THE ELLISON SITE CHRONOLOGY, MORMON BAR, MARIPOSA COUNTY, CALIFORNIA

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ABSTRACT

Excavations undertaken by Caltrans in 1995 and 1996 along with an analysis of materials excavated in 1963 and 1965 by Francis Riddell at the Ellison site (CA-MRP-17/H) have allowed for the study of a wide range of artifactual and ecofactual materials. Those studies help to illustrate issues in the use, development, and testing of prehistoric chronological models. Implications for the use of current chronological models are explored (Figure 1). Caveats are offered regarding the use of both projectile point types and obsidian hydration measurements in the construction of chronological sequences.

INTRODUCTION

The Ellison site (CA-MRP-17/H), a large midden site (140,000 m^3) with a dozen known bedrock mortar outcrops along State Route 49 at Mormon Bar, sits at an average elevation of 534 m (1750 ft.) amsl. The archaeological project was a response to several proposed California Department of Transportation projects. Some areas of the site have been destroyed by various construction projects. Other, extensive site areas have not been explored archaeologically. The site was found to contain human remains, a considerable range of steatite artifact types including vessels (Figure 2), shell beads (Figures 3 & 4), and projectile points (Figures 5-8) as well as a variety of ground, battered, and flaked stone tools (Rondeau and Wulf 1998). A review of relevant literature for the Yosemite region found the local chronological scheme to be undergoing reevaluation (Hull et. al 1996). When, exactly, the site was occupied, is the subject of this paper.

GENERAL FINDINGS

The Riddell collection and the Caltrans materials involved ten human burials and 13,092 archaeological specimens. The recovered specimen classes included flaked stone (N=10,359), ecofactual materials (N=1510), historic artifacts (N=931), unmodified minerals (N=120), beads and ornaments (N=97), steatite artifacts (N=48), ground and battered stone (N=36), bone and antler tools (N=21), and baked clay pieces (N=5). Several of these specimen classes overlapped due to the presence of multiple use specimens as well as the use of several non-mutually exclusive categories.

The flaked stone class included debitage (N=9488), edge modified flakes (N=639), projectile points (N=178), cores (N=41), unfinished bifaces (N=11), and eight drills. The ecofactual materials (N=1510) included faunal bone (N=1477), unmodified shell (N=20), and 13 seed specimens. The unmodified minerals included steatite (N=91), ochre (N=18), quartz crystals (N=8), and one chiastolite crystal, a chert sphere, and a crystalline milk quartz rock. The beads and ornaments (N=97) included shell beads (N=62), steatite beads (N=32), and three *Haliotis* ornaments.

The ground and battered stone artifact class (N=36) included manos (N=15), hammerstones (N=10), metates (N=6), spalled cobbles (N=5), one hopper mortar, one pestle, and a metate blank. The non-bead steatite artifacts (N=16) included a nearly complete bowl, other bowl and vessel fragments (N=9), two perforated disks, an "awl" fragment, a pipe fragment, and a possible atlatl engaging spur. Historic artifacts totaled 931 specimens with 27 pieces of historic glass classed as either edge modified shards (N=16) or debitage (N=11) from intentional flaking.

A total of 200 obsidian samples, roughly divided between the older and newer collections, underwent analysis. One hundred and forty-two were from the Casa Diablo source area with a band width range of 1.1 μ to 7.2 μ and a mean of 4.55 μ. Forty-five were from the Bodie Hills locality with a range of 1.6 to 9.6 μ and a mean of 5.1 μ.

YOSEMITE CHRONOLOGY

Bennyhoff (1956) originally proposed a three complex sequence for the Yosemite National Park region. From oldest to youngest they were the Crane Flat, Tamarack, and Mariposa Complexes. The earliest, the Crane Flat Complex, was assigned a terminal date of approximately AD 500. No inception was suggested (Bennyhoff 1956:55, 57). Diagnostic traits of the Crane Flat Complex were thought to include slab metates and manos and several types of heavy, large projectile points weighing more than 3.5 grams. Point styles included concave-based, leaf-shaped, indented stemmed, and expanding-stem shouldered forms. Heavy core scrapers of chert and basalt, as well as "nubbin" drills were included. No use of bedrock mortars and pestles was indicated.

The Tamarack Complex was assigned the tentative time span of AD 500-AD 1200. Those tentative dates were based on similarities to Central Valley point types. Bennyhoff (1956:54, 55) considered the Tamarack Complex tentative until more excavation could be done to substantiate the sequence. Likewise, he thought that the complex itself was poorly defined (Bennyhoff 1956:55-57). Even so, he characterized the complex as probably representing the initial use of bedrock mortars and cobble pestles, although handstones and milling slabs were still the primary grinding equipment. Other traits suggested as diagnostic included lighter projectile points weighing between 1.0 and 3.5 grams. Those smaller points were thought to represent the introduction of the bow and arrow in the region. Common point types included those with shouldered or barbed expanding stems, barbed points with straight stems, side-notched points with indented bases, and leaf-shaped points with concave bases. Also thought to be common in this complex were flake scrapers and short, triangular drills (Bennyhoff 1956:54).

The Mariposa Complex, related to ethnographic Miwok use of the area, was tentatively placed from AD 1200 to AD 1850. Material representing this complex included steatite vessels, steatite beads, clamshell disk beads, bedrock mortars, cobble pestles, small, light projectile points weighing less than one gram, various types of flake scrapers, and long, parallel sided drills. The bedrock mortars and cobble pestles were seen as the acorn and seed grinding implements. Later research would eventually assign the relevant projectile points to the Desert Side-notched, Cottonwood Triangular, and Gunther types.

Based on analysis of materials from later excavations, Fitzwater (1962, 1968) attempted to change Bennyhoff's (1956) chronology into a two-part sequence. He assigned new dates based on stratigraphic evidence and ^{14}C dates. He subsumed the Tamarack Complex into the other two complexes by changing the dates of the Mariposa Complex to begin by AD 1000 and lasting until 1850 AD while the Crane Flat Complex was assigned a beginning date of AD 1 and continuing until AD 1000.

Further work has since corroborated Bennyhoff's three-part sequence (Moratto et al. 1988). However, the sequence proposed by Bennyhoff (1956), and further refined over the years, is still considered inadequate (Hull et al. 1996). As part of the current effort to construct an archaeological synthesis and research design for the Yosemite National Park (Hull et al. 1996), suggestions have been made for testing and refining that chronological scheme. Those suggestions have involved an assessment of successes and inadequacies in previous work. A revised chronological sequence has been tentatively suggested that might serve to better address current archaeological concerns (Moratto with Roper and Hull 1996:5.6, Table 5.8). The Crane Flat Phase, in that provisional scheme might span a period beginning around 500-200 BC and last until AD 700-900 (Hull et. al 1996). The

Tamarack Phase may be assigned a range from AD 1000 to AD 1200. The Mariposa Phase in that chronology has been provisionally placed as ranging from AD 1200 to AD 1500 (Hull et. al 1996).

Further inadequacies to the original scheme have been recognized, especially regarding its limited time depth. The recognition of earlier point types, especially Western Stemmed Series forms that can be associated with the early Holocene and the Western Pluvial Lakes Tradition in the far west, have been recognized in the Yosemite region (Moratto with Roper and Hull 1996). Such a presence in the region might fall within a time span of 8,000-10,000 BP and possibly involve obsidian band readings in the 8 and 9 μ range. This has led to the proposal of a hypothetical El Portal Phase to help guide future research. Further, point styles following later in time, but still older than the Crane Flat Phase, have been found in the region. Several kinds are comparable to Pinto types and the Stanislaus Broad-stemmed. Likewise, large side-notched points were also noted as falling within that same time slot. Finally, the possibility of an early division for the Crane Flat Phase has also been mentioned. In all cases, however, future additional research to define these potential chronological elements has been recognized as necessary (Moratto with Roper and Hull 1996).

