TAHITIAN BONITO FISHING

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Fish is the chief source of protein for most of the people of French Polynesia; fishing has been one of the principal occupations of the Polynesians since Europeans first met them, and judging from the archaeological evidence of hooks and lures it was important long before that. Tahiti, and to some extent the rest of the Society Islands, has developed fishing into a major local industry, the fish being consumed fresh by the inhabitants of the islands. A large proportion of these fish, up to fifty percent in the peak season, is contributed by the deep-sea (moana) fishing, carried out by small groups of men working in loose association. Deep-line and other forms of va'a (outrigger canoe) fishing contribute the big fish, but the bulk of the crop is smaller surface fish, caught from the poti auhopu (small-bonito boats), 25 to 40 foot diesel-motor launches that have in this field replaced the old-style canoes. The mainstay of the industry is the oceanic bonito or skipjack, Katsuwonus pelamis; the fishermen, the boats, and the industry are called after this fish. Also important are the yellowfin tuna, Neothunnus macropterus, and the mahimahi, Coryphaena hippurus.

Tahitian fishing in general, and deep-sea fishing in particular, have received little attention. Baessler (1905) and other observers have tended to stay within the reef in their observations. There is one brilliant monograph on the subject of off-reef fishing, however: "Notes on the off-shore fishing of the Society Islands," by Charles Nordhoff (1930). Nordhoff was an exceptional observer with great experience in and knowledge of his subject, and his work remains the standard one on Tahitian fishing. Except for it, almost no references to bonito fishing exist, though as early as the late 1700's Joseph Banks (1896) figured a bonito lure of the parau type was still used.

A general introduction to bonito fishing may be useful here. The demand for fish is great in Tahiti; fish are easy to catch, and inexpensive, while meat is harder to get. Also, fish serve to set off the Tahitians from the Europeans and Chinese--who are meat-eaters--and thus serve the cause of nationalism, or, at least, resistance to acculturation. In February 1961, about 120 tons of fish were sold in the marché central alone. The poti auhopu bring in 10 to 40 percent of the total fresh fish, the variation being seasonal, from a low in late winter (August to September) to a high in summer (January to February). Demand and supply are enough to keep some 25 boats operating out of the Papeete harbor, and about 20 more out of other Society Island locations on Tahiti and elsewhere. Since there are normally three men to a boat--two fishermen and one young (or, sometimes, especially old) "ship's boy"--and also boat owners and others associated, this means that perhaps 130 men on Tahiti are involved in the industry, out of the Tahitian population of 30,000. The business focuses around certain nerve centers--the ship docks (one special section of the Papeete quai; Ludwig Ellacott's Taunoa dock; Tautira and Vaira'o at the east end of the island, opposite from Papeete; and a few other minor spots) and the fish part of the marché central, two blocks inland from the poti auhopu docks. The bonito industry is not big business; no one, certainly not the fishermen, makes big money

or becomes powerful. Personal ties and obligations are the core of the system, and formal organization means little. Most of the techniques and many of the underlying attitudes are the same as they were before the whites came. But marketing, and much of the overt social behavior, are very different now from what they were; the changes will be discussed in later sections of this paper.

My primary purpose here is to report all data gathered. I make no attempt to summarize the previous literature (consisting as it does of only one important piece, easily accessible and more or less complementary to the present work) or to relate my work to other aspects of Tahitian life (except when necessary). I have tried to analyze change and development, working on the idea that an accurate description is and has to be a description of a process rather than of a static situation, and that to be useful a report must deal in these terms.

From June 24 to August 17, 1961, in the dead of (southern hemisphere) winter, I lived in Tahiti studying the fish market and the deep-sea fishing on the poti auhopu. I spent 27 days on the water, accompanying the fishermen; the other days I took fish-names and recorded statistics at the marché central in Papeete, the capital and only large town of the Society Islands. The principal research related to the bonito industry, and is presented in this paper. Further ethnoscientific and economic notes have been written up separately, and deposited with Peabody Museum Library (Cambridge, Mass.) and Dr. Bengt Danielsson in Tahiti.

In my work I was always dependent on the cooperation and assistance of the fishermen, fish sellers, market police, and many other Tahitians. They were infinitely helpful, friendly, and interested. My first acknowledgments are to them, and particularly to Ka Léon Tchéou and his family; Taui, Emile, and Tani, and their crews; and Ludwig Ellacott. This work was done under the direction of Dr. Douglas Oliver, who has also been of great assistance in writing up this report, and Dr. Bengt Danielsson. I wish to thank them most deeply here.

Technical

Description of Fish Taken

The skipjack or oceanic bonito, Katsuwonus pelamis, is a stocky powerful fish of the family Scombridae, the family to which all tunas, bonitos and wahoos belong. Like its relatives, the skipjack--the bonito of this monograph, following the usage of Nordhoff (1930) and others--is marked by great speed and power, predatory habits (its food in Tahitian waters consists of ca. 75 percent fish, ranging from one inch (for small bonito) to about five inches, and 25 percent of four to six inch squid), a small mouth with reduced teeth (the prey is swallowed whole without use of these teeth), and several (6 to 8) small finlets between the rear dorsal fin and the tail above and between anal and tail fins below. These finlets, controlled by a single muscle-unit for the dorsal and another for the anal, assist the fish in making rapid sudden turns. The bonito spawns in winter (June-July, and to some extent in the other cool months) far out at sea; the fry scatter widely, many returning to shore areas, others remaining at sea. According to Murphy and Ikehara (1955) the skipjack is one of the most pelagic of the Scombridae. The young fish grow rapidly, "an average length of 45 centimeters being attained by the end of the first year, 70 centimeters by the end of the second, and 80 centimeters by the end of the third. Seemingly very few . . . live longer than this" (Gosline and Brock, 1960:257; Hawaiian data). The bonito is one of the most tropical of fish, not straying as the tunas do into warm temperate waters far north of the tropics.

Great flocks of birds--sometimes six hundred or more birds in a flock--congregate over schools of fingerlings beyond the reef. The fingerlings congregate at special points where food is available: the roiling eddies just off the southeast tip of Moorea, the currents off Papenoo, etc. In general, areas of upwelling and activity are the good feeding places. Here fingerlings come, squid come to eat them, and the big birds and fish eat both.

The Tahitians--and, reportedly, the fish (Nordhoff, 1930), and certainly the birds--find fish schools by watching the overhead flocks. The central figure in this search is the ua'ao[1]--the Red-footed Booby, Sula sula, a large brown or white bird much like the gannet of the North Atlantic. The ua'ao is the largest common seabird of Tahiti and the highest-flying; thus it is the first seen, in nearly all cases. Tahitian fishermen, trained and alert, can see it for at least two miles, at which distance it is invisible unless it wheels, in which case it appears as a barely perceptible speck. It flies ten to seventy feet above water, depending on how far under surface the food fish are; diving and coming up from beneath to seize its prey, it often hits bonito and tuna, causing--according to the fishermen--the gaping wounds so often seen raw or healing on the sides of the big fish.

A few other seabirds are important in fish-locating: the Black or Lesser Noddy, Anous minutus, called 'oio; its larger relative the oa (Brown Noddy, Anous stolidus); a more distant relative, the White Tern or itata'e (Gygis alba); and, to some extent, the two species of frigate-bird, Fregata minor and F. ariel, both called otaha and occupying an important place in Tahitian consciousness--being often pointed out with excitement.[2]

Not only do the birds locate fish-schools, but they tell the fishermen exactly what type of school to expect. Nordhoff (1930) has described at length the position of birds as markers. I can add little except a loose arrangement of the types of schools (iria in Tahitian) and their accompanying bird flocks: (1) deep schools of fairly large fingerlings, followed by toheveri, bonito over 30 inches long, and marked by a large flock of ua'ao circling in one direction at ca. 60 feet, and rarely diving; few other birds attend these flocks; (2) huge schools of small fingerlings attended by small tuna and bonito, by sharks, and by hundreds of 'oio as well as large numbers of oa, itata'e, ua'ao, and other terns, and by Audubon's shearwaters (Puffinus l'herminieri, conspicuous in all flocks), the birds flying low and diving much; (3) a variant of (2)--schools in which "patch rises" occur, the small fish suddenly banding into knots and surfacing at once, causing a boiling mass of birds, bonito, fishermen, and other predators to pack into a tiny area where each bird may have only a cubic yard of air to move in and where bonito lash the water white--these give the best fishing, especially near but not in the patch-rises (the bonito in such marginals will be biting, but have few fish to bite at); (4) small schools of small fish that will rarely bite, and are followed by 'oio and itata'e, very few of the larger oa and ua'ao. Many variants and minor notes can be added; no two schools are alike, and watching the birds tells the competent observer far more than I have described. Moreover, a school changes with time; it may sink deep, leaving the birds and fishermen to scatter out and quarter back and forth, prepared to rush in when one bird finds fish; or the birds may sit on the water, thrusting their heads below surface to watch underwater movement.

Birdlore is perhaps the most important part of the bonito fisherman's knowledge, as important, I think, as knowing the equipment well. Every fisher-

man knows the important birds and flocking behavior perfectly. A Type 1 flock will always call out the big double-pole for toheveri; motions of itata'e lead to trolling; and so forth. The day is literally one long observation of birds.

To return to the bonito. In the schools, these fish operate with great speed and precision. They feed in a manner most important for fishing techniques: many bonito, often dozens, band together into a long line like a cavalry charge, and sweep through the water on a broad front that may be many fish broad but only two or three deep. In packed schools they may break formation and mill about considerably. The lines charge forward with great speed, cutting back and forth through the school.

It is this feeding method that determines much of Tahitian bonito fishing technique. The fisherman cruises around a school, waiting for a line to pass underneath; when it does he catches what he can, and waits again. The typical bonito hook is barbless, short-pointed, and not too sharp; if time had to be spent disengaging the hook from the bonito's mouth, the line of fish would be past before more than one fish could be taken from it. In actual fishing, a typical record of catches in a good school would be as follows: three fish caught in twenty seconds--no fish for ten minutes--then four in less than a minute--nothing for fifteen minutes--two in ten seconds--nothing for fifteen minutes, etc.

The bonito is the big fish par excellence in Tahiti. It is the most often caught, and it looms largest in everyone's mind. The fishermen's boats are the poti auhopu, "boats for small bonito," though many species of fish are taken from these boats. Formerly, much ritual and magic surrounded the bonito fishing (Nordhoff, 1930); all this religion is gone, and the modern bonito-fisher is the most practical and unsuperstitious of men. Any magic beliefs that exist are unimportant (and/or secret) enough to escape completely my observation and carefully indirect questioning. But the bonito is still a subject of much thought and of endless observation and discussion.

Three names are current for the bonito; there is no one name for the species, as there is for tuna.[3] The three, as used in 1961, are: auhopu, for a fish under 20 inches and about 10 pounds; tore, for 20-30 inch fish of about 15 pounds; toheveri, fish over 30 inches, weight 20 pounds or more. The fish in Tahitian waters may reach about 50 inches and 30-35 pounds. There is no general name for bonito, nor has there ever been one, apparently. Nordhoff (1930, p. 236) cites the following names (data through the 1920's):

> Pirara (obsolete)--the young bonito up to about four pounds weight.
> Auhopu (formerly atu)--four to about eight pounds.
> Auhopu tore--eight to about twelve pounds.
> Paamea, paamoa--twelve to about sixteen pounds.
> Poarahi--sixteen to about twenty pounds.
> Toheveri--from twenty pounds up.
>
> The auaeroa is defined as a "long, thin, pointed bonito," and toheoo is the short, enormously-bulky fish, with a very small tail. The latter is said to reach a weight of a hundred pounds.

