

Apart from specific information concerning individual sites it is possible to reconstruct from physical analysis some idea of the broad environment of prehistoric times. This remains true, even if that environment is at present radically different and even if no direct documentary or ethnographic data are available. Thus from the twenty-odd sites we have studied we could deduce that they encompassed four clearly distinct habitats. Thus the Central Valley mounds with their content low in rock, moderate in charcoal, high in fish and bird bone with traces of shell bespeak a river bank culture with much alluvial land, rich in aquatic food but without forest resources. The Bay region sites demonstrate the presence of a hilly or rocky terrain, with good wood supply and enormous reserves of food in the form of shellfish. The Mendocino County deposits with their huge residues of rock and charcoal indicate a hilly, brushy or forested region with chief dependence upon plant food and mammals. The Santa Barbara deposits show again a costal area where inland the topography and biota resemble the Bay region but where the aquatic fauna was different. This in turn seems to be reflected in cultural divergencies.

Not only geographical but temporal deductions may be made. Of these the most important is that the Central Valley habitat appeared to undergo no significant change with respect to living conditions from the inception of the earliest known cultures down to the advent of the white man.

Clearly such conclusions can be couched only in terms of the broadest generalities. As refinements in technique, however, permit us to draw finer and finer distinctions it should become feasible to derive a reasonably clear idea of many aspects of lost civilizations which elude conventional qualitative and purely descriptive examination. The examples just cited give a fair preliminary indication of the type of information which may be secured by subjecting midden deposits to a careful quantitative analysis.

2. OBSERVATIONS ON EARLY MAN IN CALIFORNIA*

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More than forty discoveries of human skeletal remains or man-made artifacts claimed as ancient have been made in California in the past century.¹ Not one of these has been unqualifiedly accepted by American archaeologists as constituting evidence of early man or the Paleo-Indian in the same sense that the foremost student of the subject, F. H. H. Roberts, employs the word.

The celebrated hoax in the form of the Calaveras skull, said to have come from the Pliocene gravels in a mine shaft near Altaville at a depth of 130 feet, was finally disposed of by the investigation of W. H. Holmes of the Bureau of American Ethnology about 1900. Not one of the numerous finds of chipped and ground stone implements claimed to have been recovered from the auriferous gravels of the Sierra Nevadas has been authenticated, yet as

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recently as 1948 Ruggles-Gates in his Human Ancestry expresses the belief that they may yet prove to be of equal antiquity to the Tertiary and Quaternary gravels from which they were claimed to have been excavated. The several caves in the western slope of the Sierra Nevadas excavated or reported upon by Merriam, Furlong, Putnam, Sinclair, and Stock, and known as Potter Creek (Sha-48), Samwell (Sha-49), Stone Man (Sha-50), Mercer (Cal-11), and Hawver (Eld-16) caves yielded no reasonably credible artifacts of human remains of Pleistocene date, though considerable discussion was printed regarding the possibility of certain chipped stone tools and possible bone artifacts as having been made by human hands and being contemporaneous with the remains of extinct animals also recovered from the caves.

At Borax Lake (Lak-36), near Clear Lake, M. R. Harrington believes he has recovered evidence of the Folsom, and perhaps a pre-Folsom culture.² The dating of the site by Antevs was based largely upon the artifacts found. Antevs in 1939 concluded that the Borax Lake site was occupied sometime between 35,000 and 10,000 B. C. Ten years later he revised his opinion and now dates the site from the period 5000 to 2500 B. C.³ If Antevs is now correct in his dating of the Borax Lake site, the whole construct of typological-chronological teleconnexion established by Harrington falls. Harrington, following the hazardous method of equating typological similarity of two lots of artifacts widely separated geographically with chronological equivalence, was led to believe that the Borax Lake site was occupied at the same time the true Folsom culture was in operation further east and south. Not only have other students pointed out that the typological similarity of the fluted Borax Lake specimens and those of classic Folsom form is not at all close⁴ but in addition the Borax Lake site, in a large number of its traits, resembles closely that of the Middle Horizon culture of the Sacramento Valley which probably does not date farther back than 1000 B. C.⁵ When the archaeological complex of one site can be reasonably assigned a position in a well established local sequence, the necessity for dating it with reference to a series of sites 500 to 1000 miles distant is not apparent. I am not here primarily concerned with classifying the Borax Lake site per se, but to make the point clear that the Borax Lake site cannot, at this time, be held up as an example of the presence of the Paleo-Indian. I also wish to make clear the fact that I am not criticizing Mr. Harrington's work or his report which I believe he wrote in good faith and with the reservation that future work might correct or alter the conclusions at which he arrived.

