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William C. Massey and Carolyn M. Osborne**

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*** START OF THE PROJECT GUTENBERG EBOOK A BURIAL CAVE IN BAJA CALIFORNIA ***

**A BURIAL CAVE IN BAJA
CALIFORNIA**

THE PALMER COLLECTION, 1887

BY
WILLIAM C. MASSEY AND CAROLYN M. OSBORNE

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PREFACE

In 1888 an archaeological collection of material from Bahía de Los Angeles in Baja California was deposited in the United States National Museum by Dr. Edward Palmer. Although the material was duly catalogued, together with Dr. Palmer's notes, it has gone undescribed until the present.

Dr. Robert F. Heizer called this collection to the attention of the senior author in 1948. At that time the archaeology of Baja California was receiving emphasis at the University of California because of the interest of the Associates in Tropical Biogeography, under the chairmanship of Dr. C. O. Sauer. The late Professor E. W. Gifford, then Curator of the Museum of Anthropology at the University of California, arranged with Dr. T. Dale Stewart of the United States National Museum for a temporary study loan of the collection.

From the beginning, the division of labor between the authors has been primarily in terms of "hard" and "soft" artifacts. Massey has handled the analyses of the imperishable artifacts, their ethnographic and archaeological distributions, and the distributions of all artifacts for Baja California. Mrs. Osborne has dealt with the netting, textiles, and cordage, and the distribution of their techniques outside Baja California. Dr. Lila M. O'Neale began the analysis of the textiles and netting and directed it until her untimely death. Professor E. W. Gifford advised on the initial description of the imperishable artifacts.

This presentation has been delayed for many reasons, but the intervening years have added much detailed information to the original data, both in the literature of anthropology and in subsequent field work.

We are very grateful to friends, past and present, for their help and encouragement. We wish to acknowledge the support of the Department of Anthropology, University of California, for the photographs of the imperishable materials. Thanks are due Bob Ormsby, a University of Washington student, for the drawings of netting. All other drawings and the maps were done by June M. Massey. We acknowledge with thanks the assistance of Mrs. Gene Marquez, whose services as a typist were provided by the Department of Biological Sciences of the University of Florida.

Above all we wish to dedicate this small work to the memories of two tireless teachers and workers in anthropology—and in humanity: Dr. Lila M. O'Neale and Professor E. W. Gifford.

W.C.M.

C.M.O.

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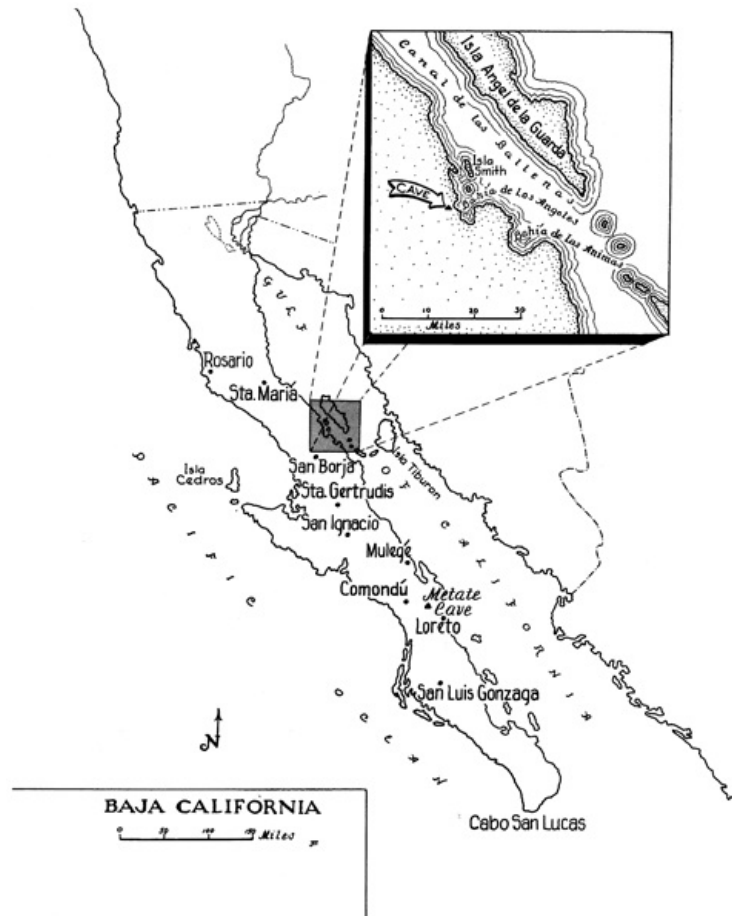
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Map 1. Baja California, showing location of Bahía de Los Angeles.

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INTRODUCTION

In December of 1887 Dr. Edward Palmer, the naturalist, set sail from the port of Guaymas in Sonora, crossed the Gulf of California, and landed at Bahía de Los Angeles on the peninsula of Baja California. Then, as now, there was a modest gold-mining operation at the bay. During his brief stay at the mining station, Dr. Palmer excavated a small natural cave which had been used by the Indians who were then extinct in that part of the peninsula.

Seven partially disturbed skeletons and a variety of associated artifacts were collected and deposited at the United States National Museum. The collection also included some potsherds and shells from a midden on the shores of the bay. All of these items were listed and briefly described in the Annual Report of the United States National Museum for the year 1888 (pp. 127-129).

Aside from the intrinsic value of presenting archaeological material from the little-known area of Baja California, the Palmer Collection has particular importance because of its immediate geographic source. Bahía de Los Angeles lies in that part of Baja California most accessible to the Mexican mainland ([map 1](#)). Not only is there a relative physical closeness, but the Gulf islands

form here a series of “stepping stones” from Bahía de Los Angeles across to Tiburon Island, home of the Seri, and thence to the adjacent mainland coast of Sonora.

The bay lies in the north-central desert region of the peninsula, where the environment is especially difficult because of extreme aridity, scarcity of surface water, and the consequent dearth of plant and animal life.

In view of these conditions, it has been suggested that the Seri may be descendants of people who, hard-pressed by the environmental poverty of this section of Baja California, may have moved across the Gulf to Tiburon Island and Sonora (Kroeber, 1931, pp. 5, 49-50). This hypothesis has appealed to one California archaeologist, although at present there is insufficient evidence from archaeology or ethnography either to support or to deny it (Rogers, 1945, p. 194). However, the archaeological collection from Bahía de Los Angeles does indicate trade and some contact across the Gulf.

In this paper emphasis is placed on the evaluation of the Palmer Collection with respect to the known archaeology and ethnography of Baja California.

ETHNOGRAPHIC BACKGROUND

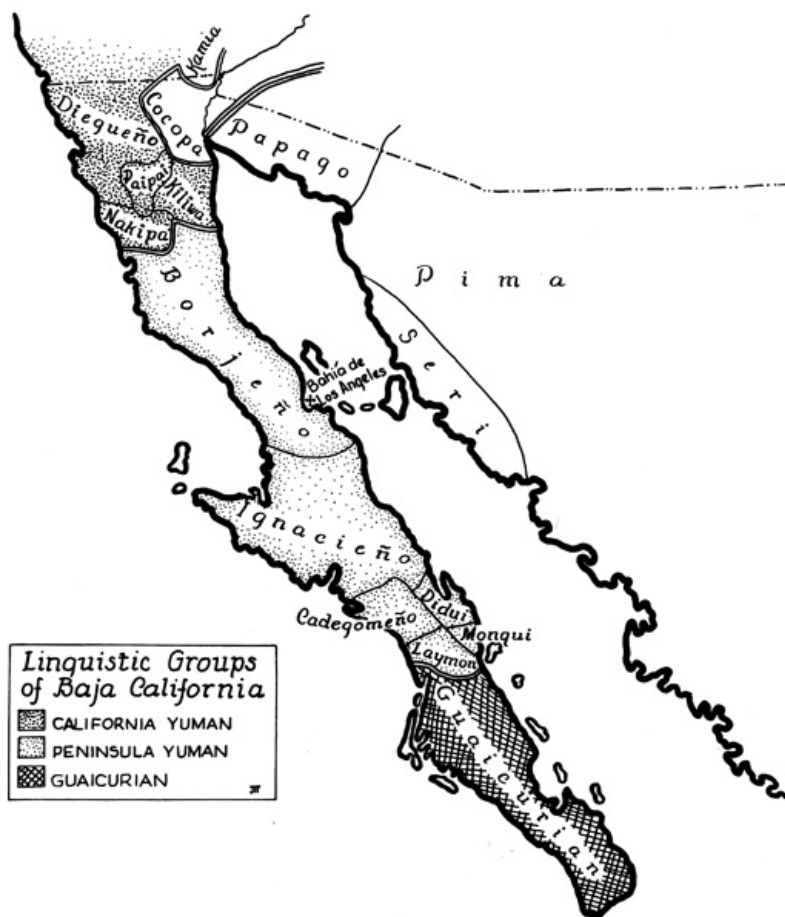
The Indians who inhabited the area surrounding Bahía de Los Angeles spoke the Borjeño language of the Peninsular Yuman group, of the Yuman Family of languages ([map 2](#)). They were linguistically and historically related to other Yuman-speaking groups of the peninsula and areas to the north (Massey, 1949, p. 292). At the time of European contact these people—like all other aboriginal groups on the peninsula—were hunters, fishers, and gatherers. The nearest agricultural tribes were on the lower Colorado River.

Culturally, the Borjeño were like other Peninsular Yumans of relatively late prehistoric and historic periods in central Baja California. However, they lived in more widely scattered groups because of the greater scarcity of water in this part of the peninsula. Immediately to the north of them at Bahía de San Luis Gonzaga—at approximately the 30th parallel—a decided break with the Peninsular Yuman tradition occurred.

In 1746, during a voyage up the gulf coast from Loreto to the mouth of the Colorado River, Father Fernando Consag noted that (1) the Spanish and their “Cochimí” interpreters could not converse with the natives; (2) the natives had dogs; and (3) the Indians had pottery vessels (Venegas, 1944, III:107-109).

