

FOR THE LOVE OF LITHICS: PROCUREMENT AND REDUCTION PATTERNS OF STONE TOOLS AT TOTEM POLE

ALEXANDRA K. JONASSEN
ANTELOPE VALLEY COLLEGE

The focus of the lithic analysis from the Totem Pole (AVC 184) archaeological site collection was threefold: to determine the cultural chronology of the site, to identify the variety of material types present, and to determine what types of manufacturing were taking place. The site was occupied during the Late Prehistoric Period, as evidenced by the presence of Cottonwood and Desert Side-notched series projectile points. Analysis of material types indicates both local and non-local toolstone procurement patterns, suggesting interregional exchange links with other California culture groups. Comparisons of manufacturing techniques and procurement patterns with other Western Mojave Desert settlements are presented.

In this initial stage of the lithic analysis of the Totem Pole (AVC 184) archaeological site, three purposes were established: to determine the chronology of the site, to locate the sources of material types present, and to determine what types of manufacturing were taking place. The site was likely occupied during the Late Prehistoric Period, as evidenced by the presence of Cottonwood and Desert Side-notched series projectile points. Analysis of material type and manufacturing techniques indicated that trade was taking place. This allowed for an overall better understanding of the Native American culture present.

METHODS

The analysis of flaked stone from AVC 184 had three major goals: to determine the chronology of the site through projectile point styles, to locate the sources of material types and their trade implications, and to analyze the projectile points, debitage, and cores to locate manufacturing patterns within the site. With these objectives in mind, the projectiles found were weighed, measured, and classified by material type and point style. By determining the style of each point, we were able to associate the style with a given time period which helped confirm the site's occupation as being in the Late Prehistoric era. All material types were recorded for cores, debitage flakes, and hammerstones as well as projectiles which would lead us to determine what materials were locally and non-locally sourced. By noting what materials found in the assemblage were not native to the desert area, we determined that the trading of obsidian and Franciscan chert must have taken place in the Mojave region. In analyzing the debitage, it was divided into material and flake type and then totaled up in order to see what percentage each material made up of the overall distribution. This, in conjunction with recording the material type of the cores, allowed us to determine what manufacturing patterns were taking place at the site.

OVERALL STATEMENT OF THE ENTIRE ASSEMBLAGE

The flaked stone assemblage recovered from AVC 184 includes 122 flaked stone artifacts and 5,758 pieces of debitage. High densities of debitage dominate, followed by cores and both whole and fragmented projectile points, with the balance comprised of hammerstones and casual flake tools (Table 1). The latter tools are composed of high proportions of chert (cryptocrystalline [CCR]) toolstone, with a substantial amount of fine-grained igneous, a small percentage of obsidian, and trace amounts of other lithic materials.

Table 1. Flaked Stone Artifacts.

debitage	5,758
cores	63
hammerstones	6
projectile points	6 whole, 39 fragments
casual flake tools	8

DETERMINING CHRONOLOGY THROUGH PROJECTILE STYLES

In analyzing the lithics from AVC 184, one of the main project goals was to use the data gathered to confirm whether the site was occupied by Native Americans around the Late Prehistoric Period. Projectile point styles are particularly helpful for this goal in that specific styles are common to certain time periods. By finding projectile points common to the Late Prehistoric Period, such as the Desert Side-notched, Cottonwood Triangular, Cottonwood Leaf-shaped, and Rose Spring Corner-notched, one can confirm when the site was occupied.

In total, only six whole projectile points were recovered from the site. These projectiles had styles common for the Late Prehistoric Period in the Antelope Valley—the Cottonwood Leaf (n = 1) and Cottonwood Triangular (n = 5). These points are typical styles dating from A.D. 200 to the contact period, confirming that the site was occupied in the Late Prehistoric Period. In addition to these whole point styles, 32 fragmented points were found, seven of which have some recognizable characteristics that indicate a possible point style (Table 2). Four of the fragments have visible notches similar to the Desert Side-notched style, one has a rounded base similar to that of a Cottonwood Leaf style, and four others closely resemble the Cottonwood Triangular style. Although they cannot be firmly classified to those styles due to their fragmentation, it is important to note that they resemble styles that also confirm the Late Prehistoric time period, dating from A.D. 200 to contact.

It is worth noting that the lack of whole projectiles and prevalence of fragments might be due to damage caused to the site after the time of contact. The land on which the site is situated has been documented as being owned by the Sheriff’s Department and used as a space to house their horses. It is possible that trampling and other forms of damage were done to the site and its artifacts, influencing the lack of representation of complete artifacts. These findings relate to other sites in the Mojave Desert region in that they confirm a similar time frame. In comparison specifically to the Lovejoy Springs assemblage, 34 projectile points were found, 17 of which were Cottonwood style and one was Desert Side-notched (Price et al. 2009). The presence of these styles suggests an overlapping time frame of occupation between the two sites. In addition, these points were made up of similar material types, such as obsidian, rhyolite, and CCR. These similarities suggest that the Totem Pole site was not necessarily unique, but typical in lithic production for Mojave Desert sites.

