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## *Comments on Fredrickson's "Cultural Diversity"*

BERT A. GEROW

David Fredrickson recently summarized in the first issue of this journal the major conclusions of his doctoral dissertation (Fredrickson 1973). A model to explain observed and predicted cultural diversity in Central California between approximately 2500 and 500 B.C. is proposed. A shift from an earlier emphasis upon the collection of small hard seeds to the acorn and increasing emphasis on hunting is attributed to either a major climatic change or to the intrusion of a new population (Penutian speakers?). Since I have previously offered a historical model of two interacting traditions and populations in early Central California, the following comments may, hopefully, spark the development of a constructive dialogue (Gerow 1954, 1972,

1974; Gerow with Force 1968).

It is encouraging to find that some of the ideas which I espoused as early as 1954 are now openly accepted by someone other than myself. We apparently agree that within Central California the shell artifact typology, developed originally from an analysis of lower Sacramento Valley data, predicts time and not type of complex. We also agree in our rejection of the earlier conceptualization of widespread parallel cultural succession or development within Central California, in the recognition of the early coexistence of two distinct cultural traditions or patterns in the San Francisco Bay region and the lower Sacramento Valley, respectively, and in our acceptance of a long period of contemporaneity for these two between approximately 2500 and 500 B.C. Fredrickson's Fig. 2 (Periods and Patterns . . . .) (1974:47) also implies a recognition that cultural differences between the several regions were greater during this time span than during the following one thousand years or so. One notes a general conceptual similarity between Fredrickson's two competing economic modes and Gerow's contrast between an earlier, marginally located, generalized food collecting technology and economy and a later, centrally located, more specialized one, emphasizing the use of projectile points in hunting and warfare. There are allusions to the possibly important role that Penutian speakers may have played in the introduction of new technologies. Finally, it should be noted that Gerow's model of convergence through acculturation and gene flow has never excluded the possibility of more than two traditions or patterns coexisting during the period under discussion.

While a conceptual similarity exists between Fredrickson's model of two competing economic modes and that of Gerow's, the roles of Early San Francisco Bay and Wind-miller peoples are reversed by casting the

former as the later arrivals and technologically superior innovators and the latter as part of a basement culture which hung on conservatively due to "social influences" in a competitive struggle with his Berkeley people down to sometime between 1000 and 500 B.C.

The suggestion that the introduction or development of acorn processing was the major dynamic force for culture change in Central California during his Middle Archaic Period is linked to several unsupported assumptions which require comment since they are diametrically opposed to my own position. Fredrickson's model as presented in his Fig. 2 (1974:47) and accompanying text assumes: (1) The Windmill Pattern is older in Central California than his Berkeley Pattern; (2) The Berkeley Pattern people were responsible for introducing acorn processing and for a greater emphasis on hunting; and (3) During the period of coexistence of Windmill and Berkeley Patterns the former represents a conservative manifestation of an earlier culture which is replaced by the expansion of the latter between 1000 and 500 B.C.

A major difficulty encountered in evaluating Fredrickson's theoretical position is that he does not explicitly define his several cultural patterns and aspects. He seems to assume that there is general understanding and agreement on their application. It seems to me that any constructive dialogue must start at this level. Unless there is agreement as to what constitutes his Windmill Pattern, Berkeley Pattern, Morse Aspect of his Berkeley Pattern, etc., and their spatial and temporal dimensions, his proposed integrative framework of Lower, Middle, Upper Archaic periods, etc., rests largely on unstated and/or untested assumptions.

Even in the much fuller discussion offered in his unpublished doctoral dissertation, one finds chiefly a listing of traits present or absent. Since no attempt is made to deal with relative frequencies of association, his cultural

patterns seem static and changeless even when the available data indicate otherwise, as is almost certainly true in the case of the several Windmill facies components. Early San Francisco Bay assemblages differ from contemporaneous assemblages in the lower Sacramento Valley in the relative frequencies of given traits more than in their mere presence or absence.

