

Mackerel landed by the New England fleet, in sea-packed barrels, at all ports, was as follows:

Time.	1885.	1886.
Up to August 1	116, 836	19, 112
Week ending August 7	40, 150	1, 849
Week ending August 14	18, 303	10, 381
Week ending August 21	18, 584	1, 118
Week ending August 28	19, 066	2, 031
Three days ending August 31	10, 153	2, 812
Total to September 1	223, 152	37, 303

Whaling fleet of Provincetown, Mass., August 13, 1886.

Name.	Net tonnage.	No. of boats.	No. of men.	Location of whaling grounds.
Schooner William A. Grozier *	111.00	2	16	Atlantic Ocean.
Brig David A. Small	113.83	2	16	Do.
Schooner Quickstep †	89.25	2	16	Do.
Schooner Ellen Kizpah †	63.43	2	16	Do.
Schooner Mary G. Curran †	97.03	2	16	Do.
Schooner Rising Sun †	65.99	2	16	Do.
Schooner Agate †	76.95	2	16	Do.
Schooner Arctarctic †	95.57	2	16	Do.
Schooner Baltic †	76.81	2	16	Do.
Schooner Bloomer †	70.13	2	16	Do.
Schooner Aloyone †	87.61	2	16	Do.
Schooner Gage H. Phillips †	101.37	2	16	Do.
Steamer Angola B. Nickerson	26.97	6	Off New England coast.
Total	1, 076.03	24	198	

* Arrived on August 9. † Now on voyage. ‡ Arrived June 14; now on second voyage.

GLOUCESTER, MASS., August 31, 1886.

78.—HAWAIIAN FISHING IMPLEMENTS AND METHODS OF FISHING.

By Mrs. EMMA METCALF BECKLEY,

Curator of the Hawaiian National Museum.

[Abstract.]

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

The spearing of fish 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,

and there he 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. 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 while the fisherman strikes rapidly at other fish in succession should they come in a 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 is of a delicious flavor. It is generally speared in inclosed 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 under rocks or in holes, bring out the fish one by one and put them into a bag attached for the purpose to the 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. Goldfish 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 practiced 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 1 to 4 feet in length, but the larger kinds live in deep water always and are known as 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, which, 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. 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, when in its hole is always, according to Hawaiian fishermen, keeping a lookout for anything eatable that may come within reach of its eight arms. The moment a cowry 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, which it closely hugs, curling itself all around it. It remains very quiet while 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 done rapidly, before the animal has time to become alarmed and let 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 practiced on calm dark nights. The fish are either caught with small scoop-nets or are speared. Torch-light fishing is always done 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 leaves, or of twigs of the spurious sandal-wood bound together in the same manner.

The Hawaiians have four kinds of basket fishing. The first is with a basket looking something like the coal-scuttle bonnets of a hundred years ago, and is woven with the air roots of the *Freycinetia arborca*. 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 shrimps 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 puts some fern leaves inside the gourd to keep the shrimps from creeping out, as they are lively little fellows living a long time out of water and scampering about on land like cockroaches.

The second is with a small basket made from the vines of the convulvulus, and it is renewed from day to day as wanted. A light framework 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, 3 or 4 feet in circumference and about $1\frac{1}{2}$ in depth. Shrimps pounded and inclosed in cocoa-nut fiber are 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 being attached in such a way as to be easily detached. Each woman then moves away from her basket to some distance from which she can watch the fish enter the basket. When all the fish that are in sight have entered, she takes the basket up and transfers the fish to a large small-mouthed gourd, and moves the basket to a fresh place.

Fishing in this way can be carried on only during 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 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 thus for a day or two, and if the place is a good fishing-ground the basket will be full by the time they come for it.

The third kind of 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, or twenty years. 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 convulvulus with the leaves on, so as to throw a little shade into the basket to keep the fish from being frightened while they are 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, and 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 fishermen were tired. These fish are very good eating when they first arrive, as they are fat, with the liver very much enlarged; but after a month they become thinner, not perhaps procuring their proper food here, and then taste strong and rank.

The fourth kind of basket is the largest kind used in fishing by the Hawaiians. These are round, rather flat baskets, 4 to 5 feet in diameter by $2\frac{1}{2}$ to 3 in depth, and about $1\frac{1}{2}$ across the mouth. A small cylinder or cone of wicker is attached by the large end to the mouth and turned inward towards the bottom of the basket. This cone or cylinder is quite small at the free end, just large enough for the fish ("kala") to get in. Immediately below the end of this cone, on the bottom of this basket, is placed the bait, properly secured, which is a coarse, brownish-yellow alga, on which this fish feeds and from which it takes its name, ripe bread-fruit, cooked pumpkins, half-roasted sweet potatoes, and papayas. 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 that 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.

