THE MEAGAN SITE, ARCHEOLOGY ON THE RUSSIAN RIVER: SELECTED ANALYTICAL RESULTS

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ABSTRACT

This paper discusses selected analytical results of the Meagan Site (CA-Men-1802) excavation. Findings reviewed in this paper include: 1) comments on the Mt. Konocti obsidian exchange system; 2) evidence that may support the reordering of the relative hydration rates among North Coast Ranges obsidian sources; 3) definition of a possible assemblage variation for the Dry Creek Phase; 4) a clarification on the use of serrated unifaces; and 5) an alternative method for testing if "reworked" bifaces were intentionally reworked.

BACKGROUND: PROJECT HISTORY

In September 1984 an archeological excavation was conducted at the Meagan Site to recover a sample of that portion of the site to be buried under fill by a highway widening project on U.S. 101. The site was named for the niece of the author who was born on August 10, 1984.

Under CEQA the burial of an archeological site is considered preservation and therefore no excavation is needed. However, under Section 106 site burial by a proposed project can lead to excavation to recover a reasonable record of that portion of the site to be buried (Principal VIII, Manual of Mitigation Measures, Advisory Council on Historic Preservation [ACHP]). The ACHP suggests that the archaeological fieldwork to recover this reasonable record be conducted on the level of a test excavation. The phrase "recover a reasonable record" was interpreted, for this study, to also require a substantial level of analysis and reporting as a part of that recovery.

BACKGROUND: SITE LOCATION AND DESCRIPTION

CA-Men-1802 is near the Sonoma-Mendocino county line on the east side of U.S. 101. It is situated on the western slopes of the Mayacmas Mountains east of the Russian River. It lies between the archeological studies conducted in the Warm Springs Dam locality to the southwest and those in the Geysers Geothermal area to the east. The site is comprised of two flats separated by the confluence of two seasonal drainages.

Both flats of the Meagan Site (Loci A and B) were created by slumping events. Uphill from the site to the east numerous similar formations give a stair step appearance to the hills. This unstable condition is due to the unconsolidated nature of the geologic deposits of those hillsides and the large amount of water that is contained in them as indicated by several active

springs (even after ten months without rain) on the point of land between the confluence of the two seasonal drainages.

BACKGROUND: ARCHEOLOGICAL FINDINGS

The archeological investigation involved mapping of the site and the excavation of 12.6 cubic meters of deposit using 14 surface scrapes, three 1x1 m and four 1x2 m excavation units. Subsurface cultural deposits were found to range in depth from 22 to 190 centimeters. The excavation recovered evidence of two subsurface fire hearths and a living surface along with 21,749 pieces of flaking waste (16,431 or 75.5% obsidian, 5204 or 24.0% chert, and 114 or 0.5% miscellaneous materials including quartz, quartzite, basalt and metasedimetary types), 56 whole and fragmentary projectile points, 28 whole and fragmentary bifaces, 14 reworked projectile point and biface fragments, 14 unifaces and 3 uniface retouch flakes, 52 whole and fragmentary cores, 19 use worn flake tools, and 73 specimens of ground, pecked, battered and abraded stone. Most of the projectile points, fifty-five, were fragmentary. Thirty-eight of these could not be identified as to type. The collection included three Rattlesnake corner-notched, two Excelsior, two concave base, one square stem, one Houx contracting stem and nine lanceolate specimens.

Two radiocarbon dates (270±50 B.P. and 760±120 B.P.) were also recovered. Analysis indicated that nearly all of the obsidian was from the Mt. Konocti source while Borax Lake, Annadel and Napa glass types were also present in trace amounts.

Available evidence suggests that the Meagan Site may have been used during the Skaggs Phase (3000 B.C. to 500 B.C.). The main use of the site appears to be during the Dry Creek Phase (500 B.C. to A.D. 1250). Evidence of the late period (Smith Phase, A.D. 1250 to A.D. 1850) suggests a marked decline in the intensity of occupation at that locality.

The use of the site during prehistory appears to have been intermittent, perhaps on a seasonal basis. It is tempting to claim that the Meagan Site was a village or semi-sedentary base camp during the Dry Creek Phase when it saw its heaviest use. However, it may not constitute a village or even a seasonal base camp around which lesser task sites were distributed. The ephemeral nature of most of the manos may argue for a casual use of the locality.

