

SAMOAN MATERIAL
CULTURE

BY
TE RANGI HIROA
(P. H. BUCK)

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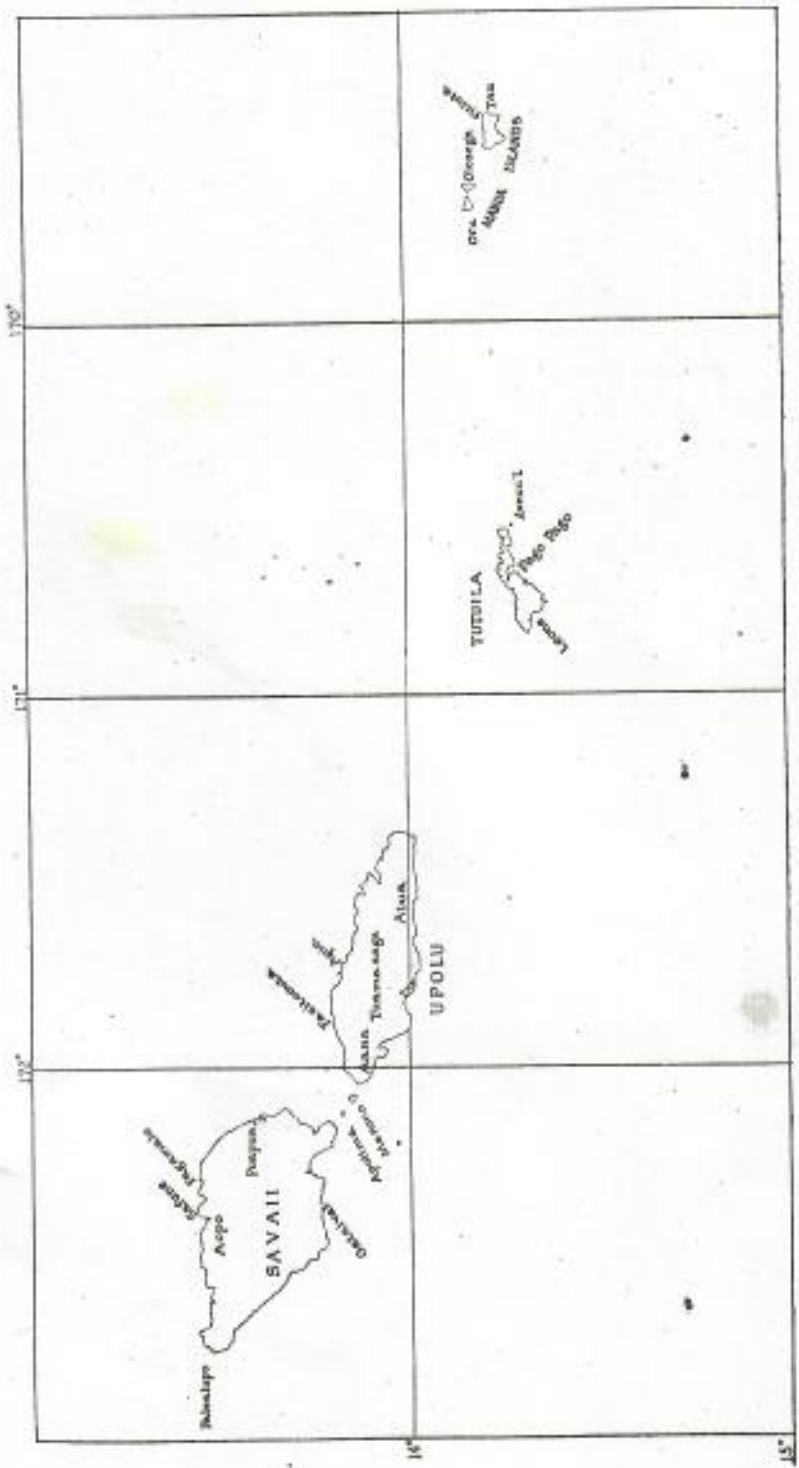
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INTRODUCTION

Samoa is a group of islands in the western Pacific lying 13.5° to 14° S. lat. and 168° to 173° W. long. Rose Island, the most eastern of the group, is of coral formation and uninhabited. The other islands are volcanic, well-wooded, mountainous, and for the most part surrounded by coral reefs.

Up to the year 1900, the affairs of the whole group were jointly administered by the three powers, Britain, America, and Germany. At that date Britain withdrew. The islands to the east of the 171st. longitude were given to the United States which delegated control to its Navy Department. The islands to the west were administered by Germany until 1914, when, owing to the state of war between Germany and Britain, New Zealand troops took possession on August 29, 1914. At the end of the war, Germany renounced all right and title to western Samoa. The principal allied and associated powers agreed that the territory be administered by Britain and in 1920, the Dominion of New Zealand was empowered to administer the mandated territory.

American Samoa consists of the large island of Tutuila and the Manuan group consisting of the three small islands of Ofu, Olosega, and Tau to the east of Tutuila. The naval station and seat of administration is at Pago Pago in Tutuila. Western Samoa consists of the two large islands of Upolu and Savaii with the two small islands of Apolima and Manono lying between them. The seat of administration is at Apia in Upolu. Savaii, about 48 miles in length by 25 miles in breadth, is the largest and most western island of the group. Upolu has the largest population and is the most important island politically. The small Manuan group is important in the traditional history of Samoa.

The Samoan population of western Samoa on January 1, 1926, was given as 36,308. The population of American Samoa by the census of 1922 was given as 8,194 without counting those of mixed blood. The native population of the whole group on this data is 44,502. Numerically this makes the Samoans the largest branch of the Polynesians next to the Maori of New Zealand. Though admixture has taken place, there is a very high percentage

of full-blooded Samoans. Government and popular writers have referred to the Samoans as being the purest branch of the Polynesians. Such statements are assertions not based on any scientific data and should be disregarded until an anthropometrical survey of all branches of the Polynesians has been completed. Measurements were made in Samoa by Mr. E. W. Gifford and Mr. W. C. McKern and the material worked up by Sullivan (37). The Polynesians are a mixed people and until they can be dealt with as a whole, it is futile to make statements as to which branch retains most of the physical characteristics of the original stock which broke into the Pacific.

The speech of the Samoans is a dialect of the Polynesian language. As the Polynesians had no written language, the early missionaries represented the sounds phonetically by English letters as was done throughout Polynesia, Hawaii, and New Zealand. The usual Polynesian consonants are present with the exception of *h* and *k*. The *h* sound of other Polynesian dialects is represented in some words by the sibilant *s* and in others by *f*. The *k* sound was dropped but its place in a word is represented by the glottal closure which causes a hardening of the following vowel or almost the sound of *h*. In the written language, the elision of the *k* sound is represented by an inverted comma placed above the position which the sound originally occupied in the word. For comparative philology, it is necessary that the glottal comma be shown in the right position. The interchangeable *l*, *r*, *v*, and *w* sounds take the form of *l* and *v*. The *ng* sound is present but was unfortunately represented by the compilers of the alphabet as *g*. This usage has become official and is a source of confusion to those not acquainted with it. The important naval station in Tutuila through being written as Pago Pago is usually pronounced by the travelling public as Pay-go Pay-go or Pag-go Pag-go instead of Pango Pango. Even at this late period, the erroneous *g* should be altered to *ng*. To facilitate comparison with other Polynesian dialects, the lead given by Handy (14, p. 4) in representing the *ng* sound by the letters *ng* will be followed in this work¹. It was done originally with the dialects of New Zealand and the Cook Islands and has given complete satisfaction. The authoritative work on the Samoan dialect is still the "Grammar and Dictionary" compiled by George Pratt (23).

Recent changes have taken place in the spoken language in the substitution of *k* for *t* and a loose mutual interchange between the sounds *n* and *ng*. The re-introduction of *k* in place of *t* is extremely interesting as it evidently indicates a Polynesian tendency not confined to one dialect. A similar change has already completely occurred in the Hawaiian dialect in which it passed through two distinct phases. Thus, in the widespread Polynesian word *kumete* (wooden bowl) the first phase was the dropping of the *k* so that the

¹The Polynesian words "malaga" and "numaga" are accepted by the Bishop Museum as English words. However, the *n* sound is included in their spelling throughout this text.

word became 'umete. In the second phase which occurred later, the *t* was changed to *k* and the word became 'umeke. Thus the lost *k* came back into the dialect but in no word did it reoccupy its original position. In the process of resurrection, the *k* displaced the *t* sound completely out of the dialect. In Samoa, the first phase of dropping the *k* had been completed before the Bible was printed in Samoan and *kumete* had become 'umete. The second phase of substituting the *k* for *t* is now taking place in everyday speech and a wooden bowl is now more often referred to as 'umeke than as 'umete. The talking chiefs make the change in official speeches and the retention of the *t* sound is regarded by the public as pedantic. It seems probable that the Samoan *t* like the Hawaiian *t* is doomed to extinction.

The interchange between *n* and *ng* has become so common that I had to constantly consult Pratt to find out which was the original sound used. Thus in spoken speech, it is more usual to hear *paono* instead of the correct *paongo*, and *tafangi* instead of the correct *tafani*.

The Samoan population lives in large well-organized villages. Except for the doing away with some of the highest ranks, corresponding to that of petty kings and provocative of war in grasping at power, the introduction of a foreign culture has made little fundamental difference to the basis of Samoan society. The hereditary titles of high chiefs and talking chiefs are still conferred and supported by the family groups entitled to them. These are not inherited by primogeniture on the male line but are conferred by the group majority and hence lead to much political intrigue. The village *fa'alupenga* (order of rank prestige) is still jealously observed. Ancient customs connected with the drinking of kava, the distribution of food, the giving of fine mats, and much social ceremonial are still living factors in the life of the people and give pleasure and satisfaction. The pleasure derived from the exercise of native institutions is perhaps the most important factor that has led to the persistence of Samoan customs and helped them to resist the disintegration that has taken place in other parts of Polynesia. The Samoans are thus more conservative than other branches of their race and their satisfaction with themselves and their own institutions makes them less inclined to accept the changes that foreign governments consider would be of benefit to them. Their viewpoint is bounded by their own immediate horizon. This attitude of the mass of the people is expressed in the reply of a talking chief to myself after I had sketched the migrations of the Polynesians from the mainland of Asia to the remote isles of the Pacific. "We thank you for your address," he said. "The rest of the Polynesians may have come from Asia, but the Samoans—No. The Samoans originated in Samoa." The Samoans are self-contained. Strictly speaking, they require little in the way of clothing or food from foreign sources. So long as life is filled and satisfied by local conditions, they cannot be blamed for thinking that they are fit to govern

Carrying straps (*faufafa*). Women carry large bundles of leaves for the oven, sugar cane leaves, and other material strapped to the back by strips of bark. To carry on the back is *fafa*, and the burden *fafanga*. The bark of the *fau*, *fu'afu'a*, or the *fue* creeper are used for tying on the burden. These bark strips are termed *faufafa*. Pratt (23, p. 120) gives *faufili* as a cord used for tying on the burden. There may be a distinction to denote plaiting from *fili*, to plait. Another term, *avci*, is also used.

The bundle is first tied together. A single strip of the tying material is passed vertically over the back of the burden on one side. The long end of the strip passes over the shoulder on that side, then diagonally downwards across the chest, under the burden, vertically upwards at the back, over the shoulder, and diagonally across the chest to meet the other end to which it is tied in front.

FOODS

VARIETIES AND USE

There is so much detail in connection with foods that it is advisable to deal with each article separately. Foods divide naturally into flesh and vegetable foods.

Flesh foods consist of pork, fowl, certain wild birds, turtle, fish, crustaceans, and shellfish. Pork forms the most desired food, and on all festive and ceremonial occasions, it is regarded as essential. Fish, however, is the staple flesh food. In olden times the dog was eaten and, on occasion, man.

FLESH FOODS

Pigs (*pu'a*). Pigs are traditionally stated to have been stolen from Fiji, and were originally known as *so'oso'o*, a term still used in calling them to feed. They were kept in enclosures of fair extent bounded by walls of loose stones and pieces of lava. These enclosures (*pa pu'a*) were at the back of the village or some little distance away. The walls about 4 feet high were crossed in places with stones arranged to form steps, or by a tree trunk with steps cut out of the solid. The pigs were fed sometimes with mature coconuts cut open or other available fruit. Pigs form a source of wealth to a family enabling them to make a good showing at the various functions demanding pork. They are sometimes kept for fattening in small stalls made by crossing horizontal lengths of coconut tree timbers. These are situated at the back of the dwelling house to be near any food left over from the meals. In a well-disciplined community pigs are never allowed to run about the village.

Pigs are killed by strangling immediately before cooking them. They are never killed beforehand and allowed to hang. Climate and custom are against it. They are never stabbed as that would waste the blood. The Samoan attitude is, "Why catch the blood in wooden vessels when the interior of the

pig forms a vessel already." Strangling was executed by holding the pig down on its back, placing a carrying pole or other pole across its throat, and pressing it down on either side. The pig loses consciousness. It is probable that the pig would recover after pressure was removed if disemboweling and cooking did not follow in such rapid succession. The strangling takes place after the oven stones are well on the way to being heated. The pig is singed by rolling it on the hot stones. If the sea is close enough it is washed in salt water.

The lower abdominal wall (*alo*) is cut off, wrapped up in leaves, and sent to the taupou as her official portion. The pig is kept on its back to save the blood which has emptied into the abdominal cavity. The fat from the sides and over the intestines (great omentum) is stripped off, shredded into small pieces, and mixed with the blood in the abdominal cavity. The heart is removed, split, and wrapped up with some fat in a leaf package. All such packages are termed *ofu*. The heart *ofu* (*ofu fa'afale alo*) is for the high chief. The blood mixed with fat is ladeled up into receptacles of banana leaf which are wrapped neatly around the fluid contents. These *ofu* are termed *ofu valevale* to distinguish them from the package containing the heart. There are several of them. They are for distribution among the chiefs and young men who do the work. When cooked the blood coagulates like black puddings. I was at a loss to account for the white material in the cooked packages until informed of the shreds of great omentum. The liver is *mea fono* (for official use) to the talking chief. The intestines and the remainder of the internal organs go to the butchers and cooks. The gullet is removed through a slit in the throat and the removal of the rectum completes the cleaning.

By this time the oven is ready. With the *iofi* tongs, a hot stone is placed in the slit in the throat and another in the aperture left by the removal of the rectum. In a large pig a big stone is placed in the thorax and another in the abdominal cavity. Another may be pushed down into the pelvic cavity. The abdomen is then stuffed with 'o'a leaves for preference but others may be used. The leaves give the pork a flavor and are termed *lavai*. The method of stealing the first pigs from Fiji may now be understood. The taking of live pigs from Fiji was not allowed, but the Samoans returning home were allowed to take dead pigs as provisions. In the abdominal cavity of a large dead pig, small live pigs wrapped in leaves were used as *lavai*. This enabled them to evade the customs of the country.

Some 'o'a leaves are spread on the heated stones of the oven. The pig is placed on them with the abdomen downwards. The forelegs are bent back and the hind legs forward under the body. More 'o'a leaves are spread over the pig and then the usual covering of other leaves. The pig is always cooked whole no matter how large it is.

The cooked pigs are carried whole on poles to the guest house with the other food. In important functions they are heaped together to make a goodly show. In every community there are one or more expert carvers of pigs who delight to exhibit their dexterity. The distributing talking chief may himself carve; if not, he superintends operations. The portions into which the pig is divided have been set by usage. Each part has its name and the person or rank to which each part is allotted is also set by usage. The forequarters, legs, and head are removed and the body and neck divided according to *Fepulea'i* as shown in figure 72.

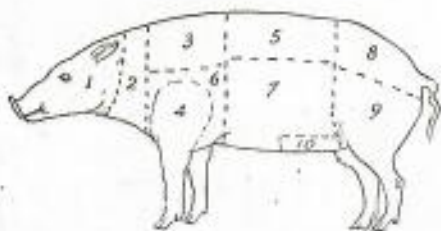


FIGURE 72.—Pig, ceremonial divisions: 1, *ulu* (head) to the *au manga* (young men who cook); 2, *ivi muli ulu* (neck) to the *tulafale* (talking chief); 3, *o'o* (back) to the *ali'i* (chiefs) of second grade; 4, *alanga lina* (shoulder) to the *tulafale* (talking chief); 5, *tuala* (loins) to the *ali'i* of the first grade; 6, *itu mea tele* (big side) to the *ali'i* of second grade; 7, *itu pale asu* to the family of chief; 8, *muli* to the women; 9, *alanga vae* (leg) to the *matai* (chief of lesser rank); 10, *alo* (abdominal wall) to the *taupou* (village maid).

The ceremonial division of the pig has become such an important social event that it has had an unexpected effect. The actual cooking of the pig has become a secondary matter. If the pig is too well done, the flesh is liable to tear away and the exact boundaries of the ceremonial divisions can not be maintained. This creates adverse criticism and comment on the part of those watching. Instead of an important spectacular success, the division becomes a failure. The failure reflects on the talking chief in charge. He in turn, vents his displeasure on the young men who overcooked the pig. This, by creating a fear of overcooking, has brought about an avoidance custom of undercooking the pig. The cooks often have an argument as to whether the pig is in danger of being overcooked. They may settle it by casting lots. A stick of any length is thrust down into the leaf coverings of the oven. Commencing from below the alternate hand grips are taken on the stick by the two sides. The one desiring the oven to be opened says, "Umu vela" (cooked oven) as he takes his grip. The other grips immediately above saying "Umu mata" (raw oven), and so on up the stick. The one who gets the upper end of the stick wins.

Often the pork is merely warmed through. When the guest receives his share in the guest house he is not compelled to eat it. His correct share has

been given to him which is the all important thing. He may eat a little in addition to the fowl and fish which has fallen to his portion. The remainder he sends home with the rest of his unconsumed portion. The pork is recooked in his home for his next meal. Guests also have it set aside for them, and it reappears at a later meal in a more palatable form.

The appearance of raw pork in feasts is often adversely criticized by people of another race and wrong deductions are made. The pork is not uncooked because the Samoans like raw pork, but because it is necessary to the proper carrying out of the ceremonial division. A failure in ceremony can not be remedied, but underdone pork can be recooked.

The official portions given to high chiefs and talking chiefs are often not meant to be eaten at the time. They are *mea fono* (for official use). Official positions have to be maintained. The ceremonial division has been partly devised to assist them in discharging social obligations. The official portions are recooked for the entertainment of guests and visitors at a later meal. The guests may be neighbors who drop in for a bowl of kava, in which event the chief falls back on his official reserve of pork, and by sharing it with others, not only avoids the stigma of selfishness, but acquires merit. It must be remembered that these portions are not a couple of slices or chops but whole joints. Here again the supposed disadvantages of underdone pork are discounted. The official cutting up of the pig may be compared to the cutting up of joints in a butcher's shop. It is for distribution primarily and not for immediate eating.

Sometimes pigs are cut up into small portions. At Fitiuta in Manua I saw this done with two pigs. Each man got five pieces that came from different parts. This ensured the even distribution of bone and the meat. This method is observed in Safune, Savaii, and has led to the method being termed *fa'asafune* (like Safune).

Fowl (*moa*). Fowls are grilled on the fire (*tumu*) or cooked in the oven (*tao*). For ordinary guests, the fowl forms an economical substitute for the pig. At feasts, they are provided in quantity. The cooked fowl is divided by tearing it apart with the hands. It is never cut. There is a ceremonial division. The only parts that count are the legs. In tearing the two apart, the coccygeal part that carried the tail feathers adheres to one of the legs. That particular leg is called *vae ma le muli*, or *vae ma le no'o*, and it is the correct part for the high chief or visiting chiefs. When Mr. Judd, Mr. Cartwright, and myself went on a journey (*malanga*) around Tutuila, we were served with legs at every village. We formed the idea that the more choice breast and wings were being selfishly kept back. Inquiry into the details of the food complex soon revealed the fact that from the Samoan viewpoint we could not be given anything else but legs. To have offered us the breast would have been lack of respect. The more one is apt to criticise the more interesting will be the in-

formation revealed if it is sought. On the other hand, much of the food ceremonial has been built up around the chiefs by the talking chiefs who superintended food division. When the legs had been torn off for the high chiefs, the talking chief had the rest of the fowl.

Pigeons, doves, tern, and other wild fowl were netted or snared. In any ceremonial division they were treated as fowl.

The turtle (*lauvai*). No opportunity occurred for a practical acquaintance with the turtle. Kramer (18, vol. 2, pp. 163, 164) describes the preparation for cooking by cutting through at the base of the neck and removing the intestines and rectum. The heart and other organs were removed through the same opening. The fat and blood were wrapped in leaf packages and cooked in the oven. The entrails were washed in the sea, cooked on the fire, and eaten by the cooks and the chief. In a large turtle, the leaf packages of organs, fat and blood, reached to 150 in number; in a small turtle to 50. Heated stones were placed inside the turtle and a *lavai* of leaves put in. The turtle was then cooked on its back in the oven.

The cooked turtle was taken to the guest house and divided up. The forequarters (*sanganua*), the hindquarters (*sangamuli*), the breast, and abdominal parts were removed. The stones were taken out and the fat cleared away to expose the juice (*suapeau*) within the cavity. The juice was dipped out in half coconut shells, and laid before the chiefs. The parts were then distributed as follows:

Ulu (head)—High chief.

Sanganua (forequarters)—Talking chief.

Sangamuli (hindquarters)—Village maid.

Tua (back)—Young men who did the work.

Fish (*i'a*). Fish abound within the lagoons and form the stand-by of flesh foods. The smaller fish, always cooked in leaf packages (*afi*) were placed unscaled and uncleaned on a banana or breadfruit leaf which was folded over them and perhaps tied with a strip of *fau* bark or husk fiber. Larger fish were placed on a piece of coconut leaf cut to the length of the fish. The leaflets were then brought round the fish from either side and crossed alternately over it as in the commencement of a check braid. This bundle was termed a *fa'alau'i'a*. In serving to guests, the packages were placed before them unopened but with any tying strip removed. The guest then had the pleasure of opening his lucky package and seeing what fortune had sent him. The cooked scales are simply pushed aside with the fingers. Entrails are not wasted.

Coconut cream (*pe'ape'e*) may be used by pouring some into the cupped banana leaf with the fish before wrapping it up. The leaf forms an impermeable cover. Cooking curdles the *pe'ape'e* into *fa'ai* and hence the preparation is termed *fa'ai i'a*.

Got
Kramer

Bonito ('*atu*). Of the larger fish, bonito and shark (*malie*) require special notice. The bonito of all fish is regarded as a chief's fish. A special canoe, rod, and hooks are devised for its capture, and there is much ceremonial connected with it. It is natural therefore that a set division and allocation has become established. The parts are shown in figure 73. The head (*idu*) is cut off in a vertical line that passes behind the attachment of the pectoral fin. Here again the chiefs were given important parts which they shared at a meal with guests. The bamboo knife used to cut up the bonito was called *manamate*.

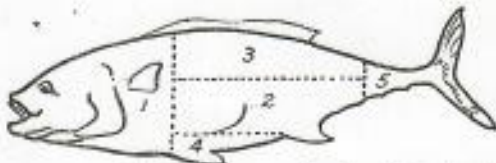


FIGURE 73.—Bonito ceremonial divisions: 1, *idu* (head) to the high chief; 2, *io alo* (sides) to the talking chief; 3, *io tua* (back) to the other chiefs; 4, *ma'alo* (belly) to be put aside; 5, *s'usi'u* (tail) to be discarded.

The bonito is a favorite fish for eating raw. At Falealupo in Savaii, while being welcomed to the village by the chiefs sitting cross-legged in the round guest house, a chief suddenly raised his head and interrupted the talking chief, who was exercising his function, by an exclamation, "*Atu!*" The official speech stopped and all present transferred their attention to the *tautai* (head fisherman) of the western end of the village who was approaching with a large bonito. A young man grasped a *laulau* platter from a *fata* shelf and laid it on the floor at the front of the house. The *tautai* laid the present for the guest on the platter amid a chorus of, "*Fa'afetai mo le fa'aaloalo*" from the assembly. The *tautai* went off and the platter was laid on the ground before me. The speech was no sooner resumed than the same chief again grunted, "*'Atu!*" The *tautai* of the eastern end of the village appeared and another bonito was laid on a waiting platter. This joined its fellow. After the speeches my talking chief, on my behalf, gave one of the bonito to the chiefs present.

The bonito is cut up into small pieces in a large wooden bowl with water in it. Nowadays the juice of limes is added. Portions are then served in half coconut shells. The shells are not specially prepared but are merely those discarded after grating the contents for *pe'ep'e* cream. The bowl is placed at the back of the house with the server sitting behind it as in the serving of kava. Attendants quickly place a *laulau* platter before each guest sitting against their respective wall posts. Another attendant comes around with a basket of cooked food and places a *talo* and breadfruit on each platter. Then a coconut vessel containing the cut-up raw bonito with some of the blood-stained water is given to each guest. If balance is precarious a few stones are

scooped out of the floor and the vessel set in the hollow. The floor mats to provide seating accommodation are around the walls only. The rest of the floor is bare. If, however, the floor is covered, mats are simply pulled aside to allow the hollows to be made. The fish is eaten with the *talo* and the liquid drunk. It is better than it looks.

The shark (*malie*). The flesh of the shark is much prized for eating. The ceremonial surrounding it has also led to set division and allocation of the parts. (See fig. 74.)

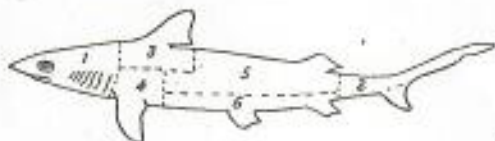


FIGURE 74.—Shark ceremonial divisions: 1, *ulu* (head) to the *taupou* (village maid); 2, *ʻu* (tail) to the high chief; 3, *nono* (dorsal fin part) to the talking chief; 4, *au* for official use; 5, *io* (body) for general distribution; 6, *lau alofa* (belly) for lesser chiefs and general distribution.

The head part includes the gills (*aulana*). The tail is cut off from behind the second dorsal fin. The *nono* has its posterior boundary behind the first dorsal fin from which the portion receives its name of *nono*. The lower boundary is at the junction of the pectoral fin. The *io* takes in most of the body. It is split down the middle and each half divided into four parts. The internal parts are divided into the stomach, intestines, and liver. The stomach (*tanga*) and the intestines (*silo*) are regarded as the best parts of the fish. They are shared by the talking chief and the head fisherman, the former exercising the preference. The liver (*ate*) is divided up among the other shares.

When the canoes come in with a good catch the crew shout and wave their paddles to advertise the fact. The villagers gather, the chiefs taking kava root with them. Leone in Tutuila is divided into seven parts. The canoes take their catch to their own part of the village. After viewing the catch, reasonable time is allowed the head fisherman to get cleaned up. The chiefs then go to his house, take up their positions, and present the kava root they have brought with them. As a bowl of kava is being prepared speeches expressing thanks for the good fortune that had attended the fishing are made. The head fisherman sitting at the back of the house replies. If strangers are in the village, they attend and also make speeches. The kava is drunk.

The talking chief now takes charge of the cutting up. The visitors are first advised to wait, generally in another house. The *lau alofa* is generally cooked at once by the young men (*aumanga*) for a general meal. The chiefs while away the time of waiting in the house by plaiting sennit braid, by conversation, and perhaps another bowl of kava. The allocated official parts

together with portions for the waiters, are taken away to their houses. The head, tail, dorsal fin portion, and *au* are ceremonial shares, not eaten privately, but cooked and brought out at a later meal to which others are invited. Instead of a set meal they can be used at a ceremonial kava drinking with *talo* for supper. As in the allocations of pork they help the chiefs to maintain their position and also the prestige of the village. Where there is no *taupou* in a village or division of a village, the official share of the head goes to the *aumanga*.

The *laualofo* and perhaps part of the *io* having been cooked, a general meal is partaken of. In this the chiefs share even after shares have been allotted to them. Thus, the body and belly of the fish are for immediate and general use; the other parts for deferred and official use.