ELLISON SITE CHRONOLOGY

The Mariposa Phase was represented at the Ellison site by radiocarbon dates (120±50, 120±50, 320±50, and 750±50 rcybp), the flexed burials excavated by Riddell (Rondeau and Wulf 1998: 321-333, Figures 1-3), a range of temporally diagnostic artifact classes, and hydration band width data. The temporally diagnostic artifacts included 40 Desert Side-notched points and variants along with five Cottonwood Triangular projectile point specimens (Rondeau and Wulf 1998:50-51), 32 steatite disk beads, ca. 26 *Olivella* shell beads, three *Haliotis* ornaments, and one *Saxidomus* shell bead. Another 15 steatite artifacts including vessel fragments and several disks were also considered representative of this late phase.

Nine Desert Side-notched points of obsidian yielded a range of 1.5-2.6 μ Casa Diablo/Bodie Hills (CD/BH). Three Cottonwood Triangular points had a range of 1.2-3.0 μ CD/BH. Sixteen, non-point specimens yielded band width readings under 3.0 μ CD/BH. Even so, a calendrical placement for the Mariposa Phase was not refined by the Ellison site studies, although it appears to fall between 1.0 and 3.0 μ CD/BH.

No clearly Tamarack Phase component was indicated at CA-MRP-17/H. The only suggestion of that phase was the six Rose Spring Corner-notched projectile points. The 750±50 BP radiocarbon date was borderline with the traditional initiation of the Mariposa Phase (Bennyhoff 1956). The term Rose Spring is used here rather than "Rosegate" since the concern is with corner-notched point types and the Rosegate designation also includes the Eastgate point type, which were notched into the preform's convex basal margin.

However, the Rose Spring and Elko series points did not fit neatly into the basic pigeonholing exercise of typological cross-dating that is often used for the Tamarack and Crane Flat Phases. The possibility of a continuum in which there appeared to be a gradation in size and form from Elko Corner-notched (e.g., Figure 6h) through an intermediate, more gracile form (Figure 6g) to those belonging in the Rose Spring type (Figures 6d and 6e) was intriguing. However, such a continuum was not clearly evident due to the limited number of specimens involved (N=7). The obsidian band width measurements that might involve a hypothetical transition period included 3.5 (Figure 6e), 3.8 (Figure 6h) and 4.4 (Figure 6d) μ CD, 4.0 μ Mono Craters (Figure 6f), and 3.0 μ Queen (Figure 6g). Since a variety of glass types were involved, a strict comparability of band widths could not be established. Even so, a period representing a transition between the two phases might be suggested. The construction of any such "transitional" phase might only be suggested in incomplete or hypothetical terms given the very tenuous nature of the data.

The Crane Flat Phase is represented at the Ellison site by both obsidian point types and hydration band measurements. The Elko Corner-notched situation may or may not represent the

Crane Flat Phase as noted above. However, the Sierra Concave Base points present no such problems with four specimens representing band width readings of 4.5, 4.7, 5.0, and 5.2 μ CD (Figures 7c, 7b, 7a, and 7e). One of those specimens (Figure 7a) was also reminiscent of point forms east of the Sierra (Basgall and Giambastiani 1995:50; Figure 4.3) where there is a tendency for Elko Eared type assignments to approach a side-notched morphology. Several of the large side-notched points from the Ellison site may represent local variants of that "eared" trend during late Archaic times (Figure 8i; 3.8 μ CD and Figure 8h; 4.3 μ CD). However, their morphological similarity to the eastern specimens was not completely convincing given available comparative data.

Dart-point sized, contracting-stem points in the Yosemite region have been found to be largely coeval in time with Elko series projectile points (Kathleen Hull, personal communication 1998). Likewise, contracting stem points such as Figure 7i may also represent a temporal equivalent to Elko Contracting-stem points found on the eastern side (Basgall and Giambastiani 1995:51; Figure 4.4). However, this specimen did not have a measurable hydration band. Other data from the eastern side of the Sierra Nevada has also indicated that contracting stem points, reported as part of the Gatecliff series (Bieling 1992), are in that region no older than Elko series points. Those two point series in Bieling's work (1992) had a combined obsidian band width range of 3.4 to 4.8 μ CD/BH.

The placement of larger contracting stem points at the Ellison site (Figure 7g and 7h; 6.4 and 6.8 μ CD) exhibited earlier hydration band measurements than for other Crane Flat Phase point specimens discussed above. Does this suggest that the Crane Flat Phase extends further back in time, as measured by obsidian hydration studies; that there might be an earlier division to the Crane Flat Phase for the Ellison site; or even an earlier, pre-Elko phase? Such possibilities may be considered, but must remain tentative since the sample size (N=2) is simply too few to allow the recognition of any kind of temporal pattern.

Beyond the question of placement for large contracting-stem points, the presence of a temporal period earlier than Crane Flat Phase at the Ellison site appeared possible. Fragments of two large, side-notched specimens with thicker band width measurements (Figure 8j; 7.0 μ BH and Figure 8g; 7.2 μ CD) may represent the terminal manifestation of a pre-Crane Flat Phase. Likewise, the few other hydration band widths of 7.0 μ and larger (Figure 1) suggest that the inception of occupation at the Ellison site was probably during a pre-Crane Flat Phase period. For purposes of testing, not interpretation, these large, side-notched point pieces might be seen as having their Great Basin origins equated with the Fish Slough Side-notched (Basgall and Giambastiani 1995; Basgall et al. 1995). Those points on the eastern side of the Sierra Nevada yielded band width ranges of 7.5 to 9.5 μ Queen and 7.8 to 11.7 μ CD (Basgall and Giambastiani 1995:54). Those points were considered to be early Holocene.

PROJECTILE POINTS AS TIME MARKERS

Projectile point types are widely accepted as temporal diagnostics because their forms changed through time. How and why they changed through time is not totally understood (Rondeau 1996). The mechanisms for the spread of point types across space and the speed of their progress is more often assumed or inadvertently implied than verified. Likewise, the persistence of a type and the reasons for its duration in a region are also important considerations. On a superficial level, saying that the first place of a point type's occurrence is probably not the last place of its occurrence speaks to a certain level of perceived variability in projectile point type distribution. However, their distribution is defined archaeologically. Therefore, it needs to be remembered that not just their periods of deposition, but of post-depositional survival, are the time frames most often defined by archaeology.

The temporal variation for the presence of a point type among regions and within regions needs to be considered. For a given type, they could not have been used everywhere in a region at the same time unless their use began and ended simultaneously at all sites. The first problem is that not all sites could have been occupied equally throughout any such point type's use life. Thus, the period of point type use at one site is not necessarily the same as at another.

Second, the main period during which a point type was being discarded at a site, may not represent the entire period of its use by that site's inhabitants. One of a series of potential examples is offered. Available evidence suggests that most points in an archaeological context were largely derived from discard behavior during weapon tip retooling events (Rondeau 1996). If accepted, then even limited changes in mobility strategies, influencing such factors as seasonality of occupation and shifts in the on-site tasks, could mean that the rate of point discard was not necessarily static during the period of a point type's use.