Forster (1778) records "peerara" (pirara) as the current name in his time.[4]

A not-very-close second to the bonito in amount caught by the bonito fishermen is the yellowfin or Allison tuna, Neothunnus macropterus. Distinguished

from the bonito (to which it is closely related) by its thinner body, bluer back, lack of stripes on the abdomen, and yellow-tipped dorsal and anal fins and finlets, it is also a fiercer fish, preying on larger game (in relation to body size), and a much harder fighter. The tuna feed with the bonito, and sometimes on them, but in a bigger school will tend to be off by themselves eating bigger fish and under fewer 'oio and more oa and ua'ao ("bigger fish, bigger birds," the Tahitians told me). Tuna tend to be accompanied by sharks, which fact can be used in locating the former. Sharks are neither caught nor eaten by Tahitians.

The general name for all tuna is 'a'ahi, a pan-Polynesian word meaning "ball of fire" (Farrington, 1942), an exceedingly apt description. The yellow-fin--'a'ahi uteute, "yellow-red fireball"--is the one normally taken from the poti auhopu, and then usually only small fish are caught, mostly in Type 3 schools. The other two Tahitian tuna, the 'a'ahi taria (apparently albacore) and 'a'ahi piro ("black tuna"--possibly the Oriental tuna), as well as most large 'a'ahi uteute, are taken by deep-line outrigger-canoe fishing. Tuna, like bonito, have three sizes: papahi, under 2 feet, about 15 pounds; 'a'ahai, 2-5 feet, to 100 pounds; aue, the rarely caught giants.

Third in numbers taken, but often second in value, of the i'a poti ("boat fish," i.e. fish taken from a motor-powered boat, opposed to i'a va'a ("canoe fish"), i'a upea ("netted fish"), etc.) is the mahimahi, Coryphaena hippurus (family Coryphaenidae). This is the "dolphin" (fish, not the mammal famous in science and art) of the Atlantic, the "dorade" of French-speakers. Nordhoff (1930) describes the now-lost special canoes for catching mahimahi; he also describes the fishing techniques, which still flourish in the Pacific, having been more or less adopted by white fishermen and retained by native ones. The fish are taken by trolling; the method and equipment will be described later. Mahimahi travel in small schools, following their chief food, the marara (flying fish). The mahimahi are large--3-5 feet, to perhaps 25 pounds--and laterally compressed, with huge heads, tapering bodies, thin powerful tails. Brilliantly and garishly colored blue and green and gold, they can be seen swimming under water from some distance. They go though a whole gamut of colors in the dying process (they die very slowly). The sure mark of mahimahi is a small flock of itata'e, or a lone one, swooping and dipping crazily, beginning to dive and then stopping, hovering close to the water, and generally acting in a strikingly erratic manner contrasting with the bird's normal feeding manner of slow even patrolling at fairly high altitudes. The swooping action is seen and identified from great distances, and the fishermen close rapidly on such flocks. There are never more than about ten birds of all species hovering around mahimahi. Frigate-birds are often attracted to the fish--perhaps because they scare flying fish into the air where the otaha can grab them--and follow the mahimahi, sometimes even tracking a caught fish until it is landed and the huge bird is hovering five feet from the fishing boat.

The Tahitian fisherman must understand not only fish and birds, but also weather and currents. While I was in Tahiti the weather held steady, a constant east or northeast wind with cool mornings and warm days that often clouded up in the afternoon (bringing some rain) but were otherwise clear. This is ideal fishing weather, and I had no opportunity to observe limiting effects of weather on fishing. Nordhoff's article (1930) contains pertinent information and should be consulted. Currents are important for two reasons: the fish

congregate in upwellings and current-meeting zones, and the fishermen must lay course according to lay of current (e.g. south along Moorea but north along the facing Tahiti shore, never in the middle, when running the strait between the islands). The currents give the overall routes for voyages; the birds point out the fish.

The fishermen are deeply committed to their life, and their attitude toward fish and sea are important in their work. They do not see the fish and birds as creatures to be loved and/or pitied. This sort of attitude is generally foreign to Tahitian reaction to animals. Animals are seen as powers to be respected but not feared. The excitement when someone hooks a mahimahi is intense and startling; it is one of joy, pleasure that a good opponent has been captured. A really large tuna electrifies the whole crew. The fish are important; they are not only part of the environment, but a significant part of the environment--landmarks, living focal points, to be regarded with interest and an analyzing eye. The mahimahi is valuable and tough, the tuna fierce and hard to catch, the bonito is the bread-and-butter mainstay, the shark is a potentially dangerous pest--to each fish there is a strong reaction, as there is--in less degree--to each bird and current.

These affective feelings have obviously suffered change in Tahitian history. In the absence of pre-1930 comparative material it is difficult to describe this. The chief difference between the fishermen described by Nordhoff and those of today lies in the more spontaneous and emotional reactions of the 1930 crews. The 1961 fisherman is quiet, reserved, and overtly emotional in more silent and even ways (except when catching a big fish) than was the 1930 one; this quietness comes with ability, the young boys showing it less than the older ones, and these in turn showing less than adults; the evenness is apparently a correlate of ability.

Equipment used in fishing

The equipment of fish-catching is fairly simple. Two basic catching processes are involved, trolling and pole-fishing. The less complicated of these is trolling, used chiefly in catching mahimahi. The mahimahi equipment is about 100 feet of nylon line with a wire leader and a commercial iron hook about 3 inches along the shank. The original Tahitian dolphin hook was deeply incurved; the modern iron hook, a simple one-barbed one, is hammered by the fishermen until it is incurved, but less than the handmade hooks were.

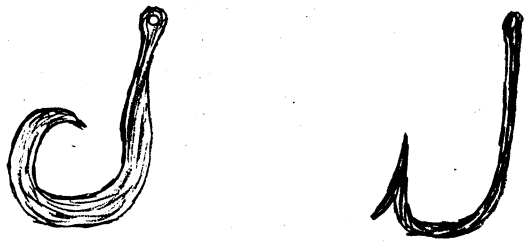


Fig. 1. Ancient and modern mahimahi hooks

The bait is the mahimahi's normal food, the marara--flying fish. These are caught at night, brought into the Papeete fish market in the early morning, and bought there by the fishermen. On the water, the first activity beyond the reef is baiting the trolling hooks. The hook is removed from the line, a six-

inch iron threader takes the line through the fish's body from mouth to belly, and the hook is replaced; the flying fish is tied in place thereon. About three hooks are normally prepared this way, sometimes five or six; a fish once thus used is wasted unless soon activated, so making too few is better than making too many. If the fisherman runs out of flying fish, he will take a bonito or tuna stomach and cut it carefully into an excellent copy of a six- or seven-inch squid; this bait is almost as effective as marara. When no flying fish are to be had in the Papeete market, the rather similar ature (Trachurops crumenophthalmus) is substituted. The short wire leader and connected hook is the unit baited; this unit is easily attached to more leader on the end of the line, so a rapid change can be made from bait to bait, and only one line is needed (or used).

In fishing for mahimahi, the fisherman first locates the fish by the crazy swooping of the itata'e; he then passes close alongside the school and pays out the line. A mahimahi usually bites soon, and one sudden powerful jerk hooks it; then a quick snapped series of commands to whomever is working the engine keeps the boat more or less matching speeds with the fish, which fights for a while but soon becomes quiet. The boat is taken in a slow, ever-narrowing spiral around the fish, which usually tries to make one mad break when it sees the boat come close; the fish is finally gaffed in. Excitement during this process runs very high. Killing a mahimahi is a long process; once landed, the fish is usually stabbed repeatedly through the head with the sharp handle of a file, and then placed under the rack in which bonito are kept when cleaned. After a while the mahimahi quiets down, drowned in air, and is cleaned and placed under the banana fronds that provide a soft, friction-affording pad on the boat roof--until they are wet with seawater and put over fish to keep them fresh.

Trolling is also employed for huge tuna and for ha'ura (marlin). Here a quarter-inch rope, thick wire leader, and huge rusty hook that may be baited with a whole auhopu are used. If a huge fish is sighted, chum of all kinds is thrown over until the fish is following the boat, then the captain may stand on the roof with a pole attached to the trolling line. When the fish bites, a great upward jerk with the pole hooks it, and then the pole is dropped--the line paying out takes the pole along with it into the water (where it can be recovered). Often poles get broken in this process and the fish escapes. It appears that most of the really big fish are not taken by this method, however, but by fishing from outrigger canoes; how a man in such a canoe handles a thirteen-foot marlin is rather hard to imagine. Apparently the fisherman lets the fish tow him until it is exhausted.

Most of the fishing from the poti auhopu is done with bamboo poles, of which there are two kinds. These are made with a special bamboo (cf. Nordhoff 1930, p. 247), thick, tough, and three times as expensive as the ordinary kind. The first type of pole is some 10 to 15 feet long, 2-1/2 inches or so thick at the proximal end, tapering to 1 inch or less. A line almost of the same length as the pole is attached, so that when the lure is on the line it can be hooked neatly to the pole's proximal end for storage. Every boat carries about half a dozen such poles, and one double-pole--two of these poles linked together by a 2 foot line at the tip--used for toheveri (it takes two men to do a good job of landing a toheveri). The second type is shorter (ca. 7-8 feet) and thinner and shoddier, and used in really big schools when speed is even more essential than

usual; the shorter, lighter pole permits faster action. The boats have about six to ten or more of these.

No hooks are used except for trolling. In fishing with poles, lures are used; these are of two types, the manu and the parau. The manu (see Fig. 2) is an outcome of Tahitian ingenuity applied to new materials. It involves a piece of wire, filed to a point at one end and bent into a suitable hook shape; a piece of flashlight casing (according to the fishermen, the tin casing of a flashlight makes the best manu, but other similar things are used); and some solder.

