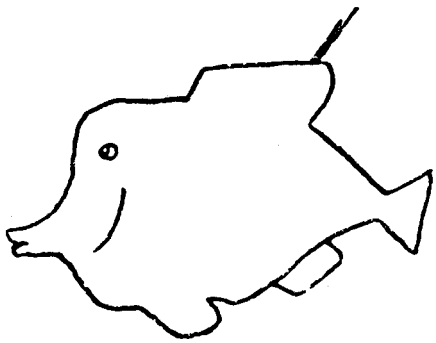


CHAPTER 9

FISHHOOKS

No matter how good . . . the rest of your tackle, it is that little hook that holds and lands your fish. Of does not hook him because it is badly designed.
—*R. L. Bergman*

Traditionally Micronesians fashioned their fishhooks from bone, shell, or wood. Forming and finishing such hooks using nonmetal tools was a laborious task often taking several days. With so much labor going into their making, and so much hinging on their successful functioning, such hooks were valued much more highly than we value modern hooks. Accordingly they were fashioned with considerable care. In Palau the knowledge that went into the design of such hooks has vanished; even Ngiraklang knew nothing about them. His hooks came from the store and were made in factories thousands of miles away. Such was also the case with most of the other fishermen I met throughout Micronesia.

But in the South West Islands the older fishermen still prefer to make their own hooks. They are now made of stainless steel wire (some of it coming from Japanese war planes downed during World War II). But they are formed by hand, using grooved rocks as anvils, and chunks of cast-off metal as hammers. And most of the knowledge that goes into their shaping predates the invention of stainless steel by centuries.

The preservation among Tobians of the ancient skills involved in the design and use of such hooks provided a rare opportunity to examine their function. Such a study is of more than academic interest, for the question of the relationship of shape to function in fishhooks has received little attention from marine researchers (e.g., Baranov, 1976; Saetersdal, 1963); and the form of many machine-made hooks owes as much to fashion as to proven function (Hurum, 1977).

Hundreds of pages have been written about the fishhooks of Oceania by anthropologists, and it might be thought that much could be learned from them about functional design. But hooks have been used in these studies mainly as aids in establishing cultural sequences and historical links, much like pottery. Comparatively little effort has been made to understand what their makers undoubtedly considered to be their most important attribute—their ability to catch fish.[1] So little is known in fact that Reinman (1967, p. 188), in a major review of fishing archaeology in Oceania, states with elaborate caution, "although we are here entering *an area of speculation*, there is *some* evidence *suggesting* that *perhaps* the different shapes have *some* significance in terms of the kind and size of fish taken and do not *just* represent *idiosyncratic behavior* on the part of the makers" (emphasis added).

Some early European observers scorned these stone, bone, seashell, wood, or coconut shell devices. "Ill-made," said Banks (cited in Best, 1929). "Very clumsy affairs," said Polack (cited in Best, 1929). "Ill-contrived for the purpose," said Horace Holden (1836, p. 38) of Tobian turtle shell fishhooks.

What then should we make of the fact that other Europeans, after having tried native hooks, favored them over European designs? One admirer described them as "a triumph of stone age technology" (Beasley, 1928, p. 20). Captain James Cook (1785, pp. 149, 150) said of Hawaiian hooks, "considering the materials of which these hooks are made, their strength and neatness are really astonishing; and in fact we found them, upon trial, much superior to our own." U-shaped European hooks are "far inferior" to native hooks, stated Danielsson (1956, p. 183). "My experience is that the native form of hook is preferable," claimed an early New Zealand visitor. "I always made my own *hapuku* hooks" (Best, 1929, p. 36). "After a short sojourn in the Pacific I gave up European and took to native fishhooks, and always found the latter more deadly," said Romilly

1. Nordhoff (1930) fished extensively with the Tahitian pearl shell tuna lure, however, and carefully described the functional aspects of its design. Kennedy (1929) provided a useful description of the function of a specialized Pacific island hook used to catch the oilfish, *Ruvettus pretiosus*.

