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A Fluted Point from the Mendocino County Coast, California

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Recent discovery of a fluted, cryptocrystalline projectile point near Caspar, Mendocino County, California, completes documentation of the coast-to-coast distribution of this artifact form. Fluting, a highly refined stoneworking technological innovation having a limited temporal duration (late Pleistocene/early Holocene), is known in numerous North American localities – from the Debert site on the Bay of Fundy in Nova Scotia (MacDonald 1968) to, now, within ten meters of the Pacific Ocean at Caspar, an east-west distance of 4,788 km. (2,975 mi.).

In this report the depositional context and formal attributes of the Caspar fluted point are described and discussed. A recon-

struction is then offered of the probable Mendocino coastal habitat that could have been exploited by hunter-gatherers 11,000 years ago.

THE SITE

Since 1980, the Albion Archaeological Project of San Jose State University has been an ongoing research program of archaeological survey and excavation focusing on the northern coast of California in central Mendocino County. The work is being conducted with the approval and support of the Mendocino County Archaeological Commission. In August 1983, during investigation of a shell midden (CA-MEN-1918) near Caspar, a fluted projectile point was discovered lying on the sub-midden surface of a recently bulldozed cut running through the northern edge of the site. In the area where the fluted point was found, the about 20 m.-wide cut extended approximately 30 m. along an east-west axis and was roughly a meter deep. The main concentration of overlying shell midden had a depth of about one meter and covered an area approximately 1,600 m.² in extent. Given the generally good condition of its shell, which is contained in an acidic soil matrix, the midden is suspected to be no older than 1,000 years. The midden rests atop the wave-battered face of a receding coastal bluff, about 9.2 m. above a narrow rocky beach. An unnamed, seasonal stream is located just north of the midden.

The bluff forms part of the coastward side of Terrace 1, lowermost in a series of five marine terraces recognized in this region of coastal California. A generalized east-west geological and vegetational transect of the Caspar area is presented in Figure 1. The bottom of the bulldozer cut from which the fluted point was recovered penetrates slightly a sub-midden deposit composed of consolidated, yellowish, beach alluvium estimated to be of late Pleistocene age based on geo-

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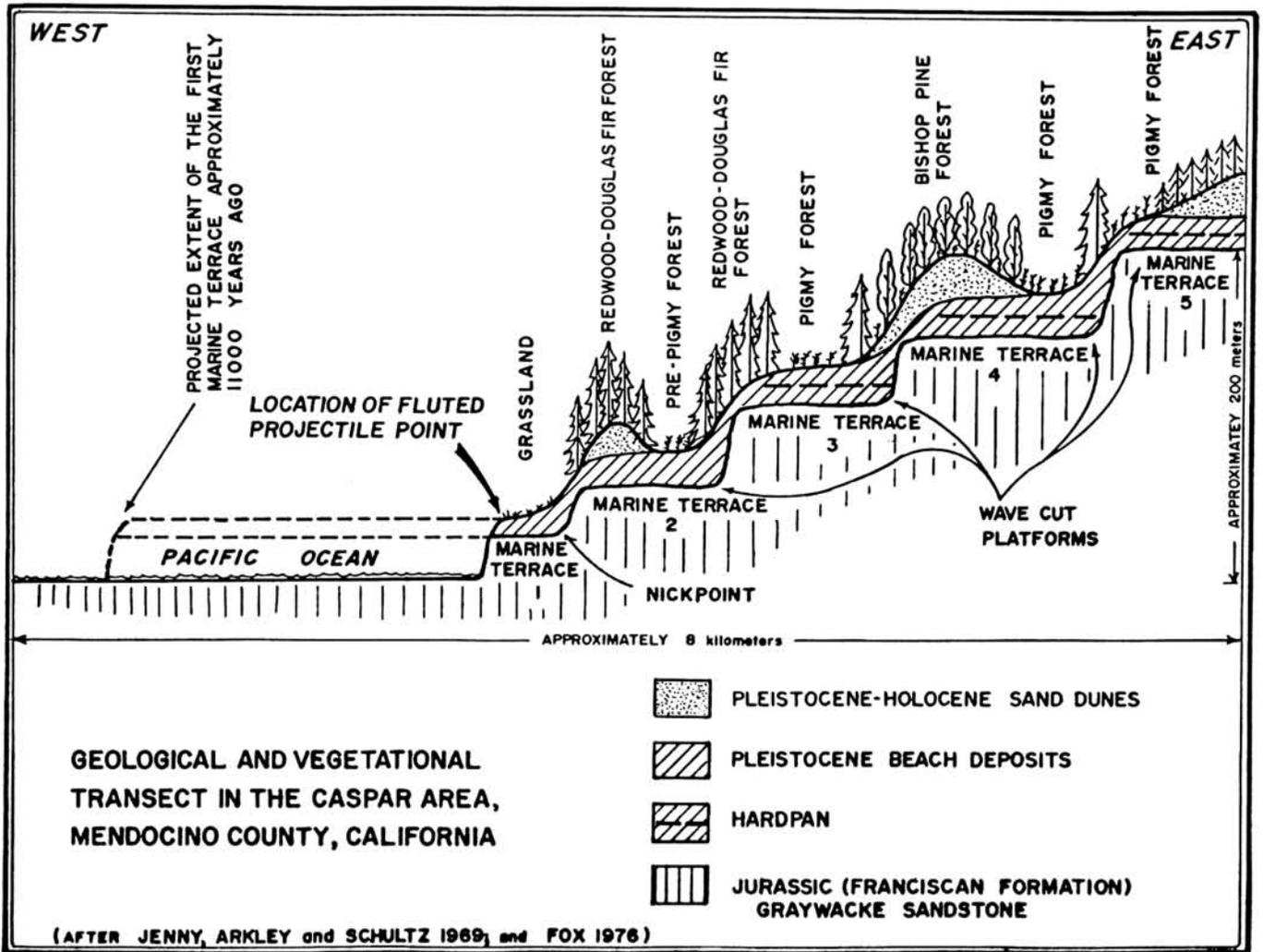