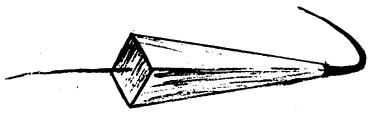


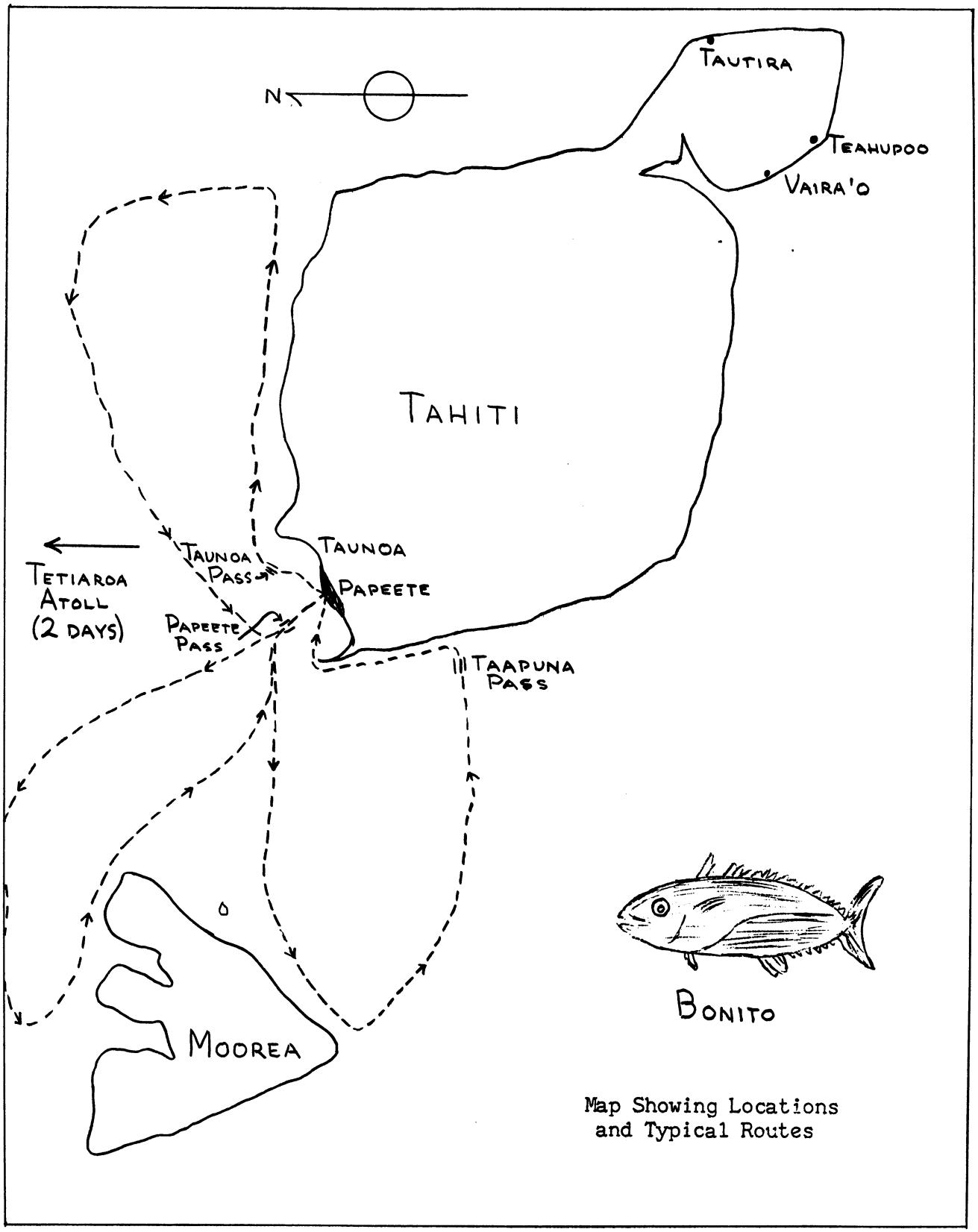
Fig. 2. Manu (about natural size)

This lure, silvery and shining, is meant to imitate a small fish (in spite of its name, which means "bird"), and is a recent invention, probably having come in about the same time as the mechanized boats.

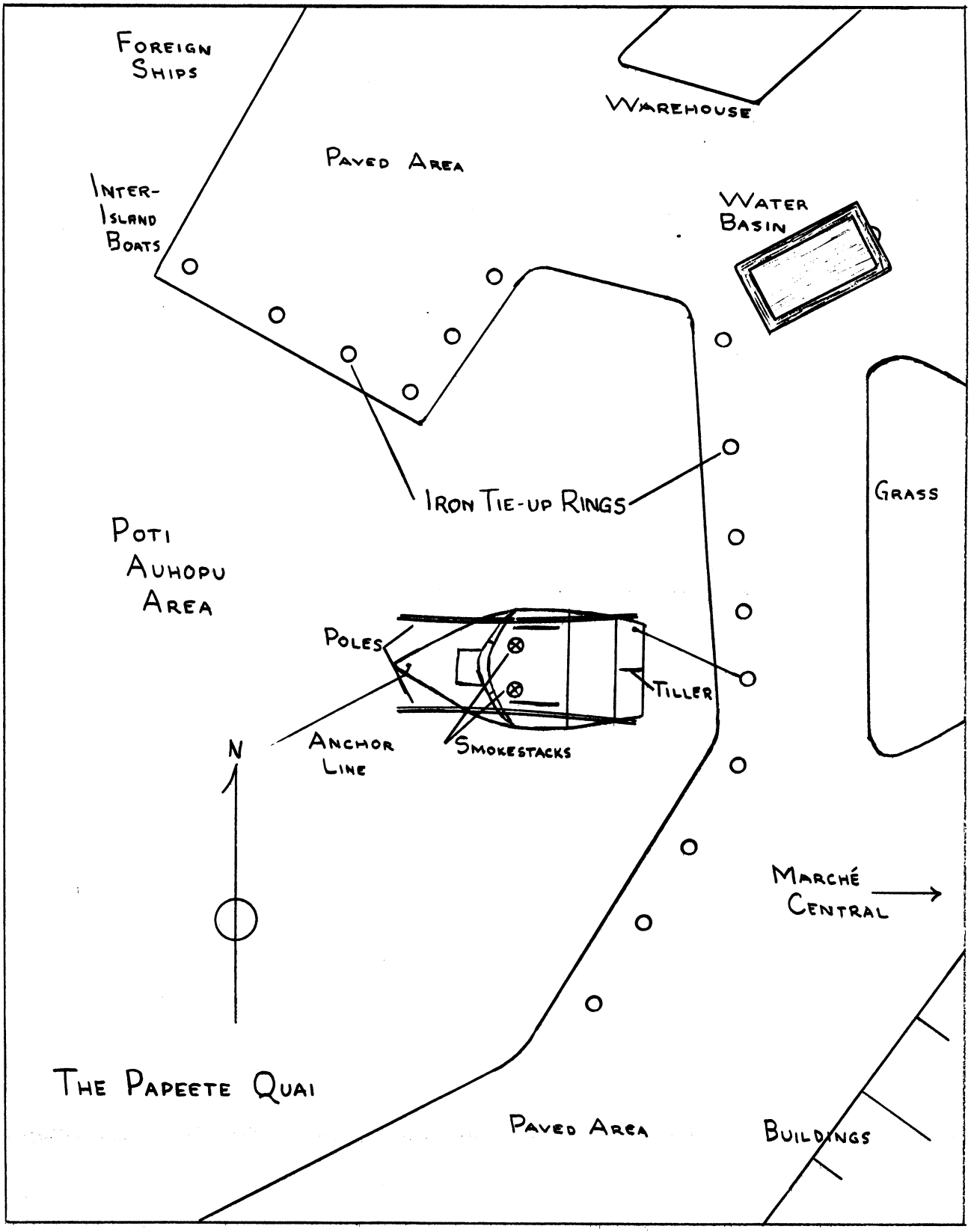
The other lure, the parau (see Fig. 3), is the classic bonito hook of the Pacific, found all over that ocean, as far back as archaeology can trace, very similar in shape and construction from New Guinea to Hawaii and New Zealand (see Nordhoff, 1930; Burrows, 1938; etc.). Despite the wide distribution and great abundance of this most famous and perhaps most specialized of "hooks," I know of no one who has ever recorded what it imitates. The common supposition that it represents a small fish is without foundation and in the Society Islands, at least, is incorrect. Both observation and report (of the fishermen) agree that the parau lure is modeled after the squid, the fe'e chinois ("Chinese octopus"). It is the wrong color for a fish; it is too large to be a fish (bonito take only small fish, only fair-sized squid; there is little size overlap); it is not shaped like a fish. The streaming tufts of hair behind do not resemble a fish's tail; they represent the trailing tentacles of the squid.

In modern Tahiti[5] the base of the parau is a straightened-out, filed-sharp piece of thick wire about 4 to 6 inches long (size of rig depending on size of fish to be caught), and bent to the proper angle. This wire is lashed at the bend point to a piece of pearl shell; tufts of cowhair bristle out on each side of the distal end of the lure. A hole, bored with a metal-tipped improvised pump-drill, is made in the proximal end of the shell, and the line attached there.

Fig. 3. Parau (about 1/2 size)



Map Showing Locations
and Typical Routes


FOREIGN SHIPS
WAREHOUSE
PAVED AREA
INTER-ISLAND BOATS
WATER BASIN
IRON TIE-UP RINGS
GRASS
POTI AUHOPU AREA
POLES
TILLER
N
ANCHOR LINE
SMOKESTACKS
MARCHÉ CENTRAL
THE PAPEETE QUAI
PAVED AREA
BUILDINGS

The shape, size, color, form, and overall appearance of these lures are subject to infinite variation, from the long lean toheveri lures to short blocky ones for small auhopu, and each fisherman carries several types with him and has many more at home; each lure is specially adapted to season, weather, type of fish, conditions of food, etc. (see Nordhoff, 1930, for discussion).

The parau lure is as important as a work of art as it is as a lure. It is the only piece of native art now frequently made in Tahiti, European-inspired "souvenirs" aside. A well-made parau is a thing of beauty and a matter of pride to its owner, who has spent many hours making it.

The process of making a parau is as follows. Pearl shell (special type, purchased and often specially ordered from far islands for the required color, lustre and thickness) from the Tuamotu is marked off with pencil, thus:  and the blank for the lure is sawed out along the marks. The result is carefully filed down. When it finally reaches the correct proportions and size, and what to an outside observer would appear to be the correct finish, the real work begins. The owner takes it with him to the waterfront, where there is a fresh-water tap equipped with a four-foot-long basin made of a special type of stone. This stone is the ideal grinding surface for parau, and every morning many fishermen spend minutes (sometimes the entire day) working with their shell blanks, sanding off inappropriate patches of color, rubbing the blank with their thumbs to see if it is smooth, and sanding again. Hours of this work go into each parau. Many deep grooves have been worn in the stone basin by years of parau-making. Finally a pump-drill is improvised from two sticks, a string, and a metal point, and a hole is drilled for the line. Then the metal (formerly bone) hook and the cow-hair tufts are attached, and the new lure is added to the large supply that along with a couple of manu and a couple of mahimahi hooks are stuck into the plaited frond carrying-basket of the fisherman.

In actual use, the parau correct for season and weather is attached to the line before fishing starts. Three or four different poles each carry a different parau, and substitution is common during fishing. On rare occasions the manu is used, apparently more for variety than anything else; although almost as effective as the parau, the manu is not favored.

