Cultural Diversity in Early Central California: A View from the North Coast Ranges

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FOR more than 30 years the Central California chronological sequence proposed by Lillard, Heizer, and Fenenga (1939) with additions by Beardsley (1948, 1954) has formed the backdrop against which subsequent investigations have had to stand. Beardsley outlined several advances in method which allowed recognition of the temporal sequence of Early, Middle, and Late Horizons in Central California, an area which previously had been noted for absence of perceptible change (cf., Kroeber 1909, 1936). Briefly, the methods involved (1) deliberate investigation of small, single component sites as well as large stratified ones; (2) the treatment of each individual burial, including its associated artifacts and other attributes, as an analytic unit; and (3) the recognition of beads and ornaments, frequently found as grave furnishings, as sensitive indicators of temporal variation. Beardsley explicitly acknowledged that a sequence of burial complexes was obtained by these methods rather than a sequence of "prehistoric cultures in the full sense." The success of the third method sketched by Beardsley can be demonstrated by the fact that the established sequence of beads and ornaments, with refinements added primarily by Bennyhoff (cf., Bennyhoff and Heizer 1958), still offers a temporal framework for the cross-dating of archaeological sites throughout Central California and into the Great Basin.

When emphasis is shifted from beads and ornaments, however, to other elements of culture more intimately linked to basic subsistence patterns, the cultural picture which has developed in the past several years appears more complex than that suggested by the traditional Central California sequence. It is difficult to view the beads and ornaments as markers of cultural identity; rather they are more easily seen to represent trade or exchange horizons. While the examination of exchange networks would seem to have a great deal to offer with respect to the understanding of social relationships and political development (cf., Cohen n.d.; C. King 1973), this paper focuses on the spatial and temporal relationships between the culture types which existed during the span encompassed by the Early and Middle Horizons in the Central California area within the regions of the lower Sacramento Valley, San Francisco Bay, and the North Coast Ranges.[1] It seems clear that a simple unilineal sequence of culture types does not provide an adequate model for understanding the changes which appear to have taken place within this area during this time period and that the transition from one culture type to another did not take place uniformly throughout the area, but

rather took place in different regions at different times. Thus, the absolute dating of transitions from one culture type to another must be determined independently for each region. It is recommended that an understanding of the changes which occurred in each region be sought through examination of both technoenvironmental and sociohistorical factors.

The relationships proposed here are based upon published and unpublished data from the North Coast Ranges, as well as similar data from San Francisco Bay and the lower Sacramento Valley. Specifically, I refer to investigations, including radiocarbon dating, at Lak-261 near the town of Lower Lake (Fredrickson 1961, 1973), the analysis of Borax Lake obsidian carried out by Findlow, De Atley, and Ericson (1973), the obsidian hydration seriation and geological study of the Borax Lake site conducted by Meighan and Haynes (1968, 1970), the analysis and radiocarbon dating of Windmiller materials reported by Ragir (1972), the comparative analysis based upon the University Village materials from San Francisco Bay done by Gerow and Force (1968), and the investigations, including radiocarbon dating, at CCo-308 in interior Contra Costa County (Fredrickson 1966). A summary of these findings follows below while relevant radiocarbon dates appear as Table 1.

At the present time, the earliest cultural materials in the regions under discussion appear to derive from the Borax Lake site, about 90 miles north of San Francisco Bay. Although absolute dating is questionable, Meighan and Haynes (1970) found both obsidian hydration rim measurements and the geology compatible with an age of up to 10,000 B.C., but not necessarily of that age. This, of course, is a time depth considerably earlier than that proposed for the Early Horizon (cf., Heizer 1958a). The finding that the thickest hydration rims were obtained from Clovis-style fluted points and chipped crescentics gives credence to the view that the Borax Lake site was originally occupied at a very early time period (cf., Glennan 1971, Tadlock 1966). Provisionally, I refer to the culture represented by these earliest Borax Lake artifacts as the "Post Pattern" (named after Chester Post, the amateur who first called the site to the attention of professional archaeologists [Harrington 1948]). The suggestion of Meighan and Haynes that these materials may relate to localities such as Tulare Lake (cf., Riddell and Olsen 1969; Roehr and Wilwand 1968), where fluted points and crescents were found as part of a surface assemblage, appears reasonable, although fuller documentation and better dating are needed to determine relationships more precisely.