Another custom prevails in connection with official shares. Chiefs from neighboring villages, hearing of a catch, may send in and ask the chiefs of their corresponding grades for their official shares. Thus high chief sends to high chief, talking chief to talking chief, and *taupou* to *taupou*. This can be done even if visitors from the particular village have been present and have received a share. Such requests may not be denied. The only legitimate excuse is that the shares have already been eaten or given away. This custom shows how official or public the shares allocated to chiefs are and what an important part they play in social organization. The part the talking chiefs play in framing the rules is seen in the allocation of shares. The high chief receives the worst part of the fish in the tail, whereas the dorsal fin portion that falls to the talking chief is the best. Though the talking chief subsequently shares his portion, he has the satisfaction of demonstrating that in some things he exercises more *pule* (power) than his superior. These diplomatic workings of the Samoan mind are fully recognized and retailed by the Samoans themselves.

The fresh water eel (*tuna*). The tail part goes to the chief.

The squid (*fe'e*) is a delicacy eagerly sought after by women at low tide with sticks for poking them out of holes in the reef, and at high tide by men using squid lures from canoes.

The proper method of cooking is termed *fai'ai fe'e*. The dark liquid contained in the squid (*tafama*) is expressed and mixed with coconut cream. The tentacles are cut into short pieces and together with the cream mixture are wrapped up in banana leaf packages and cooked in the oven. Sometimes *talo* leaves are included in the package.

Crab (*pa'a*) may be cooked plain or with coconut cream in a package to form *fai'ai pa'a*.

Dogs (*maile* and *uli*). Pratt (23, p. 62) gives the form *uli*, but there is little doubt that it should be *'uli* as *kuri* is the Maori and Rarotongan word for dog. Stair's contention (33, p. 187) that the word is derived from *u*, to bite

and *li*, to show the teeth, does not seem to fit the case. He states that the native dogs were a small breed with sharp pointed ears, but he saw only one wild one in the distance. Judd (17, p. 16) draws attention to the dogs seen in *Tau*, which has been fairly isolated as regards the introduction of animals by later foreign residents. He says the dog has a queer yap, slender legs, long body, pointed nose, and bat ears. They were also fed on coconuts and it seems possible that they are descendants of the Polynesian dog. Samoans of the present day are loath to admit anything that may render them subject to criticism of a disparaging kind, though why the eating of dog's flesh should be considered a disgrace to a people with a limited supply of flesh food is more than a rational person can understand. However, Stair (33, p. 187) states: "Dogs were formerly eaten by the Samoans, as at other islands: of late years, however, the practice has been discontinued."

Man. The remarks about dogs apply with greater force to human beings as a source of food. Practically all branches of the Polynesians except the Maori, Cook Islanders, and Marquesans, deny that their ancestors ate human flesh. The virtue claimed has been somewhat due to the condemnation of the practice by foreign teachers who came from countries abounding in beef, mutton, and other flesh foods. Their ancestors had no lack of different kinds of flesh foods to give them variety in their diet. It is, perhaps, natural for those who never felt the physiological need, to condemn a practice without considering it from a purely dietetic point of view. The acceptance of modern ideas beclouds the issue and leads to the forgetting of things now regarded with disfavor. While the Samoans did not replenish their larder with human flesh as a general custom, their traditional narratives contain individual instances of anthropophagy. One of the *Malietao* was supplied with human victims regularly, until a shock made him give up the practice. The shock was due to his own son having taken the place of a living victim in a coconut leaf bundle that was delivered before him and opened up in his presence. The custom of a lesser chief saving his life by making abject apology and submission by being tied up in coconut leaves, carried on a pole and deposited before his more powerful neighbor as food goes back to a period when the eating of human flesh prevailed more than in later years. It was also the custom to take the wood and stones for the oven along with the individual making submission. The tendency now is to treat the custom as a metaphorical abasement in which the person likens himself to a pig, but more probably it had a literal significance.

VEGETABLE FOODS

Vegetable foods form the larger part of the diet. Except for coconut, breadfruit, and banana, they consist of root crops in the form of *talo*, yam, and to a smaller extent, *umala*. Of these the *talo* is by far the most im-

The stone nail figured by Kramer (18, vol. 2, p. 204) as a *fao* is unique and no information could be obtained regarding such objects.

SUMMARY

Samoaan stonework is characterized by negatives. In stone structures, cut stone was not used. The stone posts of the *Fale-o-le-Fe'e*, often quoted as having been cut by human agency, are natural basaltic prisms. The outstanding religious stone structures of eastern Polynesia and Hawaii find no counterpart in Samoa. The Tahitian term of *marae* for such structures exists in the Samoan form of *malae* but the term is applied to an open space in a village where public meetings are held. The Samoan *malae* has the same meaning as the Maori *marae* but though both areas have retained the social significance of the term, the special stone structure associated with it in Tahiti is absent both in Samoa and New Zealand. Samoan religious houses were built on raised stone platforms but both house and platform were directly connected with the technique of dwelling houses and the stone platform underwent no specialization for religious purposes. With the absence of the specialized religious structure in stone is associated the absence of stone images either large or small.

Among the necessary implements, tanged adzes as a form of purposive technique are entirely absent. The most common type of adz are quadrangular with the widest surface at the back. The commonest types are marked by a minimum of grinding, but full grinding on all surfaces except the poll is present in many of the smaller adzes and the less common types. Triangular adzes are characterized by the widest surface forming the back while the reverse is exceedingly rare. In spite of the cruder appearance of the adzes, good work was accomplished with them as evidenced by the technique of the arches of the guest houses and the flanged plank canoes. The aesthetic sense of the Samoan craftsmen did not express itself in stone but sought some other medium. Similarly the pounding of food and other material was performed with natural objects and stone pounders and pestles did not enter into Samoan domestic economy.

CANOES

The Samoans enumerated seven types of canoes differing in size and varying in construction. The different types may be grouped into two main divisions; the dugout, and the plank canoe. Both divisions have a single survivor that remains in active use. The differences between types are connected with size, involving the number of outrigger booms and whether the canoe was used for sailing in addition to paddling. Sailing involves the addition of supports for the sail, bow and stern covers, and a projecting balancing boom on the side opposite the outrigger.

DUGOUT CANOES

1. Paopao. The smallest dugout, with two outrigger booms, propelled by paddling.
2. Soutau. A medium dugout, with three outrigger booms, propelled by paddling.
3. 'Iatolima. The largest of the dugouts, with five outrigger booms, topsides, bow and stern covers, and sail.

PLANK CANOES

4. Va'a alo. The bonito boat made of lashed planks, with two outrigger booms connected with float, propelled by paddling.
5. Amatasi. A plank canoe larger than the bonito boat, with two outrigger booms connected with the float, a platform over the booms, balancing spars on the right, and a mast for sailing.
6. Taumualua. A wide plank canoe without outrigger, modelled originally on whaleboat lines, idea foreign but technique native.
7. 'Alia. The double voyaging canoe made of planks and consisting of two canoes lashed together.

All have top sides and bow and stern covers.

Outriggers are always on the left side. They consist of a float, cross booms, connecting pegs, and a connecting lashing. The float (*ama*) is a large spar of light wood set parallel with the canoe at a little distance and floats on the surface of the water to give the narrow canoe a wider support on the water. The outrigger booms (*'iato*) are lashed to both gunwales or upper edges of the sides of the canoe and project out to the left over the float. Being straight they are connected with the float by an indirect attachment of connecting pegs (*tu'itu'i*) and a lashing of braid (*li*) which extend between booms and float.

The *'alia* voyaging canoe disappeared as foreign transport afforded an easier way of getting to the various islands in the group. Its disappearance was hurried by the coming in of the *taumualua* as far back as 1849, though the *'alia* survived for some time after that. The *taumualua* was created from a foreign model and made wide enough with sennit-sewn planks to dispense with the outrigger float. It was much used in military operations to convey armed troops, and its sides could be barricaded to protect it from gun fire from the shore. It was paddled after the Samoan fashion with the paddlers facing the bow and propelling it like an ordinary canoe. As inter-district wars died down, the *taumualua* in turn gave way before the *fautasi*, a boat built purely for transport in the form of a large whaleboat with planks nailed together and rowed with oars resting in rowlocks. The *fautasi* in turn are rotting in their boat sheds, as the desire for speed and less labor has reached

the Samoan and he prefers to travel by the interisland steamers and motor boats that are now becoming more and more available. The *fautasi* are also community boats which require large crews. They are unsuited to the needs of the few. Governments have also extinguished any flickering remains of the Polynesian voyaging spirit by prohibiting travelling in boats between distant islands owing to the danger. In this way, the descendants of one seafaring race is protecting the descendants of another from the element that made their ancestors famous.

The *'iatolima* and *amatasi* are no longer seen but an odd *sootau* still survives as an interesting relic of the past. The Samoans have reduced the canoe building craft to a minimum. Only such craft as have a material advantage which cannot be otherwise supplied are made. The types still made have therefore dwindled down to two, the *va'a alo* (bonito boat) and the *paopao* (dugout). The bonito still swims in Samoan waters and no easier method of securing them has been devised than the pearl shell hook trolled in the wake of a fast-paddled plank canoe. Even now change is taking place for more and more bonito canoes are being made of dugouts. It only remains for a cheap kind of oil engine to be put on the Samoan native market and the lingering type of plank canoe may join its contemporaries. The *paopao* is a necessity which cannot be discarded. So long as the people obtain an important part of their food supply from the lagoon, so long must every family have some kind of vessel to assist in obtaining it. The *paopao* is light, easy to manage, and not expensive in building. The complex of the hollowed log, the outrigger float, and the direct paddle is so ingrained in the methods of the people that the *paopao* is assured of existence for many years to come.

THE SMALL DUGOUT CANOE

The *paopao* dugout is in active general use throughout the group for fishing or transport inside the reef and is an indispensable part of every male adult's equipment in life. In fine weather, they are used in *alafanga* fishing with the *paala* hook trolled from a line outside the reef. (See Pl. XXXVIII, A.)

The timber for the hull is *papaongo*, *pipi*, *fau*, *'ulu*, *tamanu*, and *mosooi*. A tree with a trunk of suitable size is selected in the forest, cut down and roughly shaped to lessen the weight. The stern end is invariably shaped to a knob with a constricted neck. Around the neck, a rope is tied with which to haul it to the village. While at Tau, a roughly shaped hull of *tamanu* was floated round from the village of Amouli, a few miles away. Two men accompanied it, without a canoe, but simply swimming beside it and propelling it in that manner outside the reef. Opposite the channel at Tau, one of them swam in with the end of the rope which was tied to the constricted neck described. The villagers went down and assisted in hauling it in by the rope

THE MEDIUM DUGOUT CANOE

The *soatau* is hollowed out of a longer section of tree trunk than the *paopao*, and is provided with a longer float and an extra outrigger boom. Topsides, bow and stern covers are not added. The general lines of the bow are similar to the *paopao* but the stern is wider and cut square across without the hauling knob characteristic of the *paopao*. A full sized *paopao* figured by Kramer (18, vol. 2, p. 246) features the square stern and also the divergence of the connecting pegs towards the float. (See fig. 222.)



FIGURE 222.—*Soatau* dugout canoe, stern end: 1, square stern, no hauling knob; 2, aft boom; 3, two pairs connecting pegs, widely divergent lower ends, upper ends crossed over boom; 4, longitudinal pole lashed to booms to inner side of connecting peg lashings (after Kramer).

A model in Bishop Museum (Pl. XXXVIII, B), shows a more sloping stern but the divergence of the lower ends of the connecting pegs is present. The connecting pegs are in two pairs but their lower ends are more widely apart in the long axis of the float than they are in the *paopao*. The upper edges of the sides are provided with inner flanges under which the lashings of the straight booms pass. The float is cut off square close behind the aft connecting pegs, while the fore end reaches the level of the bow. Longitudinal poles are attached to the outer ends of the booms close to the lashings of the connecting pegs. A complimentary lashing to the connecting pegs was also used. The only *soatau* seen was at Upolu.

THE LARGE DUGOUT CANOE

The *'iatolima* (*'iato*, outrigger boom; *lima*, five) receives its distinctive name from having five outrigger booms. It is an advance on the *soatau* in size with additional booms and being sailed, it usually has additional depth provided by topsides and protection from an inrush of water by bow and stern covers. A *suati* balancing spar also projected from the right side of the canoe.

No *'iatolima* was seen, but Kramer (18, vol. 2, p. 248) figures a model of a *soatau* which is rigged as a *'iatolima*, including the sail. The hull is undoubtedly a *soatau* dugout with finer lines at the bow and stern. The upper edges have wide inner flanges and there are no topsides, or bow or stern covers which my informants stated were characteristic of the *'iatolima*. On the other hand, there are five outrigger booms; a forward pair, a middle pair, and an aft single. Each boom has its own set of two pairs of connecting

pegs not diverged below so much as in the *soatau*. The float is cut off short behind the aft connecting peg. Two longitudinal poles are lashed to the booms above the connecting peg lashings. The *suati* balancing spar is present. The characteristic features of the rig of the *'iatolina* may be followed out in figure 223, taken from Kramer.

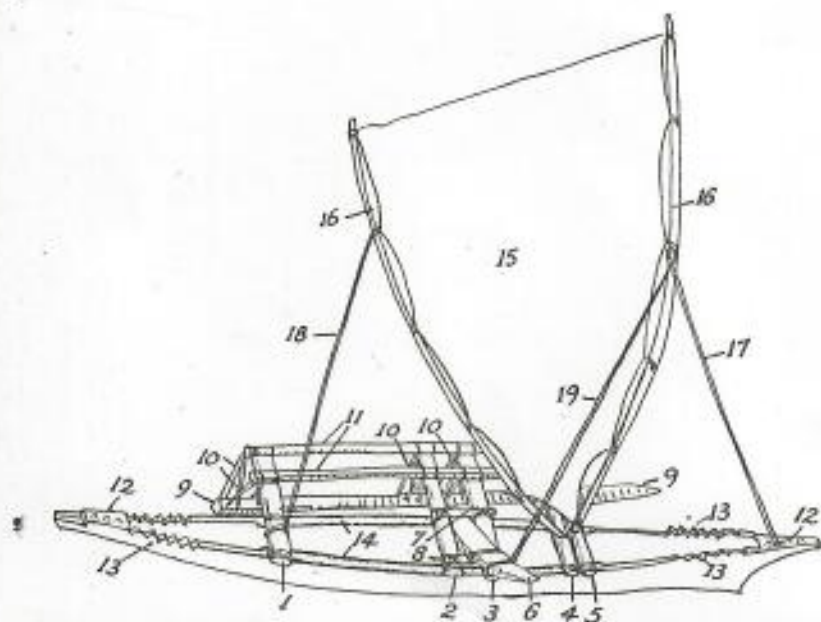


FIGURE 223.—Five-boom, *'iatolina* dugout: 1, aft single boom; 2, 3, middle pair of booms spaced sufficiently to allow balancing spar to be placed between; 4, 5, forward pair of booms close together; 6, *suati* balancing spar with inner end passing under cross piece (7) and above a second cross piece (8); 9, float; 10, connecting pegs in pairs; 11, two longitudinal poles; 12, knob ornamentation; 13, serrated edge ornamentation; 14, wide inner flange of upper edges; 15, sail; 16, spars supporting sail; 17, fore stay from fore spar to bow; 18, aft stay from aft spar to aft boom; 19, right side stay from fore spar to balancing spar; stay on other side to one of the outrigger booms concealed by sail.

*The significance of the five booms can now be followed. Three booms would have been quite enough if the canoe had been propelled by paddles alone, but the use of a sail necessitated special provision for a balancing spar and the support of the sail spars. The balancing spar was provided for by placing two booms close together in the middle with enough space for the spar between them. A cross piece was lashed above the booms over the left edge of the canoe and another similar cross piece was lashed above the right edge of the canoe. The inner end of the spar was placed under the left cross piece and as it projected out over the right side it rested on the second cross piece to which it was lashed. The forward pair of booms were placed closed together to give support to the lower ends of the spars supporting the sail.

The triangular sail, with the apex down, was lashed on two sides to fore and aft spars the former of which was kept vertical by three rope stays; one to the solid bow piece, one on the right to the balancing spar, and one on the left to one of the projecting outrigger booms. The aft sail spar was stayed to the single aft boom and could be manipulated as required. In sailing with the wind on the right, any heeling over that would submerge the float to the verge of capsizing the craft was remedied by putting weight on the balancing spar. With the wind from the left any heeling over that brought the outrigger float too much out of the water was met by leaning out on the outrigger booms.

The *'iatolima* has the distinction of being the only dugout that was sailed and it received its name from the special technique of providing five booms to enable a *soatau* hull to be sailed. The provision of topsides, and bow and stern covers are improvements to a craft that sails out beyond the reef.

Before passing on to plank canoes, it may be stated that dugout bonito canoes are now being made quite extensively in Savaii. The hull is hollowed out of a single log but the lines and finish follow those of the plank canoe.

PLANK CANOES

THE BONITO PLANK CANOE

The bonito canoe (*va'a alo*) was built for speed so as to keep up with the schools of fish being pursued by the bonito. To obtain speed, the hull had to be made as light as possible. The size of the canoe was no problem as trees larger than the canoe were readily obtainable and were used in the *soatau* and *'iatolima* types. To get the hull thin enough, it was easier to control the thinness of the material by dubbing out short sections of planks than by excavating the whole hull in one piece. Of later years, better control over a one-piece hull has been obtained with the sharper steel adzes, and has led to the manufacture of dugout bonito canoes. Before the advent of steel adzes, however, the technique of the plank bonito canoe had become established and many craftsmen despise the dugout bonito canoe as not being true to type. The manufacture of the plank canoe came within the field of the guild of expert carpenters. The canoe is made in the old style except for the use of steel adzes.

Besides timbers and adzes, a good supply of sennit braid is needed for the lashings. The braid is made up into working hanks which in canoe building are distinguished by the term *tanganga* instead of being called *i'o fanga* as in house building. A length of braid is used for measuring. For marking the wood, a piece of charcoal, or some chacoal mixed with water in a half coconut shell with a piece of coconut leaflet midrib, are needed. For fitting the planks, red earth is mixed in another half coconut shell and a section of coconut husk (*pulu*) is used as a brush. A coconut leaf to supply leaflet midribs to serve as needles, and some bits of wood to form wedges are also on hand. Holes are

now bored with a bit and brace but in olden times, the *foufoa* (*Terebra*) shell with its spiral whorls running to a point was used as a drill or gimlet.

The canoe hull was built in a canoe shed (*afolau*) or in an unoccupied dwelling house.

The hull. The plank hull consists of separate sections of which the keel, bow piece and stern piece are single elements sharing in the construction of both sides. The other separate pieces of plank (*laufono* or *lauva'a*) are arranged in two tiers (*taloo*) of which the lowest, consisting usually of five pieces, is termed the *laudalo* (bottom tier), and the upper the *laulua* (second tier). The vertical or oblique joins between individual pieces are termed *tautu* while the horizontal joins between tiers is distinguished as *aufono*. The arrangement of pieces in the hull is shown in figure 224.

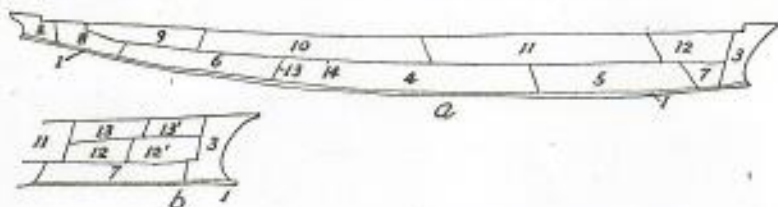


FIGURE 224.—Bonito canoe (*va'a alo*) plank sections: a, plank sections of one complete side: 1, keel (*ta'ele*); 2, stern piece (*taumuli*); 3, bow piece (*pale*); 4, 5, 6, 7, 8, form the lower tier (*laudalo*)—4, *tumatua* middle piece with wider lower edge and ends running obliquely upwards and inwards; 5, and 6, *tatao o le tumatua*, they press (*tatao*) against the *tumatua* on either side; 7, *angai o le pale* (companion of the bowpiece); 8, *angai o le taumuli* (companion of the stern piece); 9, 10, 11, and 12, four pieces forming the second *laulua* tier, without specific names; 13, a join between sections (*tautu*); 14, a join between tiers (*aufono*); b, section of smaller pieces which corresponds to the usual section (12 in a) is made up of smaller sections (12, 12', and 13, 13').

The five sections of the lower tier have been given individual names by the carpenters as they have to be very carefully shaped and fitted to form the foundation lines of the canoe and are often referred to during work. The four sections of the upper tier have no individual names but are referred to as *ola o le laulua* (sections of the second tier).

A flaw in an otherwise good piece of timber was met by cutting out the flaw and putting in a patch rather than to waste material. Such patches (*fa'asosolo*) are often seen in perfectly good canoes and their presence does not depreciate the value of the canoe. Canoe builders were masters of shaping, fitting, and lashing, and though they had a general rule as to the number of sections to be used in each tier, they had no hesitation in altering details to make the available material suit their purpose.

The keel. After assembling the material, work commenced with shaping and setting up the keel (*ta'ele*). Bonito plank canoes were seen in various stages of construction throughout the group but the actual setting up of a keel

was seen in Leone. The master builder remarked that I had come to the right place as the knowledge of building bonito canoes had been derived from Uamea and Pœausi, both builders and head fishermen of Leone.

The keel is made in one piece of *ifilele* or *talie* wood and may be simple or compound in form.

The simple keel in the Tau canoe (Pl. XXXVIII, C) is 23 feet 5 inches in length and ranges in width from 1.3 inches near the pointed ends to 4.5 inches in the middle, while the greatest depth is 2.5 inches. The greatest width is that of the convex under surface which is exposed throughout its length. At either end, the keel is triangular in section, the two inclined sides meeting in a median ridge. As the keel widens out, a grooved upper surface is dubbed out in such a way as to provide flanges for the lashing technique. For details see figure 225.

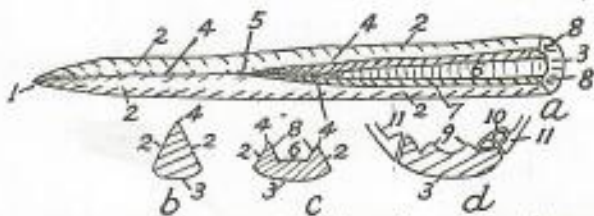


FIGURE 225.—Bonito canoe with simple keel, 23 feet 5 inches long: a, stern end of keel from above; 1, pointed end; 2, sides inclined to meet in upper median ridge (4), lower convex surface seen in end section (3), the solid triangular part is 5 inches long at the bow, and 12 inches at the stern; 5, point 12 inches from stern point (1) where, owing to the widening of the keel, the median upper ridge opens out gradually into the upper surface (6). The sides (2) and the curved bottom (3) continue in their relative positions. The upper surface is dubbed out to a lower level than the upper edges of the sides to form flanges. b, Section of solid triangular part near ends, showing lower convex surface (3) which forms the exposed part of the keel, the two inclined sides (2) which fit against the stern piece, and the upper median ridge (4). The width of the solid part is 1.3 inches. c, Cross sections of keel in middle. The keel has widened out to 4.5 inches, the wider convex bottom (3) and the sides (2) occupy the same relative position, the sections of the lower tier will fit against the sides, the upper surface (6) has widened out to 2.3 inches and is at a lower level than the upper edges (4) of the sides. From the upper edges of the sides, the keel is cut downwards and inwards on the inner sides to meet the upper surface and thus forms flanges (8) which will subsequently be pierced with holes to take the lashing of the sections to the keel. d, Section of keel through two raised ridges (9) to inner side of lashing flanges, to protect lashings (10) which pass through keel flanges and flanges of side pieces (11).

In some canoes two raised longitudinal ridges are left on the upper surface close to the inner side of the lashing flanges. (See fig. 225, d.) They are situated in front of where the aft boom will cross and are called *tali tata* (*tali* to receive; *tata*, bailer). The ridges are long and protect the lashings as the bailer is scooped along the bottom.

The compound keel has the complete stern piece cut out of the solid with the keel, and also raised portions at the bow end (fig. 226). This form of

districts. What was used in one district might not be used in another, simply because of the varying quantity in the distribution of plants, as well as the varying distribution itself.

Repairs. When damage occurred to a plank resulting in loss of material, the whole plank had to be removed and a new one of the same size made, with flanges at all edges for joining. Patches could be put in before the sections were thinned down, as the thick material allowed flanges to be made at any shaped edge. Similarly, cracks could be repaired by the flange method, if the cracks occurred before the timber was thinned. Cracks in finished canoes could not be repaired by the flange method so alternative methods were adopted, as shown in figure 247.

Two-rod fishing. In Savaii, a short rod (*matila*) is sometimes carried in addition to the full length rod. The rod post is wider and has a lower groove on the right for the short rod. At the back of the steering seat there are also two semit loops (*futia*), the right one again being for the end of the *matila*. The forward high-forked rest on the fore boom has two forks; the right one being for the short rod.

THE THREE BOOM PLANK CANOE

The *amatasi* was described to me by an old man in Manua, who had seen one, as a plank canoe made like a bonito boat but larger and with three outrigger booms. A platform was built across the booms and the canoe was sailed with a triangular sail. The mast was stepped to a raised rim on the bottom of the hold and lashed to the middle boom. The triangular sail had a spar along each of the long sides. The apex of the sail was held back to the stern and on a tack, the apex was swung around to the bow. A boom (*suati*) projected on the right side. This he remembered and also the phrase "*Tatao le suati*" (Press down the *suati*), which was used when the canoe heeled over on the outrigger side.

The *amatasi* was very fast and was used in catching *masimasi* (dolphin) which were trolled for with a baited hook. Kramer (18, vol. 2, p. 268) figures an *amatasi* model, the main features of which are shown in figure 248. Another of Kramer's models (p. 269) shows a triangular mat sail with light spars along each side and the apex turned to the stern. The mast, however, is attached apparently to a kind of middle boom, but does not pass down to the hold. The outrigger booms appear well above the gunwales and the model does not appear a satisfactory one as regards the booms and the details connected with it. A noticeable thing is the backward projection of the float.

Wilkes (42, vol. 2, p. 150) who did not see any double canoes, states that the longest canoes were 30 to 60 feet in length and built of planks with the typical flanged edges. They had a deck fore and aft and could carry 10 to 12

people. The fore deck was decorated down the middle line with large white *Ovula* (marine shells) attached to a row of pegs. This part formed the seat of honor upon which the Samoan chief easily sat with safety, but one of Wilkes' gentlemen had a very precarious time in keeping on it. The song sung to him was "Lelei tusa lava le tau mua" (Good above all is the part before).

"Having both a prow and stern, these canoes cannot be manoeuvred without tacking; consequently the outrigger that constitutes their safety is, in using their sail, alternately to leeward and windward, and does not, when to leeward, add much to the stability of the canoe. They carry less sail than the canoes of the other natives of Polynesia, and to guard against the danger of upsetting, the natives rig a sprit or boom (*suati*), projecting from the opposite side to that on which the outrigger is fitted. The boom is secured with guys to the top of the mast. When the wind blows fresh, some of the men go out upon it and thus balance or counteract the force of the wind. Those on the other side of the canoe are kept ready to go out on the outrigger when that becomes necessary. The sail is made of mat, of a triangular shape, with its apex below; some of these are ten feet high."

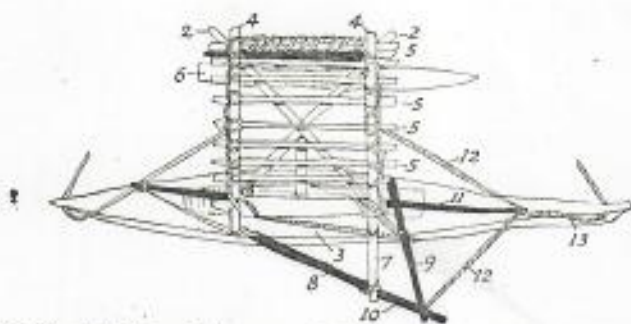


FIGURE 248.—*Amatasi* plank canoe (after Kramer). Short middle boom with 2 diagonal pieces of timber (2) crossing diagonally from the hull (3) to outer ends of the 2 outrigger booms (4). Above the crossed diagonals and below the outrigger booms, a number of spaced planks (5) form a platform which reaches to the outer ends of the booms. The float (6) is cut off square behind the attachments to the aft boom, but it does not project far forwards. The spar (7) is evidently lashed to the fore boom. A spar (8) is run out from the hull near the aft boom and lashed to the outer end of the spar (7) while another spar (9) also runs out to it. The part (10) is the *suati* (balancing spar). The spar (11) for the sail is shown down with the side stays (12) and a forward stay (13) attached to its end.

