EARLY MAN IN CALIFORNIA AND THE TRANQUILLITY SITE

Gordon W. Hewes

A brief note in Science in the spring of 1943 reported the find of an association of human burials and artifacts with the remains of Camelops, Equus, and Bison, near Tranquility, Fresno County, California. The present paper is a more detailed description of the cultural remains and a fuller report of the writer's findings at the site prior to 1944. Excavations in that year by the University Museum, University of Pennsylvania, are mentioned below. They will be described in a forthcoming paper by Lloyd and Satterthwaite, to include a critical examination of the evidence for and against the contemporaneity of the human and extinct mammal remains.

In 1939, while on a reconnaissance archaeological survey of the central San Joaquin Valley for the University of California Museum of Anthropology, William C. Massey and the writer first visited the site, staying only two days. Three burials which had been exposed by wind and water erosion were removed, and a surface collection of artifacts was made. The condition of the bone material, human and animal, which was strikingly mineralized, led to further collecting trips in 1940 and 1941. A fourth burial was found in October, 1941, along with mammal bone later identified as belonging to the extinct genus Camelops. The site was revisited by the writer, his wife, and Mr. and Mrs. William C. Massey, after the identification of the Camelops material was made known, on December 7, 1941. The entrance of the United States into the war at this time disrupted plans for further work on the Tranquility site, and it was not until August, 1942, that a final visit was undertaken by the writer. The 1942 collection included the well-preserved mandible of a Camelops embedded in a hardpan matrix, along with bones identified as belonging to Equus and Bison. Although the total time spent on the site prior to 1944 was short and no excavation into undisturbed deposit was attempted, the number of artifacts and other specimens is considerable.

In April, 1944, a group from the University of California at Berkeley, including E. W. Gilford of the Museum of Anthropology, R. A. Stirton of the Department of Palaeontology, Carl O. Sauer of the Department of Geography, and Arden King of the Department of Anthropology, examined the site and made a small surface collection. From May 13 to June 6, 1944, the University of Pennsylvania Museum, in cooperation with the Museum of Anthropology at Berkeley, carried on carefully controlled excavations in an effort to determine whether or not the extinct mammals were contemporaries of man at the site. Dr. Linton Satterthwaite, Jr., of the University Museum in Philadelphia, and Mr. Malcolm Lloyd, Jr., of Philadelphia, took part in this work. The writer regrets that work in Washington made it impossible for him to participate directly, although he was enabled, through the cooperation of the University Museum, to participate indirectly in the excavation through study of the records, plans, cross sections, and photographs.

The site lies on the open plain in the central trough of the San Joaquin Valley, about 24 miles west of Fresno and approximately halfway between San Francisco and Los Angeles. As shown in Figure 26, the small town of Tranquility lies about 2½ miles southwest of the site. Fourteen miles west are the Diablo Range foothills, a part of the Coast Range; thirty-five miles east, beyond Fresno, are the foothills of the Sierra Nevada. The landscape in the vicinity of the site lacks perceptible natural elevations. Between Mendota, where the San Joaquin River flowing west out of the Sierras bends northwestward, and the summit of the low alluvial lobe which divides the San Joaquin

1 Hewes, 1943.
2 Hewes, 1941.
River basin from the Tulare Lake basin, the change in elevation is only forty-five feet. The elevation of the site itself is about 165 feet above sea level. The archaeological deposit occupies the upper portion of an old valley-filling soil which has developed a calcareous hardpan, identified by soil scientists as typical Fresno Hardpan. The soil consists of clay loam and fine sand, and has no natural inclusions of rocky materials. Under pre-agricultural conditions, prior to the introduction of irrigation in the last century, drainage was stagnant and poorly defined. The valley trough receives overflow from the Kings River to the south, which ordinarily drains into Tulare Lake basin but which may flow northward through marshy country to join the San Joaquin River system when the water level in Tulare Lake basin is higher than the alluvial barrier. For the past seventy-five years, surface waters have been subject to artificial control, with increasing diversion into the canals and ditches of irrigation districts, so that the flow of water in the vicinity of the site and the resultant erosion and sedimentation can be attributed to modern agricultural activity.