Meighan and Haynes also provide obsidian hydration measurements which indicate that the wide-stem Borax Lake projectile point may date back as far as 4000 to 6000 B.C. and further hypothesize its association with milling stones and hand stones. That this conjecture may be correct is suggested by the recent discovery of similar points in milling stone contexts in two Central California localities. In Little Indian Valley, about 9 miles northeast of the Borax Lake site, Orlins (1971, 1972) found such an association. Obsidian flakes from this context have yielded hydration rim measurements comparable to those from the wide-stem points from the Borax Lake site. In the Klamath Mountains, northeast of Redding, Clewett (1973) found an assemblage with a similar pairing. Clewett obtained a charcoal-based radiocarbon date of 4580 B.C., which provides considerable support to the Meighan and Haynes dating of the earliest milling stone occupation of the Borax Lake site. Provisionally, I consider this assemblage of wide-stem Borax Lake points and milling stones to be an early manifestation of the "Borax Lake Pattern," the milling stone

Table 1

SELECTED RADIOCARBON DATES FROM CENTRAL CALIFORNIA

Site	Lab No.	Pattern: Augustine	Berkeley	Windmiller	Borax Lake	San Dieguito	Remarks
Sac-21	M-885	1700 ± 150					Middle Phase 1
CCo-309	I-1193	1665 ± 95					Phase 2
Sac-60	M-749	1638 ± 200					Phase 2a
CCo-138	M-884	1450 ± 150					Late Phase 1
Sac-21	M866	1440 ± 150					Middle Phase 1
Sac-6	M-648	1330 ± 200					Late Phase 1 or Phase 2
Mrn-115	C-186	1230 ± 130					Phase 1 or Middle Horizon
CCo-138	M-865	1025 ± 150					Middle Phase 1
Sol-236	M-886	870 ± 200					Middle Phase 1
CCo-138	C-689	721 ± 200					Middle Phase 1
Sac-29	M-752		200 ± 500		A.D.		End Middle Horizon
Mrn-27	I-3148		30 ± 95		B.C.		Middle Horizon
Lak-261	I-2791		150 ± 150				Houx Aspect
CCo-259	UCLA-297		230 ± 250				Ellis Landing Facies
Ala-309	LJ-199		360 ± 220				Ellis Landing Facies
Mrn-27	I-3149		370 ± 190				Middle Horizon
Ala-328	C-690		389 ± 150				Ellis Landing Facies
Sac-6	C-691	460 ± 200					Late Phase 1 or Phase 2
Ala-307	M-121		500 ± 250				
SJo-142	I-2750a			545 ± 120			Phase 5?
SJo-142	I-2750b			635 ± 100			Phase 5?
Sac-197C	GX-0659			725 ± 135			
SMa-77	L-187A		750 ± 350				Early SF Bay
SJo-56	I-2751			905 ± 115			Phase 3
Ala-307	M-123		930 ± 300				
SJo-68	I-3038			1030 ± 110			Phase 4
Sac-168	I-3037			1120 ± 170			Phase 3?
Sac-107C	I-2748			1125 ± 105			
SJo-68	M-646			1130 ± 300			
Ala-307	M-126		1190 ± 300				
SMa-77	L-197B		1200 ± 300				Early SF Bay
Ala-307	M-127		1250 ± 250				
Ala-307	M-122		1260 ± 300				
SJo-142	GX-0660			1495 ± 110			Phase 5?
SJo-68	L-2749a			1635 ± 110			Phase 1
Ala-307	M-124		1650 ± 250				
Lak-261	I-2754				1740 ± 130		
SJo-68	I-2749			1825 ± 160			Phase 1
Ala-307	M-125		1910 ± 450				
SJo-68	C-440, 552			2102 ± 160			
SJo-68	M-645			2150 ± 250			
SJo-68	M-647			2400 ± 250			
CCo-308	UCLA-259		2500 ± 400				Early Middle Horizon
Men-581	GX-0229				3370 ± 145		
Sha-S258	GAK-4219				4580 ± 300		
Ker-116	I-1928					5650 ± 200	
Ker-116	LJ-1356					6250 ± 400	
Ker-116	LJ-1357					6250 ± 400	