The reason for the special shape of the bonito-hook--barbless, short, not incurved, and often slightly blunt--has been given before. A more complete description of the process of landing a fish is now in order. Two men (sometimes one or three) stand in the stern of the boat, holding the ten-foot bamboos between their legs. The poles stand out at an angle of about 45°, so that the lure skitters along the surface of the water.[6] The fish comes up from behind, seizes the lure without stopping, and is pulled in by a sharp, strong jerk. The fish's momentum carries it into the boat. The barbless hook dislodges itself immediately, either in the air or as the fish hits the boat. The hook is thus ready to catch another fish, often before the first is in the boat. Frequently the fisherman jerks the fish in against his body, so that the hook dislodges as the fish strikes the man. Emile, captain of the Hei Fara and an excellent fisherman, affects a theatrical variant: he swings the fish high into the air, at the full vertical stretch of pole and line, and makes it describe a circle; it falls off the hook there, and plummets twenty feet down to land at Emile's feet. This is more difficult and less efficient than the normal way, but is a most effective bit of showmanship. The jerk when the fish

seizes the lure requires more skill than strength; if it is too weak, the fish will slide off the hook; if too strong or sudden, the pole may break (with at best the loss of a valuable pole, at worst the injury coming from splintering bamboo). If the jerk is not in line with the fish's motion, the fish simply falls off. Even more skill is required in taking tuna, which unlike the bonito will fight the hook. The double pole for toheveri is used by two men; toheveri are heavy, and lifting them out of the water is hard work.

On landing, the fish are clubbed to death by the ship's boy with the ra'au tairi e i'a, a foot-long "potato-masher"-type club, and immediately cleaned. The superstition noted by Nordhoff that fish-blood and cleanings drive other fish away no longer holds; the blood is washed out freely through the scuppers. Guts, however, are saved; they can be used later as chum (but not for bonito; tuna are the objects of chumming, whether with guts or with small fish, usually 'ouma (Mulloides auriflamma)). Guts can also appear as trolling bait, and occasionally the roe (huoro) is saved and sold with food.

Mahimahi run more or less all year. In winter, when I was there, about two were taken on an average day, often only one; over three was exceptional. As far as I know, this remains fairly constant through the year, but the numbers of bonito and tuna taken vary greatly. In winter (May-October) both food fish and bonito are off spawning in the deep sea; few fish remain in Tahitian waters. One might catch as many as 200 or more pounds of fish, but days when no fish were caught by at least some fishermen were common. There was a constant supply of fish, though; a few fishermen had good luck on any given day. In October the food fish return, very small, and the young bonito with them; from then till next May, the small food fish grow steadily, and the bonito fishing is good--at its best from December into March. September is the worst month, and the January catch may be a dozen or more times the September one. All fish show some variation, but the bonito show by far the greatest. Formerly, when canoes were paddled, no one bothered to go out between May and October; now the fishermen go out every day of the year--even the 14th of July--except on Sundays ("that's the day of rest") when they sleep and eat large dinners. On any given day two or three boats will not go out simply because the crew wants a rest, but except on Sundays most of the fleet is operating; a few, but very few, boats are inactive in the slow months.

A Working Day

The fisherman's day begins about 5:30 A.M., when the fishermen begin to congregate around the Papeete fish market; many of them have fish to sell, having kept them in icebox overnight; others come around to watch and talk. A general movement to Wa Hing's tearoom (just south of the market) occurs, and by 6:30 the market-facing end of Wa Hing's is half-filled with fishermen and the apprentices and ship's boys. Usually the fishermen and the boys sit at different tables, those of the latter being locations of more animation and excitement. The groups drink coffee and eat French bread and e i'ota taioro (raw fish marinated in lime juice and served with coconut cream), and then move down to the boats, two blocks away on a specially reserved part of the waterfront. The most enterprising captains, such as Eugene of the Dora, have already set out, as early as 6:00 on some days. The departures mount in number until about 7:45, by which time most of the boats have left or are readying themselves to leave. The last ones weigh anchor about 8:30, leaving a few that are not being run, either because their crews are resting or because they are in no condition to run, and also leaving

the wreck of a bonito boat whose utility is long past but which no one bothers to remove. For the rest of the day, the fishermen who have not gone out sit or stand along the quai, talking and sanding down lures; the others are on the water.

The boats leave Papeete harbor by two passes, Papeete and Taunoa, and from there proceed in three general directions (see map): straight out, to a position north of Moorea; south, through the channel between Moorea and Tahiti (keeping close to the Moorea shore because of currents), to the upwellings southeast of Moorea, one of the best fishing grounds; or east along the shore to waters off the north end of Tahiti, where again current disturbances concentrate food. The boats cruise around from about 10:00 to 3:00, looking for fish and working the schools they find. At about 3:00 they begin to head in, respectively by cutting south and then driving straight in across the head of the channel; by cutting over toward the Papeete shore and finally following it up, often coming home through Taapuna Pass (this route, again, determined by currents); and by going away from shore and coming back through open water, finally in through Papeete Pass. During the day, in winter, an average of between two and three auhopu schools, one toheveri school, and two mahimahi schools will be worked, often rather desultorily (if the fish are not biting). The boats return about 5:00--a few earlier, especially if they have started early, to hit the afternoon markets; some later, having hit nothing good until late in the day. On the water, only one man is normally active; he stands at the tiller (or sits at it), steering and watching for birds. The other man sleeps, or helps watch for birds; the boy sleeps or idly watches the sea. The captain usually spends less time on tiller than his fellow. On one occasion, I observed a fisherman bring a couple of comic books to read on the water.

When a fish school is sighted, the men of the crew get into action, standing together in the stern where they can control the tiller; the boy's job is to clean and put in racks the fish as they come in; he rarely if ever fishes.

One aspect of Tahitian fishing has to my knowledge never been previously recorded. This is the sign language. Tahitians always accompany their speech with gestures, and for purposes of communicating between widely separated, noisy boats, certain standardized gestures have been developed. It is made up mostly of directional and quantificational signs--where the fish are, how many, how large, etc. The most commonly used sign is the downward-pointed, horizontally circling index finger that means "flock of birds circling"--the unfailing mark of bonito. Much gesturing goes on between two boats in any case--a surprising amount of friendly insults and general gossip can thus be exchanged--but the impromptu and casual nature of such signing is very different from the sharp, abstract, definite signs that are the language of the open Tahitian sea.

At the end of the day, the boats are anchored along the quai, and tied with rope to rings thereon. The fishermen load the catch on poles--the fish tied in pairs, the tie-line around the tail-bases, and slung over the pole--and carry them to market or to storage for morning marketing. Then everyone disperses; some linger around the market till it slacks off about 6 P.M., others return to the waterfront, others go home. Small groups drift into bars in the early night, and then they go home, to get up the next morning long before first light.

In comparing the above with older accounts of the deep-sea fishing industry (principally, of course, with Nordhoff 1930) one sees that almost no essential

technical features have been lost. The principal changes are:

(1) Substitution of motored boats, with attendant greatly increased mobility. This permits much moving from school to school, activity in formerly unusable parts of the year, and fine maneuvering difficult in a canoe (this last applies mostly to mahimahi fishing).

(2) Introduction of new materials--wire, solder, etc. This has led to the invention of a new type of lure, the manu, and new types of hook.

(3) Change in crew. The old crew included several cooperating paddlers, a master fisherman, an apprentice, and perhaps one or two others. The present crew consists only of two master fishermen and one apprentice (or boy).

(4) Disappearance of all religious observances, etc., connected with the fishing. It probably has not disappeared from the minds of all the fishermen, but it has no pragmatic value. Anything the fisherman cannot explain he will not attempt to explain; in notable contrast to the American fisherman, he has neither a mystic attitude toward his equipment nor a religion of "luck" with its attendant long explanations for everything. Where an American--commercial or sport fisher--will put down his bad luck to the light or the trash-fish or the gear, and his good luck to his proper use of circumstances, the modern Tahitian assigns chance-determined things to chance: "The fish weren't biting, that's all," or "plenty of fish today!" are the most frequent comments on luck. No beliefs or superstitions affect in any way the work on the water.

Principal continuities are:
(1) The parau lure with its specialized knowledge.
(2) The knowledge of fish, birds, weather, etc.
(3) The techniques of fishing, for each species, and--in general--the tackle used.
(4) Probably; data on this are scanty--the respect-of-forces attitude, the excitement in chasing fish.

Under the circumstances, it seems likely that these four things have stabilized, and will last as long as the industry does. Change, however, continues. One trend seems to be the increasing exploitation of new goods: metal and other things. Mechanical knowledge sufficient to allow the fishermen to repair the engines, for example, may be expected to develop soon. Larger boats--and larger crews to man them--may come in, but this may prove to be uneconomical because the largest boats used now require too much fuel to be run economically in slack times.

The intensely practical side of the fisherman's attitude must have existed along with ritual and magic, as the practical data is necessary for successful fishing. The magic is now gone, leaving the practical data. Whether this is a stable situation or not remains to be seen. At present it seems to hold well. Change has been in the direction of rejecting unnecessary knowledge while keeping useful data; this may be expected to continue, the present body of knowledge changing as new techniques come in, accommodating these techniques and blotting out data relating to processes made obsolete.

Economic

The Market

The fish section of the Papeete marché central is the center of life for the whole island of Tahiti. From all the districts and all parts of the town of Papeete, people come in to buy fish, sell fish, or watch the whole show. Very few Tahitians buy fresh meat except for special events; most protein comes from fish, either canned or bought through the marché.

This market consists of the east side of a huge open-sided roofed-in area, a block in extent, in which all kinds of food are sold. The fish market is about 180 by 60 feet. The sides are lined with stone-topped and wood-topped tables, on which fish are sold; another rank of tables runs along the long axis east of center. Down the market, between these tables, runs a series of high iron racks--two parallel head-high ones, flanked by parallel waist-high ones. At the northeast corner is the weigh-in station, where the mutoi makate (market police) weigh incoming fish for purposes of taxation.

The market is strictly if informally zoned. The two areas that concern us here are the northeast corner, including the weigh-in booth and the butchering tables behind it, and the section of the central iron racks just north of center. In the former, bonito are taxed, and the larger ones cut up; in the latter they are sold.

At the end of the fishing day, the bonito fishermen bring their fish to the weigh-in station (or to storage for a next-morning weigh-in). The fish, on their pole, are duly weighed, and the weight recorded for taxing and statistics (all fish go through this process). The tax, extracted for the privilege of using the public market, varies according to the "qualité" of the fish. "Qualité," nominally dependent on the demand-fixed price of the fish, is in practice often determined partly by the mutoi makate's mood and feelings toward the fisherman. It is assigned by species, but a mixed-species haul is assigned a single qualité, the assignment depending as much on the fisherman's ability to pay and his friendship or lack thereof with the mutoi as by the type of fish involved. The tax is collected at the marché gate after the fish are sold. Bonito is third qualité, being taxed at 2.25 francs on the kilo.[7] Tuna, second qualité, is 3 fr/kg. Note that this tax holds winter and summer, despite great price fluctuations.

The mutoi makate ("ma'o"--sharks--in Tahitian slang) weigh and calculate tax; the fish are then carried in, to be hung over the tall iron racks in their special section, north of center and along the east aisle. Small tuna and most bonito are hung here. The large tuna, toheveri, and ha'ura (about once every two months or less, someone catches a marlin from a bonito boat) go immediately to the butchering tables; the middle-sized tuna and bonito may go there later. The butcher--there are about four--buys the fish from the fisherman, paying the tax for him. The fish is cut in longitudinal fourths, the head cut off, and the fourths cut into convenient-sized pieces (1/2 to 1-1/2 kg), and the pieces sold, the butcher getting 10 to 20 percent profit. Not only i'a poti (fish taken by powered boats), but all large fish, such as large paaishere, are cut up thus. A seniority exists among the fish-butchers ("coupeurs du thon"--cutters of tuna); Eugène, the oldest and most experienced, has prior claim to fish.