The two loci appear to have been used more or less contemporaneously through time. However, a change in intensity of use for different site areas through time is suggested by the inter-loci comparison of chert and obsidian (Rondeau 1985) for both the formal chipped stone artifacts and the debitage. It appears that early use of the site may have centered around Locus A. During the Dry Creek Phase, site use shifted northward with an increased use of Locus B. During the Smith Phase, use may have shifted southward to center around the northern portion of Locus A.

BACKGROUND: OBSIDIAN SOURCE INFORMATION

Four types of obsidian were identified at CA-Men-1802: Konocti, Borax Lake, Napa and Annadel (Bouey 1985). Visual inspection of the collection indicates that over 99% of the debitage is from Mt. Konocti. The second most common is Borax

Lake. However, it only occurs in trace amounts. Based on the results of sourcing analysis Napa is third with only the slightest presence of Annadel. An examination of the 87 non-debitage obsidian specimens (points, bifaces, unifaces, cores and modified flakes) found that 14 (16.1%) are not made of Mt. Konocti obsidian.

COMMENT: MT. KONOCTI OBSIDIAN EXCHANGE SYSTEMS

A model of the obsidian assemblage at CA-Men-1802 as generally representing a specific point in the Dry Creek Phase exchange system for Mt. Konocti glass suggests a perspective by which to characterize prehistoric behaviors concerning lithic production and use. This characterization of behaviors was indicated by the technological analysis of the debitage and the whole and broken bifaces.

Elsewhere in California, sites on other obsidian exchange networks often exhibit only a portion of the biface reduction sequence (Rondeau 1981). In such networks transport and reduction behaviors often alternated, creating a pattern of increasingly advanced biface thinning with distance from the source.

Information recovered by this project shows that the Meagan Site was on a distribution route for Konocti obsidian; with the obsidian generally arriving in bifacial form, but not necessarily as finished artifacts. Comparison with two sites, representing the same archeological period and nearer to Mt. Konocti in the Geysers area, indicates that the biface reduction sequence was further advanced at CA-Men-1802 than in the Geysers Geothermal Field (Harvey Crew, personal communication 1984). Such localities further afield from the source, such as those sites in the Warm Springs project area (Basgall and Bouey 1984) or CA-Son-1344 (Garfinkel and Bingham 1984), received Mt. Konocti glass, at least in part, via sites like CA-Men-1802. At these more distant sites, the obsidian appears to have arrived in an advanced state of reduction, often in the form of finished or near finished bifaces.

Most obsidian arrived at the Meagan Site reduced by percussion biface thinning, which continued at CA-Men-1802. Use of the biface pressure technique for finishing projectile points appears to have also been used. Some point and biface fragments were reworked by bipolar percussion.

BACKGROUND: OBSIDIAN HYDRATION RIM INFORMATION

Hydration rim readings were taken on 53 specimens, both artifacts (10) and flakes (43) (Jackson 1985). These are the same set of specimens that were subjected to source determination analysis. The hydration rims indicated that some mixing of the archeological deposits has occurred as evidenced by separate comparisons within both the Borax Lake and Napa glass specimens for units N81W24 and N90W26. For N81W24 the Borax Lake specimens generally relate to the upper portion of the deposit while the Napa tends to characterize the lower half. The Napa and Borax Lake specimens from N90W26 are more evenly distributed throughout the depth of the deposit.

The sampling of the obsidian for source and hydration studies focused on selecting non-Konocti specimens when possible.

The selection also sought to test integrity of the deposits by incorporating as many levels as possible from as many units as possible. It is recognized that this is not a statistically representative sample, but it is thought to be sufficient to suggest general trends for the various obsidian types.

The rim readings for the three larger glass type samples (Napa, Borax Lake and Mt. Konocti) exhibited modal distributions (Table 1). To test that the three peaks represent a single period of site use, several relative hydration rates for the three glass types were compared.