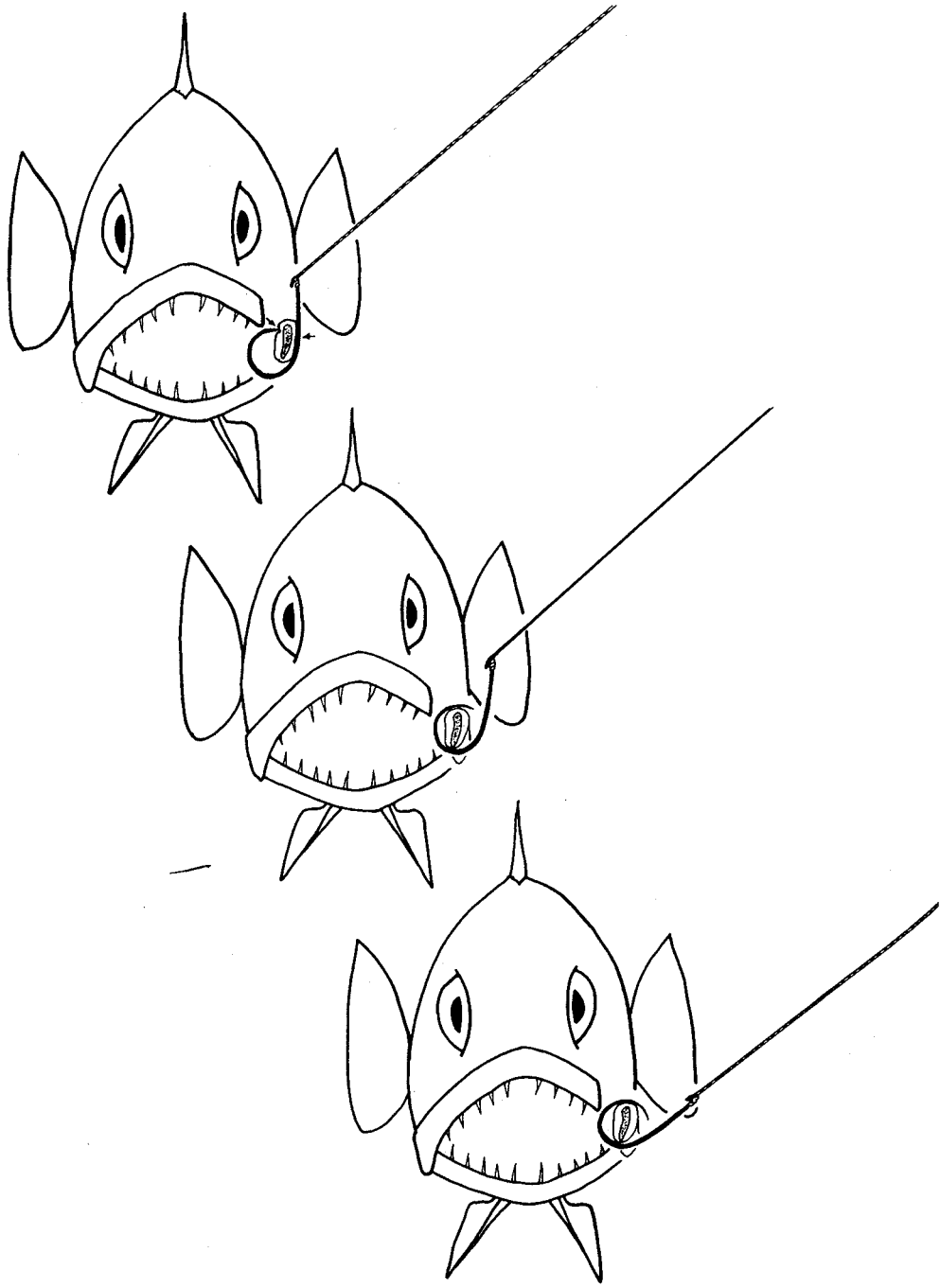
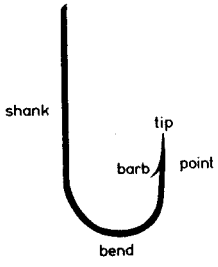


FIGURE 5. How a rotating hook functions. See text for explanation.

(1856, p. 133). Of Tahitian hooks Wilson (1759, p. 386) said, "notwithstanding the form which to us appears most clumsy and crude, they will succeed, when we with our best hooks cannot." "In my opinion the Polynesian incurved hook . . . is mechanically superior to hooks of our kind," said Nordhoff (1928, p. 44). "The old Hawaiian fishermen caught more with these peculiar hooks than they could with the more dangerous looking hooks of the foreigner," stated Brigham (1903, p. 8).