In the interior desert of Southern California two independent groups of investigators have come to widely variant conclusions in regard to the dating of the lithic complexes believed to be associated with strand lines and terraces of former Pleistocene and Postpluvial Lakes. Malcolm Rogers' Playa culture is the Lake Mohave culture of Mr. and Mrs. Campbell who, when their study was made, were associated with the Southwest Museum. To the Pinto Basin culture first named and described by the Campbells, Rogers adds the Gypsum Cave complex as contemporaneous in time and partly concurrent in distribution. Rogers believes the Playa or Lake Mohave culture to be about 3000 years old; the Campbells date this culture as at least 15,000 years old on the strength of Antevs' study in 1937 of the geology. Antevs is at present of the opinion that the Lake Mohave culture probably dates from 9 to 10,000 years ago. Aside from this notable lack of agreement by Rogers and Antevs concerning the dating of these stone tools, the injection of the Gypsum complex as coeval with the Pinto complex presents still another temporal problem. Harrington in his report published in 1933⁶ dates Gypsum Cave at

about 8500 B.C. or roughly 10,000 B.P. by employing a standard method in archaeology of calculating the time required for a refuse deposit to accumulate where some idea of the rate of accumulation can be estimated. In room 1 of Gypsum Cave, the type site of the Gypsum Culture complex, the Basketmaker culture was represented in the lower part of layer No. 1. Two fireplaces associated with remains of the extinct ground sloth Northrotherium lay directly beneath at a depth of three times that of the Basketmaker level. The Basketmaker culture was dated at 1500 B.C. by Harrington in 1933 and by multiplying this figure by the depth-of-deposit factor of 3, he calculated the age of the ground sloth-fireplace level at 10,500 B.P. or 8500 B.C. Basketmaker II culture is now believed to date from about 100-500 A.D., or from about 1400-1800 years ago. Multiplying this latter figure by 3 yields a corrected figure of 5400 elapsed years or a date of 3450 B.C. for the Gypsum Cave culture. When this date of 3450 B.C. is compared with Malcolm Rogers' Pinto-Gypsum date of ca. 800 B.C. - 200 A.D. we still have a discrepancy amounting to about 2500 to 3000 years. Apparently we must withhold a decision on the attribution of the Southern California desert cultures as truly representing remains of ancient man if age estimates by authorities are as widely variant as these appear to be. As a constructive observation, I may say that the Pinto-Gypsum culture blend identified by Rogers is of great potential importance to the study of Early Man in California for the reason that the Pinto culture stands as the only one which can be reasonably linked with a site outside California which has yielded cultural remains in association with extinct animals. Whether the ground sloth lingered at Gypsum Cave into the very recent period as it did at Sandia Cave in New Mexico, or whether the Gypsum Cave culture is to be dated by the corrected Basketmaker tree ring dates as mentioned above, or whether the Gypsum culture actually proves to be 10,500 years old, it furnishes, I believe the most hopeful possibility for arriving at some true dating for at least one of the surface archaeological cultures of the Southern California desert region.^{6a}

This review of cultures, sites and dates might be extended at some length, but the main point I consider to have been now made. This is the fact that we have a considerable number of finds which have been confidently claimed to be ancient, but in each instance one or more alternative opinions or facts pointing to the relative recency of the find are at hand and must also be considered. Since a definitive conclusion cannot be reached in these cases, the find must of necessity remain at that twilight position where it is labelled "possible, but not proven." If it were possible to get a few Carbon 14 dates for some of these discoveries, we should then have some temporal framework in which we could place the various culture. Possibly the Stahl site at Little Lake (Iny-82), Gypsum Cave, and discoveries which still lie in the future will give us the much needed date references, now so widely variable. Let me illustrate this point with a concrete example. If Rogers' proposal that the Gypsum and Pinto cultures overlapped in time in the Southern California desert is generally accepted, and a date for the Gypsum Cave site is secured by the Carbon 14 method, the Pinto culture will be automatically dated. The Gypsum date might then be expected to correlate with a Carbon 14 date from the Stahl site, a Pinto culture occupation site which will probably yield charcoal. Dating of the Pinto culture may then stimulate renewed investigations into the relationship between the Pinto and Playa or Lake Mohave culture. Rogers suggests that the terminal Playa culture is contemporaneous with Pinto-Gypsum, and the Campbells agree with this to the extent of attributing to the Lake Mohave culture greater antiquity than to the Pinto culture. By this sort of analysis, both pre- and post-Pinto-Gypsum cultures might be guess-dated

and a culture chronology which would be generally acceptable would result. At least two dates, such as those suggested above, would be required for drawing up such a chronology.

From in and around Los Angeles have come three finds of skeletal material recovered under conditions suggestive of considerable antiquity. None has been adequately described, either as to the geological conditions, or as to the exact morphological nature of the bony remains. I refer to the skeleton from Pit 10 in the La Brea asphalt deposit (LAN-159) and attributed to the Recent or Postglacial period; the Angeles Mesa skeletons, six in number, recovered in 1924 from depths of 19 to 20 feet (LAN-171); and the skeleton found at a depth of 12 or 13 feet near Inglewood (LAN-172) in 1936, and known as Los Angeles man. The last two finds in particular seem deserving of further study by qualified investigators in the Los Angeles area, since any human remains buried at such depths were almost certainly interred when the land level was lower than at present.

