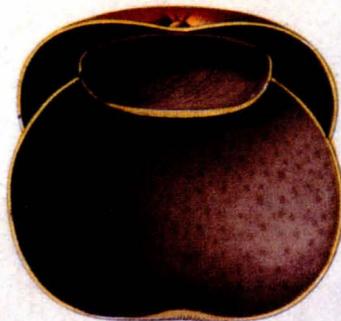
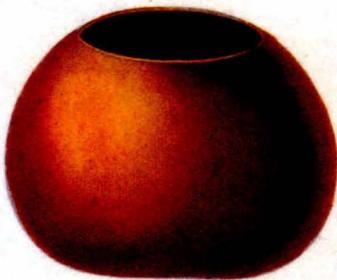
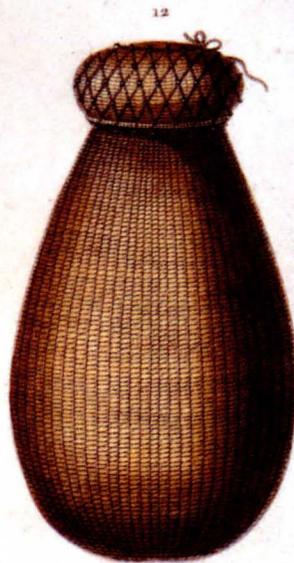
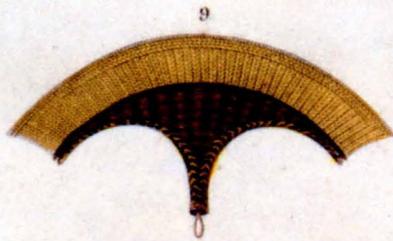




# ARTS AND CRAFTS OF HAWAII

By  
TE RANGI HIROA  
(SIR PETER H. BUCK)



Shark-tooth implements were early discarded for metal implements and, unfortunately, information regarding the use of various types was not preserved. Some of the simpler types were used for cutting flesh for food, bait for fishing, and wood in fine carving. In many parts of Polynesia sharks' teeth were used for cutting or shaving the hair and for incising the skin to emphasize grief during death ceremonials, and it is possible that the Hawaiians used them for similar purposes. The more complicated forms with multiple teeth were used as weapons. Lacking sufficient information to definitely separate all of the implements into tools and weapons, the various types are dealt with together under weapons (pp. 443-450).

#### BREADFRUIT SPLITTERS

Breadfruit splitters made of wood are found in various parts of Polynesia but not in Hawaii. However, two stone implements of different shape in the Hawaiian collection have been cataloged as breadfruit splitters. They are described here for the record, though the authenticity of their function requires further proof.

One such implement (B.2556), made of black basalt, is 7.4 inches long and smoothly polished. It consists of a thick curved blade 2.75 inches long with shoulders which slope into the narrower handle. Its greatest width is 2.75 inches, its

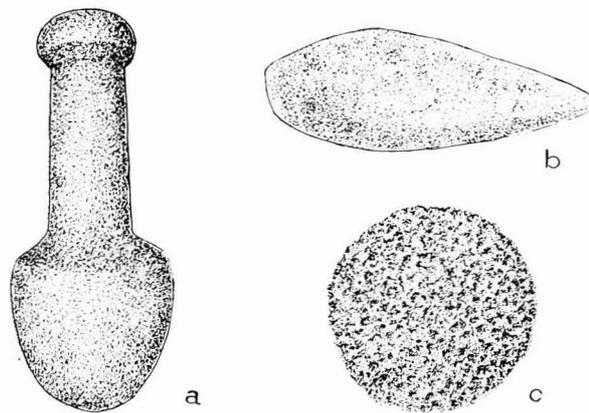


FIGURE 10.—**a**, black basalt breadfruit splitter; **b**, gray basalt breadfruit splitter; **c**, vesicular basalt pig scraper.

greatest thickness is 1.5 inches, and its curved margins form a sharp edge from shoulder to shoulder. The rounded handle averages 1.5 inches in width and 1.3 inches in thickness, and it ends in a terminal knob averaging 1.5 inches in diameter (fig. 10, *a*).

The second implement (B.9599), of gray basalt, is somewhat adz-shaped with a pointed poll and a curved cutting edge. It is 6.5 inches long with a maximum width of 2.5 inches and a maximum thickness of 1.9 inches (fig. 10, *b*).