Finally, there is the meaning of multiple point types for a given time period. While Elko Series, Sierra Concave Base, and Contracting Stem types are all considered to represent the Crane Flat Phase, then the finding of these three kinds, as a traditional cross dating exercise, would treat them all as being equal in time. At the Ellison site, for reasons that remain unclear, and sample size effect is certainly one possibility, they did not fall within the same obsidian hydration band width range. Could this mean, for the Ellison site, that they were temporally distinct? If so, does that suggest some differences in activities (e.g., use of darts vs. thrusting spears or javelins) by a single group through time or different groups of people with different point type traditions occupying the site during the Crane Flat Phase?

While the current formulation of the Crane Flat Phase allows for the overlapping use of a set of projectile point types, the Tamarack Phase is otherwise organized. The findings from the Ellison site certainly suggest more questions, but few answers. For example, is it more likely that there was a "transitional" period of overlap than an abrupt temporal break in the use of Rose Spring and Elko point types? Would such a period indicate the diminution of the Elko Corner-notched point type after the adoption of the bow and arrow or does it signal a period of overlap in the use of the throwing stick and dart with the bow and arrow as has been argued elsewhere (Flenniken 1991)? If such a period exists, is it largely invisible due to the chronological typology that currently promotes a distinct temporal boundary between clearly "Elko" and clearly "Rose Spring" specimens? Likewise, does the current point dogma result in the placement of morphologically transitional point specimens into one or the other accepted point type, also serving to preclude the recognition of transitional point forms and the time period they represent?

It seems reasonable that the potential for site-specific variations in point type histories needs to be recognized with and without variations in point morphology. Morphological variations, however, might have occurred for any one of a number of additional reasons that does not necessarily change the specimen to another type, but may make its identification difficult at best (Rondeau 1996).

OBSIDIAN HYDRATION AS A RELATIVE CHRONOLOGY

Obsidian is the only contender with projectile points as an important source of temporal data at many sites in the Yosemite region. The Ellison site, aside from the Mariposa Phase, is no exception. As noted previously, an extensive temporal continuum for both Casa Diablo and Bodie Hills glass types is indicated (Figure 1). However, it needs to be remembered that there is a range of difficulties with obsidian hydration data as well. First, in this study, the Casa Diablo and Bodie Hills obsidians have largely been treated as having equal hydration rates which may not be likely (Tom Origer, personal communication 1997), although there may be some suggestions of comparability at the Ellison site.

Second, the rates for these two glass types are not well understood and certainly have not been verified for the Mormon Bar vicinity. For example, should it be accepted that the older the segment of a hydration sequence involved, the more time that is compressed into and therefore represented by each progressively older micron? Thirdly, variability in hydration rates for different specimens of the same obsidian type may need to be considered for some glass types. Finally, environmental influences may have been variable. Those influences may have included climatic changes through time that influenced otherwise consistent hydration rates. The influence of elevation on hydration rates may have been especially significant for specimens that were not recovered from the elevation where most of their use and post-depositional histories may have occurred. Lastly, potential variables among local sites and perhaps, specific site areas may have had more influence than currently perceived. Future research may find that fewer or more of these were important influences under differing conditions.

In the attempt to control for these as well as other potentially disruptive influences, a sample size (N=200) sufficient to indicate the general trends in the obsidian record of the Ellison site was sought. Even so, it was found that this sample size produced inconclusive results for some research questions. Those questions might each have required an independent sample similar in size to the original for specific formed artifact and debitage types. As an example, the limited number of points with useful readings, when compared to the larger glass sample, are little more than nodes on a continuum of hydration band readings. In that regard, it is important to remember that point types and hydration measurements are not necessarily independent temporal indicators. Most points in the Yosemite region are made of volcanic glass. The influx of Great Basin obsidian over time appears to indicate a past system for the outright transport of Great Basin projectile point types and/or their mental templates to lower, western Sierra Nevada elevations. It was Great Basin obsidians that dominated projectile point types throughout the Yosemite region.

TEMPORAL PERIODS

The potential for at least one "transitional" phase has been previously suggested. The traditional Yosemite chronology has most often been presented as having discrete blocks of time. This seems to fit with the view that phases are arbitrary breaks in a continuum of cultural evolution. If that arbitrary structure is accepted, then there is no place to insert a "transitional" phase. Still, such phases are artificial constructs for purposes of modeling the past. As interpretations of the archaeological record, any chronological model is only as good as its fit with the evidence of the past. What is to be done, then, if an archaeological component does represent a transitional pose between two defined phases? Does it actually show a transition in diagnostic artifacts? Does it show a transition in archaeologically definable behavior patterns? If future research answers such questions in the affirmative, then a reassignment of phase designations may be in order.

However, the concept of a "transitional" phase is not the only potential scenario. The temporal element for a phase assignment need not, necessarily, end when another begins. For example, the temporal overlap of two different phases with different diagnostic artifact forms was expressed in terms of both hydration measurements and radiocarbon dates in the Sacramento River Canyon of northern California (Basgall and Hildebrandt 1989). The recognition that specific cultural phases did not begin and end everywhere at the same time, nor that they are necessarily mutually exclusive in time or space from one another has been charted as prehistoric chronologies elsewhere in California (Fredrickson 1973). The possibility of such phase overlaps may offer an alternative solution to the Tamarack/Crane Flat Phase issue. Likewise, with positive support from future research, the overlap concept might provide some insight into the placement of different point forms currently assigned to the Crane Flat Phase.

Other questions might benefit from the overlap concept. What is the temporal placement of any pre-Crane Flat Phases, the large side-notched points, and band widths of 7.0+ μ CD/BH? Should those points be assigned to the early Holocene as on the eastern side of the Sierra Nevada? Would that place them in a hypothetical El Portal Phase? Do such points persist into middle Holocene times, thus overlapping with other phases? It is suspected that an ending of the early Holocene around 7.0 μ CD/BH for the Mormon Bar area may have been too far back in time for that narrow a band width. Regardless of whether or not the overlap scenario applies to any middle Holocene occupational phases at the

Ellison site, the Holocene chronology represented by hydration band widths for the central Sierra Nevada is far from understood, especially in terms of calendrical dates. Ultimately, a more realistic temporal scheme than current single-line, linear chronologies may emerge for the central Sierra Nevada.

WHAT ARE CHRONOLOGICAL SEQUENCES TELLING US?

Potentially overlapping phases at a single site may parallel in cause, if not timing, the temporal offset of otherwise similar periods presented in different regional chronologies of the central Sierra Nevada. Three major chronological schemes are recognized within the central Sierra Nevada: the Yosemite (Bennyhoff 1956; Moratto with Roper and Hall (1996), the New Melones (Moratto et al. 1984; 1988), and the Buchanan (King 1976; Moratto 1972) sequences. All three tend to agree in numerous elements of broad change such as settlement patterns and subsistence economics as well as the general trends in the appearance and disappearance of specific artifact types. However, there is some temporal variation in the placement of specific transitions among those schemes. Temporally variable transitions may be identifiable in the archaeological record as differences in the timing of changes in settlement patterns and assemblage compositions, especially in terms of both the frequencies and the kinds of functionally diagnostic artifacts. What do those temporal variations tell us about the past, the chronological schemes themselves, and the methods used to construct them?

That variability is certainly due, in part, to the coarse grained nature of some archaeological dating efforts. The archaeological record itself has, at times, certainly placed limits on those efforts. Differences in study methods and the level of knowledge and understanding of prehistory during the time when each scheme was constructed also appear to account for some variation. Given such limitations on the comparability of the methods used by chronological ordering efforts, some temporal differences cannot be shown to be real, let alone significant. Even so, a review of an extensive set of additional dating efforts relevant to the Yosemite region (Moratto with Roper and Hall 1996) appears to suggest that variation in the timing of changes for certain prehistoric practices is a commonly recurring pattern in the archaeological record.