Fig. 1. Generalized east-west geological and vegetational transect of the Caspar area, central Mendocino County coast, California, showing the relative locations of the fluted-point site and the projected 11,000 B.P. shoreline (after Fox 1976; Jenny, Arkley, and Schultz 1969).

morphological analyses of marine terraces along the central Mendocino County coast (Barry and Schlinger 1977; Gardiner 1967; Jenny, Arkley, and Schultz 1969; Sholars 1982). A generalized geological section taken from the exposed bluff face, 20.2 m. south of the fluted point discovery site, is illustrated in Figure 2. Analysis of the section and the relationships among its component strata suggests to the authors that the original provenience of the fluted point was near the upper surface of the stratum of yellow beach alluvium. This interpretation is reinforced by the presence of beach alluvium of the same

yellowish color tenaciously adhering to the surface of the artifact. Hence, it seems unlikely that the fluted point is an heirloom piece attributable to the hunter-gatherers whose subsistence activities produced the overlying shell midden. No other cultural remains were discovered on the surface on which the point was located, and no organic materials suitable for radiometric dating were found in the yellow beach alluvium.

THE ARTIFACT

The fluted projectile point from CA-MEN-1918, with morphological and reduction-

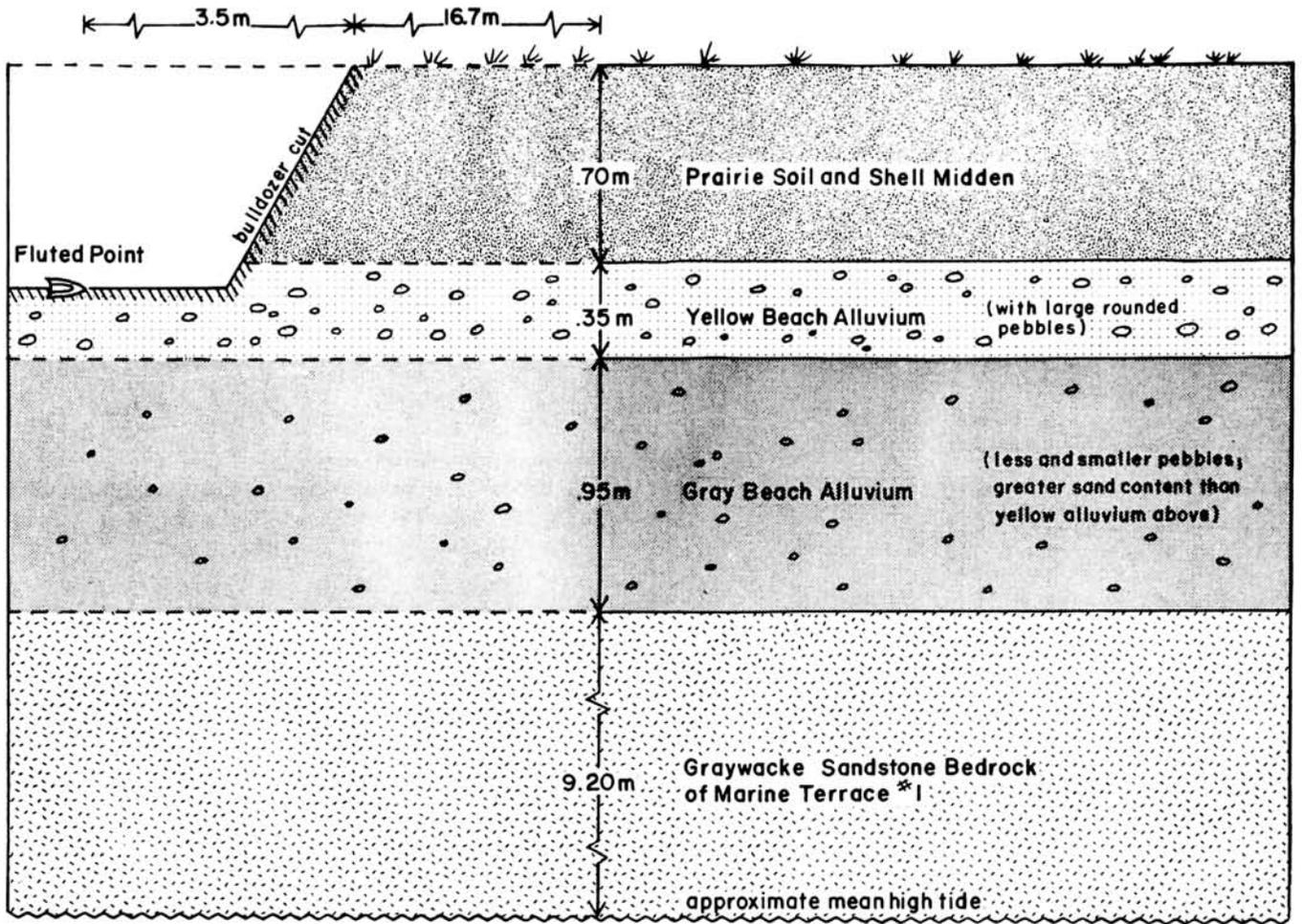


Fig. 2. Generalized geological section at the Caspar fluted-point site (CA-MEN-1918).

technology details noted, is illustrated in Figures 3 and 4. Facial and edge orientations are identified in the accompanying captions. In its present fragmentary condition, the specimen is 75.0 mm. long, 38.8 mm. wide and 10.3 mm. thick at a point 45.0 mm. above its proximal edge, and weighs 41.2 g. When complete, it is estimated that the artifact was about 115 millimeters in length and weighed about 50 grams. The point is made of a mottled, greenish-gray Franciscan chert that is slightly lustrous, particularly at a proximal break on the right edge of the dorsal face where an internal, "cracked," break scar is evident. A small, incipient pot-lid occurs on the ventral face. These two traits, along with the slightly reddish hue of portions of the point, could indicate that the chert was

annealed or deliberately thermally altered.

No data indicating the original core or primary flake from which the Caspar point was made are available. However, the dorsal face of the artifact displays evidence of the nature of the facially worked preform, probably a biface, which was shaped prior to fluting. As shown in Figure 4, approximately 25% of the remaining dorsal face retains secondary flake reduction scars. The scars are wide and may have been produced by soft antler billet percussion, hammerstone percussion, or by a punch. If pressure flaked, the tip of the flaking tool may have been relatively blunt. The secondary reduction scars indicate generally good control of the material.