The process of selling, for fishermen selling their small auhopu and papahi direct, is simple. The men stand behind the low iron rack, surrounded by

their heavy fish, and wait. Several hundred people move through the market each day; these people pass, look, and buy, after a small amount of haggling and a large amount of looking around for better buys. Watching the fish market is one of the great spectator sports of Tahiti, and many people come to the market only to look and to talk about the catches. On Sunday mornings, when the market is busiest, a true "peanut gallery" of these non-buyers forms at the northwest corner of the main part of the market. Prices rarely change through the day; occasionally a price will be reduced 20 francs if the sale has not been made before the market is emptying. Unsold fish are taken to an icebox near the market, there to be stored until the following market time. Demand, however, always keeps up with supply, and there is never a surplus of fish building up.

The market has two sessions: in the morning from 5:20 to 8:00, and in the afternoon from 1:30 to 6:00. Long before the official opening at 5:20, the sellers are there, and have set up their fish on the tables and racks; often they come at 3:00 A.M., especially on Sundays, when 50 to 100 percent more business is done than on any weekday. By 7:00 most fish are sold, by 8:00 all are, except for occasional latecomers and undesirables, which may wait through the day until the afternoon market. At 1:30 or 2:00 the first fish--usually large, canoe-caught tuna--appear for the afternoon, and by 3:00 the market is in full swing. It trails off around 5:00 to 6:00, and is deserted by 7:00. The peaks of activity are at 6:15 to 6:30 and 3:00 to 3:30, the morning one being greater. There is no afternoon market on Sunday, and--since no one fishes Sunday--effectively no market Monday morning (in winter, about six hauls will appear). The Sunday market blights marketing from Saturday through Tuesday. Thursday and Friday are busy days, sometimes rivaling Sunday. In winter, on a normal Sunday, about 180 hauls of fish pass through the market. These average perhaps 120 kg, but ranging from small three-kilo catches from a breakwater to 2,500-kilo hauls of ature brought in by fleets of trucks. All these loads are sold. Fish come from Moorea, Tahiti, and the Tuamotu Archipelago to the north; the leeward Society Islands have their own market, at Ra'iatea. Thursday may see 100 loads, Tuesday about 20.

The bonito boats contribute as much as 40 percent of the total fish by weight. In winter, the off season, 10 percent of the weight is bonito (other fish drop in amount sold, but not nearly as much as the bonito do). Bonito appear both in morning and in afternoon, the morning ones having been brought in from the districts during the night, or stored overnight.

The price of bonito varies greatly throughout the year. In winter, when the supply is low, bonito are far more expensive than in summer. A normal auhopu, weighing perhaps 1-1/2 kilos, will cost 10 fr in February, 70 in June, 100 in early July. Then the fête, the three-week celebration of Bastille Day (July 14), sends prices skyrocketing; the fish goes from 100 to 150 fr in a few days. The bonito fishermen work through the fête, even on July 14 itself, but few others fish, and everyone is in town spending money; so all fish increase in price, over and above supply and demand considerations of a long-term nature. Through August the fish slowly decline, to around 130 fr, but low supply keeps them high till October, when returning season makes prices fall. Tuna, being considered better and being somewhat rarer, is more expensive by 20 percent or more.[8] Demand remains about the same for fish throughout the year, and for fresh fish demand always keeps up with or ahead of the supply. An overstock of fish is theoretically possible, but apparently does not happen. The public can

easily accommodate the 100,000 kilos of fish that come in during a winter month. Demand rises somewhat during the fête, but short supply has even more effect on price. Fluctuations in price correlate primarily with fluctuations in supply of bonito, secondarily with fluctuations in supplies of other fish. The demand is "inelastic," in economists' terms; I lack sufficient figures to calculate how much so. An estimated supply-demand graph can be set up; see Table 2.

On the average winter weekday, about 350 kilos of bonito pass through the market; the summer average is about five times this, and almost 4,000 kg may move through the market in one (exceptional) day; there is a more-than-tenfold difference between the worst and the best months.

Nearly all bonito and tuna are sold through the central market. The boat owner may take a couple of fish, or a few may be bought at the quai by friends of the fishermen, but none are sold otherwise except through the marché. The situation is different for mahimahi, however; Arupa, a Chinese who owns a store on the Rue des Remparts, buys the fish (through a representative who spends his afternoons hanging around the bonito quai, and has an almost supernatural ability to spot incoming boats with mahimahi) for 75 fr/kg, and sells them to restaurants and hotels for 100 fr/kg. The mahimahi is the favorite fish of most whites (including the writer), but is too dry to be highly favored by the Tahitians (who also disvalue swordfish). Therefore mahimahi wind up almost exclusively in places that cater to the popa'a (whites)--hotels and the tourist-trade restaurants. Here they are served in the form of tiny steaks, each one costing as much as 150 fr. Tahitians, already disturbed by Arupa's goodly margin, are astonished by this last markup.

Fish roe and other lights are occasionally brought in, and either sold in the market or sold to Chinese merchants on the wharf. For some reason, however, this almost never is done; I saw only two or three buckets of lights in the market. Roe is not much desired, and does not sell well.

Operation of Industry

Such is the selling aspect of the bonito industry. The economics of operating the industry may now be discussed.

The fishing boats are inboard motor launches, 25 to 40 feet long, 6 to 10 feet broad, with the engine in the bow under the deck, a cabin amidships, and a tiller. (Sometimes a wheel also occurs.) The boats are powered by diesel engines of several kinds. British makes, such as the Perkins and the powerful noisy Parsons, predominate; the German Mercedes is perhaps the most liked by the fishermen, but is too expensive for general use. A commoner German motor is the Renk, somewhat less powerful than the British ones. Lister, BMC, and Enfield (perhaps the least powerful) engines occur. Few French motors are used; they break down frequently--according to the fishermen, at least--and in any case the Tahitians have little love for the French and their products.

The boats themselves are locally built, not infrequently by the owner. A boat costs from 50,000 to 150,000 francs to build; the engine costs as much as 250,000 francs or more. The little Enfields are, I believe, the cheapest engines, costing perhaps 150,000 francs. Total cost of the outfit is thus often over 300,000 francs--a really large amount.

There are some 50 poti auhopu scattered through the Society Islands. The outer islands have one or two each; the rest are in Tahiti. Of these about 25

make up the Papeete fleet. The rest operate out of Tautira, Vaira'o, and Luc Ellacott's shipyard in Taunoa (the north quartier of Papeete); possibly out of other coast points occasionally. Boats regularly shift from one point to another, especially between nearby points.

The boats are owned by demis--part-Tahitians, a category not recognized by the Tahitians themselves, who call them "French" if they are unpleasant, "Tahitians" if they are likeable--in most instances. Two boats at least are owned by Chinese: the Hei-Fara, Kai Chun's boat, and the Aroma, belonging to Swing. (Note that the fishermen are virtually all Tahitians, i.e. men minimally acculturated to French life and not too obviously white or Chinese in parentage.) The owners do not usually fish; Philip Lauglin, owner of a few boats, was the only owner whom I saw go out regularly during my stay. (See Table 3 for boats and owners.)

Once the boat is made and paid for, the engine must be renewed every two or three years (according to the fishermen; actually the period is longer; but most of the engines are indeed fairly new). Breakdowns occur every so often, and the boat must be repaired occasionally. This all requires a good deal of capital; how much I do not know. Otherwise, a bonito boat is rather cheap to operate: 200 fr or so a day for fuel, another 100 for food, perhaps 50 for bait. Equipment is rarely lost. The knife-blades used for opening cans and cleaning fish are very rarely replaced, and the most important piece--the parau--is handmade at little cost. The bamboo poles cost two fr or a little more per foot.

The daily operating cost is subtracted from the day's gross profit. The remaining money is split: the owner gets half, and the crew gets half to divide equally among them, the captain getting no preference, the boy no reduction. Thus it is good to have as few men as possible on a boat. On the other hand, the more men there are, the faster the fish can be pulled in, particularly in summer when more fish are there. In winter 1961, there was only one boat (the Fare Ute) with crew of four; most boats had crews of three, but several had crews of two (the boy being the one dispensed with, except on the Vaiava, which usually ran with only the captain, Taui, and the boy, Jean) and one had a crew of one (the necessary second man being the owner, Lauglin, who substituted for the captain on the boat Te Vihonu).

Thus the overhead is met jointly by men and owner. L. Ellacott has recently begun meeting all the cost of fuel; the other owners do not do this.

In an average day, about 1500 fr may be cleared. The earnings hold relatively constant throughout the year. Winter brings many times fewer fish than summer, but many times as much money per fish; the earnings work out at about 1200-2000 fr/day (work day) in all seasons. (When fish are caught, at least; often in winter nothing of significance is caught.) A big catch of toheveri, a few mahimahi, or a huge tuna mean extra income; this tends to average out the no-catch days. But profits are not great. A 1500 franc workday means about 210 francs per fisherman--about 21 fr (23¢) per hour. In summer, when every day brings many fish, incomes are steadier and slightly better. However, more people can (and do) work, and more boats are pressed into service.

The fishermen move around a good deal, particularly the crewmen; they may be working in Papeete one year, then in Tautira, then in Vaira'o, then in Papeete again, then perhaps as far off as Moorea. They work for various captains, but tend to stick to one owner for a fairly long period of time.

Labor relations in the industry are normally good; personal obligations, the net of responsibilities of person to person, keep them so. There is no institution-

alized method for the fishermen to appeal from an owner's decision; but neither is there any institutionalized way for an owner to keep his workers. If an owner did try exploitation, no one would work for him; there are plenty of more responsible bosses.

The case history of one owner indicates some facts not otherwise brought out. Ludwig (Luc) Ellacott owns more boats than anyone else. I met him early in my stay; he was one of the most helpful people I encountered. In his late forties or early fifties now, he began work over twenty years ago, as a carpenter. "I looked around," he says, "and saw that the bonito boat owners were doing well, so I thought I would get into that." He built a small boat, named after his first daughter, Caroline. The boat (like its namesake) is now around twenty years old and doing well. Since then M. Ellacott has built seven more boats, two of them named after further daughters. M. Ellacott is mostly French, speaking no English; he says his name is German in origin; he is "Tahitian" to those working for him. He lives in a large house in Taunoa; a few blocks from his house is his lagoon-side carpentery and shipyard. This consists of a building whose backyard opens on the lagoon, and operates as a drydock. Two or three of M. Ellacott's boats are usually tied up in the lagoon, and several fishermen sit on benches under trees. M. Ellacott also has boats operating out of Papeete, Vaira'o, and Tautira, and drives from one place to another in his gray pick-up truck, carrying fish and people and other items. He is a relaxed, friendly person, but like the fishermen he is very alert and sharp, and he has a good head for business. He maintains good relations with the fishermen on his boats, and does not fish with them. He has several cousins who also own boats.