BACKGROUND: NORTH COAST RANGES OBSIDIAN HYDRATION RATES

The practice of determining dates for obsidian samples based on an assigned rate of hydration has encouraged the construction of a variety of formulas for computing age (Ericson 1977:67). Since environmental conditions may have influenced the rates which have been proposed for the different obsidian sources, the uncritical application of any formula may be suspect at best. The application of a variety of hydration rate formulas to rims from Borax Lake, Mt. Konocti and Napa obsidians have produced some highly irregular and sometimes totally useless results (Kaufman 1980:69-74).

As a result, the assignment of specific dates based on hydration rate formulas has declined as an archeological method of interpretation among recent studies in the North Coast Ranges. It has been replaced by an approach which favors the placement of artifact assemblages relative to one another (Fredrickson 1984). This placement of assemblages is based on the range of rim readings that each exhibits without claiming specific dates (Basgall and Bouey 1984; Origer 1982; White 1984). This study found greater utility in using this more recent analytical method and refrained from the attempt to link dates with rim readings.

ANALYSIS: A COMPARISON OF HYDRATION RIM DISTRIBUTIONS

In order to indicate that the majority of the specimens of the three obsidian types may represent the same general time span a relative relationship for their different rates of hydration was needed. One set of rates, used by some investigators to compare the three glass types, has been evaluated by Kaufman. He noted that while the "data do not permit assignment of a definitive rate model and constant for the above sources they do provide some indication of relative rate speed" (Kaufman 1980:68). The rates that he provides come from Meighan et al. (1968); these being 670 years per micron for Napa, 979 years per micron for Borax Lake and 1873 per micron for Konocti.

If Mt. Konocti hydrates the slowest and Napa is the most rapid, it would be expected that the three glass types should exhibit a peak of increasingly thicker rims from Konocti through Borax Lake to Napa. While it seems that a trend may be suggested for the Mt. Konocti-Borax Lake comparison, the Napa glass does not fit (Table 1). A sampling bias may be indicated. The possibility also exists that the use of different glass types was not strictly synchronous. Such possibilities might include Napa having been used somewhat later in time. The abrupt appearance of Borax Lake at rim thickness greater than 4.0 microns may suggest its use was generally restricted to the earlier portion

Table 1

OBSIDIAN ANALYSIS SUMMARY FOR CA-Men-1802

Rim (Microns)	Mt. Konocti	Borax Lake	Napa
0			
	A		F
1.0			
			F
1.5			
2.0			
2.5			
	A		FF
3.0			
	AAFFFFFFF		FF
3.5			
	AAFF		FFF
4.0			
	AF	AFFFFFFF	FFF
4.5			
	F	FF	AFF
5.0			
		FFF	
5.5			
	A		FF
6.0			
6.5			
			F
7.0			

9.0			
		F	
9.5			
10.0			
10.5			
11.0			
			F
11.5			
12.0			
12.5			
			F
13.0			

A = Artifact F = Flake

of the site's main period of use.

However, studies in progress indicate that Borax Lake glass may hydrate at a significantly faster rate than the Napa (Thomas Jackson, personal communication 1985). That the hydration rate for Borax Lake is faster than previously believed is also suggested by the data from CA-Lak-510 (White 1984; Thomas Jackson, personal communication 1985). If the three glass types are reordered with Napa as the obsidian with the middle rate and Borax Lake the fastest, then a different picture emerges.

This alternative arrangement of the types provides a better fit with the pattern expected for a single major period of occupation. The distribution of the Napa obsidian suggests that its use may have been more evenly spread through time. Since Napa glass is limited in the Meagan Site, the potential for a sampling error may be greater than for the other obsidian types. If this is the case, then the distribution pattern of hydration rim readings exhibited by the Napa sample may be more apparent than real. However, it is felt at this time that the modal distributions of Napa, Borax Lake and Mt Konocti glass types tend to support the findings of Jackson (personal communication 1985).

BACKGROUND: GROUNDSTONE

A total of 73 specimens of ground and battered stone were recovered by this project. Seventy-one specimens were of sandstone and two greenstone. Both materials are locally available. Only nine specimens were complete. The broken condition of all 64 specimens was caused by fire fracturing.

