

E. P. Upham, 3ml

HAWAIIAN FISHERIES

— AND —

METHODS OF FISHING

WITH AN ACCOUNT OF

The Fishing Implements

USED BY

THE NATIVES OF THE HAWAIIAN ISLANDS.



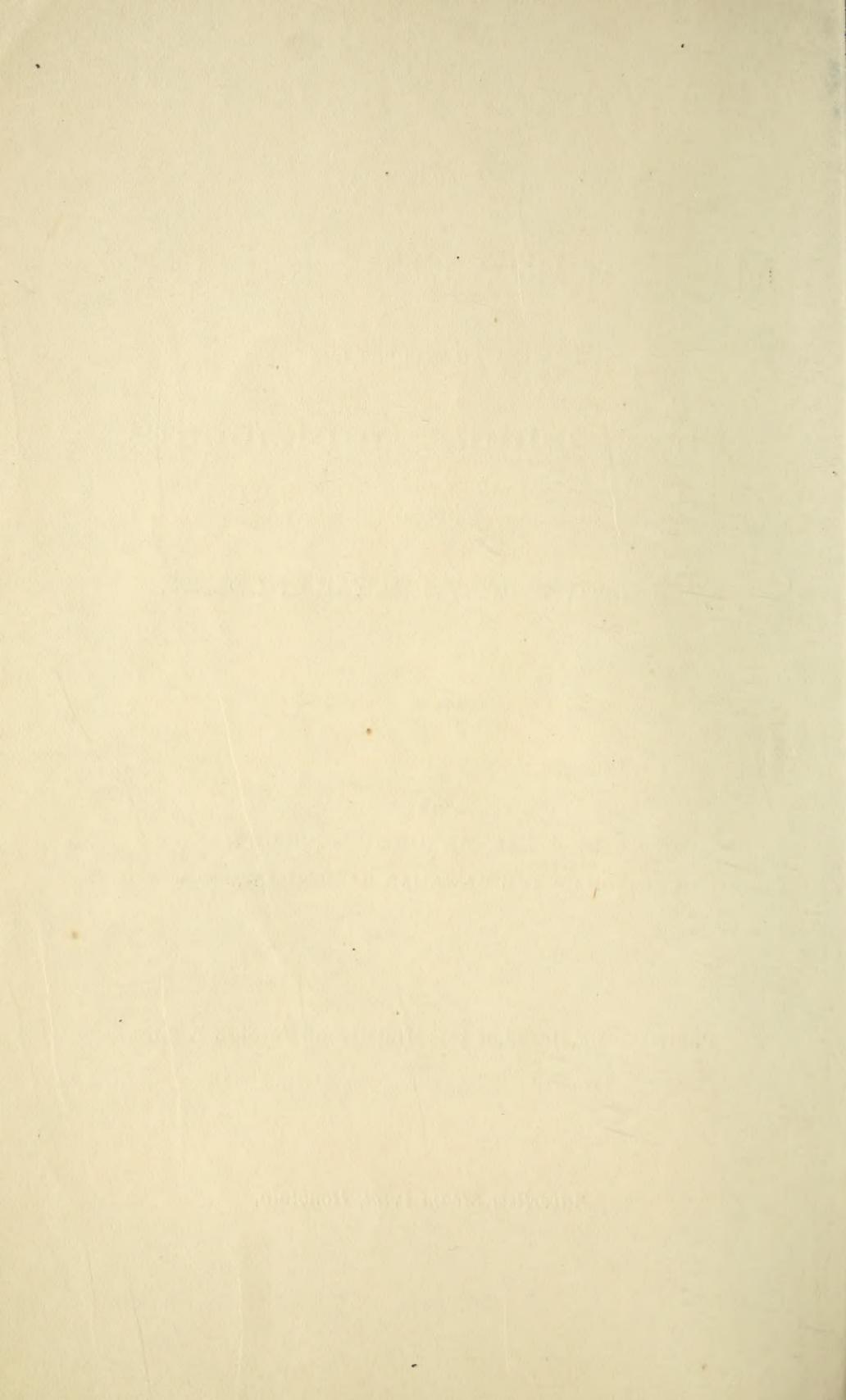
BY

MRS. EMMA METCALF BECKLEY,

CURATOR OF THE HAWAIIAN NATIONAL MUSEUM.

Published by Order of the Minister of Foreign Affairs.

Advertiser Steam Print, Honolulu.



SH
679
H3839
1883
ANTH

PREFACE.

The information contained in the following pages has been exclusively obtained from Native sources by the Authoress, who is herself a native Hawaiian lady. The treatise contains a full account, believed to be complete, of the methods of fishing in use among the Hawaiian Islanders, from the earliest times of which there is any tradition, down to the present day. The Authoress desires to acknowledge the assistance rendered to her by the Rev. Dr. C. M. Hyde, Principal of North Pacific Theological Institute, who furnished some of the information concerning Torch-light fishing obtained by him from his native pupils,

The publication of this little work has been ordered by His Excellency the Minister of Foreign Affairs in the belief that it will form an interesting and useful adjunct to the Collection of Fish and Fishing Implements forwarded by the Hawaiian Government to the Great International Fisheries Exhibition of London.

