BEHAVIORAL INTERPRETATIONS DERIVED FROM ARCHAIC PERIOD LITHIC MATERIALS IN THE NAPA VALLEY

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ABSTRACT

Only Archaic period prehistoric materials were recovered, during a Caltrans-generated project, from NAP-710/H, a task-specific site in the Napa Valley south of Rutherford. This paper evaluates alternative explanations for obsidian tool production and use through lithic analyses including obsidian hydration, morpho-functional, and replicative studies. This information is used to infer Archaic period activities at the site.

INTRODUCTION

Due to a proposed highway widening project along Route 29 in the northern Napa Valley, a small lithic site, NAP-710/H, was investigated to evaluate potential impacts to the site and its significance. Caltrans and Sonoma State University personnel conducted site testing. Through obsidian hydration analysis, NAP-710/H was found to span the Archaic period, containing concave base projectile points and various biface forms. In this paper I will use the scheme developed by Fredrickson (1984), which divides the Archaic into three periods: Lower Archaic (6000 to 3000 B.C.), Middle Archaic (3000 to 1000 B.C.), and Upper Archaic (1000 B.C. to A.D. 500). This period is notable because the Archaic represents the earliest known cultural use of the Napa Valley. The regional research strategy developed by Hayes and Fredrickson (1984) called for the investigation of single-component sites to isolate artifactual and functional manifestations of each cultural unit. NAP-710/H helps define the range of Archaic period activities in the Napa Valley.

PREVIOUS RESEARCH

In 1953, Meighan proposed that an early "basement culture" existed in the Napa Valley that was not well documented. Based on findings from manufacturing site NAP-131, he determined that these earlier sites were characterized by a lack of midden, a lack of features, a paucity of obsidian tools, point morphologies dominated by lanceolate and concave base forms, and the presence of basalt tools (Meighan 1953). Heizer (1953) suggested that the

site represented an earlier basalt-using culture which occupied the area before obsidian gained popularity. He further noted that the archaeology of the Napa region is intimately tied to that of the Sacramento Valley.

In subsequent studies where obsidian hydration was performed, it was found that Archaic period sites support Meighan's, but not Heizer's hypotheses; i.e., Napa Valley Archaic period sites contain no midden, no features, and a paucity of obsidian tools, but no basalt tools. In fact, these sites contained Napa obsidian debitage, small numbers of tools, and little else. Furthermore, it seems unlikely that obsidian was unpopular during the Archaic because they all contain considerable amounts of obsidian debitage. Although these sites have a paucity of obsidian tools they do not illustrate a cultural transition from basalt to obsidian.

Several recent studies have provided information on the Archaic period in the Napa Valley (Figure 1, Table 1). Dietz and Holson (1983) excavated portions of NAP-36; subsequent obsidian hydration readings from site artifacts ranged from 3.5 to 6.5 microns. NAP-528, excavated by Sampson (1983), produced obsidian hydration micron readings ranging from 3.0 to 5.0. Bieling (1986) monitored project related land disturbances at a small lithic site, NAP-721. Obsidian hydration analysis yielded Archaic period micron readings of 4.5-8.4. From 1986 to 1990, excavations at NAP-710/H have resulted in obsidian hydration micron readings ranging from 3.2 to 6.4. These results are discussed in depth later in this text.

Through obsidian hydration, investigators in the Napa Valley have been able to identify the presence of an Early Archaic component in some sites, but the range and density of these deposits has remained unknown. Collections from the sites that contain projectile points show, with the exception of one stemmed point, that virtually all identified Archaic period points are lanceolate and concave base forms. Within these two point forms there appears to be great variability. This is consistent with findings by White et al. (1982) who concluded that there appeared to be great variability between contemporaneous concave base point forms in this region.

Aside from general similarities in point morphologies, the 10 sites in the Napa region containing Archaic period obsidian hydration readings also share a close proximity to the Napa River and an overwhelming dominance of Napa Valley source obsidian.