Adding to this testimony are numerous reports that Pacific islanders had little use for metal fishhooks of European design, reshaping them and often removing the barb. Ellis (1859, p. 150), for example, claimed that the Tahitian fisherman "would rather have a wrought iron nail three or four inches long, or a piece of iron wire of the size, and make a hook according to his own mind than have the best European-made hook that could be given to him." Even a relatively fragile pearl shell hook was considered "much better than any made in Europe," Ellis stated.

An examination of Tobian fishhooks helps explain these conflicting accounts. Of the thirteen basic hook patterns in use on Tobi, the invention of all but one appears to predate the introduction of metal to Oceania. And when the older Tobian fisherman does come into the possession of an imported hook, he sometimes modifies it strongly before use, just as his ancestors did in the nineteenth century.[2]



The feature of many Pacific island hooks that most often perplexes the Westerner is the strongly in-curved point. The tip, instead of pointing upward, points inward toward the shank, or even downward (figure 5 and plate 21). Western fishermen unfamiliar with such hooks instinctively doubt their effectiveness. When noted American angler Harlan Major first saw one, for example, he was skeptical that "it would catch—to say nothing of hold—any fish" (Major, 1939, p. 52). But the design is intentional and the hook highly effective when employed properly. Called a rotating hook,[3] it is used under conditions where it is difficult to set the hook by jerking the line sharply when a fish bites. Such conditions occur when dropline fishing either in deep water or in strong currents. In either case water currents cause the line to "belly," or curve, rather than hanging straight down. Jerking the line tends simply to straighten it somewhat and little of the energy applied is transferred to the hook.

2. According to Holden (1836), Tobian fishermen could not be induced to use the European hooks his crew gave them "till they had heated them and altered their form."

3. Nordhoff (1930) learned how these hooks functioned and appears to have been the first writer to use the term "rotating" to describe them.

which they are to be used. Although both models are basically deep water hooks, the model with the point closest to the shaft is used in the deepest water when the belly in the line will be greatest and the line slackest. A variable compromise is thus made between the speed and ease with which a fish can be hooked (faster and easier when the gape is wide) and the likelihood of retaining the fish on the hook (greater when the gape is narrow). Deep water fish are worth the extra time and care involved in hooking them. The deeper Tobians fish, the larger, on the average, are the fish they catch.[5] They fish to depths of more than 600 feet.

Also influencing the fisherman's choice of the particular type of rotating hooks to use is the number of sharks in the vicinity. When sharks prove troublesome, a hook with a wider gape is used. Fish escape more easily from such a hook but they hook up faster. This reduces the time they must be played and during which they make easy targets for sharks.

The range of compromise between the speed and the secureness with which a fish can be hooked is further extended by another basic fishhook type, the "jabbing" hook. This is a shallow water hook used with a taut line in trolling, shallow dropline fishing, and pole fishing and is of the general design most familiar to Westerners. There is little if any inward curve to the point and the gape is generally greater than that of a rotating hook. A fisherman jerks a taut line to set this hook. Only the barb, if it is present, plus sustained tension on the line, prevents a fish from throwing a jabbing hook. And as the hole in the jaw created by such a hook becomes enlarged during the struggle, the barb holds the fish progressively less securely. The fisherman must thus land the fish as quickly as possible.

Whether a jabbing hook is used with or without a barb often depends on how fast the fish are biting. Tuna in a school feeding at the surface often bite voraciously. But the school usually dives after a few minutes, so as little time as possible must be wasted unhooking fish. In this kind of fishing the fisherman's skill is measured largely by the speed with which he lands and unhooks fish and gets his hook back into the water. Concerning similar fishing in Tahiti, Nordhoff (1930, p. 215) states:

> The skill of a bonito-fisherman may be judged from an inspection of his hooks. A green hand uses long points, very sharp, to ensure landing every fish that strikes. The expert uses short, blunt points, just sharp enough to lift the fish out of the water before they drop out of the jaw.

5. An increase in mean size of fish with depth has often been noted by biologists (Helfman, 1968), but no one as yet has come up with a generally accepted explanation for this trend.

> While the beginner is landing a dozen bonito, many of which must be disengaged from the hook by hand, the adept will have pulled out of the water fifty fish and landed forty-five of them without touching the hook.

Under such conditions many Pacific island tuna fishermen, including Tobians, traditionally used barbless hooks, as do tuna pole fishermen of countries throughout the world today.