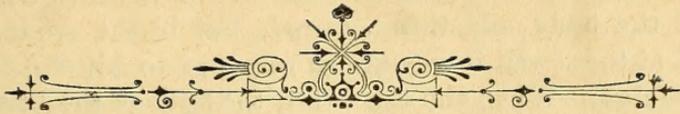
Foreign Office, Honolulu, June 25th, 1883.

NOTE.

As a guide to the pronunciation of Hawaiian words the following simple rules will suffice.

- 1—Every syllable ends with a vowel.
- 2—The vowels have the same sound as in Italian.
- 3—Every vowel should be separately pronounced.
- 4—The accent should be placed on the last syllable but one of a word.

There are exceptions to all but the first of these rules, but they are very few in number and no rule for them can be defined.



— AND —

HAWAIIAN

FISHING IMPLEMENTS

METHODS OF FISHING.

The Hawaiians have five methods of fishing: by spearing, hand catching, baskets, hook and line, and with nets.

The Ia O, is the spearing of fish and is of two kinds, below and above water. That below water is the most important, and is generally employed for the different kind of rock fish. The spear used by the diver is a slender stick of from 6 to 7 feet in length made of very hard wood and sharply pointed at one end, but more tapering at the other. Since the possession of iron spears are always tipped with it, but perfectly smooth, without hook or barb. Diving to a well-known station by a large coral rock or against the steep face of the reefs, the diver places himself in a half crouching position on his left foot, with his right foot free and extended behind, his left hand holding on to the rock to steady himself, watches and waits for the fish. Fish in only two positions are noticed by him, those passing before and parallel to him, and those coming straight towards his face. He always aims a little in advance, as, by the time the fish is struck, its motion has

carried it so far forward that it will be hit on the gills or middle of the body and thus secured, but if the spear were aimed at the body it would be very apt to hit the tail, or pass behind. When the fish is hit, the force of the blow generally carries the spear right through to the hand, thus bringing the fish up to the lower part or handle of the spear, where it remains whilst the fisherman strikes rapidly at other fish in succession should they come in a huakai (train) as they usually do.

Except in the case of Oopuhue spearing, above-water spearing is very rarely used, and then generally in connection with deep sea line and hook fishing. Oopuhue is the well-known poison fish of the Pacific, but of a delicious flavor. It is generally speared in enclosed salt water ponds from the stone embankments. The poison of this fish is contained in three little sacs which must be extracted whole and uninjured. The fish is first skinned, as the rough skin is also poisonous in a slight degree. Should the teeth of the fish be yellow then it is so highly charged with poison that no part of its flesh is safe even with the most careful preparation. Oopuhue caught in the open sea are always more poisonous than those from fish ponds.

Some fishermen dive to well-known habitats of certain fish and lobsters and, thrusting their arms up to their armpits under rocks or in holes, bring out the fish one by one and put them into a bag attached for the purpose to the malo or loin cloth. Women frequently do the same in shallow waters and catch fish by hand from under coral projections. It is also a favorite method employed by women in the capture of the larger varieties of shrimps and oopus in the fresh water streams and kalo ponds. Gold fish are also caught in that way, and at the present time form no inconsiderable portion of the daily food of the poorer classes living near kalo patches or fresh water ponds. Their power of reproduction is very great. The different kinds of edible sea slugs are caught in the same way, although the larger kinds are sometimes dived for and speared under water.

There are two ways of octopus fishing: In shallow water the spear is used. Women generally attend to this. Their practised eye can tell if an octopus is in a hole whose entrance is no larger than a silver dollar, and plunging their spears in they invariably draw one out. These mollusks have the peculiar property of drawing themselves out and compressing their bodies so as to pass through very narrow apertures many times smaller than the natural size or thickness of their bodies. Those caught in shallow waters vary from one to four feet in length, but the larger kinds live in deep water always and are known as hee-o-kai-uli (blue water octopus). They are caught with cowries of the *Mauritiana* and sometimes of the Tiger species. One or more of these shells is attached to a string with an oblong pebble on the face of the shell, a hole is pierced in one end of the back of one of the shells through which the line is passed, and having been fastened is allowed to project a few inches below, and a hook whose point stands almost perpendicular to the shaft or shank is then fastened to the end of the line. Only the finest kind of *Mauritiana* or Tiger cowries are employed for this purpose as the octopus will not rise to a large-spotted or ugly one. The spots on the back must be very small and red, breaking through a reddish brown ground; such a shell would have the strongest attractions for an octopus, and is called ipo (lover). Cowries with suitable spots, but objectionable otherwise, are slightly steamed over a fire of sugar cane husks. This has the effect of giving them the desired hue.