A paleoenvironmental reconstruction developed by Simons (n.d.) for NAP-710/H suggests that initial occupancy of the site occurred in the warmer mid-Holocene. At this time there was an expansion of taxa preferring environments associated with drier, warmer climates, such as chaparral, grassland, and deciduous oak woodland/savannah. Deer and other upland game could be expected in the chaparral areas. Oak woodland areas were probably

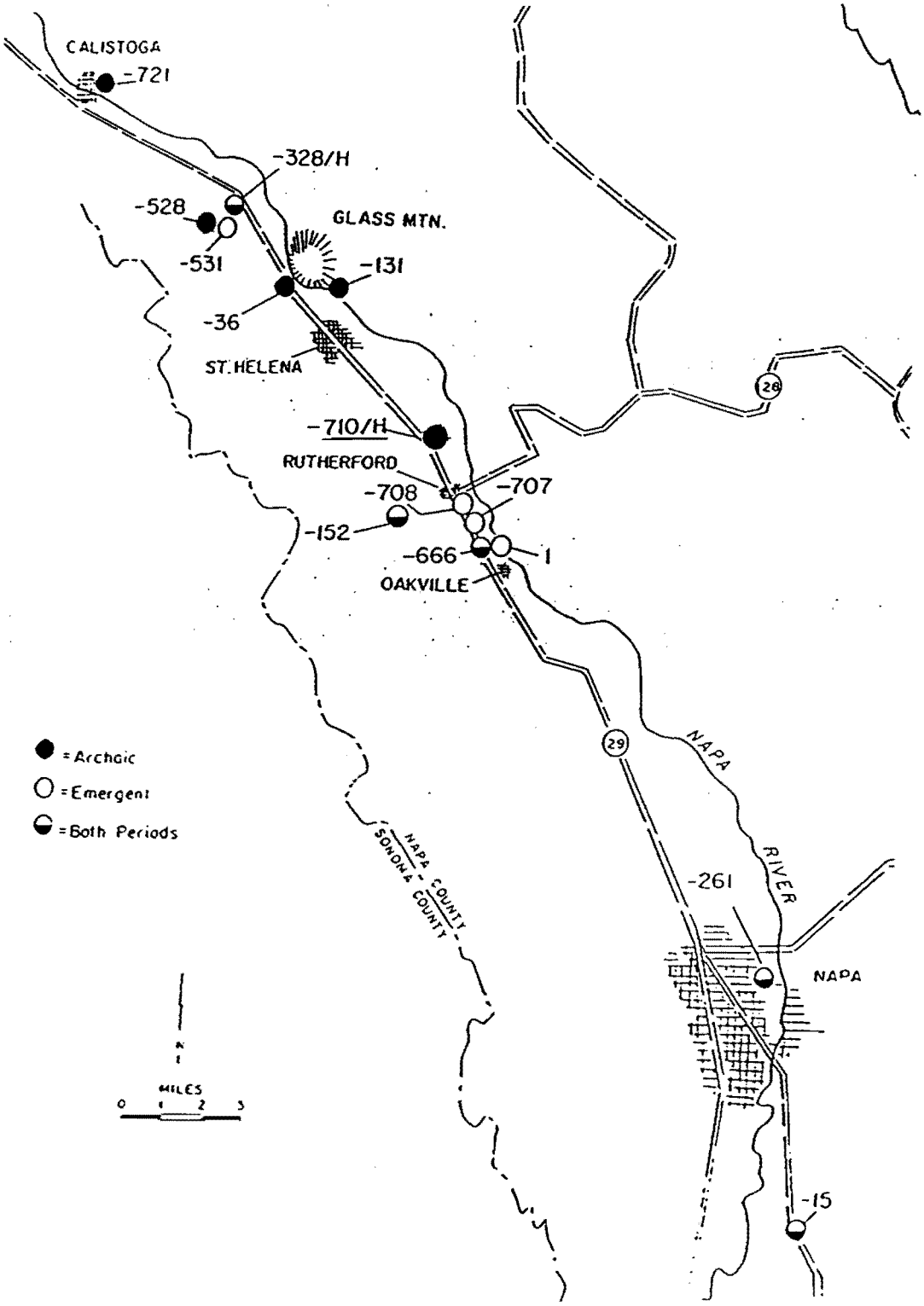

Figure 1. Napa Valley sites with obsidian hydration readings.

Table 1. Hydration values for selected Napa Valley sites.

