again at a comparatively recent day. Mention of this deposit has been made by Dr. Stephen Bowers, and he concurs with us in opinion as to its great age. The neighborhood still affords a rich field for the archaeologist, and patient investigation may yet give us many interesting facts connected with the daily life, customs and religion of the race that occupied these shores and enjoyed the delicious climate and charming scenery that has fallen such a pleasant heritage to us.

82. OBSERVATIONS MADE IN THE RUINS OF THE VILLAGES OF THE ORIGINAL INHABITANTS OF THE PACIFIC COAST OF NORTH AMERICA

Paul Schumacher

ABSTRACT

This article is reprinted in translation from the Mittheilungen der Anthropologischen Gesellschaft in Wien, Vol. 7, pp. 287-93, Vienna, 1876. It was submitted by the author from San Francisco, California, during the same year as its publication. Schumacher's observations mostly concern the characteristics (formation, composition, use as burial places) of the shell heaps of the Santa Barbara coastal region, although examples of sites from Oregon are also included.

* * * * * * *

The hills of mussel shells along this coast mark the ruins of villages of the original inhabitants. An exception to this is found only where the collections of mussels are in places where edible mussels were found in abundance and thus were visited from time to time. The mussels were freed from their shells at these temporary campsites to make their transportation to the permanent home easier. Thus these mounds of shells were built up through the centuries by means of countless meals consumed at these places. We do not find signs of the existence of huts at these temporary campsites. There are no pieces of flint and nothing which points to the manufacture of weapons and utensils. We find only cobbles in small piles which, with ashes and charcoal, give clear evidence that these used to be fireplaces. It is remarkable that the shells found at the temporary campsites are only of

those species which are now found in the vicinity. We see, for example, on the dunes running for twelve miles between Point San Luis and Point Sal several temporary campsites which consist almost exclusively of shells of Lucina sp. with a small number of Venus mercenaria and other edible types mixed in. Aside from this one finds only a limited number of bones of small land animals and fishes, while on Point Sal, where there are the remains of a permanent village, we find not only all of the species which live on the rocks in the nearby sea (these are predominantly Mytilus californicus) but also those which occur on the sandbar near the temporary campsites. Here are found many bones of different land and sea animals. It is difficult to say if these areas were considered neutral territory or if the shells came to be used among the coastal inhabitants as trade materials for inland products. It is certain however that the inland people were supplied with them, as we ascertained by the remains of these shells high up the course of the Santa Maria River.

The view that these mounds of shells were made for burial of the natives, especially for the burial feast, is false. The fact has been shown without doubt that the mussel heaps mark the location of old villages and accumulated for centuries as the kitchen refuse of the natives. Graves were dug in these mounds only when the surrounding ground was rocky and could not be worked with the primitive tools of the natives. We find not only the whole mass of the kitchen midden mixed with fragments of utensils, tools, and weapons, but also, as clear proof of a permanent village, circular depressions which show the locations of the huts. The depressions are usually surrounded by a circular raised rim. Further proof of this are the workplaces where arrowpoints and knives were made. These can be recognized by chips of chalcedony, jasper, flint, quartz, obsidian, and similar stones, and by the numerous broken and half-finished points and broken, handsized pieces of the aforementioned minerals which are not found naturally in this form on the islands or along the coast. Final proof are the tools themselves, such as, for instance, the round stones on which the flakes were made into the raw form of weapons and drills by means of a stone hammer of harder material. This was done before the bone needle was employed to finish the job.[1]

The first impression the observer gets when he looks at the traces of a native village, especially if the signs are on grassy and solid ground, is that of a group of enlarged molehills which have sunken in except for a narrow rim (Fig. 5k). An excavation of such a depression shows the underground part of the hut. This part reaches 4 feet below the surface. The floor can be recognized by a hard layer. In the middle of the floor we find the fire-

1. See End Notes. [End Notes are converted from the Footnotes appearing in the original article. Ed.]

place, together with ashes and charcoal. Sometimes the sides of the hut can be recognized by horizontally-lying split boards and vertical posts. Although the structure is square in most cases (about 10 feet on a side), we do find that the depressions we see today, which are seldom more than 2 or 3 feet deep, are often very steep and have become circular. This is probably due to the rim of earth and the natural reaction of the soil when a hole is filled with loose earth. As an exception we find some huts in Oregon which were surrounded by a square elevation, but these date without doubt from the time of white influx and thus are only modifications of the hut of an Indian and that of a trapper. They are like those of the present Klamath Indians. As proof of this we found wood worked with an ax, while the wood in other [older] huts is charred and split at the ends. The "foundation" of the hut remains quite similar along the whole coast and only varies in a few places where the circular shape occurs. The furnishings vary somewhat. We opened, for instance, several huts of the main village ruins of the Tu-to-tu-ni [Tututni] on the right bank of the Rogue River, about five miles from the estuary, and found the fireplace on the side with a chimney leading underneath the rim to the surface (Fig. 51). At Chetl-e-shin, at the mouth of the Pistol River, also in Oregon, we found the fireplace also on the side but there was no chimney. In other places in Oregon the fireplace was in the middle of the hut, similar to those in which we excavated along the California coast south of San Francisco.