The fisherman having arrived at his fishing grounds first chews and spits on the water a mouthful of candle nut meat which renders the water glassy and clear; he then drops the shell with hook and line into the water and swings it over a place likely to be inhabited by an octopus. This being a voracious animal is always, according to Hawaiian fishermen, when in its hole, keeping a look-out for anything eatable that may come within reach of its eight arms. The moment a cowny is perceived an arm is shot out and the shell clasped, if of the attractive kind, one arm after the other comes out, and

finally the whole body is withdrawn from the hole and attaches itself to the cowry or cowries which it closely hugs, curling itself all around it, and seeming oblivious of anything but the pleasure of hugging its "lover." It remains very quiet whilst being rapidly drawn up through the water till, just as its head is exposed above water it raises it, when the fisherman pulls the string so as to bring its head against the edge of the canoe and it is killed by a blow from a club which is struck between the eyes. This must be rapidly done before the animal has time to become alarmed and lets go the cowry, when, should the arms be a fathom in length, it becomes a dangerous antagonist, as there would be risk of the fisherman being squeezed to death. Having eight arms, an octopus of such a size could very well manage two or three persons, as the cutting off of one or more of its arms does not affect the rest in the least.

Torch light fishing is practised on calm dark nights. The fish are either caught with small scoop nets, or are speared. Torch light fishing is always in shallow water where one can wade. The fisherman must be spry and light of step, passing through the water without a splash to disturb the fish which remain quiet as if dazzled by the light unless alarmed by the splashing or concussions in the water. The torches are made of split bamboos secured at regular intervals with ki leaves, *Dracæna terminalis* or twigs of the naio (spurious sandal wood) bound together in the same manner. Should the light burn with a pale flame, then the fisherman will not meet with good luck, but if the torches burn with a bright red flame, he will be apt to be very successful.

The Hawaiians have four kinds of basket fishing—Hinai. The Hinai opæ, sometimes called apua opæ, is a basket looking something like the coal scuttle bonnets of a hundred years ago, and is woven from the air roots of the *Freycinetia Arborea* (Ieie). This is used for mountain shrimping, and women always attend to it. They move in a crouching position through the water, moving small stones and thrusting sticks under the large ones to drive the shrimp to a suitable place

which is always some place where the grass, ferns, or branches of trees droop over on the water; the shrimps take refuge in or under these and the fisherwoman places her basket under the leaves and lifts them out of the water, when the shrimps drop into the basket; she then unties the small end and drops them into a small mouthed gourd attached to a string, which she keeps floating after her for that purpose, and putting some fern leaves inside the gourd to keep the shrimps from creeping out, as these are lively little fellows who live a long time out of water and scamper about on terra firma like cockroaches. The Hinai Hooluulu is used in Hinalea fishing, (a small species of *Julis*,) and is a small basket made from the vines of the awikiwiki, a convolvulus, and it is renewed from day to day as wanted. A light frame work of twigs is first tied together and then the vines, leaves and all, are wound in and out round and round till of the requisite size, three or four feet in circumference and about one and a half in depth. Shrimp pounded and enclosed in cocoanut fibre is occasionally placed at the bottom of the basket for bait, but usually the scent of the bruised and withering leaves seems to be sufficient. Women always attend to this kind of fishing. They wade out to suitable places, generally small sandy openings in coral ground or reef, and let the baskets down suitably weighted to keep them in position, the weights attached in such a way as to be easily detached. Each woman then moves away from her basket to some distance, but from where she can watch the fish enter the basket. When all the fish that are in sight have entered, they take the basket up and transferring the fish to a large small-mouthed gourd, move the basket to a fresh place. Fishing in this way can only be carried on, on a calm sunny day, and at low tide.

Since the introduction of the weeping willow, baskets for this fishing are sometimes made of willow twigs. Such can be used over and over again. Men sometimes take such baskets and using wana (sea eggs), for bait, with the top of the shell broken to expose the meat, place them in comparatively deep water, piling stones around them to keep them in place. They

leave them for a day or two, and if the place is good fishing ground the basket will be full by the time they come for it.

The Uiui basket is shallow, of about the same size as the above but wider mouthed, used in deep water for catching a small flat fish called uiui that makes its appearance at intervals of from ten, fifteen to twenty years. Whenever it appears it is taken by fishermen and people generally as a sure precursor of the death of a very high chief. At the last appearance of the uiui, the imported marketing baskets were generally used by those who could not obtain the old-fashioned kind, as any old cast-away basket would do, with a little patching, occupying perhaps, five minutes, and two sticks bent over the mouth or opening from side to side, and at right angles to each other for a handle to which to tie the draw string. It should be twisted round and round above the jointure with a little of the sea convolvulus, (pohuehue), with the leaves on, so as to throw a little shade in the basket to keep the fish from being drawn up to the surface of the water. In these baskets cooked pumpkins, half roasted sweet potatoes, or raw ripe papayas were placed for bait. The canoes thus provided would sail right into the midst of a school of these fish; the basket being lowered a few feet into the sea, the fish being attracted by the scent of the bait, would rush into the baskets and feed greedily. As soon as the baskets were full of fish they would be drawn up and emptied into the canoe and then lowered again, with more bait if necessary, and this would go on till the canoe was loaded or the fisherman was tired. These fish are very good eating when they first arrive, as they are fat, with liver very much enlarged; after a month they become thinner, not perhaps procuring their proper food here, and then taste strong and rank.

The Ie kala basket is the largest kind of basket used in fishing by the Hawaiians. These are round, rather flat, baskets four to five feet in diameter by two and a half to three in depth, and about one and a half across the mouth. A small cylinder or cone of wicker is attached by the large end to the mouth and turned inwards towards the bottom of the basket.