Wide, longitudinally oriented thinning flakes, or "flutes," have been removed from

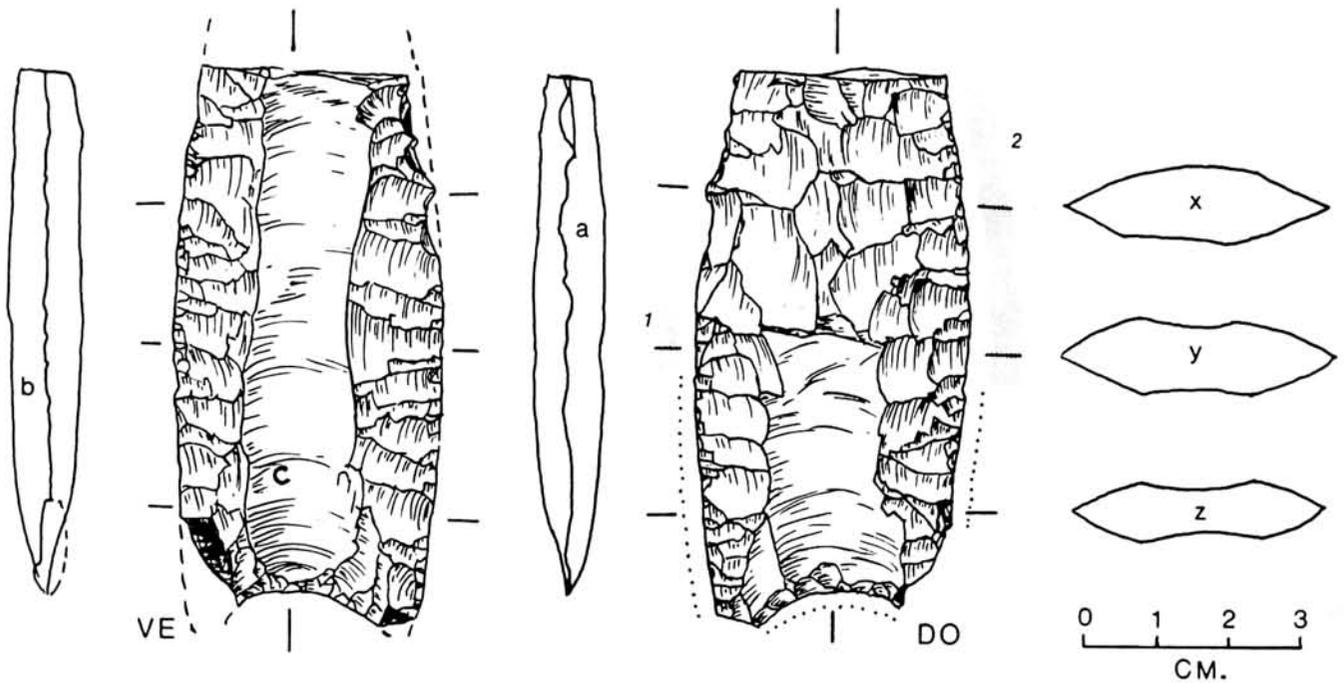


Fig. 3. Fluted projectile point from CA-MEN-1918. The dorsal face is on the right, ventral face on the left. Dotted edges are ground. Shaded and numbered units (e.g., 1, 2) are tool employable units as described in the text. Proximal position is to the bottom, distal position to the top.

both the dorsal and ventral faces of the artifact. At least two flakes were removed on the dorsal face; the first was an apparently smaller flake from the left side of the proximal edge, while the second was the major flute. The nature of the smaller flake scar suggests that it was one of a pair of flakes detached on each side of the centerline to create a platform for flute removal. This platform was removed during the fluting process. The dorsal flute terminates in a thin hinge at what is now the point of maximum artifact width and thickness. Four flakes, extending over the margin of the flute, were taken off the left edge of the dorsal face after the flute was removed.

On the ventral face of the artifact there is also evidence that smaller flakes were removed parallel to, but on either side of, the longitudinal centerline before the central flute was struck off. This flute either ran beyond the present length of the tool or caused its distal break. None of the lateral flake remov-

als along the edges of the ventral face appear to have been made after the flute.

Roughly 60% of each face retains evidence of final tool edging. Flake scars generally originate at or near the present edge, are generally long, oval-to-slightly-expanding and overlapping, and average six millimeters in width between arrises. These appear to have been removed in a skip-over-and-return sequence, thinning down high arrises while also regularizing the edge. They most frequently terminate in a thin hinge, appear to have been well controlled, and are likely to have been detached by pressure flaking despite the width and flatness of the scars. There is no evidence of a strong sequence of edge or face progression.

