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A Fluted Projectile Point Fragment from the Southern California Coast: Chronology and Context at CA-SBa-1951

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RECENT archaeological research on the Santa Barbara coast yielded a fragment of a fluted projectile point among a larger lithic assemblage from CA-SBa-1951. The available data suggest that the fluted point has no direct temporal relation to the remainder of the site assemblage, which was obtained from a large low-density site that appears to date primarily to King's (1981) Early period. Although small, the fluted point fragment exhibits attributes common to classic Clovis-like points found elsewhere in California (e.g., Harrington 1948) and western North America. While similar fluted points have been reported from many interior California sites (Davis and Shutler 1969; Glennan 1971; Carlson 1983; Moratto 1984), only one coastal specimen has been reported previously. This was a Clovis point from the northern California coast (Simons et al. 1985). The CA-SBa-1951 fluted point extends the geographical range of Clovis points in North America and represents an extremely rare occurrence along the Pacific coast.

This paper discusses the geological and archaeological context of the fluted point from CA-SBa-1951, describes the technological and material attributes of the specimen, and explores two alternative hypotheses for the derivation of the point.



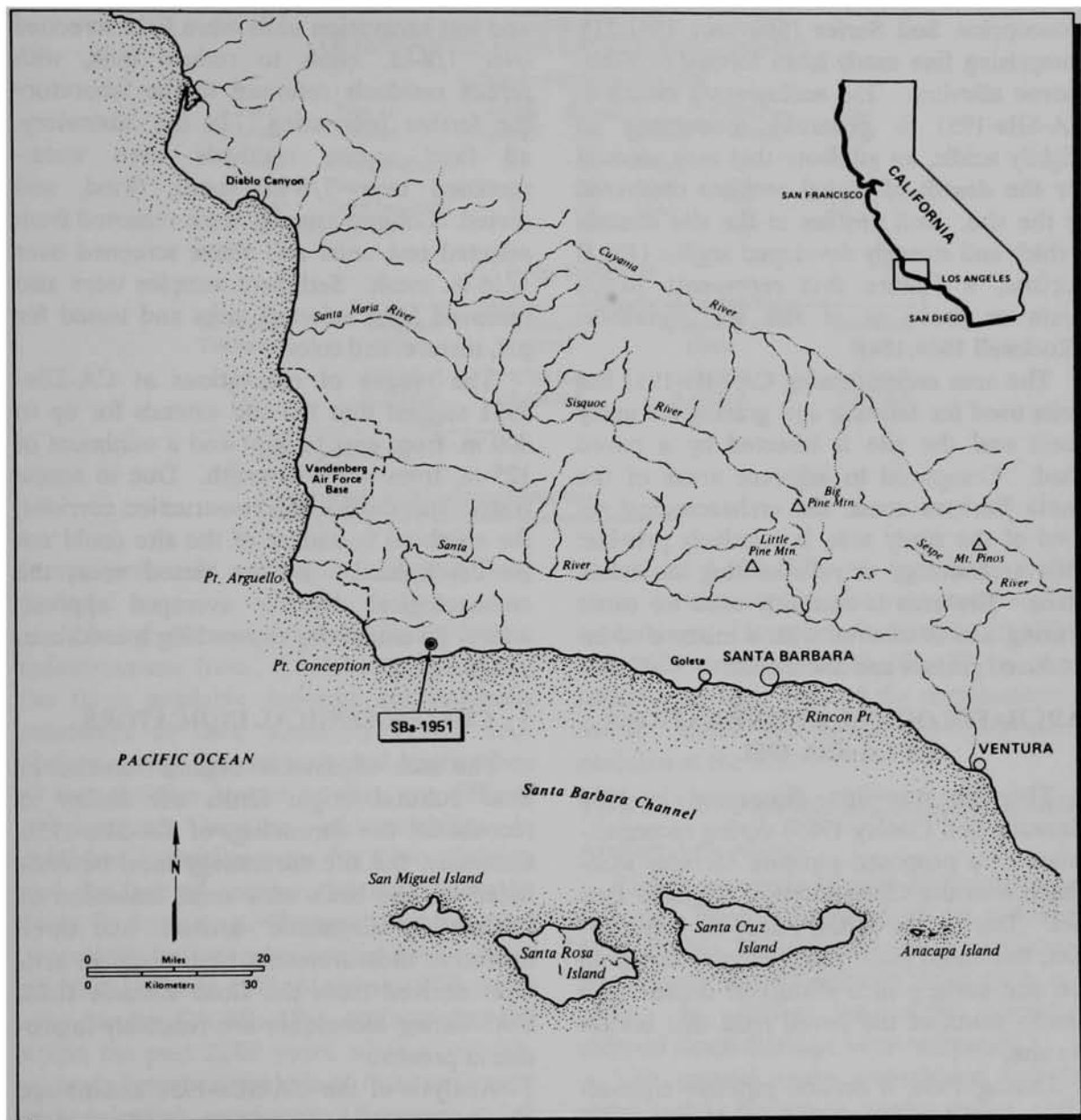


Fig. 1. Location of the fluted point find.

LOCATION AND SETTING OF CA-SBa-1951

CA-SBa-1951 is located approximately 60 km. west of Santa Barbara, California (Fig. 1). Gaviota State Park lies 13 km. to the east and Point Conception 9 km. to the west. The site is at an elevation of 60-70

m. (197-230 ft.) above sea level, 800 m. from the Pacific shore, at the north end of an uplifted marine terrace dating to the last interglacial. Canyons bracket the site on the east and west, and the Santa Ynez Mountains rise steeply to the north.

CA-SBa-1951 is the type locality for the

Concepcion Soil Series (Shipman 1981:21), comprising fine sandy loam formed in Pleistocene alluvium. The sedimentary matrix at CA-SBa-1951 is generally moderately to slightly acidic, an attribute that may account for the dearth of faunal remains recovered at the site. Soil profiles at the site contain a thick and strongly developed argillic (Bt) B horizon, a feature that represents 10,000 years or more of *in situ* soil formation (Rockwell 1984:124).