This cone or cylinder is quite small at the free end, just large enough for the kala to get in. Immediately below the end of this cone, on the bottom of this basket is placed the bait, properly secured, which in the case of the kala is limu kala (a coarse brownish yellow alga on which this fish feeds and from which it takes its name), ripe bread fruit, cooked pumpkins, and half roasted sweet potatoes, and papayas. This basket is called the ie lawe (taking basket). The fishermen generally feed the fish at a given place for a week or more before taking any, using for this purpose a large basket of the same kind without the inverted cylinder, and wider in the mouth, to allow the fish free ingress and egress. After a week or two of feeding they become very fat and fine flavored, as also very tame, and baskets full of fish can be drawn up in the taking basket without in the least disturbing those which are still greedily feeding in the feeding baskets. These baskets are occasionally used for other kinds of fish, substituting the bait known to attract that particular kind, but never with the same degree of success as with kala.

The Gilbert Islanders have of late years introduced fishing with a basket in a manner different from any formerly practised by Hawaiians. This is an oblong basket called by these people a punger, larger at one end than another, with a flat and oval top, convex like a carriage top, and gradually sloping to the small end. A cone with the end cut off is inserted at the large end, the body of the cone being inside of and opening into the basket. A trap door is fixed on the end of the cone in such a manner that it will open by a touch from the outside, but cannot be pushed open from the inside. The basket is taken to a good sandy place in two to four fathoms water, where there is plenty of coral or stones handy. The fisherman then dives and places the basket in the exact position he wishes; he then takes pieces of coral rock and begins to build up and around the basket, enclosing it completely with stones so as to form an artificial dark retreat for the fish. The entrance to the cylinder or cone is left exposed, and the fish seeing an inviting entrance to a dark place go on an exploring

expedition till they find themselves inside. Once inside they cannot return. This basket is left from two days to a week in a position at the bottom of the sea, when the stones are displaced, the basket and its contents are hauled up to the canoe or boat, a door left at the smaller end of the basket is opened, the fish shaken out, and the basket is ready to be replaced in the sea.

The natives had a very ingenious method of catching oopus, small fresh water fish found mostly in our mountain streams and having the flavor of trout. This was a platform of large logs placed side by side across our larger streams on the mountain slopes. This is put in place towards the end of the dry season when the water is low, and is placed at about or just above high water mark. When the first heavy rains of the season fall, and the streams get full, the water becomes so muddy with the wash from the sloping ground adjoining the banks that the oopus of the whole previous dry season are driven away from their usual haunts in water holes, under large rocks, logs, etc., and are carried down by the hurrying waters. The oopus always try to keep in the surface water as being comparatively clear, and are thus swept in immense quantities onto the platform, and from there into a ditch leading out to a plain where they are gathered up in immense quantities. These oopus are highly prized as they have a very delicate flavor from, it is supposed, having fed on the fallen flowers of the *Eugenias*, which always line the banks of mountain streams and are known as oopu-ai-lehua (lehua fed oopu). The oopus breed or are hatched in salt water and the young fry ascend the streams to live and grow. The young are known as hinana, scarcely any larger than maggots, and seem to have a special aptitude for getting up almost perpendicular embankments or water falls.

Paeaea is fishing with rod, hook and line. There are only seven kinds of fish sought for in the paeaea fishing. The bait most liked is shrimp. Earth worms are sometimes used and any obtainable fry of fish. The fisherman takes a handful of shrimps, baits his hooks, and then, bruising the remainder and

wrapping it up in cocoanut fibre, ties it with a pebble on the line and close to the hooks; the bruised matter spreads through the water when the line is dropped, and serves to attract fishes to the vicinity of the hooks. This bruised matter is called palu.

For hook and line fishing which is generally practised in deep water, kawakawa and aku (bonito) and ula (lobster) are the usual bait; for lack of these any kind of fish is used with varying results. The bonito were formerly caught with muhee for bait, a kind of squid found floating on the surface of the sea in great quantities. A mother-of-pearl hook is also used in place of bait. Small mullets and iiao (a small fish that comes in immense schools) are now the favorite bait, and must always be used in connection with the mother-of-pearl hooks. These fishes are taken out alive in large gourds or tubs to the fishing grounds, which are any places where bonitos are seen, usually three to ten miles out on the open sea, and are thrown over board, a handful at a time, they will immediately make for the shadow cast by the canoe as affording comparative shelter, the bonitos then give chase to them and are thus attracted in great numbers around the canoes, which, for this kind of fishing are generally double ones. The mother-of-pearl hooks are then thrown in the water without being baited and are mistaken for fish by the bonito, being on account of their shimmer and glisten like the iiao. The mother-of-pearl hooks are called pa, and are of two kinds, the pa-hau (snowy pa) and the pa-anuenue (rainbow pa). The pa-hau is used in the morning till the sun is high, as the sun's rays striking it obliquely makes it glisten with a white pearly light which looks like the shimmer from the scales of the smaller kinds of fish on which the bonito lives, but at midday when the sun's rays fall perpendicularly on it, it appears transparent and is not taken by the fish. The pa-anuenue is then used. This has the rainbow refractions, and the perpendicular rays of the sun make it shimmer and glisten like a living thing. Sometimes shells are found uniting the two characters, and such are always highly prized, as they

can be used all day. The shell is barbed on the inner side with bone and two tufts of hog's bristles are attached at the barbed end at right angles to it. The bristles are to keep the inner side up so the shell will lie flat on the surface of the sea.