Undoubtedly, part of the problem of definition arises from an absence of any real unit of analysis for materials from the North Coast Ranges. The number of grave lots is miniscule, and no other method for making the data comparable is offered. How does one compare a Borax Lake Pattern, based on the inferred early co-occurrence of wide-stemmed points and millstones and mullers with a Windmill Pattern, cryptically defined by a quality of "social cohesion" inferred "from the pattern's tightly organized burial practices" (Fredrickson 1974:44)? Since mortars and pestles and projectile points increase in his Houx Aspect in the North Coast Ranges, and these changes are attributed to an expansion of the Berkeley Pattern, we infer that these implements characterize the latter.

Lumping Gerow's Early San Francisco Bay materials with later "Middle Horizon" materials under the rubric of Berkeley Pattern reveals a fundamental misconception of my theoretical position. Fredrickson's paraphrasing of my (sic) "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 Windmill, while the burial mode and general technology indicated that the site was more closely related to the Middle Horizon than to Windmill," is misleading. While I agree that the University Village Complex and other Early San Francisco Bay assemblages share some traits with post-Windmill components in the lower Sacramento Valley, such

as an emphasis on flexed burial posture, variable position and orientation of the body with respect to cardinal directions, I have repeatedly stated that Early San Francisco Bay complexes share fewer traits with assemblages assigned to the "Middle Horizon" than do Windmillier facies components (Gerow 1954:9-11; Gerow with Force 1968:12, 125). Fredrickson, following Ragir (1969, 1972), may prefer to interpret existing data as indicative of an abrupt change between Windmillier and later local components and of a fundamental connection between Early San Francisco Bay and Delta Middle period components, but such an interpretation should not be attributed to me.

If one considers relative frequency of association, a definition of a Windmillier Pattern would certainly include extended burial posture, ventral position, westerly orientation of the head, flat-quadrilateral-cut-and-drilled fractions of abalone shell, flaked stone points, quartz crystals, and biconically drilled "charmstones."

There is no real evidence that such a pattern is earlier in Central California than a pattern of flexed burial posture, variable position and orientation, and high incidences of red ocher relative to ornamental-ceremonial forms of shell, stone and bone, end-abraded whole *Olivella* shell beads relative to cut and drilled shell fractions, and flaked stone scrapers and bone points (awls and gorge fish-hooks) relative to flaked stone points.

At the 1972 Meetings of the Southwestern Anthropological Association and the Society for California Archaeology, Gerow presented a paper entitled: "Stanford Man II: An Early Grave from the San Francisco Bay Region." Two radiocarbon dates based on bone collagen of  $2450 \pm 270$  B.C. (UCLA-1425A) and  $2400 \pm 125$  B.C. (UCLA-1425B) were determined for a burial recovered at a depth of  $16\frac{1}{2}$  to 17 feet, exhibiting flexed posture, lateral position and ENE orientation

(70 degrees east of magnetic north) and associated with three large side-notched or expanding stemmed, leaf-shaped points of Monterey chert. On that occasion my theoretical position was restated and comparisons were made with Fredrickson's "CCo-308: The Archaeology of a Middle Horizon Site in Interior Contra Costa County, California (unpublished Master of Arts thesis, 1966) and Sonia Ragir's "The Early Horizon in Central California Prehistory (unpublished Doctor of Philosophy dissertation, 1969)." Note was taken of the fact that the two Stanford Man II dates, as well as that from CCo-308, equalled the earliest date from the Windmillier culture and exceeded the earliest comparable dates on extended burials in the lower Sacramento Valley by several hundred years. Further, Gerow commented on the fact that Ragir in her dissertation did not refer to the radiocarbon date of  $2500 \pm 400$  B.C. (UCLA-259) determined for CCo-308 nor offer any explanation for the fact shown in her Table 16 that deviations from the Windmillier pattern of extended posture, ventral position and westerly orientation were more frequent in the lower and earlier Windmillier phases at SJo-68.

According to the figures given in Ragir's Table 16 (1972:213), 79.3% of 58 undisturbed burials above a depth of 30 inches conformed to the Windmillier Pattern, whereas only 24.4% of 45 undisturbed burials between 30 and 60 inches so conformed. Powdered red ocher in the grave, non-ventral position, non-westerly orientation, flexed burial posture, and bone points appear more frequently in the earlier Windmillier phases at the Blossom site (SJo-68).