The area encompassing CA-SBa-1951 has been used for farming and grazing for many years and the site is bisected by a paved road. Compared to adjacent areas of the Santa Barbara coast, the archaeological record of the study area is relatively pristine: little archaeology or relic-hunting has taken place. The area is currently used for cattle grazing and is covered with a mixture of introduced grasses and low shrubs.

ARCHAEOLOGICAL INVESTIGATIONS AT CA-SBA-1951

The site was first discovered in 1985 (Imwalle and Cooley 1985) during reconnaissance of a proposed pipeline corridor associated with the Chevron Point Arguello Project. During the initial phase of investigation, the fluted point fragment was found on the site surface in a disturbed context two meters south of the paved road that bisects the site.

During 1986, a revised pipeline right-of-way was the subject of relatively intensive investigation, including several episodes of surface collection, excavation of 21 shovel test pits (STPs) and 25 test excavation units (10 units measuring 0.5 x 1.0 m. and 15 units measuring 1 x 1 m.), and controlled mechanical trenching with intensive archaeological monitoring. No additional Clovis-like artifacts were recovered.

All sediments excavated from the STPs

and test excavation units were field screened over 1/8-in. mesh to reduce bulk, with screen residuals returned to the laboratory for further processing. In the laboratory, all field screen residuals were water-screened over 1/8-in. mesh, dried, and sorted. Column samples were removed from selected test units and water screened over 1/16-in. mesh. Sediment samples were also removed from selected units and tested for pH, texture, and color.

The results of excavations at CA-SBa-1951 suggest that the site extends for up to 300 m. from east to west and a minimum of 125 m. from north to south. Due to access restrictions outside the construction corridor, the southern boundary of the site could not be determined. In the tested area, the archaeological deposits averaged approximately 80 cm. in depth, reaching a maximum of 130 cm.

CHRONOLOGICAL INDICATORS

The lack of datable organic remains of clear cultural origin limits our ability to reconstruct the chronology of CA-SBa-1951. Currently, the site chronology must be evaluated on the basis of a small collection of "temporally diagnostic" artifacts and three hydration measurements from obsidian artifacts derived from the Coso volcanic field. Both dating techniques are relatively imprecise at present.