The proximal edge of the point is shaped into a concave planview (retaining a straight sideview) that, prior to corner breakage, is estimated to have been eight millimeters deep. The proximal edge is moderately ground, as is the lower 30 mm. of each lateral edge.

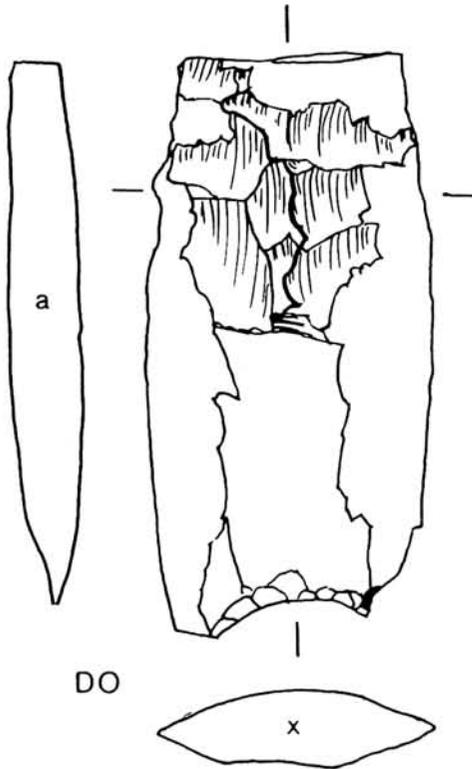


Fig. 4. Secondary reduction flake scars on the fluted point from CA-MEN-1918. View is of the dorsal face, highlighting flake scars of the secondary, bifacially reduced "preform" that was subsequently thinned, fluted, and edged to produce the tool illustrated in Figure 3. Note that the scars outlined in this figure are also shown in Figure 3.

Originally, 33-35 mm. of the lower lateral edges may have been ground. There is no indication as to whether the proximal corners were sharp or rounded. Lateral edge grinding appears to end at the point of maximum tool width, thickness, and distal termination of the dorsal flute. Proximal edge grinding is not associated with any macroscopically evident facial grinding or scratching in the related flute scars.

There are remnants of two employable units ("EUs," cf. Knudson 1983) on the Caspar point, one on each of the two lateral edges (Fig. 3). Both edges have a production edge angle (i.e., the angle formed by the edge and the primary facial plane of the tool) of 44° and an immediate edge angle of 52° . There is no evidence of scratching or polishing

