abandoned, and Meganos cemeteries at CCo-311 and CCo-2 appeared nearby. Most of the population in the far northern Alameda District likely fled across Carquinez Strait, but amalgamation probably occurred at CCo-151, where ventral extension and flexed burials appear together in the midden. The major occupation at Union City (Ala-453), Fremont (Ala-343), and SCl-327 probably represents the Terminal phase of the Middle period.

The Middle/Late Period Transition, roughly A.D. 700 - 900, represents a period of disruption in much of Central California (see figure 8.4). Such northern traits as harpoons, collared pipes, bow and arrow, and grave pit burning signal the arrival of the Augustine Pattern, almost certainly brought south by the ancestors of intrusive Patwin speakers. Their penetration into the Solano District forced the indigenous Petersen (Sol-2) population to move south of Suisun Bay where they emerge as ancestral Bay Miwok. Ancestral Karkin Costanoan return south of Carquinez Strait; CCo-2 is abandoned; and CCo-259 (the Fernandez site) is reoccupied in early Phase 1. The 300 years of separation of the Karkin from the other Costanoans is the probable explanation for the fact that Karkin is the most conservative Costanoan language. The Meganos cemeteries disappear throughout the Alameda and Diablo districts. Most of the Meganosians returned to the Delta, where an increase in sites occurs. One group actually crossed the Mokelumne River to occupy the Morse site (Sac-66) for this single phase.

In early Phase 1 (figure 8.5) the Bay Miwok expand into the west Delta to occupy the Hotchkiss site (CCo-138). The Meganos cemeteries CCo-20 and CCo-139 were abandoned. The latest evidence for a Meganos cemetery appears in Early Phase 1 of the Late period at the Cardinal site (SJo-154) in Stockton, where 84% of the nineteen interments were flexed. Amalgamation with Valley Yokuts appears to have been the fate of the Meganos survivors. By Middle Phase 1, a new settlement pattern is evident in the Stockton District, and burial always occurs in the village.

Post-1968 Research

Since 1968, much more variability is evident in the Meganos culture. Unfortunately, we are still plagued by a miserable data set. Most sites are non-midden cemeteries or buried sites discovered by bulldozers—hence 20-40% of the burials lack crucial information on burial position and orientation. Single phases are often represented by small numbers. For example, at SJo-106, the ninety-one burials represent five phases, each with only twelve to twenty-two burials. The two phases recognized at SJo-154 are represented by twelve and twenty-three burials. Excavation at Ala-413 was limited to the edge of a sewer trench; seventeen burials were partial exposures so position and artifact associations are clouded. Ala-

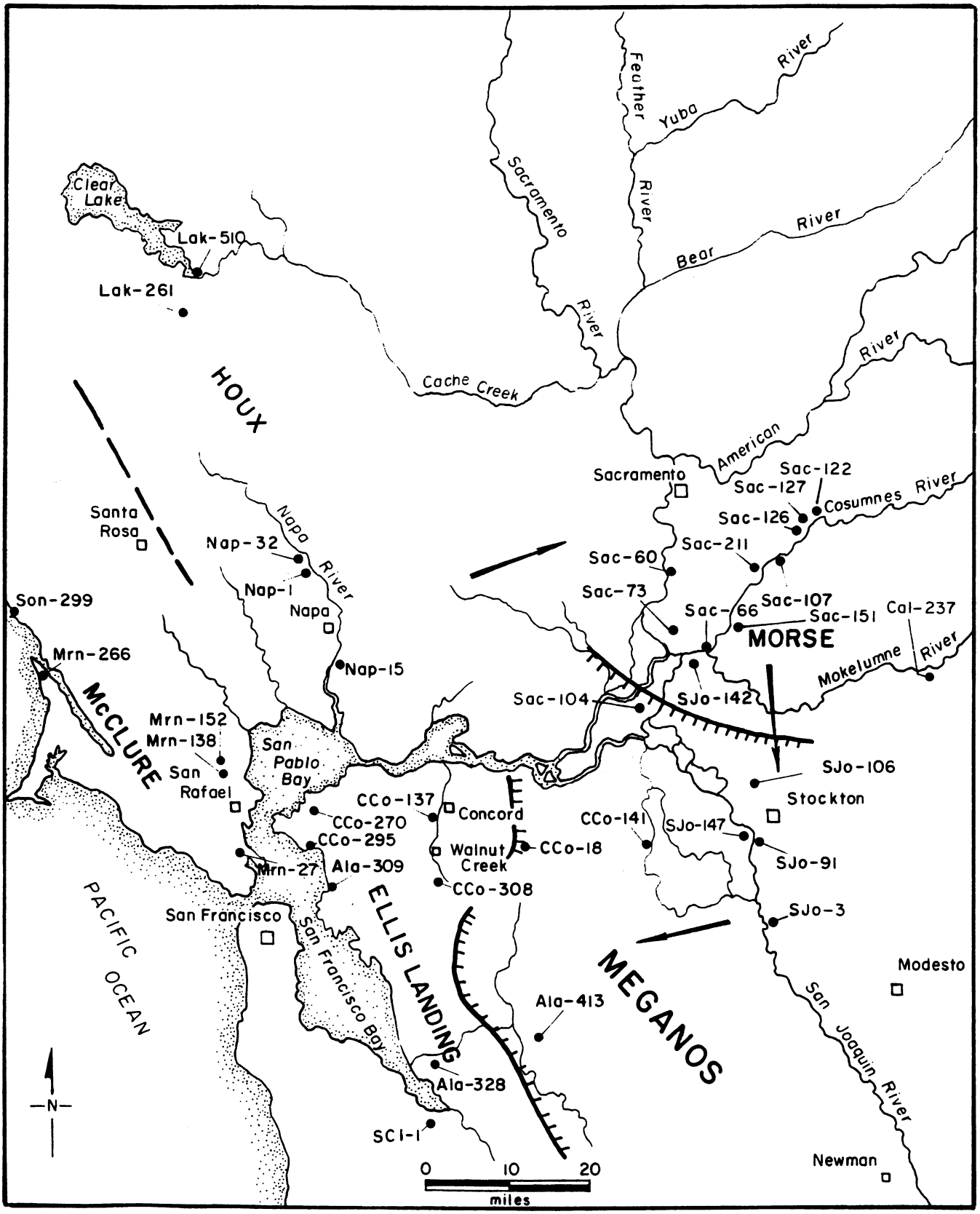


FIGURE 8.2 The emergence of Meganos during the Early/Middle Period Transition and early phase of the Middle period, 500 B.C. - A.D. 100.

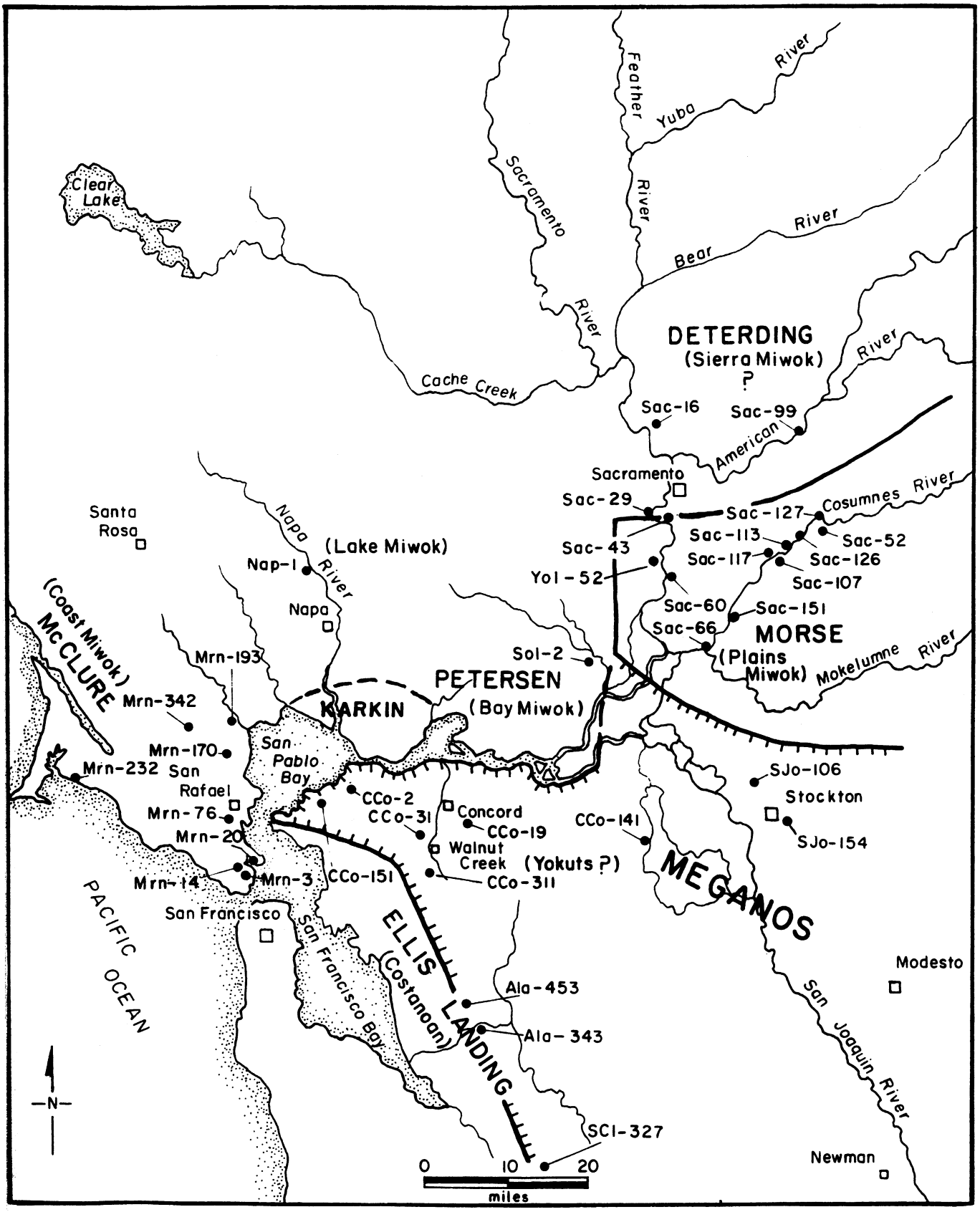


FIGURE 8.3 Meganos expansion during the Middle period (Late and Terminal phases), A.D. 300 - 700.

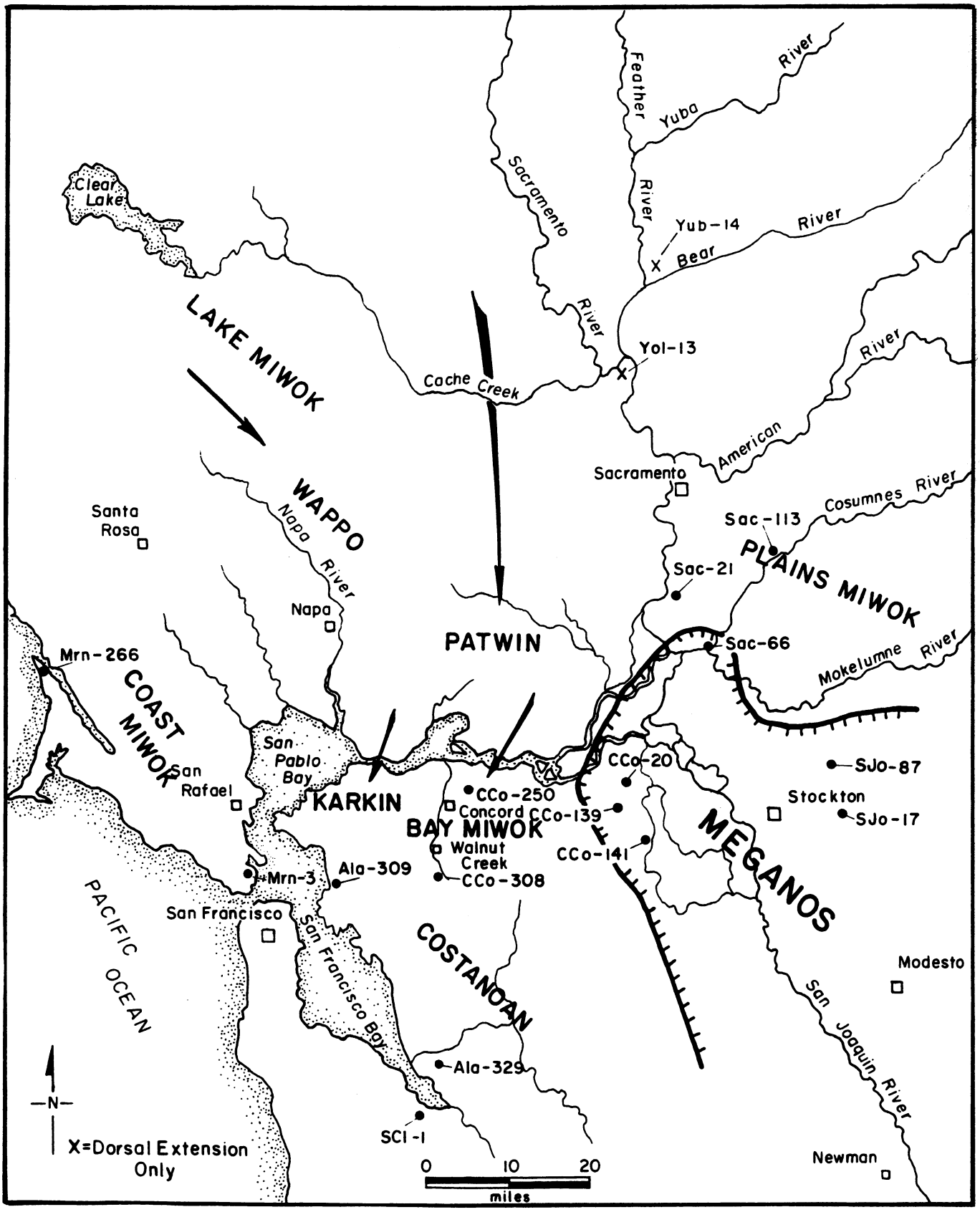


FIGURE 8.4 The Meganos retreat to the Delta during the Middle/Late Period Transition, A.D. 700 - 900.