Summers are extremely dry, annual rainfall averaging about six inches; the soil becomes very hard, and there is wind erosion of barren surfaces. Climatically, the region is quite similar to the Mojave Desert. The vegetation is salt desert shrub except in the sloughs. A few willows and cottonwoods grow along the canals, but there are no oaks visible for about five miles in any direction, and there is no reason to suppose that any oak groves have been cut by the modern inhabitants. If acorns were a staple in the diet of the people who occupied the site, as they were in the diet of the historic Indians of central California, a vegetational change may be indicated for the area.

Superficially, the occupational and burial deposit is not sharply differentiated from the surrounding soil. The original limits of the occupation area are further obscured by the canal and levee on the south side. The canal, shown in Figure 27, is the main by-pass for Fresno Slough (Kings River Slough), which flows northward to the San Joaquin River. It rejoins the slough proper about two miles northwest of Tranquillity. The canal had existed for several decades before the building of the second levee, north of the site, which parallels the canal for a short distance. The north levee is apparently well outside the area of aboriginal occupancy.

In 1937–1938, with the building of the north levee, a sluggish northeastward flow of water established itself when the canal was overflowing and began to cut a shallow channel or “slough” across the archaeological site at A and B on Figure 27, continuing into the depression

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3 For the topography of the area, see the Jameson Quadrangle, United States Geological Survey, and Figure 26, which shows the location of the site in relation to geographic features of the Central San Joaquin Valley.
at D. From 1939 to 1942 this cross channel or slough had cut to a depth of about 30 inches in the artifact and burial deposit. The reported exposure of archaeological material in this cut led to the investigation of the site in 1939. At that time there were small bare areas considered to be the results of scraping. When interviewed by Satterthwaite, the former owner conceded that some of them might have been so caused but stated that others occur where this explanation is not applicable.

The top 30 inches of soil were cut as shown in Figure 27, exposing large sections of the Fresno Hardpan up to 60 feet in width; in other sections of the channel, or slough, either there is no underlying hardpan or it lies deeper than the present bottom. The chief occurrences of human, artifact, and faunal remains were (1) on the exposed Fresno Hardpan surface, 30–35 inches below the general land surface, onto which stone fragments, human and animal bone, and occasional artifacts appear to have been precipitated from the softer sand and loam soil which washed away; (2) in the soil, above the level of the hardpan, some in situ in the habitation and burial deposit and some in disturbed, redeposited soil. On Figure 27, A marks the center of concentration of the artifact and bone collections and the exposed surface of Fresno Hardpan.

Three burials and many artifacts were found practically exposed, within a few inches of the general soil surface, mainly on the east side of the slough to the east of A, during the first visit to the site in 1939. Subsequent finds have come from lower surfaces or from excavation into the deposit. A fully articulated burial, designated as No. 4, from a level slightly below that of the Fresno Hardpan but in a section of the slough, which was removed. In small crevices of the exposed upper surface of the hardpan there are calcareous inclusions, which would lead to the assumption that at one time the specimen lay more deeply embedded than at present. As a result of recent examination of this specimen, a soil scientist suggests that the hardpan had not reached its present state of hardness when the jaw was deposited; at any rate, the hardpan did not antedate the jaw. Within 10 inches of this mandible there were small fragments of stone, apparently belonging to the archaeological deposit. None of the Camelops remains occurred in the immediate vicinity of human burials, but artifacts, including points, were found within a deposit.

The bared surface of the hardpan was littered with minute fragments of flint, chert, and obsidian, other splinters of stone and bone, and a few pieces of fire-reddened clay; vermicular calcareous concretions, some of considerable size, also lay on the exposed hardpan. No artifacts, bone, or fragments of rock appeared beneath unbroken hardpan in the subsoil which was examined; it is presumed, though not verified by extensive removal of the formation, that the hardpan marks the lower limit of the archaeological deposit.