From the Wilkes' description, the canoes referred to were *amatasi*. As all canoes except the recent *taumua* and the *'alia* had one float (*amatasi*), it seems likely that the use of the name *amatasi* for this type was to distinguish a larger plank sailing canoe from the double canoe.

—THE BOAT CANOE

The *taumua* was so called because it had two bow-shaped ends (*taumua* bow and *lua*, two). None are to be seen in Samoa at the present time. They were described to me as a long, wide canoe made of planks with raised flange

edges lashed together like the 'alia and the bonito canoe. They had raised projections at the bow and stern which were ornamented with *pule* shells. The outstanding feature was that they had no outriggers but were sailed as boats. They were propelled with paddles, the crew facing the bow and using the paddles in the same way as in other types of canoe. They were much used in the Samoan fighting of the last century, when barricades were erected along the sides for protection against the firearms which had come into use.

Smith (32, p. 158), who saw them, gives the following particulars of one:

The length was 60 to 70 feet and the width 7 to 8 feet. The planks were 7 or 8 feet long, 0.5 inch thick and sewn together like the 'alia double canoe. The depth of the hold was about 3 feet and there were ribs 4 feet apart. It was decked fore and aft for 8 feet. The seats for the paddlers were 3 inches below the gunwale. The bow and stern pieces were of *malili* wood and the hull of *ifi tele*, or *fatau*. A triangular sail was used with the apex down. The mast rested on top of thwarts, where it was kept in position by stays. The steering paddle was 14 feet long with a 12-inch-wide blade.

Kramer (18, vol. 2, pp. 266, 267) figures a *taumualua* in the water, and two models. In all, the upward projections at bow and stern are present but have no bearing on ancient technique, as they are only present in the *taumualua*. The curved ribs extending from gunwale to gunwale across the bottom are distinct pieces of wood lashed to projections or flanges on the inner surface of the side planks. A horizontal piece on either side is lashed to the ribs and in turn supports the thwarts. One of the models shows the mast stepped to a longitudinal board attached in the middle line to two cross booms which rest on the gunwales. The mast is stayed with ropes. The triangular sail has the apex forward over the bow cover, while one side runs parallel with the lines of the gunwales, and the base is directed astern.

The whole technique is apparently native and surprising as a departure from the use of the outrigger. My Samoan informants in various parts of the group always enumerated the *taumualua* among the types of Samoan canoe and stoutly maintained that the canoe was not due to foreign white influence. Their proof was the native technique in building and the use of paddles. They failed to see my difficulty in accepting their claims to having invented a vessel without an outrigger. Only one old man said that the *taumualua* was not very ancient but must have come in about the same time as the missionaries. However, he, too, maintained that it was native to Samoa in that the Samoans made it. The claims of the present-day Samoan to the invention of the *taumualua* is an excellent example of the intentional fallacy of human memory. It gave them great satisfaction to think that they had a distinct type of canoe that others did not have.

However, Samuel Ella (11, a, p. 247) states that the *taumualua* was introduced into Samoa in 1849 owing to an incident in the Samoa "war of 1848-1851." Owing to damage to the property of British subjects, Captain Worth

of H.M.S. "Calypso" inflicted a heavy fine on Malietoa and his adherents, who were settled in a fortified position at Mulinu Promontory near Apia in Upolu. He blockaded them with a long boat manned by a few marines. The opposing people of Aana and Atua were so interested in the success with which a vessel of the long-boat type could keep Malietoa's army blockaded that they desired a similar type of canoe. Mr. Eli Jennings, an American citizen living in the district, built for them two boats 50 feet in length on the model of a whale boat. Planks were fastened across the thwarts and bulwarks of bamboo raised. Fore and aft figureheads were erected and decorated with white shells. After obtaining these models by diffusion, they learned to make them themselves to a length of 50 or 60 feet and more. Hence the origin of the *taumua*, which is interesting in the subsequent adaptation of Samoan technique to supply the lack of nails and sawn timber in carrying out a foreign idea.

THE DOUBLE CANOE

Stair (33, p. 152) states that the original Samoan double canoe, termed *va'a tele* (large canoe) was much larger than the more recently used one which has supplanted it. Two canoes, one much larger than the other, were lashed with crossbars amidship. A thatched shed or cabin was built on a stage projecting over the stern instead of amidship as in the Tongan type. They were much larger but more difficult to handle and could carry two bonito boats on deck if required.

The double canoe used in Stair's time, he states, is not original Samoan but an adaptation of the Tongan double canoe. This is the *'alia* and evidently warrants as little description as the *taumua*. The canoe hulls were made of planks fitted together as in the true Samoan plank canoes.

The last full-sized canoe rotted away recently at Mulinu near Apia owing to the deplorable lack of interest of those who might have preserved it for study by sending it to a museum. A model in Bishop Museum (Plate XL, A) serves to illustrate the general principles of construction and throws light on such important points as the technique of the deck, house, stepping of the mast, and arrangement of the sail. In the model both canoes are dugouts instead of being made of planks. The one on the right is larger and longer and has the deep Samoan bow and sloping stern. The smaller canoe on the left has the bow sloped in exactly the same lines as the stern and thus from size, shape, and position represents a large outrigger float. The fact that the canoe acting as a float is as high above the water as the main canoe does away with the need for intermediate connections between booms and float. Both canoes have front and stern covers. The raising of the woodwork to which the connecting cross booms (*'iato*) are attached and the provision of a deck are shown in figure 249.

Bailers. Bailers are called *tata* and to bail out a canoe is *tata* and *asu*. Wooden bailers are usually made of *fau*. The bailers seen consist of three kinds:

1. A half coconut shell is used in the *paopao* canoes.
2. The long narrow bailer without a handle (Pl. XI., C, 1) is used in the bonito canoes. It has a narrow front which accommodates itself to the narrow upper surface of the keel of the bonito canoe which may be still narrower owing to the *tali tata* projections.
3. The bailer of larger canoes (Pl. XI., C, 2) is the typical Polynesian sugar scoop form with a median handle projecting forward from the upper edge of the back.

Anchors. Pieces of discarded iron have displaced the stone anchors (*tauda*) used with *paopao*. Some of these had holes drilled through. A *fue* vine which lasts longer in the water was used as a rope.

Masts. The mast (*fana*) of the double canoe has been described. It is called *fana* while the word *tila* is used for the spars of sails. Pratt mentions (23, p. 319) that *tila* is now being used for mast. In eastern Polynesian the word *tira* is used for the mast.

CUSTOMS AND USAGE

There is nothing to be added to what has been said about the making of the smaller dugout canoes. They were common and did not enter into the ceremonial which surrounds expert craftsmanship. The plank canoes which involved the laying of keels and expert shaping came within the sphere of the Sa Tangaloo, the builders' guild. The builders built canoes as well as houses. In the mythical tales of the early meetings of the guild, with Tangaloo himself presiding, one of the subjects that came up for discussion was whether sennit braid (*'afa*) should be used first on a canoe or a house. It was decided in favor of the house and sennit braid was thus used on houses before the canoes. As the houses were the better type of house made by the Sa Tangaloo we may take it that the canoes were also the better types. The story would seem to indicate that the higher development of the house preceded the making of plank canoes. Cook houses, ordinary dwelling houses, and the simpler dugout canoes were beneath the notice of the Sa Tangaloo and would not, therefore, come up for discussion. The lashing of canoes with sennit braid must go as far back in time as there were coconuts to provide fibre so the historical discussion must have dealt with a special use that involved quantity and method such as is explained by the lashing of planks, and not the ordinary lashing of outrigger booms alone to ordinary dugouts.

The person desiring a better class of canoe had to approach a master builder with all the ceremonial preliminaries observed in house building. The canoe and the house were on the same level. The chief, therefore, mobilized his family and his resources beforehand. He planted food crops and collected fine mats for he had to feed and pay the master builder and his associates. Everything being ready, he approached the desired builder with a fine mat and over the ceremonial bowl of kava made his request and proffered his mat. The builder replied and if he accepted the mat, the contract was sealed. If he refused, the chief sought another expert with the rejected mat.

The builder on an appointed day arrived with his party, selected the timber and did the preliminary shaping whilst the chief's family did the rough work in transporting the timber from the forest to the village. The wood was allowed to season while the builders returned home. The wood sufficiently seasoned, the builders returned and dwelt on the hospitality of the chief and his family. All the general observances described in house building were carried out in canoe building. The builders had to be fed on the best of food with variety in delicacies or they abandoned the work which no one else would take up. A member of the chief's family had to be in constant attendance to show the respect evinced by an active interest in the work, as well as to anticipate the material wants of the builders. Interim payments had to be made and if they proved unsatisfactory to the builders, they left on the pretext that they had not been treated with sufficient respect.

Stair (33, p. 150) gives the five interim payments as follows:

'O le taunga. The fine mat at the first interview.

'O le oloa. At the laying of the keel.

'O le tao fanonga.

'O le sa. On the completion of the sides.

'O le unusanga. On the completion of the work.

According to Stair, the most ceremonial payment was on the completion of the sides of the canoe. The fine mats were divided up into six portions, and each portion was given with an appropriate speech for a specified reason.

'O afu i yao. The covering (*afu*) for working in the bush.

'O le solinga. The cutting of the timber.

'O le afu o le tufunga. The covering of the principal builder.

'O le afu o le ava. The covering of the builder's wife.

'O le si'inga o le taumua. The lifting of the bow of the canoe.

'O le salusalunga o le ta'ele. The rubbing smooth of the keel.

In house building, a similar enumeration took place at the final payment. Stair (33, p. 151) states that strange scenes were seen at the final payment.

The chief's family sat within the guest house and the builders sat outside in the open space before it. Women wearing the fine mats went out and then laid them before the builders. If not enough, the builders coaxed and threatened, saying the payment was inadequate and not what they considered in keeping with the rank of their employer. The chief pleaded poverty. The builders replied by asking why, if poor, he had presumed to employ them. If the chief produced some more mats, the builders were extravagant in their praise; if not, they were equally loud in their vituperation. However, the chief was at last in a commanding position for the canoe was finished and no strike could affect him. All that the builders could do was to return home and broadcast accounts of the chief's parsimony to all and sundry.

During the building of the canoe, however, the builders could adopt a rather mean way of venting their spite on a chief when it was not deemed advisable to go on strike. They could make the canoe, if it were a fishing canoe, unlucky. There were two ways of doing this. The lashings of the topsides or gunwale to the side pieces in a bonito canoe are called the *pu fan-gota*. The correct number of lashings as already stated are 15 on the right and 16 on the left. All the builders had to do was to change that number and the canoe would never catch more than ten bonito. This may apply only to Tutuila where it was told to me but it gives an idea of how simply a disaster could be brought on the man who was sparing of food and fine mats. The man who had reason to suspect the builders probably watched the drilling of the topsides very carefully. Even so, there was another method easily overlooked. In the temporary fitting of the side pieces, small wooden wedges, *tina* or *mata lafi*, were driven under the lashings to tighten them. In permanent lashings, these wedges were of course removed. All the dissatisfied builder had to do was to leave a temporary lashing with the wedge under it and the finest bonito hook could not overcome the evil influence of that one wedge. The wedge was left in a lashing under the bow or stern narrow part. When the bow or stern cover was lashed, the keenest-sighted owner could not locate the wedge. He found out afterwards from results or rather from lack of results.

In Savaii, I watched a master builder solemnly strike an unhusked green coconut against the bow piece of a newly-built bonito canoe, walk sedately around the canoe twice and as I waited with a camera until he struck it again sufficiently hard enough to crack it to make the contents flow, he cast it into the sea. He then pushed the canoe out into the lagoon and critically watched the set of the float and how the canoe rode in the water. The owner then waded out, got aboard and showed her speed to the admiring family gathered on the beach. Whether the coconut was a substitute for the bottle of wine of another culture, I was unable to determine. In spite of the head builder's

assurances to the contrary, I looked upon him as a biased witness. Besides, he was the man who said that stone adzes were hafted with the bevel surface in front.

HISTORY

Every person of any status had a bonito canoe. These went out in fleets during the season and sometimes in pursuing shoals got out a good distance. Bougainville, seeing a fleet of fishing canoes, looked upon the Samoans as daring sailors and thereupon called the Samoan group the Navigators Islands. The bonito canoe thus gave the people an unearned reputation. Samoan voyages were mostly confined within the limits of their own group with occasional voyages to Tonga and Fiji. As regards communication between Samoa and Tonga, it was the Tongans who made most of the voyages.

Samoa historical narratives are singularly lacking in detailed stories of long sea voyages, and present a marked contrast to the wealth of such material in marginal Polynesia. This may be attributed to the fact that the Samoans were early located in a group of islands sufficiently large to absorb their population. Many of the trips of Samoan legendary ancestors were accomplished by swimming, which shows how little pride they took in voyaging canoes, else they would have handed on more details of the form of actual transport. Stair (33, pp. 271-286) has described a number of long sea voyages which he attributes to Samoans but he rather naïvely explains that he got his information from a Rarotongan. In these narratives he takes all mention of Hawaiki as referring to the Samoan dialectical form of Savaii, and regardless of the many Hawaiki scattered over the Pacific, claims all the famous long sea voyagers of marginal Polynesia as Samoans. Stair, himself, states that the original Samoan double canoe was so difficult for them to handle that the Samoans abandoned it for the Tongan type with which they came in contact comparatively recently. It is significant that the two largest types of canoe, the *'alia* and the *taumualua*, were both adopted from foreign patterns. The Samoan evidently not only did not have the necessity for long sea voyages but he did not have a satisfactory type of large craft in which to make them. It is fair argument to suppose that he had not evolved a satisfactory type because, though he had an organized guild of canoe builders, he had not developed, or had lost, the voyaging instinct. There seems to be no material reason why he should have gone searching for land. Thus, both Bougainville and Stair have given the world a wrong conception of what the Samoans did with the canoes they had.

FISHING

GENERAL FEATURES

The waters within the bounding reefs provided the main source of fish so all important in furnishing the chief flesh food supply of the Samoans. These waters were combed over and over again and day after day in every conceivable fashion, from simple groping between the rocks with bare hands to skilled devices with traps, nets, and hooks. The habits and movements of various kinds of fish had been practically studied by generations of fishermen and the knowledge influenced invention and method. Method varied from the efforts of individuals to the organized cooperation of the community. The sphere of women was restricted as they were denied the use of the fishing canoe. The canoe took men outside the reef to seek the deep sea fish that came within the possibilities of their attainment. The deep sea fish pursued were the bonito, dolphin, shark, flying fish, and some that frequented the outer side of the reef. Of the migrating fish which entered the lagoons, the most important were the mullet and the mackerel. In fresh waters, the eel and fresh-water crayfish were obtained and the migrating fry of the *ingava* in two rivers of Savaii. Within the lagoon, marine foods such as seaweed, shell fish and the marine worm known as palolo added to the supply.

Groping. Both men and women are expert at groping (*naonao*) in the crevices between rocks for the rock-frequenting fish which rest there. The men often use the short spear but women use the bare hands, or nowadays a piece of cloth. The narrow clefts from which there is no escape are naturally productive of the best results. The constant search that commences in childhood naturally leads to the villagers coming to know every suitable cleft and crevice in the lagoon that adjoins the village. They submerge and with open eyes swim around the rocks peering and feeling in the crevices. When a fish is caught, it is brought up, the head bitten to kill it and the catch deposited in a basket of the *ola malu* type tied around the wrist or slung over the back. The groping method also accompanies the community fishing with nets as the people assisting in a drive simply cannot pass suitable looking rocks without diving down and groping amongst them.

Rock heaps. To furnish extra resting places to attract fish, rocks are piled up in heaps (*ma'a*) in suitable places within the lagoon. In Savaii, the lagoon is dotted with these piled heaps which are simply called *ma'a* (rock), or *fatuati*. Piles of branching coral (*'amu*) are also used and called *fatu'amu*. These form suitable places for simple groping. An improvement is the use by women of the *ola tu* fish basket. The basket is held open against a suitable part of the pile while women remove the stones gradually from the other side and by taking away the cover of the fish, drive them into the basket. The

The 'avasa (*Tephrosia piscatoria*) is also said to have been used. Stem, roots, and leaves were all pounded together between stones and made into balls like the *futu*.

The poisoning of smaller pools is termed *aloolo*. The method was used in conjunction with nets which were drawn round the rocks or across channels which led away from the pools. Men dived down and placed the poison below the rocks. As it permeated the water, the fish were driven out of the inaccessible crevices and in seeking to escape they were enmeshed in the nets or speared. The poison was used to drive them out rather than kill them. If too strong the fish died in the crevices and many were lost.

Poisoning on a larger scale sometimes took place with the *lauoa*, where again the object of the poisoning was to drive the fish out of their refuges. In this form the families contributed their share of grated poison.

A man was seen using poison to obtain bait for the modern hook. He spread a *lavavava* over a small pool and then pushed the poison in under the cloth. The small fish soon began wriggling out of the pool and as the man saw a fish wriggling under the cloth on the margin of the pool he seized it through the cloth.

WALLED FISH WEIRS

The principle of the weir is seen in the v-shaped lines of coconut and banana leaves, and the winged nets with a purse in the middle. Walled weirs of stone were known throughout the group but confined to practically one village in each of the three large islands and the Manuan group.

The walls, made of loosely built coral stone, were termed *pa* and the fish weir, *pa iva*. With the exception of scanty notes from Savaii, the data and diagrams here recorded were obtained from the answers sent in to Mr. Stokes (35) in reply to a questionnaire on walled fish traps sent out from Bishop Museum.

In Savaii weirs of loosely built coral were made in the bay at Iva. The rough sketch (fig. 259, a) was drawn for me by Sua of Iva. The walls were renovated each year before the season. They are not used now and have fallen down.

Regarding Upolu weirs, Dr. E. Schultz, Chief Justice of German Samoa in 1911, wrote in a letter to Mr. Stokes:

Walled fish traps are also unknown in German Samoa (Upolu and Savaii), except the village of Falelatai in South Aana (Upolu) where the lagoon is shallow enough to allow the building of such walls. These Falelatai walls are also called "*pa*." These Falelatai *pas* are built only temporarily and after use are pulled down again in order not to stop the traffic of boats in the lagoon. Size varying. Height about 5 feet. Each family or each *fuaiala* (division of the village) have their customary place where they build their *pa*. Some find it more convenient to make the *pa* of *laufala* (pandanus leaves) as the piling up of stones and their pulling down again means work. The following kinds of fish are caught in the Falelatai *pas*.

1. *Vete* (chiefly—*Mulloidés vanicolensis* Bleek).
2. *Mata'ele'ele*—very likely the first stage of the *filoa* (*Lethrinus reticulatus*).
3. *Malauli*—*Caranx hippos*.
4. *Lo*—*Trentis*.
5. *Malava*—*Trentis*.
6. *'Umiāmi*—*Polynemus phlebejus*.

The fish were caught by means of a hand net by the men who are waiting at the entrance of the *pa* when the tide is going out.

There are as far as I could ascertain no traditions in Falelatai concerning these traps (my authority being a *tulafale* orator of the very best reputation in such things) and, as stated above, in no other village in German Samoa are such traps known.

Schultz also made the sketch of the weir shown in figure 259 *b*. He evidently had not heard of the Ivan traps in Savaii.

In Tutuila the weirs were situated at the mouth of a bay or lagoon between Nuuli and Tofuna. From the notes supplied by N. E. Crosse, Governor of American Samoa in 1911, and Mr. J. L. Lisonbee, the following is recorded.

Figure 259, *c*, from Mr. Lisonbee's sketch shows that the walls were so built as to form weirs with the entrances opening both towards the sea and towards the shore. Fish coming in on the rising tide were caught in the

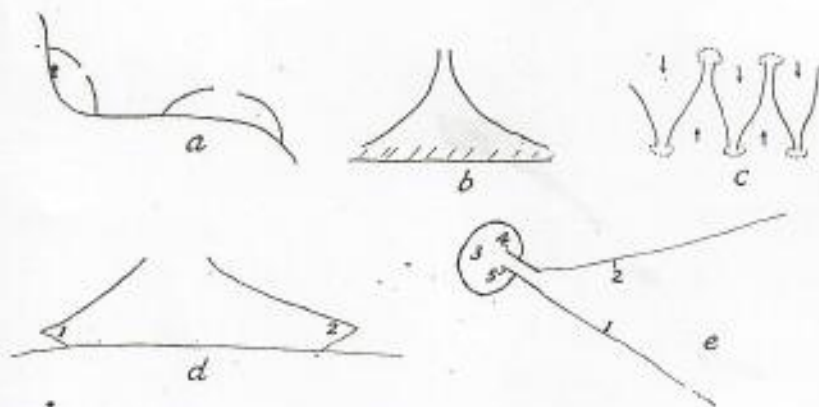


FIGURE 259.—Outlines of walled fish traps and modern trap (*e*): *a*, Savaii trap at Iva sketched by Sua. Curved walls stretched out from the shore, the opening closed with a leaf sweep after the fish had entered. *b*, Upolu weir at Falelatai sketched by Dr. Schultz. The curved walls were from 200 to 300 feet in length, and the narrow opening 2 to 3 feet wide. A scoop net was used at the narrow opening. *c*, Tutuilan trap at Nuuli, sketched by Mr. Lisonbee; length of walls 420 feet, width across wider openings 400 feet; arranging to form alternate narrow openings towards sea and shore; fish caught at exits with nets. *d*, Manuan trap at Tau, sketched by Mr. A. G. Meyer. The distance on the beach between where the walls touch is about 250 feet but each wall ran out to a sharp angle a little distance from the shore. The distance between the outside ends is 100 feet. Used in conjunction with leaf sweep to drive fish into sharp angles (1, 2). *e*, Modern trap at Pangamalo, Savaii, made of wire netting attached to stakes. Two long lines (1, 2) intercepted the fish, which were led into the circular enclosure (3) from which the projecting arms (4, 5) prevented the fish finding their way out.

first set and fish returning to the sea on the falling tide were intercepted by the others. The traps spread right across the lagoon entrance, there being 7 narrowed exits towards the shore and 6 towards the reef. The distance covered from shore to shore was about 208 rods. The walls were of coral rock from 2 to 4 feet wide at the bottom and about 3 feet high when examined. When in use, they were probably higher. The fish were caught at the exits with nets. The traps belonged to the people and had been in existence "before the time of the grandparents of the oldest inhabitants." These were the only traps known in Tutuila.

The traps were visited by Mr. A. G. Mayer (35) in 1920, but only the remains were seen. The walls were knocked down by a storm and the weirs have gone out of use.

In Manua stone weirs were used at Tau on the island of Tau.* The sketch in figure 259, *d*, was made by Mr. Mayer. There are really two blind v-shaped walls with the long outer walls towards the reef and with a gap of about 100 feet between their ends. Through this opening the fish passed and when the shoals were in, a coconut leaf *lauoa* was drawn across the opening. It was then swung round in whichever direction the shoals went until the *lauoa* extended from the end of the particular long arm of the weir to the shore. The *lauoa* was then swept along towards the closed point of the "V" and the fish were secured by hand nets and spearing. In 1920, the pointed ends were in good preservation but I saw nothing of them seven years later. Kramer (18, vol. 2, p. 188) pictured the same weir years previously when it was being used to catch *atule*.

Both the Falelatai and Nuuli weirs provide converging walls which force the fish through an opening into the net. The methods at Iva and Tau are simply an open enclosure which must be closed with the coconut leaf *lauoa*.

In Upolu and Savaii there are now many v-shaped weirs with walls made of wire netting supported by stakes driven into holes made with an iron crowbar. The shape of one seen in Savaii is shown in figure 259 *e*. The long arms were set so that they stood obliquely across the line of the falling tide. There were two widths of wire netting at the deeper part. A circle of wire netting was made round the apex and the two walls prolonged into it. This prevented the fish from getting out as they worked round the netting and could not find the opening. The form may be old but the method of execution is modern. At Fangamalo, large numbers of *atule* were caught. The advantage of a wire netting trap is that it is permanently set and does not need watching.

FISH TRAPS

From information obtained in both groups, samples of all the known types of Samoan fish traps were secured. Though the manufacture of certain

types is being forgotten in some districts, it survives in others. Those who had forgotten the technique were able to say where it was still in use. Samoan traps made with vines and light wooden rods may be divided into six types. Of these, one is manipulated by the fisherman, and five are self acting.

The material for the lobster pot type, which is the most widely distributed, is the vines or aerial roots of the 'ie'ie (*Freycinetia*). The roots are collected in lengths, the older roots are discarded as they are brittle and liable to break when bent. The vines are bound in a coil about the size of a motor tire for carrying home. The coil is soaked in sea water and then beaten against the rocks on the shore to denude the vines of the outer bark (*pa'u*). When cleaned the material is termed *sala* in Savaii. In Tutuila certain traps were made of 'ie'ie which, in Savaii were said to be made of *sala*. It was some time before I found out that they were both *Freycinetia*. On pointing this out, the Savaiians maintained that the traps were not made of 'ie'ie but of *sala*. "Don't the Tutuila people clean the 'ie'ie?" they asked.

"Certainly," I replied.

"Then," they remarked triumphantly, "They make them of *sala* and not of 'ie'ie."

If the traps are not made soon after the *sala* is prepared, the material is left out at night exposed to the dew to soften it. Three types of trap are made with this material.

A fairly thick, creeping vine (*tuafanga*) is used to make the large double entrance traps (*fangaui*). If not used immediately after the vine is brought in, it is kept soaked in water to keep it from drying. In Tutuila, *tuafanga* was applied to the aerial roots of the 'ie'ie.

Bamboo is used to make *fanga'ofe*. The *lafo* creeping plant with long thin stems, and also fine wooden rods are used to make the sea eel trap.

MANIPULATED TRAP

This trap with the longest name (*fanga fa'atau tu'u'u*) is also the smallest. The type specimen in Bishop Museum (Pl. XLII, B) is made of single warps of dressed 'ie'ie (*sala*) with a single pair twined west of the same material. The trap is commenced at the bottom. (See figure 260.)

The trap is used by women, in day fishing amongst the coral in the shallow parts of the lagoon, to catch the dark fish (*tu'u'u*). The woman with an *ola malu* basket tied around her waist wades out to where branching coral (*'amu*) is plentiful. To commence with, she places a dark stone about the size of the fish in the trap and lays it on its side near the spot where she sees the fish. The *tu'u'u* is very aggressive and can be seen darting about ready to fight anything of its size that offers. Leaving the trap on the bottom, the woman remains within reach, with her head submerged, watching the trap. The

piece of braid (9) is tied to the braid at (6) and also run obliquely back to be attached to the side wall. A piece of braid (10) is run through a hole made at (11) and tied obliquely back to the other wall. The braid end which passed through the holes (5, 6, and 7), stitched the free edges of the sheet together. The sheet which formed a continuation of the tube at its front is flattened out at its rear end into a narrow transverse slit (12) $\frac{1}{2}$ inches long and its maintenance kept up by the oblique outward pull of the braid cords (9, 8, and 10). They also keep the end hanging above the bottom. In any case as there is no stiffening hoop to continue the tubular commencement, there is a natural tendency for the material to flatten out. *c*, A longitudinal section of the inner part of the tube and the fabric part with the same numbering as *b*, shows how the tube flattens out.

The top of the box is now made with two longitudinal crossbars and transverse rods. The two bars are fitted so that they will rest on the inner side of the side walls. The lashings are made leaving a gap in the middle of four inches by not adding any transverse rods in that part. The top is then turned over to place the marginal longitudinal bars on the under side. A mesial longitudinal bar is then lashed to the rods in the true upper surface. Two side longitudinal bars are also added to the upper surface and merely lashed here and there. The top is fitted in position and the projecting ends of the longitudinal bars lashed to adjacent projecting ends. The trap is now complete except for a door to close the upper opening.