The Hungarian Jesuit was the first to note the southeastern linguistic boundary of the California Yuman groups, a boundary which lay immediately north of Bahía de Los Angeles. At the same time he placed the southernmost extent of dogs and the making or use of pottery on the peninsula in the 18th century.

In describing the collection from Bahía de Los Angeles, we have the benefit of ethnographic descriptions from three periods of the Spanish occupation of Baja California prior to 1769 and the expulsion of the Jesuit missionaries. Some historical data derive from the initial voyages of the Spanish along the gulf coast in the 16th century. Later there were occasional contacts with these natives by Jesuit explorers during the first half of the 18th century. Finally, there was the period of active missionization, beginning with the foundation of Santa Gertrudis (1751) and continuing with San Borja (1762) and Santa María (1766).



Map 2. Linguistic Groups of Baja California.

Toward the end of the 18th century there are applicable descriptions of Indians immediately to the north by the Dominican priest, Father Luis Sales (1794).

The ethnographic information contained in the documents bears out the fact that the cave artifacts belong in the cultural tradition of the Borjeño who inhabited the region at the time of European contact and conquest.

THE SITE

Bahía de Los Angeles is a semicircular bay, about four miles in diameter, on the gulf coast of Baja California at 28° 55' N. and 113° 30' W. (map 1). On the northwest it is open to the waters of the Gulf of California and to the Canal de las Ballenas, which runs between the peninsula and Isla Ángel de la Guarda, some twelve miles distant. (This island and the smaller Isla Smith obstruct a view of the outer gulf, and from the shore Bahía de Los Angeles appears to be completely landlocked.) Within a few hundred feet of the shore, sandy beaches give way to the talus slopes of the mesas and peaks which edge the bay. An arroyo enters the bay from the west.

The cave excavated by Dr. Palmer is situated on a granitic hill to the west of the bay, at an elevation of 30 ft. above sea level. Just below the mouth of the narrow fissure is a spring which supplies water to the little mining community. The cave itself measures 9 ft. in depth; it is 6 ft. wide and 5 ft. high at the mouth. Before Dr. Palmer's excavations, miners of the Gulf Gold Mining Company had removed some stones—referred to in the Report as a "wall"—from the front of the fissure, thus exposing a few bones, which lay sun-bleached on the talus slope (Annual Report, 1888, p. 127).

THE BURIALS

The small cave at Bahía de Los Angeles contained at least seven burials: six adults and "fragments of one or more infants" (Annual Report, 1888, p. 128). These burials were extended with an east-west orientation corresponding to the axis of the fissure; the foot bones were to the west, at the mouth of the cave, and the crania were in the tapered interior. The published report does not indicate whether placement was prone or supine.

According to the Report the burials had been placed on a layer of sewn rush matting (139533[1]; see "Matting"), of which three bundles were collected.

The artifacts described here were found in direct association with the skeletons. There are few details as to actual associations. However, three hairnets (139534) were found on three of the crania.

To date, the use of small caves for the specific purpose of burial appears to be characteristic only

of the extreme south of Baja California, in the Cape Region. Interments there were customarily secondary, although primary burials, usually flexed, do occur (Massey, MS 1). In the extensive area that lies between Bahía de Los Angeles and the Cape Region, excavations have failed to produce cave cemeteries. To judge from published reports, such a custom was rare elsewhere in western North America.

A variety of artifacts accompanied the burials, but while the range of types is large, the number of any one type is small. Preservation of all specimens is generally good. We are fortunate in having perishable pieces—netting, matting, cloth, and wood. Certain general categories of items, such as household utensils and remains of foodstuffs, are absent and unreported.

ARTIFACTS

STONE

Tubular stone pipes.—Two tubular sandstone pipes were recovered from the cave. They are dissimilar in size, and, in some particulars, in manufacture.

The larger specimen (139563; pl. 12, e) is a ground sandstone tube, 29.8 cm. long. In shape it tapers very gradually from the broad bowl end to the narrower mouth end. The conical bowl is 3.5 cm. deep; the mouth end has a depth of 1.6 cm. A small (4 mm.) drilled hole connects the two ends. The mouth end is filled by a plug of partially carbonized matted coarse fibers. There is a narrow carbonized strip, slightly in from the bowl end, which runs around the pipe; this appears to be the remnant of a cord that had been tied around it. Since the pipe had been broken at that end, it may have been repaired aboriginally with such a cord.

The smaller pipe (139564; pl. 12, d) barely tapers from the bowl end to the mouth end. The ends of this pipe are conically drilled and they interconnect; there is no drilled hole connecting the bowl with the mouth end, as in the larger specimen. A partially carbonized plug of matted coarse fibers also fills the mouth end of the smaller pipe.

Although simple tubular stone pipes occur sporadically in the archaeology of the Southwest, they are encountered frequently in central and northern Baja California. Stone tubes or pipes, called chacuacos, are often mentioned in Spanish sources as part of the shaman's paraphernalia in this Yuman-speaking area of the peninsula (Venegas, 1944, I:93, 95; Clavigero, 1937, p. 115).

In the known areas of archaeological occurrence these pipes appear in two distinct sizes, even as they are represented in the two Bahía de Los Angeles specimens. There is the long type, measuring more than 15 cm., of which several specimens have been found in Baja California, at Bahía de Los Angeles, at a site near the Rosario Mission in the northwest, and throughout the central part of the peninsula (Massey, field notes). This type has also been noted from Ortiz, Sonora (Di Peso, 1957, p. 288), and in a late prehistoric or historic level at Ventana Cave (Haury, 1950, p. 331).

The shorter type, usually about 7 cm. in length, is known to occur in the general central region around Mulegé (Massey, MS 2) and at Bahía de Los Angeles. In the Southwest, the smaller type has been reported from Chiricahua-Amargosa II levels at Ventana Cave (Haury, 1950, p. 329); La Candelaria Cave, Coahuila (Aveleyra et al., 1956, pp. 174-175); San Cayetano Ruin (Di Peso, 1956, pp. 423-430); and from a series of sites, particularly in the Mogollon area (Martin et al., 1952, pp. 112-113, fig. 44).

Similar pipes have also been found in the western Great Basin at Lovelock Cave (Loud and Harrington, 1929, pl. 52) on the old shoreline of Humboldt Lake (ibid., pl. 65), and at Humboldt Cave (Heizer and Krieger, 1956, p. 71; pl. 31, e, f).

Ethnographically, pipes of straight tubular shape are characteristic of California, the Great Basin, and the west coast of Mexico; however, they are usually of pottery where pottery-making was known (Driver and Massey, 1957, pp. 262-263, map 70). In these areas they were used for smoking, frequently in association with religious or curing ceremonies.

In mission times tubular stone pipes were used throughout northern and central Baja California by shamans; they were smoked and the smoke was blown on injured or diseased parts, or they were used as sucking and blowing tubes for the removal of disease-causing objects.

Miscellaneous stone artifacts.—There are few stone artifacts besides the pipes. Among these is a worked piece of pumice (139613), 8 cm. by 4 cm., which has a bowl-like concavity ground through from one side to the other (pl. 12, c). There are two fragments of gypsum which have been roughly chipped along one or more edges (139568, pl. 13, f; 139569).

BONE

Bone awls or "daggers."—Two bone awls or "daggers" of identical type are included in the collection (139589, a and b; pl. 12, a, b). Both specimens are made of the sawed and ground metapodials of some large mammal, presumably deer. The shorter of the two (139589a) retains vestiges of a black adhesive for half the length of its convex surface. This is probably the result of

hafting. Nothing precisely comparable to these specimens has been reported so far in the archaeology of the peninsula; however, similar artifacts do occur in near-by regions. They have been reported from southern California (Gifford, 1940, p. 161), from Basketmaker sites in Arizona (Kidder and Guernsey, 1919, p. 128), and from Ventana Cave, where they are concentrated in Level 4 (Haurly, 1950, fig. 86J, p. 376, table 30).

Other bone artifacts comprise two parts to flakers (139556, 139557), for which see "[Wooden Artifacts.](#)"

SHELL

A number of shell ornaments and a piece of coral were recovered from the cave. At the same time unworked specimens were found and collected both from the cave and from the midden which occupies the bay shore just east of the cave.

Abalone ornaments.—Three abalone shell ornaments (139551-139553), identified as *Haliotis splendens*, were found. Two are complete, one (139553) is fragmental. They all appear to be examples of a single type. They are oval to circular, with the following dimensions: 139551 (pl. 13, c) is 4.8 cm. in diameter; 139552 (pl. 13, a) is 5.3 by 4.3 cm.; and 139553 (pl. 13, b) appears to have been 3.9 cm. in diameter. Thickness varies between 2 and 3 mm. In manufacture the original external surface of the shell has been ground and polished to a nacreous surface. In decoration of the two complete specimens there is a central conically drilled hole from which short incisions radiate, and an additional hole is drilled on one edge, probably for stringing. The fragmental specimen (139553) has these holes, but in addition has three other holes drilled near the original central hole. The original description of the artifacts suggests that these holes may have been intended as repairs (Annual Report, 1888, p. 129). All three shell specimens are edge-incised, and two have punctate designs.

Until the present, few shell ornaments have been noted in the archaeology of Baja California. No specimens identical to those from Bahía de Los Angeles are known; however, all of the decorative elements and techniques recorded here can be duplicated among specimens of oyster (*Pinctada mazatlanica*) shell ornaments from the Cape Region far to the south (Massey, MS 1). Since abalone do not occur in the Gulf of California, these shells must have been obtained by the Bahía de Los Angeles people from the Pacific Coast, either directly or in trade. Specific mention of the use of abalone among the historic Indians of the peninsula is rare in the documents; however, contemporary Kiliwa women use pieces of the shell for ornamentation (Meigs, 1939, p. 35).

Abalone shell was commonly used by peoples of adjacent California. Both the shell and, probably, the ornaments themselves were widely traded into the Southwest. Ornaments very similar to the Bahía de Los Angeles specimens have been found in Basketmaker caves in Arizona (Guernsey and Kidder, 1921, p. 49).

Olivella shell.—Four broken strings of *Olivella* shell beads (*O. biplicata*) (139546) were found with the burials. Two types are represented. There are three short strands, totaling 17 beads, in which only the spires have been ground from the shells for stringing (pl. 13, e). The fourth strand held 9 *Olivella* shells, somewhat larger than the others, from which both the spires and bases had been ground (pl. 13, d).