complex described by Meighan as early as 1955, which is widespread throughout the North Coast Ranges and the adjoining region to the northeast (Fredrickson 1973). It is also important to note that Dotta (personal communication) obtained a charcoal-based radiocarbon date of 3370 B.C. for a milling stone assemblage in Mendocino County, while at Lak-261, about 9 miles south of the Borax Lake site, charcoal from another milling stone assemblage was dated at 1740 B.C. The Lak-261 assemblage is artifactually similar to the later manifestation of the Borax Lake Pattern distinguished by Meighan and Haynes at the Borax Lake site, and placed by them within the time range of 1000 to 3000 B.C. At Lak-261, stemless points, including nonfluted concave base ones, predominated, while milling stones and hand stones, occasional mortars, and a burin industry were other characteristics of the assemblage.

Thus, it appears that the adaptation of the Borax Lake Pattern existed in the North Coast Ranges at a time depth comparable to that of the Early Horizon, that is, the "Windmiller Pattern," in the lower Sacramento Valley. While the earliest radiocarbon date for Windmiller is about 2400 B.C., Ragir (1972) gave it a maximum age of about 3000 B.C., stating that she found little evidence to substantiate Lillard, Heizer, and Fenenga's (1939) prior estimate of 5000 B.C. Ragir placed the terminal date for Windmiller at about 1000 B.C., although radiocarbon dating of bone collagen suggested that it may have been as late as 500 B.C.

The terminal dating for Windmiller, which is considerably later than the date of 2000 B.C. cited by earlier workers (cf., Heizer 1958a) gives support to Gerow's contention, first made as early as 1954, that materials from the University Village site on San Francisco Bay were stylistically similar and of an age comparable to Windmiller, while the burial mode and general technology indicated that the site was more closely related to Middle Horizon than to Windmiller. Provisionally, I have grouped Gerow's Early San Francisco Bay materials, dated by radiocarbon as early as 1200 B.C., with later Middle Horizon materials under the rubric of "Berkeley Pattern." Additional support for occupation of the Bay by Berkeley Pattern peoples comes from the suite of C-14 dates from the West Berkeley mound (Heizer 1958a), the bottom portion of which Wallace (Gerow and Force 1968:10) had identified on stylistic grounds as contemporaneous with Windmiller. Finally, the Berkeley Pattern assemblage and charcoal-based radiocarbon date of 2500 B.C., obtained from CCo-308 at the western foot of Mount Diablo (Fredrickson 1966), offers more weight to the proposal that Berkeley Pattern on the Bay was contemporaneous with Windmiller Pattern in the Valley, as well as with the later portion of the Borax Lake Pattern in the North Coast Ranges.

Sometime between 500 and 1000 B.C., the Berkeley Pattern replaced Windmiller in the Valley, while in the North Coast Ranges, at least in the localities south of Clear Lake, what I refer to as the "Houx Aspect" of the Berkeley Pattern replaced the Borax Lake Pattern. A charcoal-based radiocarbon date of 150 B.C. was obtained from the Houx Aspect component which was situated stratigraphically above the Borax Lake Pattern component at Lak-261. The Houx assemblage included mortars and pestles, but lacked milling stones and hand stones. There was a large number of projectile points, presumably dart points, suggesting that hunting was considerably more important in the Houx Aspect than in the earlier milling stone period. There was also continuation of the earlier burin industry. In short, the assemblage appeared to contain elements of both the Borax Lake and Berkeley Patterns and is tentatively considered to be a coalescent pattern. Fig. 1 is a

