Early Man on Santa Rosa Island

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EARLY MAN IN NORTH AMERICA

American anthropology began about a century ago with a decided orientation toward ethnography inasmuch as many Indian tribes were still in existence and could be readily studied. Compared with the Old World there was no literary record to be found in the Americas, save for the only partially-understood glyphs of Mesoamerica. As a consequence, many aspects of American prehistory were shrouded in uncertainty. The question of the origin of early man in America could be answered on the basis of the racially-distinguishing features of the Indian population. They possess the Mongoloid appearance of the people of northeastern Asia. On the other hand, the time of entry of man from Asia into the New World was much more enigmatic. About 50 years ago the influential Smithsonian anthropologist Aleš Hrdlička (1928:491) declared: "The beginning of the migration into America did not take place before the time of the European late Palaeolithic or, more probably, the early Neolithic Period which reduced to years would be somewhere between possibly ten or at most fifteen thousands of years ago."

This picture of the American past gained notable quantitative support with the discovery and application of radiocarbon dating by W. F. Libby (1951) in the late 1940s. After it had been proven that radiocarbon measurements produce reliable dates by comparison of radiometric and known historical ages for the same samples, a committee of prominent archaeologists assisted in the selection of a number of important samples for Libby to date. As a result, the earliest clearly man-related dates in the Americas were found to be not older than about 10,000 years. In fact, it appeared that the end of the Pleistocene and the arrival of man in the New World were synchronous.

In California, over the course of the years, the Santa Barbara Channel Islands had become increasingly important in archaeological research. Santa Rosa Island in particular had gained a reputation for being rich in aboriginal sites and, moreover, in the occurrence of dwarf mammoth remains (Orr 1968). Interestingly enough, peculiar deep, red-baked circular fire areas had been found on the island, often in close proximity to the characteristically abundant dwarf mammoth remains. The suspicion thus arose very early that man and mammoth were somehow connected. Arguing against such a relationship was the notion that man had arrived in the Americas only at the very end of the Pleistocene, around 11,000 to 12,000 years ago. Indeed the oldest finds of human bone on Santa Rosa Island, at Arlington Springs, are dated at near that age (Olson and Broecker 1961, Berger in press). However, many fire areas were radiocarbon dated as much older (Orr and Berger 1966, Berger and Orr 1966), and it was suggested that these fires were actually pit barbecues, since so great a thickness of red-baked soil was inferred to be produced by digging a pit, filling it with burning embers, placing wrapped meat on top, covering that with more embers, and ultimately sealing the barbecue with soil.

A much greater antiquity of man was suspected when, for example, a fire pit containing apparently burned mammoth bones was found and dated as 29,700 ± 3,000 years old (Broecker and Kulp 1957). Yet the question arose whether these bones actually had been burned or perhaps discolored by a deposit of manganese from ground water. In short, missing was conclusive evidence such as directly-associated human bones or artifacts. Over a period of some 15 years, during which I was privileged to explore Santa Rosa Island, many fire areas were investigated