In addition to the strings of beads, *Olivella* shell is recorded in use with two other specimens in the collection. Fragments of shells are found as inlay on a wooden artifact (139565); for a description see the section on "[Wooden Artifacts.](#)" They are also found tied in with bundles of human hair in a garment (139539).

The use of *Olivella* shells, with spires, bases, or both removed by grinding in order to make beads, is known throughout Baja California archaeologically. Similar occurrences are even more frequent in the archaeology of southern and central California (Gifford, 1947, p. 11). *Olivella* shells inlaid in asphaltum have been found in southern California (ibid., p. 36). The inlaid fragments of the shell from Bahía de Los Angeles duplicate this type of decoration.

Coral.—There is a piece of coral (139566) which may have been purposefully smoothed into an elongate object, 10.5 cm. in length.

Unworked shell.—Dr. Palmer collected sample specimens of unworked shell from the open midden on the bay to the east of the burial site, as well as unworked shell in association with the burials in the cave (Annual Report, 1888, p. 129). These are listed below:

Cave Specimens

139561-*Cardium elatum* Sby.

139562-*Pecten (vola) dentata* Sby.

Midden Specimens

139590-*Cardium pentunculus*

139591-(*Aximea*) *gigantea*

139592-*Strombus gracilior* Sby.

139593-*Strombus tessellatum*

139594-*Callista chionaea*

139595-*Chione fluctifraga*

139596-*Crucibulum spinosum* Sby.

139597-Chione (?) succinata
139598-Neverita reclugiana
139599-Dosinia ponderosa
139600-Arca sp.
139602-Pecten (vola) dentata
139603-Venus guidia
139604-Cardita (Lazaria) californica
139605-Avicula sp.
139606-Tapes grata Sby. and histrionica
139607-Solecurtus californianus Com.
139608-Spondylus princeps
139609-Ostraea palmilla cpr.
139610-Liacardium elatium
139611-Phyllontus sp.
139612-Prinna sp.

MIDDEN POTSDHERDS

In addition to the unworked shells there are body and rim sherds from at least two pottery vessels which came from a shell midden on the bay.

There is a single rim sherd (139614a) which comes from a shallow bowl with a direct flat-topped rim. Color of both the interior and exterior surfaces is buff. The paste is fairly coarse, with a granitic sand temper which has also some pumice inclusions. There is also evidence of vegetable-fiber inclusions. There is no mica in the paste. The fragment is 5 mm. thick.

The second fragment (139614b) is a large rim and body sherd from a large bowl which would have been 27 cm. in diameter and 17 cm. high. The rim is direct, with a grooved lip (pl. 18, a, b). The surface color is black to dark gray. The paste is coarse, with sand and quartz inclusions, some of which are as large as 5 mm. in diameter. No mica is present. The surface is scarred by burned-away vegetable inclusions. The specimen is about 9 mm. thick.

This pottery could have been native-made pottery from the Mission period, or it could have been derived from pottery-making Indians to the north. Neither source has been adequately studied on the peninsula. Comparable pieces have been seen, however, from mission ruins in central and northern Baja California.

WOOD

Flakers.—Two compound flakers, made by securing pieces of ground bone to short wooden shafts, were found in the collection. In one specimen (139556) the entire flaker measures 12 cm., and the projecting bone 3.4 cm. (pl. 14, b). The other specimen (139557) is 13.1 cm. long, with a bone piece 5.6 cm. long (pl. 14, c). In both specimens the ground pieces of bone were laid in grooves in the round wooden shafts, and secured to them with 2-ply Z-twist cordage (see "Haftings" for details). Both of the wood shafts are incised with lines encircling the handle area. These lines may have been decorative, or they may have been intended to supply friction to the grasp.

Flakers of bone have been reported for the northern part of Baja California (Sales, 1794, I:49) and must have been known to all peoples on the peninsula despite the absence of direct evidence in the archaeology and most of the historical sources. They were known throughout adjacent regions, although usually in the form of simple antler tines. Specimens identical to those from Bahía de Los Angeles, except for the use of sinew lashing in place of the cordage, have been reported from Basketmaker caves in Arizona (Guernsey and Kidder, 1921, p. 96; fig. 15c).

Cane whistles.—Two cane, or carrizo, whistles were found in the cave. They are identical in form and mode of construction, but they differ in decorative details. In both the whistle hole is cut into the cane at a node, and is reinforced with a black adhesive, possibly asphaltum.

Around the whistle hole of the longer of the two specimens (139588a; pl. 15, h) are five pits which have been burned in; two are at one end of the hole, three at the other. As added decoration a series of incisions encircles the shaft of the whistle, some of which, at the mouth end, are joined by pairs of cut lines. All of these incisions are blackened, either by carbon or through handling.

The shorter whistle (139588b; pl. 15, g) has no burned pits at the hole, but the encircling incisions, minus the connecting lines, are present. At the end of the whistle opposite the mouth is the remnant of a hole in which there is a fragment of knotted cordage.

No other whistles have been recorded for the archaeology of the peninsula. Spanish documentary sources are unrefined in the differentiation of flutes and whistles; either or both were known to the historic tribes of Baja California. Use was restricted to ceremonial occasions in all recorded instances.

Directly to the north of Bahía de Los Angeles, in the 18th century, shamans used whistles in ceremonies performed several days after a death (Sales, 1794, I:79), just as the modern Kiliwa

use a reed flute at the ñiwey ceremony (Meigs, 1939, p. 45). In neighboring southern California, the use of flutes was nearly universal, while whistles were used infrequently (Drucker, 1937, p. 25).

Bull-roarer (?).—One highly polished wooden artifact (139565) may have been used as a bull-roarer. This artifact, with a length of 23.5 cm., a diameter of 5.1 cm., and a thickness of 6 mm. (pl. 15, i), is made of a very hard dark wood—probably ironwood, Olneya tesota. It is concave on both faces. At each end, and at a right angle to the main axis of the specimen, is a groove filled with a hardened black substance inlaid with fragments of Olivella shell (O. biplicata). The hole at one end is biconically drilled. This artifact has been tentatively called a “bull-roarer” because no other purpose can be conjectured. It is too large for a net-gauge, which it somewhat resembles because of its concave ends.

There is no mention of bull-roarers in the Spanish sources for the peninsula; however, one archaeological specimen has been recovered from the surface of a cave in the San Julio Basin, to the east of Comondú. This wooden bull-roarer has a conventional shape; it is a long oval-shaped piece of hardwood which is double-convex or lenticular in cross section and has a length of 21.5 cm.[2]

The use of bull-roarers for ceremonial purposes was nearly universal in southern California (Drucker, 1937, p. 25). They have also been reported for the Kiliwa of northern Baja California, where they were used by shamans in the ñiwey ceremony, and for placating ghosts by anyone in an emergency (Meigs, 1939, p. 45).

Projectiles.—A single compound arrow (139587) or dart is in the Palmer Collection. Although it is broken, there can be no doubt that the two pieces of cane shaft form a single piece, 92.5 cm. in length (pl. 15, a). There is no foreshaft. The sting-ray spine, which makes an excellent natural projectile point, was let directly into the split end of the cane, and was secured by cord binding (see “Haftings”). Instead of the usual nock in the butt end of the shaft for a bowstring, there is a cuplike depression (fig. 1). This suggests, of course, that this may have been a dart for use with a thrower or atlatl. Although that weapon is unreported in the Spanish sources on central and northern Baja California, dart-throwers were reported by Spanish explorers for the first quarter of the 17th century for the southern Cape Region; they are also known archaeologically from the same area (Massey, 1957, pp. 55-62).

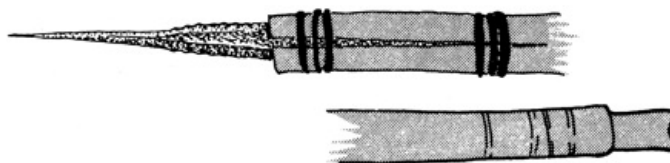


Fig. 1. Detail of arrow or dart (139587), showing sting-ray spine point and cuplike depression at butt end.

One smoothed wooden specimen (139560) appears to have been a foreshaft. It is sharply pointed at one end, and has a cuplike depression in the opposite, thicker end. It is straight and tapered, with a length of 38 cm. (pl. 15, f). Similar specimens are common in historic levels of caves in the Sierra de La Giganta (Massey and Tuohy, MS).

Viznaga spines.—A bundle of seven spines of the Viznaga cactus (Echinocactus wislizeni) was found (139547; pl. 14, a). These spines had all been straightened from their natural curved condition. They could have served a variety of piercing purposes.

Miscellaneous wooden artifacts.—In addition to the artifacts of vegetable origin that can be identified with certainty, there are several fragments and whole specimens which remain to be considered.

There is a round straight piece of wood (139559), measuring 30.5 cm. in length and 8 mm. in diameter, which has both ends blunted and rounded, apparently from use in grinding and pounding (pl. 15, e). Its exact use is unknown.

Two sticks, lashed together in two places, were found (139585a). Together they measure 50 cm. in length (pl. 15, c). The longer pointed stick has a notched end as for an arrow butt (see “Haftings” for details of the tying).

There is also a round, sharply pointed, and tapered fragment of hardwood with a length of 8.8 cm. The shape suggests that it may have been part of a digging stick; however, the specimen is very highly polished on all of its preserved surfaces.

Two wooden fragments (139586) are listed in the catalogue of the United States National Museum as parts of a bow. Actually there is little about their shape to suggest such a use (pl. 15, b). Both are round in cross section, and they do not fit together. One piece (139586a), which is 58 cm. in length, is slightly curved, with a knob carved on the complete end. There are faint indications that there had previously been wrappings at this end. The other specimen (139586b), with a length of 56.5 cm. and a diameter of 1.3 cm., is fragmental at both ends. It has two places in which the shaft has been carved around. Incised diagonal lines mark the surface in several places.