A barbless hook has the added advantage of penetrating the fish's mouth faster and with less resistance. Barbless jabbing hooks are also used in the South West Islands for pole fishing on the reef; a fish has little time to struggle and escape before being yanked from the water when hooked under these conditions. The same hook type is used for shallow dropline fishing when the fish are biting rapidly and, as in the case of fishing for surface-feeding tuna, speed of unhooking is important. Much line fishing is done at night on Tobi. The ease with which an unbarbed jabbing hook can be removed from a fish is also an advantage on a moonless night when the fisherman cannot see clearly what he is doing.

There are nine basic types of Tobian jabbing hooks. All are for use in shallow water. As with rotating hooks several of these types come in two different models. Once again the model with the point closer to the shaft is used with a slacker line than the other model with a wider gape. But whereas the point is curved inward to bring it closer to the shaft in a rotating hook, the shank is bent to bring it closer to the point in a jabbing hook. The straight-shanked version is used for trolling close to the canoe—a situation in which the line is almost always straight. Bent-shanked jabbing hooks are used in trolling with a long line and for shallow dropline fishing—situations in which the line is more curved and the tension more variable.

Until recently only the subjective impressions of Pacific island fishermen and their European converts could be used to support the contention that incurved hooks are superior to those with straight points. But recent trials conducted in the Caribbean (Kawaguchi, 1974), in Scandinavia (Hamre cited in Hurum, 1977), and in Great Britain (Forster, 1973) have demonstrated that in dropline fishing incurved hooks catch more fish.

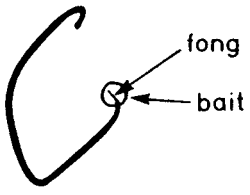
The incurved points of rotating hooks also render them less liable to hook up on the bottom—an important feature when dropline fishing over coral-studded bottoms. Before the arrival of metal, rotating hooks had an additional advantage over jabbing hooks. Bone or shell hooks could not be jerked as hard as metal hooks for fear of breaking them. Therefore a hook that imbedded itself in a fish's mouth when only a gentle pull was exerted on the line was valuable even in shallow water, particularly when large fish were being sought.

Like many other Pacific islanders Tobians do not just "go fishing"; they fish for specific species and their techniques vary accordingly. There is a saying on Tobi that "the hands of a fish are its mouth"—meaning that in the absence of hands, fish manipulate their food with their mouths. Some hold their food between their teeth or lips and move some distance with it, often repositioning it before swallowing it. Groupers tend to "inhale" food deep into their mouths with a single motion. Others nip off small pieces. Still others take food into their mouths and blow it out repeatedly before swallowing it. Mouth shapes, sizes, and hardness also vary greatly in different fishes. All these factors are considered when deciding what hook to use for a particular species.

The wider the bend in a hook the greater the difficulty a fish has in spitting it out. Thus in the South West Islands hooks with wide bends are used for large-mouthed fish such as groupers and most squirrelfish. Such hooks tend to hook deeply in the jaw rather than the lips and are therefore also used when fishing for species with easily torn lips, such as rainbow runners and tuna. Smaller sizes of wide-bend hooks are used for smaller-mouthed fish, such as wrasse and fusiliers, that tend repeatedly to suck in and spit out the bait cautiously. Hooks with narrower bends are used for small-mouthed fish such as squirrelfish of the genus *Holocentrus*. Hooks with long points tend to be used for species with narrow, deep mouths, whereas short points are used for those with shallow mouth cavities. Another factor in determining point length is that a short point penetrates quickly but is likely to be dislodged by a species that struggles vigorously; a long point does not drive home as readily but is more difficult for a fish to throw.

Tobians distinguish a third type of hook—the *fong* hook. When the terminal few millimeters of a hook point are bent sharply inward this tip is known as a *fong*. Such hooks may function like rotating or jabbing hooks depending on their shape. The *fong* serves to help keep the fish on the hook. And in two out of three *fong* hooks it also helps keep the bait on the hook. The third *fong* hook, of unusual and ingenious design, was invented on Tobi after the introduction of metal. Called *haufong*, it was designed specifically to catch triggerfish, a group of fish which Tobians relish.

Triggerfishes have small mouths with exceptionally strong jaws (Aleev, 1969). Because they take small bites, many species do not take bait of normal size into their mouths whole. Instead, they nip pieces off the bait until what remains falls off the hook. They are, in consequence, notorious bait stealers (e.g., Buck, 1949). If, to counteract this, a very small hook is used with a small piece of bait, they will take the entire hook into their mouths, often snipping the line to which it is attached with their teeth.