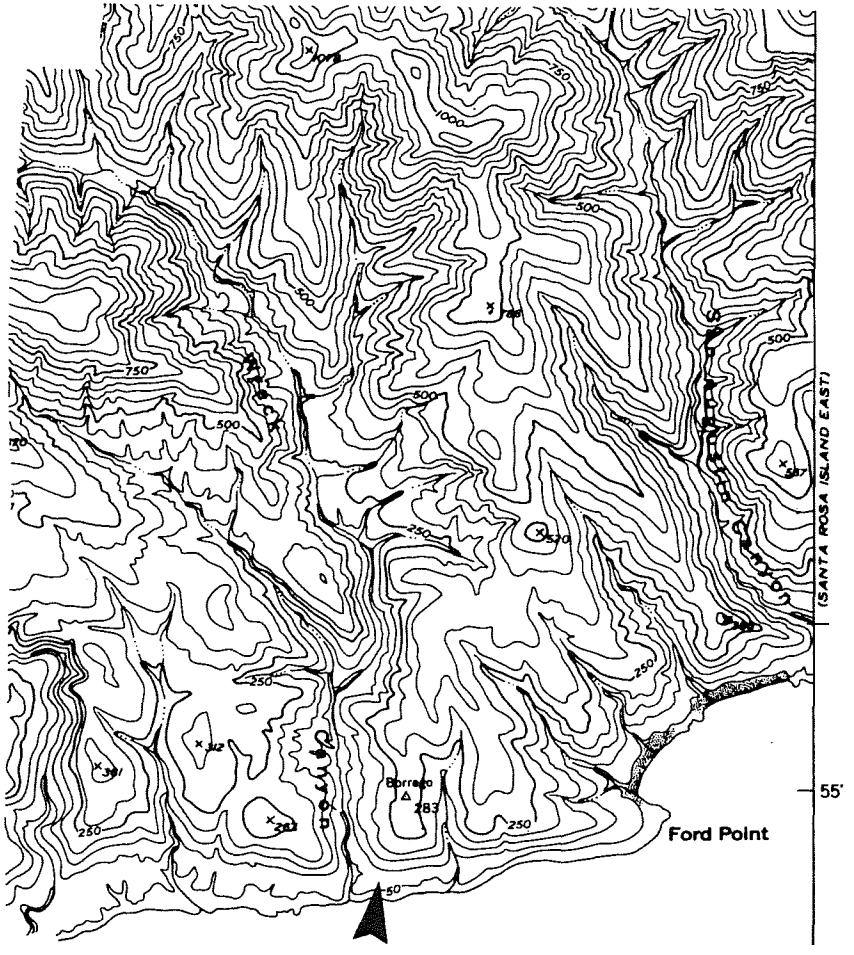

FIGURE 1. *Location of Woolley site near the mouth of Wreck Canyon, southern tip of Santa Rosa Island, marked by arrow.*

and dated, but any concrete connection between man and mammoth remained elusive. Many of these fire areas are exposed in the face of sea cliffs or canyon walls, often at levels as high as 30 m, that sometimes prove difficult to excavate. Erosion, however, exposes more of these red-baked areas every year and permits their inspection. In addition, some mammoth remains are found on the horizontal surface of the sea cliffs in close association with stone tools; but the question remains whether these surface finds are truly related or merely accidental.

THE WOOLLEY SITE

In 1975 geologist John Woolley of Vail and Vickers Co., owners of Santa Rosa Island, probed a badlands area near the mouth of Wreck Canyon and found, under a thick overburden, a

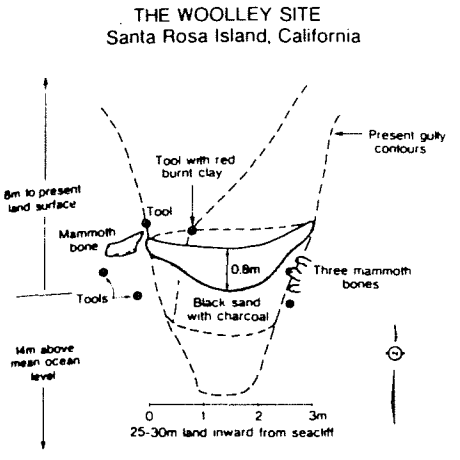

FIGURE 2. *Schematic cross section of gully in which hearth surrounded by mammoth bones and stone tools was discovered.*

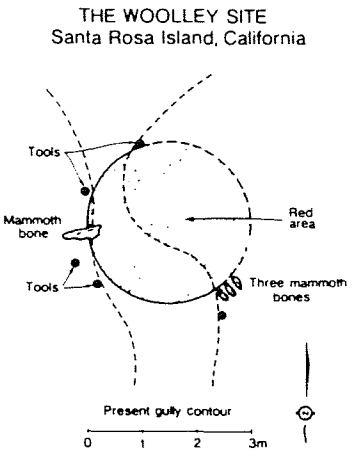

FIGURE 3. *Top section of hearth.*

large fire area exposed by a naturally cut narrow trench or gully. This feature comprises a circular hearth 3 m in diameter which contains mammoth bones and stone tools made of metamorphically altered rock *in situ* around its exposed perimeter. In April of 1976 this site was partially excavated (Berger 1976; and see Figs. 1, 2, and 3).