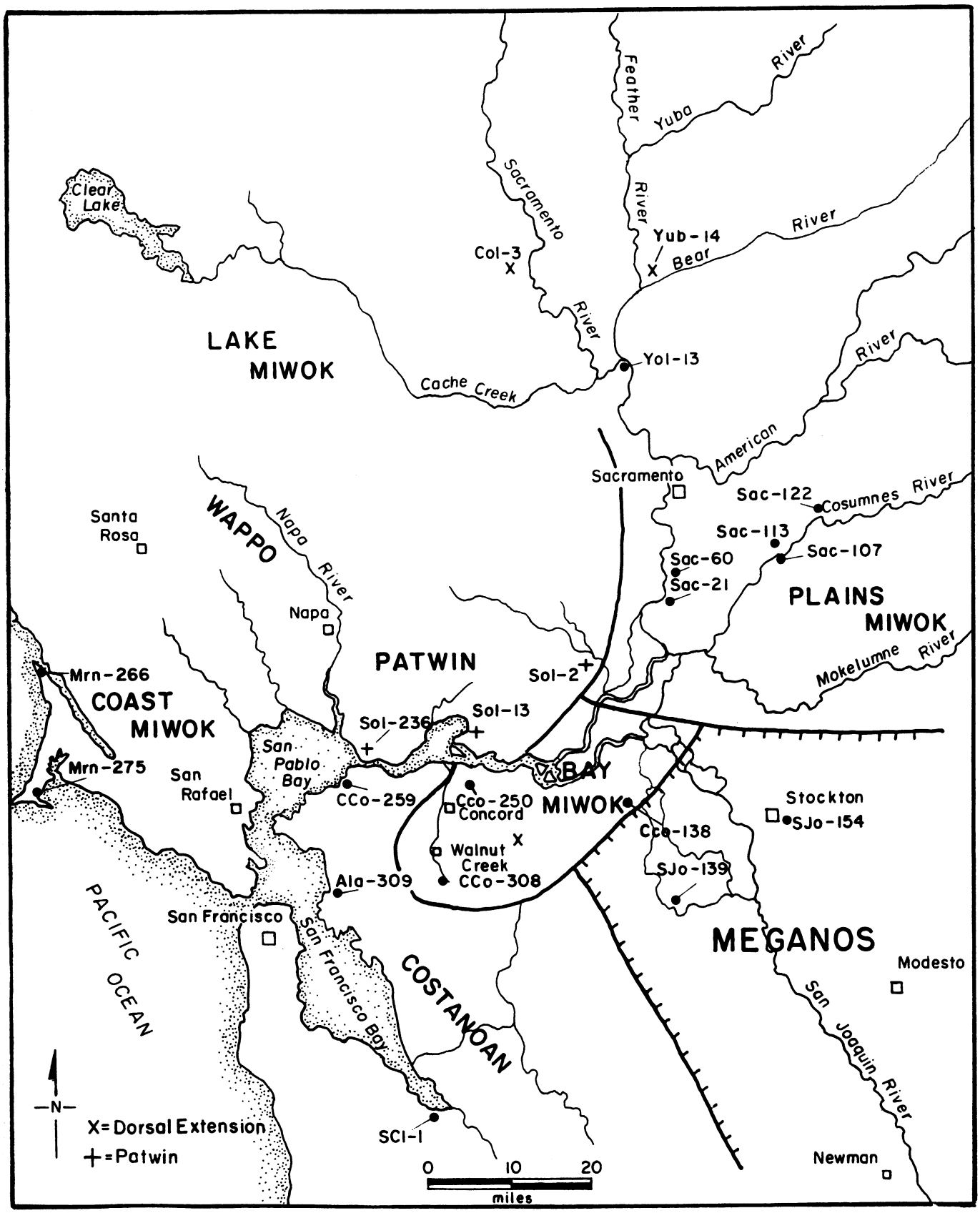


FIGURE 8.5 The end of Meganos during the Late period (Early Phase 1), A.D. 900 - 1100.

453 has a similar problem. Depth relationships have not yet been worked out at Ala-343. Few sites have been intensively analyzed, and I personally have seen only partial collections from the many recent sites. A variety of typological problems have yet to be resolved. At Ala-413, Wiberg (1984) refers to semi-extension as flexed, while J. Hall refers to Ala-343 extensions with bent legs as semi-extension. New shell bead variants keep emerging, and no satisfactory shell ornament analysis has been completed.

The problem of midden vs. non-midden cemeteries remains unresolved. Fenenga and I have both dug at the Windmiller sites Sac-107 and SJo-68. Fenenga argues that Sac-107 is leached midden; I do not agree. The Meganos sand mound cemeteries definitely lack midden. As one approaches the Bay, uncertainty prevails. CCo-151 is definitely a village midden, but Ala-413 and 454 seem more like campsites. Ala-343 at Fremont is one of the more instructive in that burials were concentrated in the midden, but many off-site burials also occurred.

The variability in burial position is most puzzling and too complex to summarize quickly. At SJo-68, Ragir (1972) felt that dorsal extension in the Windmiller culture reflected warfare mortality. So far, I find little support for this in Meganos, but dorsal extension is much more rare than ventral extension.

At SJo-106, of sixty-seven burials with data, 73% were extended and 27% were flexed. When phased, there is a clear shift from 73% ventral extension in early Middle times to 73% flexed in the Middle/Late Transition. At SJo-154 in Terminal Middle times, 63% of eight burials were extended (two ventral extensions, three dorsal extensions) while 37% were flexed. However, in early Phase 1 at SJo-154, 84% were flexed and only 16% were extended (two dorsal and one ventral extension).

In contrast, at Ala-413, the four flexed burials were all confined to the older component of the Early/Middle Transition phase (thirty ventral extensions, five dorsal extensions, and two semi-extended). At CCo-151, also, flexure is emphasized earlier than extension, and Late Middle burials are more often flexed than extended (58% vs. 42%). The Terminal Middle burials, on the other hand, reverse these frequencies: 61% were extended and 39% were flexed. While phasing problems may be involved at CCo-151, these figures could support the interpretation of a local population acculturating to the new Meganos intruders. *All* extensions at CCo-151 were ventral.

Most Ala-343 burials probably represent the Terminal Middle phase, and flexure is emphasized (57% flexed, 43% extended). Flexure and ventral extension were equal (four each) at Ala-453, and all seven Terminal Middle period burials at SCl-237 were ventral extensions, but a mass burial was represented.

Turning to orientation, the Windmiller emphasis on pointing skulls to the west is abandoned in Meganos sites. There is a very clear shift to north in all the western Meganos sites, those in the Livermore Valley, Walnut Creek Valley, and the Alameda District sites. At Ala-413, 79% of burials were oriented northwest, north, or northeast, while 78% of burials at Ala-343 were so oriented. Delta sites are quite variable, with southwesterly being found at SJo-106, and south or west favored at Sac-104.

The numbers of artifacts associated with Meganos burials also is variable. At SJo-106, only twenty-four of ninety-one burials (26%) had artifacts associated, and these numbers tend to decline over time; only 41% of seventeen early Middle period burials had artifacts, while none of twelve Middle/Late Period Transition burials was accompanied by artifacts. At SJo-154, nine of twelve (75%) of Terminal Middle period burials were accompanied by artifacts, while sixteen of twenty-three (70%) of Phase 1 burials has associations. At Ala-413, 39% (twenty-five of sixty-four) of the burials had associations, though seventeen burials were not fully exposed. Forty-three of seventy-one burials (61%) at Ala-453 have artifacts associated with them. In general, SJo-91 and the western Meganos sites seem to have more of a ceremonial emphasis than I found at SJo-106. Charmstones, bird-bone whistles, and ceremonial points are more common in the west.

Summary Comments

I am most impressed by the continual appearance of unique traits in Meganos cemeteries. Though not far separated spatially, the Patterson phase of the Berkeley Pattern at Ala-328 features shield ornaments of abalone, while the contemporaneous Ala-413 buri-

als yielded new multi-perforated forms. Ala-413 has a distinctive humerus with bead appliqué not found elsewhere. The site also contained unique cannon bone tubes and tibia pendants (or sweat scrapers), as well as a unique steatite bowl. Ala-453 has a new oval saddle bead type. Nonetheless, most sites show an active participation in trade—particularly involving exchange of shell goods for obsidian. At Ala-413, 66% of the obsidian recovered occurred with burials (trans-Sierran obsidian sources Mt. Hicks, Queen, and Casa Diablo dominate, only 34% from the Napa Valley) but only 26% of the midden obsidian came from Casa Diablo (68% derived from the Napa Valley and 5% from Annadel). Thus, there appears to have been extensive trade in finished products. Eastern sources were also important for cemeteries in the Delta. White chert was emphasized in the Diablo District (see figures 1.2 and 1.3) and was traded to CCo-2 and West Berkeley (Ala-307; cf. Wallace and Lathrap 1975:13, plate 3q, r).

These three recently excavated sites in the south San Francisco Bay Area (Ala-343 in Fremont, Ala-453 in Union City, and SCl-327 at Eastridge) have extended the distribution of the Meganos culture a significant distance southward from San Pablo Creek and increase the cultural variation found in this Middle period assemblage.

9

Archaeological Taxonomy in Central California Reconsidered

David A. Fredrickson

(1992, revised 1993)

Introduction

DURING THE 1960S AND early 1970s, but before the then-called New Archeology had exerted its full influence, I was one of several archaeologists who were rethinking what is now referred to as the Central California Taxonomic System (CCTS) (Beardsley 1948, 1954; Lillard, Heizer and Fenenga 1939; see also Moratto 1984:181-201). This was prompted in part by the growing realization based mostly upon excavations in the larger San Francisco Bay region that the cultural sequence had greater complexity than that implied by the CCTS's Early, Middle, and Late horizons (e.g., Gerow with Force 1968; Wallace and Lathrap 1975). Other factors also contributed to the rethinking, including the terminological confusion resulting from placing "earlier than early" cultures into the system.

As the New Archeology gained influence, the interest quickly dissipated and archaeological taxonomy tended to be ignored, frequently dismissed as irrelevant, or criticized for its inadequacy. Exceptions to such dismissal were on the whole restricted to doctoral dissertations that were in process during the period of "paradigmatic shift" (Fredrickson 1973; Ragir 1972). For me, completion of the dissertation brought with it a loss of interest in taxonomy based more on tedium than any rational consideration, although being engaged in a full-time teaching position brought other more immediate issues to the forefront of my attention. There were few occasions that prompted thought on the topic, even when the taxonomic concepts raised in the dissertation were criticized (e.g., King 1974b; Gerow 1974).