The faunal remains, heavily mineralized—a condition also characteristic of the human skeletons—are the most striking feature of the collections. Almost all bone, including artifacts of this material, has remarkably increased density, increased hardness, and a purplish-gray to nearly bluish-black color; mineralogically the replacement is collophane, a form of calcium phosphate. The fauna identified includes the following:

1. Camelops (sp. indet., probably hesternus): two mandibles, an astragalus, and fragments of teeth. Camelid identification was made from the astragalus by Dr. Chester Stock of the California Institute of Technology, Pasadena, in 1941. The mandibular material, obtained later, enabled Dr. R. A. Stirton to make a tentative generic identification of Camelops, probably hesternus. These finds came from the upper surface of the hardpan layer and from disturbed soil above it, 30–32 inches below the present land surface and near the base level of the recently eroded slough. The best-preserved mandible of Camelops is apparently adherent or "cemented" to the Fresno Hardpan matrix in which it was removed. In small crevices of the exposed upper surface of the mandible there are calcareous inclusions, which would lead to the assumption that at one time the specimen lay more deeply embedded than at present. As a result of recent examination of this specimen, a soil scientist suggests that the hardpan had not reached its present state of hardness when the jaw was deposited; at any rate, the hardpan did not antedate the jaw. Within 10 inches of this mandible there were small fragments of stone, apparently belonging to the archaeological deposit. None of the Camelops remains occurred in the immediate vicinity of human burials, but artifacts, including points, were found within a deposit.
FIG. 28.—Artifacts from the Tranquility site. a-o in the University of California Museum of Anthropology; p-z in University Museum, Philadelphia. a, yellow chert, 1-61917; b, obsidian, 1-61918; c, reddish chert blade with broken base, 1-61946; d, fragment of obsidian blade with transverse flaking, 1-64946; e, f, basal fragments of obsidian points, 1-64946, 1-64622; g, fragment of schistose point, 1-61920; h, fragment of brown chert point, 1-61919; i, basal fragment of reddish
thirty-foot radius on the exposed hardpan.

2. *Bison*, perhaps of the modern species, is represented by an orbital fragment and some tooth fragments. While bison were unknown in the region in historic times, their remains have been found in archaeological sites on Buena Vista Lake, at the south end of the valley. This suggests fairly recent survival of bison in central California.

3. *Equus* is represented by tooth fragments whose condition makes specific identification impossible. One fragment of a horse's tooth, together with stone and bone materials, lay on the surface of the hardpan not far from the place where the *Camelops* mandible was found. Some remains of horses' teeth were found in juxtaposition with small obsidian chips in sandy soil at the north end of the slough channel, marked C on Figure 27. Remains of *Equus* had acquired the color which is characteristic of the other bones and teeth and which apparently results from the process of mineralization at this site. It is, of course, possible that the horse remains belong to the period of white contact and are no older than the late eighteenth century; if so, they are the only recognizably recent intrusions into the cultural material, which lacks the broken glass, ceramic beads, and traces of iron objects which are encountered on sites of the contact period in the San Joaquin Valley.

4. Other identified remains of mammals include *Cervus nannodes* (tule elk), *Antilocapra americana* (American antelope), *Canis* sp. (dog or coyote), *Urocyon cineroargentus* (gray fox), *Taxidea taxus* (badger), *Lepus californicus* (jack rabbit), *Scapanus* sp. (mole), and *Thomomys bottae* (pocket gopher). The remains of badger, jack rabbit, pocket gopher, and fox may be those of animals which died in their burrows, but it is highly probable that the bones of the larger mammals were brought together as the result of human hunting activities.

5. A few small and unidentified fragments of chert point, 1-64946; *j*, yellowish chert scraper 6 mm. thick, worked one side only, 1-51576; *k*, obsidian scraper 7 mm. thick worked both sides, 1-64946; *l*, schistose drill, maximum thickness 3 mm., 1-61922; *m*, three of fifty-six obliquely lopped beads made from *Olivella* shell beads associated with burial, 1-51182; *n*, bone point, broken at base and scratched around tip, elliptical cross section, heavily mineralized, 1-51176; *o*, fragmentary highly polished spatulate bone artifact associated with Burial 3, 1-51181; *p*, pinkish stone point, A51, from hard surface; *q*, fragment of gray-black obsidian blade, A2, found in hard stratum, depth 15½ inches, in Test Pit 1b, about 15 feet from position of Burial 4; *r*, basal fragment of obsidian point apparently reworked from longer blade, A32, from on or near hard surface, cf. e and f; *s*, dull black scraper, A50; *t*, brown flint, A33c, from hard surface; *u*, obsidian point, A43, from north side of slough; *v*, brownish mineralized bone point with flattish cross section, broken at base, A93, from hard surface; *w*, fragment of obsidian drill, A72, from surface of Fresno Hardpan; *x*, obsidian point, A19, from loose surface in slough; *y*, reddish chert point, A1, from loose sandy surface in slough; *z*, reddish chert point with broken base, A39, from hard surface below sand. *e*-*l*, *n*, and *s* are from the surface.