For deep sea fishing the hook and line are used without rods, and our fishermen sometimes use lines over a hundred fathoms in length. Every rocky protuberance from the bottom of the sea for miles out, in the waters surrounding the islands, was well known to the ancient fishermen, and so were the different kinds of rock fish likely to be met with on each separate rock. The ordinary habitat of every known species of Hawaiian fishes was also well known to them. They often went fishing so far out from land as to be entirely out of sight of the low lands and mountain slopes and took their bearing for the purpose of ascertaining the rock which was the habitat of the particular fish they were after, from the positions of the different mountain peaks.

The natives distinguish the sharks seen in Hawaiian waters into five species: The *mano-kihikihi* (hammer-headed shark) and the *lakea* (white fin) are considered edible, as the natives insist that these never eat human beings. Then comes the *mano kanaka* (man shark), the shark god of the ancient Hawaiians; supposed to be entered and possessed by the spirits or souls of the descendants of the first shark god, who could take human form at will and left a numerous human progeny. This was the kind of shark that was formerly fed on *awa* (*piper methysticum*) and bananas, and who only bit or ate people when they were in the wrong. Then comes the *mano*, a large white shark, the largest of all known to Hawaiians, but not a particularly ravenous one. It is very rarely seen. The *niuhi* completes the list; a very large shark, and the fiercest of all. Fortunately, it very rarely makes its appearance in Hawaiian waters. In the night the *niuhi* can be seen a long way off by the bright greenish light of its eyeballs. These sharks will attack the largest of double canoes, and the fisherman's only safety is in precipitate flight at the first appearance of his greenish light.

The mano-kihikihi and smaller lalakeas are caught in old nets, but the larger lalakea with hooks, as are also all the man eating kinds. Especial preparations were made for the capture of the niuhi, but there has been no regular fishing for it for the last eighty years. The common kind of shark was caught in vast quantities, and the liver with a little of the flesh was wrapped in ki leaves and baked underground, then from fifty to a hundred of the largest single and double canoes were loaded with baked meat and large quantities of the pounded roots of awa, mixed with a little water, and contained in large gourds. The fleet would sail many miles out to sea in the direction in which the niuhi is known frequently to appear. Arrived at a comparatively shallow place, the canoe containing the head fisherman and the priest and sorcerer, who was supposed to be indispensable, would cast anchor, meat and the baked liver would be thrown overboard, a few bundles at a time to attract sharks. After a few days the grease and scent of cooked meats would spread through the water many miles in radius. The niuhi would almost always make its appearance after the third or fourth day, when bundles of the baked meats were thrown as fast as it could swallow them. After a while it would get comparatively tame and would come up to one or other of the canoes to be fed. Bundles of the liver with the pounded awa would then be given to it, when it would become not only satiated, but also stupified with awa, and a noose was then slipped over its head, and the fleet raised anchor and set sail for home, the shark following a willing prisoner, the people of the nearest canoes taking care to feed it on the same mixture from time to time. It was led right into shallow water till it was stranded and then killed. Every part of its bones and skin was supposed to confer unflinching bravery on the possessor. The actual captor, that is, the one who slipped the noose over the niuhi's head, would also, ever after, be always victorious. This shark's natural home is, perhaps, in the warmer waters of the equator, as the Gilbert Islanders now here, make the assertion that it is very frequently seen and captured at their group.

The tradition here is, that it is only seen just after or during a heavy storm, when the disturbed waters, perhaps drive it away from its natural haunts.

There are two general divisions of the kinds of nets in use here, the upena-paloo, long nets and the bag or purse nets, with endless variations of those two main features. The finest of the upena-paloo or long nets is a mesh one half inch wide called nukunukuaua. It is generally a fathom and a half in depth, and from forty to sixty fathoms in length. It is used to surround and catch the small mullets and awas in shallow waters for the purpose of stocking fish ponds. Small pebbles frequently ringed or pierced are used for sinkers and pieces of the hau, (*Hibiscus Tiliaceus*), and kukui (candle nut tree) for the floaters. Upena-paloo of one to two inch mesh are used for the larger mullets, awa weke, and pau-u-lua. A two to two and a half inch gill net is called upena hoolewalewa, or upena apoapo, according to the use to which it is put. The upena hoolewalewa (hanging net) is stretched from a given point to another at high tide, and always across what they call fish-runs in shallow waters, which a long sandy opening in coral places. Two, or sometimes one person, work this net, passing backward and forward, to seaward of the net, taking out fish as fast as caught in the meshes. This way of fishing is only practised at night. For upena apoapo, a place where fish are seen or are likely to be, is surrounded and the water inside the circle beaten, when the frightened fishes dart in every direction with great violence and are meshed. The upena oio is a long net of three to four inch mesh, used for catching oio, kala, nenu and large awa-kalamoho. It is of eighty, one hundred, one hundred and forty to one hundred and fifty fathoms in length by two to three fathoms in depth, it is used in the deeper waters, just inside, or in shallow waters just outside, the reef or breakers. For oio fishing the fishermen go in canoes, one man called the kilo (lookout) is always standing upright on the cross bars of the canoe, keeping a sharp lookout for a school of oio. When he sees one, the canoes follow it at a distance from place to place, or wait