This particular fire area is located in buff-colored, fine-grained alluvial sediments at the mouth of Wreck Canyon. These horizontally well-stratified deposits occasionally include horizons of small-sized pebbles 1 to 2 cm in diameter. Substantially-sized rocks are absent. The original fire burned a layer up to 80 cm thick which contains abundant charcoal, some of which was collected for radiocarbon dating.

The first sample (UCLA-2100A) came from the uppermost levels of the hearth, the second (UCLA-2100B) from a location directly above burned bones in the west bank at the same level as some of the stone tools. The third sample (UCLA-2100C) was taken from the east bank near mammoth bones, and the fourth (UCLA-2100D) came from the bottom layer underneath the consolidated red-burned alluvium. All samples were inspected microscopically in the laboratory. Inasmuch as the Santa Barbara Channel contains natural oil seeps, it was necessary to ascertain the origin of the material by observing the cellular structure of the charcoal; asphalt is characterized by a brightly reflecting amorphous mass containing gas bubbles. Indeed, the samples were found to be composed entirely of biological material.

All the charcoal samples were treated in the laboratory with hydrochloric acid and subsequently with dilute sodium hydroxide to remove both inorganic carbonates and humic acid contamination. After drying, the samples were converted to carbon dioxide and counted in a 7.5 l proportional counter. None of the four samples indicated any measurable radiocarbon activity and were therefore dated as older than 40,000 years, the upper limit for that particular dating method.

The great antiquity of the Woolley site prompted a careful macroscopic and microscopic analysis of the stone tools and mammoth remains. Most of these core tools are made of substantially-sized pieces of black metamorphic rock not belonging in the fine-grained al-