Nonetheless, my dissertation was used by others as a source for concepts and terminology. The generally uncritical use of concepts and terminology, often extracted from their taxonomic context, commonly occurred in gray literature archaeological reports, especially in Northern California. I take the use of such terminology as evidence that there are archaeologists interested in grouping assemblages with which they work with similar ones found elsewhere. This tendency implies on the one hand a need for systematic organization of archaeological phenomena, as taxonomic systems attempt to do, and on the other hand, a desire to reach comparative results with the least effort (cf. Rowe 1962). A major failing is that assemblages are often too incomplete to warrant such groupings; frequently it is the occurrence of but one or two artifact forms that prompt these assignments.

Having lived now for about twenty years with the implications of an essay I completed during a time when the topic—archaeological taxonomy—

was obsolete, I have had many occasions to find significant flaws in the system which I described. Since by training and temperament I am historically oriented and my scientific turn of mind informs me that social factors can certainly be conceived to be as important as environmental ones in shaping history, I retain the urge to group archaeological phenomena in ways that clarify both historical and social relationships. While I agree that improper classification can obscure rather than enlighten, I find the effort of great heuristic worth in that it prompts questions about historical relationships that otherwise might never be raised. Nonetheless, I have found many flaws and inadequacies with the taxonomic system attributed to me; not always, however, the same flaws referenced by others.

In the present essay I intend to identify specific shortcomings in the taxonomic system described in my dissertation (Fredrickson 1973). While trying to correct for retrospective falsification, I will also describe some of the factors that stimulated my interest in the Central California Taxonomic System (CCTS) and archaeological taxonomy in general. In so doing I hope to clarify certain concepts with which others from time to time have indicated dissatisfaction. I do not intend to provide a defense or systematic revision; I am not at all convinced that either would be worthwhile. Because of the information explosion in archaeology, no one individual can control the detail required to identify the variation found in the archaeological record, and variation, after all, is what we are attempting to understand and what prompts us toward taxonomy. I am convinced that any attempt to create a working taxonomy would require considerable effort and commitment by regional experts who are willing to open their imaginations and keep in check their doubts as the synthetic process moves forward.

Historical Context

The CCTS as developed by Lillard, Heizer, and Fenenga (1939), and later formalized and geographically expanded by Beardsley (1948, 1954), followed the methodological approach employed elsewhere in North America at the time (e.g., McKern 1939). Using the comparative method, empirical archaeological data were grouped by site into specific assemblages. Assemblages from different sites were then grouped together with respect to similarities and differences. When similarities dominated, the composite assemblage received its own identity marked by a distinctive name. Prior to radiocarbon dating, these composite assemblages were ordered in time by virtue of their stratigraphic relationships, following the principle of superposition. Each discrete assemblage was referred to as an archaeological culture; that is, the artifact grouping itself was the culture. Application of this procedure throughout North America over several decades resulted in a monumental achievement, definition of the basic spatial and temporal structure of North American prehistory.

In the 1950s, Willey and Phillips (1958), after publishing preliminary articles to stimulate comment, formalized the method by synthesizing its various applications into a single methodological framework, clarifying ambiguities and offering standard definitions and terminology. They further synthesized regional sequences into a general set of culture-historical periods that reflected similar changes at different places throughout the New World: i.e., Paleoindian, Archaic, Formative, Preclassic, Classic, Postclassic.

This sequence is seen by some to represent yet another version of unilineal cultural evolution. In retrospect, I do not see it as a revival of nineteenth century cultural evolution, nor do I see it as an effort to apply principles of biological or Darwinian evolution to the cultural domain, as is sometimes done today. I now see it as an effort to find historic processes that reoccur under similar circumstances at different times and different places, an application of the scientific method.

The historical importance of the Willey and Phillips work is that it marks the apex of the empirical culture-historical approach. Its comprehensive summation of New World archaeology implied that the methods of archaeology had done their job; the major prehistoric cultures had been identified, the sequence of prehistoric events determined, and the major prehistoric themes articulated. It also implied that what remained for future workers was merely to fill in data gaps for lesser known regions, to resolve discrepancies, and to make refinements and adjustments. These implications set the stage for so-called new perspectives and help us understand why an earlier statement of similar perspectives by Walter Taylor (1948) elic-

ited little response for action in the profession as a whole—the stage had not yet been set for the play to be enacted.

One of the major accomplishments of the 1960s New Archeology was a change in the concept of culture. For those employing the earlier empirical approach, the archaeological culture was the artifactual assemblage (including, of course, not only formal artifacts but other observable features such as mortuary attributes). The New Archeology contributed to the contrasting idea that material remains were in large part the residue of cultural behavior, while culture itself was an abstract system. In a sense the application of this view to archaeology relieved the practitioner from what I sometimes see as the "tyranny of the artifact," by transforming a tight focus on formal artifacts into a much broader panorama that included nonartifactual constituents, site formation processes, and the environmental context itself. To me, this shift made clear that archaeology was involved in the study of cultural behavior and variability.

Rethinking Taxonomy

My initial involvement in rethinking the CCTS began as a result of excavations in the San Ramon Valley of Contra Costa County between 1962 and 1964 (Fredrickson 1966, 1968; Moss and Mead 1967). These investigations involved five archaeological sites that collectively contained at least seven components spanning a time period of up to 4000 years. Although I did not use a formal hypothesis testing structure, several of my questions rested on the fact that the CCTS was derived in the main from the study of mortuary data.

While examining the explication of the CCTS provided by Beardsley (1948, 1954), I was struck by the observation that different time periods not only had different frequencies of artifact types but also had different frequencies of graves with associated artifactual materials. This observation raised methodological questions. That is, was it really worth the effort in terms of existing procedures to excavate numerous graves that lacked associations to find that rare grave containing time sensitive artifacts? This question in turn prompted me to look for meaning in materials that occurred with greater frequency within habitation sites (Fredrickson 1969)—namely, those materials that I came to call "debris of customary daily living," in contrast to those materials that were dependent upon ritual circumstance. Only later was I to understand the social implications of mortuary differences (Fredrickson 1974b).

In turning to nonartifactual residues, I felt the necessity to demonstrate that the CCTS was either simply a sequence of contrasting mortuary practices or an actual sequence of differing cultures. It was inherent to the logic I was following that I look at nonartifactual residues (e.g., marine and terrestrial faunal remains, debitage) as reflecting adaptive behavior rather than simply as a list of utilized species and materials (Fredrickson 1968). The data convinced me that the CCTS was indeed a cultural sequence, i.e., a behavioral sequence, rather than primarily a sequence of attributes and artifact types associated with graves. Without being fully aware of the implications of what I had done, I had effectively freed myself from the idea that the artifact equaled the culture.

I had further problems in applying the CCTS. In dealing with these problems, as well as in seeking the cultural assignments of the various site components, I sought the knowledge and guidance of my colleague Jim Bennyhoff. One problem I encountered was the unexpected 4400 year antiquity of the deepest component at CCo-308, which had attributes similar to those expected for Middle Horizon (or Berkeley Pattern) sites at a time depth equivalent to the Early Horizon (or Windmiller Pattern), the termination of which Heizer (1958b) then placed about 4000 years ago. Although later data indicated that the 4400 year age for the Contra Costa site was probably excessive, the more probable 3400 year age for the component still left it contemporaneous with Windmiller, after Sonia Ragir's (1972) reanalysis of the Windmiller radiocarbon dates showed its terminus was as late as 2500 years ago. On the basis of the 4400 age, I concluded that the CCo-308 deep component was contemporaneous with Windmiller. A recent re-reading of my assessment suggests to me that to some extent I doubted my findings and did not wish to rock the boat unnecessarily:

> That the period represented by CCo-308C may have been coexistent with the Early

> Horizon proper cannot be ruled out completely as the distance between the Early Horizon Windmiller Facies series of sites is sufficient to have allowed the existence of two different culture types without too high a degree of mutual influence (Fredrickson 1966:143).

A later review of Gerow's work (1954; Gerow with Force 1968), the results from the West Berkeley shellmound (Wallace and Lathrap 1975), and the dating information on Windmiller compiled by Ragir (1972) removed doubt and convinced me that the culture in the larger San Francisco Bay region was different from the culture that existed simultaneously in the Delta.

Eventually, because of efforts to address these and other questions in the San Ramon Valley (as well as in other geographic regions, especially, in my case, the North Coast Ranges), Jim Bennyhoff and I entered into a process of revising the CCTS, although at the time we aimed at developing a system that could be applied to the state as a whole. Insofar as possible we attempted to use the existing system as a starting point, adjusting its terminology according to the Willey and Phillips usage as described elsewhere in this volume, while conceptually attempting to integrate behavioral criteria into what was originally an artifactually derived chronology, an approach that later was categorized in the gray literature as "functionalist" (as contrasted with "chronological" and "processual") (Fritz and Smith 1978). Several changes were made in the Willey and Phillips scheme to adapt it to the California situation. One of the more important changes was the addition of the 'district' in place of the 'locality' as the practical spatial unit of analysis (to replace the idiosyncratic 'facies' and 'province' of the earlier CCTS) because of material culture similarities between many adjoining localities (not to mention the practical difficulty of amassing a sufficient database for locality analyses).

Although Bennyhoff and I had hoped to produce a separate work on the revised taxonomy, the emergence of New Archeology advocates in Northern California in the late 1960s, who were rightfully critical of the existing CCTS and its conceptual foundations, as well as of our formulations, prompted us to drop the idea. The New Archeology advocates, for the most part graduate students at U.C. Davis and elsewhere, made their pitch against the existing analytic and taxonomic approach during a series of workshops conducted mostly at U.C. Davis during 1967 and 1968. The workshops drew together regional specialists from Northern California (although planned originally as a state-wide venture) with the aim of revising the CCTS. Small work groups from different regions brought together substantive data and constructed local sequences within districts for which they controlled sufficient data. Their work proved that the district concept (locality was the term employed then) was viable in that it was possible to distinguish assemblages from adjoining districts even when the districts shared in the regional culture.

Workshop participants recognized the terminological problem which explicitly *linked temporal placement with cultural content* (i.e., Early, Middle, and Late horizons), and several terms (tradition, culture, and pattern) were suggested to replace the term *horizon* as used in the CCTS, since the term was assigned a quite different meaning elsewhere in North America (Willey and Phillips 1958). Bennyhoff and Fredrickson adopted the term *pattern* (see chapter 2, this volume) based upon general but not universal agreement of the workshop participants. During the discussion phase, a premature note appeared in the Newsletter of the Society for California Archaeology reporting that the term *tradition* had been adopted, although the workshop group later rejected that term. An important objection to use of 'tradition' was its deviation from the Willey and Phillips (1958:37) definition as a "temporal continuity represented by persistent configurations in single technologies or other systems of related forms" (see also chapter 3, this volume).

New Archeology proponents essentially halted the workshops through mobilizing an effective criticism of the logical inconsistencies and other shortcomings of the empirically based taxonomic approach. One of their criticisms was the failure of the empirical approach to deal with functionally based partial assemblages, such as those found in upland locations, which, when used with the comparative empirical approach could produce archaeological cultures that differed from cultures identified in lowland sites even though both sets of sites were created by the same community.

The Davis workshops came to a relatively abrupt end following this critical attack, and the hope of

publishing its results evaporated. However, in consultation with Bennyhoff, I included my understanding of the revised taxonomy in my doctoral dissertation, which had the formal date of 1973, although the taxonomic portion had been completed several years earlier. What appears in the dissertation is unlikely to have been what would have appeared if the workshop had proved successful in its original intent or if Bennyhoff and I had continued with our plans for a joint publication.

In summation, the cultural sequence upon which the CCTS was based remains a ground-breaking achievement based upon sound analytic and comparative principles. However, attempts to extend that sequence to neighboring regions were premature due to the considerable but mostly unanticipated diversity encountered as archaeologists explored more localities. Also the inherent but unanswered question as to the minimum number of diagnostic elements required for horizon assignment remained. The traditional CCTS proved to be too rigid. Bennyhoff and I attempted to produce a system that had greater flexibility and that included non-artifactual variables, including behavioral and adaptational ones. It was not our intention simply to offer different names for what had already been defined.

In the following sections I comment on the Bennyhoff/Fredrickson system as it appeared in my dissertation (and somewhat modified in Fredrickson 1974a), pointing out when appropriate how new data and new understanding require that at least portions of it also be revised if its use is to be continued. Terminology used here is defined elsewhere in this volume.