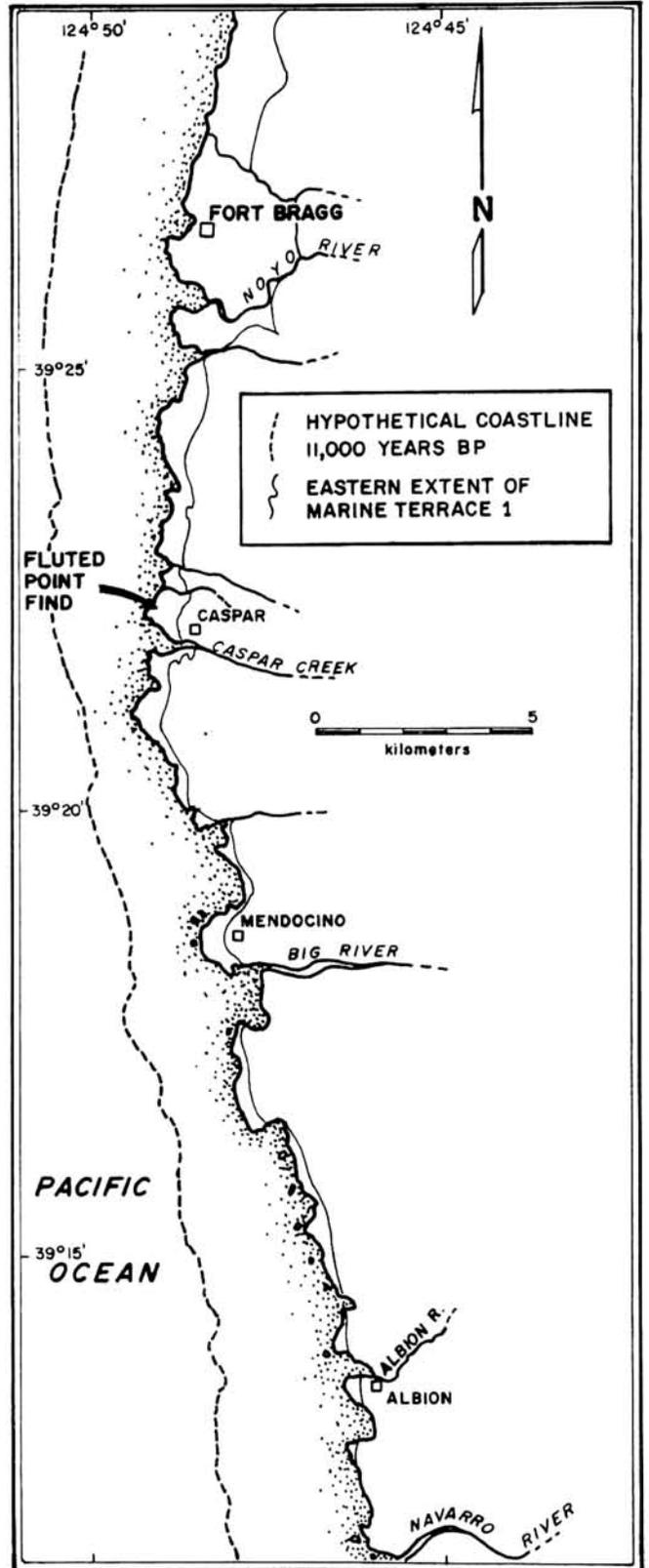


Fig. 5. Coast of central Mendocino County, California, showing the hypothetical 11,000 B.P. shoreline and extent of the lowermost marine terrace.

along these edges, nor of any crushing or ripping of the edge itself. There is also no evidence of facial polish associated with these edges. Macroscopic attributes, therefore, neither support nor disallow the possibility that these edges were used as individual cutting tools in addition to the functioning of the artifact as a projectile.

DISCUSSION

Fluted projectile points have been recovered from a number of localities in California (Carlson 1983; Davis and Shutler 1969; Moratto 1984: 79-88). These finds include those from China Lake Basin in the southern California desert (Davis 1978), the Witt site in the southern San Joaquin Valley (Riddell and Olson 1968), and the Borax Lake site (Harrington 1948) in Clear Lake Basin 113 km. (70 mi.) southeast of Caspar. At the latter site, geological and obsidian hydration studies suggest an early post-Pleistocene age for the fluted point assemblage (Kaufman 1980; Meighan, Findlow, and DeAtley 1974; Meighan and Haynes 1968, 1970).

Fredrickson (1973, 1974, 1984) assigned fluted points from the Borax Lake site to the provisionally defined Post Pattern, which currently represents the earliest recognizable archaeological manifestation in the North Coast Ranges of California. Although a detailed typological comparison is beyond the scope of this paper, the Caspar fluted point does not appear to closely resemble "classic" Clovis or Folsom point forms described from 11,500- to 10,000-year-old sites on the Great Plains and in the Southwest. Instead, the Caspar specimen is most similar to other fluted points reported in the Far West (Carlson 1983; Moratto 1984). There is a temptation to place the point within a previously defined archaeological horizon, such as the Post Pattern, but its occurrence as an isolated artifact with no clear artifactual associations in a highly disturbed context leads the au-

thors to regard it as presently unassignable to any established archaeological scheme.

Given its apparent deposition in soils of late Pleistocene age and its overall stylistic similarity to other fluted points considered to be of late Pleistocene age, a projected maximum absolute age of about 11,000 B.P. for the Caspar fluted point does not seem unreasonable. This estimate is, of course, counterbalanced to some extent by the disturbed depositional context and complete lack of associable cultural remains. The circumstantial evidence for such a temporal assignment is, nevertheless, strong.

Paleoenvironmental Reconstruction

Assuming a possible age of about 11,000 B.P. for the Caspar fluted point, the site of deposition probably was not situated, as now, immediately adjacent to the coast. Data presented by Atwater (1979: Figs. 5-6), Atwater, Hedel, and Helley (1977: Fig. 6), and Helley et al. (1979: Fig. 12) suggest that about 11,000 B.P. sea level along the central Mendocino County coast was roughly 75 m. (246 ft. [41 fathoms]) lower than today. Thus, the current 40-fathom line closely approximates the relative position of the shoreline 11,000 years ago (Fig. 5). At that time, the Caspar site would have been located 2.6 km. (1.6 mi.) inland from the Pacific Ocean.

