

An interim report on two rock shelter sites with early Holocene occupation in the northern Baja California peninsula

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Abstract

In two field seasons in 1997 and 1999, excavations were conducted at the Abrigo Paredón, in conjunction with a geoarchaeological study of the Laguna Chapala basin in the central interior of the peninsula. This small rock shelter, at the foot of an outcrop of granite boulders, proved to be the site of a lithic workshop principally for the production of bifacial points. Approximately 25,000 small flakes (80% > 10 mm) were recovered from a limited area. Although choppers, thick humpbacked core/scrapers, and retouched or utilized flakes were also recovered from the shallow aeolian/colluvial silty sand deposits, the predominant artifact type was a large lanceolate point preform. Finished projectile points were small foliate forms. A radiocarbon date of ca. 9000 B.P. from the lower deposits indicates an early Holocene occupation, probably when the now-dry Laguna Chapala basin contained a permanent lake or marsh.

In 2000 and 2001 excavations were undertaken at the Abrigo de los Escorpiones, a very large rock shelter situated high in a volcanic outcrop overlooking the Pacific coast ca. 5 km south of Ejido Eréndira. At present, it is known that the rock shelter is filled with shell midden to a minimum depth of 5.5 m below the present surface of the deposit; a reddish-brown loamy silt with heavy rubble extends to bedrock at ca. 8 m depth. However, with increasing depth below present surface, the rock shelter enlarges; and the earliest occupation is possibly to be discovered in its as-yet unexcavated interior. A radiocarbon date of ca. 8900 B.P. indicates an early Holocene age for the lowest midden deposit presently exposed. The collection of shell samples from the site is yet to be analyzed, but notable is a shift from predominantly clam and limpet in the earliest occupation levels to overwhelming dependence on rock mussel after the early Holocene. The site was primarily a shellfish collecting station throughout its history, although some fish bones, sea mammal bones, and a number of manos and milling stones indicate that other resources of the coastal zone were also exploited. The artifact assemblage is markedly different from that of the Abrigo Paredón. Projectile points are very rare and restricted to early Holocene levels; the major categories of flaked stone artifacts are large flakes, flaked cobbles, cores, and choppers. Artifacts of shell or bone are very rare. Some sherds of plain brown pottery were recovered from the upper 10 cm of the midden.

Introduction

The long-term focus of our research in Baja California is the search for evidence of a

Pacific coastal route of entry for the earliest settlers of the Americas. In recent years, the venerable Clovis-first model, proposing an interior entry of specialized big-game hunters about 12,000 years ago, has disintegrated, with geological evidence that the hypothetical ice-free corridor through which the Clovis hunters supposedly entered was closed by continental ice at its northern end between 30,000 and 11,000 RCYBP (Lemmen et al. 1994), and with the archaeological evidence that populations maintaining diverse subsistence adaptations and technological traditions were already in South America before Clovis times (Dillehay 2000; Lavallée 2000). An increasing number of North American archaeologists now support the model that the first American colonists came by watercraft along the north Pacific rim, utilizing ice-free areas along the coastline (Dixon 1999; Fladmark 1979; Gruhn 1994). If so, we reason, elements of this early coastal population should have soon expanded south into Baja California. For us, the prime research questions are, how early did this movement occur, and what technology did the earliest colonists bring with them?

What is the earliest archaeological evidence from Baja California? Archaeologists commonly believe that fluted projectile points like Clovis are the key indicators, and they refer to the discovery of several such specimens in the northern part of Baja California Sur (Aschmann 1952; Hyland and Gutiérrez 1995). These few points were all surface finds, however, with no paleoenvironmental or archaeological context. They are undated and should not be treated as type fossils of an age that can be extrapolated from dated sites hundreds of kilometers farther north and east. And with the collapse of the Clovis-first model, it can no longer be assumed that fluted points are manifestations of the earliest colonists.

In our view, bifacial stone projectile point styles need not be the key to identification of the earliest archaeological sites in Baja California. We believe that the first people were coastally adapted generalists who had long exploited the productive Pacific coastal ecosystems with a relatively simple lithic technology. No doubt artifacts of bone, shell, and especially vegetal materials were exceedingly important, but unfortunately much less likely to be preserved. We expect that the earliest archaeological sites will produce very sparse cultural material, with simple undiagnostic lithic artifacts. To identify the earliest sites in Baja California, therefore, it is absolutely essential to find and excavate datable archaeological contexts.

In our search for early sites, we have been involved with Baja California archaeology for some time. Our good friend Don Tuohy had accompanied William Massey on several field trips to the interior of Baja California Sur in the 1950s, and in 1991 Tuohy guided Bryan around the entire peninsula so that he could become familiar with the area. In 1992 Bryan took a former student, Ian Franck, on a more intensive road survey of areas with archaeological potential, discovering sites which were further examined by Bryan and Gruhn in 1993. In 1998 Franck was engaged by Bryan and Gruhn to carry out an intensive survey by bicycle of the northwest coastline between Punta Banda and Punta Colonet. On each of these informal surveys, notes were taken but no artifacts collected, and reports were provided to the regional INAH offices.