Digression on Assumptions

Before entering into this discussion, however, I believe it necessary to make explicit several ideas about culture and cultural relationships that influence my views of historical processes and archaeological taxonomy in general. My foremost assumptions, which I adopt from the insights of Robert Murphy (1964) and Yehudi Cohen (1969, 1970), follow from the observation that every society lives in contact with other societies (chapter 5, this volume). This situation implies mutual interaction between different societies (even at the scale of Binfordian [1980] foragers and collectors) and interdependency of their social systems. Such observations prompt me to assume that social factors have importance equal to technological and environmental ones in the adaptations and careers of human groups.

Similarly, I assume that the Darwin-Lotka energy principle, that organisms tend to optimize their energy inputs with respect to energy outputs, a process fundamental to reproductive success, applies to the social, as well as the biophysical sphere. I also assume that certain technological innovations in effect require redefinition of the niche or effective habitat to which a community adapts. Because of feedback processes, such redefinition may involve changes in social relationships, community patterning, and/or demography.

Further, I assume that different processes have differing degrees of importance at different times, depending upon factors such as population density and the existence of firm territorial boundaries. As mentioned above, I draw upon a model of culture change developed from the work of Yehudi Cohen (1970, 1975); a brief statement of this perspective is provided elsewhere (chapter 5) in this volume.

Archaeological evidence for interaction of prehistoric societies in California consists not only of items such as standardized forms of shell beads and ornaments occurring throughout much of the area, but also of the widespread occurrences of similar assemblages at all time depths. Interdependency, however, is either assumed or indirectly inferred. For example, demographers have suggested that a population must number at least 500 persons (including children) in order for that population to contain a sufficient number of both males and females of reproductive age to successfully reproduce itself over time. This being the case, interdependency between different social groups is required for those smaller than this size, whether organized as mobile foragers or sedentary collectors.

Finally, I assume that change in California prehistory was often historically contingent, that is, it came about due to unforeseen conditions, even as a result of chance. For example, an event may not be the predictable outcome of circumstances but merely one of many events that could alternatively have occurred. However, once an event does occur, its implications may resound over time far beyond the event and the circumstances that prompted it.

These assumptions affected my initial thinking

on taxonomy very little, but have greatly influenced my present perceptions. I make reference to these and related assumptions and some of their implications in the following discussion.

Local Sequences

Although the building of a local sequence may seem a straightforward archaeological task, the following discussion should serve as a caveat that what appears simple may not be so in practice. The empirically based local sequence, although describing only a single locality, requires a considerable amount of excavation data. Importantly, however, since the locality is conceptually equivalent to the space occupied by the village community, or tribelet, it has potential for being the most meaningful unit of analysis (Hughes and Bettinger 1984).

However, as pointed out elsewhere (Fredrickson 1973:93ff.), in practice it may not be possible archaeologically to separate one locality from another, since assemblages may well be too similar to allow distinctions to be made between adjacent localities. This may be so because interaction (or social distance) between them is such that identity markers that distinguish one from the other (if they indeed exist) may be too subtle to be teased out by archaeological means. Thus, the traditional application of the comparative method to distinguish one locality, i.e., one village community, from another on the basis of similarities and differences in artifact assemblages may not be possible. For this reason, Bennyhoff introduced me to the district, which consists of two or more closely interacting localities, as the most feasible spatial unit for definition of a local sequence. This does not negate the importance of the village community as an appropriate unit of analysis.

In practice the development of a local sequence has been done without reference to specific physical limits; that is, historically, the locality was defined on the basis of empirical distributions of archaeological materials. Thus, localities (and districts) could be seen to expand and shrink over time congruent with the spatial distribution of the diagnostic assemblage. Although a local cultural sequence may be defined for any arbitrarily defined space, it should always be left open to demonstration whether one or more of the assemblages within the sequence extends into other adjacent spaces.

During the past twenty years, I have received a number of comments suggesting that the identification of a district in terms of the spatial distribution of assemblages was somewhat confusing, since it allowed a district, a spatial division, to expand and contract at various times. For example, as the Meganos aspect expanded westward during the Upper Archaic, the Stockton District necessarily expanded as the Diablo and Alameda districts shrunk; the reverse occurred at the end of the Upper Archaic as Stockton shrunk and Diablo and Alameda expanded when Meganos retreated eastward (see chapter 1, this volume). It has been suggested, and I now concur, that separation of culture and a specific space is as important as the separation of culture and a specific time.

I now recommend that it would be best for control of variables if spatial units were to remain constant over time, thus cultural manifestations may be found to expand into adjoining districts (as with the Meganos aspect of the Stockton District) or contract into only a portion of an area it once occupied. The implication here is that the spatial unit of analysis should be readily understood in geographic terms, e.g., a watershed of a major stream or an estuary system and its catchment.

In practice, I commonly employ the term *locality*, defined without necessary reference to cultural content, and I find it quite useful for comparative analyses. The *locality*, used in this sense, has clearly described geographic limits and may be of any size, although usually no larger (and often smaller) than the geographic space likely to have been utilized by a village community. It is an analytic unit whose usefulness may be limited over time. I have found this usage to be better operationally than usage following its classic definition of a geographic space that exhibits complete cultural homogeneity at any given time (Willey and Phillips 1958:18). The confounding element here is employing the same term as both an operational tool and a synthetic integrative unit.

One of the principles put forth in my dissertation (Fredrickson 1973:95) was that only one phase can exist in a locality or district at any one time. Recent findings in the Clear Lake Basin (White 1984) and the

Santa Rosa Plain (Wickstrom 1986) suggest that it is indeed possible for two phases to be present within the same locality or district at the same time (see also Basgall and Hildebrandt 1989:444ff. for a similar example on the upper Sacramento River). Ethnographic data show that this occurs frequently, most notably during periods of seasonal abundance when a non-resident group makes regular use of seasonally available resources. Care must be taken to demonstrate that multiple phases are indeed such rather than representations of functional or other intracommunity differences. I submit that given proper premises and analytic procedures, it is possible to make that distinction. On the most simple level if the two assemblages are in the same environmental context and the tool kit of one is functionally identical with the tool kit of the other, and if each of the assemblages exists separately elsewhere, then separate phase identity is supported. In the Clear Lake and Santa Rosa models, two phase coexistence is postulated to be seasonal, with two communities utilizing the same resources during times of relative abundance, e.g., during fish spawning periods and when large numbers of migratory waterfowl are present. In other situations, two phases may be found contemporaneously in the same habitat when there is no agreement as to boundary location. Finally, on a more abstract level, two groups may occupy the same locality or district without significant conflict when each occupies a different niche within the habitat.

Traditional cultural classification in archaeology, including the approach explicated in my dissertation, has a strong village bias. The reason for this does not need much reflection. Because traditional methods emphasized artifacts, the greater number of artifacts implied greater success in the taxonomic effort. Flake scatters generally have few artifacts and therefore contribute little to the construction of an assemblage. Villages, of course, usually contain a more diverse artifactual assemblage and thus contribute more to assemblage construction. They contribute only partially, however, to the understanding of the settlement-subsistence system.

In addition, traditional phase definition requires more information than is generally available except at major village sites under good conditions of preservation. Traditional phase criteria also implicitly defines as irrelevant archaeological sites that are characterized by low diversity and that lack materials which significantly contribute to artifactual assemblage definition. It should be seriously considered that some time periods in some geographic areas lack cultures that had the kind of diversity required by traditional application of the phase concept. Thus, a chronological emphasis that depends primarily upon a relatively full artifact assemblage may write off a majority of sites that represent cultures with a smaller array of nonperishable material items.

Although I have no immediate solution to this problem, it is clear to me that exclusive dependence on traditional assemblage building will not address the problem. Because village assemblages do not necessarily measure important behaviors related to settlement and subsistence, some combination of methods may be required that includes not only artifact assemblages but also site types (and environmental contexts) in phase definition. This approach has already been foreshadowed in studies such as King (1974c) where settlement patterning was specifically addressed in discussion of the regional chronology. Such an approach would appear feasible today with the emergence of Cultural Resources Management and the large body of survey data that has become available. Throughout much of Northern and Central California the obsidian hydration method may be capable of providing needed temporal control.

The Pattern

It is ironic that the *pattern* (see Fredrickson 1973; chapter 3, this volume), the cultural construct about which I have had the most concern (stated in chapter 7 in this volume), is the one which has been most widely adopted (e.g., Breschini and Haversat 1980 [Monterey County]; Sundahl 1992 [northern Sacramento Valley]; Connolly 1988, 1990 [Southwest Oregon/Northern California]; Moratto 1984). Despite my own concerns about the Pattern, I have little argument with its application by others. Moratto (1984:201-215), pointing out that the Pattern is an integrative unit without temporal implications, employed the concept in his discussion of the Windmiller, Berkeley, and Augustine patterns of Central Califor-

nia. Breschini and Haversat's (1980) formulations of their Sur and Monterey patterns appear based primarily upon economic adaptations with little emphasis on technological features, and may well provide a framework that will be filled out in other dimensions as more data accumulate. Sundahl (1992) incorporated the 'pattern/aspect' scheme in her discussion of northern Sacramento Valley archaeology. Her units included the Borax Lake, Squaw Creek, Whiskeytown, Tehama, and Augustine patterns. Connolly (1988, 1990), in his discussion of Northern California and Southwestern Oregon relationships, designated the Siskiyou Pattern as encompassing Northern California's Redding aspect sites as well as southwestern Oregon's Rogue phase and other sites. I do not object at all to this synthetic grouping, especially considering Connolly's (1990:57) statement that the term "acknowledges the overall similarity among late prehistoric assemblages in interior southwest Oregon and northern California, but should not impinge on attempts to clarify local variants or chronologies," and the fact that Oregon assemblages played no role in earlier formulations of the Shasta/Redding units. A question for some future workshop is, Where in Northern California does Siskiyou end and Augustine begin?

I suggest that Connolly's use of the 'tradition' concept as an integrative unit (cf. Willey and Phillips 1958:37) is particularly important. Connolly (1990:57) used the concept in his Glade Tradition to emphasize morphological continuity in certain tool forms "across an enormous span of time, from 9000 years ago to late prehistoric times," pointing out that the "persistence of the Glade technological tradition over many millennia in southwest Oregon parallels the continuity observed in the Borax Lake Pattern of northern California." Sundahl (Clewett and Sundahl 1990) also incorporates the 'tradition' concept but apparently with more emphasis on continuities in adaptive responses rather than technological attributes. Instead of assigning names to perceived traditions, Sundahl (e.g., 1992:105) uses narrative to trace continuities across patterns. I suspect that a positive addition to the 'pattern/aspect' taxonomy would be greater emphasis on tradition, in both technological and adaptive terms. As an aside I point out that while tradition implies continuity, it does not imply fixed form.

My problems with the 'pattern' concept are discussed in chapter 7. My latest thoughts are these. When culture is viewed as a multivariate phenomenon, we are committed to the position that the domains of technology, exchange and wealth, and ceremony will not necessarily covary with one another. On the other hand, however, such domains *may* covary. The extent of such covariance may well be a function of the extent of direct interaction between different communities.

Interaction may come about in a number of different ways. For example, the interaction involved among foragers, i.e., those societies organized to travel as a group to resources as they become available (Binford 1980), may actually have a relatively high level of interaction with other similar groups over a relatively wide geographic space. The demographic requirements for human reproduction, i.e., a minimum population of about 500 persons, implies this type of interaction. It is not unreasonable to postulate that the nature of forager interaction fosters a high degree of cultural uniformity over a broad geographic range. Under this model, it is likely that different domains of culture would covary with one another. Cultural uniformity would most likely be interrupted by language differences and geographic features that would interfere with access between groups.

With collectors, i.e., those who consistently bring resources back to a home base (Binford 1980), other types of interaction may have precedence. For example, interaction would be fostered through means such as regularized participation in trade feasts and intergroup ceremonial occasions. Under this model, different cultural domains may also covary, but stylistic detail within the domains may vary between groups according to wealth and status differences or other markers of community identity.

If covariance between different cultural domains is a function of the extent of interaction, we can hypothesize that the least covariance will occur when there are barriers to interaction, either physical or social. For example, we would predict that two or more groups that shared similar technologies would be more likely to differ with respect to other spheres of activity if each of the groups spoke a different

language. The level of certainty in this prediction could be affected by any number of intervening variables, including demographics, that prompt intermarriage or economic arrangements reinforced by ceremonial obligations.

Although I now conceive of the pattern as being more or less equivalent to Binford's (1965:208-209) adaptive sphere, definable first in terms of the technomic dimension, different spheres of activity may covary so commonly that my concern is misplaced. Variation in spheres of activity other than the techno-environmental may constitute sufficient grounds for distinguishing between aspects rather than requiring the formulation of a different pattern.