If it is accepted that there is a pattern of temporal variability repeatedly exhibited by the archaeological record, it is the result of differences in the prehistory of specific archaeological sites as well as larger archaeological units. Thus, the expectation that various changes happened at exactly the same time everywhere in the central foothill region of the Sierra Nevada appears unrealistic. Even so, the use of geographically encompassing archaeological chronologies, especially based on artifact cross dating, appears to accept the unstated assumption that such changes occurred at the same time over wide areas. Potential corollaries to that assumption are that such changes occurred in the same way and for the same reason over vast areas. The degree to which such ideas may be accurate has yet to be determined. However, the historical record repeatedly indicates that the reasons for many wide spread changes and the ways in which they occurred seldom followed a single timeline or path of human behavior.

If some variability in the timing of transitions between localities and specific sites should be expected, then the construction of cultural chronologies aimed at the goal of producing overarching regional time frames where "one scheme fits all" is overly simplistic. They require that a growing body of evidence indicating the variability of prehistory be ignored. In this light, project specific archaeological interpretations based on such chronologies too easily serve as a tool to pigeonhole artifacts, assemblages, sites, and settlement patterns into preconceived constructs. At best, such pigeonholing places normative constraints on the interpretation of the behavioral variability evident in the archaeological record. At worst, it has obscured extant evidence of past behavioral variability that could have provided a basis for the development of greater insights into prehistory. The chronology of the Ellison site has not been presented as being firmly fit into an existing scheme for numerous reasons discussed above. Rather than invalidating previous chronology building, the Ellison site study has been used as a test case to consider avenues of future research that might serve to refine and strengthen future chronological constructs in the Yosemite region.

REFERENCES CITED

Basgall, Mark E., Michael G. Delacorte, and M. C. Hall
1995 Fish Slough Side-notched Projectile Points: An Early-Holocene Time Marker in the Western Great Basin. *Current Research in the Pleistocene* 12:1-4.

Basgall, Mark E., and Mark A. Giambastiani
1995 Prehistoric Use of a Marginal Environment: Continuity and Change in Occupation of the Volcanic Tablelands, Mono and Inyo Counties, California. *Center for Archaeological Research at Davis Publication* 12. University of California, Davis.

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. University of California, Davis.

Bennyhoff, James A.
1956 An Appraisal of the Archaeological Resources of Yosemite National Park. *Reports of the University of California Archaeological Survey* 34.

Bieling, David G.
1992 *Perspectives on Behavior Gained from Lithic Analysis and Archaeological Investigations near Bridgeport, Mono County, California.* Unpublished Master's thesis, Department of Anthropology, Sonoma State University, Rohnert Park.

Fitzwater, Robert
1962 Final Report on Two Seasons Excavations at El Portal, Mariposa County. *California Archaeological Survey Annual Report* 1961-1962:235-306. 1968 Big Oak Flat; Two Archaeological Sites in Yosemite National Park. *Archaeological Survey Annual Report* 1968:275-314.

Flenniken, J. Jeffery
1991 The Diamond Lil Site: Projectile Point Fragments as Indicators of Site Function. *Journal of California and Great Basin Anthropology* 13(2):180-193.

Fredrickson, David A.
1973 *Early Cultures of the North Coast Ranges, California.* Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

Hull. Kathleen L., Michael J. Moratto, C. Kristina Roper, Helen McCarthy, Lester A. Ross, Mark R. Hale, Elena Nilsson, and W. Geoffrey Spaulding.
1996 *Archaeological Synthesis and Research Design, Yosemite National Park, California.* Draft edited by M. J. Moratto, Yosemite National Park.

King, Thomas, F.
1976 *Political Differentiation among Hunter-Gatherers: An Archaeological Test.* Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Riverside.

Moratto, Michael J.
1972 *A Study of Prehistory in the Southern Sierra Nevada Foothills, California.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

Moratto, M. J., M. R. Arguelles, S. K. Goldberg, S. O'Brian, L. Riley, and W. G. Singleton
1984 *New Melones Archaeological Project, California: Indian Sites 04-Cal-S-286, 04-Cal-S-347, and 04-Cal-S-461. Final Report of the New Melones Archaeological Project* IV (1, 2 and 3). National Park Service, Washington, D. C.

Moratto, M. J., with C. Kristina Roper and Kathleen L. Hull
1996 Cultural Chronology, 2: The Yosemite Data. In *Archaeological Synthesis and Research Design, Yosemite National Park, California* by K. L. Hull, M. J. Moratto, C. K. Roper, H. McCarthy, L. A. Ross, M. R. Hale, E. Nilsson, and W. G. Spaulding, pp. 5.1-5.79. Draft edited by M. J. Moratto, Yosemite National Park.

Moratto, M. J., J. D. Tordoff, and L. H. Shoup
1988 *Cultural Changes in the Sierra Nevada, 8000 B.C.-A.D. 1950. Final Report of the New Melones Archaeological Project* IX. National Park Service, Washington, D. C.

Rondeau, Michael F.
1996 When Is An Elko? In *Stone Tools, Theoretical Insights into Human Prehistory*, edited by G. H. Odell, pp. 229-243. Plenum Press, New York.

Rondeau, Michael F. and Eric Wulf
1998 *The Ellison Site (CA-MRP-17/H), Phase II Eligibility Studies Along Highway 49 at Mormon Bar, Mariposa County, California.* California Department of Transportation, Sacramento.