Time	microns	Napa County Site Numbers 7 0 8	2 6 1	5 3 1	7 0 7	1 5 2	0 0 1	5 2 8	6 6 6	1 3 1	7 1 0	7 2 1	3 2 8	0 3 6	0 1 5
Emergent Phase II	0.9	1							1						
	1.0														1
	1.1		1										1		
	1.2		4										1		2
	1.3								1				1	1	
	1.4												4	1	2
	1.5		1								1		2		
	1.6												3		4
	1.7	1													1
	1.8		1										3		1
Emergent Phase I	1.9	1							1				6		6
	2.0		1		1	1							1		1
	2.1		1						1				2		
	2.2					1							1		
	2.3		3	1					2				1		2
	2.4	1	1	1	1								3		5
	2.5	1	2										2		5
	2.6						1				1		3		3
	2.7		2						1	1	1		3		2
	2.8		3										7	1	1
Upper Archaic	2.9		3	2	1		1			1			1		
	3.0		10				1	3		1			1		2
	3.1		3						1				5		7
	3.2		5								2		1	1	
	3.3		2	1					1		3		1		3
	3.4		1						4		6		5		7
	3.5		3						4		2				2
	3.6								4	1	3		2	1	4
	3.7				1				6		6		1		2
	3.8		2						3	1	9		1	1	2
Middle Archaic	3.9		4					1	2		12		4		3
	4.0		3					1			5				2
	4.1		3			2		1	3		3		1	2	2
	4.2		1					2	1		7				4
	4.3		2			1			1		5			1	3
	4.4		1	1			1		1	1	3		2		3
	4.5					1					1	1		1	5
	4.6						1		3		3			1	3
	4.7							1	6		4				4
	4.8										1				
	4.9							1	1		8		2		1
	5.0									1	3		1	1	3
Lower Archaic	5.1		1						3		2		1		3
	5.2								1		6		5		3
	5.3								1		4		1	2	1
	5.4								1		2				
	5.5								2		2			2	1
	5.6								4		2		2	2	1
	5.7										4		1	1	2
	5.8								1		3			3	1
	5.9								1	2	1			1	3
	6.0										2				2
	6.1										3	1	1		3
	6.2										1				1
	6.3										2	2		1	
	6.4														
	6.5									1	1			1	
	6.6								1				2	1	3
	6.7													3	3
	6.8													1	1
	6.9													1	1
	7.0													2	1
	7.1											1			1
	7.2													1	1
	7.3													1	2
	7.4														
	7.5														1
	7.6												1		
	7.7														
	7.8														1
	7.9														1
	8.0												1		
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	8.5														
	8.6											1			
	8.7														1
	8.8														1
	8.9														
	9.0													1	2
	9.1														
	9.2														
	9.3														
	9.4														
	9.5									1					
	9.6														
	9.7														
	9.8														
	9.9														
	10.0														
Totals		5	64	6	4	6	5	10	63	11	124	6	87	36	140

inhabited by moderate numbers of deer, elk, and small game. The Napa Valley sites mentioned in this study are located in oak woodland areas near the riparian corridor of the Napa River. It is likely that these sites were in areas that had direct access to acorns, grass seeds, as well as moderate numbers of elk and deer. Since there is a lack of material culture supporting an "acorn economy" (e.g., bowl mortars) , this hypothesis is not considered here although the possibility of acorn gathering exists. Fredrickson (personal communication 1991) suggests that early acorn processing may have involved methods different from those used in the Emergent and Upper Archaic periods and may be less archaeologically visible. On the other hand, tools and locational data relating to the North Coast Ranges "deer economy" as proposed by Bieling (1986) and Simons and Basgall (1978) support the hypothesis that deer were probably exploited as primary prey with co-harvesting of secondary species such as rabbits, rodents, quails, and doves.

Paleoenvironmental and locational data suggest that more complex sites could have been developed along the river during the Archaic. Since such sites were not developed, the task-specific, low-density nature of the sites indicates specific human choices in the use of the landscape, the curation of tools, and on-site manufacturing of tools. NAP-710/H is considered significant because it is one of the few sites in addition toNAP-131 that have yielded enough materials to understand the range of Archaic period assemblages in the Napa Valley (Dowdall n.d.).

