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Shell Fishhooks of the California Coast

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Familiar to every student of Pacific ethnography are the characteristic incurved fishhooks used by the natives throughout a large part of Polynesia and Micronesia. Ranging from tiny shell or bone hooks to huge wooden specimens over a foot in length, such hooks form a distinct hook culture of considerable importance to the ethnologist.

The object of the present paper is to give a description of and the results of experiments with the incurved shell fishhooks from the Santa Barbara Channel Islands and the mainland coast of southern California—the only known area outside of Oceania where this type of hook has been found. I made a study of several hundred complete and fragmentary fishhooks in archeological collections from the Channel region in the Southwest and Los Angeles Museums at Los Angeles, and the Santa Barbara Museum of Natural History at Santa Barbara.

Five or six generations ago a traveler visiting the Santa Barbara region would have found the Channel Islands and adjacent mainland shores thickly populated by a remarkable group of Indians, known as the Chumash or Canalino (8 pp. 550-568)[1]. They were a fishing and canoe-using people, living largely on the rich marine life found in the protected waters of Southern California and holding constant communication between the islands and the mainland. Nothing remains of these people but the numerous shell middens which mark their former village sites. Investigation of these sites in recent years has produced a considerable variety of implements of stone, bone, and shell, of which the shell fishhooks form a large part.

That the Chumash were successful fishermen is authenticated by the reports of the early Spanish exploring parties along the coast

[1] Numbers in parentheses refer to Literature Cited, p. 65.

during the late eighteenth century. Fray Juan Crespi (3, pp. 24-25) wrote in 1769:

> This channel of Santa Barbara is very well settled, with towns composed of large huts roofed with thatch and with a very great number of peaceable and friendly Indians. There are at least nine or ten towns. All have canoes, very well made. Six villages had as many as fifteen canoes each, which they use for fishing, because many kinds of fish, such as tunny, needlefish, sea bass, barbel, and very large sardines, are plentiful.
>
> All these towns welcomed us with much rejoicing and entertained us well, bringing us a fine supply of fish, in particular fresh tunny, of which they made great piles for us.

Several early observers noted a variety of fishing gear in use on the Channel, including harpoons, spears (9, p. 41), large and small nets (5, p. 365), anchored traps or "pots" (10, p. 320), and the fishhooks made of shell. Of the shell hooks, Martinez (9, p. 44) wrote in 1792: "They have fishhooks made of shell, and sometimes they prefer them to our iron ones." Anza (4, p. 105), writing in 1776, states that the Channel Indians had ". . . hooks made of shell but as perfectly fashioned as those made of iron . . ." Fages (6, p. 75), in describing the Chumash farther north on the San Luis Obispo coast, says: "The fishhooks are made of pieces of shell fashioned with great skill and art."

According to data on a model in the Southwest Museum, Los Angeles, which was supplied to the model maker by John P. Harrington of the Bureau of American Ethnology, the fish lines were of milkweed fiber, with a stone serving as a sinker.

As shown in figure 1, most of the shell hooks from the Channel region are usually nearly circular in shape. The shank stands at a tangent from the general curve of the hook proper and the barbless point is curved inward in varying degrees.

These hooks range from tiny specimens 0.40 inch long, to large ones over 2.5 inches long. They are made of two kinds of shell, the abalone (*Haliotis*) and the valves of the dark purplish mussel (*Mytilus*). (A number of small hooks in the Southwest Museum from San Nicolas Island are made of the small red top shell, *Norrisia Norrisii* Sowerby.) The abalone shell makes the sturdiest hook, the thick nacrous interior being ideally suited to hook making. A few specimens are made of bone, evidently from the longbones of large mammals.