In August, one of the fishermen operating out of Tautira on one of Luc Ellacott's boats caught a Giant Petrel--an Antarctic bird--with a U.S. Fish and Wildlife Service band. The entire L. Ellacott family, including grandchildren, went out to see it--taking me in my capacity as authority on birds and U.S. inscriptions. I identified the bird, and held it down while we were all driven back to Papeete, some 50 miles away by the road taken. The bird died in a week; it was sick when caught, and Tahitian medicine (force-feeding with sugar-water to "cool" it after it had eaten "hot" food, viz., a piece of stale fish) completed its destruction. M. Ellacott carefully instructed me to get the Fish and Wildlife Service to send him a report on where the bird came from, and this has been done (the bird was from South Georgia). M. Ellacott's scientific interest in the whole process was a most interesting thing to observe. It is this sort of quick interest and ability to pick up facts that has given him the ability to run so successfully a fleet of bonito boats.

In general, the fishing industry is characterized by a position intermediate between independent effort (farming, lagoon fishing) and salary work. Cooperation but not subservience is required; independent but not individual enterprise (in the sense that lagoon fishing is individual, each man alone) is dominant. The cooperation stressed by Nordhoff (1930) is still found, here perhaps more than in most Tahitian occupations; not only on the boat, but also between crews and between fishermen and owners there is much cooperation, friendship, and webwork of personal responsibility. Because of the binding forces structured around material (e.g. pay division, boat assignment) and immaterial (authority-structure interactions, etc.) exchanges, the structure of the industry is relatively resistant to change. Though it has changed more than the technicalities of fishing have--money has come in, the non-fishing boat-building owner

has become more important, etc.--the cooperation, even division of profits with half going to the dominant person (owner), and process of work have remained as they were prior to white contact.

One feature which deserves special attention is the coming of the market. Before the whites, bonito catches went to the chiefs and to the families and friends of the fishermen, apparently. The chiefs could take over what possessions they wanted (Danielsson, 1958), and had claim to certain large fish for ceremonial occasions (Nordhoff, 1930). Now, the fisherman keeps none (or almost none) of his catch, nor does any significant amount go in nonmonetary transactions; it is sold on the open market, almost entirely to Tahitians (very few Europeans come to the fish market, and Chinese there buy paaishere, tuna, etc. more than bonito). This altering represents a really profound change in Tahitian social structure, although it is not easy to trace the effects without wider knowledge of ancient Tahitian fishing than we possess. Money has a value similar to fish in the past; it can be exchanged for goods and services, and it is. But the old personal relationships have been changed for market relationships. The unit in which supply-demand laws operate has changed from the local chiefdom to the open market where anyone from several islands can buy. Buying a fish does not obligate the buyer to maintain future contacts with the fisherman; the bargain is completed immediately; the social binding created by direct transactions, and based as much on personal power as on simple supply-demand, has been replaced by a free market. The fisherman is no longer a man fishing, but a fisherman, a specialist, free of chiefs, responsible only to his owner and himself and his kin. It seems that in the future this society will have to be restructured along more formal lines, especially as population grows and personal relationships become more difficult to maintain. An investigator covering this ground in twenty years may find price-fixing, embryonic labor unions, and many of the other social checks and balances now not needed in the bonito industry. The depersonalization noted by Nordhoff (1930) seems destined to continue and develop.

Social

Definition and Analysis of the Community

The Tahitian bonito fishermen form a distinct group, a sort of community, within the universe of the Society Islands; this community is defined occupationally, and divided along occupational lines. Anyone fishing for bonito belongs to it--men and boys alike. In this section the formal and informal definition of the community--the denotation and connotation, as it were--will be examined, and some attempt made to fill out the picture with further data.

The focus, and practically the entire areal definition, of the community is the section of quai between the pleasure-yachts and the big freighters and passenger boats, along the Papeete waterfront. This section of quai is devoted entirely to the bonito boats, which tie up to the rusty iron rings sunk in the concrete seawall that drops off into shallow water (see chart, p. 97). Minor focuses occur at certain points along the coasts elsewhere, as at Luc Ellacott's Taunoa shipyard, the short breakwater in a bay in Vaira'o, and of course the fish market--second only to the quai in importance. There are fishermen at the quai from six in the morning until ten at night; on Sundays many fishermen come there even though no fishing is done.

TABLE 1

MARKETING OF BONITO

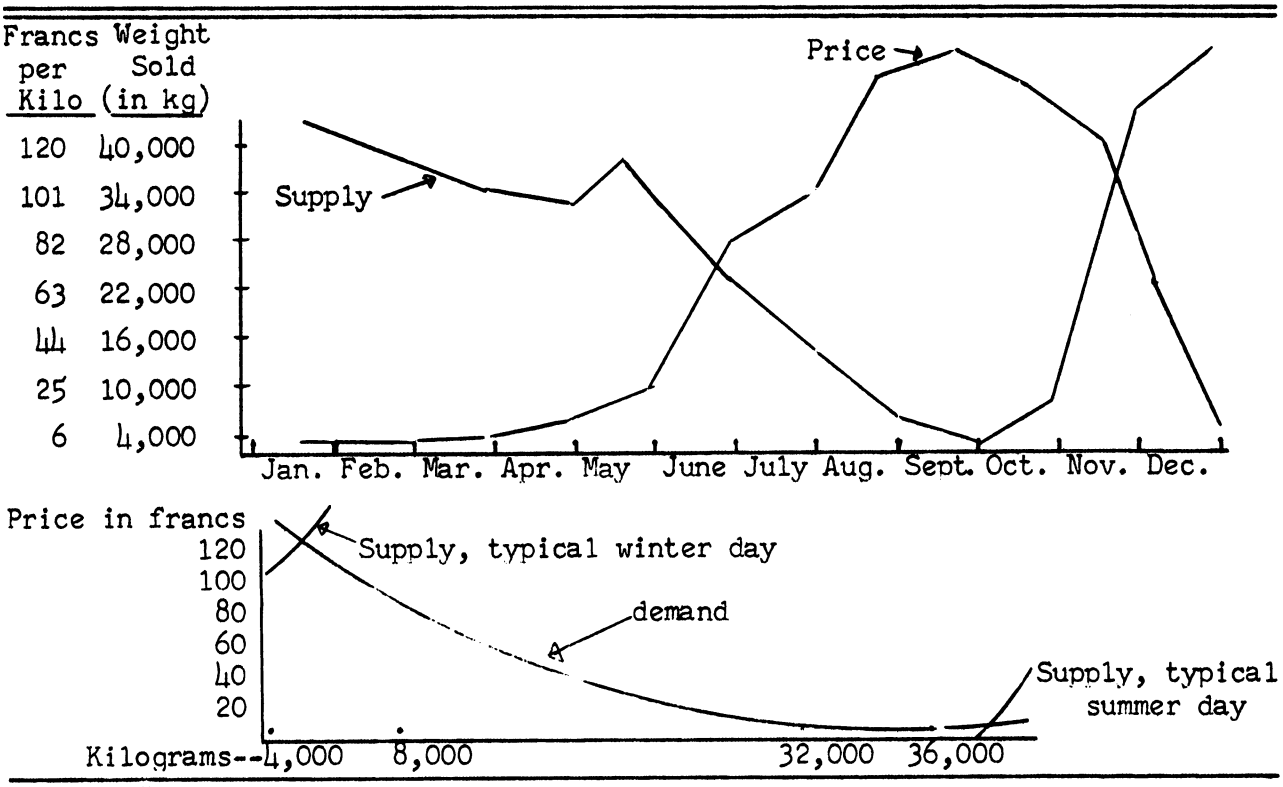
Compiled from market statistics (not always accurate) kept by police
(All figures in kilograms)

Bonito by month, July 1960 to June 1961				Comparison of two weeks in July 1961 with two weeks in February 1961					
July	15,512	January	41,419	June	30	151	February	1	1,857
August	5,407	February	35,034	July	1	537		2	3,440
September	3,494	March	32,480		2	220		3	760
October	9,765	April	29,370		3	M*		4	1,020
November	23,149	May	33,145		4	355		5	940
December	40,385	June	22,161		5	45		6	M*
					6	389		7	1,670
					7	275		8	330
					8	210		9	1,106
					9	467		10	1,520
					10	M*		11	2,675
					11	545		12	2,140
								13	M*

*M = Monday when almost no fish brought in, and statistics not kept at the market.

TABLE 2

GRAPHS OF TAHITIAN FISH MARKETING*



*I am indebted to Mr. Richard Sylla for assistance in preparing this material.

The water trough is a minor focus within the area of the poti auhopu quai. Fishermen come to the trough to wash, to get fresh water for the day (every boat carries several bottles), and to talk; the trough's main use is, of course, for sanding down parau lures. Three or four fishermen are always engaged in this process, until all the boats have left; and when (as usually happens) a few boats have not gone out, work goes on all day. Other local foci on the quai develop when the quai offers a good seat: on a bus or truck, on the huge piles of Douglas fir planks often shipped in from northwestern North America and left on the quai for some days. On these vantage points, small groups of fishermen (and, often, one or two wives and other women) sit and talk through the day. The boats come in around 5:00 to 5:30, marketing is finished in a while, and fishermen return to the quai.

Certain boats serve also as foci. The most notable is the Fare Ute, possessing a relatively outgoing crew that with four members is the largest crew operating. As soon as it docks in the afternoon, other fishermen come aboard, and much joking and catch-discussing goes on; when the Fare Ute does not go out, the same process more or less goes on all day. It should be noted that these foci are behaviorally defined; clusters of people gather and remain in one area, and others gather around. The foci are not cognitive marks, "landmarks," in the sense defined by Lynch (1960); the fishermen would probably not think of them as true markers; but these foci are key spots in the social structure of the community. At night, some of the fishermen may form small drinking parties that drift quietly through the Papeete bars, often rallying at Quinns; a few drink the Hinano beer on their familiar quai; some go home; some merely sit around talking for a while. By 10:00 P.M. the quai is deserted for the night.

Thus despite the quai's temporary supplanting, in the early morning, by the north end of Wa Hing's and by the market, the quai remains the center of life for the fishermen. The fishermen do not live in any special quarter of town; they are spread out over all sections. And their moving around keeps them from building up a residence community anywhere. They tend to live where their women are, or where they can find a place for the right cost. The community is occupational, not residential; but it is areally defined by the bonito-boat section of the waterfront.

Also important in the community is status definition. The group is split into two parts, men and boys (most of the latter are temporary fishermen, fishing until they settle down; the former are the career bonito men). All members of the community drift and group together, but splits are visible; Wa Hing's tea room shows most interesting patterns. The boys form a large, talkative, homogeneous group; the men divide into relatively stable associations of four or five men, each one holding its own table. These associations partially correspond to boat-crews, an average of two crews to an association. But social interaction is never restricted to any grouping, and much calling across tables, shifting of places, etc., goes on. The holder of a large supply of freshly made e i'ota is sure to become the center of a large group. The boys, however, are a slightly different order of being. They too come to whoever has e i'ota, but keep somewhat apart even then. On the quai they mix more freely, but the line is still not invisible. This status division is as much from the boys' choice as from the mens'; the boys prefer each other's relatively convivial and talkative company to that of the older, quieter, more withdrawn men.