ASSEMBLAGE DIVERSITY

Overall density of cultural materials at NAP-710/H was low: only 74 items per cubic meter. Prehistoric materials included 6 projectile points, 31 bifaces, 1 uniface, and 2,165 pieces of debitage.

Through visual sourcing and XRF, it was determined that the obsidian from NAP-710/H consisted entirely of the Napa source. Ninety-seven percent of the 124 obsidian hydration samples fall between 3.2 and 6.2 microns. There is no apparent vertical patterning in micron readings at NAP-710/H which would correspond to research by Origer (1982), where readings between 5.2 and 6.4 microns correspond to the Lower Archaic, the readings between 4.0 and 5.0 microns correspond to the Middle Archaic, and the readings between 3.1 and 3.9 microns correspond to the Upper Archaic.

However, there does appear to be some horizontal patterning whereby the area adjacent to the highway appears younger than areas further east or across the highway to the west. This is consistent with Dietz and Holson's (1983) findings at NAP-36 where they also found horizontal hydration patterning. From this patterning, Dietz and Holson suggested that NAP-36 was comprised of a series of loci. This site characteristic appears to be the

case at NAP-710/H also.

PROJECTILE POINTS

Six items were classified as projectile points based on the presence of a hafting element. Five of the projectile points have concave bases, and one is a lanceolate form. Obsidian hydration rim readings fall between 4.3 and 6.1 microns. Three of the projectile points have impact damage characteristics, such as bending breaks and reverse hinge fractures, which suggest that they were broken during use.

NOVICE BIFACES

Three artifacts have characteristics often associated with bifaces made by less experienced flintknappers, possibly children, and are called for the purposes of this paper: "novice bifaces". These bifaces are characterized by a combination of several attributes including a plano-triangular cross-section, varying width-to-thickness ratios, complete or nearly complete flake scar coverage, and abundant hinge terminations. Shelley (1990:46) in a replicative experiment in "novice biface" manufacture describes these bifaces as having step and hinge terminations because "less experienced flintworkers not only produce hinge and step terminations at a moderately higher rate, but more importantly, more frequently fail to successfully correct their errors".

It is important to note that informal replicative experiments have shown that these bifaces can also be produced by other factors including unfamiliarity with the material being worked, poor materials, fatigue, or just a "bad day".

One novice biface was classified as a concave base projectile point. The most striking feature is its variable width to thickness ratio and tendency to become thicker at the distal end. This thickening at the distal end would not be desirable for a projectile point and is not present on other concave base points from NAP-710/H.

The other two novice bifaces have excessively small width-to-thickness ratios, hinge terminations, and numerous flake scars on the dorsal and ventral surfaces.

The hydration rim readings, 4-6 microns, for these bifaces place them within the range for the other bifaces and projectile points from the site. It can be assumed that they were manufactured during roughly the same time period as the better-made bifaces and projectile points.

Based on Shelley's (1990) research one can hypothesize that the site was utilized by inexperienced as well as experienced

knappers. These skill levels may or may not indicate individuals of different ages.

OTHER BIFACES

The bifaces were grouped into 3 categories based on degree of modification. Bifaces in the first group show few invasive flakes scars and these may represent manufacturing discards. Bifaces in the second group have more invasive flake scars and less definable surfaces. Bifaces in the third group show evidence of carefully controlled modification. These items are assumed to represent projectile points, knives and other "finished" items.

Of the 24 bifaces recovered, 3 have large amounts of cortex on the dorsal surface and few invasive flake scars. These pieces show little evidence of modification and can be assumed to represent manufacturing discards. One of these bifaces is unusual in that it was manufactured from a piece of obsidian that exhibits incipient cone cortex. This is cortex formed in part from minute cones of force introduced into the cobble during water tumbling. All the other cortex studied is primary geological cortex produced by natural weathering of the obsidian. This indicates at least two distinct procurement areas.

Of the remaining bifaces, 2 fell into the second group of intermediate modification; 19 fell into the third group exhibiting relatively greater modification. This suggests that most of the items were in a "finished" state at the time of deposition.

DEBITAGE ANALYSIS

To gain another perspective on site function, a sample of 100 obsidian flakes were selected for analysis from a vertical unit where 3 mm wet screen was used. The sample was classified according to degree of dorsal complexity, amount of cortex present, size of flakes, and flake type. The flake types were separated into 6 categories based on debitage type and degree of completeness (Tables 2 and 3). Flake type definitions are based on Crabtree (1972).