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## PIG SCRAPERS

In dressing pigs for the earth oven, the hair was singed off and the skin scraped or rubbed with a flat piece of vesicular basalt or lava with a rough surface. A specimen (B.1845) obtained from Honaunau, Hawaii, is in the form of a flat disk 3.2 inches in diameter and 1.5 inches thick (fig. 10, c). Its rough surface forms a rasp admirably suited to its purpose.

## POUNDING BOARDS

Pounding boards (*papa ku'i poi*) upon which cooked taro was pounded (*ku'i*) into a mash were necessary kitchen equipment. They were made of heavy wood in the form of flat, shallow trays or dishes, somewhat rectangular in shape but with the corners rounded off. In a collection of 20, two approach the circular, as the length and width approximate one another in measurement.

In some boards the low sides and ends slope downward and inward on the outer side to meet the flat bottom at an angle to form an edge, but in the older specimens the outer slope is rounded off to meet the bottom without an edge. A few boards of modern make have a low flange about 0.5 inch wide around the circumference of the bottom surface. On the undersurface of each of three boards are four short legs not more than 0.75 inch long, but these may be regarded as a modern innovation. The rim along the sides and ends may be rounded or flat. The inner slope of the sides and ends meet the flat internal surface at an angle, and the inner depths of these shallow utensils range from 1 to 2 inches, with the

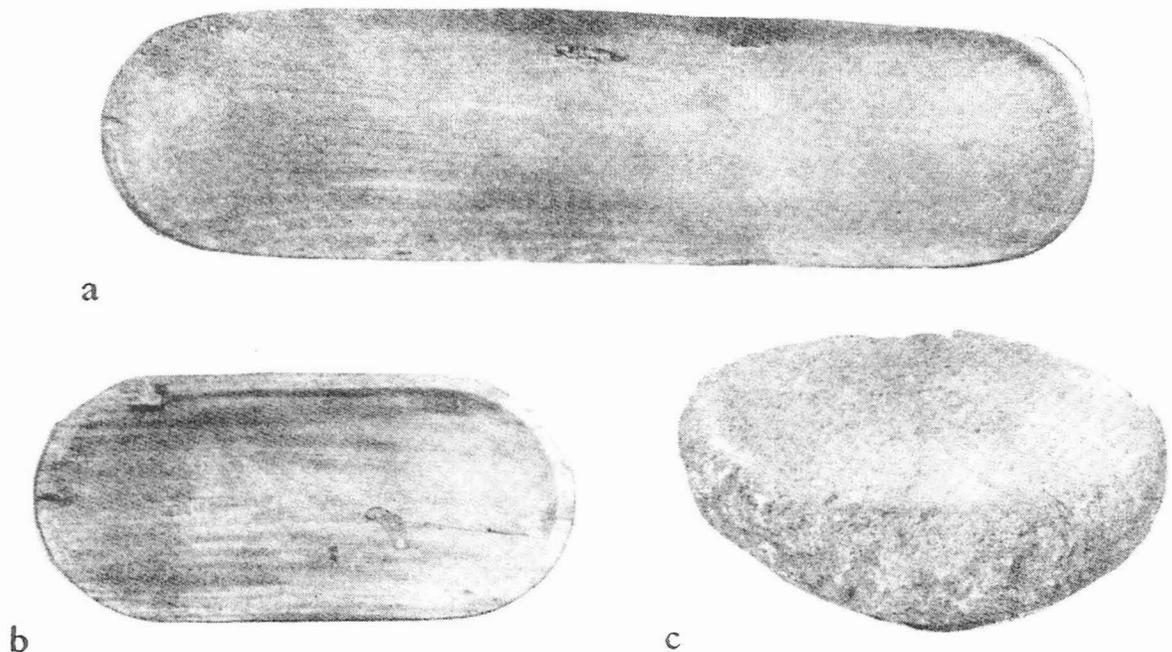


FIGURE 12.—Poi pounding boards: a, two-man board; b, one-man board; c, stone slab said to be pounding board.

exception of the largest board in the collection, which is 2.5 inches deep. The thicknesses of the bottoms range from 2 to 5.5 inches.

The pounding boards divide into two classes: short boards at which only one man could work and long boards at which two men could work, one at each end. A typical one-man board (4225) is 34.75 inches long and 16.5 inches wide (fig. 12, *b*). The longest two-man board in the Museum collection (C.6174), made of breadfruit wood, is 83 inches long and 22.5 inches wide, with a bottom thickness of 5.5 inches (fig. 12, *a*). Intermediate boards vary in length and width, and it is difficult to decide where the one-man boards end and the two-man boards begin.