Manos were most common with five whole and 37 fragmentary specimens. While several fragments were clearly shaped, one involving a subrectangular form (specimen x29) and another exhibiting pecking on its margin (specimen x54), the general trend was clearly towards the use of unmodified cobbles. This fits well with the evidence indicating ephemeral usage of these artifacts. Some specimens indicate that they were bifacial. The fragmentary nature of the collection, however, precludes any meaningful tabulation of morphology.

The ephemeral nature of many of the ground surfaces made recovery of these specimens in the field and their identification in the laboratory difficult. Most of the groundstone, less than 15%, would not have been identified without magnification and careful use of lighting in the laboratory.

Among the fragmentary specimens other than manos, 15 ground surfaces not identifiable as to artifact type were recovered along with six definite metates and one questionable metate fragment, two broken cobble pestles, and one fragment each of a shaped pestle, a hammerstone and a pallet.

Three of the five complete manos exhibit evidence as a multi-use tool. Specimen x67 may have also been used as a hammerstone while x48 exhibits a flattened end and with its squat morphology may have also been used as a maul. The mano x88 was used as a hammerstone and as an abrader. One face exhibits a series of striations like those the author has noted as resulting from flintknapping studies involving the grinding of biface edges during platform preparation. A similar artifact to x88 is x77 which is classed as a multi-use tool since it exhibits evidence of being a hammerstone and an abrader.

COMMENT: DRY CREEK/HOUX/WHATEVER ASSEMBLAGE VARIABILITY

The groundstone found at the Meagan Site may not fit well with the general cultural chronology defined in the Warm Springs project area. One trend noted for the Dry Creek Phase in that locality was that the groundstone was predominantly mortars and pestles rather than manos and metates (Basgall and Bouey 1984). This is thought to reflect a heavier reliance on acorns over seeds than during earlier times.

Due to the detailed inspection used to identify groundstone at CA-Men-1802, the results are probably not comparable to other studies in the region. Further, the number of pieces from the Meagan Site exceeds the number of pieces recovered for the Skaggs Phase at Warm Springs and represents 26% and 45% of the amounts recovered for the Dry Creek and Smith Phases, respectively. Given the fairly limited groundstone collection from Warm Springs and its geographical location relative to the Russian River, much more inter-site variability in groundstone assemblages may be expected in the general region.

Sampling bias is another possible factor that might play some role in the pronounced dominance of manos at CA-Men-1802. Since the groundstone component does not fit well with the Dry Creek Phase or the Houx Aspect, it may be suggested that the assemblage may be more appropriately assigned to what has been termed the Willits Pattern (Hildebrandt and Hayes 1984) or Southern Mendocino (White 1984). However, Hildebrandt and Hayes (1984:186) hypothesized that it might be recognized as "semi-sedentary lowland villages". The Meagan Site may not have been a village. In addition, they suggest that "although handstone and millingslabs are still in use, the mortar and pestle become an important attribute of the assemblage" (Hildebrandt and Hayes 1984:186). It is suspected by this author that with further investigation that a different set of artifact assemblages or, at the least, more varied assemblages may be discovered along the Russian River.

If CA-Men-1802 served as nothing more than a temporary camp, the mano dominated assemblage may represent a task specific behavior oriented towards the processing of a common food resource not requiring other groundstone tool kits thought to dominate assemblages in other areas. As noted previously, the ephemeral nature of the manos may be behaviorally misleading. If their interpretation is based solely on their number, they might be assumed to suggest more activity than actually occurred.

It appears that the methods of artifact recovery used in the field and laboratory are simply not comparable and therefore differences in assemblages may be more apparent than real. On the other hand, the locational differences between the Warm Springs locality and the Mendocino region of the Russian River Valley may have encouraged different adaptive poses that could be reflected in variations in artifact assemblage.

BACKGROUND: USE WEAR ANALYSIS

Even though the analysis of use wear patterns has been recognized for several decades as having the potential to make substantial contributions to the understanding of prehistory (Semenov 1964), this field of research is often misunderstood and incorrectly applied. As a result, most cultural resource management studies shy away from such analysis and the few that have pursued this sort of research have generally produced questionable results.

Two major problems have contributed to this situation. First, there has been a poorly developed sense of what can reasonably be called use wear. Secondly, there has been little thought as to what sorts of questions might be addressed by the use of such analysis. Thus there has been a tendency to produce data with-out seeking to develop insights into past behaviors.