After calling attention to so many doubtful finds, it would be less than fair if I did not enter the lists as the champion of a discovery which I feel may, but hasten to add, does not certainly, represent the remains of a California Indian of respectable antiquity. I refer to the Stanford Skull discovered in 1922 on the Stanford University campus (SCL-33) by a student. The student, Mr. Bruce Seymour, found the skull in the vertical bank of San Francisquito Creek, imbedded in a gravel layer at a depth of 20 feet from the surface and about 7 feet above the then present bed of the creek. The details of the stratigraphy and anthropometric observations on the calvarium are contained in a brief report which has just been issued by the University of California Archaeological Survey.⁷ The gravel layer in which the skull lay firmly cemented marks the bed of a former stream later buried under the Stanford alluvial cone and subsequently cut through, at right angles to the older buried channel, by the present creek. Dr. Bailey Willis and his colleagues (Buwalda, Stock, and Lawson) agree that the skull "was an indigenous boulder in the formation". Since the alluvial deposit non-conformably underlying the gravel is identified as the Santa Clara formation of Lower Pleistocene age, the gravel containing the skull is probably to be considered post-Pleistocene. Dr. Willis was of the opinion that the skull might be 4000 years old, and because of the impossibility of now rechecking the original observations we may accept his date with the understanding that it is the opinion of one observer, eminently qualified in geology and conditioned against foolish claims of ancient man through his association in the field and in publication with Hrdlicka in the investigation of claims of ancient man in South America. I believe this skull to constitute as acceptable an instance of relatively old human remains as any so far known in California, though if the Los Angeles or Angeles Mesa remains were adequately and critically reviewed they might hold as strong or even stronger claim to really ancient evidence of man in this state.

A further observation seems worthy making. What we should keep looking for is buried finds, because such discoveries offer more and varied approaches to estimating their antiquity than surface finds. Any implements, hearths, bones of food animals or of man himself thus interred may be dated by one or several of the various methods now known. Invertebrate remains, pollen, soil horizons, paleontology, conchology, geology, flourine content of bones, Carbon 14 content of organic materials or residues, and the like may yield a fairly definite date of the horizon in which the artifact or skeletal remains

lie. Such discoveries are probably being made every month in California as an incidental result of the enormous amount of earth moving attendant upon road construction, irrigation and flood control projects, excavations for industrial and home sites, and the like. When such finds are made, the only way in which the archaeologist can learn of them is by advertising the fact among the general public that these discoveries are important and should be immediately reported to the nearest museum or university. Secondly, each such report should be checked. For us to pass on this duty to the next generation as the last generation did to us, is to admit that archaeology is unimportant, and not worth the work it involves. Education of the general public which then acquires a sense of awareness and value of such discoveries will, by itself, be instrumental in creating a source for the necessary funds for salaries and field expenses with which to carry out the needed investigation of California's fast disappearing prehistoric record.

NOTES

1. Heizer, R. F., A Bibliography of Ancient Man in California. Reports of the California Archaeological Survey, No. 2, Berkeley, 1948. Site numbers employed are those in the files of The University of California Archaeological Survey.
2. Harrington, M. R., An Ancient Site at Borax Lake, California, Southwest Museum Papers No. 16, Los Angeles, 1948; Harrington, M. R., "Pre-Folsom Man in California." Masterkey, vol. 12, Los Angeles, 1938, pp. 173-175.
3. Letter to the author, January 1, 1949. Also see, Wormington, H. M., Ancient Man in North America. Denver Museum of Natural History, Popular Series, No. 4, 3rd ed., Denver, 1948, p. 104.
4. Wormington, op. cit., pp. 48, 101-105; Roberts, F. H. H., "Developments in the Problem of the North American Paleo-Indian." Smithsonian Institution, Miscellaneous Collections, vol. 100, pp. 51-116, Washington, 1940, pp. 92-94.
5. Heizer, R. F., The Archaeology of Central California I: the Early Horizon. University of California, Anthropological Records, vol. 12, No. 1, Berkeley, 1949, pp. 37-39.
6. Harrington, M. R., Gypsum Cave, Nevada, Southwest Museum Papers, No. 8, Los Angeles, 1933.
- 6a. Since this paper was written, I have received notice from Mr. Harrington that the Carbon 14 age determination of Gypsum Cave has actually been made. Now with a Gypsum Cave date it becomes most desirable to reinvestigate the Pinto-Gypsum culture complex, and to ascertain the Carbon 14 date of the Pinto culture itself in California. Mr. A. Treganza's recent field investigations in coastal and desert Southern California will, when published, show that some of the evidence of Mr. M. Rogers' conclusion that the Pinto and Gypsum cultures are contemporaneous is open to serious question.
7. Heizer, R. F., and McCown, T. D., The Stanford Skull, a Probable Early Man from Santa Clara County, California. Reports of the University of California Archaeological Survey, No. 6, Berkeley, 1950.