An interesting feature in some of the two-man boards is the shape of the interior, or upper, surface, which has been worn down at each end, presumably by pounding. However, the boards may have been carved that way. Thus in one board (B.4507) 54 inches long the middle depth is 1.25 inches, whereas the end depths are 2.0 and 2.25 inches respectively. The smaller boards could have been used as serving dishes for meat, as cut marks on the inside bottom indicate.

In Kauai, the island with unique ring and stirrup pounders, stone slabs are said to have been used for pounding taro. A specimen (L.3228) cataloged as a poi pounding slab from Kauai is circular in form with a diameter of 23 inches and a thickness of 6 inches (fig. 12, *c*). It is made of a very porous rock, and there are no signs of any organic matter in the numerous holes on the slightly hollowed upper surface. Stone slabs may have been used, but they would have had to be made of finer basalt than the specimen described.

### STONE FOOD POUNDERS

Stone food pounders (*pohaku ku'i poi*) for mashing cooked taro to prepare poi were of three types: the general form with a terminal rounded knob, ring pounders, and stirrup pounders. In the Bishop Museum collection of 278 perfect specimens which I examined the types were distributed as follows: knobbed, 170; ring, 68; and stirrup, 40. These figures do not give the true proportion of the three types, for most of the specialized ring and stirrup pounders have found their way into the Museum, whereas the common, knobbed form is found in large numbers in private collections. The ring and stirrup pounders appear to have been made exclusively on Kauai, whereas the knobbed form was the type made on all the other islands. The majority of the pounders of all types were made of close-grained basalt. Some made of vesicular basalt appear to be of more recent date.

#### KNOBBED POUNDERS

The knobbed pounders are characterized by an upper terminal knob which prevents the hand from slipping upward when the pounder is grasped by the neck or grip. The knob is circular in horizontal section, and it protrudes evenly beyond

the narrow neck which it surmounts. In the commonest form, the knob joins the neck at a slope; and its upper part is convex, giving the knob a general rounded appearance (fig. 13, *a*). Some knobs project from the neck at a distinct angle, which produces a mushroom shape (fig. 13, *b*). A third, less common, form is in the shape of a flat cap, as its upper surface is flat instead of convex (fig. 13, *c*).

The neck, circular in section, slopes down into the shaft, which gradually increases in diameter, but with enough length to form a convenient grip. The lower end flares outward markedly, in order to provide a larger pounding surface at its lower end. The lower end meets the circular under surface at a distinct

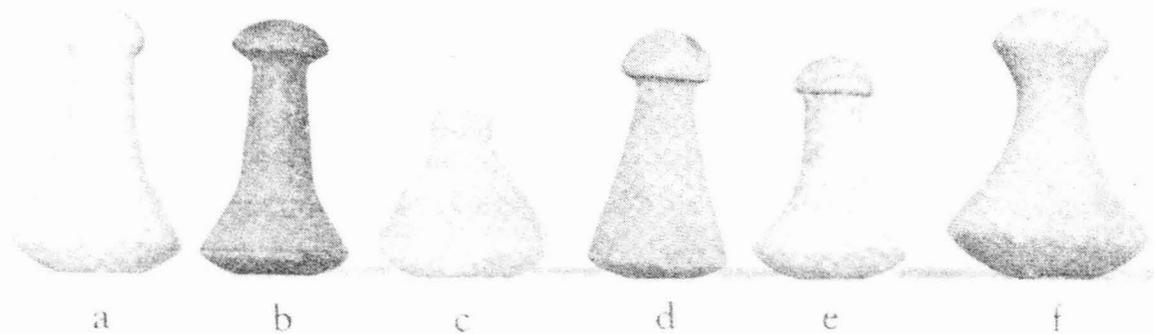


FIGURE 13.—Knobbed pounders: *a*, commonest form, with rounded knob; *b*, cylindrical, mushroom-shaped knob; *c*, flat-topped form; *d*, pestle form; *e*, light pounder; *f*, normal, or medium, pounder.

edge, though in a few pounders this junction is rounded off. The under surface is convex to an appreciable degree and rarely flat; but in a few of the very large pounders, the convexity is exaggerated markedly. The under surface in most pounders is circular; but in a few, the cross diameters do not approximate closely, with the result that the surface assumes an elliptical form. In general, the technique in shaping the pounders is fairly uniform, but slight variations occur which are of no consequence except in some pounders which assume a pestle form.

The pestle form flares less at the lower end, which gives the neck and body a more cylindrical shape and lessens the diameter of the pounding, or under, surface. The pestle form of pounder differs from true pestles in that there is always some flaring at the lower end, whereas pestles are not flared (fig. 13, *d*).