The situation is partly a result of extremes. On the one hand are investigators that, on the basis of unaided visual inspection, assign such edge damage forms as nibbling, crushing, scalar scarring, step scarring and striations to the use wear category. These investigators are correct in the idea that those edge damage forms can result from use, but they fail to address the fact that they can also result from accidental damage. This situation can lead to the production of useless data and incorrect interpretations about past cultures.

At the other extreme are those who will settle for nothing less than high power magnification to identify use wear. The facilities, time and money for high power microscopy, are not usually available to cultural resource management projects. These two schools of investigation often give a mistaken impression that there is no middle ground; that it has to be the either/or proposition. Acceptance of either view can lead to data loss.

A number of recent studies have contributed to the development of a middle ground in the study of use wear (Flenniken and Haggarty 1979; Knudson 1979; Rondeau 1980; Tringham et al. 1974). The findings of Tringham et al. (1974) have only partly withstood the test of time. Their trampling experiments concluded, for example, that such accidental damage only takes random forms in terms of flake scar shape, size and distribution along the flake edge (Tringham et al. 1974).

Uncritical acceptance of their findings (Tringham et al. 1974) has led some investigators to incorrectly conclude that all forms of edge damage on chipped stone artifacts that exhibit symmetrical flake scar shapes, symmetrical patterns, and uniform sizes are the result of intentional activities (e.g. Patterson 1984). Much of the uncritical use of their findings by investigators that has produced questionable use wear information could have been avoided if Tringham's results had been taken as a model to be tested. The conclusion that trampling damage produces only random forms has been rejected as a result of other studies (Flenniken and Haggarty 1979; Rondeau 1980). However, Tringham and others did clearly document that random damage forms can be products of trampling (Tringham et al. 1974).

A more recent trampling experiment found that numerous uniform flake scar patterns of shapes, sizes and sequences that result from use, also result from the trampling of flakes

(Flenniken and Haggarty 1979). Remarkably similar results were obtained from the study of an archeological site heavily trampled during recent decades (Rondeau 1980). Both studies concluded that rounding was the only sure form of use wear edge modification that did not also result from this kind of accidental damage. Knudson (1979), in a study of trampled bottle glass, found that striations can also result from trampling.

An important caution is required with the use of rounding as a diagnostic trait of use wear. Various forms of weathering including sand blasting and water induced wear also produce rounded edges. The point here is that when a rounded edge is observed, it is necessary to inspect other elements of the piece to determine if the rounding is pervasive or localized.

BACKGROUND: UNIFACES

A total of 19 specimens were placed in the uniface category. This artifact type has been defined as a flake with its edges modified by retouch. All of the retouch is on the dorsal face of the original flake blanks. Pressure retouch dominated with only three specimens modified by percussion flaking.

Fourteen specimens exhibited a generally ovoid shape when viewed from the top, while another may have had this form. Eleven of these artifacts are similar in form, exhibiting a worked, convex edge. Another four are suggestive of this edge morphology. A single specimen has a combination of modified convex and straight edges. Five specimens had an irregular form.

Thirteen specimens were made of chert and six obsidian. Eight were whole and seven fragmentary. Two specimens were damaged by fire fracturing. Only one piece did not exhibit use wear under magnified inspection. The level of magnification (30X) or the level of use, may not have been sufficient to make use wear apparent on that one specimen.

Eight unifaces retained serrated edges manufactured by pressure flaking with another six pieces suggestive. Some of these latter specimens appeared not to exhibit serrations due to edge attrition during use.

ANALYSIS: SERRATED UNIFACES

The uniface artifact category evidenced the highest ratio of specimens exhibiting use wear (18 of 19). The number of unifaces that were originally serrated cannot be determined due to use wear.

For this artifact class it has been stated that "Visible edge wear and tool morphology suggests the flake serrates were used as saws or cutting tools" (White 1984:204). While the serrated edges of some of these pieces may be suggestive of cutting or sawing tools, the overall morphology of these pieces as unifaces may question such a functional assignment.