I have an additional thought on the pattern, that can be phrased rather simply: "One artifact type does not a pattern make." In chapter 7, I have suggested that use of the concept of 'style-area' could facilitate communication prior to definition of specific phases and aspects. I suspect that it would also be useful applied to certain kinds of material culture distributions that cut across pattern lines. One example would be the "Gunther point style area." This would imply a geographic area extending from northwestern California into the Sacramento Valley and northward into southern Oregon. The term would refer to the geographic dispersal of the artifact style; although historical connectedness may be implied in the usage, cultural connections would not.

Periods in Prehistory

Most archaeologists are accustomed to the use of chronological periods with reference to discrete assemblages, such as those defined for local or regional cultural sequences. However, there is little use of the chronological period as an integrative concept, that serves to identify temporal relationships between different but contemporaneous assemblages. In our formulation of the *period* as an integrative concept, Bennyhoff and I (Fredrickson 1973:112ff) drew heavily upon the insight of Willey and Phillips (1958:61ff), who pointed out that Americanist archaeology of thirty-five years ago was willing to treat localities, regions, and areas as unified systems, but appeared reluctant to extend these systems further. Today, for the most part, the conduct of day-to-day archaeology in Northern and Central California seems little different.

The emphasis upon the empirical predisposes archaeologists to divide archaeological space into a series of closed systems, the nature of each system dependent upon the extent to which cultural forms are shared. Although there are notable exceptions (e.g., Bouey and Basgall 1984; Moratto et al. 1978), archaeologists seem disinclined to posit relationships between events in different regions, whether contemporaneous or temporally displaced. I continue to believe that there is both communicative and heuristic value in the division of prehistoric Central California into periods *independent of specific cultural assemblages*. Classification, by its nature, simplifies reality; in return for this simplification, communication should be facilitated. The taxonomic process should not foster a view of uniformity, but should in effect create a base line or model, reasonably based upon empirical data; deviation from the base line would have interest.

In our early work Bennyhoff and I divided prehistoric California into four periods, based for the most part on the "stages" discussed by Willey and Phillips (1958). These periods (Early Lithic, Paleoindian, Archaic, Emergent) are discussed briefly elsewhere (Fredrickson 1973). Originally, the Archaic was divided into Lower and Upper periods. Later, however, after reviewing the archaeological literature of the time and completing a forty-page-manuscript review of California prehistory, I further divided the Archaic into Lower, Middle, and Upper periods (Fredrickson 1974a). Figure 9.1 presents an adaptation of the "hypothesized characteristics" for each of these periods as I conceived of them in 1974 (Fredrickson 1974a:figure 3).

Some critics have stated to me their objections to this framework. To them it implies the iconic shibboleth, cultural evolution. This prods one to believe that Willey and Phillips (1958:64) were correct in their assessment that a persistent reaction against "nineteenth-century evolutionism" may have inhibited developmental classifications in American archaeology. I do not share the view that the evolutionary implications of the period terminology is a fatal flaw, and find it of interest today that a number of Northern and Central California archaeologists are interested in

FIGURE 9.1

HYPOTHESIZED CHARACTERISTICS OF CULTURAL PERIODS IN CALIFORNIA

1800 EMERGENT PERIOD	Upper	Clam disk bead money economy appears. More and more goods moving farther and farther. Growth of local specializations re: production and exchange. Interpenetration of south and central exchange systems.
1500	Lower	Bow and arrow introduced, replace dart and atatl; south coast maritime adaptation flowers. Territorial boundaries well established. Evidence of distinctions in social status linked to wealth increasingly common. Regularized exchanges between groups continue with more material put into the network of exchanges.
1000 ARCHAIC PERIOD A.D. B.C.	Upper	Growth of sociopolitical complexity; development of status distinctions based on wealth. Shell beads gain importance, possibly indicators of both exchange and status. Emergence of group-oriented religious organizations; possible origins of Kuksu religious system at end of period. Greater complexity of exchange systems; evidence of regular, sustained exchanges between groups; territorial boundaries not firmly established.
500	Middle	Climate more benign during this interval. Mortars and pestles and inferred acorn economy introduced. Hunting important. Diversification of economy; sedentism begins to develop, accompanied by population growth and expansion. Technological and environmental factors provide dominant themes. Changes in exchange or in social relations appear to have little impact.
3000	Lower	Ancient lakes dry up as a result of climatic changes; milling stones found in abundance; plant food emphasis, little hunting. Most artifacts manufactured of local materials; exchange similar to previous period. Little emphasis on wealth. Social unit remains the extended family.
6000 PALEOINDIAN PERIOD 8000	Upper	First demonstrated entry and spread of humans into California; lakeside sites with a probable but not clearly demonstrated hunting emphasis. No evidence for a developed milling technology although cultures with such technology may exist in state at this time depth. Exchange probably ad hoc on one-to-one basis. Social unit (the extended family) not heavily dependent on exchange; resources acquired by changing habitat.

Adapted from Fredrickson 1974a:figure 3.

implicitly evolutionary occurrences associated with the development of social complexity in California, e.g., the shift from a forager to a collector lifeway and, related to this, processes of cultural intensification.

To me today the processes of change implicit in the 'period' scheme are largely a matter of historical contingencies and feedback processes. In chapter 5, I present a model of such processes leading to sociopolitical complexity during the Emergent period. King (1974a, 1978) has elaborated on feedback processes involved in the development of sedentary lifetstyle among foragers and the development of cultural complexity or increased political differentiation. I have no objection to the tenor of King's arguments and, in fact, several have influenced my own thinking.

In retrospect, I find myself agreeing with much

of the commentary of King (1974b), in his well-argued critique of my period formulations. King (1974b:233ff), while remarking that he had "no argument with the overall picture of directional change presented by the typology," thought that it was neither demonstrated in fact nor of hypothetical value. I accept King's criticism that I did not provide the data required to support the divisions as outlined. In retrospect, it would have been more appropriate had I introduced the period divisions with proper documentation in a paper separate from my review of the North Coast Ranges (Fredrickson 1974a). I still appreciate King's analysis of figure 7.1 (as it originally appeared in Fredrickson 1974a), identifying the dimensions of change that contributed to the typology: procurement system, exchange system, social organization, climate, and population movements. However, because culture is multivariate (rather than univariate), I fail to understand why King demanded that concurrent change in procurement, exchange, and social organization occur from one period to the next. I also owe King thanks for apparently suspending disbelief and filling in other of my omissions while discussing implications of the period typology, albeit criticizing the paper for not pointing them out.

Other critics appear not to understand the concept of the Emergent period, which has historical roots in the debate (e.g., Baumhoff 1963; Heizer 1958a; Meighan 1959; Willey and Phillips 1958:134) as to the complexity level of California's cultures at the time of initial European contact. At the heart of the debate was whether California's ethnographic cultures were Archaic or Formative under the Willey and Phillips (1958) classificatory scheme. The choice between one or the other was dependent upon whether emphasis was placed upon (a) technological features or (b) social features, population density, and other nonmaterial elements of culture (Meighan 1959:305). Heizer (1958a), who emphasized social features, classified as Formative those Californian cultures located within Kroeber's (1936) culture climax regions. Meighan (1959), who emphasized technological features, characterized the California archaeological area as Archaic for a proposed period of 7000 years. Baumhoff (1963:229-30) also gave priority to technological over social features, arguing that, although Central California had a social situation comparable to that of Formative cultures, its cultures were "blocked from 'forming' a subsequent stage" because of the absence of agriculture.

Because of my emphasis upon social features and processes, I proposed the Emergent period as the nonagricultural equivalent to the Formative of Willey and Phillips (1958). I believed that the term Emergent avoided the predictive connotation of "forming" the basis for subsequent development and "emphasizes the direction of development *from which* the society derived, rather than the direction *toward which* it is going" (Fredrickson 1973:38-39). I still hold that viewpoint.

One common misunderstanding I have encountered is the view that uniformity of cultural development is expected within each cultural period. This view has been expressed for the most part with respect to the Emergent period. The view holds that when one finds a culture dating to the Emergent period but conforming to criteria for an Archaic culture, the typology is refuted (cf. Farber 1985). The reverse would also occur when a culture that meets Emergent criteria occurs during the Archaic period.

This viewpoint is based on the mistaken idea that a *period* implies cultural uniformity. As stated earlier in this essay, one of the more important assumptions underlying the taxonomy is that all cultures of a given *period* are part of an interaction system and thus must be viewed in relationship to one another. An earlier paragraph described the occurrence of what we believe to be two contemporaneous phases in the same locality (White 1984; Wickstrom 1986; Basgall and Hildebrandt 1989). As a result of such occurrences, the issue of interaction of societies at different levels of sociocultural integration has emerged in the North Coast Ranges as an important research domain with respect to questions of territorial expansion of villagers at the expense of bands and shared resource use by villagers and bands. To reiterate, cultural uniformity is not implied by division of prehistory into a series of periods.

On another level completely, mostly because of my work with both upland and lowland lithic scatters, I have found use of the *period* in its temporal sense quite workable for communication purposes, apart from its connotative meaning. This is particularly true in districts where our ability to place archaeological

sites in time (because of the obsidian hydration method) overshadows our understanding of artifactual assemblages and their historical relationships with one another. For example, obsidian hydration data from more than twenty sites in the Napa Valley suggest that village sites are located along the Napa River and at the base of the hills. Most of the sites on the valley floor between these two zones consist of flake scatters which rarely contain temporally diagnostic artifacts. We can observe, however, despite our ignorance of artifactual assemblages, that different activities were carried out within this environmental zone during the Middle and Upper Archaic periods (when obsidian site residues were the heaviest) than during the Emergent period (when obsidian residues showed a dramatic decrease). Because there is evidence that this zone was also used during the Emergent period, we can ask the question whether the differences between Archaic and Emergent uses of this environmental zone are due to differences in mobility and social organization or simply a change in the role of obsidian in the region (e.g., the use of obsidian to tip arrows during the Emergent period resulted in significantly less debitage than its use to tip darts during the Archaic).

As Willey and Phillips (1958:105) pointed out, archaeologists throughout North America recognize differences within the Archaic period, often breaking the Archaic into two or three subperiods. The timing of the divisions between subperiods and the criteria for differentiation appear to be specific to each archaeological area. I have found it useful to divide California's Archaic into three periods. From my perspective today, these periods were ultimately governed by climatic and environmental variables, beginning with the drying of pluvial lakes at the transition between the Paleoindian and Lower Archaic periods. Responses to environmental shifts (which probably did not occur synchronously throughout the state) together with historic contingencies make it possible to distinguish the dominant culture trends. Although the objective reality of the various periods may be questioned, it may be a matter of perspective rather than "objectivity." I have found the divisions workable for my own research purposes; for others, the divisions may not be useful.

I take this opportunity to clarify several other concepts related to taxonomy and definitions (or their absence). For example, it is generally understood that the common occurrence of known Paleoindian period sites on old lake shores may reflect the relatively high productivity of this setting during different portions of the annual cycle. Such use has at times contributed to the accumulation of relatively substantial archaeological deposits. Whether it is correct to label such a society as "semi-sedentary" is a matter of definition. If semi-sedentary does not connote regularized exchange relationships or sustained cooperative work efforts beyond the extended family, I see no a priori reason to reject the term. This applies to later periods as well; the fact that a social unit may reside for an extended period of time at a single location does not necessarily imply complex social arrangements.

From my perspective (see also Wallace 1954), there is considerable (but not total) cultural uniformity during the Lower Archaic, with most of the few cultures known at this time depth tending to meet the criteria of Wallace's Early Milling Stone culture. The abundance of projectile points and bifaces, however, suggests a more important role for hunting in Northern California than that demonstrated in Southern California.

Possibly associated with climatic shifts, the Middle Archaic may be associated with more dependable resources as local specializations (e.g., riverine, upland, marine) developed and tool kits became more diversified. Although climatic and environmental variables still governed society, the Middle Archaic is marked by the filling of diverse habitats/niches, implying population growth. I suggest that the forager adaptation, based upon the wide ranging extended family, together with ad hoc exchange, was dominant from the Paleoindian through the Middle Archaic periods; relatively rare, localized collector societies did coexist within some resource rich localities.