The knobbed pounders differ in size and may be grouped into small, medium (or general), and large. The small pounders average 5 inches in height and 2.5 pounds in weight. I have distinguished them from mullers because they are flared. It is difficult to interpret why such light pounders were made for pounding taro. Though the pounding of taro was done by men, it is possible that the lighter pounders were made for women who, in an emergency, could pound out sufficient taro for a meal. (See figure 13, *e*.)

The medium-sized, or normal, pounders for general use average about 7

inches in height with a pounding surface averaging 5.2 inches in diameter and 4.5 pounds in weight. In number, they far exceed all other variations. (See figure 13, *f*.)

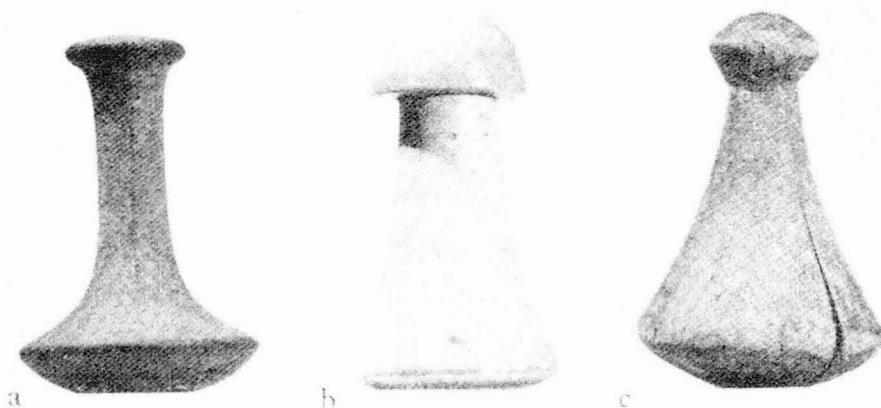


FIGURE 14.—Aberrant pounders: *a*, of iron; *b*, of ivory; *c*, of wood.

The large pounders average 8.8 inches in height and have an average base diameter of 6.4 inches and an average weight of 9.9 pounds. Some of them made of vesicular basalt and with the exaggerated convexity of the under surface seem to have been made for show, for on the under surface are no signs of use. The average weight of nearly 10 pounds makes it hard to believe that they were used by the average man in the long tedious process of pounding taro in quantity. One abnormal specimen weighs 15 pounds 6 ounces. It is possible, however, that some of the large pounders were used in the preliminary stage to break down the whole tubers and that the lighter, medium form was used to complete the operation.

For comparative purposes, the average measurements in inches and the weights in pounds of the different forms are shown in table 4.

Table 4.—Knobbed Pounders

POUNDER	HEIGHT (inches)	DIAMETER (inches)			WEIGHT (pounds)
		KNOB	NECK	BASE	
Small	5	1.9	1.5	3.6	2.5
Medium	7	2.2	1.6	5.2	4.5
Large	8.8	2.9	1.8	6.4	9.5
Pestle type	7.7	2.4	1.8	3.8	3.5

Some odd pounders were made of iron, ivory, and wood. An iron pounder (B.7191), probably made in the early days of trade, has a flat knob, a cylindrical shaft, and a flared base (fig. 14, *a*). The knob is 2.2 inches in diameter, with a height of 7 inches, a base diameter of 4.6 inches, and a weight of 7 pounds 6 ounces.

An ivory pounder (4107) made from a sperm whale's tooth and termed *palaoa ku'i*, has a high knob 3 inches in diameter, a height of 8 inches, an elliptical base with cross diameters of 4.0 and 3.6 inches, and a weight of 2 pounds 12 ounces. It was made in more recent times with steel tools. (See figure 14, *b*.)

A wooden pounder (C.5514), shaped like the stone pounders, is shown in figure 14, *c*. It has a knob diameter of 2 inches, a height of 7 inches, an elliptical base with cross diameters of 4.75 and 4.2 inches, and a weight of 1 pound 4 ounces. It was used for pounding sea weed and breadfruit.

#### RING POUNDERS

Ring pounders are termed *pohaku puka ku'i poi*, in which term the general descriptive word *puka* is added to denote the hole which is the marked feature of the type. This type of pounder does not occur elsewhere in Polynesia; and it is peculiar, not to the Hawaiian Islands, but to Kauai. It appears to have derived from the round form of stirrup pounder, which has a hollow on the front surface. A similar hollow on the back surface results in the perforation. The fact that the stirrup pounder is also peculiar to Kauai supports such a derivation.

