Abstract:
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. 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 The relationships proposed here are based upon published and unpublished data from the North Coast Ranges, as well as similar data from San Francisco Bay and the lower Sacramento Valley.

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

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-

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