In November 1997, with a permit from INAH, Bryan and Gruhn, working with Loren Davis, initiated a geoarchaeological study of the Laguna Seca Chapala basin, in order to check Brigham Arnold's hypothesis that large bifaces found on old lake beaches were Pleistocene in age (Arnold 1957). This project led to the excavation of a small but highly productive rock shelter, designated the Abrigo Paredón, which proved to be a lithic workshop with early Holocene radiocarbon dates.

In 2000, Bryan, Gruhn, and Davis shifted the focus of research to the northwest coast of the peninsula, following up on Franck's earlier survey. With a permit from INAH, Davis

conducted a geoarchaeological study of the La Bocana area at the mouth of the Santo Tomás River, while Bryan and Gruhn initiated excavations in a large rock shelter designated the Abrigo de los Escorpiones, located south of Ejido Eréndira. With further excavations in 2001, this site has proved to be filled by a very deep shell midden and has produced evidence of an early Holocene occupation.

To date, then, our research in Baja California has resulted in the discovery of two rock shelter sites with evidence of early Holocene occupations, dating back to ca. 9000 RCYBP. These two early sites, the Abrigo Paredón in the Laguna Chapala basin and the Abrigo de los Escorpiones on the Pacific coast near Ejido Eréndira, will now be described.

Abrigo Paredón

The Abrigo Paredón, located at north latitude 29° 23' 7" and west longitude 114° 20' 3", is situated on the eastern side of the Laguna Seca Chapala. The elevation of the site is 661.80 m above sea level, about 3.5 m above the level playa floor.

The site is on the north side of a large round-topped granite boulder with a vertical face which rises about 5 m above the surface of the fill. South, directly behind this granite boulder, a long bedrock ridge rises steeply, strewn with large and small granite boulders and felsite and granite scree; but a 6-x-4-m area in front of this vertical-faced boulder is level. To the north of the boulder is an open area of sand and silt which slopes down gradually to the playa, about 100 m distant to the northwest. The shelter thus faces north; and in the fall and winter months, most of the area is in shade and out of the wind most of the time, although no protection is provided from rain. At the west end, however, west of the large vertical-faced boulder is a small (3-x-2-m), low, covered alcove formed by adjacent overhanging boulders. This alcove has been used as a campsite in recent times, as there is a stone-lined fire pit and much modern garbage in the corners of the alcove.

With a permit from INAH, the first excavations were carried out from November 17 to December 8, 1997; and the excavated area was expanded in February 1999. In 1997, two 2-x-2-m units, C4 and D4, were excavated in the east part of the shelter (Figure 1); and in 1999, Unit A4 in the alcove, Unit B4 adjacent on the east, and Units C5 and D5 directly north of the shelter were excavated. Also in 1999, a backhoe trench 4 m long by 1 m wide was excavated to a depth of 200 cm 4 m to the north of Units C5 and D5.

The excavations in the 2-x-2-m units were carried to a maximum depth of approximately 55 cm below the surface through brown sandy silt deposits, which were apparently of mixed aeolian and colluvial origin (Figure 2). Throughout this stratum, there were abundant flaking detritus and numerous lithic artifacts, a very small quantity of shell and bone fragments, and rare small charcoal fragments. Underlying was a sterile cemented gravel stratum comprised of tightly packed granite and felsite clasts, probably scree derived from the high rocky ridge directly behind the shelter. The sterile gravel deposit was excavated only to a maximum depth of 40 cm in one of the excavation units, but the backhoe trench placed 4 m north of the excavated area revealed sterile cemented sandy silt sediments underlying it to the maximum excavated depth of 200 cm below the surface.

The brown sandy silt stratum contained abundant grass throughout, rendering it coarse in texture. In the lower part of the deposit, the sediment was markedly compact, due to increased calcium carbonate content: the lowermost 5-10 cm of brown sandy silt, over the gravel stratum, was virtually cemented.