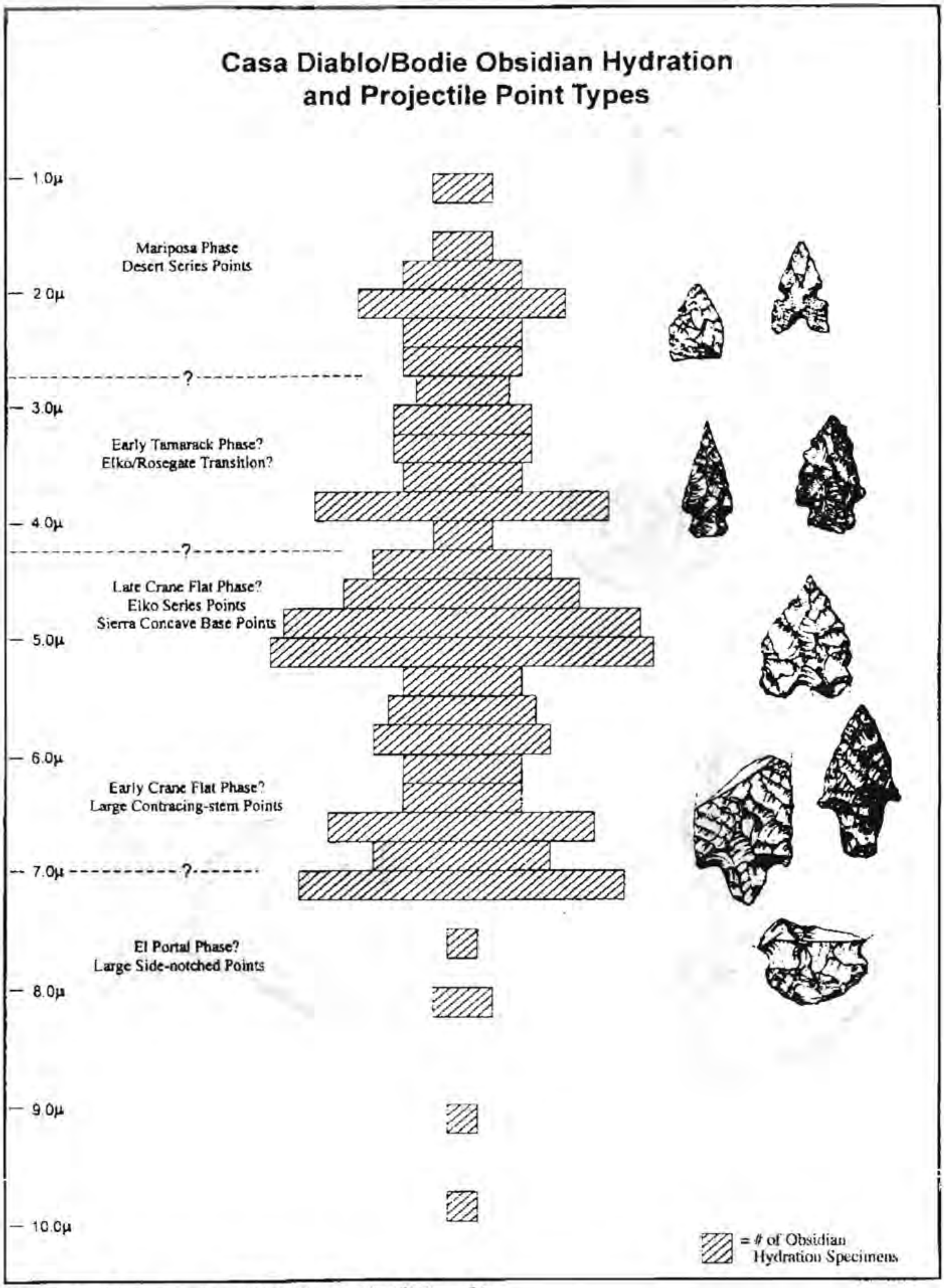

Figure 1 Chronological Modeling at the Ellison Site

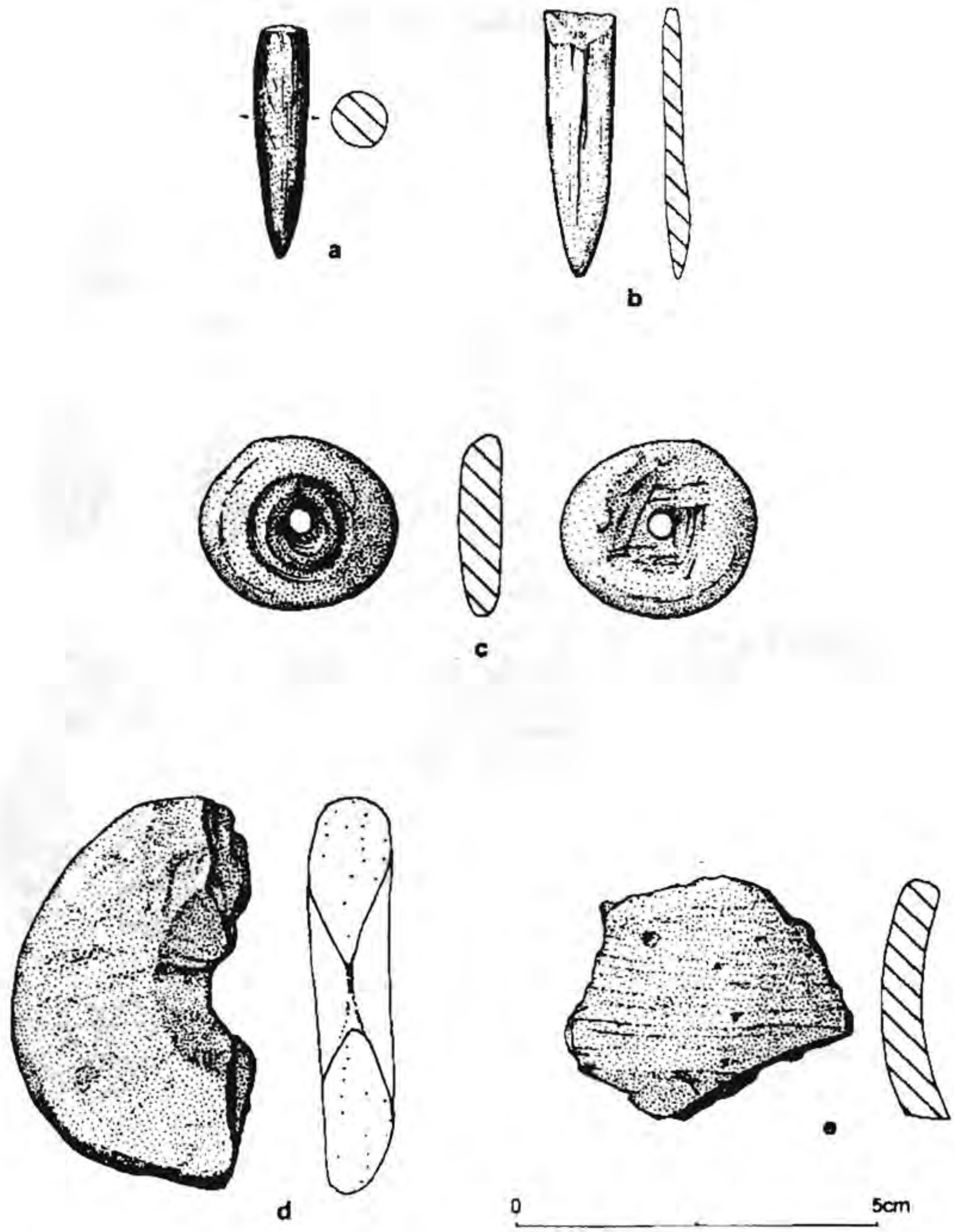

Figure 2 Steatite artifacts from CA-MRP-17/H:
a, w-73-373; b, w-73-200; c, w-73-91; d, w-73-3; e, w-73-593.
Illustrations by Tammara Ekness.