As Fredrickson notes Ragir (1969, 1972) gave her Windmillier culture a maximum age of about 3000 B.C. However, she also states a few lines previous to this: "The author tentatively accepts the 4000 B.P. age for the early period of the Windmillier occupation"

(1972:122). One has only to recall that the earliest SJo-68 dates which directly refer to the Windmill Pattern are  $1825 \pm 160$  B.C. (I-2749b) and  $1635 \pm 110$  B.C. (I-2749a).

In Fredrickson's Table 1 (Selected Radiocarbon Dates from Central California) an outdated source (Heizer 1958) is used for University Village (SMA-77) and West Berkeley (ALa-307) radiocarbon dates. For a proper evaluation of these dates one should refer to Gerow (1964), Deevey, Flint, and Rouse (1967), and Gerow with Force (1968). In 1973 two samples of bay oyster shell from University Village (Test Pit 4, Upper and Lower Shell Lenses) were submitted as unidentified samples by USGS, Menlo Park, to Teledyne Isotopes. Age determinations of  $1100 \pm 85$  B.C. (I-7591) and  $1315 \pm 85$  B.C. (I-7592) were obtained for upper and lower shell lenses, respectively. These agree well with corrected dates of  $1000 \pm 350$  B.C. (L-187A) and  $1450 \pm 300$  (L-187B). Three West Berkeley radiocarbon dates have been corrected by the University of Michigan in the direction of greater antiquity. M-121 (96-108 inches), now reads  $750 \pm 250$  B.C.; M-127 (192-204 inches), reads  $1750 \pm 300$  B.C.; and M-124 (156-168 inches, west), reads  $1750 \pm 350$  B.C.

A unique single-piece curved bone fishhook from a Windmill Phase 2 burial at SJo-68 finds a close analogue in a specimen recovered from the West Berkeley shellmound at a depth of 16 feet. Again University Village and West Berkeley charmstones seem to correspond mainly to types which Ragir regards as early in the Windmill development.

For a typological discussion of the relative dating of University Village, West Berkeley, and the four major Windmill components the reader is referred to my "Analysis of the University Village Complex with a Reappraisal of Central California Archaeology" (Gerow with Force 1968).

The recent scaling down of Windmill

dates (Ragir 1969, 1972) and the increase in University Village and West Berkeley dates generally corroborate the argument offered by Gerow in 1968 that University Village was contemporaneous with one or more of the Windmill facies settlements and typologically most similar to the Blossom site (SJo-68), the earliest rather than the most recent of the several Windmill components.

In the absence of any chronometric support for the greater antiquity of his Windmill Pattern in Central California, Fredrickson seems to have invoked the argument of cultural conservatism. To me, his portrayal of Windmill people conservatively hanging on, due to "social influences," in a competitive struggle with Berkeley people down to sometime between 1000 and 500 B.C. before finally being replaced by the latter is not convincing. If one considers the wealth of beads and ornaments of marine shell, worked obsidian, quartz crystals, etc., in the later phases of Windmill development as an index of technological and economic vitality, one wonders what advantage Berkeley people could have had other than just sheer numbers. I have suggested elsewhere (1968, 1974) that increasing evidence of ventral position, westerly orientation of the head, projectile points, and quartz crystals on the Santa Barbara coast in Olson's Intermediate and Late Periods are traceable, directly or indirectly, to the Windmill culture or tradition.

I have also suggested that any hiatus between Windmill people and their successors in the lower Sacramento Valley is more an artifact of the archaeological sample than a historical verity (Gerow with Force 1968: 108). Fredrickson is certainly conversant with published and unpublished data which show that extended burials continued in the valley alongside of flexed burial posture for at least several hundred years after 500 B.C. R. F. Heizer, after earlier ambivalence, now states: "In brief, the Windmill culture is

an early phase in what must be an unbroken cultural tradition . . . " (Heizer 1974:190). This has been my position since 1954.