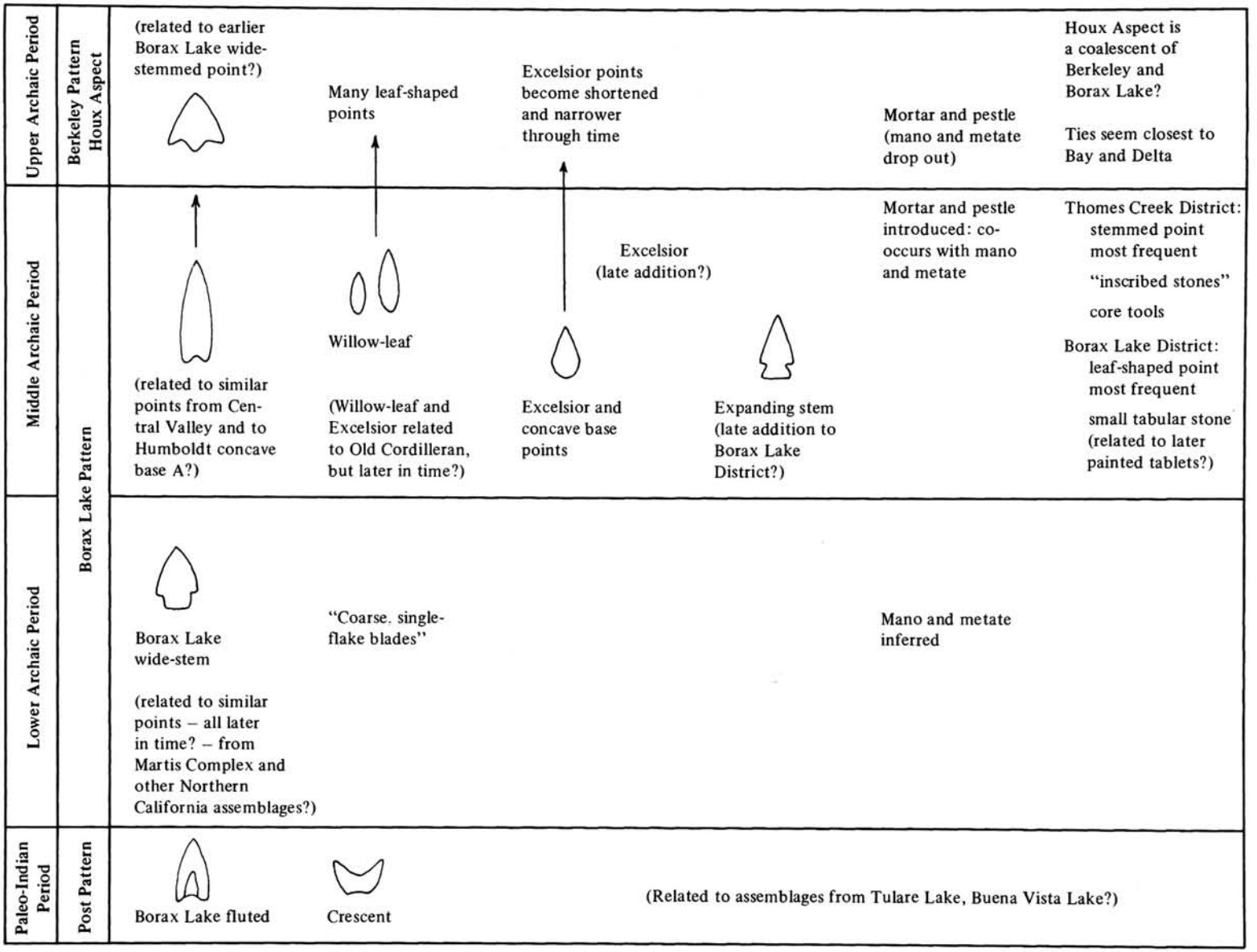

Fig. 1. Cultural Sequence Within the North Coast Ranges (Paleo-Indian and Archaic Periods).

schematic representation of the early cultural sequence described above for the North Coast Ranges.

By 500 B.C., then, the Berkeley Pattern appears to have been firmly established in the San Francisco Bay region, to have replaced the Windmiller Pattern in the lower Sacramento Valley, and in the North Coast Ranges to have merged with the Borax Lake Pattern to form the Houx Aspect. I suggest that the archaeological record would produce even greater diversity with respect to basic adaptive and economic modes in Central California at this time level–approximately 2500 B.C. to the early portion of the Christian era–if greater geographic scope were included in this discussion. For example, Bennyhoff's (1968) "Meganos Aspect" of the Berkeley Pattern, centered in the northern San Joaquin Valley, which follows Windmiller in time, appears to be a merging of Windmiller and Berkeley elements. The relationships between these patterns in the North Coast Ranges, San Francisco Bay and lower Sacramento Valley are diagrammed in Fig. 2.