A problem in the upper 20-25 cm of the brown sandy silt stratum was extensive

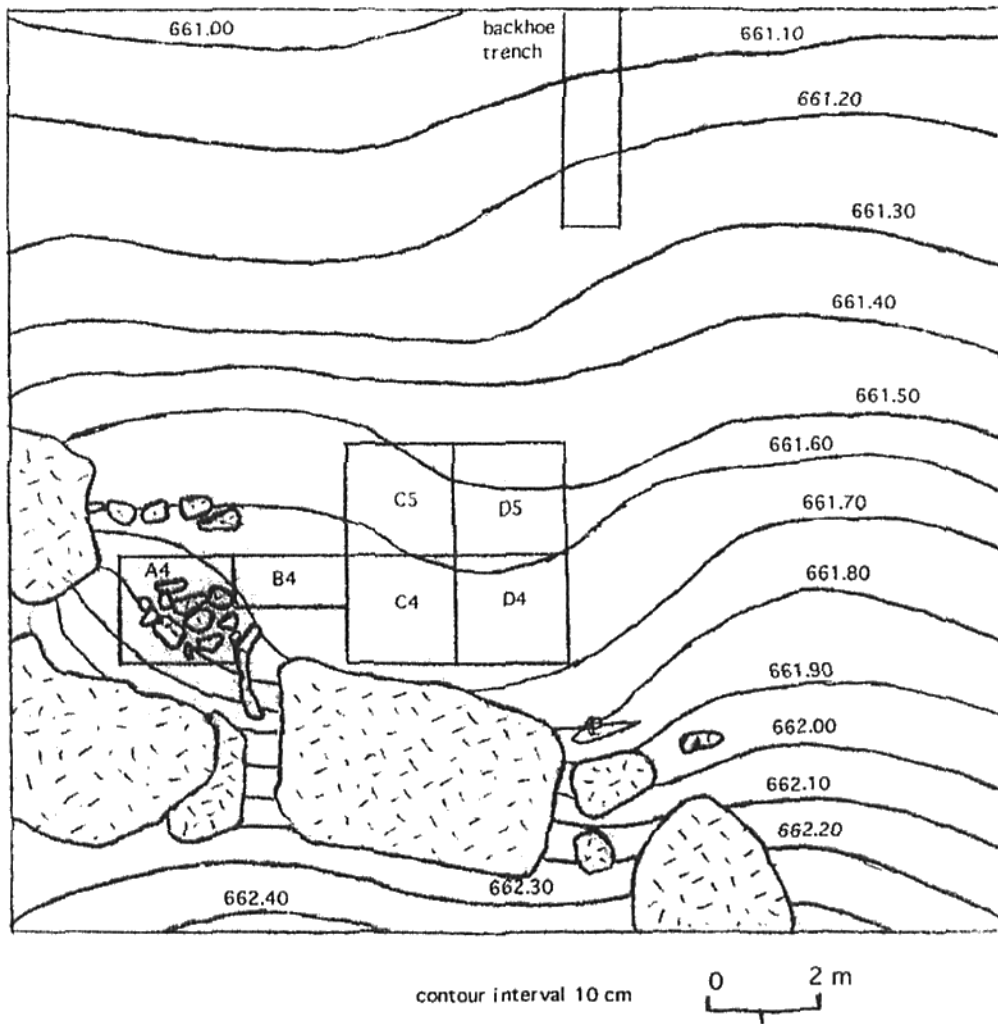


Figure 1. Map of the Abrigo Paredón, indicating the position of the excavation units.

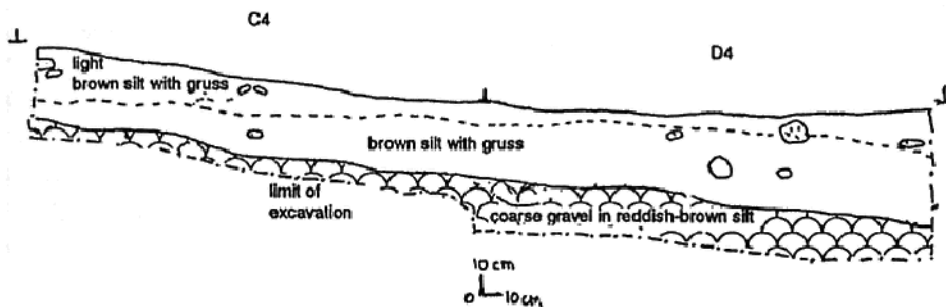


Figure 2. Abrigo Paredón, north face of Units C4 and D4.

bioturbation induced by the burrowing of rodents, spiders, and ants. Rodent runs penetrated the surface of the cemented zone in the lowermost part of the brown sandy silt stratum, but there was no evidence of recent disturbance within this cemented zone, which also yielded abundant flakes and numerous artifacts.

The brown sandy silt stratum incorporated clasts of granite and felsite, usually 3 to 5 cm in size but ranging up to 20 cm, scattered throughout the stratum. A few large slabs of granite and felsite encountered lying flat with the brown sandy silt stratum were possibly manuports, although there was no trace of any modification on the stones.

Faunal remains, vertebrate and invertebrate, recovered from the brown sandy silt stratum were very sparse, small, and in bad condition; nevertheless, identification of some genera was possible. Among the mammalian bones identified by Hugh Wagner of the San Diego Natural History Museum, hare (*Lepus* sp.) predominates. There were also some splinters of artiodactyl long bones. All of the remains of marine shellfish identified by Scott Rugh of the San Diego Natural History Museum were Pacific coast species, mainly mussel and cockle.

The few hearths encountered in the brown sandy silt stratum were just below the surface, and to judge from the association of glass, foil, and rusted metal, were modern in origin. Within the brown sandy silt stratum, charcoal fragments were rare, very small, and scattered. Uncalibrated results from five samples which could be dated by the AMS method included two recent dates of 370 \pm 40 B.P. (Beta-115418) and 340 \pm 50 B.P. (Beta-115419) from the upper 15 cm of deposit; and three early Holocene dates of 9070 \pm 60 B.P. (Beta115420), 8650 \pm 60 B.P. (Beta-115421), and 6800 \pm 580 B.P. (TO-8112) from between 20 and 50 cm depth. From these results, it may be seen that the upper 515 cm of the brown sandy silt stratum contained some very small charcoal fragments which were historic-period in origin, probably intrusive due to bioturbation. The samples from the lower levels of this stratum indicate that the brown sandy silt began to accumulate in the early Holocene, by at least 9,000 radiocarbon years ago.