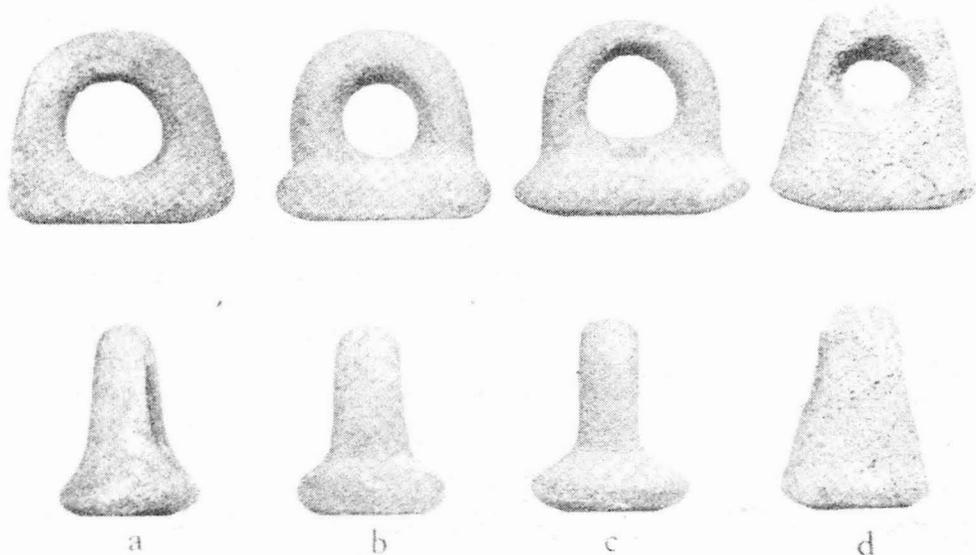


FIGURE 15.—Ring pounders, front and side views: *a*, with slightly widened base; *b*, with flared base; *c*, perforated stirrup form, flared base; *d*, hybrid.

The 68 ring pounders in the Museum collection have an average height of 5.2 inches. The upper part forms a convex curve, or arch, which slopes downward and outward to meet the base. The front and back form wide surfaces which curve downward from the narrower arch above to the slightly wider base below. The corner edges between the two surfaces and the narrow sides are rounded off so that the under, pounding surface is elliptical in shape, with its long axis run-

ning from side to side and averaging about 5.6 inches, a little more than the height of the pounder. The surface is convex, and its average width from front to back in the middle line is 3.4 inches.

Holes are bored from front and back below the arch; and where they meet in the middle, a slight edge is formed which is not usually ground out. A funnel-shaped perforation is thus formed, and its outer edges are rounded off to merge into the front and back surfaces. The completed hole is practically circular, with an average diameter of 2 inches. However, in some pounders the vertical diameter is greater; in others the horizontal diameter is greater, giving the hole an elliptical shape. The arch above the hole is practically circular in section with average diameters of 1.4 and 1.5 inches. The thickness between the bottom of the hole and the under surface averages 2 inches. (See figure 15, *a*.)

The weights range from 2.5 pounds to 6.2 pounds with an average of 3.5 pounds. One very large pounder (10618), 6.9 inches high, weighs 7.2 pounds.

Slight variations occur. In some pounders the sides flare out toward the base (fig. 15, *b*, *c*); and in a few pounders the pounding surface is rectangular in shape instead of elliptical. In the series of 68 ring pounders are two hybrids which are of stirrup form but perforated (fig. 15, *d*). The thumbs of both hands of the operator were passed through the hole from the back and, with the fingers, gripped the sides of the arch. Though the words front and back have been used for the purposes of description, there is no difference in shape between them, so the thumbs could be passed through from either side. One pounder with the hole too small for a thumb to pass through is obviously an incompleting specimen.

#### STIRRUP POUNDERS

The stirrup pounder is the second of the specialized forms from Kauai and, like the ring pounder, is unique to that island. The descriptive term stirrup was applied locally from a fancied resemblance to the foreign stirrup; and as no specific Hawaiian name has been recorded for this pounder the term may be continued arbitrarily to distinguish it from the other two types of pounders.

Stirrup pounders resemble ring pounders somewhat in general plan, but they differ markedly in having one hollow ground-out surface instead of holes meeting from two surfaces. The upper-end treatment varies. In some it forms a convex curve, in others it is straight or curved concavely. The front surface is flat and the back surface convex. The sides, which are narrow and rounded, incline slightly outward to the base. The under, or beating surface, influenced by the shape of the body, is straight in front, convexly curved at the back, and rounded off at the side ends. The long axis is from side to side, and the surface is convex.