patiently if the fishes remain in an unfavorable place till they move into the accustomed fishing grounds, called (kuuna, "where nets are dropped.") Two or three canoes are almost always engaged in this kind of fishing. When the fish are in a suitable place one canoe approaches very cautiously and stations itself where the net is to be dropped, whilst another one carrying a net of the same kind, makes a wide circuit till immediately opposite with the fish between, when the ends of the nets are dropped simultaneously from the two canoes, and both paddle in a semi-circle whilst paying out net and striving to meet the dropped ends of the opposite nets as soon as possible, so as to completely enclose the school before they become alarmed. The first canoe having met the end of the opposite net, if on sandy bottom, keeps on one side of the net already down and drawing its own net after it, thus gradually reducing the circle, as well as making two or three rings of netting around the fish, so if they make a rush to any given point and by their weight bear down the floaters, those escaping from the first circle will still be enclosed by the outer ones, and eventually be caught by becoming entangled and meshed. When the nets have been drawn, to the mind of the head fisherman, they all jump overboard with their canoe poles and beating the water frighten the fish who dash here and there with great violence, entangling themselves in the nets, and are easily captured. For upena-kaka, the oio or mullet nets are used either in daylight or at night, though the best results are almost always obtained at night. The nets are dropped in a semi-circle and some of the fishermen making a wide sweep to the opposite side, spread out fan-shape and move rapidly towards the net, beating the waters as they go with their arms, and thus driving the fish from quite a distance into the comparatively small area partly enclosed by the nets, whilst the two men holding the kuku (stick supporting the end of the net and standing perpendicularly in the water) run on the approach of the beaters towards each other. Should the water be dirty and the net rather long the ends are then gathered together till the circle

is all reduced and the fish all taken. If at night, numbers of rock fish are also taken with those that spread in schools, called by Hawaiians ia-hele, whilst rock fish are ia-koa.

The Nae is the finest of all kinds of net, the mesh being only one-fourth inch. The upena pua is for young mullet fry for stocking ponds or for eating. This net is generally a piece, a fathom square, attached on two sides to sticks about three feet in length and fulled in, the bottom rope shorter than the upper one and forming an irregular square opening to a shallow bag, which is supplemented by a long narrow bag about three or four inches wide and two feet deep. The sea convulvulus generally found growing on the beach is twisted, leaves, branchlets and all, into two thick bushy ropes some fifteen or twenty feet in length, and these are attached on each side of the net to the kuku (side sticks); these lines are then drawn forward in a semi-circle sweeping the shoals of fry before them till enough are partly enclosed, when the two free ends are brought rapidly together in a circle which is gradually reduced, the same as in long net fishing, till the fry are all driven into the bag. The same mesh, but made into a larger bag is used in fishing for ohua, a small kind of fish very highly prized by natives, which lives in and on the limu kala, a coarse alga that grows on coral in shallow water. Long ropes, one, two, or even three hundred fathoms in length having dry ki leaves braided on them by the stems, the blade ends of the leaves hanging loose and free, are started from a given place in opposite directions to sweep around and finally enclose a circle which is afterwards reduced in the same manner as in long, or pua fishing. Great numbers of men, women and children assist at this kind of fishing to hold the ropes down to the bottom, and by the splashing and disturbance of the limu drive the fish away from the ropes and into the net. Persons are generally stationed every yard or so on the ropes for this purpose and also to disentangle the ropes if caught on a rock or other obstruction. When the circle is narrowed to from ten to fifteen feet in diameter, one end of the ropes is untied and the ends attached to the ends of the

kuku of the bag net, forming a guard on each side, and the circle further reduced till the fish are all driven into the net.

Upena uluulu (diver's net) is a small bag of two-inch mesh, about two and a half feet across the opening or mouth of the bag, and the same in depth. Two sticks are attached on each side of the opening leaving a space of half a foot in width between them. This net is managed by one person only who dives to the small caves and holes in the bottom of the sea, which are always well known to the local fishermen, and placing his net across the opening of the cave or hole, mouth inwards, he then inserts a slender rod, with a tuft of grass at the end, called a pula, into the hole, and gently drives the fish which may be in there into the open mouth of his net, which, by joining the two sticks together he closes. Then placing his driving stick over the closed mouth as a further preventive, he rises to the surface, and emptying his bag into the canoe, goes to another cave or fish hole where he repeats the operation till tired or satisfied with the quantity caught.