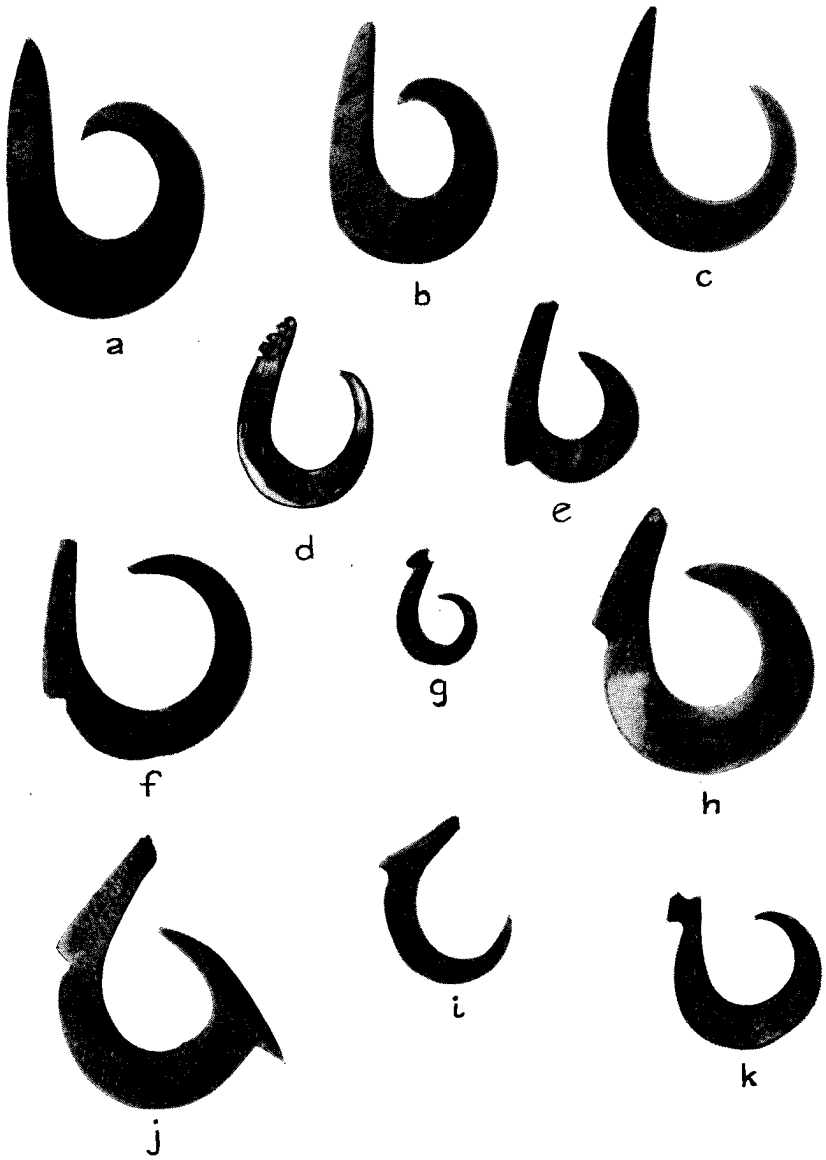

FIGURE 1.—Circular type shell and bone fishhooks of the Chumash (actual size), *a-c,* pointed shank type (U.S. Nat. Mus.), *a-b,* deeply incurved hooks, Santa Cruz Island: **a,** cut from a section of heavy long bone of some large mammal; **b,** mussel shell (*Mytilus*); **c,** open-pointed hook of abalone shell (*Haliotis*) from San Miguel Island; **d,** notched-shank type hook from a site near Avila, Calif. (Los Angeles Mus.); **e,** mussel-shell hook, La Patera (U.S. Nat. Mus.); **f, h,** abalone shell hooks, Santa Cruz Island (U.S. Nat. Mus.); **g, k,** abalone hooks, San Nicolas Island (Southwest Mus.); **i,** open-pointed mussel-shell hook, San Miguel Island (U.S. Nat. Mus.); **j,** barbed bone hook, probably post-Spanish, Santa Cruz Island, (U.S. Nat. Mus.).

There are the following three types of shank:

1. Grooved shank (fig. 1, *e-k*). Most hooks in museum collections are of this type. The groove in which the fiber line was lashed varies in length from a groove encircling a small knob at the top of the shank (fig. 1, *g, k*) to a groove encircling the full length of the shank (fig. 1, *e*), thus forming a shoulder on the outer edge of the shank. Many specimens have medium length grooves (fig. 1, *f, h-j*). In fastening the line to hooks of this type, the line strands are carried round the groove, and the transverse turns of the lashing thread effectively keep it in position. Schumacher (14, pl. 22) illustrates a bone hook of this type from Santa Cruz Island, the lashing thread being fine two-ply fiber. Occasionally, hooks of this type have traces of asphaltum remaining on the shank, indicating that this popular natural cement had been used to aid in holding the fiber lines in place.

2. Plain shank (fig. 1, *a-c*). This type has a plain, smooth shank, coming more or less to a point at the top; the shank always shows evidence of having been coated with tar in which the impressions of the transverse lashing element are usually visible. A close examination of these impressions shows that the end of the fiber line was laid along the inner edge of the shank, to which it was securely lashed by a transverse serving of flat, ribbon-like thread, possibly a bark fiber.

3. Notched shank (fig. 1, *d*). The shanks of hooks of this type are more or less pointed at the top, like type 2, except that they have a series of from two to six notches on the outer edge near the top. These hooks usually show no traces of tar cement, the notches evidently giving security to the lashing thread. Hooks with notched shanks are the least numerous of the three types in museum collections; they are possibly a variation of the plain shank type.