Table 2. Projectile Points by Typology and Material Type.

TYPE	RHYOLITE	OBSIDIAN	CCR	OTHER	TOTAL	% OF TOTAL
Cottonwood Triangular	1	2	1	1	5	83%
Cottonwood Leaf	0	0	1	0	1	17%
Desert Side-notched	0	0	0	0	0	0%
Rose Spring	0	0	0	0	0	0%
fragments	1	15	20	3	32	--

LOCATING THE SOURCES OF MATERIAL TYPES AND IMPLICATIONS OF TRADE

In analyzing the data from the debitage, cores, hammerstones, and projectile points found at the site, both local and non-local material types were found. In the Mojave Desert area, typical materials that occur naturally in the area for lithic production include rhyolite, CCR, and flint. The majority of the materials used in lithic production found at the site consist of these materials. For projectile points, three materials were identified for the whole projectiles—obsidian, CCR, and Franciscan chert (Table 2). In the fragments, obsidian and CCR were the majority materials. The type of CCR found is a local material, but Franciscan chert and obsidian are non-local (Robinson 1996). The obsidian most likely originated from the Coso Volcanic Field, specifically West Sugarloaf Mountain or Sugarloaf Mountain proper or possibly from the Mammoth Mountain area. The Franciscan chert material originated from coastal environments over 50 miles southwest of the Totem Pole site. This indicates that trade was taking place between coastal populations and more northern and Mojave Desert Native American groups.

The rest of the lithic production data supports this notion of mainly relying on locally sourced materials for lithic production, but also trading with other groups to get access to obsidian and Franciscan chert. In the debitage data findings, the majority was made up of locally sourced CCR at about 60%, quartzite making up 9%, rhyolite making up 4%, and quartz making up 3% (Table 3). The remaining 13% of debitage material type was categorized as other, which included slate, shale, and flint, also locally sourced materials. Non-locally sourced materials included small amounts of Franciscan chert making up 0.5% of the debitage and non-local obsidian made up 11%.

In the core data findings, 65% of the total cores were quartzite, 13% were rhyolite, 13% were quartz, and 9% were other types of materials including basalt and sandstone (Table 4). These material types are common to the area surrounding the Totem Pole site. In addition, all nine of the hammerstones that were collected are quartzite and quartz, which are also locally found and sourced materials (Table 5).

ANALYZING PROJECTILE POINTS, DEBITAGE, AND CORES TO LOCATE MANUFACTURING PATTERNS

By examining the number and material types of cores, debitage, and projectiles that were generated at the site, we can determine what manufacturing patterns were taking place. In looking at the cores from the site, 65% of the total cores were made of quartzite, 13% were made of rhyolite, 13% were made of quartz, and 9% were of other types of materials, including basalt and sandstone. All of these materials are found locally and near AVC 184. The processing of cores is one of the first basic steps of manufacturing projectile points and their presence indicates that early stages of manufacturing lithics were taking place on site with local materials.

In analyzing the debitage found at the site, we are able to see what types of processing went on after the initial procurement of cores from local sources. In the debitage data findings, the majority of the waste was made of locally sourced CCR at about 60%, quartzite making up 9%, and rhyolite making up 4%. The remaining 13% of debitage material was categorized as other, including slate, shale, and flint, which are also locally sourced materials. It is interesting to note, however, that there is an overwhelmingly large amount of CCR debitage found on site, but no cores of CCR. This could suggest that the Native Americans were either processing the CCR down to smaller workable pieces in another area offsite, in other areas of the site that were not excavated, or that they had a disposal process of moving debitage out of daily activity areas; for instance, perhaps they disposed of it into the Little Rock Creek wash/drainage. The rest of the core types relate to the rest of the debitage findings well, with rhyolite and some quartz being represented in the cores found.

In looking at the flake types of CCR, quartzite, and rhyolite, there appears to be an increasing upward curve of smaller amounts of primary flakes and secondary flakes, then an increase in the number of tertiary

Table 3. Debitage by Material Type.

MATERIAL	PRIMARY	SECONDARY	TERTIARY	PRESSURE	SHATTER	TOTAL	% OF TOTAL
CCR	280	932	540	1,223	410	3,385	60%
other	33	293	149	226	49	750	13%
obsidian	1	25	105	494	20	645	11%
quartzite	3	210	37	174	87	511	9%
rhyolite	4	85	62	83	13	247	4%
quartz	1	15	19	56	99	190	3%
Franciscan chert	1	7	12	9	1	29	0.5%

Table 4. Cores by Material Type.

MATERIAL	TOTAL	% OF TOTAL
quartzite	36	65%
rhyolite	7	13%
quartz	7	13%
other	5	9%

Table 5. Hammerstones by Material Type.

MATERIAL	TOTAL	% OF TOTAL
quartzite	8	89%
quartz	1	11%

and pressure flakes. This pattern seems typical of lithic manufacture in that the closer the manufacturing gets to a finished point, the greater the number of smaller flakes that are going to have to be removed in production. These are also all locally sourced materials—CCR, rhyolite, and quartzite.