Ten pounders in the Museum collection of 40 stirrup pounders have rounded upper ends. They average 4.7 inches in height, 4.6 inches in the base diameter from side to side, 3.4 inches in the base diameter from front to back in the middle line, and 3.5 pounds in weight. Some hollows, ground on the front flat surface,

are quite shallow. However, in one specimen (B.1315) the hollow is an inch deep. It is rectangular in shape with the corners rounded off and with the long axis vertical. The deep hollow is circular, and the implement needs only a similar hollow on the other surface to convert it into a ring pounder. (See figure 16, *a*.)



FIGURE 16.—Stirrup pounders, front and side views: *a*, rectangular with rounded upper end and deep hollow; *b*, with straight horizontal edges; *c*, with shallow concave top; *d*, with deep concave top.

In the other 30 pounders the widths of the upper ends from side to side average 3 inches and the downward and outward slope of the sides is shown by the fact that the average base width is 4.6 inches. The treatment of the upper edges varies appreciably. The edges of three pounders are straight horizontally (fig. 16, *b*). They are curved concavely in 13, the curve being shallow in some (fig. 16, *c*) and deep in others (fig. 16, *d*). Usually the ends are cut off obliquely at the junction with the sides. In three other pounders the ends of the single curve project upward and outward like small lugs (fig. 17, *a*). The last variant, found in 10 pounders, is a double concave curve meeting at an edge in the middle line (fig. 17, *b*). In some the mesial edge is low, and in others it projects above the level of the ends (fig. 17, *c*). As in the ring pounders, the hollow in the front surface varies a good deal. In many pounders the back surface is markedly convex from above down, as well as from side to side (fig. 17, *d*).

The average measurements and weights of the 30 pounders are summarized as follows: height, 4.8 inches; top width, 3 inches; base width, 4.6 inches; base

cross width, 3 inches; and weight, 3 pounds 6 ounces. They do not differ materially from those of the stirrup pounders with rounded upper ends.

This beater was grasped with both hands from the back, the fingers passing around the sides to the hollow in front and the two thumbs passing vertically upward over the top edge. The curves in the upper edge were meant for the thumbs and not for ornament; but when the ends projected to form lugs, the addition was evidently for decoration.

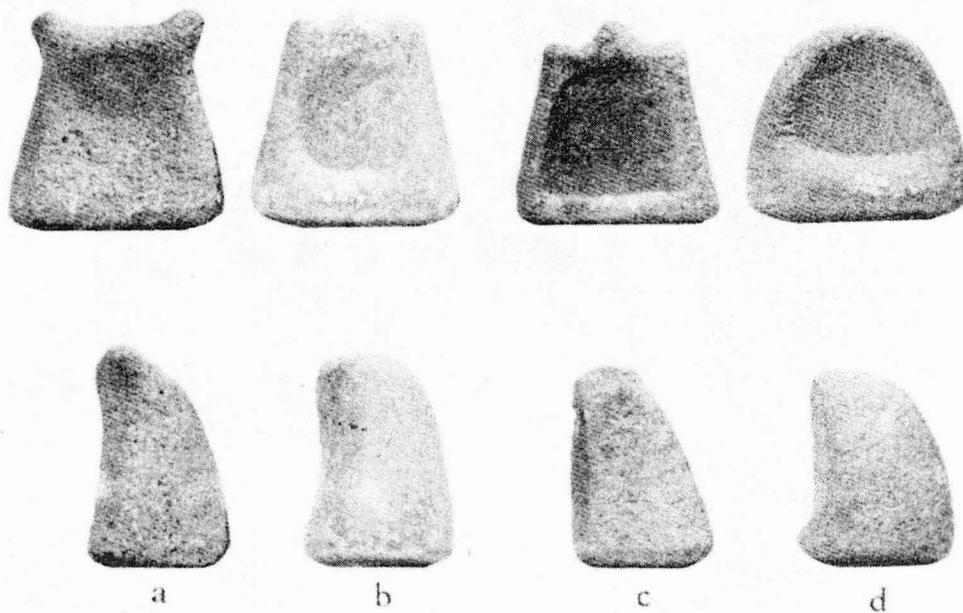


FIGURE 17.—Stirrup pounders, front and side views: **a**, curved top with luglike projections; **b**, top with double curve, meeting in middle line; **c**, with mesial edge projecting above level of ends; **d**, with back and side surface markedly convex.