Human skeletal remains at the Tranquillity site can be separated into material from articulated, intentional burials which retain their original positions and material from disturbed burials, scattered by erosion of water and wind, probably within the last few years. Five skeletons were found in a relatively undisturbed condition, the first three within a few inches of the present surface. Burial 4, better preserved than the rest, lay 39 inches below the present surface, at a level slightly below the hardpan layer but in a section of the slough channel where no hardpan was present. The matrix of Burial 4 was an indurated soil, not true hardpan, onto which a somewhat lighter soil seems to have been introduced as part of the burial preparation. All the burials still in position were semi-flexed, but there was no uniformity in their orientation. Artifacts occurring in burials were few. There was a point with Burial 1, and a fragment of an obsidian point may have been associated with Burial 2. From Burial 3 came a fragment of polished, worked bone, and from Burial 4, a chipped flake of chert. With some of the scattered skeletons not designated by burial numbers there were a total of fifty-six obliquely lopped beads made from *Olivella* shell, five spire-lopped beads from the same species, and one disk bead of clamshell 10 mm. in diameter.

All except Burial 5 lay in an exposed or partially exposed condition prior to removal. Only Burial 5 was excavated from an undisturbed surface; a detailed description of this burial will appear in the report of the University of Pennsylvania Museum. As stated previs-
ously, all bone, human as well as animal, was heavily mineralized.

By arrangement with the Museum of Anthropology at Berkeley, all human skeletal remains from the site have been gathered together temporarily at the University Museum in Philadelphia for repair, study, and reporting by Dr. J. Lawrence Angel.

Cultural evidence in addition to the burials was fairly abundant, although there were, unfortunately, few artifacts with traits of "diagnostic value." Chipped stonework and raw materials were of a variety of stones: obsidian; yellow, red, and green chert; chalcedony and other flint-like materials; along with schistose and slaty substances. A few complete points, fragmentary points and blades, a drill, some scrapers, and chipped pieces too incomplete to identify make up this category of the collection. Figure 28 illustrates chipped stone items found by University of California and University of Pennsylvania parties, the latter being included by courtesy of the Pennsylvania institution. The obsidian points and blades include some with transverse flaking, but really fine secondary flaking is lacking.

Among the artifacts of ground stone are numerous roughly oval mullers (manos), two fragments of metates, several fragments of pestles, and parts of at least two mortars made from boulders with little or no finishing of the outside surface. Two flattish stones with roughly chipped side notches probably were used as net sinkers. Several quartzite hammerstones, a possible "charmstone" with grooved end, and sherds of steatite which may have been fragments of crudely finished steatite vessels were found. An unworked quartz crystal, some lumps of asphaltum, and a large quantity of broken stone, foreign to the locality, may be mentioned, although they are not artifacts in a strict sense.

Bone implements include a long dagger-like cannon bone awl; three blunt points, two of which are illustrated; two spatulate fragments with a high polish; and one awl made of the ulna of an ungulate. Shell objects, in addition to the *Olivella* beads associated with the burials and the disk bead, are represented by two cut shell pieces, one triangular, both of rather crude workmanship and about 7 cm. wide. No abalone shell was identified, although shell artifacts made from abalone occur elsewhere in the San Joaquin, appearing in abundance in the Sacramento Delta horizons as well as at Buena Vista Lake.

Lumps of burned clay, two with stick and pole impressions and one with imprints of tule leaves and of unidentified plant fibers, suggest structures or matting. No pottery was found, but its absence is not significant since it has never been reported from archaeological sites in the region or in the areas to the north except in the form of lumps and figurines.