A far more rigid status separation is that separating the fishermen (and boys) from the waterfront children below them and from the owners above. The waterfront youths, some of whom aspire to be bonito fishermen, are a permanent and familiar feature of the Papeete quais, where they fish for minnows congregating at sewer outfalls. These wharf children are tolerated, but not part of the community. Most interactions between them and the fishermen are initiated by the youths; the fishermen usually ignore them, even when they fish for small fry from the tied-up poti auhopu. A certain amount of humor does flow, and sometimes they provide bait for the fishermen. The owners keep themselves separate, being quite conscious of their superior economic and social status. Except for Philip Lauglin, most owners are conspicuous by their absence from Wa Hing's and the fishing boats, though many of them wait on the quai, seeing catches come in. Many of them, such as the various Ellacotts, come into the market a few times a week, and see their fishermen there, only rarely coming to the quai.

The only other parties that normally impinge on the social lives of the fishermen are their families and their associates in marketing. The boys may have no families and live mostly on the quai, sleeping in the boats. Most of the men have or have had wives (in the free but complicated arrangements that serve as marriage in Tahiti) and more or less care for children. All forms and degrees of responsibility exist; most of the fishermen are in some way or other responsible to one or more women and various children. The women occasionally appear on the quai; at the time of my stay, Emile's and Tani's wives were fairly regular fixtures of the area. With market personnel the fishermen have less close relationships, of course. The weigh-in police, mutoi makate (market police) or ma'o ("sharks," about equivalent to "fuzz" in the U.S.), are a constant feature, exacting the tax; fish sellers, boat owners, and regular buyers know the fishermen, and at least one of the fish-butchers is an ex-fisherman who still associates much with his former colleagues. The Chinese who represents Arupa in buying mahimahi is one of the few nonfishermen who invade the quai regularly; he stays there during the afternoon, waiting for his fish to appear.

Occupation, area and focus, and status are the necessary and sufficient conditions for defining the bonito fishing community. Further marks are diagnostic and more or less specific to the community, but not part of the Tahitians' definition of it.

Among these are clothes. The most noteworthy of these is the battered straw hat, the back trained up against the crown, the front pulled down to shade the wearer's eyes. This hat is a real necessity for men whose lives are spent staring into blazing sunglare on tropical water, trying to pick out tiny specks of distant birds. The fishermen often shade their eyes from below with their hands, from above with their hat-brims, leaving a slit similar to that left by Eskimo snow-goggles. But the fishermen's daily clothing has a certain, worn, shoddy quality that is distinctive. This applies not only to the shorts and worn-out jackets that are for on-boat use only, but to all the clothes except Sunday best. The latter is similar to the usual Tahitian Sunday best: bright sport shirts and clean pants of cheap material. The clothes, coupled with the dark weather-beaten faces resulting from on-water life, give the fishermen a distinctive appearance.

Another, far more important feature of the fishing community is the general reserve and quietness of the fishers, especially the men. On the water,

interactions are virtually nil. When another boat is close, unless the boats are fishing in a school, a spirited and often humorous exchange of gestures and sign-language always occurs; but on one boat, the crew interactions are confined almost entirely to the few necessary communications: information on where the schools are, and orders in tight situations, e.g. when hauling in a mahimahi. Often not twenty words will be spoken in a whole fishing day. Conditions vary from boat to boat, crew to crew. Taui was particularly quiet with the boy Jean, but when teamed up with another adult fisherman, Taui became quite verbal, and the two carried out a long, animated, humorous conversation. On the quai, in the small groups of fishermen, a short sentence will be followed by a long quiet pause and then a short reply. In accordance with standard Tahitian practice, a good deal of communication is effected through para-language, including sitting place (near to, far from, or in some special relation to another person) and exchange of material goods (especially fruit and beer). Relations of seating location, and posture and way of moving when sitting or standing, are particularly important. Friendship does not depend on small talk or constant joking, but upon position, gesture, and expression.

Some differential in the sociability of the fishermen does exist. A tangible expression of this is the tendency to group in one boat, whose crew contains one or more relatively outgoing personalities. The Te Riona (when it was there, i.e. about half the time), the Te Tuanui, and others serve thus; the chief one during my stay was the Fare Ute. When it came in about 4:30, several fishermen immediately climbed onto it and settled down to talk about the weather and the catch, to joke, or simply to rest. Hinano, the beer that is Tahiti's chief social facilitator, was more in evidence on this boat than elsewhere. A similar function is performed by a certain part of Luc Ellacott's shipyard, where some benches and some shade provide a rest spot with a high concentration of fishermen.

The reserve and control shown by the fishermen extends to most parts of their behavior. They are not heavy drinkers. Their first and most often-repeated criticism of Americans is that the latter get drunk until they can't control themselves. The fishermen almost never drink on the water, and during the day confine their intake to one or two bottles or none at all. At night they occasionally frequent bars, but go home before they ingest high quantities of alcohol. Also, the fishermen are almost incredibly even-tempered. I not only never observed a fight, but never observed any important aggressive behavior. When I was the subject of general dislike, for inadvertently failing in generosity, I noticed only one change before I was informed of my fault: the fishermen showed no inclination to take me out on the boats. No one spoke to me unpleasantly or acted aggressive in any way I could see. As far as I know there is no release whatever for aggression--certainly not in drinking or other schismogenic behavior.

Emotionality of strong nature occurs in two situations: (1) in tremendous excitement of having hooked a big fish; (2) in the cause of friendship. The fishermen have exceedingly warm relations with and feelings for their friends, and often show these.

Why is the fishermen's community so free from aggression? Only a tentative explanation is possible here. Natural aggressive energy is directed against the fish and expended in the activity of fishing. Therefore the strong emotionality when a big fish is hooked. The permissive family situation keeps intra-familial tensions from accruing. The strong emphasis on friend to friend

contact, kept on an equality basis by free and equal exchange of goods and services, plays down potential conflict and destroys its major basis. On a somewhat more basic level, those situations described as approach-avoidance conflict (Miller, 1959), in which a subject seems both attracted to and repelled by a stimulus, seem rare in Tahitians. Conflict exists and occasionally flares up; for example, Tahitian children may systematically find and crush sea-urchins along the quai. The special types of tensions arising from approach-avoidance tensions, however, do not seem to appear frequently.

In any case, the fishermen play down aggression and play up friendliness and generosity, self-control and sobriety, and mutuality in relationships.

Two Life Histories

The variation, background, and general attitudes of persons in the industry are best described by reference to short life histories. I present two, those of Ka Léon and Taui, the bonito fishermen I knew best.

Ka Léon

Ka Léon, whose real name is Chia Liang Tchéou, is no longer a fisherman. His father was Chinese, his mother Tahitian; the two separated when Ka Léon was about 12. He left school, as do most Tahitians, at 14; and became a bonito fisherman (a boy, working on one of Luc Ellacott's boats) at 15. He remained in Luc Ellacott's service for ten years, by which time he was married (he married at 19) and had two sons (now about 5 and 3) and a daughter (now about 4). His third son was born while I was in Tahiti. About the beginning of 1961, Ka Léon decided to drop fishing for a steadier-paying job; he considered fishing too uncertain a way of earning a living. He became a fish-butcher in the Papeete market, buying big fish, cutting them up, and selling the pieces at a slight profit. In August 1961 he took another job, washing dishes at night at the Hotel Tahiti (where he was astounded at the way rich tourists throw their money around--"A little piece of mahimahi, like this [four-inch piece indicated], costs 150 francs!"). He lives with his family, about a mile from the market, to which he rides on a bicycle. He once described his life as follows: "Get up, go to the market, cut up bonito, go home, bathe, eat, sleep, get up, cut bonito again." This account leaves out an unoccupied period from 7:00 A.M. to 2:00 P.M., when the market is inactive and Ka Léon has free time; it is more an indication of his boredom with town life and work. From his Chinese father he absorbed an un-Tahitian regard for hard work and keeping himself solvent, and he is considered "Chinese" (a social, not racial, term, primarily) by the Tahitians; however his outgoingness and friendliness keep him from any anti-Chinese prejudice.

Ka Léon was my closest friend in Tahiti, and helped me out constantly. More talkative than most fishermen, he volunteered information with a serious interest in my work. He was outside the fishing community, but maintained close contacts with the fishermen.

Although he stuck to fishing a long while, he is typical of the fishermen that go into the business only because it is a good way to get money before settling down. He was the eldest of six children, and has been more or less on his own since he was quite young, completely so since he was 15. He has had rather little opportunity to drift and see and learn. It is not likely that he will; he is tied to a life of routine jobs to support himself and his family.

He has often spoken of the problem of insufficient and often poor education in the Society Islands, and the necessity of dropping school early.

Ka Léon's basic indifference to fishing per se and his dropping into a steadier job stand in marked contrast to the attitudes of the career fishermen.

Taui

Taui, captain of Melvin Tu's boat the Vaiava, has been fishing for over twenty years--about half his life. He began work with Luc Ellacott, worked his way up to captaincy serving on various boats, and then switched to the Vaiava, which he has been captaining for eight years. The intricacies of his family life are mostly lost in obscurity, but the following facts come out: in Vaira'o, where he was with M. Ellacott, he did some farming and had a vahine. On moving to Papeete he abandoned both, and eventually acquired another vahine, apparently the one with whom he now lives (I am not sure, however). He has a son, about six, from this period. Meanwhile, although he lives with a new spouse, he is still "friends" with the earlier woman and helps maintain her family. This means that he has rights to goods and services, presumably including sexual ones, as well as ordinary friendship with her. The exact nature of these responsibilities is beyond my knowledge, and involves various further complications.

Taui is an expert fisherman, able to land the fish with incredible speed and accuracy; though, even so, he is no better than the other experts of the fleet. Nordhoff notes that the "adept" will land fifty fish, "forty-five of them without touching a hook" (1930, p. 245); Taui would never fall to so low a percentage. The fish fall neatly off the hook when they get over the boat, and the lure is back in water immediately. Lacking the persistence of Emile and the uncanny ability of Eugène to know where fish will bite, Taui does not make as large catches as some boats; but his knowledge of weather and sea and of technique are great, and he is one of the steadiest fishermen. With the rather slow and sometimes awkward boy, Jean, of the Vaiava, Taui has less patience than one would expect; he snapped at Jean rather often, and once in a while got quite vociferous, as when Jean fouled up a trolling line. This unusually aggressive behavior does not diminish his friendship with the boy, but Taui does prefer the company of older fishermen; with these he becomes quite talkative, in in fact one of the more mercurial fishermen. He is quiet in dealing with his boss, Tu, who is a constant and cheerful worrier. Taui's great moment comes when he is playing a big fish; when he hooks a mahimahi, he often shouts with excitement, and plays the fish with nervous energy and pleasure.

Such are two of the bonito fishermen; they are both atypical in their ways; no one bonito fisherman is the "average."