Analysis of the CA-SBa-1951 assemblage suggests that the site was occupied primarily during King's (1981) Early period (ca. 3,500-8,000 B.P.). This chronological inference is based largely on the relative abundance of manos and metates and the near absence of artifacts diagnostic of later periods of Santa Barbara Channel prehistory (i.e., mortars and pestles). Aside from the fluted point, five projectile point fragments were recovered, including large side-notched and leaf-shaped

Table 1
OBSIDIAN HYDRATION DATA FROM CA-SBA-1951

A: Sample and Hydration Data						
Unit: Level	Type of Artifact	Width (mm.)	Weight (g.)	Source	Hydration Mean	Rind Range
4: 0-20	Biface fragment	18	0.6	Coso	7.6	7.4-7.8
6: 20-40	Flake	9	0.1	Coso	7.5	7.4-7.6
6: 40-60	Flake fragment	7	0.1	Coso	7.6	7.4-7.7
Site Mean (n=3)					7.57	

B: Age Calibration				
Mean Rind Thickness	Midpoint of Age Estimates			
	Meighan ^a (1983)	Ericson ^b (1978)	Koerper et al. ^c (1986)	SBA-2028 ^d Value
7.5	1,650 B.P.	2,580 B.P.	3,500 B.P.	6,293 B.P.
7.6	1,672 B.P.	2,614 B.P.	3,500 B.P.	6,376 B.P.

^a 220 ± 44 years/micron
^b 344 ± 69 years/micron
^c Logarithmic rate based on Orange County data
^d 839 years/micron based on 9 values from buried midden

forms commonly associated with the Early period.

Although the sample of obsidian hydration measurements from CA-SBa-1951 is small, the three available readings are internally consistent in their similarity (Table 1A). Unfortunately, the chronological implications of the obsidian hydration data are difficult to interpret because of variability in published hydration rates for Coso obsidian and the lack of comparative data from the Santa Barbara coast. Extrapolation from two general hydration rates published for Coso obsidian (Ericson 1978; Meighan 1983) yields ages for the CA-SBa-1951 artifacts that fall within the past 2,600 years, while a logarithmic rate based on analysis of Orange County archaeological specimens (Koerper et al. 1986:52) suggests an age of approximately 3,500 B.P. (Table 1B).

A hydration rate based on nine consistent readings for Coso artifacts from a nearby buried site (CA-SBa-2028) dated to 2,600 B.P. suggests that the hydration of Coso obsidian may occur at a slower rate under some circumstances. Application of the CA-SBa-2028 rate (839 years per micron) suggests that the obsidian artifacts from CA-SBa-1951 may be

as old as 6,400 B.P., an age that appears more consistent with the recovered artifact assemblage. However, the burial of the CA-SBa-2028 stratum beneath 100-150 cm. of alluvium may have reduced the temperature of the soil matrix and slowed the hydration of obsidian at the site.

THE EARLY PERIOD SITE ASSEMBLAGE

Artifact Assemblage

Eighty-one tools or tool fragments were collected during investigations at CA-SBa-1951 (Table 2), including 20 ground stone implements and 61 chipped stone tools and cores. In addition, over 6,000 pieces of chipped stone debitage were recovered.

The ground stone assemblage includes seven metate fragments, twelve manos, and a single hopper mortar. The manos and metates are typical of Millingstone assemblages found elsewhere along the southern California coast. Hopper mortars are generally found in later contexts along the Santa Barbara coast, although occasionally they may be found in Early period contexts as well (Owen et al. 1964:Fig. 6).

The CA-SBa-1951 chipped stone assemblage is dominated by debitage, almost 99%

Table 2
MAJOR TOOL CLASSES RECOVERED
AT CA-SBA-1951

Tool Class	Surface Collection	Test		Monitor	Total
		STP	Unit		
Metate	1	0	0	6	7
Mano	3	0	1	8	12
Hopper Mortar	0	0	0	1	1
Hammerstone	5	0	5	9	19
Biface	5	2	2	2	11
Borer/Drill	0	0	1	0	1
Flake Tool	5	2	6	4	17
Core	3	0	5	5	13
Totals	22	4	20	35	81

of which is Monterey chert, a rock type locally available in cobble form in beach, stream, and marine terrace deposits in the site vicinity. The chipped stone tools include 19 hammerstones, 10 biface fragments (excluding the fluted point fragment), 13 whole and partial cores, and 17 flake tools. All but three of the chipped stone tools were manufactured from Monterey chert, with the remaining three made of obsidian, chalcedony, and Franciscan chert.