CORDAGE AND TEXTILES

In addition to the cordage used in the fabrication of articles of apparel, household utensils, and for the hafting of tools, the cave contained the usual miscellany of prepared fibers and knots (139544) usually of agave fiber. There is also a bundle of unspun hair tied in the center with an overhand knot (139543). The bulk of the miscellaneous cordage is 2-ply cord—each single S-twisted with a final Z-twist. Since the spinning is so uniformly of this twisting, it is highly probable that manufacture of the cordage followed that described by Kissell for the Papago, and noted in many other places. This method of “down movement” followed by an “up movement” to make the 2-ply gives a preliminary S-twist and a final Z-twist (Kissell, 1916, p. 229).

Under the microscope, one of the specimens shows a single fiber, used as a tie at a position where a new bundle of fibers is added, weaving in and out of the old and new bundles. This gives the fibers much stronger binding than does twisting together alone. The twist is normally medium-hard to hard with an occasional crêpe twist.

Fur-wrapped cord, of which only fragments were recovered, consists of strips of hide with fur attached, about 1 cm. wide, wrapped around (S-twist) already prepared 2-ply agave fiber cord. No articles were found which had been constructed with fur-wrapped cord.

Since these fragments are undoubtedly bits broken from finished articles or remnants from the construction of articles, it is not surprising that, with one notable exception, they cover the range of prepared cordage for the other specimens. The exception is cotton cord, of which no fragments were recovered. This strengthens the hypothesis that the cotton cloth (139537) was brought to the peninsula in its manufactured state.

Both human-hair cord and palm-fiber cordage, common to cave collections from the Cape Region of southern Baja California, are missing here at Bahía de Los Angeles.

Square knots are most common in the collection of miscellaneous cordage. This is to be expected, in view of the square-knot construction of the hairnets and carrying nets found in the cave.

Identifiable vegetal fibers include those of Apocynum sp. (probably cannabinum) and Agave sp.[3]

On a comparative basis the cordage and miscellaneous knots from Bahía de Los Angeles are most like historic-period materials from central Baja California. Excavated sites and large private collections there contain an overwhelming amount of cordage that is 2-ply Z-twist; both square and overhand knots were found. Again like Bahía de Los Angeles, nets were made by the square-knot technique (Massey and Tuohy, MS).

The southern part of the peninsula, on the contrary, exhibits 2-ply Z-twist cordage only in slightly over 50 per cent of collected specimens. Both knots were known, but netting was made entirely by lark's-head knotting (Massey, MS 1).

Simplest Uses of Prepared Cord

Four-warp weaving.—Many samples of 4-warp weaving were found in the miscellaneous fiber collection (139544) and in a group of woven fragments (139554). None was found in connection with the finished articles of the collection, so that their use is purely conjectural. The warp is generally 2-ply, Z-twist, medium- to hard-twist cordage; the weft is the same, but generally lighter in weight than the warp.

Cord-wrapped sticks (bobbins?).—There are two kinds of sticks wrapped with cordage: single short sticks loosely wrapped around the midsection (bobbins?), and pairs of sticks tied together end-to-end tightly in two places. The cord on these specimens is invariably of the common 2-ply Z-twist agave fiber.

One of the pairs of sticks (139585a), with a total length of 50 cm., consists of a pointed stick with a nocked butt end lashed tightly to the second stick in two places (pl. 15, c). The stick with the nock appears to be the butt end of a projectile shaft. If it were, it would be unusual for Baja California, where projectile shafts are usually of cane. The second specimen (139558d) consists of two lengths of cane, 10.3 and 5.4 cm. long, which are loosely bound with a single-strand fiber (pl. 14, f).

Four specimens of sticks wrapped with cord were recovered. Lengths of these specimens are as follows: 139558a, 22 cm. (pl. 15, d); 139558b, 15.8 cm. (pl. 14, e); 139558c, 17.3 cm. (pl. 14, d); and 139549, 11 cm.

Strings for beads.—Shell beads were strung on a very fine 2-ply cord, probably made of agave fiber; each ply consists of about three fibers, probably of agave also (139546; pl. 13, d). Both of these groups are fragments, so use is again problematical.

Miscellaneous.—There is a piece of hide wrapped with a 2-ply cord, probably of agave fibers, loosely Z-twisted (139548; pl. 14, g). The first end is secured by wrapping-over; the outer end is drawn under some of the cord and pulled tight.

Noticeably lacking from the cave materials are sections of reed strung on cord, which formed the aprons of women throughout most of the peninsula. Specimens of this type are abundantly

reported for all of central and southern Baja California, and they have been archaeologically found in the central area (Massey, MS 1).

Haftings

Five different types of hafting were found among the Bahía de Los Angeles artifacts.

Flakers (see "[Wooden Artifacts](#)").—One bone flaker (139556; [pl. 14, b](#)) is hafted with eight rounds of cord, of 2-ply Z-twist agave, medium- to hard-twist; each single consists of three to five fibers, Z-twisted, loose-to-medium. The original end was secured by wrapping-over; the final end is broken and not secured at the present time. An overhand knot with no function occurs in the wrapping.

A second bone flaker (139557; [pl. 14, c](#)) is hafted with a 2-ply agave cord, S-twist, medium, which is wrapped three times around the bone and wood. The end is drawn under the three wrappings and twisted to the original end.

Darts or arrows.—A third hafted specimen (139585) consists of what appears to be broken parts of two arrows hafted together for greater length, wrapped in two places. The "rear" haftings, obviously the main tying, consist of a cord wrapped twelve times around the two pieces; the first end caught down by the succeeding wrappings and the final end pulled tight under the entire series and cut off. The same type of cord is used for the secondary "front" tie, where it is wrapped around from the middle and tied with a granny knot.

The sting-ray spine point of the cane projectile (139587) was simply inserted into the hollow cane shaft which had been split down to a node. The cord securing the point begins at the node on the shaft where the cord end is caught under three wrappings, carried up the split in the cane, wrapped three times around the end of the cane, and broken ([fig. 1](#)). It may once have been secured by drawing under the final wrappings, as were most of the Bahía de Los Angeles haftings. The cordage used is 2 mm. in diameter of 2-ply agave (?) with a medium-to-hard Z-twist. Each single is S-twisted and very loose.

Water bags (?).—There is a cord wrapping around what may have been the neck of a bladder or skin water bag (139555; [pl. 16, b](#)). The piece of skin had been folded together very evenly by accordion-pleating and wrapped for a length of 2 cm. with a 2-ply loosely twisted Z-twist cord, and finally secured with a granny knot.

Skins of animals and fish bladders were in use as water containers in this area in early historic times, as reported by Francisco Ulloa in 1540 (Wagner, 1925, pp. 25, 28). Farther south on the peninsula similar water bags were reported in use in the 18th century (Baegert, 1942, p. 85; W. Rogers, 1928, p. 208).

Matting

Two pieces of matting of distinct types were preserved in the collection. They probably were saved by Dr. Palmer as samples of the types in the cave.

One of the pieces (139544) is sewed, or threaded, rush matting ([pl. 16, d](#)). The lengths of rush (*Juncus acutus* var. *phaerocarpus*), which form the warp are pierced at intervals of about 10 cm. by the sewing thread which is a continuous length of cord, probably of agave. This sewing element, which serves as the weft, consists of 2-ply Z-twist cord with a medium-to-hard twist. Each single ply is Z-twisted in medium degree. Total size of this well-preserved fragment is about 50 cm. by 21 cm. The one selvage which has been preserved would indicate that the width of the mat at least was set when the worker began the sewing process.

Apparently threaded or sewed matting was not widely used in neighboring areas to the north. Such matting with a decorative selvage was found by Cosgrove in a cave in the Upper Gila region (Cosgrove, 1947, p. 114). Distributions which he gives are confined to early Pueblo period cultures in the Southwest.^[4] The trait was specifically denied for Humboldt Cave (Heizer and Krieger, 1956, p. 58).

The second fragment of matting (139540) consists of bundles of unspun fibers secured by cord with a simple overhand knot which holds the fiber warp closely together ([fig. 2](#)). In this tie-twined matting the wefts are spaced at intervals of 3.2 cm., and they consist of 2-ply agave (?) cord with a loose to medium Z-twist, with each single strand S-twisted. The warp bundles, identified as grass, are not twisted.

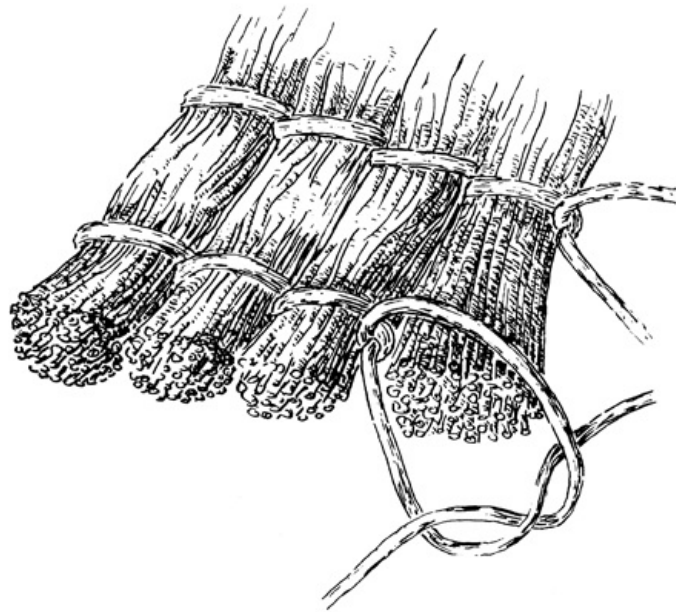


Fig. 2. Tie-twined matting technique.

Although none of the Spanish accounts lists the use of matting by the natives of Baja California, archaeological specimens of both the sewed and tie-twined types have been recovered from caves in the central region of the peninsula from Mulegé to Comondú (Massey and Tuohy, MS; Massey, MS 2). The tie-twined matting also occurs in the extreme south of the peninsula (Massey, MS 1). Mats are recorded as part of the household furnishings of most southern Californians. Mats of *Juncus* sp. are noted for the Mountain and Desert Diegueño. The Yuma do not use mats (Drucker, 1937, p. 21).