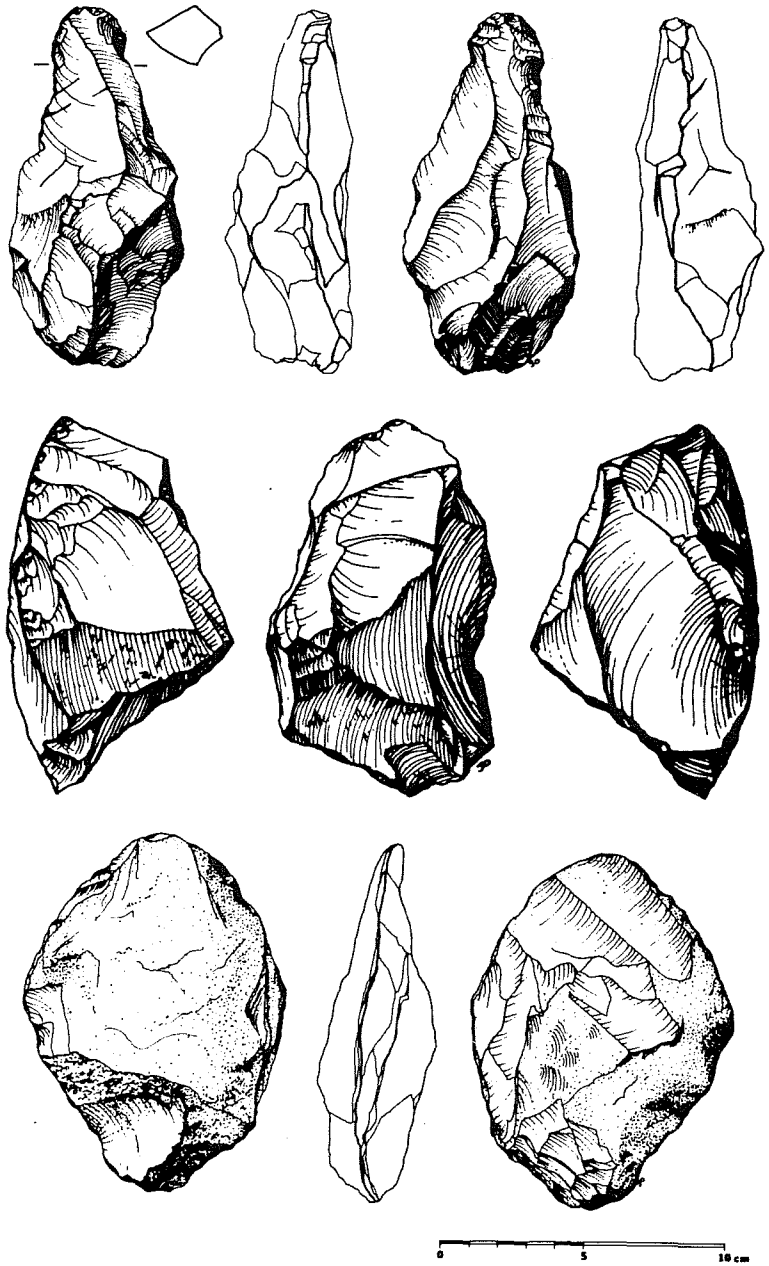

FIGURE 4. *Drawings of three representative stone tools consisting of metamorphically altered rock.*

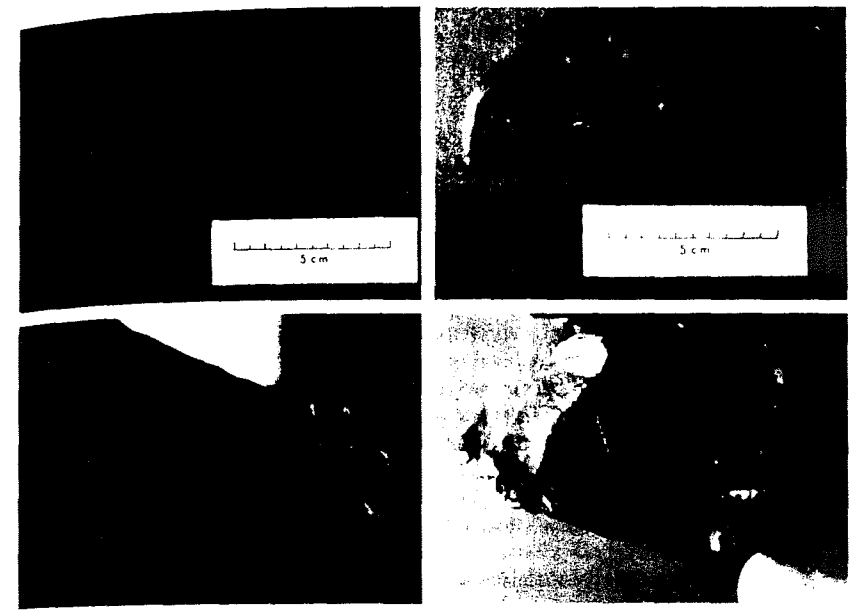

FIGURE 5. *Photographs of two of the tools in Figure 4 to show actual appearance and greater detail of flaking. Lower photographs are close-ups of objects in upper photographs.*

luvium beds. The parent rock material, often found on the beach, is due to Miocene volcanism in the Santa Barbara Channel area which modified shales and sandstones. The tools at this site were apparently made very coarsely in an *ad hoc* fashion. The modifications effected on the cutting edges are clearly visible (Figs. 4 and 5). Closer examination also reveals tool wear at the cutting edges or points.

The mammoth bones themselves are being studied at present for wear marks and are being subjected to independent dating by amino acid racemization and radiocarbon analysis. It may also be possible to directly apply a particular uranium-series method of dating.