Haufong

The *haufong* hook was invented on Tobi in the nineteenth century by a half-Tobian, half-Sonsorolese fisherman to circumvent these problems. A small portion of bait is placed on the hook so that it covers only the *fong*. (The tips of all other baited hooks are left showing.) Because the bait is small the triggerfish takes it between its lips in one piece along with the *fong* within it. When the fisherman pulls on the line the fish tries to spit the hook tip out, but the *fong* catches on its upper lip and is then driven through it. The fish then slides down the hook to the bend. The *fong* now functions as a barb.

The *haufong* is also the hook of choice for some other strong-jawed, small-mouthed fishes such as unicorn fish.[6] It is sometimes also used in fishing for other species such as fusiliers, which cautiously and gently suck the bait in and spit it out repeatedly; the *fong* tends to catch easily in their upper lip or jaw when they try to spit out the bait. Although a variety of wrasse have small mouths, strong jaws, and tend to mouth bait cautiously, this hook does not generally work well for them. Their lips are too small and their palatine bones tend to prevent the *fong* from penetrating the roof of the mouth easily.

Two different forms of *haufong* are shown on page 197. The "new" style was probably adopted because the point is directed more or less parallel to the line of tension created when fishermen pull against fish; the closer the line of penetration coincides with the line of tension the greater the penetrating power of the hook.

Patris explained to me that the *haufong* design would be of little use with hooks made of bone or shell. The *fong* would be too weak to withstand the strain put on it by a triggerfish. However a hook of similar design and function was invented independently in the Tuamotus 3,000 miles to the southwest of Tobi prior to the use of metal. Seurat (1905) states that the bait was placed on the extremity (i.e., the "*fong*") of this hook and that a version made of pearl shell was used to catch parrotfish. Because the strong jaws of triggerfish

6. Traditional bone, shell or wooden hooks of somewhat similar design were made in various parts of Oceania, but the bent tip was longer and thicker and served a different purpose. Large pieces of bait were placed on the hook *below* the bent portion of the tip, which served to prevent the bait from falling off, as well as decreasing the gape of the hook. Such hooks were used, unlike the *haufong*, for certain *large*-mouthed species. One such hook, the large *Ruvettus* hook (e.g., Kennedy, 1929) was not used in the South West Islands. The fish for which it was intended, *Ruvettus pretiosus*, apparently does not occur here; Tobians did not recognize photographs I showed them of this distinctive fish. As they routinely fish at a depth of several hundred feet on the outer reef slope (where this fish is found around many other Pacific islands), they would surely have caught it if it occurred around Tobi.

would break such shell hooks, wooden hooks of the same design were used to catch them. The shrub *Pemphis acidula*, which has very hard wood (Stone, 1970), was used for this purpose in the Tuamotus. This plant is very common and widespread throughout the coastal tropical Pacific and it is probable that it grows on Tobi. But unlike many Pacific islanders, Tobians do not appear to have used wood for making fishhooks.

Another unusual Tobian hook is called *man tanante. Man* means "being" or "person." *Tanante* is a corruption of the name Ternate, an island about 300 miles southwest of Tobi in the Moluccas. The hook name commemorates a man from Ternate who accidentally drifted in his canoe to Tobi many generations ago and introduced the design.

The design is unusual among metal hooks in that the shaft is scarcely longer than the point. I was not able to understand the functional aspects of its design, but was told that it is the Tobians' most versatile hook, and is therefore used in instances where the fisherman is unsure as to what kind of fish he is liable to catch. Once he determines which fish are biting he often switches to a hook more specific to that fish.

Traditional Pacific island fishhooks clearly suffer in comparison with Western hooks in some regards. Metal hooks have greater tensile strength. Metal and shell hooks of the same style are therefore of somewhat different shapes and proportions. Shell hooks are usually thicker throughout. Jabbing shell hooks are also often reinforced at their weakest point—the bend—with a kind of triangular keel, particularly if they were to be used on a lure for trolling for large fish. Shell hooks also tend to have shorter shanks than comparable metal hooks because of the greater likelihood of a fish biting through or snapping a long shank.

Because the manufacture of shell hooks was so time-consuming, they were treated with great care. On Tobi if a grouper ran into a hole in the reef with a hook, the line was not broken off and the hook sacrificed as it usually is today. Instead steady tension was kept on the line until the grouper finally emerged—sometimes as much as an hour later. If a hook got snagged on a coral, a rock was attached to a second line, hooked on the fishing line, and slid down it. A little slack was let out in the fishing line so that the rock weight would pull on the hook from below, thereby sometimes unsnagging it in situations where an upward pull was of no avail.