## BOWLS AND TABLE ACCESSORIES

### GOURD FOOD BOWLS

Many gourd food bowls (*umeke pohue*) were made, to augment the supply of wooden bowls. The large supply was necessitated by the use of liquid poi as the staple starchy food of the Hawaiians for every-day meals. In other Polynesian islands, where more solid food was served on plaited coconut-leaf platters or shallow plaited containers, impermeable bowls were not needed to nearly the extent that they were in the Hawaiian Islands. The demand for bowls led to the extensive cultivation of the gourd plant in Hawaii, and a number of varieties of different shapes and sizes were developed. Those not suitable for bowls were readily adapted to other uses, hence Hawaii had a greater variety of gourd utensils for different uses than did any other part of Polynesia.

The gourd plant which was carried by the Polynesians to all the high islands

Hawaiian-prepared 'ava was evidently much stronger than the 'ava made in Samoa. The Reverend William Ellis (1839, p. 381) relates an incident before a meal at which their Hawaiian host drank about half a pint of 'ava from a coconut-shell cup: "As he took it, a man stood by his side with a calabash of fresh water, and the moment he had swallowed the intoxicating dose, he seized the calabash, and drank a hearty draught of water, to remove the unpleasant taste and burning effect of the ava." It was also the custom to eat something after drinking 'ava, and such food was termed *pupu*.

The 'ava beverage was a refreshing drink, and I believe that the various derogatory accounts regarding its drastic effects have been grossly exaggerated.

### CONDIMENTS

The condiments used by the Hawaiians were salt (*pa'akai*), *kukui* nut (*inamona*), and seaweed.

#### SALT

Hawaiians were the only Polynesians who produced salt from sea water by properly constructed salt pans. King (Cook, 1784, vol. 3, p. 151) states: "Their salt pans are made of earth, lined with clay; being generally six or eight feet square, and about eight inches deep. They are raised on a bank of stones near the high water mark, from whence the salt water is conducted to the foot of them, in small trenches, out of which they are filled, and the sun quickly performs the necessary process of evaporation." The Reverend William Ellis (1839, pp. 397-398) describes the salt pans he saw in Hawaii as follows:

We saw a number of their pans, in the disposition of which they display great ingenuity. They have generally one large pond near the sea, into which the water flows by a channel cut through the rocks, or is carried thither by the natives in large calabashes. After remaining there some time, it is conducted into a number of smaller pans, about six to eight inches in depth, which are made with great care, and frequently lined with large evergreen leaves, in order to prevent absorption. Along the narrow banks or partitions between the different pans, we saw a number of large evergreen leaves placed. They were tied up at each end, so as to resemble a shallow dish, and filled with sea water, in which the crystals of salt were abundant.

David Malo (1951, p. 123) says that the shallow ponds were named *kaheka*.

King (Cook, 1784, vol. 3, p. 151) states that the salt they procured at Atooi (Kauai) and Oneeheow (Niihau) on their first visit was brown and dirty. The color was probably due to the Kauai custom of mixing red earth with the salt, a mixture held to improve the salt by giving it some tonic property probably due to the presence of iron in the red earth. King says that at Kealakekua Bay, however, the salt "was white and of a most excellent quality, and in great abundance. Besides the quantity we used in salting pork, we filled all our empty casks, amounting to sixteen puncheons in the Resolution only."

With the large quantity produced, the Hawaiians were able not only to satisfy their own wants but to enter upon a commercial enterprise. Ellis (1839, p. 398) states that besides what they made, salt lakes yielded large supplies. He goes on to say, "The surplus thus furnished, they dispose of to vessels, touching at the islands, or export to the Russian settlements on the north-west coast of America, where it is in great demand for curing fish, etc." The Hawaiians also used their salt for curing fish.

In addition to making salt pans near the sea, the Hawaiians made small pans out of natural rocks which they placed on their house platforms (fig. 44). The upper, level surface of the rock was chipped out to form a hollow, or depression, ranging from 1 inch to 2.5 inches in depth and of various dimensions according to the size of the rock. In the Bishop Museum collection of nine such pans examined by me the smallest (5885) was 8.75 inches long and 6.75 inches wide, the depth being 1 inch. A large pan (C.9281) is circular in appearance with cross diameters of 29 and 23 inches and has the abnormal depth of 4.75 inches.

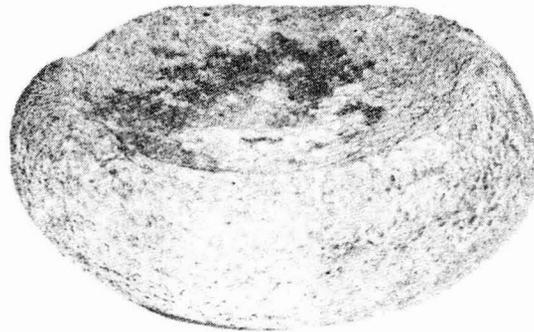


FIGURE 44.—Salt pan.