The use of tie-twined matting appears to be an old trait in the Desert Area and its cultures. It is known throughout the peninsula, where old traits were retained, and also in archaeological collections from various parts of the Great Basin and Southwest. A sampling of the literature reveals the following occurrences: Lovelock Cave (Loud and Harrington, 1929, pp. 56-60); Humboldt Cave (Heizer and Krieger, 1956, p. 57); Danger Cave (Jennings *et al.*, 1957, pp. 242-243); Promontory Point (Steward, 1937, p. 29); Hueco Area (Cosgrove, 1947, p. 113; see also p. 114 for various other Southwestern locations); the Guadalupe Mountain area (Ferdon, 1946, pp. 15-16); and portions of Texas (Jackson, 1937, p. 157).

Netting

Hairnets.—Two complete hairnets (139534a and b) and one fragment (139534c) were found on crania in the cave (pl. 16, a, c). All of these were tied with a single-element square-knot technique (fig. 3). Cordage is of the 2-ply Z-twist type with each single S-twisted. The cord is probably of agave fiber.

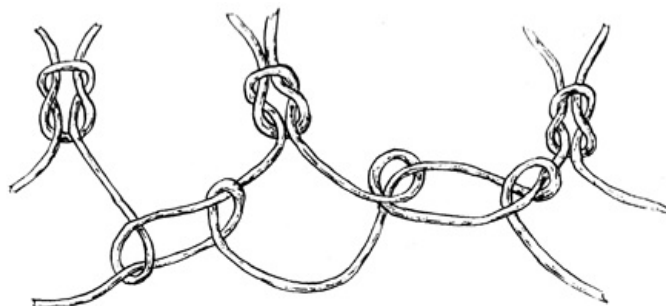


Fig. 3. Square-knot technique.

The two complete hairnets are begun with a center circle of discrete tied yarn. Ten large loops are cast onto this. In the next round, each of the large loops has three loops tied onto it with the continuous cord, making a total of 30 loops for the circumference of the net (fig. 4). The gauge of the succeeding 15 rows of knots is approximately 2.5 cm.

In order to gather the lower edge of the net for fitting purposes, the cord was doubled and two loops were gathered together and tied with the same square-knot technique (fig. 5).

The third net (c) has eleven loops cast onto the original circle; the technique of tying is the same, but the mesh gauge of 1 to 1.5 cm. is finer.

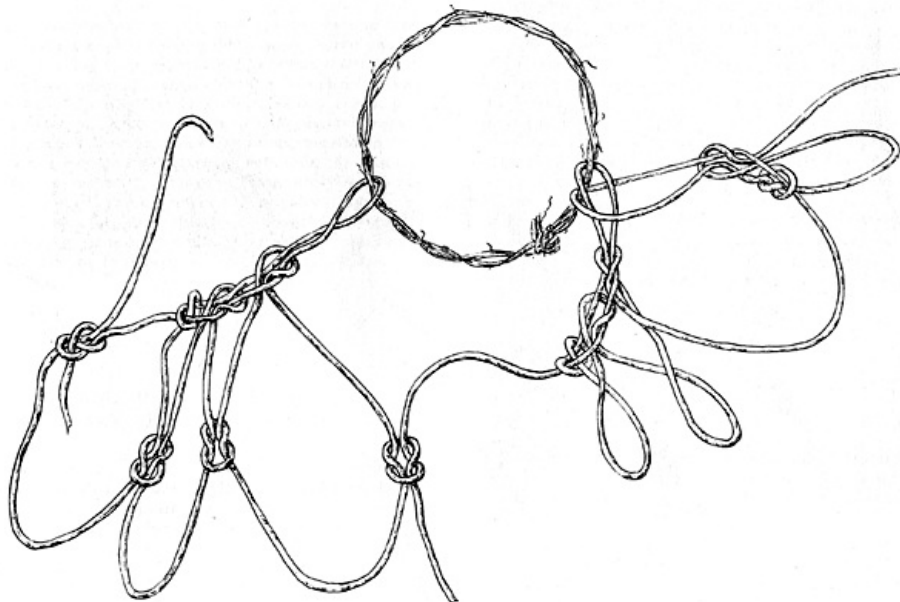


Fig. 4. Method of beginning hairnets and carrying nets.

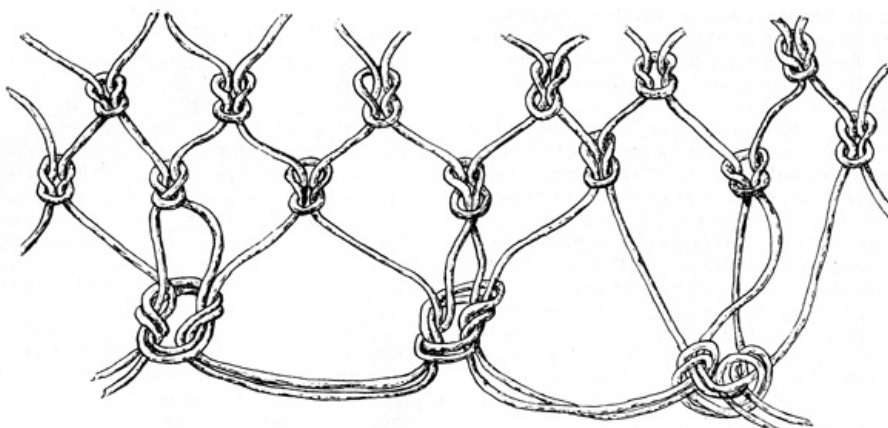


Fig. 5. Detail of lower, fitted edge of hairnet.

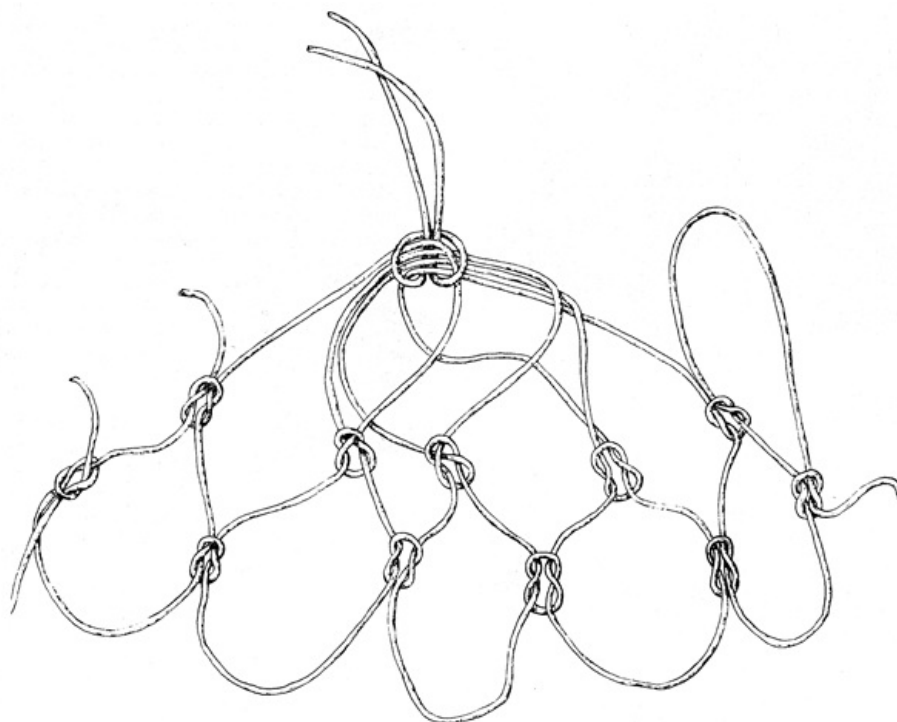


Fig. 6. Detail of lower, gathered edge of carrying net.

Among the historic tribes the wearing of hairnets, both plain and decorated, was universal among the women of Baja California. Such usage among southern Californians was denied by all of Drucker's informants (Drucker, 1937, p. 45). There appears to be no mention of them from the adjacent west coast of Mexico, but they are known archaeologically from the Great Basin. Loud and Harrington picture several from Lovelock Cave, but give no description of the knotting

technique (1929, pl. 41). However, in their discussion of knots they mention that the “mesh knot” (weaver’s knot) was the most common, and the square knot was little used (*ibid.*, pp. 83-87). Actually the nets, as they appear in Loud and Harrington’s plate, are very similar to the Baja California specimens in being knotted rather than being made by the more frequently found coil-without-foundation technique.

Hairnets were also worn in ancient Peru. Some hairnets described by Singer from Pachacamac were constructed with square knots, but most of the 29 specimens she describes were made with the sheet-bend (fisherman’s) knot (Singer, 1936).

Hairnets of the square-knot construction from Bahía de Los Angeles pose, at the present time, an unanswerable question of origin and extrapeninsular distribution.

Carrying net.—One fragmentary net (139535a), the original size of which cannot be determined, is similar to the hairnets in construction, but probably was used for carrying. The bag is tied with the same element square knot; the mesh size is approximately 2.4 cm. Both ends of this net, however, are gathered together. The net beginning is a small circular piece of cord. Four loops are cast onto this; the number of working loops is increased to 16 in the next course by the method illustrated in [figure 4](#). The square-knot tying begins with the next course.

At the lower end, the meshes are gathered together with a hitch ([fig. 6](#)). This may have been put through the loops at what would have been the top of the bag to hold it shut. This would serve as a supplementary tying cord rather than being part of the structure of the net.

This fragmentary net has one notably unique feature. Feathers, presumably decorative, were caught, not in the knots themselves, but between them ([fig. 7](#)). The knot used is identical to the “marline spike hitch” described by Graumont and Hensel (1946, p. 69; [fig. 101](#); [pl. 29](#)). This type of knot—more properly called a hitch—has not been reported elsewhere among the methods of attaching feathers. As can be seen in the reconstruction, the feather serves to hold the hitch, yet if the cord were to be pulled tightly around it, the feather could be removed only with difficulty. It remains puzzling that the carrying net, rather than the hairnets, should be so decorated.