Fredrickson implies that the mortar and pestle and, therefore, acorn processing are more characteristic of his Berkeley Pattern than his Windmill Pattern. To the extent that portable stone mortars and/or pestles equal or slightly exceed flaked stone projectile points/blades in Early San Francisco Bay graves and deposits, one may agree that plant foods were probably relatively more important along the coast than in the interior valley. However, the short flat-ended pestles, which characterize University Village and West Berkeley assemblages, seem less specialized in the direction of acorn processing than do long chisel and conical pointed pestles, from which are inferred deep wooden mortars, such as are reported for the Windmill type site Sac-107 and SJo-68, the earliest of the Windmill components. Long chisel and conical pointed pestles, and inferred deep wooden mortars, also characterize at least three of the components which have been assigned to the Morse Aspect of the Berkeley Pattern in the lower Sacramento Valley.

Important to the utilization of the acorn was a method for the removal of the tannic acid (Gifford 1936; Driver 1953). Pulverization prior to leaching aided in the process. While logically, one may posit a functional relationship between the pulverization of the acorn and the deep mortar, Gifford (1936) seems to deny any demonstrable connection. However, one may accept for purposes of discussion Fredrickson's linking of acorn processing and the mortar, their presumed introduction or development later than the grinding of small hard seeds on a millstone, and even a possible connection with Penutian speakers in California, without attributing these changes in Central California to his Berkeley Pattern people.

The mortar and pestle is attested for the

earliest phases of the Windmill culture or tradition (Gerow with Force 1968; Ragir 1969, 1972; Heizer 1974). The rarity of seed pulverizing implements of any kind in the lower Sacramento Valley may be attributed to one or more factors, namely: (1) the greater importance of hunting, and/or (2) the local rarity of suitable stone and an inferred emphasis on wooden mortars and possibly even wooden pestles which have not been preserved. Outside of California in the north-eastern and southeastern United States, the other two North American areas where the acorn was regularly used, the pulverizing of acorns was associated with deep wooden mortars and long wooden pestles.

Although earlier students of Central California prehistory have maximized the slight evidence of millstones and mullers and minimized the greater evidence of mortars and pestles in Windmill components, R. F. Heizer has recently reversed himself and concedes that the Windmill people ate acorns (Heizer 1974:188).

How Fredrickson arrived at his conclusion that Early San Francisco Bay people were responsible for not only the introduction into Central California of acorn processing but for an increasing emphasis on hunting is not indicated. Since he has not concerned himself with the problem of controlled comparison, the following facts seem to have escaped him: flaked stone points are the most frequent artifactual association in the earlier Windmill phases; they are most frequently manufactured from obsidian; and a common projectile type is the non-fluted concave base form (Ragir's type 3b).

While the avowed focus of Fredrickson's paper is on Central California, it is quite clear that he believes his conclusions to be applicable to California as a whole. One may, therefore, legitimately ask why, although more than a quarter of the references cited are unpublished, some important compila-

tions of archaeological data are not directly or indirectly included? I have specifically in mind Robert L. Hoover's doctoral dissertation (1971) and Francis Riddell's published report on the Karlo site (Las-7) (Riddell 1960).

In Hoover's dissertation much of the data obtained by R. L. Olson in 1927 and 1928 on Santa Cruz Island are made available for the first time. Materials on 663 graves from 14 early-intermediate-late island cemeteries are included.

Specific types of shell beads and ornaments indicate considerable contemporaneity for Early Island cemeteries on Santa Cruz Island off the Santa Barbara coast, Windmill components in the lower Sacramento Valley, Early San Francisco Bay complexes such as University Village (SMA-77) and the West Berkeley shellmound (Ala-307), and the Karlo site in northeastern California (Gifford 1947; Bennyhoff and Heizer 1958). There is every indication that the Santa Barbara coast and the Sacramento-San Joaquin Delta region were already cultural climaxes as early as 1500-1000 B.C. and that considerable cross-fertilization between coast and valley had taken place.