Artifacts and flaking detritus were abundant in all levels of the brown sandy silt stratum. From this relatively shallow deposit and from a relatively limited area of excavation, approximately 340 formal artifacts and fragments of formal artifacts plus 25,000 unmodified flakes were recovered.

The largest category of formal lithic artifacts is bifacial points and preforms, with most of the specimens in fragmentary condition, clearly discards. The Abrigo Paredón apparently was used primarily as a workshop for the reduction of large bifacial preforms which had been fabricated at quarry sites--felsite dikes nearby in the Laguna Chapala basin--into small and thinner bifacial preforms, and ultimately into projectile points and knives.

Evidently small, thin foliate points, willow-leaf or slightly ovoid in form, were a desired type of projectile point for the knappers at the Abrigo Paredón (Figure 3). Although most of the points recovered were fragmentary, four complete serrated foliate projectile points were found. These complete specimens ranged in size from 57 x 16 x 7 mm to 33 x 12 x 6 mm. In addition, there were 10 nearly complete points of the same form that had broken before they were finished. Only one small side-notched point was recovered from the site, apparently from a bioturbated area.

Approximately 30 essentially complete leaf-shaped biface preforms ranged in size from 95 x 30 x 15 mm to 35 x 22 x 13 mm (average 66 x 29 x 12 mm). All but two quartz specimens are of felsite. These preforms were shaped by percussion flaking, and may have been discarded as too wide or thick to finish by pressure flaking. To judge from the approximately 90 biface

fragments recovered, preforms commonly broke transversely or obliquely under percussion

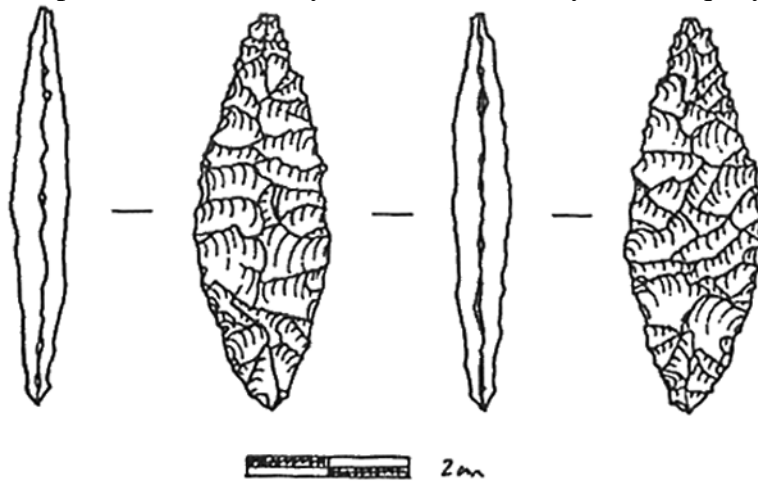


Figure 2. Projectile point from the Abrigo Paredón.

flaking.

The interpretation of the Abrigo Paredón as primarily a knapping station is supported by preliminary analysis of the approximately 25,000 unmodified flakes recovered from the brown sandy silt stratum. The fine-grained material readily available at felsite dikes in the granite outcrops in the Laguna Chapala basin within a radius of a few kilometers of the Abrigo Paredón provided most of the tool stone used by the knappers at the site: 90-97% of the flakes recovered from each excavation unit were felsite. Vein quartz, also locally available, comprised 2-10% of the flakes. Materials exotic to the basin--chalcedony, obsidian, and quartz crystal--were exceedingly rare. Over 80% of the total number of flakes are quite small, only about 10 mm or less in diameter, clearly the products of reduction of preforms and fabrication of artifacts.

Numerous retouched or utilized flakes suggest that the occupants of the Abrigo Paredón were performing other tasks in addition to knapping. Thick scraper planes or humpbacked core/scrapers were also prominent artifacts in the total site assemblage. These carefully shaped artifacts, a type well known throughout Baja California, are pyramidal or conical in form, with flat platform faces and steeply retouched peripheries, sometimes with noses or sharp graver spurs. They could have been used to work wood, or perhaps to process agave for fiber; however, very few of the Abrigo Paredón artifacts show any evidence of wear on the edges, so residue analysis would be necessary to determine if they had been utilized to work materials at the Abrigo Paredón or were simply prepared for use at another location.

In summary, the Abrigo Paredón was apparently the site of a lithic workshop, dating to the early Holocene, utilized as early as ca. 9000 RCYBP. The texture and inclusions of the brown sandy silt stratum indicate a mixed aeolian and colluvial origin of the sediment. Given the weather conditions we observed in the Laguna Chapala basin, frequent high winds and occasional heavy rainfall have likely scoured and eroded the site, resulting in deflation of the deposit. Extensive bioturbation by the small creatures which dwell underground in the desert has also mixed the sediment. The culture-bearing stratum is thus unstratified; but considering that there is very little evidence for a late prehistoric occupation of the site, it is concluded that the vast majority of the artifacts are of early Holocene age, as indicated by the radiocarbon dates.

Abrigo de los Escorpiones

The Abrigo de los Escorpiones (Abrigo de los Scorpios in earlier reports) is a large rock shelter in a prominent volcanic outcrop located at north latitude 31° 12' 58" and west longitude 116° 21' 04", approximately 6 km south of the Pacific coastal community of Ejido Eréndira. It is situated at an elevation of approximately 22 m above sea level, and overlooks a low marine platform which extends to the rocky coastline, ca. 100 m to the west of the rock shelter.