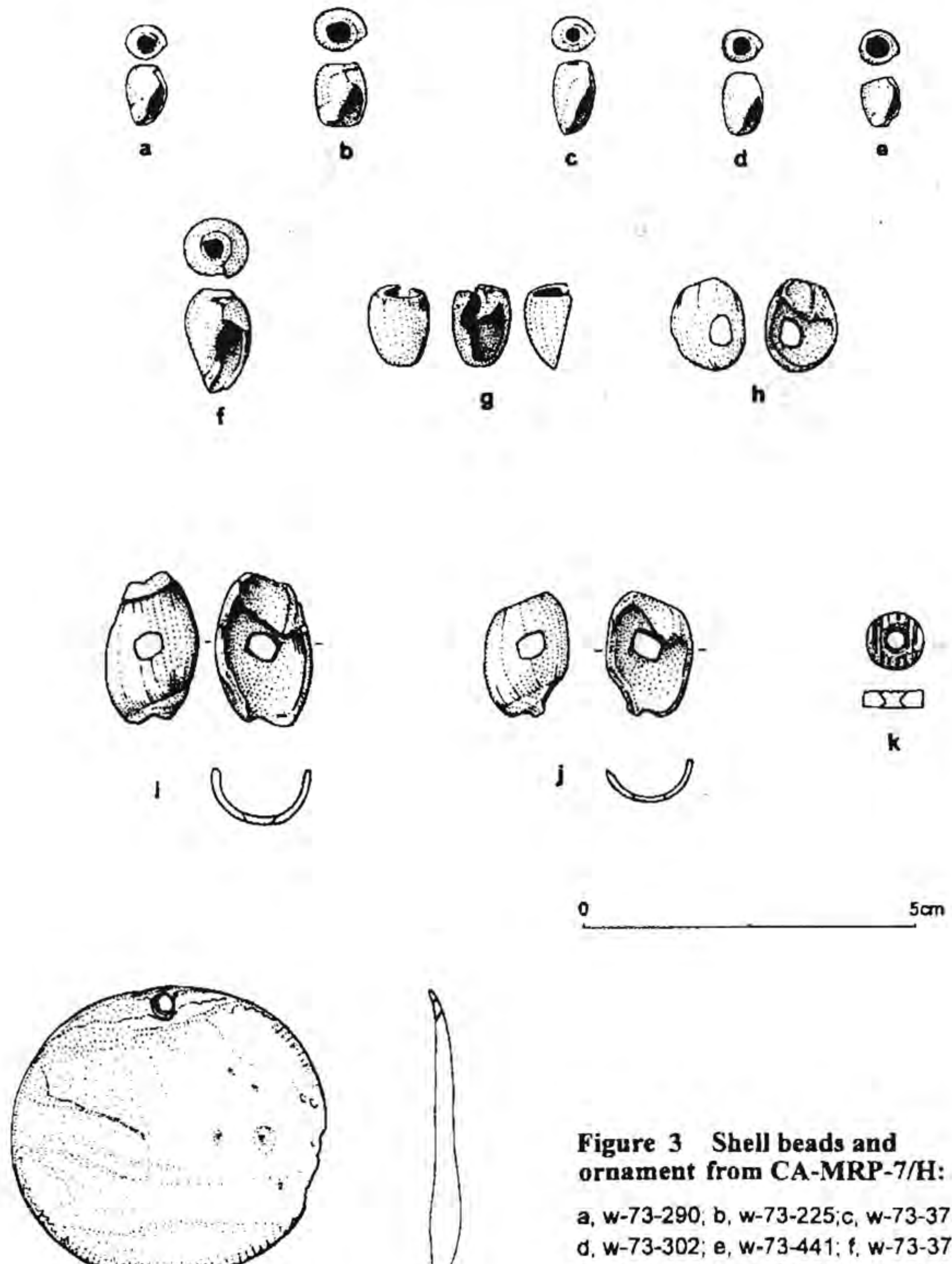

Figure 3 Shell beads and ornament from CA-MRP-7/H:

a, w-73-290; b, w-73-225;c, w-73-377A; d, w-73-302; e, w-73-441; f, w-73-376 g, w-73-252; h, w-73-528; i, w-73-324A; j, w-73-136B; k, w-73-496; l, w-73-300.

Illustrations by Tammara Ekness.

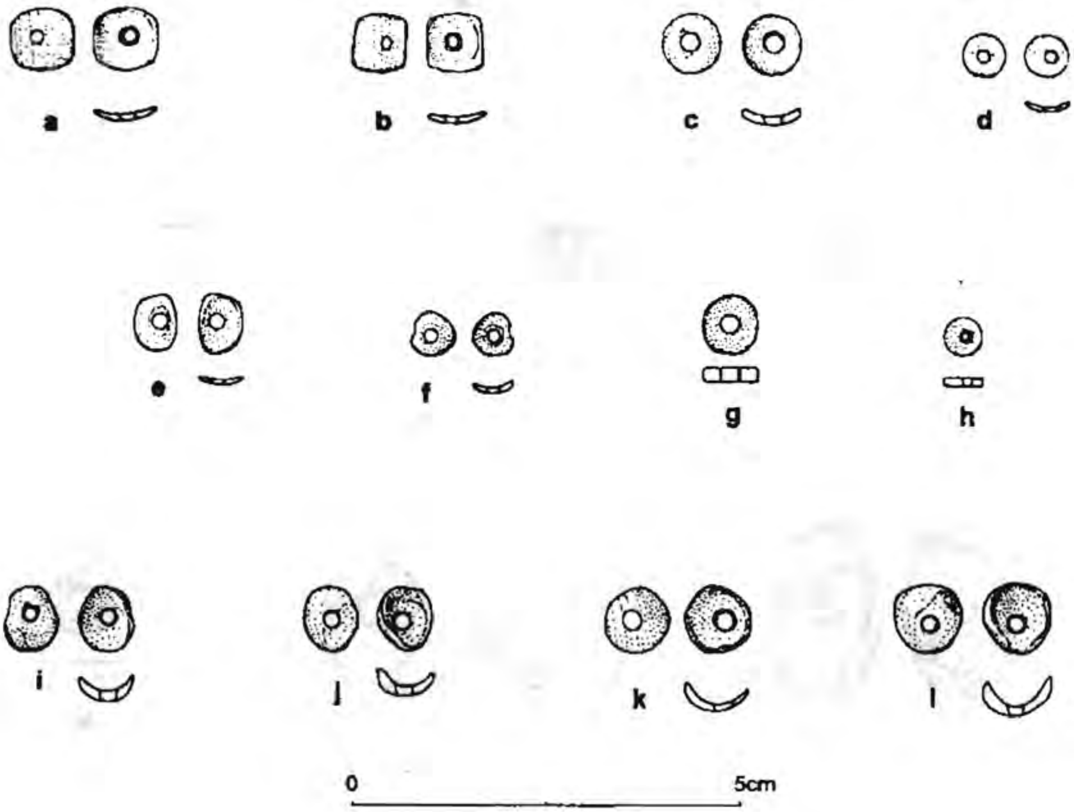

Figure 4 Shell and steatite beads from CA-MRP-17/H:
a, w-73-26; b, w-73-119; c, w-73-25B; d, w-73-137B; e, w-73-137C; f, w-73-137D; g, w-73-240; h, w-73-27; i, w-202C; j, w-73-25A; k, w-73-137F; l, w-73-38. *Illustrations by Tammara Ekness.*