Another environmental shift, with climate becoming generally cooler, marked the shift from Middle to Upper Archaic. Local specializations continued with more population aggregation which probably led to budding off of new sedentary communities that expanded into territories previously utilized by more mobile foragers, thus defining the study of their interaction as a significant research domain. From my perspective, despite the period's domination by the

forager adaptation and ad hoc exchange, it is marked by local beginnings in environmentally productive regions of a collector adaptation with population aggregation, semi-regularized exchange, sedentary villages, sociopolitical complexity, and the firming up of territorial boundaries foreshadowing later developments during the Lower Emergent.

During the Lower Emergent, feedback processes associated with social factors appear to play a large role in cultural activities. Sedentary villages based upon a collector adaptation appear to have dominated the environmentally productive regions, in some cases having displaced or assimilated foragers who earlier had utilized these regions. In general, foragers continued their lifeways in marginal regions, such as the more remote uplands, at least seasonally interacting with collector neighbors. Exchange became more regularized as the ethnographic tribelet system with relatively firm territorial boundaries became entrenched; social differentiation based upon wealth, relatively rare during the Archaic, became increasingly important over time (see chapter 5, this volume).

During the Upper Emergent, although foragers continued to coexist with collectors, their social and sacred dimensions, as well as the values associated with wealth, are postulated to have been affected by the values of now fully entrenched collectors. Social differentiation based upon wealth increased in importance as community leadership roles became more clearly defined. Although regularized exchange dominated all exchange systems, it was added to an understory of ad hoc exchange.

The influx of Europeans and Euroamericans ended the cultural systems of California's indigenous peoples. As I have stated in chapter 5, it is likely that information on the organizational complexity inferable from the archaeological record had been lost or was not elicited or recognized as important by California's early ethnographers.

Conclusion

The preparation of this essay has been both troublesome and illuminating. As I reviewed my earlier work on taxonomy, I realized that I could never recreate my frame of mind when I was so involved in its formulations. I continue to see a need for a viable taxonomic system, and although I continue to find the scheme useful for my study of California's past, I have no illusions about its usefulness to others. On the other hand, I enjoyed the effort to recall, with as little retrospective falsification as I am capable of, my thought processes and learning processes as I worked with Jim Bennyhoff, who was both my educational cohort and mentor, trying to solve the vexing issues surrounding taxonomy for California. As a result of preparing this essay, and of the conversations with others I've had in the process, I have come to doubt very much that the need for such a taxonomy will disappear in the foreseeable future, although not too long ago I thought it had. Perhaps success, or at least a satisfactory modicum of success, could better be achieved by those who do not feel so deeply embedded as I in the history of California archaeology.

10

Recent Thoughts on Archaeological Taxonomy

James A. Bennyhoff

(1993)

Introduction

BY TRAINING, I AM FIRMLY in the historical tradition of Kroeber and Heizer. An early seminar by Heizer on Petrie's *Diospolis Parva*, using Reissner's pre-dynastic Egyptian collection at Berkeley, introduced me to the intricacies of seriation. This ability was further refined following a seminar by Rowe on the Mochica I-V seriation. I applied these principles in my intended dissertation. (Heizer felt that he had covered the Early Horizon in his 1949 publication [although not one table therein is accurate!]; Frank Fenenga was to do the Middle Horizon; and Heizer assigned the Late Horizon to me.) I was to focus on Sac-6, with the largest collection from the Delta. Unfortunately, this is the one large site for which Elmer Dawson (Schenck and Dawson 1929), the brilliant high school amateur archaeologist, failed to record individual grave lots. The material was generally so similar that he lumped his daily unit collections as "group finds", mixing material from the Sutter period cemetery with prehistoric Phase 2 and Phase 1 artifacts.

I therefore turned to CCo-138 where E. N. Johnson (another amateur) and Heizer had obtained an excellent stratified sequence of burials spanning all of Phase 1 of the Late Horizon. I first seriated the Olivella Thin Rectangles by depth, and found that the deepest grave lots had only centrally perforated beads (type M1; cf. Bennyhoff and Hughes 1987:140-41, figure 8), while the shallowest graves had only end-perforated (type M2) beads. Graves at intermediate depths had a mixture of types M1 and M2. When all the grave lots were plotted by depth, a marvelous series of changes was evident. Abalone ornaments with scored incision were early, classic Banjo ornaments were late; collared pipes were early, while flanged pipes were late (cf. Bennyhoff 1978). I was thus able to divide Beardsley's (1948, 1954) Phase 1 into three phases (designated 1a, 1b, and 1c). Subsequent analysis of the Sac-21, Sac-6 controlled burials, Ala-309, and similar collections confirmed this sequence as general throughout the Bay and Delta regions.

Although I have retained Beardsley's Phase 1 and Phase 2 distinctions, I have assigned individual names to the Phase 1 divisions because these are *phases*, not subphases. The atlatl is still the dominant weapon in Phase 1a, not replaced by the bow and arrow in Phase 1b. Differences in the effigy ornaments must represent quite different religious concepts, while dance costumes were not the same throughout (only Phase 1b dancers wore the clacking girdles of heavy abalone ornaments), and significant fashion changes in shell and stone beads mark the passage of the 200 year phases. Since Phase 2b is only 100 years long, I do regard Phase 2a and 2b as subphases and

designate them as early and late Mosher (in the Cosumnes District) or Fernandez (in the Alameda District).

To understand the beginning of the Late Horizon I had to familiarize myself with the Middle Horizon and, again, fishspears, beads, and ornaments suggested a temporal sequence instead of the contemporaneous facies defined by Beardsley. By this time I had an enormous mass of data, and needed some system with which to organize it. (Heizer was on sabbatical, and Rowe agreed to accept my first chapter on ethnogeography as my dissertation in 1961. Heizer was not pleased and refused to publish it.) It had become very clear by this time that Beardsley's provinces were meaningless.

David Fredrickson and I (chapter 2 herein) collaborated on a taxonomy some years ago that has gained a certain acceptance in California archaeology, and what follows are some of my current thoughts on areas where Fredrickson and I agree and disagree (cf. chapter 9).

The Importance of Grave Lots and the Mortuary Complex

A major difference between Fredrickson and myself from the very beginning has been over the significance of the mortuary complex (cf. chapter 9, p. 101). In large part this is because he has not had to deal with scores of grave lots and, in later years, he was committed to honor the Indian opposition to disturbance of the dead. I have the highest regard for his pioneering success with midden constituent analysis and obsidian hydration, but I cannot agree that this negates the value of mortuary research. One has only to compare my Bay/Delta phase contents with those of the North Coast Ranges (seldom more than a projectile point and ground stone sequence). I am able to place beads, ornaments, bone artifacts, chipped and ground stone in a detailed sequence based on firm stratigraphy (in contrast to the chaotic mixture of unassociated midden finds). Even if graves contain no artifacts, they provide evidence for significant changes in position, orientation, wealth, sex differences, disease, and life span. The grave lot provides our closest view of a moment in time, far more reliable than a multi-used house floor or an arbitrary level. The mixture of diagnostic Middle and Late period artifacts in the same grave indicates that we are dealing with a transition phase in which new traits are being diffused to a resident population. Absence of such mixing, along with site abandonments and new settlements, can indicate population movement (especially if skeletal differences can be detected). In the historic period, for example, I can identify Foothill Nisenan intrusion into Plains Miwok territory. Regrettably, the poor quality of the early excavation notes (and an overloaded teaching commitment) has delayed my publication—along with an extreme perfectionist bent. Nonetheless, future enlightened Native California children and grandchildren will rue the day that burial repatriation destroyed their ancestral heritage.

Pattern and Tradition

Fredrickson has covered this topic adequately. It is encouraging to see that others are attempting to deal with the need for *traditions* in addition to *patterns*. However, I cannot accept Borax Lake Tradition—this pattern at present is little more than a widespread assemblage of projectile points, ground stone, and burial away from the village. Numerous traditions will someday be defined which include Borax Lake aspect as the earliest manifestation. I earlier proposed the Micos Tradition in the Alameda District (see chapter 6 herein). Jerald Johnson has a Dry Creek/Yana Tradition and, if grave lots can ever be found, I feel that a Martis/Kings Beach/Washo Tradition will be validated. This does not negate the need for 'patterns' which cut across these traditions, marking the spread of new traits.

The Locality and District

Our data from the Bay/Delta region is so detailed that we *are* able to distinguish different localities within the same district, and equate them with tribelets in the Historic and Late periods. The abalone ornament percentage frequencies by type are not the same at Sac-6A and Sac-56A or at Sac-21. SJo-43 reveals influence from the Stockton District which is not found on the Cosumnes or American rivers. Middle Period components are more of a problem, because our data are often sparse and we cannot apply the direct historical approach. However, at present, I am

impressed by the significant number of artifact types found only at single sites: the double-lined facial incision on abalone ornaments found only at Ala-309 (Bennyhoff 1978:figure 2); the shield ornaments limited to Ala-328 (Bennyhoff 1978:figure 3); and a host of unusual bone artifacts limited to these two sites. I am certain that we are dealing with different localities/tribelets, while the phase differences and proximity will support the hypothesis that Ala-12, Ala-13, Ala-328, and Ala-329 represent a single tribelet through time. These minor differences prompted the addition of the *district* to the Willey and Phillips (1958) scheme.

It is with regret that I see that Fredrickson (chapter 9 p. 96) wishes to make the district a mere geographic unit. As documented in my dissertation (Bennyhoff 1977:41-51), I found a definite correlation between a *culturally defined* district and a language group. The Delta is a classic example. Using Fredrickson's ecological boundaries, CCo-138 (Bay Miwok), Sac-6 (Plains Miwok), and SJo-82 (Yokuts) are in one district, yet three very different adaptations to this stoneless environment are represented—hence the Diablo, Cosumnes, and Stockton *districts*. Mission registers and ethnographic data *prove* that, despite bilingualism and intermarriage, most Moquelumne spoke Plains Miwok, and the Chilamne Yokuts claimed to be different from the Moquelumne. The closest cultural and linguistic relationships of CCo-138 are with the Walnut Creek/San Ramon locality—not with their Delta neighbors. As documented earlier, my inductive analysis of the differences between CCo-138 and Sac-21, between Sac-43 and Sac-29, and between CCo-138 and SJo-141 led to the *cultural* district; the linguistic correspondence emerged later. Beardsley's (1948, 1954) "province" and Willey and Phillips's (1958) "locality" also combined culture and geography in their definition.

References

Angel, J. Lawrence
1966 *Early Skeletons from Tranquillity, California.* Smithsonian Contributions to Anthropology 2 (1). Washington, D.C.

Barrett, Samuel A.
1908 *The Ethnogeography of the Pomo and Neighboring Indians.* University of California Publications in American Archaeology and Ethnology 6 (1).

Basgall, Mark E., and William R. Hildebrandt
1989 *Prehistory of the Sacramento River Canyon, Shasta County, California.* Center for Archaeological Research at Davis, Publication 9.

Baumhoff, Martin A.
1957 *An Introduction to Yana Archaeology.* University of California Archaeological Survey Reports 40. Berkeley.
1963 *Ecological Determinants of Aboriginal California Populations.* University of California Publications in American Archaeology and Ethnology 49 (2).

Baumhoff, Martin A., and J. S. Byrne
1959 Desert Side-Notched Points as a Time Marker in California. University of California Archaeological Survey Reports 48:32-65.

Baumhoff, Martin A., and David L. Olmsted
1963 Palaihnihan: Radiocarbon Support for Glottochronology. *American Anthropologist* 65 (2):278-84.
1964 Notes on Palaihnihan Culture History: Glottochronology and Archaeology. *University of California Publications in Linguistics* 34:1-12.

Bean, Lowell John
1972 *Mukat's People: The Cahuilla Indians of Southern California.* University of California Press, Berkeley.

Bean, Lowell John, and Thomas F. King, eds.
1974 *?ANTAP: California Indian Political and Economic Organization.* Ballena Press Anthropological Papers 2. Ramona, California.

Beardsley, Richard K.
1948 Cultural Sequences in Central California Archaeology. *American Antiquity* 14 (1):1-28.
1954 *Temporal and Areal Relationships in Central California Archaeology.* University of California Archaeology Survey Reports 24 and 25. Berkeley.

Bennett, Wendell C.
1948 The Peruvian Co-Tradition. In *A Reappraisal of Peruvian Archaeology* (W. C. Bennett, ed.), Society for American Archaeology Memoir 4:1-7.