Several lines of use wear evidence are useful in constructing and testing the cutting/sawing model. The use of serrated stone artifacts as sawing or cutting tools is known from elsewhere in North America (Rondeau 1979). In that study, one form of damage that occurred to the serrations on the obsidian "projectile points" during such use was the chipping and snapping off of portions of those serrations and in some cases, entire serrations were lost (Rondeau 1979:70). While the use and more

certainly the material type (chert at Ca-Men-1802) may not be comparable, the lack of such damage on the specimens from the Meagan Site fails to support the model.

The wear exhibited on these pieces was found, however, to form a continuum. Light rounding first appeared on the tips of the projections, followed by a progressive wearing down of the serrations until a uniform, completely rounded edge was all that remained. The uniface retouch flakes recovered at CA-Men-1802 also exhibit the advanced form of complete edge rounding. The continuum of progressive wear from sharply serrated unifaces into edge smoothed unifaces may suggest that a distinction between the flake serrates and the non-serrated, ovate unifaces defined by White (1984:204-206) may only be a result of progressive use wear reduction.

The second line of evidence to support the cutting/sawing concept was also absent. There was no observed evidence of use wear extending beyond the working edge of any specimen. Neither face of any of the specimens exhibited wear that might be associated with those pieces rubbing back and forth against whatever material might have been cut. Again, the use may have been more limited, not allowing this wear pattern to develop.

A third line of evidence indicates an alternative use for these unifaces. Three specimens (x127, x303, and c15) exhibited striations perpendicular to the working edge. This suggests a use motion that precludes any sort of sawing or cutting. The striations on all three were associated with heavily rounded edges.

BACKGROUND: REWORKED BIFACES

The geographical extent of prehistoric biface reworking in Northern California is unknown. It occurs at numerous sites in the southern North Coast Ranges and is known to extend as far south as several sites in the northern bay area. Localities where this variation of the bipolar flaking technique have been found include Round Valley (Orlins 1972), CA-Lak-261 and CA-Lak-510 near Clear Lake (White and Fredrickson 1981), at the Geysers (Harvey Crew, personal communication 1984), in the Warm Springs project area (Basgall and Bouey 1984), and at several sites in Marin County (Goerke and Cowan 1983).

This flaking technique is also found in southern Sacramento County in collections assigned to the Middle Horizon. A majority of the reworked types described by Basgall and Bouey (1984:173) are also found at CA-Sac-29 (John Dougherty, personal communication 1984). This author has also observed the technique in a collection from CA-Sac-42. In both cases the reworked biface materials appeared to be reduced by the bipolar technique as redefined by Flenniken (1980:51). Bipolar reduction is found in many other areas of California, but its use to rework biface fragments has thus far only been identified in the areas noted above (Rondeau 1986).

Three models that seek to characterize the nature of the reworked biface collections have been discussed at length elsewhere (Basgall and Bouey 1984) and therefore need only passing mention here. Goerke and Flenniken (1978) proposed that biface fragments were reworked to produce expedient tools and that this industry was a conservative approach in the use of

those pieces. Bartel (1979) proposed that the bifaces were broken intentionally and then reworked to manufacture tools. White (personal communication in Bouey and Basgall 1984) suggested that all of these reworked pieces can be accounted for as impact fractures.

Based on other collections observed by this author and the study reported herein, several comments are in order. Basgall and Bouey (1984) appear to be correct in stating that some of the reworked pieces could not have been caused by impact damage. Technological attributes indicate that intentional flaking of at least some of the pieces was practiced. The idea that the bifaces were broken intentionally prior to reworking appears to ignore the abundant experimental and archeological data that the manufacture of bifacial artifacts and the use of projectile points both create numerous fragments.

ANALYSIS: A USED REWORKED BIFACE FRAGMENT

Only one specimen, x304, from the limited Meagan Site collection exhibited the constellation of diagnostic attributes sought by this part of the analysis. It is a classic example of bipolar linear shatter. Roughly triangular from a top view, one face retains flake scars emanating from both ends while a second face exhibits a flake scar coming from one end and a bulb of percussion at the other. The third side retains a series of parallel, pressure flake scars perpendicular to the long axis of this linear piece. These scars exhibit the morphology and patterning from the original biface.