Despite the labor involved in making turtle shell hooks and the fact that Tobians have had enough metal to make metal fishhooks since before the turn of the century, they did not abandon the use of turtle shell hooks completely until the late 1930s. One advantage of

ease with which a hook can be set in a fish and the speed with which it can be shaken loose by the fish or removed once the fish is landed.

But, lest it be concluded from this account that the design and use of fishhooks has achieved the status of an exact science in the South West Islands, it should be added that there remains plenty of latitude for difference of opinion among the fishermen as to what hook to use for a particular purpose and how best to form it.

Those who maintained that Pacific island hooks were crude and ineffective were misled by the strange shape of the rotating hooks; it is not intuitively obvious that such hooks are very effective if used properly. O'Connell, a castaway on Ponape, provides an example of this misunderstanding. Rejecting the "rude tortoise shell hooks" of the natives, he made some "very tolerable" hooks from the ramrods of muskets preserved from the wreck of his ship. "But it was necessary," he related, "to keep the line taut, as there being no barb, the fish would otherwise escape" (O'Connell, 1836, p. 112). Had he copied the design of the rotating turtle shell hooks he saw, and sought instructions from Ponapeans in their use, he would not have been inconvenienced by the lack of a barb.

Those, in turn, who maintained that the islanders' hooks (by which they meant rotating hooks) were superior to Western jabbing hooks were oversimplifying. Rotating hooks were indeed better in design (although of lesser tensile strength) than typical Western jabbing hooks for those types of fishing involving slack lines. But the jabbing hook, native both to Europe and the Pacific islands, is a useful and versatile hook provided that it is used when fishing with a taut line in shallow water.

Contrary to the impression that is given by the early literature, it is unlikely that the islanders always modified the shapes of European hooks before using them. They probably did so only when the type of fish or style of fishing for which they were intended required it.

Lines, Leaders, and Lures

Today South West islanders still fish often with lines they make themselves out of sennet (coconut husk fiber) or the inner bark of *Hibiscus tilaceus*. One observer noted in 1898 that Tobian sennet "was twisted in various thicknesses so prettily and with such regularity that a European cordmaker would have gained credit by it" (Eilers, 1936). But good sennet rope is more than pretty. It is not only strong but also exceptionally resistant to decomposition. Heavy deep-water fishing lines of sennet are valued more highly by their Tobian owners than commercial line and often last for several generations.

the latter, according to Patris, is that many fish seem not to like the taste of metal. Once they throw a metal hook they are not soon likely to bite again. Bone or shell hooks, however, apparently taste "natural"; a fish is more likely to bite again on such hooks if not hooked the first time.

A device that operated much like a primitive bow drill (plates 22, 23) was used to cut hooks from turtle shell. (Unlike some Pacific islanders Tobians never used heat to mold their turtle shell hooks.) Instructed by the older men, Patris made one of these instruments for me—probably the first to be made in the South West Islands in many decades. The size of the hooks being cut could be varied by using an adjustable wooden wedge lashed between the cutting teeth and the pivot tooth. The drill was rotated gently and repeatedly to cut through the shell. The hook was then finished using a file made from coral and "sandpaper" made from the abrasive skin of the nurse shark.

Some turtle shell trolling hooks not only had a barb in the conventional position near the tip, but also a barb facing it, projecting from the shank. These hooks were used when one man trolled with two lines. Although the second barb made it harder to hook a fish, it made it easier to hold a hooked fish on an unattended line while the fisherman played a fish on his other line. Occasionally a second barb was placed facing outward near the tip for the same purpose. Paired barbs were never used on rotating hooks.

Superimposed on the thirteen basic Tobian hook designs (appendix C) are many intergradations in style, some with special names. In addition there are other subtle variations on these designs, all of which are considered by their makers to be of functional rather than stylistic significance. I was often unable to perceive these variations when examining the hooks, nor did I clearly understand their significance when it was explained to me.