The upper opening is the exit opening for extracting the fish. Some wide slats of wood are made and thrust in under the three upper longitudinal bars. They rest on the sides like the other rods forming the top and the longitudinal rods keep them down. As many are made as will close the gap. The trap is baited and the door slats are tied to the middle longitudinal bar.

The trap is set in the lagoon for sea eels. Attracted by the bait the eel finds the trap and enters the tube. When it reaches the fabric part it easily pushes its way through the slit opening, which readily widens in a vertical direction. Once the eel is in, however, it cannot find, let alone pass through, the slit from the inner edge side. The slit is in space and the fish keep going around the sides. The trap mechanism thus acts like a valve which can be passed through from one side by pressure but falls back after the pressure is removed. It is simple and ingenious and marks a departure from the rigid inner openings of the other self-acting traps.

The material used in the trap described is wooden sticks. The *lafa* creeping plant with a cane-like stem, used in sugar-cane thatch sheets, is also used for sea eel traps. The old style of trap is rapidly disappearing as ordinary wooden boxes of sawn timber, nailed together, are much easier to secure and prepare. Numbers of such traps were in use in Tutuila and Savaii. The trap secured was obtained at Pasitoouta in Upolu. The dome cylinder type of *'enu*, the bamboo double entrance trap, and the sea eel trap were obtained in Upolu after efforts in eastern Samoa and Savaii had failed.

NETS

Nets have the general name of *'upenga*. The craft of netting is old, as denoted by the sayings associated with the ancestor Pili: O le *'upenga* o Pili a tautau ae fangota (The net of Pili hangs up but it catches fish).

Pili did his netting at night and thus, though people only saw his net hanging up in the daytime, it nevertheless caught fish. Another saying conveys the same idea: O le 'upenga o Pili e fili i le po ae tala i le ao (The net of Pili is bundled up at night but spread out during the day).

The net was spread out during the day to dry but at night it was bundled up for transport down to the sea. Thus Pili did things quietly and unobserved without seeking public assistance.

The net is also mentioned in the early days of 'Tangaloa-ūi for it was with a net spread over the mouth of a cave in 'Tau that he intercepted Sina Sasamani on her return from bathing. An old man on 'Tau also said that there was a net associated with the Sasamani but all he could remember of it was the method of introducing extra meshes.

NETTING MATERIAL

The method of preparing netting cord has been described. The best material is *fau songa*. Turner (41, p. 167) states that nets were mostly made in the inland villages. This is due to the *fau songa* growing in greater quantity inland. On occasion the *fau tu* was used. For special nets, bread-fruit bast, paper mulberry bast, and sennit braid were used. Thicker sennit ropes in three- or five-ply braid were used for the upper and lower ropes of long nets.

A needle (*sī'a*) and mesh gage (*afa*) were used. The netting needle, according to Manuan authorities, originally consisted of a stick² about a foot long with a blunt point which was split. The cord was rolled in a ball and the end placed in the needle cleft. No detail could be given as to how it was used. The general idea resembles the *kioe*, an instrument used by the Hawaiians for mending, but in which there is no split point. The needles now in use (Pl. XLV, A, 1) are similar to those in use in other parts of Polynesia. They consist of a long flat piece of wood expanded at either end to allow for mesial longitudinal slots with narrow slits through the blunt pointed ends. The cord is wound longitudinally between the two slots. The needles are made in various sizes to suit different sized meshes, as the loaded needle must pass through the completed mesh.

The *afa* gage is a flat rectangular piece of wood scraped smooth, with rounded edges, and of different sizes. (See Plate XLV, A, 2.) Bamboo is a favorite wood as it is easy to shape. Pratt (23, p. 17) gives *afa* as meaning united in action in the phrase 'ua *afa fa'atasi* (from the same mesh stick). Hence, also, the saying, "Ua *afa fa'atasi* taofi 'uma, 'ua lelei lea mata'upu." (When all the opinions are from the same mesh stick, that matter is settled.)

TECHNIQUE

To commence a net is *alu* and the mesh is *mata'upenga*, or *mata* for short. To *lofo* is also to make a net. The netting needle is loaded and the required

mesh gage selected. One end of the cord is wound around the gage twice and tied with a reef knot. The cord is unwound and the knotted loop forms the first mesh. Meshes are thus twice the size of the mesh gage. The short end of the cord beyond the reef knot is left long enough to tie to the first mesh to form a long loop to place over the big toe to steady the commencement. (See figure 272.)

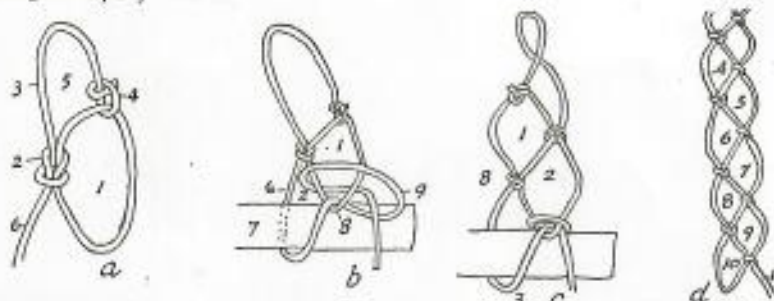


FIGURE 272.—Netting technique: *a*, the first mesh loop (1) is tied by the reef knot (2), the short end of the cord (3) is tied to the mesh loop (1) at 4 to form the toe loop (5) while the other end of the cord (6) is the part that is wound around the needle; *b*, with the reef knot (2) to the left, the cord (6) is pulled downwards and the mesh gage (7) placed over it in such a position that the lower end of the first mesh (1) rests on its upper border. The cord is doubled up over the lower edge of the gage and the needle carrying it is passed through the first mesh (1). The slack of the cord is flicked to the right to form a loose loop (9) large enough to allow the needle to pass through it later. The needle is then carried over both limbs of the first mesh (1) to the left, then back to the right under them and up through the right loop (9).

The left hand holds the gage and the left thumb holds the crossing (8) against the edge of the gage so as to fix the size of the mesh. The right hand works the needle which, after passing through the right loop (9), is drawn taut so as to tie the netting knot at the lower end (8) of the first mesh (1).

In this manner, the second mesh is formed by using the true meshing knot. Note that the gage gives the dimensions of the lower half of the mesh while of the upper half, the limb on the left is formed by the cord descending to the upper gage edge while the right limb is formed by the previous mesh. The gage is always placed over the descending cord so that the descending cord passes through the mesh from before backwards and the loop with the slack is always flicked out to the right. Netting consists of a repetition of this simple technique. *c*, The third mesh is added in a similar way but as the left hand holds the gage and the last netting knot is to the right, it is easier to twist the last knot (8) over to the left. The gage is then placed over the descending cord with its upper edge resting against the lower end of the last mesh (2). The cord is drawn upwards as before and the needle passed through the second mesh (2) and the knot tied in the way described to form the next mesh (3). *d*, The meshes are added, always keeping or twisting the last knot made to the left and then adjusting the gage. The meshes appear as in the figure and the adding of meshes is continued until the depth of the net is secured. The cord (1) instead of being tied to the last mesh (10) is left as it is for the next stage.

Good netting depends on the evenness of the meshes. After the needle is passed through the mesh above, the cord is pulled or slackened until the crossing is in the right place on the gage, when it is fixed by the left thumb while the netting knot is made.

The depth obtained forms one end of the net and is referred to as its *lautele*. The *lautele* of various nets is distinguished by the number of meshes. The length or *'uni* is obtained by adding successive rows of the same number of meshes to the end which has been set up. The method of forming the commencement strip of netting has resulted in two rows of meshes. Meshes are really quadrilateral figures with equal sides. Owing to the nature of the material, if they are pulled in one direction, they lengthen in that diameter and narrow in the other. In making the net, the pull is at right angles to the gage and the long diameter of the mesh is naturally in the same direction. To lengthen the net, the commencement strip instead of being longitudinal to the netter is placed transversely before him. The pull now comes on the other diameter but, the meshes having equal sides, it makes no difference to the technique and the placing of the gage. (See figure 273.)



FIGURE 273.—Netting technique and additional meshes: *a* and *b*, increasing length; *c* and *d*, additional meshes. *a*, The net strip from the position in figure 272 *d* is now laid transversely with the cord on the left and the pull being changed the appearance is as shown. The gage is placed over the cord (1) and the first mesh made by engaging with the mesh (9). The first mesh formed has a free margin formed by the cord descending to the upper edge of the gage and passing behind it. *b*, When the first mesh of the new row is tied, it is not now necessary to remove the gage from it. The gage is simply pushed along under the next completed mesh above. From now on, it will be noted that the last knot tied is on the upper edge of the gage. The cord (1) is simply passed behind the gage brought up over the lower edge, the needle passed through the next mesh (3) and the usual knot made. Thus after the first marginal mesh of the new row, each mesh is formed by the sides of the meshes above while the cord simply adds the lower half of the mesh. The same number of meshes are made as in the row above. The netting is then twisted over to bring the cord back to the left and another row commenced. The successive rows are added until the length required is finished. See Plate XLV, *A*, 3. *c*, Instead of carrying the cord (1) from the last knot (2) to the next mesh loop (3), the needle is passed through the loop above (4). The cord is brought down to the mesh gage and tied to the ascending cord with the usual netting knot as shown. *d*, The needle is now passed through the next mesh (3) and the netting knot tied. Thus between the knots (2) and (3) there are two meshes instead of one.

In bag nets, any narrowing may be obtained by dropping meshes in the various rows or by using smaller gages. Extra meshes, however, were seen in a hand scoop net at Tau. These were the meshes said to be derived from the net of the Sasaumani, an early fishing community who were on Tau when Tangaloa-*ui* grew to man's estate. The knotting of the extra mesh is seen in figure 273 *c*, *d*.

The Tau people called the mesh *mata 'upenga* a Sasaumani. The Tutuilan

and Savaiian people did not know it. In fact a Savaiian expert thought it was Chinese. As, however, the same mesh is used in New Zealand, it is probably old.

Cords and ropes. Most small nets have a cord running through the marginal meshes by which the net may be attached to wooden frames or handles. The cord may be twisted cord or seunit braid. In long nets of the seine type, there is an upper and lower rope usually run through the marginal meshes. The upper rope, because it supports the wooden floats (*uto*), is termed *'afauto* or *u'a o le uto*. The lower rope is the *'afavae* (*'afa*, rope; *vae*, foot) or *fauvae*. To thread in the ropes through the meshes is *tinata*. The lower rope may or may not have sinkers attached.

Floats. Casting nets, short nets set across channels and around rocks, and the long seine nets have floats (*uto*) attached to the top line. The floats usually consist of *lou*, *fau*, or other light wood. The floats are attached directly by the top rope, which is tied around them at intervals as it is threaded through the meshes. Floats are of two kinds; small peg floats and large floats.

1. Peg floats. Short lengths of about 3.5 inches in length of a light wood about 0.4 inches in diameter are tied to the upper rope with the knot shown in figure 274.

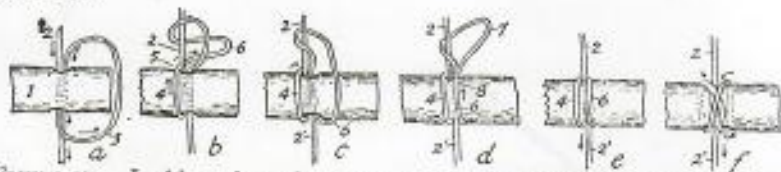


FIGURE 274.—Lashing of net floats: *a*, at the required distance from the left end, a float (1) is laid transversely over the top rope (2). A marginal mesh is drawn in under the float so that its cord rests between the float and the rope to be included in the knot. A loop (3) is formed with the rope and brought over the right end of the float into the middle line. *b*, The near end (4) of the loop is drawn taut against the float and passed upwards in the middle line to the left (5) of the standing rope (2) and the slack of the loop passed under the standing rope to the right (6). *c*, The loop (6) from the last figure is again brought over the right end of the float. In doing so it crosses the first turn made and the near part of the rope (2') beneath the float. The near end of the loop (6) is pulled downwards a little to remove excessive slack at the back. *d*, The loop (6) is carried upwards, close to the first turn and on its right. The left thumb is placed over it near the upper edge (8) to keep the turn in position, and the slack (7) is above the thumb. *e*, The near end of the rope (2') is pulled to remove the slack (7) in the last figure and the knot is complete. *f*, The view of the knot from below is shown opened out slightly.

2. Large floats. The larger floats are made of sections of larger branches which, being thicker, are naturally cut shorter than the long, slender peg floats. An average large float is about 3 inches long and 3 inches in diameter. A groove is cut around the middle transversely to give a grip for the rope. The rope may be threaded through the marginal meshes so long as the end

is not fixed, loops can be pulled up sufficiently large to tie the knot used with the peg floats.

Sinkers. Sinkers (*maene*) are used with the smaller nets, as stated above. In large nets, the weight of material against a rocky, uneven bottom would be a hindrance, let alone the nuisance of transporting the weight of clumsy material. Seine nets are not drawn in the way they are in other parts with a smooth sandy or muddy bottom. The large nets are usually set in position and for this purpose, it is easier to pick large stones from the bottom of the lagoon and place them on the bottom rope or just over it onto the meshes of the net. In a moving net, stone sinkers would catch against rocks and in clefts and seriously retard progress. It is easier in communal fishing for the numerous assistants to push the lower rope along the bottom with their feet in the method known as *tolovaa*. When the rope catches on a rock, the men simply submerge and lift it over the obstruction, at the same time driving fish before them.

The sinkers used with lighter nets consist of two kinds: stones and shells.

1. Stone sinkers. Waterworn stones of round or oval form are used. They are attached separately to the bottom rope by separate pieces of cord. The two-ply twisted sennit cord is often used for this purpose. A short piece is first tied around the middle of the stone with the float knot described above and the ends then tied around the rope. These are spaced along the bottom. Though lead is superseding stone, it is surprising how much stone is still used. (See Plate XLI, A, 2.)

2. Shells (*pule*). Shells of the *pule* (*Cypraca*) kind are used with some nets. The closed rounded ends of the shells are cracked off so that the interior becomes patent. Cords can thus be passed through the long natural slit opening on the other side. For the method of direct fastening to the lower line see page 480. (See Plate XLVI, A.)

TYPES OF NETS

Nets range from small hand nets to long seine nets. A very characteristic net is one with a bag or purse in the middle with sides diverged out like the wings of a weir.

HAND NETS

Hand nets, shaped to a bag and attached to a wooden frame, with or without special handles, are made in various forms. They are used as dip or scoop nets and as manipulated traps.

The small dip net (*'upenga lama* or *lalama*), a small bag net attached to a single pliable rod, bent around through the marginal meshes into the form of a tennis racket with the ends tied together, was used in Manua with coconut leaf torches (*lama*) at night. They were largely used for fishing in the

lagoon. They are also used as dip nets with community methods such as the *lauoa* and stone weirs.

Edge-Partington (10, vol. 2, p. 44) gives a sketch of the type in which the overlapping ends of the frame rod serve as a handle.

The **medium dip net** (*'upenga sae'e*) seen on Tau serves the same purpose as the last but has a larger frame (*a'au*). (See figure 275.) It had been started from the bottom and increased by additional meshes of the *mata Sasaumani* type.



FIGURE 275.—Frame and net attachment of *'upenga sae'e*: a, the frame is formed of 2 rods (1, 2) tied together at the thicker ends (3). A crossbar (4) about 12 inches long is lashed to the side rods about 8.5 inches from the lashing (3) to spread them. The rod ends are brought together about 28.5 inches from the crossbar and tied (5). The frame is 16.5 inches across at its widest part. b, A bag net with a line (1) threaded through the marginal meshes of its upper circumference is attached to the frame (2) by another cord (3) wound spirally around the frame and the circumferential line. The net is 32 inches deep and narrowed longitudinally at the bottom to 23 inches.

In fishing the net, two men worked in conjunction. The man with the net set it across a likely looking channel while the other drove the fish toward it with a stick. The crossbar acted as a handle (*'au*). It resembled the Aitutaki *hopai* (39, p. 290) net frame on a smaller scale.

The long-handled dip net. The principle of the crossbar and the long handle is applied in the Cook Islands (39, p. 288) to nets for catching flying fish at night with the aid of a torch. Though on Tutuila, the use of the net and the torch was denied, the method was used in other parts. Though a Samoan proverb shows that torching took place, the present day Samoans are curiously confused about it. A Samoan talking chief quoted the following proverb: "O sipa le lamanga 'ae ngase fua le malolo." (The torching was for *sipa* but the *malolo* was taken.) He could not distinguish between the *sipa* and the *malolo* flying fish, nor say what form of net was used with the torching. Pratt (23, p. 266) gives the *sipa* as a small flying fish. Thus, though torching for flying fish was known, it could not have been indulged in to the same extent as in the nearby Tokelau group and the Polynesian islands to the east. The net was probably of the type figured by Demandt (9, p. 46, fig. 1).

The double-handled dip net (*'upenga saosao'o*) is a net larger than the *sae'e* net but the distal ends of the frame rods are not tied together. One being used in Tutuila had a frame of two poles each 9 feet long. The

poles were tied together at the thicker ends to form a loose joint. The woods used for the poles were *auauli* and *talafolu*. The net which was attached along the poles for 7 feet was a bag net 5 feet deep and 4 feet wide at the bottom. The net is set across a channel or convenient pool by holding down one pole along the bottom while the other is held up to open the net. The two poles are easily manipulated by one man at the joint. An assistant armed preferably with a pole of light *nia'o* wood drives the fish into the net. The net possesses the advantage over the *sac'e* net with a rigid frame in that the poles can be closed together after the fish enter. The driving process is termed *so'a*.

In Tau, the net is called *'apenga tu uli*. The term *uli* (to steer) is used in the net name from the fancied steering of the poles of the net.

The scoop nets ('enu). The name *'enu* is shared by the midrib scoop used for palolo and the traps described on page 454. A more rigid framework is made by using rods for the bag of the net as well as the rim opening.

An *'enu* seen at Aoloau, Tutuila, had the opening frame made of a straight piece to which another piece bent into a *U* was attached. (See figure 276, *a* and *b*.) The net was used as a scoop for gathering the fish enclosed by a long net or *lauoa*.

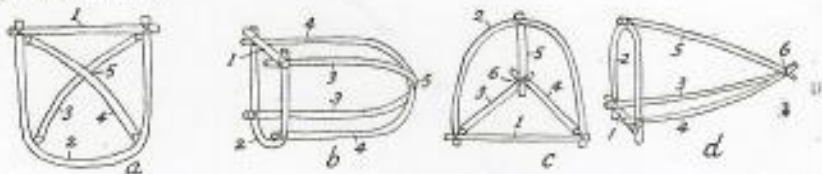


FIGURE 276.—Frame of *'enu* nets: *a*, front; *b*, side. The transverse rod (1) allows for an inside measurement of 2 feet while the *U* shaped piece (2) formed a vertical measurement of 2 feet 3 inches. Two other rods (3, 4) are bent into *U* shape and the ends tied to the inner side of the frame at diagonal corners so that the curved parts cross each other. The crossing (5) is lashed and is 2 feet, 4 inches in depth from the opening. The net is attached to the opening by a continuous cord run spirally around the rods and through the marginal meshes. (See figure 275, *b*.) The net is cut to suit the circumference of the frame round which it is wrapped. The edges are sewn together with a continuous cord and the net end is bunched over the end of the frame, gathered together and tied. *c*, Front; *d*, side. The straight bar (1) is about 36 inches long. The arch formed by the other rod (2) is 31 inches in vertical height. Instead of crossing two curved sticks to form the body, three sticks (3-5) about 45 inches long are used. The sticks (3-4) are tied to the inside of the lower corners while the third (5) is tied to the outside of the arch in the middle line. The far ends (6) are lashed together and a net attached to the frame as in *a* and *b*.

A similar *'enu* at Salailua was made in exactly the same way. The transverse rod of the opening was 40 inches long and always placed at the bottom. The inverted *U* rod tied to it formed an opening 36 inches high in the middle line. The two crossed curved rods were in this instance tied to the outer side of the opening frame and their crossing at the back called the *muli* was about

4 feet from the opening. The net with a 0.25 inch mesh was attached to the frame in the same way as the preceding 'enu but at the back, another cord was run through the marginal meshes and drawn taut to pucker the net together to close the *muli* end. A cord was tied to the lower crossbar of the opening. This larger 'enu was used in connection with the *tupa* leaf weirs described. The opening of the net was placed against the opening at the apex of the weir. It was wide enough to overlap the weir opening and it rested behind the two stones mentioned.

The fisherman stands outside the weir holding the cord attached to the crossbar. When the *i'a sina* fish have entered the net, the cord is pulled so as to lift the opening of the net above the surface of the water.

Another form of frame was seen in the same district as the above. (See figure 276, c, d.) The net is used purely as a scoop net in connection with long nets or it may be set in a small leaf weir in exactly the same manner as the preceding net. Not only *i'a sina* are caught with it but also the *atule* when it moves in shoals.

The arched hand net (*se'i*) consists of a rectangular piece of netting spread out by four sticks attached to each corner and tied together at the other ends in such a way as to arch them and thus keep the corners of the net taut. (See Plate XLV, B.) A line is run through the marginal meshes of one side and tied to the lower end of two sticks with a clove hitch. It is then run through the marginal meshes of each side in turn and tied also in turn to the lower ends of the other two sticks with clove hitches.

The lashed part of the arched sticks is used as a handle. The net is lowered down into the water and as a fish passes over it, it is drawn up out of the water. The fish caught with it are *matu* and *mumu*. It seems to be limited in distribution to the area in Upolu stretching between Apia and Fasitoouta. It is used in conjunction with a seine net termed *tolo matu*. The seine net is drawn round to enclose *matu* fish. Canoes paddle into the enclosed space and the sides of the canoe are tapped with the paddle. The fish swim in to the neighborhood of the canoe on hearing the sound and are then dipped up with the *se'i* net. The term *se'i* means to jerk and the name is applied to the net from the quick jerk given to it in drawing up the fish. The *se'i* is made at the same time as the *tolo matu* seine net and goes with it as part of the equipment. They are not supposed to be parted. Separating the two is prohibited (*sa*). The *se'i* secured was sold by the family whilst the family head was absent in Tutuila. The *sa* restriction was overcome by the vendors themselves.

The arched net with line (*'upenga sumu*) though not a hand net is dealt with here because it is exactly the same in make as the *se'i*. The one described in figure 277 was made for me by an old man at Tau who maintained

that they were so little used nowadays that he was the only man in Tau who knew how to make them.

The fish caught was the *sumu* (genus *Balister*) which frequents the outer side of the reef. Fishing took place from canoes which came in as close to the reef as possible. The baited net was lowered on a line to near the bottom. When the *sumu* bites at the bait the jerk is distinctly felt on the line. The net is drawn up quickly, the fish simply resting on the net without any attempt to get away. The net sags as it is drawn up and thus acts like a shallow bag net. A net of this type figured by Kramer (18, vol. 2, p. 170) and Demandt (9, p. 54) is shown attached to a float.



FIGURE 277.—Baited net (*ʻūpenya sumu*): four thin rods about as thick as a lead pencil and 21 inches long were tied together (1) with sennit. A piece of two-ply sennit cord was then threaded through the marginal meshes of a rectangular piece of net 17 inches long by 15.5 inches wide and tied with a clove hitch round the lower end of each rod (2). Another piece of cord (3) was tied to the top of the handle (1) and passed down through the middle of the net. A piece of thread was used to tie the cord to a net mesh where it passed through. Another thread (4) was tied to the cord above the net for tying on the bait of a piece of coconut meat or crab. A stone sinker (5) was tied to the cord below the net. From the upper end of the rods (1) to the net was about 16.5 inches while the bait thread was 5 inches above the net.

The mullet hand net (*alangamea*) is the most interesting of the hand nets as it marks a novel departure in method. (See Plate XLVI, B.) It is used in catching mullet (*ʻanae*) as they jump over a seine net by which they are enclosed. The movement of intercepting anything in the air with a net is known as *seu*. The netting of pigeons is *seu lupo* and the *alangamea* use for catching mullet in the air is *seuʻanae*. The framework is shown in figure 278.

When the net is not being used to intercept fish, the right pole is taken

out of the fork on the crossbar and placed beside the left hole which the joint admits of. The net is then wound around both poles. The net is carried folded until the fisherman takes up his position outside the seine net to *seu 'anae*. In action, the net is unwound and the right pole slipped by gradual firm pressure into the fork of the crossbar. The method of use is described later on page 484.

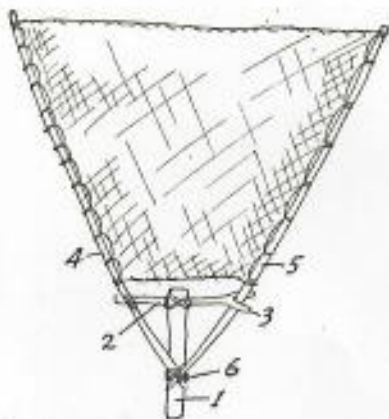


FIGURE 278.—Mullet hand net (*alangamea*). A crossbar (2) 1 inch in diameter and 32 inches long including a fork (3) is securely lashed to the tip of short stout handle (1), 1.7 inches in diameter and 38 inches long, with transverse, diagonal and circumferential turns with sennit braid in the same way as lashing a wall plate to a wall post. A 9 foot pole (4) 1.4 inches in diameter at its thick end, is lashed diagonally to the handle and the left end of the crossbar. A similar pole (5) has a groove cut around its lower end and is then tied to the handle and above the other side pole with a number of loops running one way round the groove. The lashing (6) is finished off with some circumferential turns around the lashing between the poles. The lashing forms a loose joint which allows the right pole to be stretched diagonally out towards the right and fitted into the fork on the crossbar. A net is now stretched between the poles. The outer ends of the poles, with the right pole in the fork, are 9 feet, 9 inches apart. The far end of the net corresponds to this length and the sides to the side poles to within 6 inches of the crossbar. The near edge of the net is 32 inches long where it stretches between the poles. The net is bagged to a depth of 38 inches towards the handle end. The bag is called the *mulu* of the net.

A sennit braid cord is threaded through the marginal meshes of the far end and tied to the end of each pole with a clove hitch so that there is a tight stretch of 9 feet, 9 inches between them. The braid ends are continued down through the marginal meshes of the sides of the net with a half hitch turn round the poles every here and there. They are then knotted to the poles at the near ends of the sides of the net which is 6 inches from the crossbar.

The shrimp net (*'u'uti*) is much used in the Vaisingango stream near Apia for catching fresh-water crayfish (*ula vai*). (See Plate XLVI, A.) The net has a small mesh (0.4 inches) and consists of a straight piece of net attached to side handles which are straight sticks 0.5 inches in diameter and 44 inches long. The bottom line of the net is tied to the lower ends of the sticks and when stretched apart with the net and sinkers on has a spread of about 5.5 feet.

The top line is tied to the sticks about 7 inches from their top ends and has a lesser stretch of 4 feet, 4 inches, thus giving the net a slight bag. On the bottom line of the net are the sinkers of *pule* (*Cypraea mauritiana*) about 2 inches wide at the opening. The closed ends of the shells are cracked off so that the long slit opening appears on the other side. (See figure 279.) The bottom line is run up through the marginal meshes at the sides and at the top. The side lines are attached to the handles at intervals with separate pieces of cord. No floats are needed.

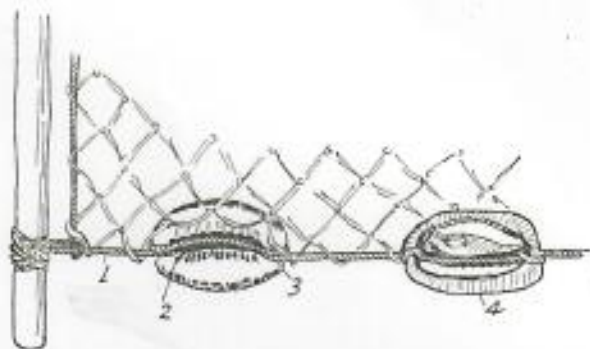


FIGURE 279.—Shell sinkers of shrimp net. The bottom line (1) is tied to one stick and threaded through the marginal meshes for about 2 inches. The line is passed through the opening of the shell (2) at one end and then takes a turn around its rim. It then passes across to take a turn around the opposite end of the rim (3). The long stretch of the line shows along the opening of the shell (2). The next shell (4) shows the loops round the back or broken part. The shells are attached about 2 inches apart and the net is threaded on the cord in the intervals.