Some kind of integrative framework to encompass this diversity would be useful. I propose that the dating and identification of temporal periods in California prehistory be kept separate from the dating and definition of particular patterns and suggest the following framework (cf., Bennyhoff and Fredrickson n.d.). The time span under consideration here is generally accepted to be characterized by the adaptive pattern of the Archaic (cf., Meighan 1959). In California, the beginning of the Archaic is marked by the introduction or development of milling stones and an accompanying emphasis upon the collection of plant foods (cf., C. King 1967; Kowta 1969). An interval from 6000 B.C. to 3000 B.C. is acceptable for the predominance of the milling stone adaptation and the span of what I refer to as the "Lower Archaic Period." The cultural developments at this time depth may possibly be linked to the Altithermal, a climatic regime believed by some to have been characterized by relatively high temperatures and low precipitation (cf., Antevs 1952, 1953; Bryan and Gruhn 1964; Kowta 1969). In general, the cultures of the Lower Archaic Period appear to have emphasized the collecting and processing of seeds, with hunting of more significance in northern California than in the south. As yet, no direct evidence of acorn utilization has been found for this period and tools characteristic of ethnographic practices involving the acorn, namely, the pestle and deep mortar, are absent from the Lower Archaic Period inventory. Nowhere during the initial portion of the period did fishing or sea mammal hunting seem important, although by the final part of the period in southern California both of these resources were gaining in significance.

Sometime between 3000 and 2500 B.C., the mortar and pestle, and presumably the acorn processing technology, were introduced or developed in California, marking the beginning of the "Middle Archaic Period." The cultural transition from Lower to Middle Archaic may have been associated with the end of the Altithermal and the beginning of the Medithermal, the climatic regime which persists through the present day. The Middle Archaic Period is dated here from 3000 B.C. to about 1000 B.C. and was marked by the geographic spread of the mortar and pestle. Hunting appears to have become significantly more important as compared with the Lower Archaic Period, and, in general, the economic base became more diversified. Shellfish collecting spread as a local specialization while sea mammal hunting and fishing became particularly significant on the south coast.

The new technologies of the Middle Archaic Period may have been the result of the intrusion of a new population or populations which coexisted with the earlier population, ultimately merging with or replacing it cul-