The rock shelter, long and curving, is formed by a high overhang on the east and north sides of an open alcove within the ancient volcanic outcrop. The sheltered area, at present 1-3 m wide, extends over a distance of approximately 35 m, with a marked slope of the surface of the fill down to the west and to the south. Along most of its length, the irregular surface of the sheltered area is covered with fine rock rubble, with several protruding boulders; but in the northwest quarter is shell midden, with shell fragments exposed on the surface far down the slope in front to the south.

The Abrigo de los Escorpiones was recorded on Franck's coastal survey in 1998. A permit was obtained from INAH, and the University of Alberta crew under Bryan and Gruhn from April 26 to June 2, 2000 carried out test excavations. It was decided to place the first test excavations at the northwest end of the rock shelter, where the midden deposit was most prominent. Three 2-x-2-m units were laid out along a trench line in a north-south direction, extending from near the rear wall of the shelter southward down the slope in front. From north to south, these were designated Units D3, D4, and D5. In late May, when time became short, efforts were concentrated upon completing the middle unit, Unit D4, to bedrock. In Unit D4, excavation continued in 10 cm levels to a depth of 530 cm below the surface. Bedrock was not reached (a probe indicated that there was at least 2 m more deposit in this area of the shelter), but the rock rubble stratum at this depth had ceased to yield cultural materials.

In anticipation of further work at the site in May and June 2001, at the close of excavations in 2000 the area excavated was filled with hay bales and then covered with back dirt; however, the site was later vandalized, and the area of excavation disturbed to an approximate depth of 2 m below the surface. To stabilize the walls in the area of disturbance, in 2001 excavations were carried out in the west half of Units E3 and E4, adjacent to D3 and D4 on the east, to a depth of ca. 2 m below the surface. In the process of stabilization of the disturbed area, Unit D2 to the north was excavated in 10-cm levels to a depth of 180 cm below the surface; and it was discovered that with depth below the present surface of the fill, the rock shelter opened up, with the sheltered area enlarging in width to the north. In the 2001 field season, excavation of Unit D2 was carried to a depth of ca. 560 cm, the limit of cultural material. In 2001 the excavation of Unit D3 was carried to bedrock at a depth of ca. 830 cm below the present surface of the fill.

The excavations in 2000 and 2001 have indicated that the Abrigo de los Escorpiones is a very large rock shelter, now completely filled by a deep shell midden underlain by a sterile deposit of reddish-brown loamy silt with heavy rubble (Figure 4). The midden, with three distinctive stratigraphic zones, extends from the present surface to a known depth of 5.6 m; below, heavy rubble in a matrix of reddish-brown loamy silt extends to volcanic bedrock at ca. 8 m depth below the present surface of the rock shelter fill.

The upper stratigraphic zone of the midden consists of abundant shell fragments in a matrix of mottled brown silt with low rubble content. This zone was found to extend from the

present surface to a maximum depth of ca. 280 cm. Shell fragments often occur in thick and