The fisherman locates the crayfish and opens out the net holding the top end of the stick handles in each hand. The bottom line is then lowered behind the crayfish and, by sweeping the two sticks round to the front, the crayfish are enclosed. They can then be scooped back into the slack of the net and removed from the water. The inland villages of Mangiangi and Tanung-amanono near the Vaisingango stream are places where the method is still used.

CASTING NET

The Samoan casting net (*'upenga tili*) consists of an ordinary straight net a few fathoms long and about 5 feet deep. (See Plate XLV, D.) It has an upper line with peg floats and a lower line with sinkers. In Olosenga the casting nets all had small sinkers of round waterworn stone but in most parts lead is now used. The success in casting depends on the way the net is gathered (*sangaio*) and held in the right hand. As it is too deep to manipulate, it is folded by turning down the upper third. The first line is held in the teeth to stretch the net to its full depth, while the left hand grasps the middle

about a third down. The teeth let go and the float line thus falls down to form the right fold. The net is usually grasped by the left hand from the front when the float line falls backward when let go. The procedure may be reversed by grasping the net from behind and letting the float cord fall forward. Whichever method is commenced must be carried on to the end. The part of the net grasped by the left hand must then be transferred to the right hand with regular sequence and arrangement between the right fingers.

The right hand holds the right end of the net temporarily. The float line is seized between the teeth and the weight of the sinkers stretches that part of the net to its full depth. The left hand selects a part of the net a third from the top and transfers the part grasped to the right hand as the teeth let go. The first fold is brought into the right palm between the thumb and forefinger and held by the thumb closing down over it. The float line about 2 feet, 6 inches to 3 feet away to the left is brought in by the left hand and held by the teeth to stretch the net. The left hand again selects a spot a third down and transfers it to the right hand as the teeth let go. The second fold is passed into the right palm between the fore and middle fingers. The method of seizing fresh folds is continued with regular spacing to the left. Three folds are successively placed between the middle and ring fingers and three between the ring and little fingers. The closure of the fingers is sufficient to keep the folds in position. The last four folds are brought into the right palm on its ulnar side and held by closing the fingers over the palm. The arrangement of folds was 1, 1, 3, 3, and 4, commencing from the thumb side, but if the net is longer, the fisherman alters the number of folds to suit. He gets to know his own net. The number of folds may alter except between the thumb and forefinger which is always a single fold but the order between the fingers must be maintained. To form a circle with the throw, the two ends of the float line must be tied together. If the floats have been dropped backwards, the line must be tied forward or away from the body but if the floats have been dropped forward, the line must be tied at the back or towards the body.

Casting. The fisherman walks along the edge of the lagoon or wades in the shallow water until he sees a shoal of fish. Judging the distance, he swings the folded net backwards and forwards to gather impetus and then, with a curve, to the front of the body and back. From the back swing, he comes forward with the cast. As the hand goes forward, he turns it with the back upwards in pronation as he lets go. The sinker line spreads out in a curve which is restricted to a circle if the ends are tied. The fisherman who demonstrated the method on land, showed his skill by throwing the net over me. The net is thus thrown with a high trajectory into the air and falls fairly vertically round the mark. Subsequent practice showed that the throwing is quite simple if the net has been properly folded.

Some doubt has been expressed as to the *'upenga tili* being native Samoan. This is due to confusing the casting net described with the Chinese cast net which is closed at the top, like an inverted bowl. This is a permanent closure whereas the Samoan net is only tied with the float line when being folded. When cast it forms a ring of netting round the fish. The Chinese casting net has become popular in some parts of Samoa but is distinguished by being called *'upenga tili Saina* (*Saina*, China). Sometimes the casting net is thrown without the ends being tied.

The casting net gets the name of *tili* from the casting process. In Asau, Savaii, the net so used is called *'upenga mangingi* from its being used to catch the *mangingi* fish which gather in shoals. The net used is about 8 fathoms long and is folded as described above. There are two methods of casting: 1. *tili tongi* (*tongi*, to cast) the complete cast with the ends tied to form a ring; 2. *fa'asavangatunu*, after gathering the folds into the right hand, three are let go as a slack and the end held in the left hand without being tied. When the cast is made, the left end is let go at the last minute so that the net makes a pronounced curve beyond the fish. The fisherman starting forward after his cast drives the fish into the curve of the net. Pratt (23, p. 101) gives *fa'asavangatunu* as to fish with two nets, but in Asau no mention was made of a second net.

SEINE NETS

Lengths of net with float and sinker lines are used. They vary from short lengths of 8 to 10 fathoms to fairly long nets. The nature of the lagoon bottom over which netting takes place is so irregular from clefts, rocks, and coral outcrop that the usual hauling of a seine net cannot be carried out. Nets are therefore set and not hauled. They form barriers, weirs, or enclosures which prevent the escape of fish. They may be divided into short, winged, and long nets.

Short nets (*'upenga fa'alava*). Short lengths of 8 to 10 fathoms with pegged float lines and stone sinker lines were used in ordinary family fishing by a small party. At Leone, I assisted the Ripley family in this form of fishing. Two persons were stationed with a net which was spread across a channel. The channel is *ava* and the method of fishing by stretching the net across is *tu ava ava*. The fisherman dived down to see that the sinker line rested on the bottom and adjusted it into holes, depressions, and around rocks so that no openings were left below the sinker line. The other members of the family, spread out in a curve, worked down towards the net, splashing and beating the water to drive the fish into the net. On the way they subjected rocks to close scrutiny by diving down and feeling or spearing in the crevices. In this manner they caught several fish and others were driven into the net

where they were meshed. Every crevice and hole in the rocks was known to them. After the drive the net was taken up and carried across to another channel. The net, being short and light, was quickly folded at the float line and carried over the shoulder of one person. In this manner, the part of the lagoon adjacent to the family dwellings was worked over.

Short nets were also useful with the artificially made rock heaps. After driving the fish into the heaps, the net was run round it and the sinker line carefully adjusted to the bottom. The stones were then removed by dropping them outside the net line. The fish were speared or caught up in some form of scoop net and the surrounding net prevented their escape, some being caught in the meshes.

The casting net was used for the above purposes quite readily. When opened out across a channel or used round a rock heap, it was an *'upenga fa'alava*, but when folded and cast, the same net was an *'upenga tili*.

Winged nets. A characteristic net has a purse in the middle called the *muli* while the two ends are spread out to form a V. The net is set and thus forms a transportable V-shaped weir. It has various names. In *Manua*, it was described as an *'upenga tali* with a bag in the middle and two wings stretching out from it. The name *tali* (to receive) has an obvious meaning. In *Savaii*, it is termed *'upenga matalili'i* (small meshes) from the fact that the meshes are made small to prevent small fish escaping through the purse. A net examined in *Safune, Savaii*, was 36 feet long opened out. It had a pegged float line and stone sinkers. The middle 12 feet was doubled and the float lines and sinker lines tied together with a continuous cord to form a purse 6 feet long with 12-foot wings on either side. The net is shorter than the average and was used to catch the small fish among the *amu* branching coral. It was set in an appropriate place and the people worked towards it, breaking the coral with sticks in the *tu'itu'i amu* process. As the commonest fish in the coral is the *tu'u'u*, the net was referred to as an *'upenga tu'i tu'u'u*, which was merely a convenient way of describing its use.

A much larger net of this type was used at *Fangamalo, Savaii*, in connection with the coconut leaf *lauoa* method described. The floats were of large branch sections and there were no sinkers attached to the bottom line, large stones from the bottom of the lagoon being rolled over the bottom line when the net was set.

The large net made of breadfruit bast to be described on page 487 was also of the purse type.

Long nets. A long net at *Aunuu* island off *Tutuila* was 300 feet long, 5 feet 9 inches deep, with a 2-inch mesh. The round floats 1.5 inches in diameter and ranging from 3 to 14 inches in length were attached in the usual way to the top line about 16 to 17 inches apart. The sinkers were of lead. The net was termed *uluulu* or *talau'au*.

In Upolu and Savaii, a long net (*tolomatu*) is used in connection with catching mullet. A short one of 26 arm spans was seen hanging out to dry at Iva, Savaii. The drying sticks of forked uprights, about 4 feet apart, are *tautaulanga*. Two pieces were being joined together by running a cord through the marginal meshes of each end. A pointed stick of coconut wood about 3 feet, 6 inches long was used to gather the net on and was called an *'ausi*. The pointed end could then be stuck into the roof of the house and thus hang up the net.

At Moataa, Upolu, the nets were joined together to form a length of 60 arm spans. The nets were carried into the water on the *'ausi* stakes. Two stakes were used with a man holding each end of each stake. Owing to the large quantity of fish that come into the lagoon, and the length of net required, the fishing operation is a community one shared by the whole village. The net is thus made in sections by the community. At Puapua, Savaii, the rule is for each matai head of a family to make two arm spans and an additional span for each male child in his family. The sections were made well before the season opened and when needed were assembled and joined together. The float and bottom lines were run through the sections. The ends of the sections were joined as seen at Iva, or were simply overlapped slightly and tied to the upper and lower lines so as not to work apart. Mullet will not go through the net but endeavor to escape by leaping over it.

The nets are used to form an enclosure round the fish. The fish are actually caught with the *alangamea* net described on page 479. After the long net has been set across the direction in which the fish are moving, the fishermen, each armed with an *alangamea*, take up their positions outside the net and close together. The free end of the *alangamea* is held tilted slightly upwards towards the set net and the slack of *muli* bag part is held in the left hand. The fish are driven towards the set net and as they reach it, they jump over it and land in the scoop nets. The scoop is tilted up and the *muli* slack let go so that the fish slide into it. By bending the heads back, the fishes' necks are broken. They are kept in the slack until 8 or 10 are obtained, when they are emptied into *paopao* canoes which are close behind the fishermen. Some of the large scoop nets will hold 15 to 20 fish before they need be emptied. The process of catching the mullet in the air with the scoop net is called *seu'anae*. When the scoop net is opened out and fitted into the fork of the crossbar it is not tied in order that it may be quickly closed when carried to another position.

At Puapua, the mullet fishing takes place between the reef and a ridge of unsubmerged rock running parallel with the reef at a place called Utuutu. A long net is stretched to form a deep U between the rock ridge and the reef with the open part facing to the east. The schools of fish come from that direction and when a sufficient number have entered the open enclosure, an-

other shorter net is run across the opening to close it. The scoop nets are then used on the outer side of the curve of the first net. Sometimes another school arrives before the first school is disposed of. These are kept waiting by shaking the short cross net. When the first school has been disposed of, the short net is drawn aside and the second school allowed to enter, when the short net is again drawn across. The schools which are kept waiting outside the short net are termed *tautau 'upenga*.

The mullet caught with the *tolo matu* and *alangamea* are red-lipped and hence called *'anae ngutu mumu* (*ngutu*, lip; *mumu*, red). This distinguishes them from the other mullet (*'anae Samoa*). The red-lipped mullet are stated by tradition to come from Fiji. The Samoan mullet is usually caught in an ordinary net, but the *alangamea* scoop is used for it at Nuuli (Tutuila), Palauli (Savaii), and also at Leulumoenga and Falelatai in Upolu.

The red-lipped mullet appears first in Upolu at Moataa. They are stated to come direct from Fiji to enter through a passage in the reef near Moataa in October. After passing along inside the reef, they move out through another passage near Vaiala and go on west to Savaii. At Savaii they enter through a channel called Tautu, which is opposite Iva. They proceed along inside the reef as far as Tuasivi, near which they pass out again. Further to the west, they re-enter the lagoon at Lano and go on to Puapua, where they are last seen. The season extends from October to December. The fishing is naturally best at Moataa, where up to 3,000 may be obtained at one catching. The shoals are further depleted at Iva before they reach Puapua, but Puapua, though last, is not least in tradition.

In Tutuila, the red-lipped mullet appear only at the western end. They appear first at Lauanae and then move westward to Amanave near the lighthouse island. Here they are caught in nets stretched across a channel between the small island and the coast. No *alangamea* scoop net is used.

TRADITIONAL ORIGIN

Sina and her daughter came from Fiji with a fish called *le 'a a Sina* (Sina's fish). They landed at Sangone in Savaii and travelled overland through the Saleleanga district, the fish following at sea. Sina, who was blind and led by her daughter, travelled through as far as Puapua without anyone offering hospitality on the way. At Puapua, she was entertained by Pau and Ungalo. In gratitude, Sina gave her fish to the village. To catch the fish, she told Pau and Ungalo to order the people to collect mats made of pandanus and coconut leaves. She indicated that the place within the reef, Ututu, should be enclosed with mats between the ridge of rocks and the reef, leaving an opening towards the east. When the fish entered the enclosure, the open end was to be closed with more mats. The people were to surround the enclosure and catch the fish in other mats as they jumped over. This was carried out successfully. Sina ordered that the catch should be divided amongst the villagers, always after a share for herself had been set aside. The following prohibitions were made:

No coverings were to be used on the head except lime.

No coverings were to be used on the body except the ti leaf kilt (*titi*).

In this manner the body was to be exposed to the sun or the rain.

One day Sina's daughter came back from the beach saying the fishermen had returned home without leaving out a share for her. Weeping bitterly over this neglect and disrespect Sina set out to leave the village, her daughter leading her. The chief Le Malu, however, met her and finding that she was leaving the village, he begged her to forgive the discourtesy and remain. Sina remaining obdurate, Le Malu abased himself before her by throwing himself face downwards across her path (*pa'u fao*). He begged her first to rest in his house and then to take his daughter as food for her journey. Such respectful treatment had the effect of inducing Sina to stay.

Sina then gave the rule over her fish to Le Malu and delegated to Pau and Ungalo the task of watching for the coming of the schools of fish in the following words: "Ia fa'ala ma fa'aua ia Pa'u ma Ungalo i le va'ava'aina o le fa'apea sau, 'ae pale 'oe i le fa'" (May the sun scorch and the rain drench Pau and Ungalo whilst watching for the fish whether it will come but you Le Malu rule over the fish).

Subsequently, Le Malu, in consultation with Pau and Ungalo, decided that Toaloa should be *le mata-o-le-fa* (the watcher for the fish).

To this day, a descendant of Toaloa holds the hereditary position of watcher for the fish. He stands to the east of the grounds and signals when the shoals are coming. The story goes on to say that the mats were changed to nets by the order of Sina.

Lack of agreement in tradition is seen in the Tutuila story.

Two youths of Tutuila went to Manua. On returning on their canoe a man on the coast of Tau called. They took no notice until they found they could make no progress. The canoe would not go forward. They took the man aboard, who was really the god Tangaloa. As they neared the islands of Tutuila, Upolu, and Savaii, Tangaloa hid the land so that they travelled on to Fiji.

From this he was called Tangaloa-afi-nu'u (The concealer of land). At Fiji, the tale records their success in evading the pointing finger of the King of Fiji, which killed all against whom it was directed. Tangaloa sent the boys back with the 'aulozoloso (flower stem of the coconut), the breadfruit (*manaveare*), and the 'aue (mullet). He told them not to hail out their canoe. Opposite Puapua in Savaii, the canoe was heavy with water. They disregarded the command and in hailing out the canoe the mullet was cast out at Puapua. The boys were brothers of Tuiafano.

The use of the *alangamea* scoop net at Nuunuli for the Samoan mullet is an importation from Upolu and Savaii. Originally a framework, like a bench with a high back, was made of poles, and from a resemblance to a canoe (*va'a*) was termed *va'a tapa'au*. This was covered with coconut leaf mats (*tapa'au*). A number of them placed outside the *tolo matu* set net. People then chased the mullet from the inside. When they jumped over the net, they struck the high back and fell down on the bench part where they were secured.

Besides mullet the long net was also used to enclose the *matu*. It received its name *tolo matu* from this use. The term *tolo* is to curve around a net and set it by pushing it forward with the feet as in the use of the *lauloa*. The net thus encircled the *matu* and the enclosure gradually decreased in size. The *se'i* hand net was used for picking the fish up and it formed part of the equipment with the *tolo matu* net.

Shark nets (*'upenga malie*.) Shark nets as described in Tau were made of the thick three-ply twisted cord of *matiaata* bast. The mesh was large; the

length about 50 yards, and the depth 18 feet. Floats made of breadfruit wood were attached to the upper rope at about 2 feet apart. Large stone sinkers were attached at either end and a lighter one in the middle. Two such stones are shown in Plate XI., *D*: one with a well marked longitudinal groove on either side was secured by Mr. Judd at Leone and was held to be an anchor for a special bait used in connection with the net. It could serve both purposes.

The bait consisted of two kinds: the *maunu seu* tied to the top line, and the *maunu tau*, tied to the meshes at different parts. The bait of fish attracted shark and other large fish which, in trying to secure the bait, got caught by the gills in the meshes.

The net is set outside the reef and at right angles to it. It had to be set in water that was not too deep. The stone sinkers or anchors (*taula*) had to rest on the ground. Hence the saying, applied to a dreamer who makes impractical suggestions with no sense in them: *Lafo le taula i fonua* (Drop the anchor where it will reach the ground).

With the first anchor near the reef, and the bottom line resting on the bottom, the floats are dragged under but still serve to keep the net upright. The upper line at each end has a large float, which reaches the surface and indicates the position of the net. The net is set in the afternoon and left until morning as the fish are caught by the gills at night. When the net is set, it is termed *fa'atofa le 'upenga* (putting the net to sleep for the night). The term is used only with a shark net.

In Asau, Savaii, a large net (*'upenga tanifa*) made of breadfruit was used for netting a kind of shark (*tanifa*) which came into the lagoon in large numbers at a certain season.

Breadfruit bast net. The net (*'upenga 'ulu*) is made of the bast preferably of the *aveloloa* breadfruit. The bark from shoots is scraped like the paper mulberry on a board but it is never beaten. When fresh, the bast is easily snapped but when dry and rolled (*milo*) into twisted cord, it is very strong.

The people at Safune had made a similar net but had given it as a present to the village of Leauvaa in Upolu. Fortunately, I tracked it down at Leauvaa and located it hanging up in a shed. The cord was of two-ply twist of the size of very thick string used in tying parcels. It varied considerably, however, in different parts of the net, some parts being comparatively thin. The mesh was 3 inches each way. The top rope was of five-ply sennit braid with a short length of three-ply added. The floats were the usual round sections of wood, some being 4.5 inches long by 4.5 inches in diameter; others were 3 inches in each measurement. The top rope was tied directly round them with the float knot in the usual way. The bottom line had no sinkers but was fixed to the bottom by rolling coral boulders or rocks over the line to rest on the net. The depth was 10 feet but the length which was considerable could not be ascertained. The net had a purse (*nuli*).

This particular net was said to be made from the 'ulu manu'a variety of breadfruit. It was called an 'upenga 'ulu from the material but the same type was called 'upenga tanifa in Asau from its function. Though the tanifa (a shark with three dorsal fins and a long thin tail like a *malaui*, caught within the reef in the passage, and close to the village at full tide in season) name is given, all fish that enter are grist to the mill.

Turtle net ('upenga 'afa). The turtle net gets its name of 'afa from the three-ply sennit braid with which it is made. The braid is slightly thicker than the ordinary braid used in lashing houses.

The only net in Savaii was seen at Ngataivai. The mesh was 13 by 12 inches and tied with the usual netting knot. An idea of the size of the meshes may be obtained from Plate XLV, C. The top line was of three-ply braid of the same thickness as the net material. The floats were the usual round sections of wood, but in tying them with the top line the marginal mesh was caught in with the tie.

The float line was threaded through the marginal meshes before each float was tied on. The bottom line consisted of a well made five-ply sennit braid threaded through the marginal meshes. Stone sinkers were tied on the bottom line by a separate cord.

The net was 24 meshes deep and each mesh was a foot deep. Made in two parts, each about 34 fathoms long, the nets were wound separately on stout poles which served the purpose also of carrying poles hoisted on the shoulders of two men. The village of Ngataivai is in two parts, one on either side of the Ngataivai stream. As the full net was owned by the community, one portion was kept on either side of the river. When the head fisherman decided the time was favorable for turtle, the two sections were assembled and the village took part in the fishing.

The turtle net is used on the rockbound cliff-girt coast west of Ngataivai where there is no reef. The net is carried on canoes with the netting party while lookouts travel along the top of the cliffs looking for turtle. On seeing them, the lookouts signal the canoes and indicate where they are. The net is dropped in a line parallel with the shore opposite the point indicated. The men then jump overboard and form lines from the ends of the net to the shore. They beat the surface of the water with sticks (*lauta*). The shore ends of the lines then work inwards to join and then advance towards the net driving the turtle into it. The turtle get their heads through the meshes and are caught up in the net. In removing turtle, the front fins are held and the turtle guided in the required direction. In the daytime, the turtle are seen and readily removed. In netting at night, larger turtle are caught. Owing to the darkness, however, the net and turtle are bundled up together and taken ashore.

Parts of the hook. Hooks are regionally divided into the shank, bend and point. The point may be provided with a barb. Samoan trolling hooks are composite and consist of two pieces. One piece forms the shank, which is shaped to represent a fish and is termed the *pa*. Thus, the shank which is the characteristic feature of the hook as against the general *matau* came to represent the type. The other piece forms both the bend and the point and is called the *manga* (branch or fork). Churchill quoted by Beasley (1, p. 22) was in error in stating that *maga* (*manga*) is the pearl shell shank.

The second piece, though it forms the bend and the base lashed to the shank as well as the point, will hereafter be referred to as the point in preference to barb as used by Beasley. The barb is a special oblique projection backwards from the actual point made for the specific purpose of preventing the point from slipping out and becoming thus freed by the struggles of the fish after it has been pierced by the point. It is a distinct invention of some cultural importance and is not present in the Samoan trolling hooks so far examined. Their feature is that the points are without barbs.

The snood is the piece of cord or line attached directly to the hook which together with the lashing forms an essential part of the completed hook.

The hackle consists of something added in the form of fibre, feathers, or hair to represent the tail or fins of a fish and so adds to the efficiency of the lure.

Manufacture of hooks. The making of hooks was expert work and a master fisherman (*tautai*) was not always a good hook maker. A certain amount of ceremonial is observed in making bonito hooks. The craftsman works indoors seated on a raised pile of mats. When employed by a chief, the chief has to make a special oven of food and send him a basket of cooked food of good quality.

The materials required were shell for the shanks, turtle shell for the points, cord for the snood, fine threads for the lashings and feathers, and strips of *fau songa* for the hackle.

The tools were the drill (*vili*), rubbing stone (*foanga*), and cutting implements. In these days, a saw is used for cutting the shell and a foreign grindstone for rubbing down. In ancient times, stone flakes must have been used for cutting the shell. The Samoan type of drill (fig. 282) is still in common use but the point is steel instead of stone. The disc which acts as a balance is termed *tateme*, *livaliva*, or *vinavina*.

The drill is used by twirling the upright so as to wind up the cords supporting the handle. The winding raises the handle. The point of the drill is placed on the object. When downward pressure is exerted on the handle, the cords in unwinding cause the upright to revolve. Sufficient pressure is used to cause the upright to go on revolving after the cords are fully unwound,

and thus wind them up again in the opposite direction. The craftsman keeps his fingers over the handle and when it rises to the requisite height, he presses again. Practice enables the right amount of pressure to be judged. The upright thus revolves backwards and forwards alternately with each application of pressure to the handle. Some of the handles now consist of a wider piece of wood with a hole through the middle which is slipped down over the upright. The hole is large enough to allow it to work easily up and down on the upright. The detached handle is worked almost as easily for the

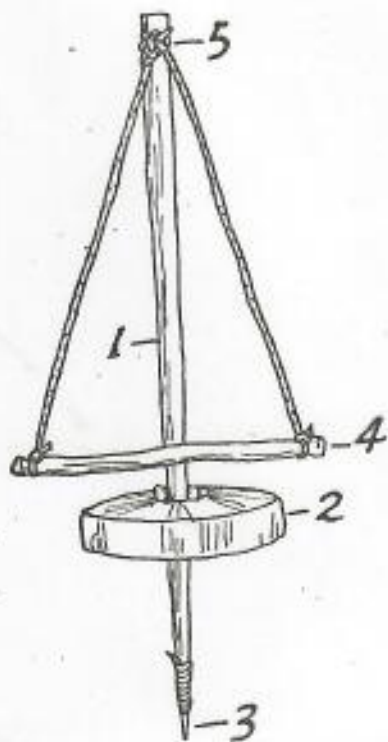


FIGURE 282.—Drill (*auvili*). The drill of average size consists of an upright stick about 17 inches long and barely 0.5 inch in diameter. The stick (1) also receives the name of *uvili*. A wooden disc (2) about 4 inches in diameter, perforated with a central hole, is run up on the stick to about 6 inches from its lower end and kept in position if necessary with wooden wedges. The lower end of the upright supports the boring point (3) which may consist of a stone flake and in some cases of a spine of the *urus* (*Echinus*). The point is thus called *mata* (point) or *matatama* or simply *urus* from the *Echinus* spine. The point is lashed to the upright with fine cord. The handle (*au*) consists of a crossbar (4) of about the same thickness as the upright and about 7 inches long. A piece of sennit braid or twisted cord is tied by its middle round the upper end of the upright with a clove hitch (5). The two ends are then tied to the ends of the crossbar handle so that when the handle hangs down it is about an inch above the balance disc.

forefinger and middle finger extend across the handle on either side of the upright and slide up and down in this position to keep it straight.

The movement of the drill has been made the subject of many sayings. In them the credit is given to the point. The revolving balance is somewhat unjustly regarded as making a lot of movement or dancing (*siva*) and doing no work. "Ua tu le matavana i le fingota 'ae siva le livaliva" (The point formed by the echinus stands up [to work] the balance dances).

Pratt (23, p. 128) gives the following: "Ua se temeteme" (Like the stick of a drill): "Applied to a restless, useless man who talks a great deal, but does nothing useful." The term *temeteme* is a variant of *tateme*.

THE LARGE TROLLING HOOK

The *tangi* is a deep sea fish larger than the bonito. The hook as verbally described was said to be larger than a bonito hook. It was a composite hook made in two pieces and the point was lashed to the shank in exactly the same way as in the bonito hook. No complete *pa tangi* was seen and it is not figured by Beasley, Demandt, or Kramer. Mr. Judd (17, p. 61) secured a large shank (Pl. XLVII, B, 11) at Leone which the owner said was a *pa tangi*. The shank, made of *lei* (whale ivory) is long, with its widest part near the head pointed end, and narrows to the end which bears the point. The front has a flat surface for the attachment of the point, while towards the head, the two rounded sides meet in a median ridge which extends to a point. A transverse hole is bored through under the median ridge in the head part. The back, convex longitudinally and slightly so transversely, is covered with colored pearl shell, neatly fitted and lashed through two paired holes which meet in the body of the shank to allow the lashing to pass through. The paired holes are towards either end of the pearl shell plate. No point was obtained with the shank, but the owner stated that one made of *nivao* hard wood had been attached when used by his grandfather.

Tongan hooks with identical shanks and barbed turtle shell points are well established. They are figured by Beasley (1, Pl. XXXVI) and a specimen in Bishop Museum is figured in Plate XLVII, B, 12.

The fact that the type of shank is not elsewhere recorded from Samoa throws serious doubts on the shank being native Samoan. Confirmation is required before it can be accepted as representing the *pa tangi* of Samoa. On the other hand I have no definite information as to what the Samoan *pa tangi* was like except that it was a trolling hook of larger size than the bonito hook.

BONITO TROLLING HOOK

The *pa'atu* (*pa*, hook; *'atu*, bonito) is a composite two-piece hook with a shell shank and a turtle shell point. (See Plate XLVII, B, 2-5). It is still in

common use and is made and lashed with the old technique except for the implements used.