The upena uhu is for catching uhu, a very highly prized kind of rock fish of two species, the red and the green. The red varieties, called uhu ula, are the more choice ones for eating raw. The green, called uhu eleele, are not so fine flavored, but attain a larger size. The net for these fishes is a square of two or three inch mesh, which has been slightly gathered on the ropes and attached at the four corners to slender strong sticks tied together at the middle in such a way that they will cross each other at the middle and can be closed together when wanted. When crossed they spread the net open in the form of a shallow bag, a string is tied to the crossing of the two sticks and the net is then ready for operations. A decoy fish, which must have been previously caught with the uluulu or hook and line is then dropped with a string attached, in a place where fish of that kind are noticed or known to frequent, and gently moved back and forth, this is called hoo-haehae, "teasing the fish." Every fish of that kind that can see the decoy fish is immediately attracted to see the strange actions of this one, and when all have been attracted that are

likely to be in the vicinity, the net is gently dropped at a little distance from the decoy, which is then gently drawn into the net. All the fish rush after it into the net, which is then quickly pulled up, the sticks bending over, which elongates the bag, also reducing the opening or mouth. By a peculiar twitch and pull on the string the sticks can be made to swing around and lie parallel, thus effectually closing the bag. No diving is necessary for this net beyond that necessary to get the decoy. It is also used for several other kinds of rock fish whose habits are known to be the same as the uhu's, always first getting a decoy of the kind wanted. Fishermen almost always carry for this kind of fishing candle nut or cocoanut meat, which they chew and spit over from time to time to smooth the sea so that they can observe the bottom.

Upena opule is a bag net a fathom in length having a small oval mouth two or three feet wide. It is used with a decoy opule, previously caught, which is drawn back and forth at the mouth of the net.

Upena aai-opelu. A large one-inch mesh net, 8 fathoms in depth, used in deep waters. The opelu is the Hawaiian mackerel, a small narrow fish caught only at certain seasons. Cooked pumpkins are placed at the bottom of the net for bait and lowered some fathoms beneath the surface, and the scent of the pumpkin diffusing through the water attracts the opelu and they enter the bag to feed on it. When a sufficient quantity of all the opelu in sight have entered it, it is rapidly drawn up and emptied of fish, more pumpkin is put in and the fishermen sail to a fresh place to drop the bag.

Upena iiao and nehu are used for two kinds of very small fish that come at certain seasons in immense schools and are much used for bait. Pickled and dried they are very good eating. The net is a fine mesh bag exactly like a pua net, but much larger. It is to be used with a lau, that is, with ropes with ki leaves attached, the same as for upena ohua, only this sort of fishing net requires no diving as it is used in deep waters.

Laaumelomelo is another kind of decoy fishing, only in this instance the decoy used is a billet of hard wood something like a club, rounded at the ends and one end smaller than the other, with a little ringed knob on the smaller end to tie a string to. This club when prepared with the proper attention to the usual lucky or unlucky superstitions common to fishermen, is then slightly charred over a regulation fire. Kukui nut meat and cocoanut in equal quantities are first baked, pounded and tied up in a wrapping of cocoanut fibre (the sheath around the stem of a cocoanut leaf) and the fishermen then start on a canoe for the fishing grounds. This should be in water not deeper than four or five fathoms. Arrived there the laaumelomelo is then greased with the oily juice of the pounded nuts and dropped over board and allowed to hang suspended a few feet from the bottom. The scent of the baked nut meat diffusing through the water seems to have a powerful attraction for some kinds of fish which surround the stick seeming to smell or nibble at it. After a while the bag net is dropped over with its mouth open towards the stick, when the latter is moved gently into it, the fish still surrounding and following it into the net. Two persons then dive and approaching the net gently, quickly close its mouth and give the signal to those in the canoe to haul it up. Some laaumelomelo were more attractive to fish than others, or were more lucky, and this the fishermen ascribed to the more perfect performance of the incantation made at the cutting of the stick from the tree and its subsequent preparation.

The hano is a large bag net of very fine mesh with a flaring mouth, used to capture flying fish. There are two varieties of flying fish here, the large malolo and the small puhikii, entirely distinct from each other. The same net and method of capture is also employed for the iheihe, a long thin fish, usually a foot and a half in length with a very sharp-pointed snout that generally arrives here at about the same time as the malolo. The hano is also occasionally employed for the akule, another fish that arrives in schools.

For malolo fishing the hano is piled on a double canoe or

large single one, and a start is made early in the morning with an attending fleet of from 20 to 40 canoes, women very often go in this kind of fishing to help paddle the canoes as no particular skill is called for on the part of the general hands, the success of the fishing depending altogether on the good judgment and sight of the kilo or spy. This person is generally on a light canoe manned by only two or three hands, and he is standing up always on the cross ties of the canoe looking for the malolo; whenever he discerns a strong ripple he points it out to the rest of the canoes who then surround the spot indicated whilst he confers with the head fishermen about the best place to drop the hano, which depends upon which way the current sets, when the net is all ready the canoes paddle very quickly in towards it, splashing the water and driving the fishes before them into the open net. It seems that these fishes will not dive to any depth and are always found swimming very near the surface, so, when completely surrounded by canoes, they can be driven wherever wanted. The fleet very often go several miles out to sea after malolo, and this fishing is called one of the lawaia-o-kaiuli, "blue sea fishing.

Upena kolo is the largest of all nets, and can only be used in a very few places, like the harbor of Honolulu, Puuloa, etc. It is an immense bag from sixteen to twenty-four fathoms in depth. Small meshed and narrow at the extreme end, but widening out into an immense flaring mouth, with long nets 16 to 20 fathoms deep attached on each side and called its pepeiao (ears). This is swept from one side to the other of the harbor, scooping up every kind of fish. A great many sharks a fathom in length are sometimes caught in it, but the net is generally used when the mullet is in roe and is designed for the capture of large quantities of that fish. It requires a great many hands to manage it.