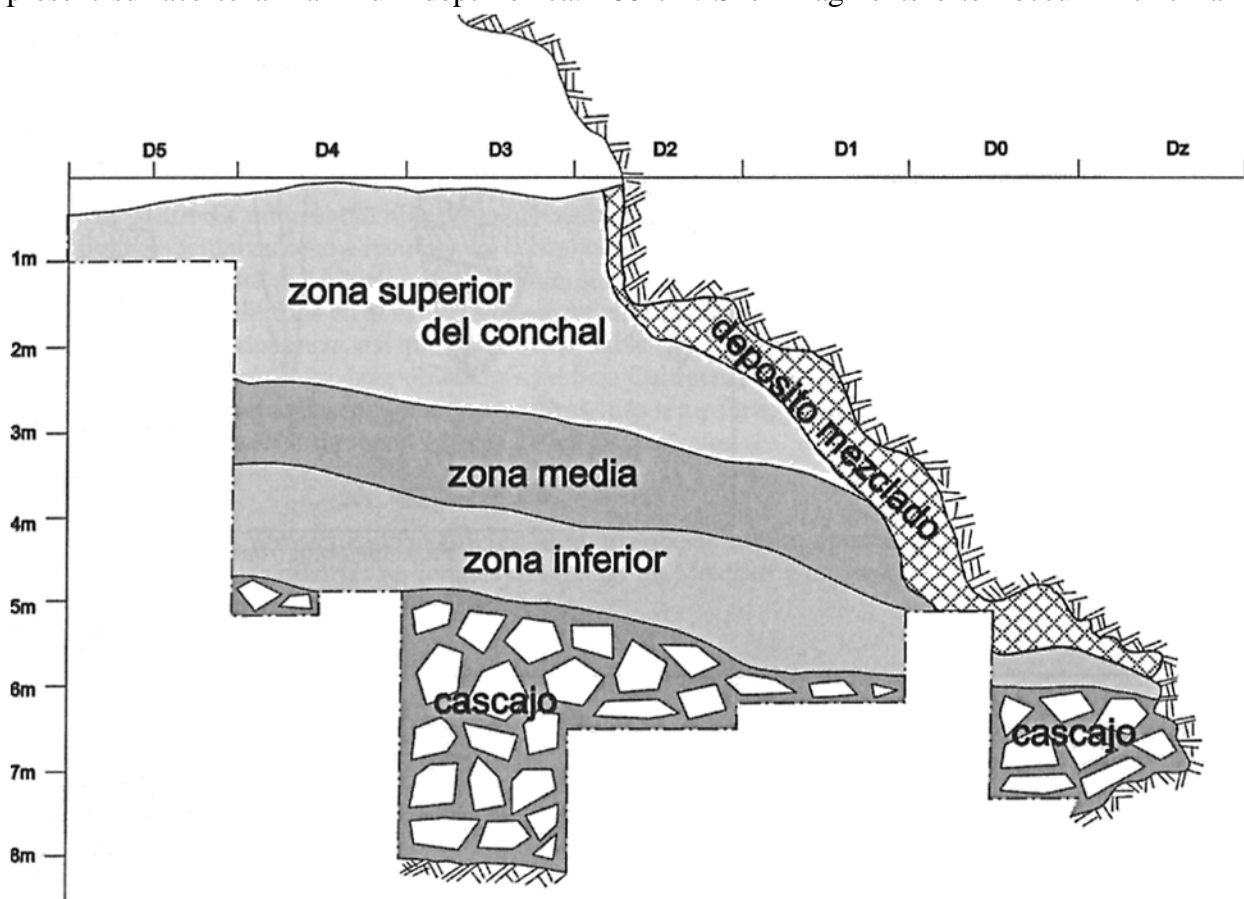


Figure 4. Abrigo de los Escorpiones, large profile.

extensive lenses comprised of complete valves, predominantly rock mussel, but also including some abalone and small marine gastropods. There are also fish bones. As the area of excavation is directly under an avian raptor perch, bones of small mammals and birds are abundant and should provide paleoenvironmental evidence when identified. Some bones of marine mammals were also recovered from the midden. With the abundance of shell and bone, and with a number of large rodent burrows penetrating the midden, the matrix of this zone of brown silt with shell is relatively dry and loose, although increasing in compactness with depth.

The zone of brown silt with shell produced many lithic artifacts. Most common were large unmodified flakes; but there were also flaked cobbles, cores, choppers, hammer stones, retouched or utilized flakes, and manos and milling stones. Less common were shell artifacts, including *Olivella* beads, modified abalone shells, and very rare shell disks. Modified bones were also very rare. Small, thin hearths and ash lenses were common in the matrix, especially near the north wall of the rock shelter.

The Abrigo de los Escorpiones is still utilized by campers on occasion, as shown by modern garbage found in pits extending into the zone of brown silt with shell as deep as 40 cm below the present surface. A sherd of a thick brown ware found in the upper 10 cm of this zone suggests a late prehistoric occupation. Four uncalibrated radiocarbon dates obtained from the zone of brown silt with shell range from 1610 \pm 90 B.P. (Beta 144831) from a depth of 50-55 cm below the surface in Unit D4 to 4550 \pm 50 B.P. (Beta 157351) at a depth of 270-280 cm in Unit

D2 under the rock shelter.

A distinctive zone of compact black/brown ashy silt with abundant shell fragments underlies the zone of brown silt with shell. The surface of this distinctive zone, which is approximately 1.5 m thick, slopes down to the north and west into the as-yet-unexcavated interior of the rock shelter. This middle zone of the midden features abundant mussel shell, often in thick extensive lenses but usually crushed and compressed, in a very dark matrix of ashy silt which appears oily in texture and odor, and adheres to the surface of shell and bone fragments. The shell is predominantly rock mussel, with some abalone and small gastropods. In the lower levels of the zone, clams and giant chitons appear, and limpets are very common. There are also fish bones throughout this middle zone of the midden. Small mammal bones are much fewer than in overlying levels, although rodent burrows are still notable. Bones of sea mammals were also recovered.

Cultural material was abundant in this zone of black/brown ashy silt with shell, with a number of small thin hearths and ash lenses. Many lithic artifacts were found, including large flakes, flaked cobbles, cores, choppers, hammer stones, manos and milling stones. Several large lanceolate projectile points were recovered from this middle zone of the midden. Also notable was a marked increase in amount of flaking debitage. Two uncalibrated radiocarbon dates obtained from the zone of black/brown ashy silt with shell in Unit D4 ranged from 6340 \pm 100 B.P. (Beta 146369) at a depth of 200-210 cm to 8040 \pm 70 B.P. (Beta 144833) at a depth of 340-350 cm.

At the base of the zone of black/brown ashy silt with shell, a distinctive zone of brown loamy silt with shell emerged, sloping down to the north and west into the as-yet-unexcavated interior of the rock shelter. This lower zone of the midden appears to be approximately 1 m in thickness. It is characterized by a matrix of brown loamy silt with much rock rubble but also contains shell fragments, charcoal fragments, flakes, and artifacts. Although rock mussel shell is common, there is a high proportion of clam shell, limpets, and giant chiton, as well as small conical gastropods. It is notable that clam and giant chiton are not found in the area of the site at the present time. This lower midden zone was very productive of lithic artifacts. Large flakes were numerous, often well retouched to form scrapers; and there were also many choppers, as well as flaked cobbles, cores, and hammer stones. A few manos and fragments of milling stones were also recovered. There was much flaking detritus. Five uncalibrated radiocarbon dates on charcoal collected from this lower zone of the midden range from 8240 \pm 160 B.P. (Beta 146370) to 8870 \pm 60 B.P. (Beta 144835).