The technique of the manufacture of fishhooks studied from specimens in museums is shown in figure 2. The shell is roughly chipped into a pear-shaped blank (fig. 2, *a*) with a hammer stone. A hole is made in the blank with a small, plummet-shaped chert drill. The hole is enlarged and the rough edges of the shell ground down smoothly on a piece of sandstone. A slender stone file is used to make a notch between the parts to form the shank and the point. The notch and drilled hole are enlarged until they meet, and the finishing touches inside and out are made with the file to form the completed hook.

The plummet-shaped chert drills are triangular in cross-section and are about 0.75 to 3 inches long. None of them show signs of having been hafted. Fresh shell is drilled quite easily when the drill is gripped tightly between thumb and forefinger and rotated. Using these primitive tools on fresh shell, I made a number of replicas of Chumash hooks. To complete these hooks required one and one-half to two and one-half hours, according to their size.

The chert drills and stone "files" have occasionally been found in association with fishhooks in various stages of manufacture. At a

village site near Point Mugu in Ventura County, a Los Angeles Museum field party found one of the chert drills on a house floor with two partially drilled shell blanks and a perfect hook (18, p. 45). At a village site near Redondo Beach, a most interesting cache was found, consisting of 44 abalone shell blanks, five drilled blanks, a finished hook, and four chert drills.

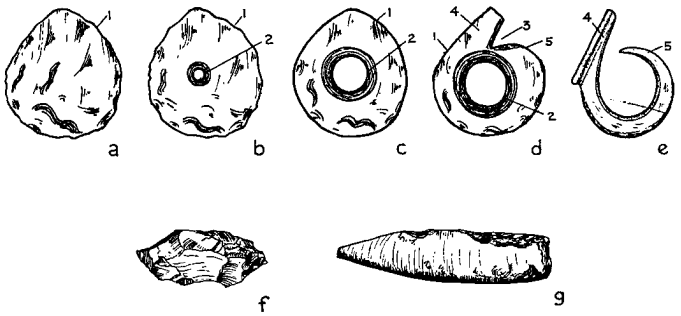

FIGURE 2.—Stages of fishhook manufacture and tools used: **a,** shell blank chipped to pear shape; edge (1) rough; **b,** central hole (2) drilled with chert drill (*f*); **c,** edge (1) smoothed and hole (2) enlarged; **d,** notch (3) formed to separate shank (4) and point (5); **e,** completed hook showing finished shank (4) and point (5); **f,** double-pointed chert drill of type commonly found in Santa Barbara region (0.5 actual size); **g,** slender stone file, commonly of basalt or sandstone (0.5 actual size).

Figure 1, *j* shows one of the barbed hooks, of which so few have been found. The barb is always on the outer periphery, somewhat below the point. There is some reason to believe that these are of post-Spanish origin, possibly copied after some European metal hook. It is possible that the outside barb on these hooks was patterned after Hawaiian hooks used by Hawaiian sailors on the California coast, for during the early 1800's it was usual for American trading vessels to employ these sturdy Polynesians as sailors on voyages to the Pacific Coast. Mr. D. B. Rogers of the Santa Barbara Museum has informed me (personal communication) that he found several barbed bone hooks at Cochies Prietos Harbor, Santa Cruz Island, in surface midden containing Spanish trade material. Three barbed mussel shell hooks in the Los Angeles Museum, from Point Mugu shell midden are likewise surface finds (18, p. 46).

As I have said, the generally round contour of the Chumash fishhook gives it a more or less circular appearance, depending upon the amount of incurve to the point. Fishhook points vary from those with

no incurve to points deeply involuted (figs. 1, *a, b, h, j; 2*), sometimes approaching within an eighth of an inch of the shank.

The Polynesian-Micronesian fishhooks of incurved type are similar in pattern to the Chumash hooks and obviously work on the same principle. The method of operation of this type of hook is well described in several publications on Polynesian ethnology. (Beaglehole, 2, pp. 59-66, 191-197; Nordhoff, 11; Kennedy, 7.) I have proved the effectiveness of the incurved hooks by catching a number of fish with reproductions of Chumash fishhooks.

The incurved fishhooks of Oceania are distributed over an immense area of the Pacific from Hawaii, New Zealand, Easter Island, and the Tuamotus in the east to the Caroline Islands in the west. Many forms of this type of hook were formerly made—large and small, simple and composite. They were used for catching many kinds of fish. Such hooks range from small pearl-shell hooks, used for catching small fish inside the lagoons, to huge wooden hooks over a foot in length, used to catch large fish at great depths outside the reefs.

These hooks were usually baited and used on hand lines, the bait being tied on below the point to prevent it from being removed too easily. For a long time the Polynesians preferred their own incurved type of hook to the European barbed hook, and they made them out of nails and wire. In fact, such hooks are still made of bronze or steel wire and are used by many native fishermen in various parts of Polynesia (11, p. 155).