The superstructure of the hut was fitted without doubt to the earth-wall, was circular, and ended like a cone at the top. On San Nicolas Island we found[2] (during our excavations made last year for the Smithsonian Institution of Washington) that the sides of the hut consisted of the huge ribs of a whale. The natural bend of the ribs was faced in such a way that the superstructure became a hemisphere and looked like a beehive. We noticed that whale bones were substituted for wood only on the Islands. These signs point to the fact that much of the life of the natives was spent out-of-doors. We find all workplaces for the manufacture of arrow tips, beads, fishhooks, mortars, etc., between the huts. The making of weapons, drills, knives, and other objects occurred at all permanent villages. The raw materials (e.g., flint) had to be imported. The same can be said about mortars and pestles which are made out of sandstone or basalt. Not only does the material used in the manufacture of these objects vary with the locality, but we also notice different degrees of proficiency in the working of the objects. This is not obvious in the manufacture of flint points if they are made of good material. In one place the productions [e.g., of stone mortars] are of masterful workmanship, beautiful in shape, and sometimes have seashells as ornaments. Some even have well-executed raised sculpturing. In other places where the worker was not as skilled, the mortars are thick, have shallow depressions, and do not look attractive. Shell beads and ornaments were pro-

duced in great numbers on the islands and served as trade material for the Indians. The beautiful cooking pot made from magnesian mica,[3] which is usually pearshaped and made with great artistry, seemed to have been an important trade object. The material has not been found to occur on this [mainland] coast, although some signs point to the fact that it may occur in southern California. This pot, cut out of a solid piece, must have been received as the finished product because, first of all, it is so large that the raw material must have weighed several hundred pounds, and second, the shape and finish of all such vessels are so similar that one involuntarily believes that they came from the same manufactory. It is hoped that the quarry of the natives will be discovered and if a Sheffield [i.e., a workshop] existed near it the place will be of great interest to us as far as the manufacturing activities of the earlier people of this coast are concerned.

It is easy to guess that because the tools for working the soil were made out of stone, the stony ground made the establishment of a village difficult and it was necessary to place a layer of sand upon the hard substratum. Thus, if a location was favorable for a village but did not have soil which could be worked easily, a layer was placed according to the size of the village. The huts were built on this layer, and camp trash and kitchen refuse began to collect. These accumulations have become present-day shell heaps.[4] In the villages formed in this way we find that the graves were always inside the artificial sandbank of the village, i.e., inside of the shell heaps. But if the ground is naturally sandy or otherwise easily workable we must look for the graves outside of the village circle. The graves of southern California consist of a community pit which is about 5 feet deep. The skeletons are separated by slabs of limestone which have been split like boards. Limestone occurs frequently along the coast. The skeletons may also be separated by whale bones which form narrow niches, and in this case they lie on their backs with the knees drawn up. This position is often disturbed when the pit is opened. To get an idea of the small size of the niche which was assigned to a deceased native, it should be mentioned that one pit of 660 square feet contained four hundred skeletons. In Oregon the burned hut of the former owner was used as the grave, or burial was in individual graves.

End Notes

1. Similar to the present Klamath Indians. Smithsonian Report, 1873; Archiv für Anthr. VII:263-65 [articles by P. Schumacher].

2. San Nicolas, like San Miguel and San Clemente, is a desert where nothing grows except sparse grass and other small plants along the coast. The

substratum is sandstone and sand. Thus driftwood is the only wood found. Water, although scarce, is found on all of the green islands. Santa Rosa is grassy but there are no trees. Santa Cruz has willows and dwarf oaks in some places and there is a small fir forest near the landing. This is probably the southernmost point on the coast where conifers occur naturally. Santa Catalina, next to Santa Cruz, is the prettiest island in the channel. It is also richly wooded but only with willow and dwarf oak. Of the eight islands--Anacapa and Santa Barbara are rocky islands without water--Santa Cruz alone has a creek. On the other islands the water is found in springs. The climate is paradise-like, especially on Santa Catalina. The islands are not now inhabited and are used only for animal husbandry.

3. The author used the English term magnesian mica [German, Magnesia-glimmer] without having chemical proof of the identification.

4. An exact, illustrated description of the structure of the village is in the hands of the editor in manuscript form.

83. THE MANUFACTURE OF SHELL FISH-HOOKS BY THE EARLY INHABITANTS OF THE SANTA BARBARA CHANNEL ISLANDS

Paul Schumacher

ABSTRACT

Shell and bone fishhooks, in addition to implements probably used in their manufacture, have been found in sites on the Santa Barbara Channel Islands, off the south coast of California. The reconstruction of the various stages of manufacture of these Californian fishhooks was published for the first time in Archiv für Anthropologie, Vol. 8, pp. 223-224, 1875. The article is here reprinted, in translation, in its entirety.

* * * * * * *

During my last trip, in the first half of this year [1875], I undertook, in the interest of the Smithsonian Institution and at the inducement of Prof. Spencer F. Baird, the guiding light of the organization, to investigate the