If I had had more time and opportunity to fish with the Tobians so as to test all these designs and their variations thoroughly, I have no doubt that this chapter would be much longer. Nevertheless this brief survey makes it clear that we can go beyond Reinman's statement that "perhaps" different shapes and sizes of Oceanic fishhooks had "some" significance beyond the whims of their makers. Fishhooks of the South West Islands have been skillfully designed to take into account the size of the fish being sought, their mouth size and shape, their biting characteristics, the toughness of their mouths, the depth at which they are being sought, the strength of the current, and the presence or absence of troublesome sharks. The ease with which different types snag up on the bottom is also taken into consideration. A varying compromise in design is made between the

Tobians recount that on recovering sennet and nylon fishing line from caches made during World War II they discovered that the nylon lines had deteriorated badly whereas the sennet line was unaltered. One of the latter coils is still in use today. Kayser (1936) notes similarly that coconut fiber left by accident for twenty-two years in a "slime pool" on Nauru was still in good shape when recovered.

Seidel (1905) described Tobian hibiscus fishing lines as "the best of their kind to be had without machines." Because the supply of fiber hibiscus is not as great as that of coconut fiber, hibiscus is used only for shorter, thinner lines. For deep trolling several meters below the surface, hibiscus is preferred because it is less buoyant than coconut fiber. Owing to its greater strength it is also used in preference to coconut fiber for making leaders. Leaders must be strong yet thin so as to be inconspicuous to an approaching fish.

The ends of the shanks of Tobian turtle shell fishhooks were unique in that they were forked and, according to Beasley (1928), provided "a more practical method of attaching the snood (leader) than is in use in any other locality." Today the shanks of stainless steel hooks usually terminate in an open loop. The leader is attached first with a slip knot, then with two or more half-hitches running down the shaft, then with a final half-hitch in the loop, over the slip knot. Because the loop is not closed the line can be quickly loosened and slipped off in order to change hooks but will not slip off when a fish is hooked.

Wire leader is sometimes used today when fish with sharp teeth, such as sharks or barracuda, are being sought. Patris pointed out to me that there is a disadvantage to this arrangement. The attachment of the rather stiff metal leader to the line provides a second pivot point (the first one being where the leader is attached to the hook), allowing the fish greater flexibility in its struggles to escape. I showed him a piece of flexible braided metal leader I had recently bought and he pronounced it an improvement over the stiff wire leader with which he was familiar.

As on many other Pacific islands, trolling lures were made from various types of shell and coral adorned with feathers (figure 6). Whereas modern research has shown clearly that colors are perceived by some fishes and that some exhibit color preferences when feeding (e.g., Ginetz and Larkin, 1973; Wagner and Wolf, 1974), the claims of some Pacific islanders that subtle differences in the coloration of tuna lures make big differences in their effectiveness is not wholly convincing. Much has been written, for example, about the importance of shading in pearl shell tuna lures (e.g., Buck, 1932; Nordhoff, 1930). But Tobians say that except when tuna are feeding

on squid, when a reddish-brown lure is preferred, tuna show little color preference.

The experiences of Palauans and of marine biologists tend to support this testimony. Today when feathers are torn by fish from worn commercial tuna lures, Palauans customarily replace them with skirts cut from plastic shopping bags. The color of the skirts may be white, grey, pink, purple, green, or blue with varying amounts of black print. Palauans express little preference for one color over another and state that the fish seem similarly undiscriminating. Ommaney (1966) experimented in the Indian Ocean with trolling lures made of bone, shuttlecock, feathers, plastic strips, rope yarns, metal foil, metal spoons, blobs of lead, and tops of cigarette cartons. "But," he states, "we never really found that one sort of lure was decisively better than any other. When the fishing was good any kind of lure would do as well as any other." In tank experiments Hsiao and Tester (1955) showed that to kawa kawa (mackerel tuna), *Euthynnus affinis*, yellow, red, black, white, and combination lures were almost equally attractive, although there may have been a slight preference for white.

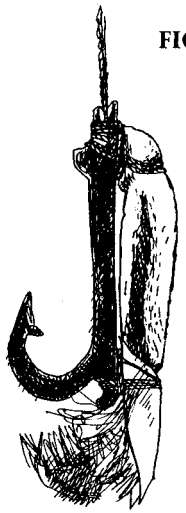


FIGURE 6. Tobian trolling lure, for smaller, near-reef species such as jacks. The body is made of red gorgonian coral decorated with chicken feathers. Over the feathers one scale of a large parrotfish is tied in order to minimize the damage done by the teeth of a struggling fish. The hook is made from turtle shell. The lashings and leader are made from *Hibiscus* fiber.