The Gilbert Islanders have of late years introduced fishing with a basket in a manner different from any formerly practiced 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 2 to 4 fathoms of 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, inclosing 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.

There are only seven kinds of fish sought for in fishing with rod, hook, and line. The bait most liked is shrimp; earthworms 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 cocoa-nut fiber, 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.

For hook-and-line fishing practiced in deep water, bonitos and lobsters are the usual bait; for lack of these any kind of fish is used with varying results. For deep-sea fishing the hook and line are used without rods, and our fishermen sometimes use lines over 100 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 from the positions of the different mountain peaks, for the purpose of ascertaining the rock which was the habitat of the particular fish they were after.

The natives distinguish the sharks seen in Hawaiian waters into five species: The "mano-kilikiki" (hammer-headed shark) and the "lala-kea" (white fin) are considered edible, as the natives insist that these never eat human beings; then comes the "mano-kanaka" (man shark), which only rarely bites people; then the "mano," a large white shark, the largest of all known to Hawaiians, but not a particularly ravenous one, which is seldom seen; the "niuhi" completes the list, a very large shark, and the fiercest of all, which, fortunately, very rarely makes its appearance in Hawaiian waters.

There are two general divisions of the kinds of nets in use here, the long nets and the bag or purse nets, with endless variations of those two main features. The finest of the long nets has a mesh one-half inch wide. It is generally $1\frac{1}{2}$ fathoms in depth and from 40 to 60 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 *Hibiscus tiliaceus* and candle-nut tree for the floaters. Nets of 1 to 2 inch mesh are used for the larger mullets. A 2 to $2\frac{1}{2}$ inch gill-net is sometimes stretched from a given point to another at high tide, and always across what they call fish-runs in shallow waters, which are

long, sandy openings in coral places. Two persons, or sometimes one, 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 practiced at night. Sometimes 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.

A long net of 3 to 4 inch mesh is used for catching large fish, such as the "oio." It is of 80, 100, 140, or even 150 fathoms in length by 2 to 3 fathoms in depth. It is used in the deeper waters just inside, or in shallow waters just outside, the reef or breakers. For this fishing the fishermen go in canoes; one man 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 fish remain in an unfavorable place, till they move into the accustomed fishing-grounds. Two or three canoes are almost always engaged together 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, while 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 semicircle while paying out the net and striving to meet the dropped ends of the opposite net as soon as possible, so as completely to inclose the school before the fish 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, 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 that 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 inclosed by the outer ones, and eventually be caught by becoming entangled and meshed. When the nets have been drawn to suit the head fisherman they all jump overboard with their canoe poles and by beating the water frighten the fish, which dash here and there with great violence, entangling themselves in the nets, and are easily captured.

In catching other kinds of fish these or smaller 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 semicircle 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 water as they go with their arms, and thus driving the fish from quite a distance into the comparatively small area partly inclosed by the nets, while the two men holding the stick supporting the end of the net and standing perpendicularly in the water run towards each other on the approach of the beaters. Should the water be dirty and the net rather long, the ends are then gathered together until 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.

The finest of all kinds of nets ("nae") has only one-fourth inch mesh. The "pua" net 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 3 feet in length and fulled in, the bottom rope being shorter than the upper one and forming an irregular square opening to a shallow bag, which is supplemented by a long narrow bag about 3 or 4 inches wide and 2 feet deep. The sea convolvulus, generally found growing on the beach, is twisted, leaves, branchlets, and all, into two thick, bushy ropes some 15 or 20 feet in length, and these are attached on each side of the net to the side sticks; these lines are then drawn forward in a semicircle sweeping the shoals of fry before them till enough are partly inclosed, 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 size of mesh ($\frac{1}{4}$ inch), but made into a much larger bag, is used in fishing for "ohua," a small kind of fish very highly prized by the natives, which lives in and feeds upon the coarse alga that grows on coral in shallow water. Long ropes, 100, 200, or even 300 fathoms in length, having dry "ki" leaves braided on them by the stems, the blade ends of the leaves hanging loose, are started from a given place in opposite directions to sweep around and finally inclose a circle, which is afterwards reduced in the same manner as in long 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 alga 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 10 to 15 feet in diameter one end of the ropes is untied and the ends attached to the ends of the side sticks of the bag-net, forming a guard on each side, and the circle further reduced till the fish are all driven into the net.

The diver's net is a small bag of 2-inch mesh, about $2\frac{1}{2}$ 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, who dives to the small caves and holes at the bottom of the sea, which are always well known to the local fishermen, and placing his net across the opening or hole, mouth inwards, he then inserts a slender rod, with a tuft of grass at the end, into the hole, and gently drives the fish which may be in there into the open mouth of his net, which he closes by joining the two sticks together. 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.