Bennyhoff, James A.
1977 *Ethnogeography of the Plains Miwok.* Center for Archaeological Research at Davis, Publication 5.
1978 Phase Charts, figures 2-6. In "Development of Regional Prehistoric Cultures," by Albert B. Elsasser. In *Handbook of North American Indians,* Vol. 8, *California* (R. F. Heizer, ed.), pp. 37-57. Smithsonian Institution, Washington, D.C.
1986 The Emeryville Site, Viewed 93 Years Later. In *Symposium: A New Look at Some Old Sites,* organized by Francis A. Riddell. Coyote Press Archives of California Prehistory 6:65-74. Coyote Press, Salinas, California.

Bennyhoff, James A., and Robert F. Heizer
1958 Cross-Dating Great Basin Sites by Californian Shell Beads. University of California Archaeological Survey Reports 42:60-92. Berkeley.

Bennyhoff, James A., and Richard E. Hughes
1987 *Shell Bead and Ornament Exchange Networks Between California and the Western Great Basin.* Anthropological Papers of the American Museum of Natural History 64 (2). New York.

Binford, Lewis R.
1965 Archaeological Systematics and the Study of Cultural Process. *American Antiquity* 31 (2):203-210.
1980 Willow Smoke and Dog's Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45 (1):4-20.

Bohannon, Paul
1963 *Social Anthropology*. Holt, Rinehart, and Winston, New York.

Bouey, Paul D., and Mark E. Basgall
1984 Trans-Sierran Exchange in Prehistoric California: The Concept of Economic Articulation. In *Obsidian Studies in the Great Basin* (Richard E. Hughes, ed.), pp. 135-72. Contributions of the University of California Archaeological Research Facility 45. Berkeley.

Boulding, Kenneth W.
1956 Toward a General Theory of Growth. *General Systems* 1:66-75.

Breschini, Gary S., and Trudy Haversat
1980 Preliminary Archaeological Report and Archaeological Management Recommendations for CA-Mnt-170, on Pescadero Point, Monterey County, California. Manuscript on file at the Northwest Information Center, Sonoma State University.

Butler, B. Robert
1959 Lower Columbia Valley Archaeology: A Survey and Appraisal of Some Major Archaeological Resources. *Tebiwa* 2 (2):6-24. Pocatello, Idaho.

Chagnon, Napoleon
1970 Ecological and Adaptive Aspects of California Shell Money. University of California Archaeological Survey Annual Report 12:2-25. Los Angeles.

Chang, K. C.
1967 *Rethinking Archaeology*. Random House, New York.

Childe, V. Gordon
1950 *Prehistoric Migrations in Europe*. Harvard University Press, Cambridge.

Clark, Donavan L.
1964 Archaeological Chronology in California and the Obsidian Hydration Dating Method: Part 1. University of California Archaeological Survey Annual Report 6:139-230. Los Angeles.

Clewett, Ed, and Elaine Sundahl
1990 A View from the South: Connections Between Southwest Oregon and Northern California In *Living With the Land: The Indians of Southwest Oregon* (N. Hannon and R. K. Olmo, eds.), pp. 37-45. Southern Oregon Historical Society, Medford.

Cohen, Yehudi A.
1969 Social Boundary Systems. *Current Anthropology* 10 (1):103-126.
1970 Schools and Civilizational States. In *The Social Sciences and the Comparative Study of Educational Systems* (J. Fischer, ed.), pp. 55-174. International Textbook Company, Scranton, PA.
1975 The State System, Schooling, and Cognitive and Motivational Patterns. In *Social Forces and Schools: An Anthropological and Sociological Perspective* (A. Scrupski and N. Shimahara, eds.), pp. 103-140. David McKay, New York.

Connolly, Thomas J.
1988 A Culture-Historical Model for the Klamath Mountain Region of Southwest Oregon and Northern California. *Journal of California and Great Basin Anthropology* 10:246-60.
1990 Cultural Stability and Change in Southwest Oregon and Northern California: An Approach to Identifying Assemblage Types. In *Living With the Land: The Indians of Southwest Oregon* (N. Hannon and R. K. Olmo, eds.), pp. 56-62. Southern Oregon Historical Society, Medford.

Cook, S. F., and Albert B. Elsasser
1956 Burials in the Sand Mounds of the Delta Region of the Sacramento - San Joaquin River System. University of California Archaeological Survey Reports 35:26-46. Berkeley.

Curtis, Freddie, and David A. Fredrickson
1964 Investigations at CCo-309, a Protohistoric Site in Interior Contra Costa County, California. Manuscript in possession of the junior author.

Dawson, Larry
1963 Technical Traditions in Basketry of Western North America. Lecture outline for Anthropology 126, University of California, Berkeley. 5 pp.

Deetz, James F.
1967 *Invitation to Archaeology*. Natural History Press, Garden City, New Jersey.

Driver, Harold E.
1936 *Wappo Ethnography*. University of California Publications in American Archaeology and Ethnology 36 (3).
1962 *The Contribution of A. L. Kroeber to Culture Area Theory and Practice*. Indiana University Publications in Anthropology and Linguistics, Memoir 18.

Driver, Harold E., and James L. Coffin
1975 *Classification and Development of North American Indian Cultures: A Statistical Analysis of the Driver-Massey Sample*. Transactions of the American Philosophical Society 65 (3). Philadelphia.

Driver, Harold E., and William C. Massey
1957 *Comparative Studies of North American Indians*. Transactions of the American Philosophical Society 47 (2). Philadelphia.

DuBois, Cora A.
1935 *Wintu Ethnography*. University of California Publications in American Archaeology and Ethnology 36 (1).

Edwards, Robert L.
1969 A Milling Stone Pattern in the Northern Sacramento Valley. Paper presented at the Annual

Meetings of the Southwestern Anthropological Association and the Society for California Archaeology, Las Vegas, Nevada.

Elsasser, Albert B.
1978 Development of Regional Prehistoric Cultures. In *Handbook of North American Indians*, Vol. 8, *California* (R. F. Heizer, ed.), pp. 37-57. Smithsonian Institution, Washington, D.C.

Ericson, Jonathon E.
1981 *Exchange and Production Systems in Californian Prehistory: The Results of Hydration Dating and Chemical Characterization of Obsidian Sources.* British Archaeological Reports International Series 110. Oxford.

Farber, Alfred
1985 Alternative Approaches to the Shasta Complex and Adjacent Expressions: Assemblages, Cultural Ecology, and Taxonomies. *Journal of California and Great Basin Anthropology* 7 (1):75-88.

Foote, Leonard
1964 Notes on Sta-133 near Patterson, California. Manuscript on file, California Department of Parks and Recreation, Sacramento.

Fredrickson, David A.
1964 Preliminary Impression on the Archaeology of Ker-116. Manuscript on file, California Dept. of Parks and Recreation, Sacramento.
1965 Recent Excavations in the Interior of Contra Costa County, California. Sacramento Anthropological Society Papers 3:18-25.
1966 CCo-308: The Archaeology of a Middle Horizon Site in Interior Contra Costa County, California. M.A. thesis, Department of Anthropology, University of California, Davis.
1968 *Archaeological Investigations at CCo-30 near Alamo, Contra Costa County, California.* Center for Archaeological Research at Davis, Publication 1.
1969 Technological Change, Population Movement, Environmental Adaptation, and the Emergence of Trade: Inferences on Culture Change Suggested by Midden Constituent Analysis. University of California Archaeological Survey Annual Report 11:101-125. Los Angeles.
1973 Early Cultures of the North Coast Ranges, California. Ph.D. dissertation, Department of Anthropology, University of California, Davis.
1974a Cultural Diversity in Early Central California: A View from the North Coast Ranges. *Journal of California Anthropology* 1 (1):41-54.
1974b Social Change in Prehistory: A Central California Example. In *?ANTAP: California Indian Political and Economic Organization* (L. J. Bean and T. F. King, eds.), Ballena Press Anthropological Papers 2:57-73. Ramona, California.
1977 Prehistoric Exchange Systems in Central California: A Contra Costa Example. Paper presented at a symposium on the "Archaeology of the Central Valley" held at Cosumnes River College, Sacramento, California, November 5, 1977.
1984 The North Coastal Region. In M. J. Moratto, *California Archaeology*, pp. 471-527. Academic Press, Orlando.

Fredrickson, David A., and Gregory G. White
1988 The Clear Lake Basin and Early Complexes in California's North Coast Ranges. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface* (J. A. Willig, C. M. Aikens, and J. L. Fagan, eds.). Nevada State Museum Anthropological Papers 21:75-86. Carson City.

Fredrickson, Vera-Mae
1968 *Tice Valley: 500 Years of Human History.* Walnut Creek, California.

Fritz, John M., and Charles Smith
1978 Archaeological Overview of Pinnacles National Monument, San Benito County, Monterey. Report on file with the National Park Service, Western Archaeological Center, Tucson, Arizona.

Gaumer, Dean
1968 Colloquia at University of California at Davis. *Society for California Archaeology Newsletter* 2 (2):14.

Gerow, Bert A.
1954 The Problem of Culture Sequences in Central California Archaeology. Paper presented at the Annual Meeting of the American Association for the Advancement of Science.
1974 Comments on Fredrickson's "Cultural Diversity." *Journal of California Anthropology* 1 (2):239-46.

Gerow, Bert A., with Roland W. Force
1968 *An Analysis of the University Village Complex with a Reappraisal of Central California Archaeology.* Stanford University Press, Stanford.

Gifford, Edward W.
1940 *Californian Bone Artifacts.* University of California Anthropological Records 3 (2).
1965 *The Coast Yuki.* Sacramento Anthropological Society Papers 2.
1967 *Ethnographic Notes on the Southwestern Pomo.* University of California Anthropological Records 25.

Gifford, Edward W., and W. Egbert Schenck
1926 *Archaeology of the Southern San Joaquin Valley.* University of California Publications in American Archaeology and Ethnology 23 (1).

Goggin, John M.
1949 Cultural Traditions in Florida Prehistory. In *The Florida Indian and His Neighbor* (J. W. Griffin, ed.), pp. 13-44. Rollins College, Winter Park.

Hall, A. D., and R. E. Fagan
1956 Definition of Systems. *General Systems* 1:18-28.

Harrington, Mark R.
1948 *An Ancient Site at Borax Lake, California.* Southwest Museum Papers 16. Los Angeles.

Hewes, Gordon R.
1943 Camel, Horse, and Bison Associated with Human Burials and Artifacts near Fresno, California. *Science* 97 (2579):328-29.
1946 Early Man in California and the Tranquillity Site. *American Antiquity* 11 (4):209-215.

Heizer, Robert F.
1937 Baked-Clay Objects of the Lower Sacramento Valley, California. *American Antiquity* 3 (1):34-50.
1941 The Direct Historical Approach in California Archaeology. *American Antiquity* 7 (2):98-122.
1949 The Archaeology of Central California, I: The Early Horizon. University of California Anthropological Records 12 (1).
1952 A Review of Problems in the Antiquity of Man in California. University of California Archaeological Survey Reports 16:3-17. Berkeley.
1958a Prehistoric Central California: A Problem in Historical-Developmental Classification. University of California Archaeological Survey Reports 41:19-26. Berkeley.
1958b Radiocarbon Dates from California of Archaeological Interest. University of California Archaeological Survey Reports 44 (1):1-16. Berkeley.
1964 The Western Coast of North America. In *Prehistoric Man in the New World* (J. D. Jennings and E. Norbeck, eds.), pp. 117-48. University of Chicago Press, Chicago.
1966 *Languages, Territories, and Names of California Indian Tribes.* University of California Press, Berkeley and Los Angeles.

Heizer, Robert F. (ed.)
1953 *The Archaeology of the Napa Region.* University of California Anthropological Records 12 (6).

Heizer, Robert F., and S. F. Cook
1952 Fluorine and Other Chemical Tests of Some North American Human and Fossil Bones. *American Journal of Physical Anthropology* 10 (3):289-393.

Heizer, Robert F., and Albert B. Elsasser
1953 *Some Archaeological Sites and Cultures of the Central Sierra Nevada.* University of California Archaeological Survey Reports 21. Berkeley.

Heizer, R. F., and Franklin Fenenga
1939 Archaeological Horizons in Central California. *American Anthropologist* 41 (3):378-99.

Heizer, Robert F., and Robert J. Squier
1953 Excavations at Site Nap-32 in July, 1951. In *The Archaeology of the Napa Region* (R. F. Heizer, ed.), University of California Anthropological Records 12 (6):318-26.

Hole, Frank, and Robert F. Heizer
1969 *An Introduction to Prehistoric Archaeology.* 2d ed. Holt, Rinehart, and Winston, New York.