The hammerstones include both battered cobbles used in chipped stone tool manufacture and intentionally flaked and battered cobbles probably associated with the manufacture and maintenance of ground stone implements (King 1967). The rectangular and irregularly shaped cores appear to have been used primarily to produce flakes for tool manufacture. Edge-wear characteristics suggest that nine of the recovered flake tools were used for scraping, four for cutting, and one as a drill. Five of the ten bifaces are too fragmentary to determine their function or temporal association. The remaining five bifaces are probably fragments of large dart points, with four leaf-shaped specimens (two with convex bases) and a single side-notched point fragment.

Faunal Assemblage

Only eight bone fragments totaling 0.91 g.

were recovered from the STPs and test units excavated at CA-SBa-1951. Of these, two canid bone fragments (0.79 g.) are clearly of recent origin and a shark tooth (0.02 g.) may be a fossil. The almost total lack of small mammal remains (only 0.01 g. recovered) in the site deposits, despite the presence of live gophers and other burrowing animals in the site vicinity today, suggests that soil acidity may be responsible for the disintegration of most bone (and possibly shell) that might once have been present at the site. Nonetheless, the presence of a single fragment of sea mammal bone (0.07 g.), along with small amounts of fish bone (0.08 g.) recovered from a column sample, suggests that some bone of cultural origin remains at the site. These faunal remains suggest a marine component in the diet of the later site occupants.

DESCRIPTION OF THE FLUTED PROJECTILE POINT

The fluted point fragment consists of the basal corner of a Clovis-like point, representing approximately 25-35% of a complete specimen (Fig. 2). A small fracture has also removed the very tip of the remaining basal tang or ear. Despite the fragmentary nature of the specimen, it exhibits several attributes characteristic of classic Clovis-like fluted points found elsewhere in the western United States (e.g. Harrington 1948). These "Clovis" attributes include: (1) a concave base; (2) a relatively straight lateral margin along the basal half of the specimen; (3) the removal of one or more channel flakes (flutes) on either face or surface of the point; (4) flutes that truncate the marginal retouch around the periphery of the point; and (5) the presence of pronounced basal and lateral edge grinding (Table 3).

The fluted point fragment is manufactured from a somewhat coarse-grained, opaque

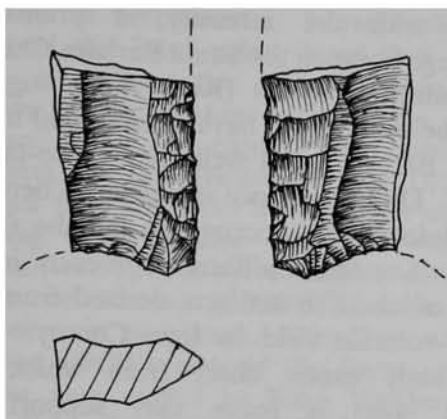


Fig. 2. Fluted point fragment (actual size).

Table 3

ATTRIBUTES OF THE CA-SBA-1951 FLUTED POINT

Weight	5.7 g.
Maximum Width	20.0 mm.
Maximum Length	27.5 mm.
Maximum Thickness	8.5 mm.
Estimated Basal Width	20.0 mm.
Maximum Visible Flute Width	12.0 mm.
Maximum Width of Marginal Retouch	8.5 mm.
Estimated Depth of Basal Concavity	6.0 mm.
Minimum Length of Lateral Edge Grinding	24.5 mm.

cryptocrystalline silicate. Fresh medial and lateral breaks expose a slightly marbled gray matte interior that is different from any known local chert source. The surface of the artifact exhibits a discontinuous reddish-orange mottling against the gray background of the interior. This discoloration is most intense within the fluted surfaces of the point fragment and more heavily developed on one side than the other. The discoloration cannot be scratched off and penetrates slightly beneath the surface of the stone. While the reddish-orange mottling resembles oxidation, its nature and origin remain unknown.

The manufacturing sequence for the fluted point is somewhat difficult to reconstruct due to the coarse-grained nature of the raw material. However, it is clear that the point was shaped through marginal retouch prior to removal of one main channel flake and at least one secondary basal thin-

ning flake on either face. Following removal of the channel flakes, the corner of the extant half of the base was bifacially re-touched. Finally, the lateral and basal edges of the point were intentionally abraded, with the ground edges reaching a width of nearly one millimeter in places. In contrast, no evidence of scratching or abrasion is visible on the flute surfaces or on the edges of more recent breaks.