The presence of margin fragments suggests that modification of already reduced bifaces occurred at the site. The presence of both complex and simple flakes suggests the possibility that two different types of reduction were occurring at NAP-710/H. The low occurrence of cortex suggests that little primary reduction was occurring at the site. Flake lengths clustered between 7 and 19 mm; the lack of flakes smaller than 7 mm argues against pressure flaking as an important activity at the site.

Table 2. Lithic analysis for NAPA-710/H.

		Complexity			
		complex	simple	indeterminate	ALL
Unit	40-60cm	13	53	5	71
	60-80cm	7	18	0	25
	ALL	20	71	5	96

		Cortex %					
		0	5	10	25	50	ALL
Unit	40-60cm	59	6	4	3	3	75
	60-80cm	21	2	2	0	0	25
	ALL	80	8	6	3	3	100

		Condition						
		complete	nearly complete	fragment	margin	shatter	indeterminate	ALL
Unit	40-60cm	11	16	41	2	4	1	75
	60-80cm	4	7	14	0	0	0	25
	ALL	15	23	55	2	4	1	100

Table 3. Flake size and weight for NAP-710/H lithic analysis.

		Weight (grams)								
		0-1	1-2	2-3	3-4	4-5	6-7	10-11	11-21	ALL
Unit	40-60cm	64	3	3	1	2	1	1	0	75
	60-80cm	22	2	0	0	0	0	0	1	25
	ALL	86	5	3	1	2	1	1	1	100

		Width (mm)									
		8-11	11-14	14-17	17-20	20-23	23-26	26-29	29-32	32-33	ALL
Unit	40-60cm	8	5	6	1	1	2	1	0	2	29
	60-80cm	4	1	2	2	0	0	0	0	1	11
	ALL	12	6	8	3	1	2	1	0	3	40

		Length (mm)												
		8-11	11-14	14-17	17-20	20-23	23-26	26-29	29-32	32-35	35-38	38-41	41-44	50-51	ALL
Unit	40-60cm	7	4	3	4	0	2	1	3	1	0	3	0	1	29
	60-80cm	2	3	1	3	0	0	1	0	0	0	0	1	0	11
	ALL	9	7	4	7	0	2	2	3	1	0	3	1	1	40

Debitage analysis of this site confirms the biface analysis. Although some primary reduction took place at the site, indicated by the minimally modified bifaces and cortical debitage, it was not the dominant manufacturing activity. The lack of angular cores, low frequency of shatter, and small and light flakes, suggests that most reduction consisted of modifying already partially reduced items. Coupled with the presence of broken projectile points and more heavily modified bifaces, data gained from debitage analyses support the hypothesis that the site was task-specific, possibly involved in hunting.

CONCLUSIONS

In conclusion, NAP-710/H provides new information on Archaic period sites. First, Heizer's (1953) suggestion that Napa Valley Archaic period sites contain an abundance of basalt tools is not supported. This suggests an adaptation based on utilization of the most available resources with little energy being expended to transport exotic materials. Second, presence of extensively modified bifaces and projectile points indicates that the site was used as a hunting camp. This provides additional support to the "deer" economy hypothesis. Third, tool morphology, the presence of possible "novice" bifaces, and the debitage analysis suggests that the site was used for a range of activities including hunting, tool rejuvenation, and tool manufacture. Fourth, Fredrickson's suggestion of acorn use at the site further expands the possible range of activities, although is not testable at this time.

Presence of horizontal obsidian hydration distribution patterning at some of the Archaic period sites studied suggests these sites occur as mosaics of diffuse loci.

Data gained from NAP-710/H added to the NAP-131 data suggest two different site types for the Napa Valley Archaic period. One type is the manufacturing site, like NAP-131, which contains large amounts of primary decortication debitage and relatively abundant tools, including projectile points, primarily in the lanceolate or concave base series. The second type is the small, diffuse task-specific site, like NAP-710/H, which is limited to secondary decortication debitage and low numbers of tools, also in the lanceolate or concave base series. Such data expand our ability to create predictive models and research designs for the Napa Valley Archaic period.

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