Lau kapalili is the use of a large bag net smaller than the kolo, but larger than the ohua or iiiao net, but of the same general shape and called a papa. Two ropes lau of 3 or 400 fathoms in length, with ki leaves attached, the same as in

lau ohua, and generally the lau of two or more ohua nets joined, are piled on to a large double canoe, which is taken out two or three miles from shore, attended by a fleet of from 60 to 100 single canoes. The head fisherman always goes on the canoe containing the net and lau. Arrived at the proper distance, which must be just opposite the final drawing place, the end of one rope is joined to that of the other, and two canoes manned by eight or ten strong men take the other end of the rope or lau, one each, and start in opposite directions and exactly parallel with the shore, whilst the double canoe remains stationary till all the lau is paid out. In the meantime the rest of the canoes have divided into two companies and follow the two leading canoes, stationing themselves at certain distances on the lau and helping to pull it. When the lau is all paid out, the two leading canoes then curve in to form a semi-circle, at the same time always moving towards the shore. When a perfect semi-circle has been made by the lau the double canoes and all the others move gradually forwards with it, while the leading canoes are pulling with all their might straight into the shore. When either end is landed the men immediately leap out and taking hold of the line pull on it, at the same time going towards each other, which has the effect of narrowing the semi-circle, whilst most of the canoes keep backing on to the double canoe, which always keeps the center. Arrived at a suitable place, always a clean sandy one a few rods from shore, the laus are untied and attached to each end of the papa net; men, women and children now gather cosely on the lau, especially where it joins the net, and make a great disturbance with their feet, which drives all the fish into the net. Lau and net are finally drawn ashore.

Lau Kapalili (trembling leaves) fishing can only be carried on on a clear, bright, sunny day, so that the shadows cast by the leaves can be seen and serve to drive the fish inland. It is called the "Fishing of Kings," as they only, could command a sufficient number of canoes, men and lau. For the same reason the Niuhi was called the "Game of Kings." The

late Kamehameha V., whose favorite residence was at Waikīki, frequently ordered the Lau Kapalili.

We have two kinds of fish ponds or enclosures ; fresh water ones, from half an acre to two or three acres in extent ; and salt water ponds, generally very large and enclosing an area of many acaes. The salt water ponds are of two kinds ; those entirely closed, and in which fish are fed and fattened, and those surrounded by a low wall that is submerged at high tide and has openings, walled on each side like lanes leading in or out of the pond.

The lanes or fish-runs are from fifteen to twenty feet in length and radiate from the wall inside and out. They are of about two feet in width at the opening in the wall and widen out gradually till they are from eight to ten feet wide at the ends. At night when the tide is coming in, a man, or more frequently a woman takes a small scoop net just wide enough to fill the entrance of the opening and of three or four feet in depth, wades out to the entrance of one of these runs and sitting on a raised stone platform on its side, always made for that purpose, holds the net in the water at the entrance of an opening towards the sea. and sits very quiet until a jerk in the net is felt, when it is immediately pulled up before the fish have time to return, and the fish dropped into a gourd or basket, when the net is immediately returned to the water and waiting and watching are resumed. Two persons generally go to this kind of fishing and sit on opposite sides of the entrance, so that as one net is raised another one is still there, as under certain conditions of the water and weather, two persons will be kept busy scooping up fish as fast as the nets can be lowered. No fish must be allowed to get free as that would put a stop to the fishing at that entrance during that turn of the tide.

These entrances are favorite stations for the ground sharks of the neighborhood to prey on the fish as they go in or out, and so when the tide is about medium height, the fishing people return to shore, as their platforms would be entirely sub-

merged at high tide. At the turn of the tide and when the platforms are exposed, other parties take their turn at the lanes, using those with entrances opening inwards. These fish ponds, known as Umeiki, are sometimes owned by the proprietors of two adjoining lands, the people of one owning the right to fish during the rise of the tide known as the Kai-Ki, and the other during the ebb, Kai-Emi. Long nets are also used in these ponds, but only during the condition of the tide belonging to each.

The large salt or brackish water ponds, entirely enclosed, have one, two or four gates called Makaha. These are of straight sticks tied on to two or three cross beams, the sticks in the upright standing as closely as possible, so that no fish half an inch in thickness can pass them, while the water and young fry can pass freely in and out. Scoop nets the width of the gates are used at these places at the flow of the tide to scoop up such fish as may be desired by the owner or pond keeper for family use. When any large quantity is wanted, the long net, generally known as Upena-Kuu, is used, the same as in shallow sea fishing.

Fresh water ponds are very seldom over half an acre in extent and are for Oopu and Opae preserves, and sometimes for Awa a kind of tropical salmon that breeds in brackish water and will live and grow fat in perfectly fresh water. The young fry of this fish is procured in shallow waters on the beach where a stream or spring of fresh water mingles with the sea, and is carried sometimes many miles inland in large gourds with water.

The Catfish has been introduced within four years and is doing well. Carp have also been introduced very recently, but it is yet too early to pronounce on the success or otherwise of the experiment.