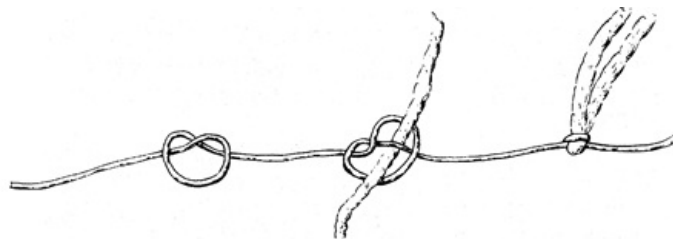


Fig. 7. Detail showing insertion of feathers in hitches of carrying net.

Turning to other archaeological examples of nets from the peninsula, we learn that specimens of square-knot netting have been found to the south in the central region from Mulegé to Comondú. Caves to the west of Mulegé have yielded two fragments of square-knot netting (Massey, MS 2). Other examples derive from Caguama and Metate caves between Comondú and Loreto. In Metate Cave there was a single complete carrying net (Massey and Tuohy, MS). Elsewhere on the peninsula little is known of them except for the southern Cape Region, where netting was in the distinct technique of lark’s-head knotting (Massey, MS 1).

On the ethnographic level, carrying nets were widely used by Indians of western North America from Canada to Mexico, and again in Central America. As part of this general distribution they were used throughout the peninsula (Driver and Massey, 1957, pp. 274, 276, [map 78](#)).

Among the Lower Californians nets were used for carrying suitable gathered products, and also, in the central part of the peninsula at least, for carrying infants. For the latter purpose two portage methods were in vogue: the net was suspended over the shoulders from a tump band across the forehead; or from the end of a pole held by one hand across the shoulder, as a “bindle.”

Feathered “Apron” or “Cape”

Even though this piece (139535b; [pl. 17, a](#)) is extremely fragmentary, it is one of the more interesting of the perishable artifacts. At present it measures about 25 cm. by 17.5 cm. Many of the tying cords and feathers have disappeared or are incomplete. The original bundles of bast fiber actually were probably little longer than in this fragment.

The method of making the article has been reconstructed as follows. The heavy “waist belt” cord is a bundle of unspun fibers and spun cord, 1.5 cm. in diameter. The origin of the spun cord is lost in the mass of material; it is probable that the cord itself was held by the wrapping cords from the bark units. The hanging bundles of shredded bark were doubled over this “waist belt” and wrapped with unspun fibers to make a rigid, tightly closed bundle. These fibers hold the feathers, which may once have covered the bundles completely for, on some, the wrapping covers the entire length. The length of these bundles varies from 13 to 17.5 cm. These bundles are held in place on the heavy cord by a wrapping cord of 2-ply Z-twisted agave, which frequently appears to cross the bundles and the heavy cord in a haphazard manner; feathers are wrapped onto the

heavy cord by this means. Although now there is considerable rigidity introduced into the fibers by dirt, the mass of ties always prevented this from being a softly hanging piece.

To date no like specimens are known from the archaeology of the peninsula. We know of no similar articles in historic times in Baja California, nor to the north in southern California.

Human Hair "Cape"

The human hair "cape" from the Palmer Collection (139539; also 139538, 139550) is fragmentary, but sufficiently intact to provide complete information on the technique of its construction and manufacture (pl. 17, b).

The hanks of human hair forming this garment are from 12.7 cm. to 27.5 cm. long with the majority falling in midrange. The hanks are about 6 mm. in diameter. Primarily, each bundle of hanks was held together by a light wrapping of single agave (?) fibers and some such adhesive material as pitch. In addition, these bundles are secondarily secured with fine 2-ply cord, which is 1 mm. in diameter, with a hard Z-twist. This fine cord also serves to tie each bundle to the main cord of suspension.

The bundles of hair were held together by the same tie-twining as in the matting (fig. 2). There is an overhand knot between each of the bundles. The twining cord itself is 2-ply, Z-twisted in a loose twist. This method served to fasten the bundles to the cord, space them, and to hold them closely. This tying consists of a basic cord and a wrapping cord. A third cord, which formed the wrapping of the individual bundles, is carried to the basic cord, wrapped around it, and in turn is wrapped by the whipping cord. This wrapping is not accomplished neatly; the garment—for all of this cord wrapping—is not a very strongly constructed article.

In the Palmer Collection there are broken hanks of human hair, undoubtedly parts of this specimen, which are catalogued separately (139538). Among these is a string of *Olivella* beads strung on 2-ply cord, and wrapped in with the tying cord of a hair bundle. Thus shell beads were probably part of the original garment. Other tied hanks of human hair (139550) were undoubtedly parts of the specimen.

There is no single item of native culture of Baja California so diagnostic or characteristic as mantles of human hair used by shamans. Few European chroniclers who had a chance to observe them failed to mention this article. However, none have appeared in any other reported archaeological excavations on the peninsula.

As part of the paraphernalia of the shaman, the cape or mask of human hair was indispensable from the Guaicura north to the Kiliwa and Western Diegueño. In all recorded cases the hair was obtained from relatives mourning the death of a recently deceased member of the family or from the dead themselves. Construction of the garments must have been in the hands of the shamans themselves, so secret were most aspects of the medicine-man's lore.

Although the cultural and tribal identification of masks or capes of human hair with the shaman is general for the Peninsular Yumans (Cochimí), such capes were found as far south as the Guaicura in historic times (Baegert, 1942, p. 123). Both of the major sources for the historic ethnography of the Yuman-speaking peoples of central Baja California attest to the use of this device by native medicine-men (Venegas, 1944, I:95-96, 100; Clavigero, 1937, p. 114). For the area nearest Bahía de Los Angeles, the best description of the use of these garments is that of the 18th-century Dominican, Father Luis Sales, who speaks of the capes as follows (1794, pp. 76-77):

When all are gathered, ornamented with charcoal and yellow, the old man places himself in the center of the circle. Under his arm he has a doubled mat of rushes in which he hides the rain cape from the *fiesta*.^[5] On another little stick he has the hair of the dead man suspended. He indicates silence, puts on the rain cape of the hair of the dead, and causes as much horror as when a bear appears. He plays a whistle and tells them that the dead man is coming; but, however much they look, they do not see him coming. Nevertheless they believe it. Then he shows them the little stick with the hair of the dead man, and tells them that he is there, that they see him—and they see nothing. However they give cries, they pull their hair, and make other ridiculous actions. Finally, relieved by crying, the old man comforts them. He puts a thousand questions to the head of hair, and he himself answers them to his liking.

This 18th-century description of Indians to the north of Bahía de Los Angeles, on the Frontera, has its exact counterpart in a 20th-century description of the ñiwey ("Talking with the Dead") Ceremony of the Kiliwa (Meigs, 1939, pp. 50-57).

Tump Band

The tump band (139536) is made with the twining technique used so frequently in such constructions. Fragments of both ends are present, but the intervening central portion is missing so the original length of the specimen is not known. The largest section is 25 cm. long and 7.7 cm. wide (pl. 17, d).

The original warps were three heavy cords which were loosely Z-twisted of two plies of 2-ply cord; each 2-ply single is S-twisted. The fiber is probably of some species of agave. The outer two of the three heavy cords form the selvage cords. The center cord was split into its two component yarns, and forms the beginning of the inner warp threads. Two-ply cords were introduced rapidly to make a maximum of the 27 present at its greatest width. Introduction of the warp elements was accomplished very evenly, producing no distortion of the flat surface. Twining was done with the pitch up-to-the-right. The weft was also of 2-ply agave (?) cord.

The one peculiar feature of this twined band is the form of the selvage, which gives the appearance of a sewing running-stitch along the heavy outer cords.

It is extremely unlikely that this was a sling or belt. The band seems too rigid to have been used for either of these two purposes, and slings are not recorded historically from Baja California.

The only similar specimen known in the archaeology of the peninsula is a fragment of a tump band from the upper or historic level of Metate Cave near Comondú.^[6] This fragment is identical with the tump band from Bahía de Los Angeles in weave, selvage, and cordage. Even the count is similar: 9 warps and 15 wefts per inch for the Bahía de Los Angeles example, and 10 by 22 for the Metate Cave specimen. Either of these is much coarser than Basketmaker bands, like those from Segi Canyon with their 24 warps and wefts per inch (Guernsey, 1931, p. 9).

The tump band was used for portage with carrying nets among the historic Indians of central Baja California (see "[Carrying Nets](#)"). The modern Kiliwa of the north supported nets on the back by a band which passed across the forehead. At the forehead this band consisted of 20 "parallel cords" (Meigs, 1939, p. 38; twined or simple cords are not stipulated). Woven packstraps were used by all southern California Indians (Drucker, 1937, p. 21). Babies and general burdens were carried in nets supported by the forehead tumpline in the central and northern areas of the peninsula (Clavigero, 1937, p. 106).

Cotton Cloth

Since woven cotton (*Gossypium* sp.) was unknown in aboriginal Baja California at the time of European contact, its provenience must be beyond the peninsula. Presumably this specimen is a piece of pre-Columbian trade goods from the mainland of Mexico, and so belongs in the cultural inventory of the cotton-weaving cultures of the Oasis Area.

The weave of this fragment (139537) is Plain (over-one-under-one) (pl. 17, c). The piece, which measures 25.5 cm. long (warp) by 30 cm. (weft), consists of one loomstring end and neither selvage. The warp is white cotton cord, 1 mm. in diameter, in a loosely twisted 2-ply Z-twist. The weft of the same material has a diameter of 2 mm. of single ply, very loosely Z-twist cord. This weft is about the equivalent of commercial slub with no tensile strength. The thread count of the cloth is virtually square (6 x 5 per cm.), although the greater diameter of the tightly beaten weft makes it the predominant feature of the textile.

The warp ends carry a decorative strengthening feature known to Southwestern textiles, both ancient and modern. Two whipping cords that are like the weft secure the end warp loops. They were structural and were probably inserted while the warp was being set up.

One side of the cloth has a whipped edge holding irregularly broken weft ends. This rough mending was accomplished with the usual native 2-ply cordage. Depth of the stitch into the material varies considerably—an indication of expedience rather than ornamentation.