Shell. All shanks are now made of pearl shell, as the shell is readily obtained from other parts and even stocked for sale by traders. Occasionally, in a remote village, a person not having pearl shell may fall back on other shell or even wood. As pearl shell does not belong to Samoan waters recourse was had in former times to other material. A *tofo* bivalve (*Perna*) and a siliceous rod-like material (*tio*) formed in the borings of certain sea worms in coral rock were used and probably other shells as well.

The shell is selected in various shades of color to suit different conditions of water and weather. The *pa tio* forms a very white hook suitable in cloudy weather. So also is the *pa usi*. The *pa laumilo* is yellowish-brown (*memea*) and the *pa ulia* has a dark part towards the distal end. The *pa lautofe* (*Perna*) is shiny and iridescent. In Manua, the name *pa sulu* was given to a brownish color (*enaena*). Demandt (9, p. 77) also records the names *pa lanulua* and *pa lupovai* as other varieties of shade and material. The craftsmen were expert at producing shades of color by varying the amount of the dark outer surface removed in grinding.

As regards size, the large hooks were named *pa no'ono*. The smallest size was termed *pa maunu* as it was said to act as bait (*maunu*) to attract fish.

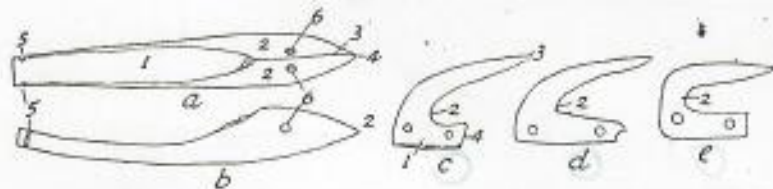


FIGURE 283.—Bonito hook shanks and points: *a*, front view; length, 103 mm.; greatest width, 15 mm.; tail width, 8 mm.; the inner surface (1) of the shell forms the front part and carries the point at the tail end. The front of the head end is ground at an equal slant inwards from the sides (2) to meet in a median longitudinal edge (3) making the head triangular in cross section. The two sides and back narrow to a point (4). The sides are grooved (5) near the tail end to take the end lashing (*fansanga* *ʻu*). *b*, Side view; maximum thickness of head, 15 mm.; thickness of tail end, 5 mm.; hole (6) drilled transversely through head 20 mm. from the point (4) and about 4 mm. below the median edge. The raised part of the head with the median edge is called *isu* (nose) in Tutuila. The sides of the tail end are vertical or slightly convex. The back is convex longitudinally following the outer curve of the shell but owing to the narrow width is flat transversely. The tail portion is concave longitudinally in front. *c*, The point; straight base, 20 mm. long; two holes for lashing; slant edge on right; depth of base part, 6 mm.; point diverges out being 26 mm. from front of shank. The point element carries the base (1), the bend (2) and the actual point (3). *d*, Point portion; straight base, 30 mm. long; curved right edge to base; depth above right hole, 7 mm.; sharp angle at bend (2); point diverges out being 26 mm. from front of shank; *e*, point portion; base 26 mm. long but curved on left; depth of base, 7 mm., with vertical right edge; point parallel with base line and 20 mm., from front of shank.

Shank and point. The pearl shell was cut across the thick hinge part to include it for the head (*ulu*) while the thinner inner part of the shell formed the tail (*ʻiʻu*). Head and tail are the terms applied by the Samoans to the proximal and distal ends, and as the shank is made to represent a decoy fish, the terms are useful descriptively. Sizes vary but a fair range in length is between 65 and 105 mm. (See figure 283.)

The point is made of turtle shell (*una laumoi*) although some are made of pearl shell, generally of the darker part towards the edge of the shell (See Plate XLVII, B, 4.) It is, however, not usual and the points so made have probably been due to lack of turtle shell and not to election. The points are devoid of barbs and are shaped as in figure 283, c, d, and e.

The hackle is composed of strips of *fau songa* fibre.

The lashing of the two parts together is termed *fausanga*. Considerable variation exists in the number of times the binding thread passes through the various holes, the circumferential turns round them, the twists round the cord, and the fixation by half hitches and stop knots. Each combination forms a *fausanga* which is no haphazard-arrangement but one with a definite count. Different experts have their own combinations. Some *fausanga* which are supposed to be better and luckier than others are kept secret by their exponents. Hooks with the attached snood were sometimes stolen by fishermen in order to study the lucky combination and commit it to memory.

In dealing with the shank, the tail end which carries the point is termed *lalo* (below) and the head end with the snood is *lunga* (above.) *Lalo* and *lunga* as meaning below and above are also applied to relationship with the snood (*ta'a*) when the point is in the horizontal position. The *fausanga* besides including the whole process of lashing also refers particularly to three local lashings that pass through the two holes of the point and the hole through the head of the shank. The first step is to lash the *manga* point to the distal end of the *pa* shank and the second to attach the *ta'a* snood. The lashing to be described was written down by Le Oso Ripley, senior talking chief of Leone in 1920, for his son Fepuleai, who demonstrated each stage from his father's manuscript. To give an idea of the formula and the details that had to be remembered, it is given in full with the technique of the first stage of lashing in figure 284, showing the various parts named.

The point (*manga*) has been firmly fixed to the shank (*pa*) by three lashings through the inner hole (*fausanga loto*) and the lower tail hole (*fau-sanga ʻiʻu*) while four running loops have been placed in position for the attachment of the hackle (*senga*). The next stage consists of attaching the snood (*ta'a*) to the point. (See figure 285.)

The preliminaries of attaching the snood and lashing cord (*alaala loloa*) to the inner hole of the point having been done, the hook is fixed in an

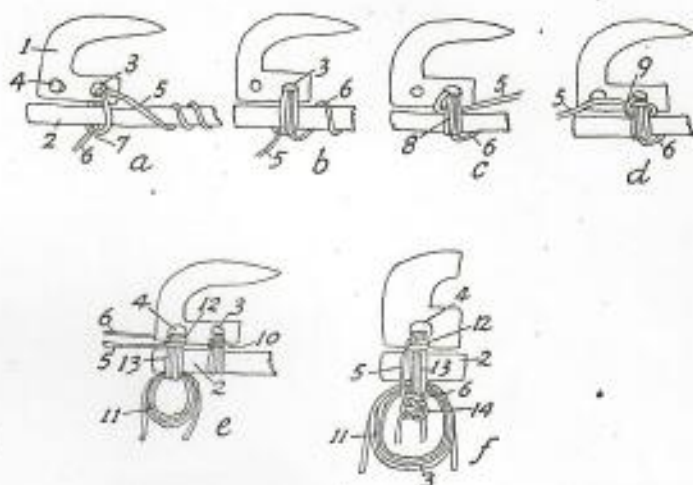


FIGURE 284.—Bonito hook, lashing formula and technique of lashing point to shank. Lashing formula: 2 fausanga loto, 2 langolango i tutui i lunga, 2 fausanga i'u, 2 langolango i tutui i lunga, 2 noatanga o le fausanga i'u, 1 lona fa'apona, 4 o le senga, 2 alaala lotoa i loto o le ta'a, 6 le alaala lotoa, 2 lave noa, 4 fausanga o le i'ru, 5 fausanga i lunga o le ta'a, 4 fa'amaunga, 4 senga sele manu pito alaala lua, 2 noatanga o le senga, 2 ona fa'apona. The numbers refer to the number of turns taken with each step mentioned.

Lashing of inner hole (*fausanga loto*): *a*, The point (1) is placed in position on the front of the lower end of the shank (2) and lashing commences with the inner hole (3). A length of thread is passed through the hole to its middle. Each half of the thread is dealt with separately so the near half (5) is wound spirally around the shank to keep it out of the way. The formula says "2 fausanga loto" which means 2 complete turns through the inner hole with each half thread. The far thread (6) is brought around under the shank, through the hole from the near side and through the first turn under the shank. The thread is drawn taut with the crossing (7) kept in the middle line under the shank. *b*, A second similar turn is made and the thread (6) wound around the shank out of the way after the thread (5) has been loosed. The thread (5) makes two similar turns which really amount to 4 half hitches. *c*, The formula demands two *langolango* turns, which consist of half hitches made round the previous turns of the lashing and corresponds in principle to the circumferential turns (*langolango*) used in house and other lashings. The thread (5) which ended at the half hitch below (*b*), continues its course upwards and passes through the hole from the far side to make the two *langolango* half hitches round the near lashing (8). The question of which side to enter under is decided in the formula by the words *tutui i lunga* (thread towards the upper end). The thread (5) therefore passes under the lashing (8) from the lower end. *d*, The thread (5) completes the half hitch (9) by passing back over the lashing and through its own loop on the lower side of the lashing. The hitch is drawn taut. *e*, The thread (5) completes the second half hitch and the other thread (6) after passing through the hole from the near side, makes two half hitches around the lashing on the far side of the hole. The ends of the two threads are disposed of by making single overhand knots as close to the lashing as possible and then cutting them off. The knots act as stopper knots to prevent the ends slipping through the half hitches. The *langolango* hitches (10) complete the full technique of the *fausanga loto*.

The tail lashing (*fausanga i'u*) is made through the outer or tail hole (4) but differs from the previous lashing in having to provide for the *senga* hackle. The hackle is provided for in the formula "4 senga sele manu pito alaala lua" (4 slip loop [*sele manu*] with

a long thread [*alaala*] with 2 ends [*pito iua*]. A long length of thread (11) is therefore formed into 4 ordinary loops in the middle part to allow of the two ends being free. The loops (11) are placed longitudinally against the under surface of the shank (2) below the hole (4), and held while another thread is passed through the hole to its middle. The formula says "2 *fausanga i'u*" so two half hitch turns are made with each half of the thread in exactly the same way as in the preceding lashing, but in passing around the shank, the turns pass through the open loop of the *senga* tail (11) and lash them securely to the shank. The *langolango* bali hitches (12) are made around the lashing (13) from below upwards as in (c) and the ends of the threads (5, 6) left long, *f*. Instead of finishing the threads with overhand knots (*pona*), the formula says "2 *noatanga o le fausanga i'u*" (2 knots of the tail lashing). The term *noatanga* means the single turn of a reef knot and 2 *noatanga* thus means a complete reef knot. The 2 threads (5, 6) are therefore brought down and tied in a reef knot under the shank. The reef knot (14) is shown loose in the figure to illustrate the technique but when drawn taut against the shank, the tie further assists in fixing the *senga* loop to the shank. The formula states "1 *lona fa'apona*" (their single overhand knot). The threads are therefore finished off with single overhand knots to prevent the ends slipping through the reef knot made. The formula merely states "4 *o le senga*" (4 of the *senga* tail) so the 4 loops of the *senga* already in position (11) are left for subsequent treatment.

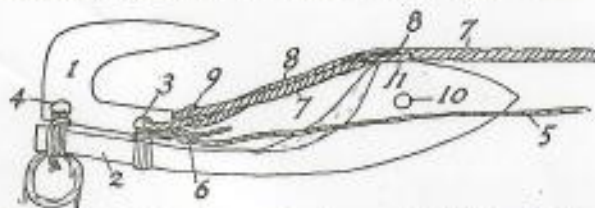


FIGURE 285.—Bonito hook lashing, tying the snood (*ta'a*) and the lashing thread (*alaala loloa*). The lashing thread (5), about 6 feet long, is drawn through the inner hole (3) to within 6 inches of its end and tied with a reef knot (6). The snood (7), made of three-ply twisted *fau senga*, is also passed through the inner hole (3) and tied in the first part (9) of a reef knot (1 *noatanga*), leaving a short free end (8) that reaches to above the hole (10) through the head of the shank. The short piece of the snood is stretched beside the long part and fixed by pushing its end (11) through under one of the plies of the main snood (7) by raising the ply with a pointed stick.

ingenious manner between the knees to give the craftsman easy control while he completes the lashing. (See figure 286.)

With the hook stretched taut between his knees, the craftsman has both hands free to complete the lashing of the snood to the head of the shank as in figure 287.

The lashing is quite simple when worked to a formula. The number of turns and knots, and whether the *langolango* lashings came from below or above, can be varied to form different formulas. The one given was the favorite technique of a master fisherman. Some lashings instead of tying the ends of the threads of the *fausanga i'u* beneath the loops for the hackle tie them over the end of the hook between the shank and the point.

A bonito hook made entirely of coconut wood was seen by Mr. Judd (17, p. 61) on Tau. When turtle shell was not available for points, shell, bone, and even wood (*olioli*) were used as a substitute.

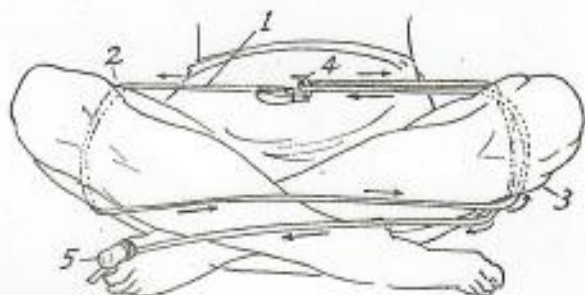


FIGURE 286.—Bonito hook in position for lashing the snood and head. The craftsman sits cross legged on the floor. If the snood is short, a long cord (1) is tied to its end. With the point of the hook to the craftsman's left, the long cord (1) is passed over the right thigh (2), brought back under the knee to pass across under to the left knee (3), and over the left thigh to the middle line where it is hooked around the curved point of the hook (4). The cord is returned over the left thigh under the left knee and across to the right big toe (5) around which it is twisted.

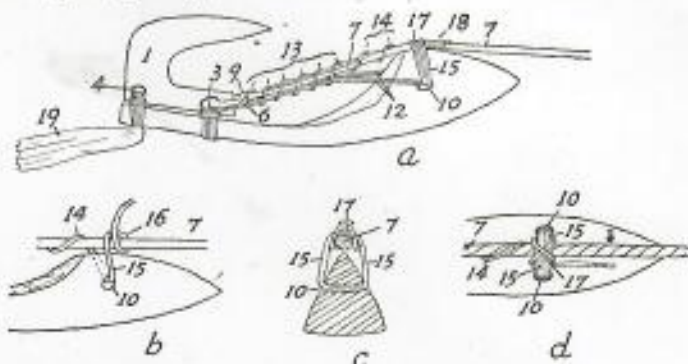


FIGURE 287.—Bonito hook, lashing completed by lashing snood to head: *a*, the figure continues on with the numbering from fig. 285. The formula (fig. 284) states "2 aloala loloa i lolo o le ta'a" (2 turns of the lashing thread below the snood). The lashing thread from its attachment (6) to the point is passed through the head hole (10) and back through the inner hole (3) of the point for the required two turns (12) below the snood. The turns are drawn taut. The formula then directs that 6 turns of the lashing thread be taken around the snood. The 6 turns (13) are made with a wide spiral and by passing around both limbs of the snood and the lashing thread turns (12) through the head hole, the elements are lashed together and tightened up. The formula directs 2 ordinary turns (2 fausanga) which are made around the two limbs of the snood alone (14). This brings the lashing thread above the head hole (10) and the *fausanga o le isu* (lashing of the nose) is proceeded with. In Tutuila, the median raised ridge above the hole is termed *isu* (nose) but in Manua the lashing is termed *fausanga ulu* (head lashing). The nose lashing (15) is shown completed, with figure of eight turns (17) above it. *b*, The detail of the turns through the head hole (10) is shown. The lashing thread after its last turn (14) around the snood, passes through the hole from the far side and passing upwards on the near side makes a complete turn (16) around the snood (7). It passes down through the hole and in all, four turns (4 *fausanga o le isu*) are made through the hole with a full turn (16) around the snood in every case. *c*, Section through hole. The formula asks for 5 turns above the snood (5 *fausanga i luga o le ta'a*). The turns are made diagonally passing through under the lashing (15) on either side of the snood (7)

and crossing in the middle line above it (17). *d*, View from above. The first crossing (17) above the snood is shown. Five turns are made so arranged as to form the simple lozenge motive. Continuing with *a* after the last figure of eight turn over the lashing, the lashing is fixed (*fo'amaunga*) with a series of half hitches (18) around the snood and the end cut off. The formula asks for 4 *fo'a maunga* but more are shown in the figure. The thread is cut off and the actual lashing is completed as shown. The hackle (19) consisting of a small bundle of strips of *fau songa*, is passed transversely to their middle, through the 4 open loops under the lower end of the shank (fig. 284, *e*, 11). The four loops are drawn taut in turn to firmly attach the hackle to the shank. The two ends of the thread are tied in a reef knot (*a noatanga a le senga*) and each thread finished off with 2 overhand knots (*a ona fa'apona*). The two ends of the hackle are drawn together and cut off level (19). A fair length of hackle is 42 mm.

Rods. The hook was trolled from a length of line tied to a rod. Rods are of two kinds; the long and the short.

The long rod (*launiu*) of bamboo (*'ofe*) is about 15 feet 6 inches long, 2 inches in diameter at the thick end and tapering off to 0.75 inches at the other end. The thick end is fitted into a wooden handle. The wooden handle (*tu'an*) has an upper grooved part for the rod and ends below in a knob

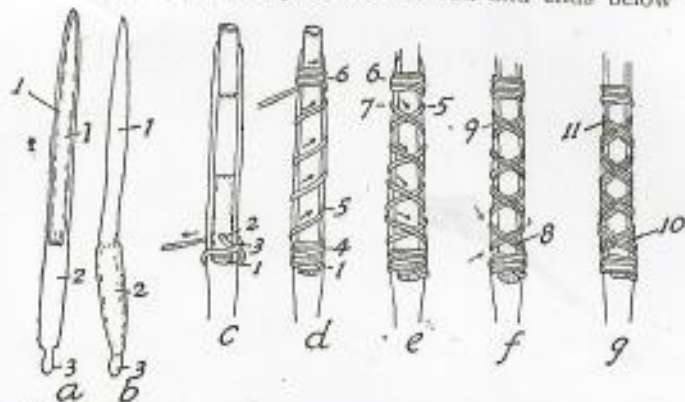


FIGURE 288.—Lashing bamboo rod to wooden handle: *a*, wooden handle, upper view; handle length, 42 inches; upper grooved part (1), 27 inches long; proximal stock part (2) gradually narrowed, ends in rounded knob (3) about 2.75 inches long usually with constricted neck. *b*, Side view of handle showing curve of stock, triangular in cross section with flat upper surface and sides curved to meet in median longitudinal edge at the back. Stock near groove, 2.7 inches thick; sides as well as upper surface narrow off towards the terminal knob. *c*, The bamboo butt end (1) is fitted into the groove of the handle and the two lashed together with sennit braid. The end (2) of the braid is placed over the butt end of the bamboo with an upward slant. A transverse turn (3) is taken around both elements and crossed over the short end to fix it. *d*, A number of close transverse turns (4) are made and the braid end covered by them. The braid is then carried in spiral turns (5) to the upper end of the handle where a few transverse turns (6) are made. *e*, The braid is then carried back with spiral turns (7) which cross the previous turns on the bamboo rod in the middle line. *f*, To make the lashing extra secure, a second set of spiral turns both up (8) and down (9) may be applied close to the first set on the same side of the first set. *g*, In some elaborately lashed rods, a third set of spirals is applied. The third set ascends (10) and descends (11) on the other side of the first set.

Lucky hooks. The hook that figures prominently in old traditions and and is used figuratively to denote good fortune is the *auamanu* while that which brings misfortune is the *auamala*. There is a myth about a rock in a river in Savaii to which the bonito come and leave a portion of their flesh as an offering. If a bonito is caught off Savaii with a portion of its flesh missing, it is held to have been to the rock. Such a fish caught on a new hook is a lucky omen for the owner. His hook has stood the test and will henceforth be lucky. The subject of lucky lashings has been mentioned. An unlucky hook is looked upon as being wrongly lashed (*fausala*).

Mistakes. When a hole is drilled in a hook and is not used in the lashing it is obvious that it has been the result of a mistake or an unsuccessful experiment. A bonito hook in Bishop Museum has two transverse holes through the head. One is 20 mm. from the head point and one is 26 mm. Dr. C. M. Cooke, Jr., of Bishop Museum, as a result of much practical experience in making artificial baits for trolling, states that if the snood is lashed too far from the head end of the shank, the hook will dart laterally too much when trolled. It resembles the pull of a fish. The only way to correct it is to shift the head lashing nearer to the end. This is exactly what has been done in the Samoan hook. The hook was lashed to a hole drilled 26 mm. from the end. Another hole was subsequently drilled 6 mm. nearer the end and evidently gave satisfaction for the snood remains lashed to it.

HAND LINE TROLLING HOOKS

The hand line trolling hook (*pa ala*) is smaller than the bonito hook but like it is a composite two-piece hook with a shell shank and a turtle shell point. It is trolled from a canoe outside the reef with a line but no rod is used. The fishing usually takes place in the early morning and the fishermen have to wake very early in order to be on the fishing grounds when morning breaks. The *pa* hook is thus named *pa ala* from *ala*, to wake from sleep. For a similar reason, the method of fishing is termed *alofanga* but it must not be confused with *alofanga* (to fish for bonito).

Shell. The shank is made from various shells. Pearl shell is rarely used. The best types are made from *pala'au*. This forms the material of the five hooks presented by the Ripley family to Bishop Museum. Other shells used were the *fatuaua* and *foafoa*. Dr. C. M. Cooke, Jr., identifies the Samoan shells as follows:

Fatuaua	<i>Spodylus ducalis</i> Chemnitz.
Foafoa	<i>Cypraca mauritiana</i> Linnaeus
Pala'au	<i>Perna costellata</i> Conrad.

Shanks and points. Two types of shank are made: with a rounded head, if the kind of shell used is thick enough, or flat throughout if it is not. The

round-headed shank (Plate XLVII, B, 6 and 7) is made of *pala'au* shell cut a rounded head while the ordinary thickness forms the tail. (See figure 290, *a-d*.) The flat type of shank (Pl. XLVII, B, 8) is made from *fatuana* and in such a manner that a thick part of the shell provides sufficient material for other shells which are not thick enough to form a rounded head. (See figure 290, *f-i*.) The thickness of material influences the direction and number of holes for the lashing of the snood to the head of the shank. In the rounded heads, which may be 10 mm. thick, a single hole from side to side is bored through as in the case of bonito hooks. In the flat heads, which are 5 mm. in thickness at most, a hole has to be bored through from front to back on either side of the middle line to provide entrance and exit holes for the lashing to pass around the snood. In five *pa ala* in Bishop Museum, the length of the shank ranges from 47 to 62 mm.

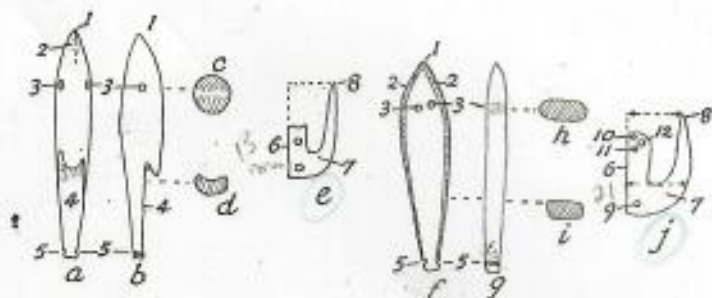


FIGURE 290.—The *pa ala* hooks (two types of shanks with points: *a-e* round shank and point; *f-j* flat shank and point): *a*, Front of round shank, 62 mm. in length and 4 mm. wide at lower end; pointed head end (1) with short upper median edge (2) and hole (3) bored transversely through head; lower part (4) of ordinary thickness with natural inner surface of shell exposed and grooves (5) on sides for lashing the point. *b*, Side view, showing thicker head part and thin lower part, 2 mm. thick at end. *c*, Section through head at hole level, round, transverse and vertical diameters both 10 mm. *d*, Section of upper end of lower part; front surface, concave; back and sides, convex; width, 9 mm.; thickness, 5 mm. *e*, Turtle shell point; straight base (6) for fitting against front of shank, 13 mm. long; two holes for lashings; bend (7) and sharp point (8) without barb; greatest length, 25 mm.; width between point and line of base produced, 12 mm. *f*, Front of flat shank, 57 mm. long; pointed head end (1); convex sides (2) showing; two holes (3) bored through from front to back, on either side of middle line and not necessarily on the same level; grooves (5) on sides at lower end for lashing. *g*, Side view, showing thin nature of shell throughout which does not exceed 5 mm. in thickness; transverse single hole thus impossible and replaced by two holes from front to back. *h*, Cross section near holes; sides well rounded off, convex; width, 13 mm.; thickness, 5 mm. *i*, Section lower part of shank, showing steeper sides; width, 10 mm.; thickness, 5 mm. *j*, Turtle shell point; straight base (6), 21 mm. in length; bend (7) and sharp point (8) without barb; greatest length, 27 mm.; width across inner angle of bend, 16 mm.; width between point and line of base produced, 15 mm. Most points have two holes, but the point figured has four. The two holes (9, 10) are the lashing holes. The hole to the outer side (12) was evidently made for the snood but being unsuitable another hole (11) was bored to which the snood is attached in the actual hook.

The points are made of turtle shell 3 mm. thick and of the same shape as the bonito hooks with a long base, bend and sharp points without barbs. Demandt (9, Pl. IV) figures a *pa ala* hook with a barb on the inner side of the point but it is not the normal technique and has probably been due to foreign influence. The hooks are still made and it would be an easy matter for a craftsman to copy the metal barb of a trade fish hook. Holes are drilled through the base of the point and the normal number is two, as in the bonito hooks. The point in figure 290 *j*, has four holes; two for the lashings, a third special hole for the snood, and a fourth without use. The provision of a third hole for the snood is not normal and may be regarded as a later development but whether it took place before native pastors and others introduced innovations from other areas, it is difficult to say. The fourth hole is due to faulty judgment in placing it to the right out of alignment with the two lashing holes which altered the line of pull. On tying the snood to it, the hook proved unsatisfactory and another hole had to be bored in the same line as the two lashing holes. The fourth hole (third in order of boring) thus became useless, serving no purpose except to indicate that mistakes are made. Had the unlashd point found its way into a collection, an ethnologist would be tempted to say that there were three lashing holes and a hole for the snood. Departures from the normal that are difficult to explain may thus be due to simple mistakes as well as freaks of genius. (See fig. 290 *e*, and *j*.)

The lashing in the usual two-hole point follows that used in the bonito hook but there are usually less turns through the holes and round the shank. The inner lashing (*fau sanga loto*) may not have the transverse *langolango* turns. The fibre hackle fixed by the outer end lashing though present is smaller and shorter, ranging from 7 to 10 mm. in length. It is not fixed transversely by special *sele* loops as in the bonito hook. The fibre is laid longitudinally along the back of the shaft and included with the shaft in the first turn of the end lashing (*fau sanga i'u*). The end towards the head is then doubled back and the subsequent turns of the lashing pass over both limbs of the hackle concealing the doubled-over part.

The snood is formed by the end of the length of line to be used in trolling and is composed of a three-ply twisted cord of *fau sanga* which is much finer than the snood of a bonito hook. In the two-hole shank it is passed through the inner hole. It is tied with a single knot and the short end is doubled back along the snood to be pushed under a raised ply near the head as in the bonito hook. A long *alaala* fine thread is tied to the inner hole and wound round the snood for a few turns. A small white feather is laid on each side of the snood with the quills towards the head but not reaching the head hole. The thread is wound spirally round both quills and snood and a couple of half hitches made to firmly fix the feathers. The thread continues the turns round the snood. Above the transverse head hole, the thread passes down

through the hole and some turns are made over the snood and through the hole, finishing up with crossed turns over the snood and transverse turns between the snood and the shank and round the lashing as in the bonito hook.

In the flat shank the lashing is similar, as the snood passes between the two head holes. In making the turns over the snood, the thread passes down through one hole and up through the other.

In the *pa ala* lashing, the thread does not pass directly from the inner hole of the point to the head hole before twisting round the snood as in the bonito hook. Various extra turns to those described are made with the fine thread in some hooks.

In the three-hole point, the inner lashing is made through the innermost of the three holes while the snood is passed through the middle hole. The two limbs of the snood then pass back to be tied in a single knot beyond the head end of the base of the point. In passing back, the snood covers the inner end hole and it may not be noticed at first that there is a third hole.