Macrobotanical evidence, including the remains of wood, seeds, fruits, pine cones, and flowers, of the nature of late Pleistocene environments occurs at a number of sites along the California coast between Tomales Bay and Los Angeles (Axelrod 1967a, 1967b, 1977, 1980, 1981, 1983; Johnson 1977, 1980; Warter 1976). Associated radiocarbon dates range between 38,000 and 10,000 B.P., with most clustered between 25,000 and 13,000 B.P. (Axelrod 1981; Johnson 1977: Table 2). Data from these localities suggest a closed-cone pine forest community, dominated by Bishop pine (*Pinus muricata*) and

Monterey pine (*P. radiata*), was continuously distributed along much of the coast at the end of the Pleistocene from about 14,500 to 12,000 B.P.

Late Pleistocene - early Holocene pollen cores have been taken at various localities on the California coast (Adam 1985: Fig. 1); Adam, Byrne, and Luther 1981; C. Heusser 1960; L. Heusser 1978; Johnson 1983: Fig. 2). Analyses of the pollen assemblages suggest that during the late Pleistocene, the distribution of coastal vegetation was shifted approximately 2.5° southward in latitude relative to the modern pattern. At the time, temperatures may have been 2-3° C. cooler than now and precipitation about 20% greater, causing a southward displacement of plant species ranges of at least 150 km.

Paleobotanical and palynological data further indicate that the continuous distribution of closed-cone pine forest along the coast during the late Pleistocene was broken up during the early and middle Holocene. This restriction of closed-cone pine forest to a series of discontinuous stands, situated in favorable localities characterized by temperate climate and sufficient rainfall, was apparently caused by post-Pleistocene sea-level rise combined with the advent of warmer, drier, more temperate early- and mid-Holocene climates (see Adam, Byrne, and Luther [1981]), and Axelrod [1967a, 1967b, 1977, 1978, 1983] for conflicting models detailing this environmental change).

Extensive assemblages of late Pleistocene mammals have not been found on the outer coast of central and northern California (Kurtén and Anderson 1980; Lundelius et al. 1983; Savage 1951). Isolated finds of late Pleistocene large-mammal remains, including those of ground sloth, mastodon, mammoth, horse, camel, elk, and bison, occur at Greenoaks Creek, San Mateo County (Motz 1983), Mussel Rock, San Mateo County (Savage 1951), Fleishacker Beach, San Francisco

County (Savage 1951), Millerton Head, Marin County (Savage 1951), San Antonio Creek, Sonoma County (Savage 1951), Arena Cove, Mendocino County (Jahns and Hamilton 1971), and the Noyo River, Mendocino County (McCullough 1969). It seems likely that the principal species of large mammal present 11,000 years ago in the vicinity of the Caspar site was Roosevelt elk (*Cervus elaphus roosevelti*). This conclusion is supported by the observation that Roosevelt elk historically attained their greatest numbers along the northwest coast of North America in coniferous forests containing small clearings and situated in areas of relatively high precipitation (Bryant and Maser 1982; Graf 1955; Harper et al. 1967; McCullough 1969; Murie 1951) — environmental conditions likely to have characterized the Caspar area about 11,000 B.P.

SUMMARY AND CONCLUSIONS

Approximately 11,000 years ago, people using bifacially fluted projectile points probably inhabited the lowermost marine terrace at Caspar on the central Mendocino County coast in northern California. Mean sea level was about 75 meters lower at that time than at present in the region, the terrace was perhaps four kilometers wide, and the Caspar fluted-point site lay 2.6 km. inland from the Pacific Ocean. Late Pleistocene and early Holocene paleobotanical and palynological data suggest that about 11,000 B.P. a closed-cone pine forest community occupied this section of the northern California coast. Coniferous forests of this type would have provided ideal habitat for Roosevelt elk, which the authors believe to have been the most likely species of large mammal hunted at Caspar. The authors also conclude that the closed-cone pine forest at Caspar would have been poor habitat for other species of large mammals, such as ground sloth, mastodon, mammoth, horse, camel, and bison, all of

which occurred mainly at more southerly coastal localities during the late Pleistocene. Thus, it seems unlikely that any of these species were hunted at Caspar.

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