Another net is for catching "uhu," a very highly prized kind of rock fish of two species, the red and the green. The red varieties are the more choice ones for eating raw. The green are not so fine flavored, but attain a larger size. The net for these fishes is a square of 2 or 3 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 may have been previously caught with the 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 "teasing the fish." Every fish of that kind which 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 required for this net beyond that which is sometimes necessary to get the decoy. It is also used for several other kinds of rock fish of like habits, always first getting a decoy of the kind wanted. Fishermen almost always carry for this kind of fishing candle-nut or cocoa-nut meat, which they chew and spit over from time to time to smooth the sea so that they can observe the bottom.

The "opule" is taken in a similar manner in a bag-net, a fathom in length, having a small oval mouth 2 or 3 feet wide.

A large 1-inch mesh-net, 8 fathoms in depth, is used in deep waters for catching 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 fish and they enter the bag to feed on it. When a sufficient quantity of them have entered 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.

Two other nets 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 ropes with "ki" leaves attached, only this sort of fishing net requires no diving, as it is used in deep waters.

In another kind of decoy fishing 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 Hawaiian fishermen, is then slightly charred over a regulation fire. "Kukui"-nut meat and cocoa-nut in equal quantities are first baked, pounded, and tied up in a wrapping of cocoa-nut fiber (the sheath around the stem of a cocoa-nut leaf), and the fishermen then start on a canoe for the fishing-grounds. This should be in water not deeper than 4 or 5 fathoms. Arrived there the decoy is then greased with the oily juice of the pounded nuts and dropped overboard 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 awhile 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.

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, entirely distinct from each other. The same net and method of capture is also employed for the "iheihe," a long thin fish, usually $1\frac{1}{2}$ feet in length, with a very sharp-pointed snout, that generally arrives here at about the same time as the large flying-fish. The "hano" is also occasionally employed for the "akule," another fish that arrives in schools.

For catching the large flying-fish 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 twenty to forty 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 lookout. 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 fish. Whenever he discerns a strong ripple he points it out to the rest of the canoes, who then surround the spot indicated while he confers with the head fishermen about the best place to drop the net, 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 fish before them into the open net.

It seems that these fish will not dive to any depth, and are always found swimming very near the surface, so that, when completely surrounded by canoes, they can be driven wherever wanted. The fleet very often goes several miles out to sea; and this fishing is called "blue-sea fishing."

The "kolo" is the largest of all the nets, and can be used only in a very few places, like the harbor of Honolulu, Puuloa, &c. It is an im-

mense bag from 16 to 24 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 ears. This is swept from one side to the other of the harbor, scooping up every kind of fish. A great many sharks 6 feet 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.

A large bag-net, somewhat smaller than the "kolo," but of the same general shape, is sometimes used. Two ropes of 300 or 400 fathoms in length, with "ki" leaves attached, and generally the rope of two or more "ohua" nets joined, are piled on to a large double canoe, which is taken out 2 or 3 miles from shore, attended by a fleet of from sixty to one hundred canoes. The head fisherman always goes on the canoe containing the net and ropes. 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, one each, and start in opposite directions and exactly parallel with the shore, while the double canoe remains stationary till all the rope is paid out. In the mean time the rest of the canoes have divided into two companies and follow the two leading canoes, stationing themselves at certain distances on the rope and helping to pull it. When the rope is all paid out, the two leading canoes then curve in to form a semicircle, at the same time always moving towards the shore. When a perfect semicircle has been made by the rope the double canoes and all the others move gradually forwards with it, while the leading canoes are pulling with all their might straight in to 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 semicircle, while most of the canoes keep backing on to the double canoe, which always keeps the center. Arrived at a suitable place, which is always a clean sandy one a few rods from shore, the ropes are untied and attached to each end of the net; men, women, and children now gather on the rope, especially where it joins the net, and make a great disturbance with their feet, which drives all the fish into the net. Rope and net are finally drawn ashore.

We have two kinds of fish ponds or inclosures: Fresh-water ones, from half an acre to 2 or 3 acres in extent; and salt-water ponds, generally very large and inclosing an area of many acres. 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, which are walled on each side like lanes leading in or out of the pond.

The lanes, or fish-runs, are from 15 to 20 feet in length and radiate from the wall inside and out. They are of about 2 feet in width at the

opening in the wall and widen out gradually till they are from 8 to 10 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 3 or 4 feet in depth, wades out to the entrance of one of these runs, and sitting on a raised stone platform on its side, 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 are 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 submerged 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 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 and the other during the ebb. 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 inclosed, have one, two, or four gates. 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 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 "opac" 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 are procured in shallow waters on the beach where a stream or spring of fresh water mingles with the sea, and are 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 of the experiment.

HONOLULU, *June 25, 1883.*