The line. The fine line which is continuous with the snood is 9 or 10 feet long and is called the *matai afo*, which really means the head or leader of the fishing line. This is joined to the *afo* (line) which consists of five-ply sennit braid about 22 feet long. The join is made by tying an overhand knot on one end of the sennit line and then another overhand knot about an inch further back. The end of the fine line is stoppered with an overhand knot and then tied round the sennit line beyond its inner knot with an overhand knot. A couple of half hitches are then made around the sennit line between its two knots and the join is complete. The other end of the sennit line is stoppered with an overhand knot and then tied around its standing part with another overhand knot to form a long loop.

When not in use, the sennit line is wound up in long loops as shown in Plate XLVII, B, 6 and 7, and the fine line wound transversely around one end for a number of turns, tied in a half hitch and finished off in transverse turns around the other end. Another half hitch is made and the hook point stuck under the transverse turns. Numbers of these lines characteristically wound up have found their way to museums and have been confused with bonito lines and hooks. The *pa'ala* is always attached to a fine *fau songa* twisted line and the line lengthened by five-ply sennit braid. The bonito hook is never attached to such a line and when not on a rod, is attached to a short snood of much thicker cord.

Feather hackle. More than two feathers may be attached to the snood. The quill ends may reach the head hole and some of the barbs included under the crossed turns over the snood. The tips may cover the point. Stair (33, pp. 203, 204) was surely in error when in describing bonito fishing he states that the shell hook was furnished with white feathers on either side. He has confused the *pa ala* hook with the bonito hook. Feathers are not attached to the

snood of a bonito hook but the hackle consists of fibre attached to the back of the shank by an addition to the end lashing. Beasley (1, p. 23) has accepted Stair's statement, hence this correction. Turner (41, p. 169) in describing two small white feathers as fastened alongside the hook, goes on to say that the hook was cast adrift at the stern of the canoe with a line of twenty feet. He thus correctly describes fishing with the *pa ala* and not bonito fishing as Beasley justifiably inferred from Stair's account. In Turner's description there is no mention of a bonito rod as the method Turner was describing was not bonito fishing.

Method of fishing. Fishing takes place in the early morning, commencing at about 4 A. M., or in the evening from 5:30 P. M. to 7 P. M. The small *paopao* canoes are used in the trolling which takes place outside the reef. The slip loop on the end of the sennit line is tightened around the big toe to fix the line. Movement but not speed is required as there is no racing school of fish to keep up with. Because it is less strenuous, the method is freely indulged in by chiefs and is regarded as a chiefly pastime.

The line is dropped overboard and the canoe may be paddled with both hands as the line is attached to the big toe and any bite can be felt by that member. The usual way, however, is to pick up the line with the right hand and give it a pull now and again (*fa'atata*) while the left hand keeps the canoe moving with the paddle. The method was seen in use inside the lagoon at Savaii. While the left hand paddled, the line was given a number of pulls to move it more quickly through the water. It was also brought in* to the canoe and then cast out to its full length. The principal fish caught was the *malauli*.

Kinds of hooks. A number of names indicating color and material are given to the *pa ala* as with bonito hooks. Demandt (9, Pl. IV) pictures a number of hooks and shanks duly named. Four round shanks evidently made of *pala'au* shell are named *ulutoto* or *laveuli*, *lavelei*, and *ululalafi*. The term *ulutoto* (*ulu*, head; *toto*, blood) evidently refers to the dark markings of the shell at the head. Three flat shanks are named *lau*, *pa ala*, *sina*, and *foafoa*. The *foafoa* hook is figured with two pairs of holes through the head. From appearance, the lower pair is misplaced by being too far back from the head point and thus causing side darting when trolled. To correct this, the craftsman bored the second pair very close to the point, unnecessarily close probably owing to the previous mistake.

HAND ROD TROLLING HOOKS

The *pa seuseu* (Pl. XLVII, B, 9, 10), the smallest of the four types, is attached by a line to a hand rod which is repeatedly cast and drawn in as in angling for trout. The motions of casting and drawing in is called *seuseu* and gives the name of *pa seuseu* to the hook. Owing to its small size it is also called *pa laiti* (*laiti*, small).

Shell. The hook is a two-piece composite hook with a shell shank and a turtle shell point originally. The old time point has now been completely superseded by small trade fish hooks of metal.

The shank owing to its smaller size with no problem of a deeper head is made from any of the shells enumerated with the bonito and *pa ala* hooks. The edges and left over pieces are also utilized. Demandt (9, p. 29) enumerates other shell material as *'alī'ao* (*Trochus*), *alili* (*Turbo*), *faisua* (*Tridacna*), *fole* (*Pinna*), and *tofe* (*Perna*). The *fole* seems rather thin material but it is evident that in small hooks, any suitable shell was used. Owing to the small amount of material required to form a shank the range of shell material was vastly increased. Different districts utilized the available shell along their coast boundaries. The *tupe* (operculum) of the *alili* (*Turbo*) is also used. The use of the various shells was to get different shades of color. Demandt (9, Pl. III) pictures a fine assortment of shanks arranged according to color and material.

Shaping. The shell is now shaped with the saw to a long rectangular form and the back rubbed down on a stationary grindstone kept wet with water. Two holes close together and in the same transverse line are bored through at one end with the Samoan drill. The rubbing down of the back passes through three stages: first it is rubbed flat until it approaches the required thickness; then it is rubbed at a slant on either side of the middle line so as to form a median longitudinal edge; lastly the median edge is rounded off. In the last stage, the shell is frequently dipped in water to clean it and held up to the light to see that it has the right shade of color. The different color of the outer surface of the shell is carefully ground off towards the sides in some hooks so as to leave a median streak or a patch near the head which is looked at from the front when it shows up through the inner clear surface of the shell. The required shade being obtained, the sides are shaped to a point at the head end and a narrowing slope towards the tail. The wider head end is for the holes. The thickness of the shank thus varies according to the shade of color required. The shape of the shank varies considerably as shown in figure 291.

Lashing. The original points of turtle shell are rarely seen now and never used. Demandt (9, Pl. III) pictures one which is reproduced here in line drawing. (See figure 291, *e*.)

Though Beasley (1, p. 25) characterizes the modern hook as "the last word in decadence," they are lashed by native technique. As illustrating adaptation and progress of a kind, the technique is worthy of description. (See figure 291, *f-h*.) A metal hook of appropriate size to fit the shell shank was selected. The end of the three-ply *fau songa* line was used as a direct snood with *pa ala* hooks.

The true Samoan point was probably fixed to the shank in the same manner as with the hand line trolling hook with a flat shank and two holes. (See figure 290, *f-j*.) Demandt's hook, however, is exceptional in showing a thick shank with the hole running from side to side.



FIGURE 291.—The *pa seuseu* hook: *a*, *b*, shanks with mesial head point (1) and two lateral points (2); *c*, shank with lateral points rounded off; *d*, shank, with rounded lateral point, and deep groove for lashing cut around lower end, which is converted into a short knob with a constricted neck (3); *e*, Demandt's hook with turtle shell point. *f*, Stages of attachment of modern fish hook to shell shank: holding the hook in the left hand with the hook eye distal, one end of the line was laid along its shank from the eye downwards (1) and the left thumb placed over it. The short end of the line is doubled back towards the eye leaving an open loop (2). From below the eye, the short end takes two or three spiral turns around the shank and the doubled line and is then passed through the open loop (3). The long end of the line (4) is pulled and the turns tightened. The line is thus fixed to the shank of the metal hook. The line at no time passes through the eye of the hook but the expansion of the eye prevents the tie from slipping off. *g*, A thin twisted thread (1) is tied by one end to the hook shank just below the eye and clear of the line knot (2). The short end is disregarded and with the long thread a number of half hitches are made round the shank to fix the thread firmly. *h*, The hook is now placed on the front of the shell shank with the part carrying the thread between the two holes. The thread is passed down through one of the holes, back up through the other, crossed over the hook shank and so continued for a number of turns. When sufficient, the thread is passed through its own loop to make a simple knot. A couple of circumferential turns are taken around the lashing between the hook and the shell shank. Each turn should pass through its own loop though this is not always observed.

The thread is run spirally (3) around the hook shank towards its bend. When it is opposite the narrow part of the shell shank end or above the groove if there is one, a number of half hitches are made close together around the iron shank to fix the thread ere commencing the end lashing.

A hackle is formed from pieces of *fan souga* fibre, bits of feather or even foreign cotton thread. The hackle material is laid longitudinally on the back of the shank with its middle opposite the lashing point. A turn is taken with the thread round the shell shank and passes over the hackle. The end of the hackle towards the head is doubled back and the subsequent turns (4) of the lashing pass over both limbs of the hackle (5) and fix it. The hook is also fixed to the shank and a couple of transverse turns each passing through its own loop are made around the lashing between the metal hook and the shell shank. The thread is thus fixed and the extra length cut off. The hackle is also trimmed off fairly short.

Use. The hook with an appropriate length of line is tied to a light bamboo or other wooden rod. The fishing takes place usually between the reef and the shore and this form of fishing is termed *aloalo* as well as *seuseu* which gives the hook the alternate name of *pa aloalo*. Generally fishing takes

place from a *paopao* canoe. In Savaii, most of the *paopao* canoes were fitted with rod rests on the float and boom to carry the rod when not in use. As stated, the fisherman makes casts with his rod, draws the hook through the water towards the canoe or parallel with the side and casts again. Where the water is not too deep, the fisherman wades about with his rod and puts his catch into a basket tied around the waist. On calm days, he may stand on the outer edge of the reef and fish in the many clefts and small channels with which the reef is seamed.

A large range of the smaller fish were caught such as the *ngatala*, *matamu*, *malai*, *matalau*, *'ata'ata*, *umiumia*, *sungalupe*, and *patangaloa*.

USAGE AND CUSTOM

The sexes. The sphere of the two sexes in fishing was clearly defined. Women spent quite a lot of time in the lagoon but the methods open to them were restricted. A woman's ordinary field kit consisted of an *ola* basket slung over her back or around her waist, a strong *mele'i* pointed stick for prising up stones and shell fish and a slender rod (*la'au sao*) for driving squids out of their holes. With this equipment she searched the shallow parts of the lagoon and the dry reef at low tide. The *tu'u'u* trap and groping under rocks formed other methods. In company with others, the *ola tu* plaited basket was used as a manipulated trap around the stone heaps and in connection with battering the branching coral *amu*. She also assisted on occasion in driving with the long leaf *lauloa* and in these days she may be seen assisting to drive into the shorter nets placed across channels.

To men all methods beyond the strictly female methods were open. In individual fishing he pleased himself but in community methods there had to be a leader who by experience and recognized authority could decide what methods were to be used, when and where, and take command over those engaged. This need created the position of the head fisherman (*tautai*).

The head fisherman. It does not appear that the Samoans delegated fishing to one particular class who did nothing else. The whole male community indulged in fishing including high chiefs if they so desired. Fishing was a sport as well as a food procuring activity. Some of the community methods were occasions of fun and excitement and corresponded to a combined picnic and sports gathering that took place in that most important Polynesian playground, the lagoon. All experienced fishermen were classed as *tautai* but amongst them one was elected by common consent to the position of head *tautai* of the village. In a large village with distinct divisions or groupings, each division might have its own *tautai*. The heads of families met in a guest house, and over a bowl of kava decided according to the season what form of community fishing should take place, as quantity or shoals of particular fish could only be secured adequately by the cooperation of numbers.

In these gatherings, the *tautai* naturally assumed command. In the community methods in the lagoon or outside the reef, the head *tautai* was in absolute command. He was the chief and men of higher rank and authority on shore were inferior to him on the realm of the sea. A clear cut distinction existed between the two spheres of influence. The authority of the *tautai* did not extend to the land except, of course, in the preliminary arrangements connected with fishing.

The distinction was conveyed in a saying which amounted to a law.

E le au le va ngauta i le va ngatai, The authority of the land does not
apply to the sea,

E le au le va ngatai i le va ngauta. The authority of the sea does not
apply to the land.

The authority of the *tautai* is best exemplified by the bonito fleet.

The bonito fleet. The bonito canoes usually go out in a fleet over which the *tautai* assumes command by right of his position. He selects the grounds to be visited and decides on the movements at sea. If a high chief accompanies the fleet, he does so as a private individual. His social position as a chief, however, is recognized by giving him the first bonito caught on the first morning that he accompanied the fleet. If he is of very exalted position, he gets the first fish on the second morning. Full respect having been paid to his shore rank, he lapses to the position of ordinary fisherman with the others. His authority remains on the land and right from the beginning he obeys the commands of the *tautai*. The first fish given to a high chief as a purely ceremonial form of respect is termed *ngalongia*.

When the *tautai* decides that it is time for the fleet to return to the shore, he raises his paddle as a signal and all obey. Before reaching shore, the *tautai* further exercises his authority by making a levy (*aleanga*) on the fleet. He takes from the successful canoes, one or more bonito according to their catch. The fisherman with moderate success goes free if his catch is small as compared with that of others. The *aleanga* is not for the *tautai* but to form the material for a community feast for the fishermen in which the unsuccessful member shares equally with his more fortunate fellows. The *tautai* in making his levy calls to each canoe, "How many?" On the reply he demands the appropriate number which are thrown into his canoe. He cannot always see what is in each canoe. If, however, it subsequently transpires that a fisherman has avoided the *aleanga* by giving a wrong account, he suffers the penalty of departing from custom in thus not recognizing the authority of the *tautai*. His bonito canoe is broken up and his fishing gear confiscated to the *tautai*.

There are two forms of mobilization of the bonito fleet over which the *tautai* rules. One is the fleet that goes out in the early morning to get on the

grounds by daylight. The other form is used by villages close to the reef which can see a good stretch of ocean. The canoes are kept in readiness above high water mark with the rod on the outrigger rests and the paddles and seats in position. These waiting canoes are called *alei* or *va'a alei*. Watch is kept for the shoals (*ingafo*) of bonito which follow shoals of small fish and whose presence is shown by the flocks of sea birds which follow. When the flock of sea birds is seen, the signal is given, the canoes are quickly launched, and the fleet is away under the command of the *tautai*.

Limitation of power. The *tautai* rules over a community acting together. His authority does not apply to the individual acting away from the community. This is illustrated by the individual canoe termed *tulialo* or *va'a tulialo*. While the fleet is out, a chief, seeing a passing flock of birds, may send a bonito boat out to try its luck. Should the *tulialo* canoe come up with the fleet it does not come under the authority of the *tautai* as it did not enroll, so to speak, with the fleet by mobilizing with it. This is recognized by the *tautai* for he cannot demand the *aleanga* levy from it. The individual canoe is responsible with its catch to the chief who sent it. In this way, in spite of the law limiting the sphere of influence of the land authority, the chief still exercises some authority but it is very limited and does not clash, in the Polynesian mind, with the sea authority exercised by the *tautai*. The *tulialo* canoe does not exist as far as the *tautai* is concerned and it is only accident that brought it in the vicinity of his fleet.

Observances. In addition to main principles, there are a number of observances that must be carried out and so become established as custom. Such are those based on hospitality, but enforced by custom for those who are not innately hospitable.

Fishermen, on coming in, must give a fish or a portion of fish to anyone they meet in the water of the lagoon or on the shore. These people, of course, have not been fishing, and are termed *tui atua*. The share given to them is termed *tufaanga sa tui atua*; *sa* means the member of the *tui atua*, and is not prohibited or sacred. By this observance, the people who could not go out are assured of a share. As the fleet comes in they go down to meet it and obtain the *tufaanga sa tui atua* as their right. Custom saves them from the opprobrium of being regarded as mendicants.

The custom applies equally to men of rank such as chiefs and talking chiefs. They have only to meet the fisherman anywhere on his journey to his house and the fishermen have to recognize their superior position by giving them of the best.

Prohibitions. There are always prohibitions in fishing as in other activities to avoid bad luck and form an excuse for ill success though the latter reason is not verbally expressed.

In bonito fishing, as in netting mullet, the fishermen wore nothing but a ti leaf kilt in olden days, and now wear nothing but a cloth kilt. The upper body must be bare. Nothing must be worn on the head except lime which is used as a protection from the sun. The *taumata* eye shade is allowed. Other prohibitions exist such as not spinning the paddle in the air, leaning back in the seat or stretching the legs over the topsides. The last is termed *sapolia*. There are also pre-fishing prohibitions: the craftsman making a bonito hook must be seated on a pile of mats and not on the floor and no noise must be made in the vicinity while he is making or lashing. A means of magnifying the importance of the hook maker and insuring it by the threat of non-success to the hook if the respect is not duly paid can be seen in this last prohibition. Many other prohibitions have probably been in force, but have not survived the clash of cultures.

As regards food prohibitions during fishing, the Samoans did not have any as evidenced by the fact that the cooked food *fu'efu'e* or *lafa'o'i* was taken out on bonito fishing expeditions.

Status of bonito. That the bonito had some status amongst fish is indicated by the use of special words such as were created around the rank of chieftainship. The common name of bonito is *'atu*, but it also has the poetic and honorific names of *pau* and *pa 'umasumu*. Large as applied to a bonito is not *tele* but *sumalie*. In counting them, they were grouped in tens expressed by prefixing *tino* to a unit as *tinolua* (twenty bonito).

Hook obtaining custom. The custom of obtaining ready-made material from some one else applied to bonito hooks. A master fisherman could call on another with the view of obtaining hooks from him. Such a visit was *malanga fanga*. From such visits, the hooks in active use that were tied to the rod and stuck in the *silinga* were exempt. The total number of hooks *sa'ana* on the rod may have been an inducement to a fisherman to have extra lines on his rod, not only for variety as already described, but to save them from a visiting fisherman on a *malanga fanga*. Should the visitor announce his wish to see his compatriots' hooks, the *tautau* basket containing the spare hooks has to be taken down and emptied out before the visitor. To thus cause a fisherman to turn out his spare hooks is termed *fa'ausu*. The visitor handles and examines the hooks and either directly or indirectly expresses a wish for one or two. The owner makes the best of a bad job and gives them to his visitor. As Tufele of Tau puts it, "He opens his basket and his heart, too." A couple of hooks so given is termed *talanga*.

Shark fishing. There is a large species of shark called *naiufi* that is regarded by fishermen as the king of sharks and treated with ceremonial respect even while planning its capture. If not prepared to noose it on first meeting it, the fisherman makes a speech addressing it as a chief of the highest rank in the terms, "Afi'o mai lau afionga." He apologizes to it for not being able

to deal with it that night but he will return the next night. The *tautai* gets another bigger canoe perhaps and a better crew if the first one is frightened. As these sharks are said to remain in one area for some time, he returns the next night. The baits are put out, the shark attracted to the canoe, and after much ceremonial speech on the part of the *tautai* the *naiufi* is noosed with the shark rope. The shark is a vigorous fighter and the canoe may be towed miles first in one direction and then in another. Always, however, according to the *tautai*, it returns to die at the spot where it was noosed. Hence the saying, "O le i'a e ngase lava i le mea no lavea ai" (The fish will assuredly die by the thing that caught it).

The thing, besides meaning the distinctive object, also carries in the saying the idea of the place where it was noosed. Hence the experienced fisherman will never cut loose no matter how far the fish tows him away, for he is confident that it will tow him back again.

It is a deservedly great honor to kill a *naiufi*. As the canoe comes in, the shell trumpet is sounded from it and the canoe parades backward and forward before the village. The owner meets his canoe at the landing with a fine mat and touches the head of the fish with it. The mat goes to the *tautai* and the fish to the canoe owner and the village chiefs, amongst whom it is ceremonially divided. The *tautai* who has noosed a *naiufi* is forever established in authority. The event may even have a bearing on the appointment of his son to succeed him after he has retired. In an argument between two aspirants, the decision in favor of one is clinched if it can be said, "His father caught a *naiufi*."

After snaring two of the ordinary species of shark, the *tautai* allows his crew to use the noose.

Distribution of fish. The individual fisherman has the right to his own catch, subject, of course, to the inroads that may be made by obeying the laws of hospitality. In bonito fishing with the fleet, the catch is subject to a levy for the communal feast of the fishermen. In community fishing with narcotics, leaf sweeps, and nets, the head fisherman gets first pick and the catch is divided up into heaps corresponding to the number of families engaged. Heaps are usually put out for privileged people, such as high chiefs, visitors, and in these days, the village pastor. Shark and turtle are divided up with special parts assigned to those with hereditary titles.

Hereditary rights and titles. The position of head fisherman while not strictly hereditary was often transmitted from father to son or a close member of the family on account of their better opportunity of acquiring expert knowledge. Information of practical value as to the habits of fish, favorable or unfavorable weather signs and suitable nights, months, and seasons were acquired by long experience and transmitted orally to succeeding generations of the same family. The acquisition of such knowledge gave a member of the *tautai* family the extra qualification that fitted him for succeeding to the

position of head fisherman. According to Pratt (23, p. 254), the name of the chief fisher at Safotu, Savaii, was *safa'ausu*. The conferring of a special title shows the honor with which the position of chief fisher was regarded, but whether the title was inherited or not by a particular family is not clear. The pride taken by a family in holding such positions would, however, lead to reciprocal efforts between father and son to retain it in the family.

Certain privileges in connection with fishing were, however, held by some families. In the *tu'i* method of fishing at Salailua, Savaii, with the mat cone and leaf sweeps, the fish in the tail end of the *tu'i* were restricted (*sa le 'a*) to a certain family. A cord was tied around the *tu'i* towards the tail end. Of the fish on the entrance side of the cord, the head fisherman got the first pick and the rest were divided up among the villagers.

Some of the privileges, like many of the chiefly titles, are associated with a traditional origin of a mythical nature. Such is the position of *le mata-o-le-'a* (the watcher of the fish) held by the family of Toalua in Puapua, Savaii. The title dates from the appointment of the first Toalua after the introduction of the red-lipped-mullet from Fiji by Sina. The watcher signals to the waiting netters when the first shoal of mullet is coming from the east. It would appear that the family of Toalua have acquired extraordinary eyesight during the period they have exercised their hereditary duties for the people of Puapua firmly maintain that the present holder of the position can see the shoal coming a mile away. Sina also gave Le Malu the right to rule (*pule*) over the fishing arrangements in connection with her mullet and the right has been exercised by the family ever since.

Sina also brought the *ingana* fish to Savaii and left her brother Faasua-i-au in charge. Ili and Tangoai were appointed guardians of the fish. The three names are titles held in Puleia and their right (*pule*) over the *ingana* is still recognized. If a man wishes to angle for the big fish that have followed the *ingana* shoals in close to shore, he must send a fine mat to Faasua-i-au, who in turn gives it to Ili and Tangoai, the hereditary guardians of the *ingana*.

Another example of an inherited right is furnished by the family of Nuu in Satupaitea, Savaii, which has a monopoly or patent right over the very crude *malauli* hook made from a fish bone tied at an angle to a piece of wood. Anyone wishing to fish for *malauli* with such a hook made his request with an accompanying present to the head of the Nuu family.

The special monopoly exercised by the high chiefs of eastern Polynesia over such fish as the shark and the turtle does not seem to have held in Samoa as a general custom though the Tui Manua would appear to have held some such privilege over the turtle as revealed by the story of the Sasaumani. The Sasaumani tribe of expert fishermen lived originally in Manua but migrated to Savaii through a number of causes among which the theft of a turtle belonging to the Tui Manua played a part.

→ SNAKES

Snakes are found in Savaii and were plentiful in the Asau district where they were formerly caught and eaten. They were caught by forming heaps of stones (*ma'a*) in the clearings and dealing with them as in the stone heap method of fishing. The deep *ola tu* basket used in fishing was also used for snakes but owing to its function, it was called *ola fai ngata* (snake catching basket). The open basket was held against one side of the stone heap and the stones gradually cleared away from the other thus driving the snakes into the basket.

They were cooked in leaf wrappings in the earth oven and tasted like eels or sea eels according to my informants. They became very fat and the greasy leaf packages after cooking looked as if they contained fat pork. The fat (*nga'o*) of the snake receives the special name of *pipi* and the fat condition is termed *tai taao*.

The snakes according to the Asau people are non-poisonous as many have been bitten by them without any poisonous results.

of the smaller adzes and the larger adzes of Types III, IV, and V are completely ground on all surfaces except the upper surface of the poll.

In cross section, the commonest forms of Samoan adz are quadrangular and not triangular as Linton shows in his list. The usual Samoan technique is therefore comparable with the marginal localities of Hawaii, Marquesas, and New Zealand and not with the central Society Islands where the common type is triangular. Of the marginal localities mentioned, Linton states (19, p. 322) that in the Marquesan quadrangular simple tanged adzes "The width of the inner (posterior) surface is equal to or less than that of the outer (anterior) surface, never greater." In New Zealand quadrangular adzes, the posterior surface is usually less in width than the anterior surface. The Hawaiian adzes are more nearly rectangular as a rule yet a number examined for this feature showed that the posterior surface was less in width than the anterior. There is thus an agreement in the cross section of the quadrangular adzes of the three eastern marginal localities. In the Samoan quadrangular adzes, the marked feature is that the posterior surface is always wider than the anterior except in the rarer form described as Type IV, subtype *A*. Of the triangular forms, only one specimen was obtained of the reversed triangular form with the wide surface in front that constitutes the common Society Islands type. This adz though well finished by being ground on all surfaces had no trace of the tang which is a characteristic feature of the Society Islands triangular adz.

Another point of marked difference is afforded by the development of the tang. In eastern culture, both central and marginal as listed by Linton (19, p. 451), the specially shaped butt or tanged adz is the dominant form. In Samoa, the tanged adz does not exist. Though Linton lists the tanged adz as "rare" in Samoa, I regard any resemblance to a tang in Samoan adzes as being due to accidental and not purposive technique.

CANOES

For comparative purposes, canoes must be dealt with in two distinct divisions; the dugout and the plank canoe. The simple dugout consists of a hollowed-out section of tree trunk. In some islands, where trees of sufficient length of straight trunk were or had become scarce, the dugout hull may be formed of two or more sections joined together transversely. In New Zealand, on the other hand, large war canoes were formed of three pieces to get an upward curve at the ends. The small dugout is for use within the sheltered waters of the lagoon. It may be deepened by building up the sides with plank gunwales. The addition of a gunwale on either side forms a three-piece canoe which is in common use both east and west. For use outside the lagoon, the dugout hull was made larger and was built up with deeper gunwales. To prevent waves washing in over the bow or stern, bow and stern pieces were

added. The bow piece took the form of a long cover or was made shorter with a transverse vertical breakwater. This constituted the five-piece canoe that Linton (19, p. 450) showed as characteristic of the eastern marginal cultures. It is a higher development of the dugout canoe made for use in the open sea. The plank canoe was made of tiers of short planks built up from a mesial piece which served as a keel but was not a dugout. The plank canoes were carvel-built with the edges of the planks accurately fitted together and lashed edge to edge. Both the five-piece canoe and the plank canoe were used in the eastern and western areas. It is in the principles of technique and the divergences from the common forms that the real difference lies between east and west.

Technique. An outstanding difference in technique lies in the method by which the separate gunwales and planks were joined together. The most widely spread and evidently the oldest method consisted of boring holes right through the wood from side to side in opposite pairs near the edges. The lashing thus showed on both the inside and the outside of the canoe. After lashing one pair of holes, it was usual to carry the braid along the inside of the canoe to the next pair of holes and thus form a continuous lashing. The other main method of boring holes through projecting flanges formed on the inner side of the plank edges has been described in full in this work. After lashing each pair of holes, the braid is fixed and cut off. The lashing is thus interrupted and shows on the inner side only of the canoe. An intermediate form of lashing consists of boring oblique holes from the same surfaces of two planks so as to meet on the edge surfaces that are fitted together. In this method the planks must be fairly thick but there are no projecting flanges. The lashings show on one side only. The three forms of lashing may be referred to as the right-through, the flange, and the oblique methods.

Simple dugout. The simple dugout while common throughout Polynesia is characterized in Samoa by a deep vertical or even concave cutwater at the bow with a sharp projection forward at the upper end. The usual dugout in the eastern area is marked by a long gradual slope upwards to a pointed bow. In some islands, however, the sharp cutwater is seen but it is not so deep usually as the Samoan. On the other hand, the gradually sloped bow is present in the smaller left canoe of the double *'alia* of Samoa. The transverse join of the dugout hull is not seen in Samoa while it is common in the east.