The motivations which bring men into the fishing business are rather difficult to find. For some, like Ka Léon, the business is primarily a way to get money during the young and free years. But for no one is bonito fishing solely a money-maker. One of the chief reasons advanced to me was that the economic insecurity is a factor--"You get paid the day you catch fish," no fixed salary binds you, your money depends all on your own efforts, is more or less what you deserve at the season, and comes when you market the fish each day instead of as a weekly salary. Another factor is the free and adventurous nature of the work and the strong community feeling connected with it; many people are attracted to it by these things; for many of the waterfront children bonito-fishing is one of the romantic dream occupations, such as "being a fireman" in the United States.

One motivation is subtle and difficult to pin down but exceedingly important. This is the fact that bonito fishing is a refuge against the popa'a (white man) and his world. Fishing, in general, is a Tahitian domain; Europeans and Chinese do not engage in it (except as owners) in significant numbers. And fishing in general is an activity whose aspect and associated knowledge has changed very little since pre-white times. Bonito fishing is basically as it was in aboriginal times; the parau lure is one of very few native-style objects still made on Tahiti; the sporting and more or less cooperative attitudes described by Nordhoff have not been replaced by individualistic business-like ones. The bonito fishermen are anti-French (in so far as they are anti-anything; in general they are a tolerant group) and opposed to the settled town life of most Tahitians of the area. For many of them, if not for all, bonito fishing is a refuge from the French and from salary jobs. The entire Tahitian fishing industry, of which the bonito industry is so important a part, serves as a refuge against acculturation.

Note that this does not apply to the owners, who are Chinese or strongly Europeanized mixedbloods. They have to keep their heads above water in business and thus adopt popa'a attitudes to some extent. Their chief motives for owning seem to be that bonito fishing is good business and that it lets them work with interesting people.

Most of these reasons which are actually advanced by the fishermen and owners are economic. The fishermen "like the method of paying," the owners "see it seems like a good thing." Psychological explanations are not considered.

The fishermen, then, are more or less drifting people, moving from area to area, living an unsure life which is primarily controlled by variables of wind and fish-schools. In comparison with other Tahitians, they are less tied down, less caught in routine, less Europeanized. Their community is neither entirely occupational nor primarily a neighborhood group; it might be called a specialized community. Having no residential definition and drawing its wives from outside, it cannot be studied by methods applicable solely to local groups. It is a fishing community, water-oriented, shifting, existing as a sharply defined separate group yet within the framework of Tahitian society.

Process in the Community

In the two centuries since Tahiti was discovered, many changes have come over the bonito industry. What has changed, and how much, must be analyzed. Here we return to the point set forth in the introduction, that a community is essentially a time-developing thing, showing not states but trends; the sort of static analysis I have sketched out above is not complete, but must be placed in the temporal context. As Head (1961) has shown, constant adaptation is the keynote of human affairs; this adaptation is an endless process, maintaining a dynamic balance between people and people and between people and environment.

In the first place, the fishing community has become much more a community than it was before. In pre-white times, the fishermen were apparently agriculturalists well integrated into their district, carrying on fishing as a part-time but important job, and then only during the October-May season. In Nordhoff's day, marketing had come in, but fishing was not very intensive, and was still seasonal; and Nordhoff says nothing of a distinct community of fishermen. At present, we have the sea-oriented world whose membership is the bonito fishermen of the Society Islands--a specialized group, strongly held together, and above all part of their own community, working and living therein all year.

Before the whites, bonito fishing was first of all an integrative job. Those who did it were made closer thereby, and their linking was one of the binding forces in local society. The rigid class system of Tahitian life divided the society; the resulting splits could be counterbalanced by cooperative work, including fishing. Nordhoff notes that the whole temper of Tahitian life has changed, leading away from cooperative effort; he applies this fact to the fishing business, particularly the tuna industry, in which a highly cooperative technique has dropped out of existence, an individualistic one achieved higher importance after having been disliked (Nordhoff, 1930). Religious cults, rigid classes, and competitive events of all kinds tended to fragment the community before the whites came; some balance was needed; this came from communal activities, of which fishing was one.

Fishing has remained an economically important activity, but is now relegated to specialists. Paid workers specializing in fishing may compare to experts of previous times, but year-round, market-oriented specialization is decidedly a new way of life.

Another variable is that of religion. The Tahitians have tended to try new cults and reject them after a while; the bonito fishermen have rejected all. Magic is not visibly practised; church is utterly outside the normal sphere of activities.

The economic base of the industry is also a variable. Originally exchange relationships served to distribute the fish; now money economy dominates the trade, and presumably will continue to do so.

Another is the acculturation differential. The fishermen are very un-European in attitudes, still clinging to old skills, still unconcerned with making large amounts of money, still keeping relationships on a mutual-exchange basis, etc. The owners are much more Europeanized. This situation may continue, but the Tahitian population in general is becoming more and more a part of the European world, and the fishermen may be expected to change with it.

Size of the industry is a further point. The growing population of Tahiti, and the increase in importance of bonito (as lagoon fish are fished out), will cause the industry to expand. This may make difficult the present situation of fairly close personal contacts between all personnel of the industry.

On the basis of these variables, one can make certain general predictions regarding the fishing community.

(1) The community will become steadily more differentiated from the rest of Tahitian life. The owner-fisherman gap will widen. A special residential area occupied by fishermen may well develop.

(2) The community will increase its importance as a refuge for young men who are footloose and seeking a job with variety, some freedom, and minimal relation to European-type wage systems. The group should be strongly nationalistic.

(3) Increase in size and importance of the industry will increase competition. This may stimulate still closer personal contact between the fishermen, to counterbalance the competitiveness; and/or it may lead to creation of a more formal structure, depending more on written contracts, rules, etc.

(4) The old skills, techniques, and technical knowledge will remain vital and will not change greatly. They are adapted to Tahitian conditions, efficient,

and successful. Through time they will probably be the least changed of all the facets of Tahitian bonito fishing.

Thus modern civilization has given a new context and a new importance to an old trade. Nordhoff (1930) found bonito fishing almost a lost art. It has now been revived, and has become adapted to a world of machines and market economies. As long as fish remain the prime protein food of Tahiti, the bonito industry will continue to flourish.

TABLE 3

POTI AUHOPU AT TAHITI, WINTER, 1961

Usually at Papeete (in order, roughly, of tie-up at quai, going from south to north):

Vaiava. Owner, Melvin Tu. Taui, the captain, is biographied on p. 114. A small boat, rather old, with an Enfield engine and a normal crew of only two.

Toru. Owner, Melvin Tu; Captain, Taerea. A larger, newer boat than Vaiava.

Fareniau. A larger boat, owned by L. Ellacott.

Annette. A small boat, inactive in winter, owned by Francis Renvye.

Fanatea. A large boat, uneconomical for winter use; inactive during my stay.

Tutera'i. Owned and captained--a very exceptional situation--by Tutera'i himself. A large, fast, new boat.

Mira. Owner, Tera'i; captain, Tetoa.

Dora. A fairly large, fast boat, owned by Xavier, captained by Eugène, who usually starts and returns two hours before the others and thereby makes the afternoon market. Eugène is an excellent captain with one of the highest averages of fish brought in.

Dodi. Also owned by Xavier.

Vairehu. Owned by Terii Fati.

Vairei. Owned by Tuarae, a most friendly and active woman, and captained by Momo, a quiet man, and a real expert.

A nameless hulk, left at the quai for want of need to move it.

Simone. Owned by Joseph Ellacott.

Chantal. Robert Waler, owner.

Te Vihonu. One of Philip Lauglin's boats, and the one Lauglin captains in place of Kapi, who was not around when I was in Tahiti.

Vainia. Another boat too large to operate much. I know nothing about it.

Taupe-Ahotii. Owned by Terii Tahoi, and not run much.

Irene and Vaiare. Two of Joseph Ellacott's boats.

Hei-Fara. Chinese-owned, by Kai Chun; captain, Emile Tahoi, one of the better and friendlier fishermen.

Mercedes. Owned by Léon Schmid.

Hei-Maire. Another of Philip Lauglin's boats. The captain, Robert, is one of the youngest captains. Crew only 2.

Fare Ute. Owner, Choucrette; captain, Tani, a large active individual. Only boat with a crew of 4.

Te Tiare. Owner, Léon Schmid.

Te Tuanui. Owner, Robert Waler.

Te Maire. Another of Philip Lauglin's boats.

This order is subject to change, and is merely a sort of average. New boats appear, such as the Te Riona (it spent about half the winter in Papeete).

At Taunoa are usually various of Luc Ellacott's boats, including the Arevareva, Liane, Rereieie, Caroline, Rimahere, René. Liane and Caroline base out of Vaira'o often. Marcial Ellacott's boats the Petea, Benina, and Taimai may also base out of Taunoa; the Taimai is usually at Teahupoo.

At Vaira'o are the Aroma (owned by Swing, a Chinese); Viriamu (owned by Amblin); Corita (owned by L. Ellacott).

At Tautira: Moetu (Warren Ellacott); and a few others unknown to me by name.

At Teahupoo: A boat, name unknown to me, owned by Parker.

Locations unknown to me: Janine and Tahiti, owned by Rafael Smith; Tuna, owned by Henri Lambert; Rorita, another of Léon Schmid's boats.

This list does not pretend to be complete, and doubtless contains inaccuracies. Most of the information is from Luc Ellacott.

In addition to the above, there are two or more boats basing out of Moorea, two at Ra'iatea, two each at Huahine and Tahaa, one at Borabora.

ENDNOTES

1. Identification of birds by both native and scientific names has been subject to some confusion. For example, the ua'ao has been recorded as uaao, or uao; I am indebted to M. Pierre Verin for providing me with the correct pronunciation. The glottal stop /'/ is often almost elided in the fast, slurred Tahitian spoken around Papeete.
   The 'oio has been variously misidentified. Nordhoff (1930) had scientific names assigned by someone with apparently little knowledge of Tahitian conditions (see p. 249). Nordhoff's description of the 'oio is clearly that of the Black Noddy--which is the bird called 'oio today--but the scientific name cited in Nordhoff belongs to a bird not regularly found at Tahiti.
2. Frigate-birds are occasionally kept as pets in Tahiti, and elsewhere in Oceania. The Oceanic interest in the frigate-bird is a striking phenomenon. In many areas the bird is held sacred or pointed out with excitement as in modern Tahiti, although the bird has no significance in fishing.
3. The use of size categories, especially three-part ones, seems to be characteristic of modern Tahitian nomenclature. It extends to humans.

4. Names seem to alter considerably through the years--not only for bonito. Nordhoff records 'ouma, ta'uo, vete as successively larger size-classes of the commonest baitfish, Mulloides auriflamma. The usage of the last two names is now reversed. A taboo on the use of dead men's names functioned in precontact Tahiti, but its abandonment seems not to have diminished the changing of names.

5. On some of the outer islands the lure is still made as it was before the coming of wire: a short bone point, and pig hair for the "tentacles."

6. This has obvious disadvantages for toheveri fishing, since toheveri feed at depths of 6 to 20 feet, and rarely come to the surface. I have once seen a toheveri taken by trolling.

7. One kilogram (abbr. kilo or kg) is about 2.2 pounds. The Oceanic franc was about 89 to the dollar in winter 1961.

8. Bonito has very dark meat; the Tahitians seem to prefer a lighter-fleshed fish, especially one with juicy flesh, judging by the qualite assignments at the market.

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