However, non-locally sourced obsidian comprised 11% of thedebitage material type but no cores of it were found onsite. Also, non-locally sourced Franciscan chert comprised 0.5% of thedebitage material type. Obsidian did not have the same upward curve from primary to pressure flakes, but was lacking in primary and secondary flake counts. It had a much higher proportion of tertiary and pressure flakes which are associated with later manufacturing phases. The amount of Franciscan chert flakes had a different distribution, with slightly more secondary and tertiary rather than tertiary and pressure flakes; however, the distribution is made up of rather small numbers. Their presence is significant though, in that it is not a localized source and originates from coastal areas of California, which would indicate it being brought to the Mojave area through trade. The fact that both Franciscan chert and obsidian are non-local and no cores were found of either material type in the area suggests that trade was taking place and the pieces that were traded were smaller pieces, perhaps in the form of pre-worked bifaces which would enable the local Mojave Desert people to process it further without having to transport large cores back to the site.

Of the six projectile points found, two were obsidian, two were CCR, one was rhyolite, and one was Franciscan chert. As stressed previously, obsidian and Franciscan chert are non-locally sourced materials, and its transformation into a complete point can further illustrate the idea that these materials were not coming into the area in large unworked pieces but rather smaller forms that were valued in serving as a viable material type for finished projectiles. The presence of the CCR and rhyolite projectiles indicate that processing of locally sourced materials from start to finish was taking place on site as well.

WHAT'S NEXT: FUTURE PROJECT GOALS

In future analysis of the lithic component of AVC 184, I hope to complete a reduction stage assessment of thedebitage. Through use of the recorded flake types, we can look more closely at associating these flakes

with reduction and manufacturing patterns and hopefully see if any specific techniques were used in production that are perhaps unique to the area (Price et al. 2009). Originally, we had underestimated the amount of debitage in the assemblage and the amount of time it would take to classify it by flake and material type; therefore, we had to put this portion of the analysis on hold to be able to get an overall understanding of the flaked tools.

As of now, we have several potential flake tools in the collection and I hope to begin an analysis on those as well. Seeing the material type and the function of these tools can help better support our evidence for trade patterns as well as provide information on what types of specialized work was being done. I hope to analyze the seven drill bits that were collected from the site and look for evidence of microwear to confirm their function. Analyzing the material type of those tools can be incorporated further into my analysis on material type and trade implications. I would also like to connect the function of the drill bits to other areas of AVC 184, such as the possibility of their usage in shell bead drilling and stone ornaments.

In addition, I hope to analyze the possible reasonings behind how Native Americans justified their picking of certain material types and look for evidence of whether material choice was due to an ease of access or preference for a particular source. I would also like to take into account the depth at which the lithics were found at the site and try to gain a date for when certain artifacts were found, particularly the projectile points. This would allow us to see if certain styles or material types were preferred over time. Comparisons of manufacturing techniques and material type with other known Mojave settlements will help determine if there were any significant differences between AVC 184 and other known sites.

In relation to specifically the hammerstones and cores on site, I would like to look at the dual functions of some of these tools and consider the reasoning behind why artifacts ended up being dual purposed. This could relate to Native Americans' needs at the time when perhaps lacking in a certain viable material type. I am also looking forward to analyzing Artifact #3221, or "Karen's knife," in more detail. It appears to be a large CCR blade; however, upon further analysis of microwear, I will be able to confirm whether the artifact was used for killing/cutting purposes or perhaps for a ceremonial purpose. Looking at the trading patterns in greater depth for the obsidian and Franciscan chert material types could provide insights on possible kinship relationships among Native American groups.

CONCLUSIONS

The inventory of complete projectile points from AVC 184 is limited to very few specimens, totaling only six artifacts. When we include the fragmentary examples, that number increases to just 38. This suggests that the procurement of large game was a rather minor component and of limited importance with respect to the cultural activities conducted at the site.

The Native Americans occupying the site were participating in trade with other peoples of the Coso Mountain region as well as the coastal environments, as evidenced by the presence of obsidian and Franciscan chert in the lithic assemblage. Using the chronology gained from the lithic projectile styles, we can confirm that the site was occupied by Native Americans during the Late Prehistoric Period.

REFERENCES CITED

- Price, Barry A., Alan G. Gold, Barbara S. Tejada, David D. Earle, Suzanne Griset, Jay B. Lloyd, Mary Baloian, Nancy Valente, Virginia S. Popper, and Lisa Anderson
2009 *The Archaeology of CA-LAN-192: Lovejoy Springs and Western Mojave Desert Prehistory*.
Electronic document, <https://scvhistory.com/scvhistory/CA-LAN-192.htm>.
- Robinson, Roger W. (editor)
1996 *The Grayest of the Gray: Selections from Antelope Valley's Most Obscure Archaeological Literature. A Preliminary Analysis of Small Projectile Points from the Antelope Valley. Antelope Valley Archaeological Society Occasional Papers No. 3.*