Five-piece canoe. The five-piece canoe was present in Samoa in the *'iato lima* type while the five-piece bonito canoe with a dugout hull is supplanting the plank bonito canoe in some parts of the group. The bow and stern covers are flat or conform to the slight upward curve of the ends. There is no breakwater, forward bow or upward stern projections. Ornamentation takes the

form of mesial rows of white *pule* shells attached to knobs on the upper surfaces of the bow and stern covers. The forward and upward projections at bow and stern for ornamentation that were present in the *taumualua* type of canoe alone were an innovation to that type which was first built by an American in 1849. The gunwales in the bonito canoe are attached by the flange method of lashing and the covers by a combination of the flange and right-through methods. The eastern five-piece canoe is characterized by the right-through method of lashing. As Linton pointed out, the forward bow and upward stern projections were present in the Society Islands, New Zealand, and the Marquesas. They form an ornamental addition to a simpler original form. The addition of a breakwater to the bow piece or cover were present in New Zealand and the Marquesas and are to be seen on the small sea fishing canoes of Tahiti at the present time.

Plank canoe. The plank canoe in Samoa is characterized by the flange join with interrupted lashings. The gunwales may have an alternating series of oblique lashings with the lashings showing on the outside. The eastern plank canoe, is characterized by right-through lashings of the continuous type though they may be interrupted here and there. This feature was observed in a plank sailing canoe from Raiatea seen in Tahiti and in a Tuamotu plank canoe in Bishop Museum. That the old voyaging canoes were lashed with the same technique is shown by the following quotation from Teuira Henry (15, pp. 549, 550) regarding the building of the famous Hohoio canoe of Hiro:

Holes were bored into the keel and planks at even distances apart, and the men set to work in the following order: Hata, the chief of Hiro's artisans, worked on the outer side to the right of the canoe, and Tau-mariari, his assistant, worked on the inner side; Memeru, the royal artisan of Opoa, worked on the outer side to the left of the canoe, and his assistant, Ma'i-bac, worked on the inner side. Each couple faced each other, fixing the planks in their places and drawing the sennit in and out in lacing the wood together; and the canoe soon began to assume form, the bows facing the sea. To make the work light, they sang.

TE PEHE O HIRO

E aha ta'u, e Tane e,
Tane, atua no te purotu e?
E 'aha,
E 'aha o te hui o te ra'i,
E 'aha na'u e Tane e!
E tui i roto, e puputa i vaho,
E tui i vaho, e puputa i roto.
Nati hua, nati mau.

(THE SONG OF HIRO.)

What have I, O Tane,
O Tane, god of beauty?
'Tis sennit.
'Tis sennit of the host of heaven,
'Tis sennit for thee, O Tane!
Thread it from the inside, it comes outside,
Thread it from the outside, it goes inside.
Tie it fully, tie it fast.

Hiro, a noted explorer and ancestor of eastern Polynesia, was a contemporary of the Rarotongan ancestor, Tangiia, and lived four generations before the colonizing fleet set out from the Society Islands to New Zealand in approximately 1350 A. D. Thus neither the old nor the recent plank canoes of

the Society Islands have any affinity in lashing technique with the plank canoe of Samoa.

Seam battens. The right-through method of lashing in repairing split planks has been described for Samoa. In New Zealand and the Marquesas, the right-through lashing of the gunwales was supplemented by placing battens over the seam before the lashings were made. This specialized technique has also been observed in Samoa in one form of repairing split planks and in connection with the gunwale lashing of a model double canoe. The eastern technique was thus known in Samoa but its general use was evidently supplanted by the flange method. The historic discussion by the Samoan guild of builders as to whether sennit braid should be used first on the house or the canoe associates the introduction of the Samoan canoe technique with that of the house with the rounded ends. There is no evidence that the flange canoe technique ever reached the Society Islands.

Outrigger. Details of the various forms of outrigger construction in the different parts of the eastern area require to be recorded and analyzed before full comparisons can be made between east and west. If New Zealand, the Marquesas, and Hawaii are regarded as retaining the oldest form of culture in the five-piece canoe, Hawaii owing to the absence of the specialized projection of the bow and stern pieces, may be regarded as retaining a simpler and older form than the other two. If this is so, the Hawaiian form of direct attachment between the outrigger boom and the float assumes a significant value. The Hawaiian booms are strong stiff pieces with an outward downward curve to meet the lower level of the float. The Marquesan boom, according to Linton (19, p. 309), was connected indirectly with the float by four to six sticks, the present stave connection being a modern invention. In New Zealand, though the outrigger was eventually abandoned, an old float discovered in Moncks Cave and described by Skinner (30, p. 364) shows by the presence of holes for connecting pegs that the indirect form of attachment had been in use. The indirect form of attachment is the common form in the eastern area. In the Society Islands, however, a mixed technique exists in that the fore boom is indirect and the aft boom direct. For security, the float depends upon the stout fore boom with the firm attachment of indirect pegs and a suspensory cord. The aft boom is thinner and purposely so selected for its flexibility to enable it to give to the movement of the waves. In the larger canoes, the boom runs out horizontally from the gunwale and then curves down to meet the upper surface of the float to which it is directly attached by a lashing passing through a hole cut through the float. In the small canoes, the aft boom looks ridiculously thin and frail. They are formed of a short length of thicker wood from which a thinner branch springs. The thicker piece is lashed to the two gunwales with the thin branch projecting

upwards and outwards on the left side of the canoe. The thin branch is then bent over in a curve with its arch projecting well above the level of the gunwales. The outer end is attached to the float either directly by insertion into a hole on its upper surface or indirectly by lashing to a wooden peg driven into the float. A metal nail now usually takes the place of the peg. The slender boom is usually lashed to the peg so that it touches the float but cases were seen in which the boom was lashed to the peg a couple of inches or so above the float. Thus even with the slender aft boom both a direct and an indirect form of attachment occurred. The attachment of the aft boom in the Society Islands marks a local development and creates another point of divergence from the Samoan canoe technique in which a rigid straight aft boom is attached to the float by four longer indirect pegs in the same manner as the fore boom.

Peg lashings. Another curious development in Tahiti is the method of lashing the float peg connections to the fore boom. After inserting the sharpened lower ends of the pegs into holes in the float, the upper ends are brought against the sides of the boom either singly or in pairs. The single pegs have the upper ends projecting above the boom and the lashings consist of oblique turns taken round both elements and finished off with transverse turns taken round the oblique turns between the peg and the boom. The paired pegs, however, have the upper ends cut obliquely to fit accurately against the sides of the boom without projecting above it. The two pegs and the boom on either side of the meeting point form four arms. The commencement end of the lashing braid is fixed and then makes a complete turn round each arm in turn, the crossing over from one arm to the adjacent arm being on the upper surface. The turns are continued, each round being on the outer side of the previous round and close to it. The technique is wrapped work and is the same as that of the New Zealand fly flap. A large single lozenge-shaped pattern is produced on the upper surface of the boom with the points extending along the boom on either side and along the pegs fore and aft. The upper ends of the two pegs are completely concealed. In the Samoan lashing, as we have seen, the ends of the paired pegs project above the sides of the boom and are never concealed. The lashing is by ordinary crossed diagonal turns which result in a lozenge pattern on the outer side of each peg but which are of totally different construction to the fly flap lozenge on the upper surface of the Tahitian boom.

The sail. The difference between east and west in the setting of the sail has been remarked by Linton (19, pp. 318, 450). In both areas, the matting sail was triangular. In the east, the apex of the sail was at the foot of the mast. One side was attached along the mast whilst the free side had a sprit or boom attached along its edge. In Samoa, both sides of the sail had sprits

termed *tila* attached to their edges. The apex of the sail was fixed forward of the mast. A rope was tied to about the middle of the upper *tila* and passed through a special support at the masthead. By means of the rope the sail was hauled up into position with its long axis oblique.

FISHING

Fishing methods employing narcotizing, spearing, sweeps of coconut leaves, walled traps, and nets made with netting needles and mesh gages are similar in principle in both areas. In Samoa, the purse net with two wings set like a V-shaped weir is common. Trolling for bonito with an unbaited hook with a pearl shell shank attached by a line to a bamboo rod is similar in principle in the two areas but there are variations in the shape of the hook point, the hook lashing and the method of setting the rod. Albacore fishing with a double canoe and a crane which is a marked feature of the Society Islands is not known in Samoa. Fishing with a baited hook from a fast sailing canoe for dolphin is similar in Samoa and Tahiti. In Samoa, the dolphin is known as *masimasi* and in Tahiti as *mahimahi*. Apart from the *masimasi* hook and the poor specimens described, Samoa is devoid of baited hooks. The shark hook was unknown and the method of noosing prevailed in its stead. Deep line fishing was absent and there is no authentic evidence to show that the deep sea *Ruvettus* was ever caught on a long line with a baited hook. The Samoans were thus surface fishermen. In the east, varieties of baited hooks occur and the shark hook is common. Linton (19, p. 402) records the shark noose in the Marquesas. The method used in Aitutaki, Cook Islands, of diving down and tying a clove hitch round the tail of sharks sleeping with their heads in crevices of the rocks cannot be regarded as a similar noose method. The catching of the *Ruvettus* has been shown by Nordhoff (22, p. 40) to have been originally confined to certain islands of the eastern area. Tahiti thus resembles Samoa in not having had a knowledge of *Ruvettus* fishing. Samoa is rich in varieties of fish traps but detailed technique from the various parts of the eastern area is lacking.

HUNTING

Traps. The principle of the bent sapling spring, the running noose and the trigger seen in the Samoan *mailei* trap to catch fowls and wild pigs was used in the fowl traps of the Cook Islands. It is also present in the rat traps of New Zealand.

The bow. The knowledge of the bow and arrow as shown by Linton (19, p. 452) was widely spread through east and west. In Samoa, it was used to shoot birds as well as fish and never as a weapon.

Net. The pigeon net of such importance in Samoa occupied no similar position in the eastern area. The dove decoy cage also seems confined to the west.

HORTICULTURE

Terraced irrigation. In the eastern area, the terraced irrigation of the taro (*Colocasia antiquorum*) forms a marked feature. The water is tapped at a higher level of the stream and conducted down by a main irrigation channel to flats formed by bends of the stream or to where the narrow stream defile opens out into a broader valley. The lower margins and sides of succeeding terraces are built up and faced with stone. Some areas are large in extent and must have involved considerable labor and ingenuity. Terraced irrigation naturally requires streams with a fair fall. The method exists not only in the east central area but also in the marginal localities of Hawaii and the Marquesas. In Samoa, terraced irrigation is absent in spite of suitable streams.

GAMES

Common to east and west. Of seven games tabulated by Linton (19, p. 453), the surfboard and dart throwing are given as common to both areas. Though dart throwing is given merely as present in Samoa and important in some of the eastern localities, the association of the game in Samoa with historical events and oft quoted sayings used by orators shows that it was equally important in the west. The use of the throwing cord with forms of dart throwing has been remarked.

Bowling and coasting which Linton gave as not present in Samoa, have been shown to be definitely present. The important Samoan game of *lafonga* played with coconut shell discs is present in Mangaia, Cook Islands, in the form of round wooden discs which are pitched in the same way for position on a mat. In both Samoa and Mangaia, the discs are termed *tupe*.

Eastern area alone. Linton has drawn attention to stilts, kites, and a draft game present in various eastern localities not being present in Samoa.

Western area alone. Of Samoan games not recorded from the east, I can only think of the water tip-cat game of *tapalenga* and the *fiti* game of jackstraws.

MUSICAL INSTRUMENTS

Shell trumpets of *Triton* and *Cassis* shell and the mouth flute are found in both areas. The true drum made of an upright hollowed log with shark skin stretched over the upper end is characteristic of the east and absent in the west. The eastern drum was important in the ritual connected with the

religious stone structures and extended from the central area to the marginal localities of the Marquesas and Hawaii. In New Zealand, where the elaborate stone structures were absent, the drum was absent also.

The wooden gong made of a hollowed log with closed ends and a narrow slit-like opening is characteristic of the western area. The history of the slotted gong in Samoa is peculiar in that the true Samoan *nafa* form has disappeared whilst the two larger forms present are said to have been introduced from Fiji and Tonga. The small *pate* form is also stated to have been introduced from Tahiti by missionaries. The small *pate* gong is present in the east central area. A larger well carved form known as *kahara* in the Cook Islands is enumerated in tradition in the list of things used in the ancient *takurua* ceremonies at Atia-te-Varinga, which Percy Smith located in Indonesia.

As Linton points out (19, p. 453), the nose flute is present in the eastern area but is absent in Samoa. Pan's pipes are present in Samoa as well as Tonga but are absent in the east. Though the specialized form of Jew's harp described by Linton (19, p. 408) in the Marquesas is absent in Samoa, the child's toy of a stiff piece of wood or a dry coconut leaflet midrib vibrated against the teeth was used in Samoa as well as in the eastern area.

WEAPONS

At the present time, the comparative study of weapons can best be made in Museums whither most of them have gone. One feature, however, may be remarked on here. Samoan clubs are marked by a variety of forms but they are all short, rarely exceeding four feet in length. They are mostly made for striking with one end whilst the proximal end is flared and blunt. The characteristic weapons of the Society and Cook islands are marked by their greater length. While the distal ends are pointed for thrusting, they are also expanded into cutting blades which are variously treated. They are much lighter and more delicately made than the corresponding parts of the Samoan clubs. Another most important feature is that the proximal ends may be pointed and are thus capable of being used to deliver a back handed thrust. The principle of the double ended offensive weapon shows a marked advance in military science and is found still better utilized in the shorter weapons of New Zealand. Curiously enough, the principle is not recorded from the other parts of the eastern area. The difference between the Samoan and the Society Islands clubs is thus not only in form but in the whole question of attack and defense.

SUMMARY

The data from Samoa would indicate that canoes with topsides or planks joined together by the right-through lashing and with the use of the covering

batten over the seam was widely used over the whole Polynesian area. Associated with it was the rectangular house with wall posts and wall plate erected before the principal rafters were put up. Distribution also indicates that with this wide-spread early culture was associated a knowledge of the bow and arrow, slings, and such games as dart casting with and without the use of the throwing cord, bowling with discs and string figures.

Certain culture traits, such as the marae type of religious stone structure, stone figures, stone food pounders, upright drums covered with skin at the upper end, and the nose flute, passed into or developed in eastern Polynesia without affecting Samoa. Associated with the worked stone complex was the tendency to improve the technique of the stone adzes used in the crafts.

The striking features distinguishing Samoan material culture from the general culture of eastern Polynesia are the arched houses and the flanged plank canoes. The other minor differences are not so striking when taken individually but grouped together they form a total that cannot be disregarded. Special efforts which resulted in improved technique were closely related with class distinction. Builders and tattooing artists obtained their most lucrative employment from the higher classes and used their crafts to still further accentuate social distinctions. Craftswomen were stimulated to their greatest efforts in developing the technique of bark cloth, shaggy garments, and fine mats through the material articles being utilized as the outward expression of social status.

The builders' guild in Samoa seems to have had more set rules of organization than their fellow craftsmen of eastern Polynesia. The definite rules of agreement in house building, with reciprocative prohibitions and definite immediate rewards during stages of the work, mark a business advance on the usual Polynesian attitude towards community labor while the actual development of a form of trade unionism with strikes and tabooing of employers, is an evolution in labor based on a commercial instinct foreign to eastern Polynesia. The usual Polynesian system of reciprocal labor, feasts and presents, is a fluid method that allows of time and opportunity in which to make payment on a credit system based on trust and honor. The Samoan system demands immediate provision of food and payment and is so business-like in its commercial bearing that the question arises as to whether the commercial principle underlying it is a purely local development or a diffusion from some higher culture to the west which did not spread further east than Samoa.

While the kava plant reached eastern Polynesia, the elaborate ceremonial associated with it in Samoa is lacking. The talking chiefs of Samoa were the systematizers of custom and usage. Their efforts in exercising their office resulted in a mass of ceremonial observances that included a set order of prestige among families and villages and the use of a distinct ceremonial

language. The talking chiefs thus rendered themselves indispensable in enabling high chiefs to comply with the etiquette demanded of their position. Much of the ceremonial has been developed locally but some elements may have been brought from the west and adapted to suit local conditions. Handy (14 a, p. 327) believes the ceremony connected with kava drinking to be adapted from the Buddhist ceremonial tea drinking. Ceremonial kava drinking and the guild of builders (Sa Tangaloa) are both associated with Tangaloa. As neither the elaborate kava ceremony nor the trade unionism of the Tangaloa builders reached eastern Polynesia, it may be surmised that they were both elements of a culture that diffused from the west as far as Samoa and its neighborhood and reached no further. Samoan material culture, apart from the elements rendered important by association with rank, was uninspired. It is not in the arts and crafts but in social organization and elaborate ceremonial that the peculiar genius of the people sought a congenial sphere of activity and found its greatest expression.

The kava is finished,
The strainer is dry,
The chiefs from afar have emptied the bowl,
And nought remains but the dregs.

(C.336), Side view of squid lure (*pule ta'i fe'e*) made of two plates of *Cypraea tigris* fitted and lashed over stone shaped like spinning top; stone of dark basalt, 85 mm. long and 49 by 40 mm. diameter at base; *tuasivi* rod of coconut root with coconut leaflet strips attached; line slipped under mesial lashing cord and end knotted; cone-shaped wooden float at proximal end of line to mark site when lure is dropped with too large a squid; lure supposed to represent a rat (Leone, Tutuila). *C* (C. 649), Float for shark bait (*mo malie*) made of breadfruit wood; length 15 inches; wide end, 4.25 inches wide, 4.75 inches thick, anterior projection 1 inch wide; sennit braid down mesial line looped around peg at back; coil of sennit at narrow end for tying bait on to mesial cord and around side grooves; line attached to loop at narrow end. *D*, Coconut fibre receptacle for palolo ('*a'a*'); sheet of natural material (*lan'a'a*) folded and tied at ends with strip of bark. *E*, Shark bait of bonito heads (*pa'o'o*); part of head with dried opercula used as bait lure tied to float or separately; maintains strong odor for some time. *F*, Many-pointed fish spear (*tao fuifui*); handle of light wood 8 feet 6 inches long; 33 points of hard wood lashed in spiral arrangement with sennit braid. *G*, Coconut leaf fish sweep (*lau'oa*); split coconut leaf wound spirally around a length of vine (*fue vai*) and used in driving fish into a set net (Fangamalo, Savaii).

PLATE XLII. *A*, Whitebait scoop (*fonoti*); formed of coconut sennit braid with a netting knot, made like a satchel but with one end not closed, and wooden handles attached to two upper edges; length 11 inches, depth 7 to 8 inches, handles 21 inches long; handles held at closed end and opened out like scissors; used for scooping up fry (*ingana*) when they come up river in shoals (Ngataivai, Savaii). *B*, Small trap (*fanga fa'ata'u tu'u'u*) made with single-pair twine from 'ie'ie aerial roots; black stone within used as decoy for tu'u'u fish; manipulated trap used by women who place hand over opening after fish enters (Fangamalo, Savaii). *C*, Fish trap (*fanga va*) of lobster pot type made of 'ie'ie root with single-pair twine; self-acting funnel entrance (Leone, Tutuila). *D*, Fish trap (*fanga va*) being made by Pepulea'i Ripley, Leone; the funnel and the *malae* concavity leading to funnel are just completed and trap is being bent round to form sides. *E*, *Fanga va* trap (*D*) completed with thick rim around lower *malae* opening; the funnel is also seen. *F*, Bottom ends of traps: 1, *fanga va* trap showing the *malae* opening at the bottom end; 2, crayfish pot (*fanga ula*) showing closed lower end; 3, *fanga fa'ata'u tu'u'u* showing small size and bottom where twining commenced over crossed warp; 4, 'enu trap made of 'ie'ie root arranged in two layers of warps with spiral weft of 'ie'ie root between lashed with sennit braid; view showing bottom in centre of which the lashing commenced (Tutuila).

PLATE XLIII. *A*, Crayfish pot (*fanga ula*) with closed lower end; warp and wefts of more than one element of 'ie'ie root; very flat around outer circumference of funnel entrance (Leone, Tutuila); *B*, *fanga'afe* double entrance trap made of bamboo with different lashing to 'enu traps; length 41 inches, diameter at middle 18 inches, diameter at ends 11 inches (Fasitoota, Upolu); *C*, sea eel trap (*fanga pusi*) made of rods lashed together to form flat box; opening enters into funnel of strips of wood and self-acting mechanism made of *lan'a'a* coconut natural fabric; length 22 inches, width 13 inches, depth 5 inches (Fasitoota, Upolu); *D*, 'enu trap of lobster pot type, showing upper funnel opening; maximum diameter 25 inches and depth 18 inches; funnel 12 inches deep and 6 inches in diameter at inner opening (Tutuila); *E*, 'enu trap of domed cylinder type set on side; length 28 inches, depth at rim 19 inches; same stroke technique as the lobster pot type (Valusu, Upolu).

PLATE XLIV. *A*, *Fanganli* fish trap made of thick *tuafanga* vine with single-pair twine; double entrance trap showing the *mata* opening with finish around rim; diameter at middle 2 feet 3 inches, diameter *mata* opening 12 inches (Sapapalii, Savaii). *B*, *Fanganli* fish trap (*A*) showing *malae* opening with the *afe* turn; diameter of opening 10 by 13 inches.

PLATE XLV. *A*, Netting implements: 1, netting needle (*sa'a*) (Savaii); 2, mesh gage (*afa*) with newly made meshes upon it; 3, net made of *fau songa* native cord. *B*,

Se'i hand net; handle sticks 30 inches in length, net 23 inches by 20 inches (Vaiala, Upolu). *C*, Turtle net of sennit braid (*'upeuga 'afa*) with large floats and stone sinkers; meshes 1 foot; depth of net 24 feet; kept wound up on sticks in two separate parts, each about 34 fathoms long (Ngataivai, Savaii). *D*, Rather narrow casting net (*'upeuga tili*) with peg floats and stone sinkers, floats 3.5 inches long and 0.4 inch in diameter; sinkers of small natural waterworn stones (Tutuila).

PLATE XLVI. *A*, Shrimp net (*'u'nti*): width at bottom 5.5 feet; sinkers of shells (*Cypraca mauritiana*), Apia, Upolu. *B*, *Alangamea* hand net for catching mullet as they leap over seine net; side poles 9 feet in length, width of net at top 9 feet 9 inches; net opened out for use with right pole in fork of crossbar. Note *muli* bag part of net near handle (Moata'a, Upolu).

PLATE XLVII. *A*, Eel hooks (*matau tina*) made of two pieces of hard wood lashed together, fixed with *fau* bast and plaited into three-ply braid (Malaeloa, Tutuila). *B*, Fish hooks: 1 and 2, bonito (*pa 'atu*) with length of *fau songa* cord attached, turtle shell point, and fibre hackle; 3, bonito hook with wider turtle shell point; 4, bonito hook with pearl shell point; 5, bonito hook showing front view; 6 and 7, *pa ala* hooks with round shanks, feather hackles, turtle shell points, and thinner *fau songa* cords of hook attached to lines of 5-ply sennit braid; characteristic coiling; 8, *pa ala* hook with flat shell shank; 9, small *pa seuseu* hook with shell shank and metal fishhook for point; also three-ply cord of *fau songa*; 10, two small *pa seuseu* with metal hook; 11, very large shank said to be *pa tangi* made of a whale's tooth and inlaid on back with pearl shell; length 190 mm., greatest width at pointed end 31 mm., width lower end 18 mm., greatest thickness 24 mm.; hole through near pointed end; lower end nicked on curved sides for lashing the point; obtained at Leone but may be Tongan; 12, Tongan hook, with barbed turtle shell point and five-ply braid line of *fau songa*; the shank is of whale's tooth shaped and inlaid on back with pearl shell in exactly the same way as the shank (11).

PLATE XLVIII. *A*, Rat trap (*mailei 'ole*): bamboo cylinder with two wooden cross pieces; the curved spring piece stayed with vertical and oblique pieces; trap set with sennit loop showing in entrance; over elaboration with sennit bindings (Tau, Manua). *B*, Hooking appliance for flying fox; branches of *anguoro* creeper with curved thorns tied to long handle in 30-inch lengths; the flying fox is hooked over the wings when coming to feed on fruit trees (Tau, Manua). *C*, Bow and arrows: 1, bow (*aufaus*) made of *fisoa* wood 53 inches long and 0.8 inches in diameter; bowstring of five-ply sennit braid which is also wound spirally around bow for ornamentation; grooves cut around ends of bow to take string (Aopo, Savaii); 2, single-pointed long arrow (*u mata-tasi*); point of *pas* wood 6 inches protruding and 5 inches bound to groove in shaft; free part square in section with edges nicked; shaft of cane (*u*) 4 feet long and 0.3 inch in diameter, not feathered; 3, two-pointed arrow (*u mata'ua*); material same as (2), but shaft not grooved for points which are laid on either side of shaft end and lashed with sennit braid; 4, three-pointed arrow (*u matatolu*); same material but shorter points; third point concealed in plate behind lower point; 5, single-pointed short arrow (*u ta'afale*); for shooting at bird in awkward position to side or behind fowling house.

PLATE XLIX. *A*, Pigeon net (*'upeuga seu lufe*): handle 5 feet 2.5 inches long, length with net 15 feet; net 6 inches wide at top, 27 inches in middle, and 7 inches at handle; bag near top end 30 inches deep (Aopo, Savaii). *B*, Jack straw sticks (*fiti*); light sticks 18 inches long and thick as a lead pencil; no definite number; rolled mat with two uprights and sticks laid in bundle between; the game is to flick off the greatest number singly without missing a stroke. *C*, Coconut shell discs (*au lafo*): Two sets of five coconut shell discs of various sizes, ranging from diameter of 2.5 inches to 5 inches, used in pitching game like quoits; the large discs have been cracked and repaired with lashings through holes bored on either side of crack; the disks have been carved and lime set in. Plaited pandanus mat used in the game.



1 2 3 4



B



C

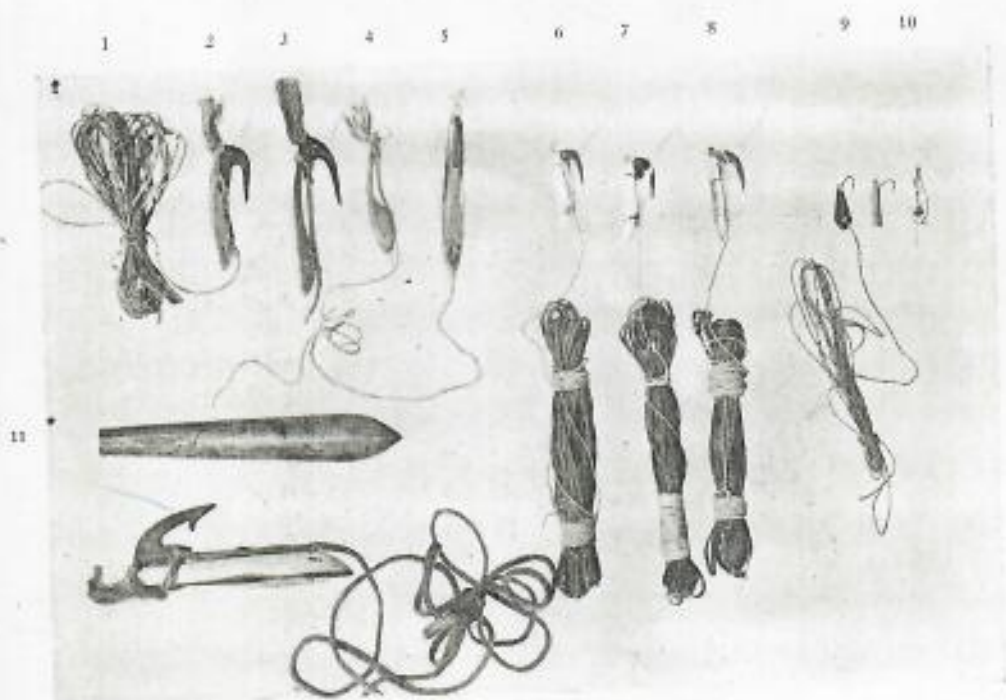


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NETTING IMPLEMENTS AND NETS.



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FISHHOOKS.

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