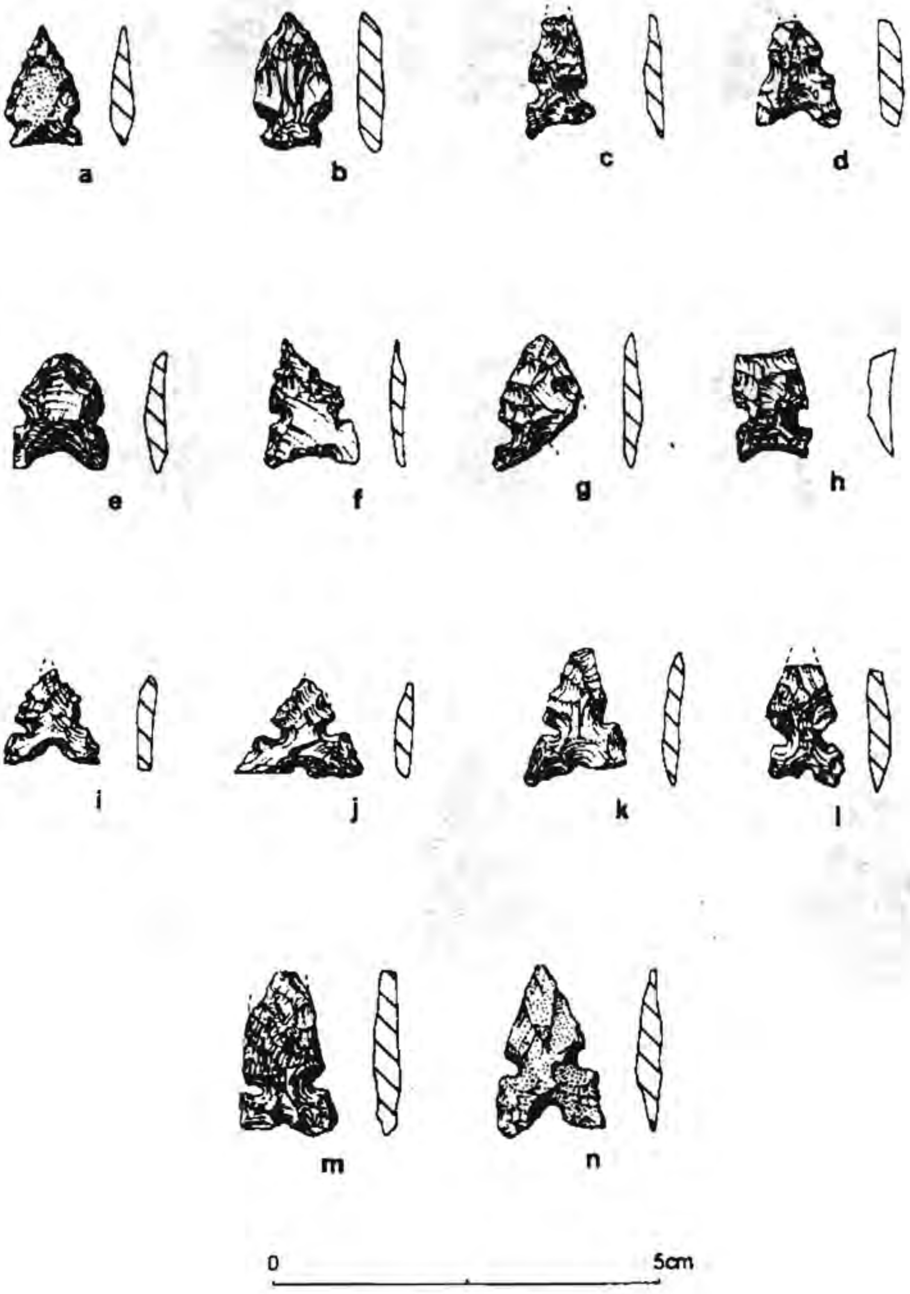

Figure 5 Projectile points from CA-MRP-17/H:

a, w-73-354; b, w-73-459; c, w-73-339; d, w-73-34; e, w-73-182; f, w-73-236; g, w-73-16; h, 81-208-14; i, w-73-473; j, w-73-370; k, w-73-316; l, w-73-92; m, w-73-102; m, w-73-735. *Illustrations by Tammara Ekness.*

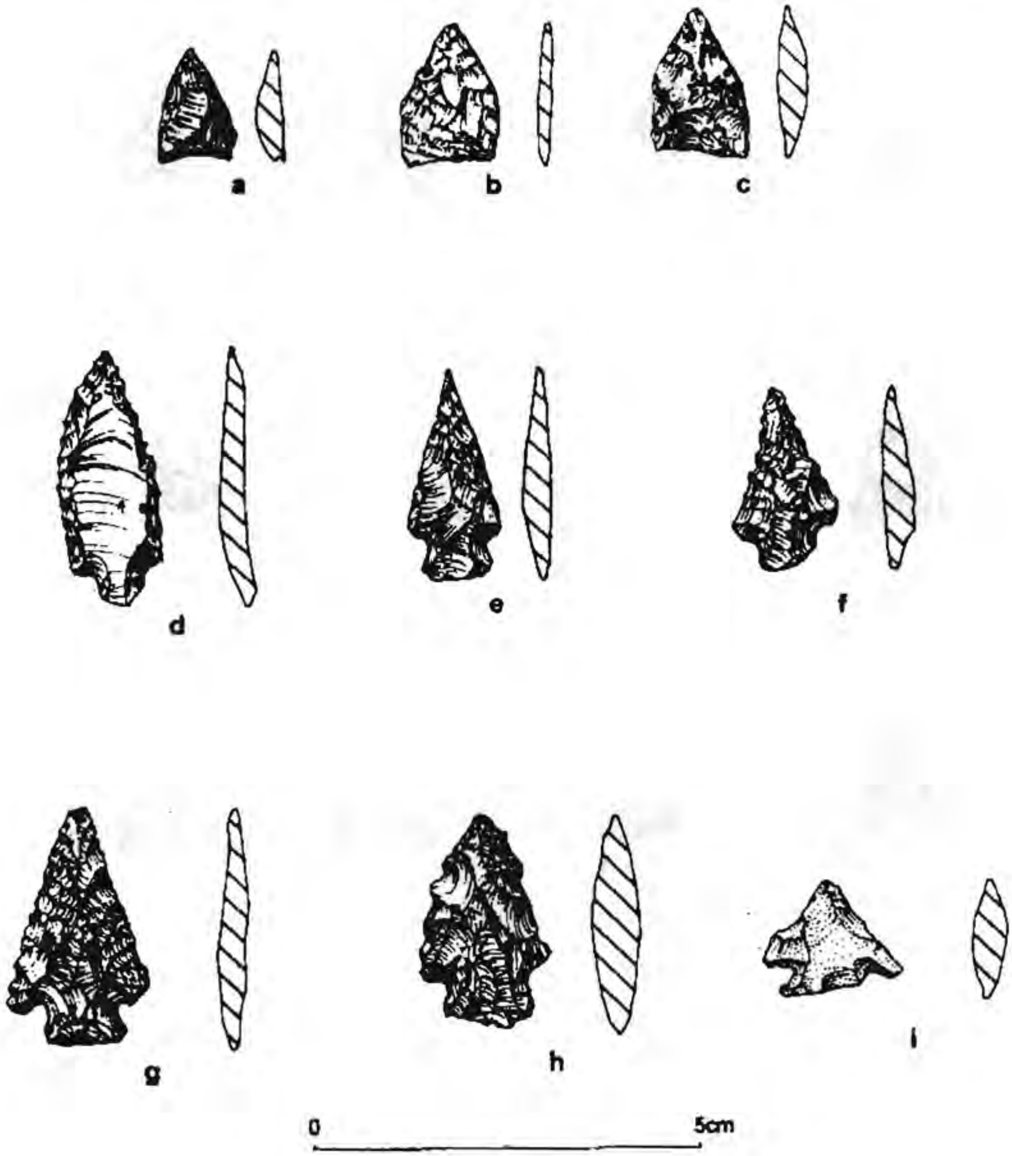

Figure 6 Projectile points from CA-MRP-17/H:

a, w-73-5; b, w-73-93; c, w-73-522; d, w-73-47; e, w-73-154; f, w-73-303; g, w-73-568; h, w-73-315; i, w-73-408. *Illustrations by Tammara Ekness.*