Hughes, Richard E., and James A. Bennyhoff
1986 Early Trade. In *Handbook of North American Indians*, Vol. 11, *Great Basin* (W. L. d'Azevedo, ed.), pp. 238-55. Smithsonian Institution, Washington, D.C.

Hughes, Richard E., and Robert L. Bettinger
1984 Obsidian and Prehistoric Sociocultural Systems in California. In *Exploring the Limits: Frontiers and Boundaries in Prehistory* (Suzanne. P. De Atley and Frank J. Findlow, eds.), pp. 153-72. British Archaeological Reports, International Series 223. Oxford.

Jackson, Thomas L., and Peter D. Schulz
1975 Typology, Trade, and Trace Analysis: A Test of Local Manufacture of Sacramento Valley Obsidian Tools. *Journal of New World Archaeology* 1 (2):1-8.

Jennings, Jesse D.
1968 *Prehistory of North America.* McGraw-Hill, New York.

Kemnitzer, Luis
1968 A Survey of Archaeology in Contra Costa County. In David A. Fredrickson, *Archaeological Investigation at CCo-30 Near Alamo, Contra Costa County, California.* Center for Archaeological Research at Davis Publication 1:173-83.

King, Thomas F.
1968 *The Archaeology of the Schwabacher Site, 4-Mad-117.* San Francisco State College, Anthropology Museum, Occasional Papers 4 (2).
1974a The Evolution of Status Ascription Around San Francisco Bay. In *?ANTAP: California Indian Political and Economic Organization* (L. J. Bean and T. F. King, eds.), Ballena Press Anthropological Papers 2:35-53. Ramona, California.
1974b Flight to New Pigeonholes: Comments on Fredrickson. *Journal of California Anthropology* 1 (2):233-39.
1974c Manos on the Mountains: Borax Lake Pattern High Altitude Settlement and Subsistence in the North Coast Ranges of California. Report on file, U.S. Forest Service, San Francisco.
1978 Don't That Beat the Band? Nonegalitarian Political Organization in Prehistoric Central California. In *Social Archeology: Beyond Subsistence and Dating* (C. L. Redman, M. J. Berman, E. V. Curtin, W. T. Langhorne, Jr., N. M. Versaggi, and J. C. Wanser, eds.), pp. 225-48. Academic Press, New York.

Klimek, Stanislaw
1935 *Culture Element Distributions: I. The Structure of California Indian Culture.* University of California Publications in American Archaeology and Ethnology 37 (1).

Krieger, Alex D.
1953 New World Culture History: Anglo-America. In *Anthropology Today* (A. L. Kroeber, ed.), pp. 238-64. University of Chicago Press, Chicago.
1964 Early Man in the New World. In *Prehistoric Man in the New World* (J. D. Jennings and E. Norbeck, eds.), pp. 23-81. University of Chicago Press, Chicago.

Kroeber, Alfred L.
1909 The Archaeology of California. In *Anthropological Essays Presented to Frederic Ward Putnam in Honor of His Seventieth Birthday, April 16, 1909, by His Friends and Associates*, pp. 1-41. Stechert, New York.
1920 *California Culture Provinces.* University of California Publications in American Archaeology and Ethnology 17 (2).
1925 *Handbook of the Indians of California.* Bureau of American Ethnology Bulletin 78.
1932 *The Patwin and Their Neighbors.* University of California Publications in American Archaeology and Ethnology 29 (4).
1936 *Culture Element Distributions: III. Area and Climax.* University of California Publications in American Archaeology and Ethnology 37 (3).
1939 *Cultural and Natural Areas of Native North America.* University of California Publications in American Archaeology and Ethnology 38.
1959 *Ethnographic Interpretations: 9. Recent Ethnic Spreads.* University of California Publications in American Archaeology and Ethnology 47 (3).
1962 The Nature of Land-Holding Groups in California. University of California Archaeological Survey Reports 56:21-58. Berkeley.

Lehmer, Donald J., and Warren W. Caldwell
1966 Horizon and Tradition in the Northern Plains. *American Antiquity* 31 (4):511-16.

Lillard, Jeremiah Beverley, and William K. Purves
1936 *The Archaeology of the Deer Creek - Cosumnes Area, Sacramento Co., California.* Sacramento Junior College, Department of Anthropology, Bulletin 1.

Lillard, Jeremiah B., R. F. Heizer, and Franklin Fenenga
1939 *An Introduction to the Archeology of Central California.* Sacramento Junior College, Department of Anthropology, Bulletin 2.

McClellan, C.
1953 Ethnography of the Wappo and Patwin. In *The Archaeology of the Napa Region* (R. F. Heizer, ed.), University of California Anthropological Records 12 (6):233-43.

McKern, William C.
1939 The Midwestern Taxonomic Method as an Aid to Archaeological Culture Study. *American Antiquity* 4 (4):301-313.

Meighan, Clement W.
1955 Archaeology of the North Coast Ranges, California University of California Archaeological Survey Reports 30:1-39. Berkeley.
1959 Californian Cultures and the Concept of an Archaic Stage. *American Antiquity* 24 (3):289-305.

Milner, George
1964 Notes on site Fre-373. Manuscript on file, California Dept. of Parks and Recreation, Sacramento.

Moratto, Michael J.
1984 *California Archaeology.* Academic Press, Orlando.

Moratto, Michael J., Thomas F. King, and Wallace B. Woolfenden
1978 Archaeology and California's Climate. *Journal of California Anthropology* 5 (2):147-61.

Moss, Jean, and Ruth Mead
1967 Salvage Report on CCo-311. Manuscript on file, Phoebe A. Hearst Museum of Anthropology, University of California, Berkeley.

Murphy, Robert
1964 Social Change and Acculturation. *Transactions of the New York Academy of Sciences*, ser. II, 26:845-54.

Newman, Russell W.
1957 *A Comparative Analysis of Prehistoric Skeletal Remains from the Lower Sacramento Valley.* University of California Archaeological Survey Reports 39. Berkeley.

O'Connell, James F.
1967 Elko Eared/Elko Corner-Notched Projectile Points as Time Markers in the Great Basin. University of California Archaeological Survey Reports 70:129-40.

Oliver, Symmes C.
1962 *Ecology and Cultural Continuity as Contributing Factors in the Social Organization of the Plains Indians.* University of California Publications in American Archaeology and Ethnology 48 (1).

Olsen, William H.
1968 A Synthesis of the Archeology of the Western San Joaquin Valley. Paper presented at the Annual Meetings of the Southwestern Anthropological Association and the Society for California Archaeology, San Diego, California.

Olsen, William H., and Francis A. Riddell
1963 *The Archeology of the Western Pacific Railroad Relocation, Oroville Project, Butte County, California.* California Dept. of Parks and Recreation Archeological Reports 7. Sacramento.

Olsen, William H., and Norman L. Wilson
1964 *The Salvage Archeology of the Bear Creek Site (SJo-112): A Terminal Central California Early Horizon Site.* Sacramento Anthropological Society Papers 1.

Origer, Thomas M.
1987 *Temporal Control in the Southern North Coast Ranges of California: The Application of Obsidian Hydration Analysis.* Papers in Northern California Anthropology 1. Berkeley.

Pilling, Arnold R.
1955 Relationships of Prehistoric Cultures of Coastal Monterey County, California. Kroeber Anthropological Society Publication 12:70-94.

Powers, Stephen
1877 *Tribes of California.* Contributions to North American Ethnology III. U.S. Department of the Interior, Washington, D.C.

Ragir, Sonia
1972 *The Early Horizon in Central California*

Prehistory. Contributions of the University of California Archaeological Research Facility 15. Berkeley.

Rathje, William L.
1972 Praise the Gods and Pass the Metates: A Hypothesis of the Development of Lowland Rainforest Civilizations in Mesoamerica. In *Contemporary Archaeology* (M. P. Leone, ed.), pp. 393-401. Southern Illinois University Press, Carbondale.

Riddell, Francis A.
1968 The Archeology of Mer-14 at San Luis Dam, Western Merced County. Paper presented at the Annual Meetings of the Southwestern Anthropological Association and the Society for California Archaeology, San Diego, California.

Rouse, Irving B.
1954 On the Use of the Concept of Area Co-Tradition. *American Antiquity* 19 (3):221-25.
1955 On the Correlation of Phases of Culture. *American Anthropologist* 57 (4):713-22.
1965 The Place of 'Peoples' in Prehistoric Research. *Journal of the Royal Anthropological Institute* 95:1-15.

Rowe, John H.
1959 Archaeological Dating and Cultural Process. *Southwestern Journal of Anthropology* 15:317-24.
1962 Stages and Periods in Archaeological Interpretation. *Southwestern Journal of Anthropology* 18:40-54.

Schenck, W. Egbert, and Elmer J. Dawson
1929 *Archaeology of the Northern San Joaquin Valley*. University of California Publications in American Archaeology and Ethnology 25 (4).

Schulz, Peter D.
1970 Solar Burial Orientation and Paleodemography in the Central California Windmiller Tradition. Center for Archaeological Research at Davis Publication 2:185-98.

Sundahl, Elaine
1982 The Shasta Complex in the Redding Area, California. M.A. thesis, Department of Anthropology, California State University, Chico.
1992 Cultural Patterns and Chronology in the Northern Sacramento River Drainage. *Proceedings of the Society for California Archaeology* 5:89-112.

Taylor, Walter W.
1948 *A Study of Archeology*. American Anthropological Association, Memoir 69.

True, D. L., M. A. Baumhoff, and J. E. Hellen
1979 Milling Stone Cultures in Northern California: Berryessa I. *Journal of California and Great Basin Anthropology* 1 (1):124-54.

Vayda, Andrew P.
1967 Pomo Trade Feasts. In *Tribal and Peasant Economies* (G. Dalton, ed.), pp. 494-500. Natural History Press, Garden City, New Jersey.

Wallace, William J.
1954 The Little Sycamore Site and Early Milling Stone Cultures in Southern California. *American Antiquity* 20 (2):112-23.
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11 (3):214-30.
1978 Post-Pleistocene Archaeology, 9000 to 2000 B.C. In *Handbook of North American Indians*, Vol. 8, *California* (R. F. Heizer, ed), pp. 25-36. Smithsonian Institution, Washington, D.C.

Wallace, William J., and Donald W. Lathrap
1975 *West Berkeley (CA-Ala-307): A Culturally Stratified Shellmound on the East Shore of San Francisco Bay*. Contributions of the University of California Archaeological Research Facility 29. Berkeley.

Warren, Claude N.
1968 *The View from Wenas: A Study in Plateau Prehistory*. Idaho State University Museum, Occasional Papers 24. Pocatello.

Wedel, Waldo R.
1941 *Archeological Investigations at Buena Vista Lake, Kern County, California*. Bureau of American Ethnology Bulletin 130.

Whistler, Kenneth W.
1977 Wintun Prehistory: An Interpretation Based on Linguistic Reconstruction of Plant and Animal Nomenclature. *Proceedings of the Third Annual Meeting of the Berkeley Linguistics Society*, pp. 157-74. Berkeley.

White, Greg
1984a The Archaeology of Lak-510, near Lower Lake, Lake County, California. Report on file with the California Dept. of Transportation, Sacramento.
1984b Cultural Diversity and Culture Change During the Archaic Period in the North Coast Ranges of California. Paper presented to the Miwok Archaeological Preserve of Marin. Marin City.

White, Greg, and David A. Fredrickson
1992 Research Design for: Anderson Flat Project Archaeological Data Recovery Investigations at Sites CA-Lak-72, -509, -510, -536, -538, and -1375, Lake County, California. Manuscript submitted to CALTRANS District 1, Eureka. On file, Northwest Information Center, Sonoma State University.

Wiberg, Randy S.
1984 The Santa Rita Village Mortuary Complex: Evidence and Implications of a Meganos Intrusion. M.A. thesis, Department of Anthropology, San Francisco State University.

Wickstrom, Brian
1986 An Archaeological Investigation of Prehistoric Sites CA-Son-1250 and CA-Son-1251, Southern Sonoma County, California. M.A. thesis, Department of Anthropology, Sonoma State University.

Willey, Gordon R.
1966 *An Introduction to American Archaeology, Vol.*

1: North and Middle America. Prentice-Hall, Englewood Cliffs.

Willey, Gordon R., and Philip Phillips
1958 *Method and Theory in American Archaeology.* University of Chicago Press, Chicago.

Wissler, Clark
1926 *The Relation of Nature to Man in Aboriginal America.* Oxford University Press, New York.

Yellen, John E.
1977 *Archaeological Approaches to the Present.* Academic Press, New York.

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