At depths ranging from 450 cm below the surface in Unit D4 on the south to 560 cm under the rock shelter in Unit D2, cultural material abruptly disappeared from the sediment, and the matrix became a reddish-brown loamy silt with heavy rock rubble. Fragments of shell and charcoal, and occasional lithic flakes were confined to obvious rodent burrows, which continued down to volcanic bedrock at 800-830 cm below the present surface in Unit D3. As charcoal fragments were clearly intrusive from above, no radiocarbon dates have been attempted from this basal stratigraphic zone. The surface of the volcanic bedrock slopes down to the north, into the as-yet-unexcavated interior of the rock shelter.

To date, the excavations in the Abrigo de los Escorpiones have yielded approximately 800 artifacts, excluding the unmodified lithic flakes, which have not been analyzed as yet. Most of the artifacts are simple. Among the assemblage of flaked stone artifacts, fine bifacially flaked specimens are very rare, and limited in distribution. Despite the mass of shell fragments in the midden, artifacts fabricated of shell were rare, as were bone artifacts. Relatively large or heavy

tools or utensils were predominant at the site -- flaked cobbles, cores, choppers, hammer stones,

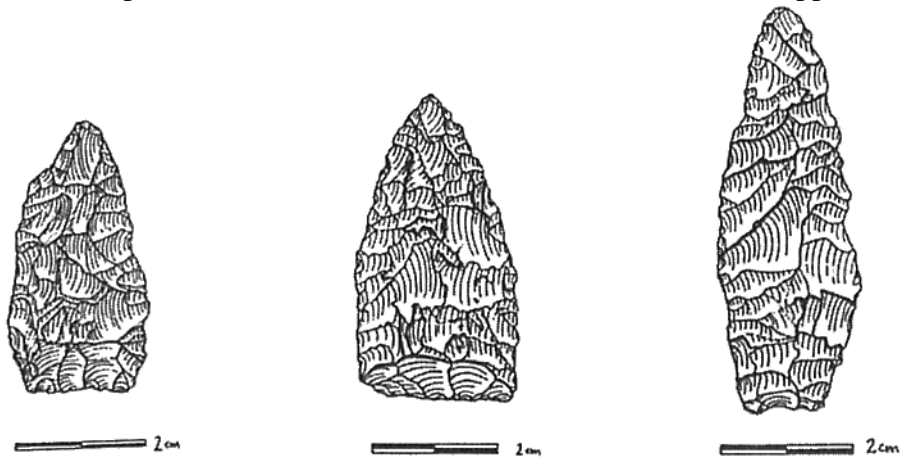


Figure 5. Abrigo de los Escorpiones, projectile points from the middle midden zone.

manos and milling stones, and large flakes. Some artifact types, however, varied significantly in frequency and distribution.

Bifacial projectile points or fragments of points found in undisturbed contexts have been limited in distribution to the middle zone of the midden, the zone of black/brown ashy silt with shell, and only seven specimens have been recovered to date. Of the three complete specimens (Figure 5), two are broad lanceolate points with straight or slightly concave bases, ranging in size from 50 x 26 x 9 mm to 42 x 21 x 5 mm. The third complete specimen is a long, thick, leaf-shaped form with lateral edges contracting from the midpoint to a concave base. This specimen measured 63 x 22 x 6 mm.

Flake scrapers, retouched flakes, and utilized flakes varied significantly in frequency in the three zones of the shell midden. In the upper and middle zones, these categories together comprised 17-20% of the total artifact assemblages; in the lower zone, these three categories comprised 54% of the total assemblage. The most notable artifacts in the lower midden zone were thick flake scrapers, a type rare in the middle and upper midden but comprising 18% of the total assemblage from the lower midden deposit.

While the counting and analysis of unmodified flakes has not yet been completed, significant differences in the size and abundance of flakes are obvious in the collections from different zones of the midden. In the upper zone, only about half a dozen flakes were recovered from each 10-cm level, and these were large flakes, usually 5-10 cm in size. In contrast, in the middle and lower zones of the midden, the number of flakes per 10 cm level increased tenfold, and most of the flakes were small, less than 3 cm in size, apparently retouching flakes.

Flakes were derived from locally available cobbles and pebbles of metavolcanic rock. In the upper zone of the midden, cobbles and pebbles with one or more flakes removed comprised about 28% of the total artifact assemblage; more completely flaked cores comprised 6%. Flaked cobbles were less common in the middle and lower zones of the midden, but cores were more frequent. Also in higher frequency in the middle and lower zones were utilized cores or choppers, comprising only 3% of the total artifact assemblage in the upper midden but 12% in the lower zone.