The remainder of the hearth is scheduled for excavation and a complete site report will be published after the conclusion of all excavation and analytical work. Hopefully, radiocarbon dating by accelerators may soon become possible (Berger 1978) so that a finite age for the site can be calculated. Otherwise, an enrichment date will be measured.

In the meantime, I suggest that the Woolley site presents itself as possibly one of the oldest mammoth kills in the Americas. From a paleoenvironmental point of view it is located near the wide, ocean-side mouth of a relatively shallow canyon in which, even today, a seasonal small stream runs. I believe that the picture may be true of a band of aboriginals chasing a dwarf mammoth into a muddy stream, killing and barbecueing it. But who these hunters were and what they looked like still remains a mystery today, for their skeletal remains have not yet been discovered. Moreover, the precise date of their first arrival on Santa Rosa Island is also not fixed, except that if the present evidence is accepted it must have been prior to 40,000 years ago. Once a more definite date is known it should be possible to suggest plausible means of how they entered the Channel Island complex from the mainland.

ACKNOWLEDGMENTS

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Recent Developments in the Archaeology of the Channel Islands

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INTRODUCTION

The Channel Islands of southern California provide archaeology with some of its best laboratories in the world for investigating the development of human adaptive systems. Perhaps the most important reason why this is so is that the islands are discrete geographic units on which the diversity and abundance of many of the resources available to human populations may be accurately measured. In addition, the islands vary significantly in a number of environmental characteristics that affect human adaptations, and, as every scientist knows, effective tests of hypotheses require variability in the empirical world. No less important in efforts to develop and test hypotheses concerning human adaptation is the fact that the islands' ecosystems are relatively simpler and potentially easier to understand. Finally, all of the islands contain relatively intact sites in which the exploitation of marine resources is represented. Indeed, the degree of preservation of archaeological resources is especially high on some of the islands, in stark contrast with the coastal strip on the mainland where a large proportion of the sites representing a maritime cultural development has been destroyed. Mention might also be made of the fact that burrowing animals are absent from some of the Channel Islands, especially in the northern group, resulting in greater stratigraphic integrity than is normally found in mainland sites, which often serve as veritable havens for gophers and their kin.

There was comparatively little realization of these distinct advantages in the earlier research beginning in the 1870s, which was primarily concerned with obtaining collections of different kinds of artifacts, almost exclusively from aboriginal cemeteries, that would represent the archaeology of the Channel Islands in museum collections (*e.g.*, Schumacher 1877). Partly because of this early collecting, the archaeological potential of the Channel Islands became widely known, and in the 1920s there was a flourishing of activity by both relatively untrained amateurs and fully professional archaeologists being turned out by the emergent academic discipline of anthropology. Much of the work done at this time, especially that under the auspices of museums, carried on the tradition of the first explorers of Channel Island archaeology (*e.g.*, Heye 1921, Rogers 1929, Bryan 1970; see also Heizer 1969, Heizer and Elsasser 1956, Decker 1970), although somewhat more attention was given to recording provenience of artifacts according to site. Some of the professionals, however, began attempting to define the temporal and spatial variations in the archaeological records of the islands so that their culture histories could be reconstructed, primarily through stratigraphic excavation and simple chronological seriation of collections obtained from cemeteries (*e.g.*, Olson 1930).

After the considerable activity of the 1920s only sporadic archaeological research was carried out on the islands until after the Second World War. The work of Phil Orr on Santa Rosa Island, beginning just after the war and lasting about 20 years, serves as a link between the temporally-oriented workers of the 1920s and the work begun in the early 1950s (Orr 1951, 1968). It was Orr, in fact, who first made extensive use of radiocarbon dating on the Channel Islands.

Beginning in 1953, Clement Meighan and his students at the University of California at Los Angeles (UCLA) began a research program on the Channel Islands. With the founding of the