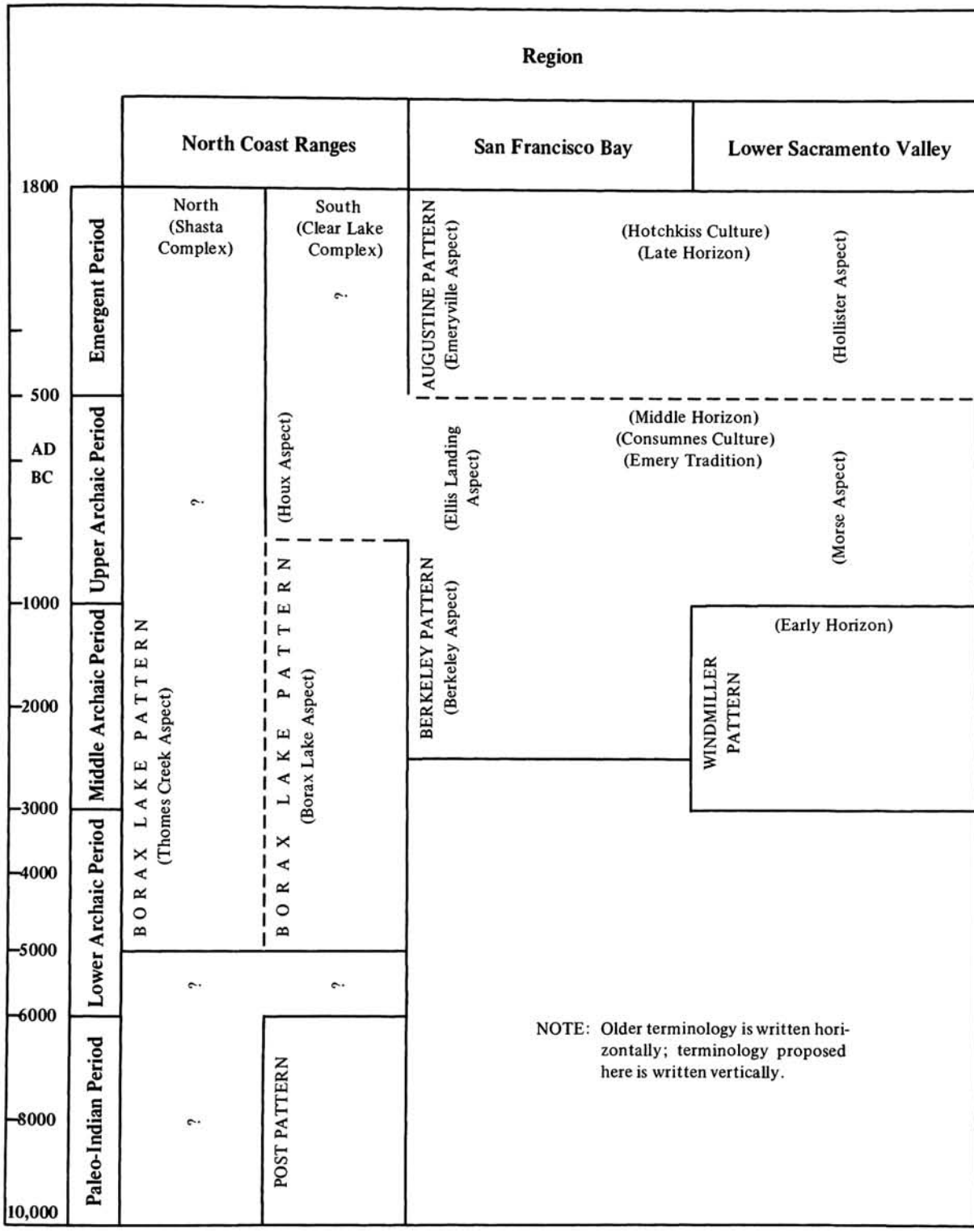

Fig. 2. Periods and Patterns in the North Coast Ranges, San Francisco Bay, and the Lower Sacramento Valley.

turally. The new food grinding technology spread rapidly though not uniformly, and, through processes perhaps associated with technological advantage, eventually either replaced the earlier milling method, was adopted as a complementary method, or was not adopted at all. In some regions, such as those in southern California, the mortar and pestle were not accepted and the milling stone remained the primary food-grinding tool. Environmental influences were probably crucial here as they may have been in other regions, such as the Sierran portions of Central California, where the milling stone and mortar technologies coexisted within the same cultures. Overall, the transition from milling stone to mortar, when it did occur, did not necessarily take place in all localities at the same time. Social influences also can be postulated to have been operative in all regions where the adaptive competition between the acorn technology and previously developed strategies occurred. For example, we can speculate that the social cohesion of the Windmiller Pattern, a characteristic inferable from the pattern's tightly organized burial practices, may have been a factor perpetuating its coexistence vis-à-vis the competing Berkeley Pattern. The overall data available as of now suggest that by 1000 to 500 B.C. the resolution of most of the cultural conflicts had taken place, although some readjustments were still to come, such as the expansion and later contraction of the Meganos Aspect of the Berkeley Pattern from the Stockton District to the Diablo and Alameda District reported by Bennyhoff (1968).

For the purposes of this discussion, the "Upper Archaic Period" is placed within the interval between about 1000 B.C. and A.D. 500. While technological and environmental changes appear to have provided the dominant themes for developments during the Middle Archaic, the Upper Archaic seems to have been marked by ever-increasing sociopolitical complexity, a growth of status distinctions based upon or marked by relative wealth, the emergence of group-oriented religious activities, and greater complexity of the exchange systems (see T. King 1972).

Sedentary life appears to have become fully established in many regions, and the developing economic efficiency may have contributed to population growth. Although similar developments appear to have been taking place in several different regions of the state, the developments in any one region may have occurred more or less independently of events in other regions. Over time, however, possibly facilitated through religious and economic exchanges, groups in different regions tended to become interdependent, but with the northern and southern portions of the state remaining relatively independent of one another.