Since cotton cloth and cotton are absent from the pre-Columbian archaeology and the historic ethnography of the peninsula, this specimen must have been obtained through trans-Gulf trade with mainland Mexico. The Seri of Tiburon Island and Sonora were probably the intermediary traders. These Indians are well aware of the peninsula opposite them to the west (Griffen, 1959).

Although the weave of this specimen is the simplest of all weaving techniques, it is lacking among other textile materials of Baja California, such as basketry and matting. The precise mainland derivation of this specimen must remain in doubt; all the tribes of Sonora—except the Seri—wove cotton (Driver and Massey, 1957, p. 216). Plain cotton cloth was extremely widely distributed in the prehistoric Oasis area, and dates at least from Pueblo I times in the American Southwest (Kent, 1957, p. 491).

SUMMARY AND CONCLUSIONS

This small collection of archaeological materials has a marked diversity of types, with little duplication. Compared to similar artifacts from habitation caves, the specimens of the Palmer Collection are complete with the exception of the fragile garments and the netting.

There are few household goods of any variety. Most of the specimens are ornamental or have a ceremonial significance. A number of artifacts, specifically the tubular stone pipes, human hair cape, cane whistles, and the probable bull-roarer, were associated with shamans among the historic peoples of the peninsula. It is most likely that one of the burials was a shaman, who had been interred with his paraphernalia in this burial cave.

Most of the material from Bahía de Los Angeles can be duplicated from various sites in the

Desert Area; however, a few have been recorded only in the archaeology or ethnography of Baja California. These include the human hair cape and the exclusive square-knot netting.

The majority of the artifacts and traits occur in the archaeological collections from Baja California and are mentioned in the ethnographic accounts for that region and for the north of the peninsula. Only the feathered cape and the specific type of bone awl, or "dagger," are not recorded. This material bears little resemblance to the collections or ethnographic descriptions from the extreme south of the peninsula.

There is absolutely nothing in this collection and in the affiliation of its artifacts with cultural materials from central Baja California to support the contentions of Malcolm Rogers (1945, p. 191 *passim*). Without a doubt the Yumans of the peninsula entered long before the advent of pottery-making in the Colorado Desert region. Neither the Palmer Collection nor identical materials from historic levels in the central part of the peninsula can be explained as being due to a post-1450 invasion of Baja California by peoples representing the last phase of the Yuman sequence in southern California.

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PLATES

EXPLANATION OF PLATES

PLATE 12

a. Bone awl or "dagger" (139589b), 16.5 cm. long, 2.2 cm. maximum width, b. Bone awl (139589a), 13.5 cm. long, 2.6 cm. maximum width. c. Worked pumice piece (139613), 8 cm. x 4 cm. d. Tubular stone pipe (139564), sandstone, 7.7 cm. long, 3.7 cm. diameter. e. Tubular stone pipe (139563), sandstone, 29.8 cm. long, 4.4 cm. diameter.

PLATE 13

a. Abalone (*Haliotis* sp.) ornament (139552), 5.3 cm. long, 4.3 cm. wide. b. Fragmentary abalone (*Haliotis* sp.) ornament (139553), 2.1 cm. present length, 3.9 cm. wide. c. Abalone (*Haliotis* sp.) ornament (139551), 4.6 cm. x 4.8 cm. d. *Olivella* shell beads (139546), same scale as ornaments, with bases and spires ground. e. *Olivella* shell beads with only spires ground. f. Fragment of gypsum (139568).

PLATE 14

a. Spines of *Viznaga* cactus (*Echinocactus wislizeni*) (139547), which have been straightened. b. Bone flaker (139556), over-all length, 12 cm.; wood, 11.2 cm. long; bone, 3.4 cm. long. c. Bone flaker (139557), over-all length, 13.1 cm.; wood, 11.5 cm. long; bone, 5.6 cm. long. d. Cord-wrapped stick (139558c), 17.3 cm. long. e. Cord-wrapped stick (139558b), 15.8 cm. long. f. Cord-wrapped cane (139558d), 10.3 cm. and 5.4 cm. long. g. Cord-wrapped hide (139548).

PLATE 15

a. Cane arrow or dart with sting-ray spine point (139587), total length of two pieces 92.5 cm. b. Two wooden fragments (139586), round in cross section; lengths 58 cm. and 56.5 cm. c. Two sticks lashed together (139585a), total length 50 cm. d. Cord-wrapped stick (139558a), length 22 cm. e. Wooden piece (139559), length 30.5 cm., diameter 8 mm. f. Tapered wooden piece (139560), length 38 cm. g. Cane whistle (139588b), length 13.5 cm., maximum diameter 1.3 cm. h. Cane whistle (139588a), length 22 cm., maximum diameter 1.7 cm. i. Bull-roarer (?) (139565), length 23.5 cm., diameter 5.1 cm., thickness 6 mm.

PLATE 16

a. Side view of hairnet (139534a). b. Cord wrapping on piece of accordion-pleated skin (139555).
c. Top view of hairnet (139534a). d. Fragment of sewed rush matting (139544), about 50 cm. x 21 cm.

PLATE 17

a. Feathered "apron" or "cape" (139535b), 25 cm. x 17.5 cm. b. Human hair "cape" (139539), hanks of hair about 6 mm. in diameter, lengths varying from 12.7 cm. to 27.5 cm. c. Cotton cloth (139537), warp 25.5 cm., weft 30 cm. d. Tump band (139536), largest section 25 cm. long, 7.7 cm. wide.

PLATE 18

a. Rim sherd (139614b). b. Reconstruction of pot, diameter 27 cm., height 17 cm., thickness about 9 mm.