The use wear identified on x304 is unique in the collection from CA-Men-1802. The lateral margins exhibit crushing and rounding as does the distal end. The inference derived from this wear pattern is that the piece was used during some sort of drilling or hole punching activity. This specimen may suggest that certain pieces produced by the reworking of bifaces may have been intended as microlithic tools.

However, a single specimen can easily be aberrant. Still, the identification of use wear is felt to be important in supporting the argument that there is a strong need for the use of mid-level functional analysis as an independent study of the reworked biface issue. Functional analysis can be used to test whether or not microlithic tools, inferred by the presence of use wear, are common among any morphological types of biface fragments.

If such specimens should be found to be reasonably common, then inferences may be derived that microlithic tools were intentionally manufactured through the reworking of biface fragments by bipolar percussion. The establishment of such data could be an important step towards the identification of the range of use worn, flaked stone tools in the southern North Coast Ranges. Models proposing general patterns of flaked stone tool distributions across time and space and the patterns of their use and discard, could then be developed for further testing.

The possibility of the prehistoric production of microlithic tools has been previously suggested for the southern North Coast Ranges (Goerke and Flenniken 1978; Goerke and Cowan 1983). Outside of California the production of microlithic tools by the bipolar technique has been documented (Flenniken 1980). The

identification of a new class of tools with implications for the definition of assemblage and adaptive strategy variations could be an area of important potential for future research.

CONCLUSION

The Russian River Valley, due to the paucity of archeological excavations, remains largely unknown. With the current emphasis on studying changes in adaptive strategies through time in the North Coast Ranges, the nature and extent of used tools during different periods remains a largely unexplored potential for research. Major research contributions to the understanding of regional prehistory may be made by functional analysis, if models are developed that reflect the patterns for the types of flaked stone tools that were manufactured and used at different kinds of sites in different localities during different periods.

This research potential has been suggested through the pursuit of a middle ground in use wear analysis. Low power magnification seeking only to identify rounding has suggested at least three areas needing additional research. These areas can be presented as specific research questions concerned with the identification of use worn tools. First, are there bifacial knives in the North Coast Ranges? The Meagan Site collection lacked an adequate sample of bifacial artifacts to adequately address the question (and was therefore not reviewed in this paper). Second, did biface reworking produce tools for use? Again, the sample taken from the Meagan Site was insufficient to answer this question. Lastly, were the serrated unifaces only used in a "scraping" motion? These questions seek to refine the characterization of artifact assemblages and the behaviors they represent.

The heavily worn unifaces suggest a potential for polish analysis using high power magnification. This kind of study, supported by replication experiments, could indicate what materials were worked by this tool type. Additional behaviors might be suggested by the findings.

Another area that may be of value for future research deals with identification of groundstone. The results of this study are not felt to be generally comparable with methods used in California. Further research into efficient ways in which to identify ephemeral groundstone could be of use. What attributes identify ephemeral groundstone needs further consideration. A sampling strategy to retain questionable specimens in the field for future laboratory studies appears to be needed. How to interpret the presence of such pieces also need further consideration. Again, this research area relates to a refined characterization of artifact assemblages, the interpretation of behaviors that occurred on-site and ultimately to the degree of use of various types of groundstone during different periods of regional prehistory.

The development of a regional data base drawing from a number of sites could eventually develop a geographic model of the extent to which tool use behavior varied through time for different areas of the region. Changes in the patterns of regional tool use through time might even be found to correlate with other changes in the archeological record. So, it may be

wise at this point to ask: What is it that has been dug up?

In California, a great deal of care is often given to the excavation and recovery of artifacts. Commensurate care in the accurate identification of those artifacts is often lacking. Cavalier attitudes towards the construction of artifact typologies, ignoring the state-of-the-art developed through advances in technological and functional studies, is not uncommon. The classification of artifact types and the identification of individual specimens are far too often assertions supported only by an implied appeal to authority.

Before there can be meaningful inquiries into the process of culture change, before there can be the testing of nomothetic paradigms and all the rest of that "good stuff" there must first be a correct identification of the artifacts. There is a basic need to have accurate knowledge of the content and structure of the archeological record before we can honestly presume to infer behaviors, social systems and the forces that moved them during prehistory.

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