As an aside, I refer to the Late Period in California prehistory, the beginning of which is placed at A.D. 500, as the "Emergent Period." Without summarizing arguments as to whether certain Californian cultures of the ethnographic period should be classified as Archaic or Formative (cf., Baumhoff 1963; Heizer 1958b; Meighan 1959; Willey and Phillips 1958), I propose the concept of the Emergent as a nonagricultural equivalent to the Formative. Evidence continues to accumulate that Californians modified the environment to increase its natural productivity (Lewis 1973; Steward 1930, 1941:232; Voegelin 1942:176), that food storage and exchange relations served to equalize the distribution of resources unequally distributed in time and space (cf., Bean 1971; Chagnon 1970; Davis 1961), that complex forms of social, religious, and occupational organization were emerging (Bennyhoff 1961; Goldschmidt 1948; Loeb 1926; McKern 1922), and that ranking societies and possibly chiefdoms were developing in several regions of the

		Period Characteristics
1800	Emergent Period Upper	Clam disk bead money economy appears. Increasing quantites of goods moving farther and farther. Growth of local specializations re: production and exchange. Interpenetration of south and central exchange systems.
1500	Emergent Period Lower	Bow and arrow introduced, replace dart and atlatl; south coast maritime adaptation flowers. Territorial boundaries fairly well established. Evidence of distinctions in social status linked to wealth increasingly common. Regularized exchanges between groups continue with more material entering into the network of exchanges.
500 AD / BC	Upper Archaic Period	Growth of sociopolitical complexity; development of status distinctions based upon wealth. Emergence of group-oriented religions. Greater complexity of exchange systems; evidence of regular, sustained exchanges between groups. Shell beads gain in significance, possibly indicators of both exchange and status. Possible origins of Kuksu religious system at the end of period.
1000	Middle Archaic Period	Altithermal may have ended by ca. 3000 B.C.; climate becomes more similar to present-day. Mortars and pestles and inferred acorn technology introduced. Hunting important. Possibility of entry of new population. Diversification of economy; sedentism more fully developed, population growth and expansion. Technological and environmental factors provide dominant themes. Little evidence for significant changes in exchange relations.
3000	Lower Archaic Period	Altithermal may have begun about 6000 B.C.; ancient lakes drying up. Milling stones develop or are introduced; plant food emphasis, little hunting. Although semi-sedentary life style, exchange seems similar to previous period. Most artifacts manufactured of local materials. Little emphasis upon wealth.
6000	Paleo-Indian Period	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, individual, one-to-one. Social unit not heavily dependent upon exchanges; resources acquired by changing habitat.
10,000		(No satisfactory information from the preceding Early Lithic Period.)

Fig. 3. Hypothesized Characteristics of California's Prehistoric Periods.

state (cf., Fredrickson 1971; C. King 1971, 1973; T. King 1970, 1972). This is not, however, the context to examine this body of evidence.

On the basis of the above model, I hypothesize that during much of the Middle Archaic Period throughout California, which dates from about 3000 B.C. to about 1000 B.C., considerable pattern diversity and cultural variation will be found. Considerable population movement should be evidenced and the early milling stone pattern should be altered both by significant internal development and by the introduction of new industries. In some regions complete replacement of the earlier pattern should be observed relatively early, in other regions relatively late. In some regions evidence of assimilation and coalescence should be forthcoming, again with probable temporal differences. Following historical reconstructions based upon ethnographic and linguistic evidence (cf., Klimek 1935; Kroeber 1923), Penutian entry into California may have been linked to the appearance of the new technologies, complicating the interrelationships between both people and technologies. Due to the nature of the hypothesized population and culture contacts, it would seem unlikely that complex, long-standing, or extensive trade networks would develop during the earlier portion of this period of change. In other words, there is

little reason to expect uniformity of culture pattern, stability of population, or regularization of cultural influences during the period from about 3000 B.C. to about 1000 B.C., that is, during the Middle Archaic Period, and possibly, in some regions, into the Upper Archaic. Fig. 3 outlines the hypothesized characteristics of California's prehistoric periods.

In conclusion, it can be pointed out that the environmental, cultural, and linguistic diversity within ethnographic California has frequently been remarked upon. It is only reasonable to expect a prehistoric period with comparable diversity. As has been noted by other researchers, California offers an excellent research area for the study of the adaptations and development of hunters and gatherers.

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NOTES

1. This paper is a revised version of a presentation given at the Thirty-Eighth Annual Meeting of the Society for American Archaeology, San Francisco, California, May 3-5, 1973.

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