In describing the rounded, incurved hooks of Hao Atoll in the Tuamotu Islands, Seurat (15, p. 297) says: "The *numi* is made of pearl-shell or turtle shell. The natives employ them to take fish which do not bite freely (*Carangue,* etc.). The fish, hooked securely in the margin of the mouth, is not able to disengage itself, being retained by the [incurved] point of the hook."

Kennedy (7, pp. 27-28) describes in detail the action of the large wooden hooks used throughout Polynesia for catching the bottom-dwelling *palu* (*Ruvettus*). His description can be summarized as follows:

> When the *palu* takes the bait (which is lashed with thread to the point-leg of the hook, leaving the point and shank exposed) he forces the angle of his jaw through the clearance between the point and shank of the hook; the pull of the line then causes the point to penetrate the thin tissues of the bottom or side of the jaw, after which the whole point-leg of the hook slips through. Once the point enters the fish's jaw, escape is practically impossible.

Nordhoff (11, p. 156) sums up the action of the Polynesian incurved hook as follows:

> In one respect the use of all these in-curved or angular native hooks differs from that of ours. When the fisherman using a European hook "gets a bite," he strikes to set the point and barb in the fish's mouth. With the native hook, on the other hand, one must never strike; a steady gentle tension is kept on the line and the fish allowed to hook itself. The pull of the line, leading from the *inner* head of the shank and causing the hook to revolve, sets the point deeper and deeper in the fish's jaw.

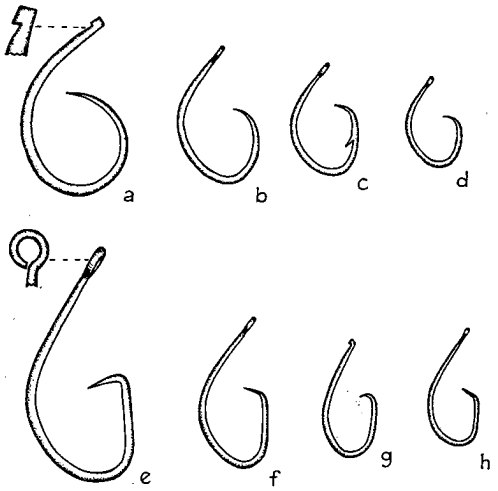

FIGURE 3.—Manufactured steel fishhooks of native type, sold in the stores of Honolulu (0.5 actual size). Used for catching *oio,* bonefish (*Albula vulpes*), *ulua* (*Caranx* sp.), and other varieties. **a-d,** rounded type, usually barbless, but may be obtained with barb (*c*); **e-h,** angular type. (*a, g* have Polynesian type shank knobs, *b-f, h* have the top of the shank bent into an eye, like most European type hooks.)

My angling experiments confirm Nordhoff's statement. I made reproductions of Chumash hooks from fresh abalone shell, and with them caught 14 fish off Santa Catalina and Anacapa Islands, and Point Mugu, California. These hooks were used on a hand line with a sinker, and were baited like the Polynesian hooks; that is, the bait was tied on with thread below the point, leaving point and shank exposed.

Species caught were mostly bottom-feeding varieties: rockfish, kelp bass, California halibut, sheepshead, and sculpin. With the small hook (fig. 1, *g*) I caught perch and a small kingfish. I found that

every fish caught had worked the thin tissues at the side of its mouth through the clearance between the point and shank of the hook and that the pull of the line then rotated the hook and caused the point to slide through. In using hooks of this type one must be careful not to jerk the line or "set" the hook as one sets the European barbed hook. A steady gentle tension is kept on the line and the fish given sufficient time to hook itself.

A fish once caught on an incurved hook with a relatively narrow clearance between point and shank (fig. 1, *a, b, f-h, j*) has little chance of escape. This fact was clearly evident during my experiments, and appears to be the strongest recommendation for using them rather than European hooks. Several native Hawaiian fishermen in Honolulu have informed me that this is the chief advantage of the incurved hook, stating that the white man's barbed hook will often slip or tear out of the flesh of soft-mouthed fish. Another advantage cited by Hawaiians is the fact that the incurved hook is less likely to foul on coral bottom.

The incurved, native type steel hooks (fig. 3) sold in the stores of Honolulu today indicate that the advantage of this invention of primitive man is still recognized.

That the shell hook is not a very ancient element in Chumash culture is clearly shown by the recent archeological investigations of Rogers (13) and Olson (12) in the Santa Barbara region, where this type of implement occurs only in relatively late period sites. Stratigraphic work by Walker (17) at a large site near Redondo Beach, California, indicated the shell hooks to be of relatively recent introduction, for they were found only in the upper levels of the midden.

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