DISCUSSION

Two possible explanations could account for the presence of a fluted projectile point on the Santa Barbara coast. The first is that the fluted point is an isolated artifact left by Paleo-Indians between 10,000 and 12,000 B.P. The second is that the artifact was found, perhaps used, and deposited there by later Indians. Several lines of evidence indirectly support the first argument: (1) the age of the surface soil at CA-SBa-1951 is consistent with the potential for Paleo-Indian occupation; (2) fossils of mammoth and other large Rancholabrean fauna are not uncommon along the Santa Barbara coast (Orr 1968:26); (3) CA-SBa-1951 is only 150 km. from Glennan's (1971) Tehachapi Mountains fluted point find, a distance well within range of mobile hunter-gatherers; (4) the Mendocino coast fluted point suggests that Paleo-Indians did occupy the California coast (Simons et al. 1985); and (5) the antiquity of shell middens on the south-central California coast has been progressively pushed back towards the terminal Pleistocene (e.g., Greenwood 1972; Glassow 1981), requiring ever more ancient predecessors for early Holocene coastal cultures.

Given these arguments, Clovis or related Paleo-Indian groups may well have occupied the southern California coast, or at least made occasional hunting forays into the coastal area. However, the extremely rare

occurrence of fluted points on the California coast argues against an extensive occupation, unless rising post-glacial sea levels (Bickel 1978), sea cliff retreat (Norris 1968), and sedimentation in coastal canyons have combined to destroy or bury most of the evidence. Exposures at the mouth of Arroyo San Augustine near CA-SBa-1951 indicate that as much as 9 m. of alluvium has accumulated in the canyon bottom during the Holocene (Rockwell 1984:121).

Paleo-Indian inhabitants of the Santa Barbara coast would have encountered a dramatically different environment than that present in the area today. During the terminal Pleistocene, the Santa Barbara coast appears to have been wetter than at present and the local flora probably contained a significant conifer and fern component (Heusser 1978). Between 11,000 and 10,000 radiocarbon years ago, sea level was rapidly rising from approximately 50 to 20 m. below the present level (Nardin et al. 1981:332; Inman 1983:8). According to bathymetric charts (National Oceanographic and Atmospheric Administration 1986) for the area, these lower sea levels would have extended the coastal plain by between 4.5 and 1.5 km. in the site vicinity, depending on the age and the place measured. Rapidly rising sea levels would also have inundated the lower reaches of coastal canyons (Inman 1983:19), forming marine embayments with productive estuaries at their heads (Erlandson 1985).

An alternative explanation for the presence of a fluted projectile point at CA-SBa-1951 involves the hypothesis that the artifact is a talisman or curio carried to the site by its later occupants. Davis and Shutler (1969:158) reported that some historic Mojave Indians recognized fluted points as good luck charms and suggested that some such points may be curios transported by prehistoric groups. This fact, when com-

bined with the intensity of prehistoric exchange between the Santa Barbara Channel and interior regions (King 1971), suggests that the point could have been traded to the Santa Barbara coast well after Paleo-Indian times. Direct evidence of exchange between the Holocene site occupants and the Great Basin of eastern California is present in the form of obsidian artifacts derived from the Coso volcanic field in Inyo County. The apparently exotic chert from which the fluted point is made may support the "talisman hypothesis."

SUMMARY

An apparently isolated fluted point fragment was recovered during archaeological investigations at CA-SBa-1951, a large and diffuse scatter of chipped and ground stone tools that probably dates primarily to the Early period. The fluted point fragment exhibits attributes generally found only on Clovis-like points dating to the terminal Pleistocene and is the only known example of such an artifact from the southern and central California coast. With the data currently available, it is uncertain whether the point is derived from a Paleo-Indian occupation of the Santa Barbara coast, or a "talisman" deposited by later inhabitants of the area.

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currently in preparation. Several colleagues examined the fluted point, shared their knowledge, or reviewed this paper, including Mike Glassow, Madonna Moss, Jean Harman, James Moriarty IV, the editors, and anonymous reviewers. Richard Hughes and Tom Origer of Sonoma State University conducted the obsidian sourcing and hydration analyses. Jeanette Simons (WESTEC) analyzed soil samples for pH, while Lori Santoro (WESTEC) analyzed the chipped stone assemblage. Greg Dean and Pat Lambert (UCSB) analyzed the faunal remains. Figures were drafted by Butch Weinberg and Mike Caldwell of WESTEC Services, Inc. The contributions of all these individuals are gratefully acknowledged, although the authors are solely responsible for the conclusions presented here.

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