Pounding and grinding implements, fabricated from granite cobbles or pebbles, were found throughout the midden deposits. Simple milling stones, unshaped, with very shallow grinding surfaces, were most common in the upper zone of the midden, in which they comprised

5% of the total artifact assemblage; only one was found in the middle zone, and four fragments were found in the lower zone. Manos were flat, oval, fist-sized granite pebbles with one or both faces smoothed by use; they occurred in highest frequency, 13% of the total artifact assemblage, in the upper zone of the midden, the frequency declining to 3% in the lower zone. Manos and milling stones were often fragmentary, discarded when damaged; the complete milling stones were often large or heavy, and were probably cached near the rear wall of the shelter for use in future visits. Manos were often used as hammer stones, resulting in battering scars on one or both ends. As well, numerous hammer stones, granite cobbles or pebbles with battering scars, were found throughout the midden deposits. In the upper zone of the midden, hammer stones comprised about 11% of the total artifact assemblage, with a decrease in frequency to 6% in lower midden deposits.

Shell artifacts were very rare in the midden deposits. Simple spire-lopped *Olivella* beads were scattered throughout the midden, comprising ca. 4% of the total artifact assemblage from the site. Two small perforated disks of abalone shell were recovered from the upper zone of the midden, and an irregular fragment of abalone shell with two perforations came from the middle zone. Modified abalone shells, complete valves with series of parallel striations on the outer surface, were characteristic of the upper zone of the midden, where they comprised 7% of the total artifact assemblage.

Bone artifacts were even rarer than shell artifacts in the midden deposits; only five were recovered. Four were blunt bone points, all broken. A unique bone artifact from the middle zone of the midden was a large well-shaped cylindrical piece with a deep circular socket, apparently a haft.

Only two potsherds have been found in the shell midden, one at a depth of 10 cm below the surface and another at a depth of 60 cm, probably in a rodent burrow. Both sherds are a thick brown ware.

When the Abrigo de los Escorpiones was first seen on our survey, it was realized that this large, inviting rock shelter, situated well above present sea level but close to the coastline and productive shellfish beds, could hold evidence of the earliest population to occupy the Pacific coastal zone of the Baja California peninsula. Our excavations to date have demonstrated that the site has been utilized primarily as a shellfish collecting station since at least the early Holocene, for some 9,000 years. We have now discovered that in fact, the original rock shelter has been filled in by the accumulation of the shell midden; and we have still to penetrate its interior, where evidence of a Pleistocene occupation may yet be found.

Conclusion

Of the two rock shelters we have excavated, the interior site has proven to be primarily a lithic workshop, and the coastal site primarily a shellfish collecting station. Although the oldest dated deposits are approximately the same age, ca. 9,000 radiocarbon years, the early Holocene artifact assemblages recovered from the two sites are markedly dissimilar. On the coast at the Abrigo de los Escorpiones, thick flake scrapers, retouched or utilized flakes, and choppers were predominant in the early assemblage. Bifacial flaked projectile points were very rare, and most were broad, thin, and lanceolate in form, fabricated by percussion. In the interior at the Abrigo Paredón, bifacial flaking of preforms brought from nearby quarry sites was the major activity, and small narrow foliate projectile points finished by pressure flaking were characteristic. Of course the marked difference in artifact assemblages may be attributed to the different activities

at the two sites. It is of interest that associated molluscan remains at the Abrigo Paredón indicate that the knappers accessed shellfish resources from the Pacific coast, so periodic movement between coast and interior may be inferred. However, if the same people were represented at both sites, one would expect similarities in the style of artifacts such as projectile points. The two sites are over 300 km apart, so it seems most reasonable to hypothesize that two different groups were involved, and by early Holocene time, populations in Baja California were already territorially defined. Whether there was an earlier, ancestral population remains to be seen, and we plan to pursue the search by further excavations at the Abrigo de los Escorpiones.

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References cited

Arnold, Brigham

1957 "Late Pleistocene and Recent changes in land forms, climate, and archaeology in central Baja California", *University of California Publications in Geography* 10(4):201-318.

Aschmann, Homer

1952 "A fluted point from central Baja California", *American Antiquity* 17:262-263.

Dillehay, Tom D.

2000 *The settlement of the Americas: a new prehistory*, Basic Books, New York.

Dixon, E. James

1999 *Bones, boats and bison: archaeology and the first colonization of western North America*, University of New Mexico Press, Albuquerque.

Fladmark, Knut R.

1979 "Routes: alternative migration corridors for Early Man in North America", *American Antiquity* 44:55-69.

Gruhn, Ruth

1994 "The Pacific coast route of initial entry: an overview", in *Method and theory for investigating the peopling of the Americas*, Robson Bonnichsen and D. Gentry Steele, eds., pp. 249-256, Center for the Study of the First Americans, Oregon State University, Corvallis.

Hyland, Justin R. and María de la Luz Gutiérrez

1995 "An obsidian fluted point from central Baja California", *Journal of California and Great Basin Anthropology* 17(1):126-128.

Lavallée, Danièle

2000 *The first South Americans*, University of Utah Press, Salt Lake City.

Lemmen, Donald S., Alejandra Duk-Rodkin and Jan M. Bednarski

1994 "Late glacial drainage systems along the northwestern margin of the Laurentide ice sheet", *Quaternary Science Reviews* 13:805-828.