In a consideration of the archaeology of the Tranquility site and its possible significance in the study of Early Man in California, its paucity of in situ associations of faunal remains, artifacts, and burials cannot be too strongly emphasized. With the exception of the beads and other materials found with the burials, only one artifact (the large obsidian blade, Figure 28, q) can be said to have been excavated from a position in the soil which it had occupied without disturbance for a long period of time. While the large fragments of metates, pestles, and mortars presumably had not been transported very far by action of wind or water in recent years, it is unlikely that they were found in the exact position in which they were originally deposited. A large part of the site which may contain burials and faunal remains was not excavated, and, as Satterthwaite's paper will show, the presence of floodwater prevented a complete investigation of the hardpan surface on which the *Camelops* mandible was found in situ. With such incomplete evidence as is now available, it may be premature to draw too many conclusions about the site. As Satterthwaite will show in his paper, the weight of evidence from his stratigraphic work, concerned primarily with sequences of soil layers, does not seem to indicate contemporaneity of burials with at least the *Camelops* mandible found in situ on the surface of the Fresno Hardpan. Whether this is sufficient to rule out the possibility of contemporaneity of man with the other remains of *Camelops* collected at the site this writer is unwilling to say. Certainly conditions here are as favorable as those of any open valley site could be for the preservation of any evidence of contemporaneity.

The possible alternative interpretations of the Tranquility site may be summarized as follows:

1. The remains of extinct animals long antedate the human occupancy; the association
with burials and artifacts is entirely fortuitous, and the striking mineralization of both human and other bone at the site is irrelevant.

2. The earliest human occupancy may have been contemporary with some of the *Camelops* and other animal remains, but other artifacts and burials are demonstrably later than the only in situ specimen of *Camelops*.

Other explanations, including the suggestion that human beings simply carried in fossil specimens of *Camelops* as curios from elsewhere or the suggestion that the cameldid represented is not the extinct American genus but the Old World draft animal used experimentally by the United States Army in California in the middle of the last century, seem to be invalid.

At the present time it is difficult to say on which side the burden of proof for contemporaneity or non-contemporaneity should rest. In contrast to the situation in American archaeology a generation or more ago, the association of a certain extinct mammal with human burials and artifacts is no longer likely to set off a controversy; whether or not the Tranquillity site represents it, the discovery of an archaeological deposit containing indisputable human burials, bones of extinct mammals, and artifacts is definitely to be expected. Such a discovery may be made in a cave or on an open site in an arid region such as the San Joaquin Valley. In the case of the Tranquillity site, none of the elements present—extinct species, human skeletons, or types of artifacts—would be in itself out of place in a fairly ancient association. Only the proof of contemporaneity within the deposit is still missing.

In conclusion, one is safe in repeating the statement made in 1926 by Gifford and Schenck, in their pioneer work on the archaeology of the southern end of the valley, "... from the time of man's first appearance in America to the historical epoch, the San Joaquin valley has offered a suitable habitat for him, and one which has not essentially changed during this interval."

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**ARCHAEOLOGY IN THE PUNTA PEÑASCO REGION, SONORA**

E. W. Gifford

The incentive for an archaeological reconnaissance of this region (see map, Fig. 29) by Mrs. Gifford and myself in the fall of 1944, and again for a single day in November, 1945, came from reading references to kitchen middens in the report of the conchologist H. N. Lowe:1 "The numerous large kitchen middens at Punta Peñasco and Punta La Cholla contained thousands of these *Glycimeris maculata* with rarely a valve of the much larger *G. gigantea*. With these were quantities of the huge *Cardita affinis*, *Chione, Ostrea, Paphia, Cardium*, and large *Murex*. No stone artifacts or black earth were noted in any of these shell heaps. Perhaps the early inhabitants preferred their shell-fish raw." At Punta Peñasco these "middens" proved to be uplifted marine deposits which Dr. Leo G. Hertlein of the California Academy of Sciences identified as Late Pleistocene, basing his opinion on specimens and photographs.

The two headlands mentioned by Lowe (Punta Peñasco and Punta La Cholla) form the southeast and northwest promontories that bound the small Rocky Point Bay, which lies

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1 Lowe, 1934, p. 4; see also Lowe, 1935, pp. 27-32.