Riddell's report on the archaeology of the Karlo site is certainly relevant to the question of dating millstones and mullers in northern California since they occur in well defined contexts which appear to be no older than 500 B.C. or less.

While the archaeological data from the North Coast Ranges are suggestive, they are extremely meager and inconclusive by comparison, especially, if one proposes to construct a model for understanding culture change in prehistoric Central California.

In 1968, Gerow pointed out that, while the University Village Complex shares some Windmill traits, the basic pattern does not seem to be an outgrowth of a Windmill culture type. Yet, of the four major Windmill facies components the relationship seemed

closest to the Blossom site (SJo-68). Early San Francisco Bay culture, as represented by the University Village Complex, the lower levels of the West Berkeley shellmound, and probably the lower levels of Ellis Landing, was characterized by "flexed burial posture, powdered red ocher in the grave and/or on the skeleton, an emphasis on whole *Olivella* shell beads rather than drilled shell fractions, on crude flake-core scraper-knives and choppers rather than flaked stone points, on crude edge-notched stone weights rather than plumb-shaped weights (perforated and non-perforated), and on unelaborated forms of shell, stone, and bone rather than their counterparts" (Gerow with Force 1968:122). A number of University Village traits were known mainly from the southern end of California and seemed to point more specifically in the direction of the Santa Barbara coast. Olson's Early Island Cemetery C-3 on Santa Cruz Island was cited as the closest analogue and Orr's Red Head phase of his Dune Dweller culture on Santa Rosa Island was referred to as a possibly earlier stage of the same basic pattern.

In the light of the more complete data made available by Hoover's doctoral dissertation, "Some Aspects of Santa Barbara Channel Prehistory," and Orr's "Prehistory of Santa Rosa Island" (1968), this earlier judgment seems sound. For those who may have interpreted my position otherwise, I wish to point out that I had no intention of implying that Early San Francisco Bay culture originated in southern California.

One notes that Olson's Early Island Cemetery C-3 on Santa Cruz Island shares, as do Early San Francisco Bay assemblages, specific Windmill facies types of drilled ornamental shell. On the other hand, at SCRI-3 such bead and ornament types co-occur with both the few extended as well as the more numerous flexed burials. Since other Windmill culture traits, such as ventral position, westerly orien-

tation of the head, flaked stone projectile points, quartz crystals, worked obsidian, concave based points increase in later contexts both on the Channel Islands as well as on the Santa Barbara Mainland, I have suggested that a model of convergence between an interior valley Windmill tradition (Penutian) and a marginal tradition (Hokan) more closely approximates the dynamics of culture change in prehistoric California during the last 4,000 years. For a more complete discussion, the reader is referred to "Co-Traditions and Convergent Trends in Prehistoric California" (Gerow 1974).

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## *Reply to King and Gerow*

DAVID A. FREDRICKSON

I'm pleased that my suggestions about early Central California prehistory, which appeared in the first issue of this journal, have stimulated constructive commentary. In response to King: The division of California prehistory into the various temporal periods

summarized in my paper was based upon the premise that a culture's utilization of new or different sources of energy will be accompanied by changes throughout that culture. Changes in the sources of energy available to a culture may be a function of any combination of environmental circumstances, technological developments, or exchange relationships between societies. I believe that the periods and their descriptions which I suggest in the paper are consistent with this premise.

In response to Gerow: While I do summarize some data in support of the contemporaneity of what I have called the Berkeley Pattern with the Windmiller Pattern, nowhere in the text of the paper do I suggest temporal priority for either pattern. It is true that Fig. 2 suggests that Windmiller began about 3000 B.C. (following Ragir's conservative rather than her expansive estimate) and that Berkeley began about 2500 B.C. (following a conservative evaluation of the C-14 date from CCo-308). I'm glad to have the opportunity to state my opinion that with respect to Windmiller/Berkeley temporal priority, the data at this point in time are not definitive. Neither are data on their origins. Careful analyses such as those carried out by Gerow may someday help provide answers. With respect to other questions brought up by King and Gerow, dealing with them may hopefully provide interesting problems for undergraduate seminars.

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