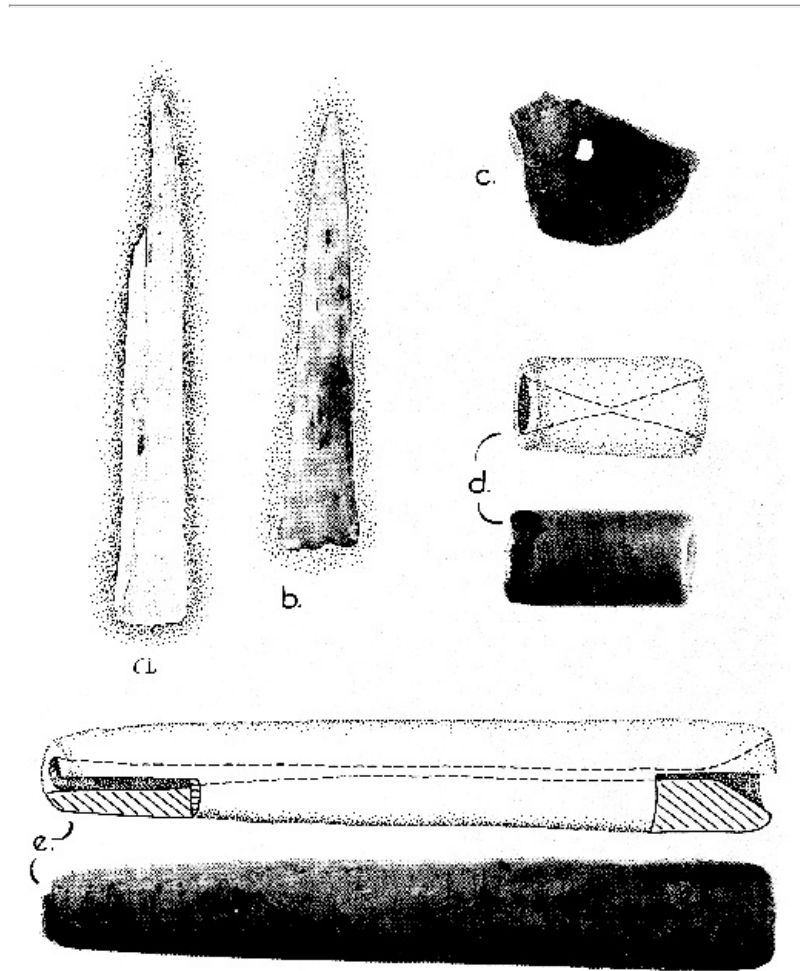


PLATE 12. STONE AND BONE ARTIFACTS

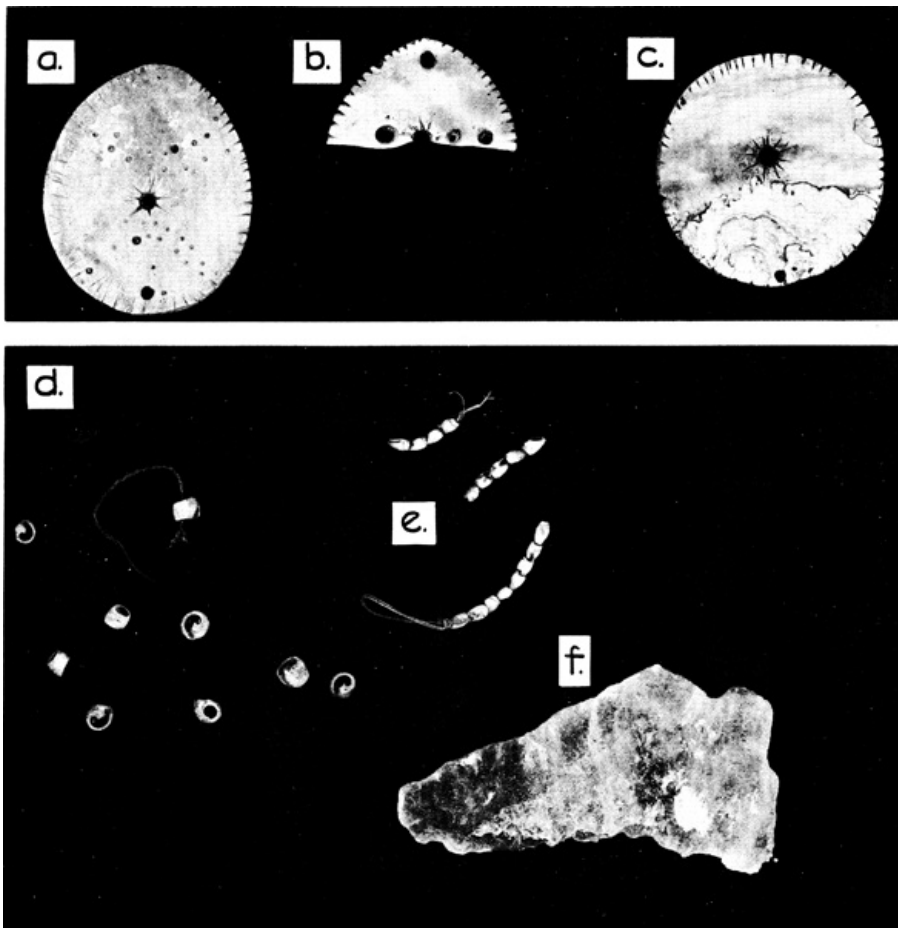


PLATE 13. SHELL AND STONE ARTIFACTS

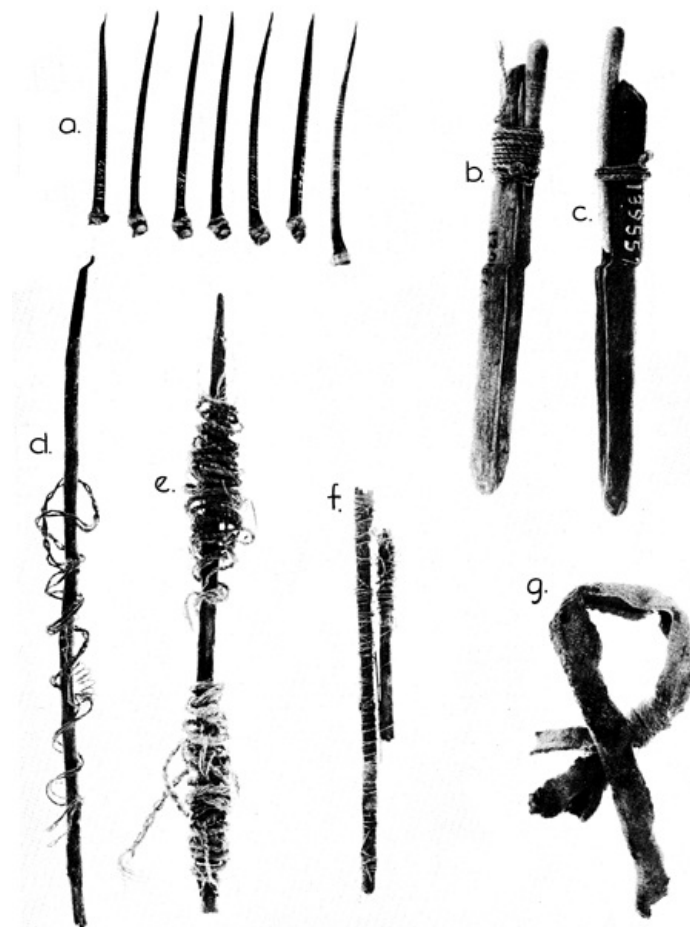


PLATE 14. VEGETABLE AND BONE ARTIFACTS

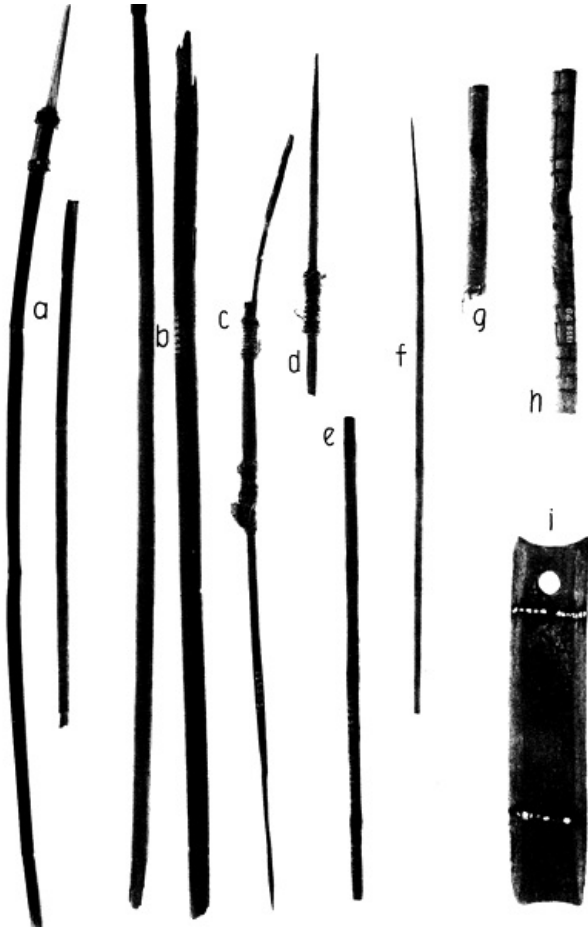


PLATE 15. WOODEN ARTIFACTS

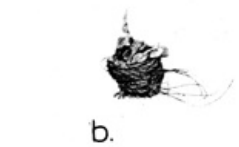
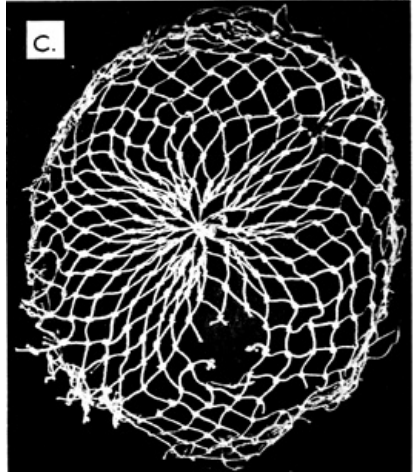
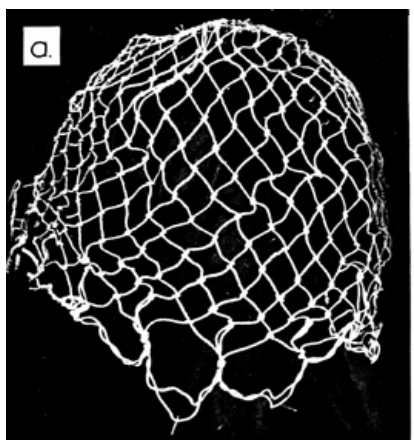
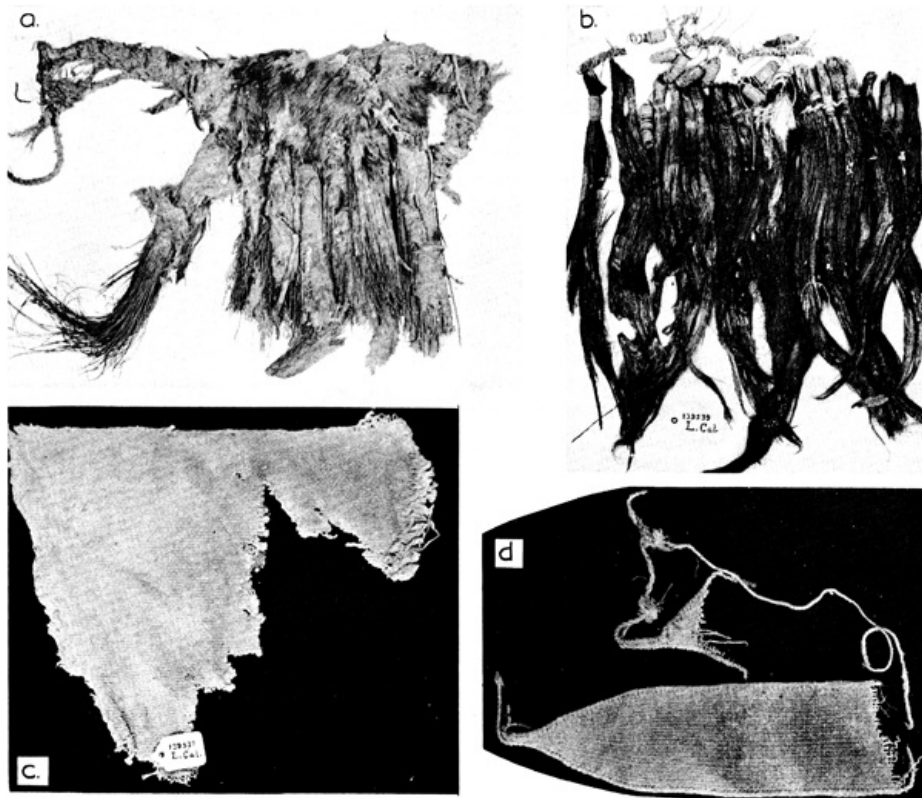


PLATE 16. NETTING, CORDAGE, AND MATTING



**PLATE 17. FEATHERED APRON; HUMAN HAIR CAPE;
COTTON CLOTH; TUMP BAND**

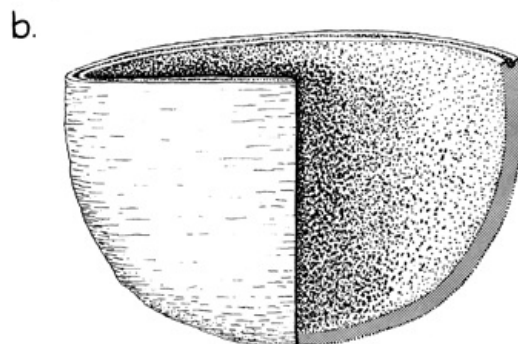


PLATE 18. MIDDEN POTSHERD ARTIFACTS

FOOTNOTES:

[1] Numbers throughout this paper refer to catalogue numbers of the United States National Museum unless otherwise specified.

- [2] This specimen (3-10308) is in the University of California Robert H. Lowie Museum of Anthropology, Berkeley. Location is from field notes, Massey, 1946.
- [3] Identifications were made by Dr. Herbert Mason and Miss Annetta Carter, University of California Herbarium.
- [4] He lists Tularosa Cave (Hough, 1914, p. 87, fig. 178) and Segi Canyon (Guernsey, 1931, pl. 58a).
- [5] Sales, 1794. p. 69. In this, his first reference to the cape of human hair in use at another ceremony, Sales says, "The old man makes something like a rain cape from the hair of the dead."
- [6] University of California. Robert H. Lowie Museum of Anthropology, specimen 3-13586.

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