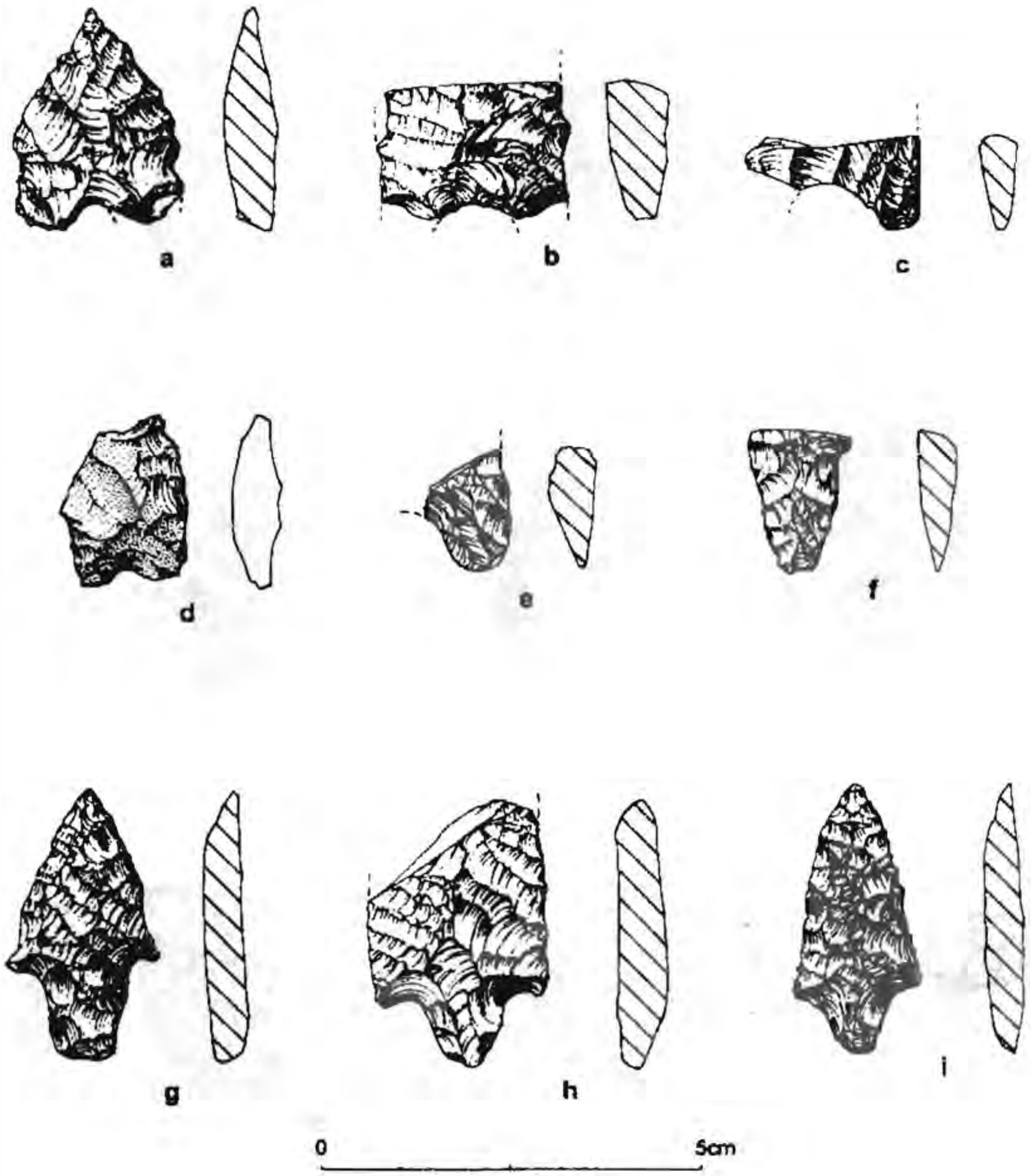

Figure 7 Projectile points from CA-MRP-17/H:

a, w-73-567; b, w-73-592; c, w-73-262; d, 81-208-13; e, w-73-19; f, w-73-14; g, w-73-494; h, w-73-139; i, w-73-430. *Illustrations by Tammara Ekness.*

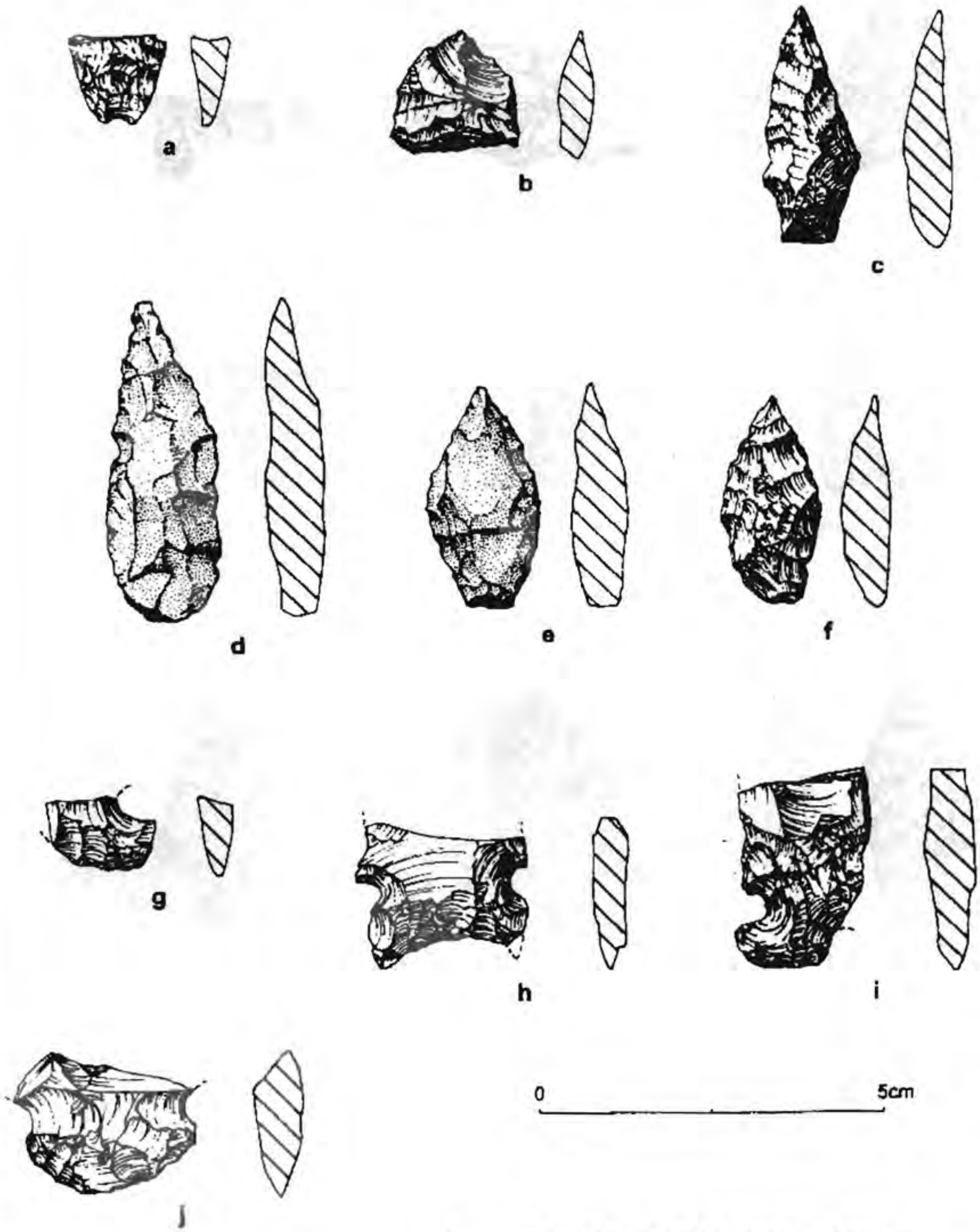

Figure 8 Projectile points from CA-MRP-17/H:

a, w-73-183; b, w-73-288; c, w-73-304; d, w-73-276, e, w-73-117; f, w-73-33 g, w-73-95; h, w-73-261; i, w-73-65; j, w-73-269. *Illustrations by Tammara Ekness.*