Women brought concentrated brine from the coastal salt pan in a gourd and poured it into the shallow stone pans at home where the evaporation was soon concluded. These stone pans were termed *poho kahapa'akai* (salt evaporating dish). The evaporated salt was in coarse crystals; and for household use, it was ground fine in a small stone mortar with a stone muller.

The stone salt pans can be distinguished from the hollows in rocks made by adz-grinding by the edges of the hollow which are cut down abruptly to the floor of the pan. The grinding hollows slope down evenly from the edges, and the surface is smooth from the grinding.

Salt is no longer made locally, owing to the introduction of the trade article; but the addition of red earth to form red salt has been continued on Kauai, a relic of the past which appears at Hawaiian feasts.

They are, however, kept reasonably clean; and their floors are covered with a large quantity of dried grass, over which they spread mats to sit and sleep upon. At one end stands a kind of bench, about three feet high, on which their household utensils are placed. The catalogue is not long. It consists of gourd-shells, which they convert into vessels that serve as bottles to hold water, and as baskets to contain their victuals, and other things, with covers of the same; and a few wooden bowls and trenchers, of different sizes.

Most of the household equipment is treated in other sections of this work. Mats, pillows, and baskets are under plaiting and twining; bed covers, under bark cloth; kitchen utensils, under food; and so forth.

#### KUKUI-NUT CANDLES

Throughout the high islands of Polynesia, the nuts of the candlenut (*kukui*) tree (*Aleurites moluccana*) were used for lighting. The nuts were baked lightly, the hard shells cracked, and the oily kernels threaded on lengths of stiff midribs from dry coconut leaflets to form a primitive candle. The Reverend William Ellis (1839, p. 374), who saw them in use in Hawaii, states that 10 or 12 kernels were strung on a coconut-leaf stalk [leaflet midrib]. The top one was lighted and when the one below ignited, an attendant broke off the burned out nut with a short piece of wood which served as a pair of snuffers. Each nut burned for two or three minutes, and, if attended, gave a fair light. It is apparent that a single candle lasted about half an hour and that the light had to be renewed frequently. Ellis (1839, p. 373) notes that large quantities of candlenuts were hanging in long strings in different parts of the dwelling in which he was staying.

Brigham (1902, p. 60) states that the string of nuts was leaned against a stone. It is probable that the stone referred to was one of the many forms of cupped stone receptacles usually referred to as stone lamps and that the candle was leaned against the inner edge. At the bottom of the cup in many of these lamps there was a small hole which was perhaps made to receive the lower end of the candle, or a wick when the cup was used as an oil lamp.

#### STONE LAMPS

Brigham (1902, p. 60) states that *kukui* or *kamani* oil was used in stone mortars, with a wick made of tapa, and that the light was increased by adding more wicks. The term stone mortars has been used loosely to include a great number of hollowed stone receptacles, many of which were never made for use as mortars. However, in a large collection obtained from various sources and without authentic information as to their actual uses it is difficult at times to distinguish between mortars, stone lamps (*poho kukui*), dye cups, and other stone receptacles. Some were undoubtedly used for more than one purpose and ended up with the name of the last use to which they had been put. The Bishop Museum has 201 stone receptacles which have been cataloged as stone lamps. Many have definite information as to their use as lamps and many have the inner edge stained black with burnt carbon. From such authenticated specimens, it is possible to identify others.

Stone lamps were of various sizes, weights, and shapes with no established single pattern. With few exceptions, they were made of easily worked vesicular basalt and some were natural pieces of rock of convenient size which were made into lamps by pecking out a circular hollow on the upper surface. The heights of the Museum series range from 1.5 to 11 inches with the greatest number between 4 and 5 inches. The low lamps are usually pieces of flat rock with a shallow, cupped depression in the middle of the flat upper surface. The greatest diameters range from 2.3 to 10 inches with the greatest number around 4 inches. The weights range from 0.5 pound to 14 pounds; but four range between 15 and 19 pounds, and two exceptionally large lamps weigh 24 and 32 pounds respectively. The majority range between .2 and 5 pounds.

The characteristic feature of the lamp is the comparatively small size of the cavity and its shallow depth. The shape at the rim, with a few exceptions, is circular. The bottom is rounded. The rim diameters range from 1.4 to 4.9

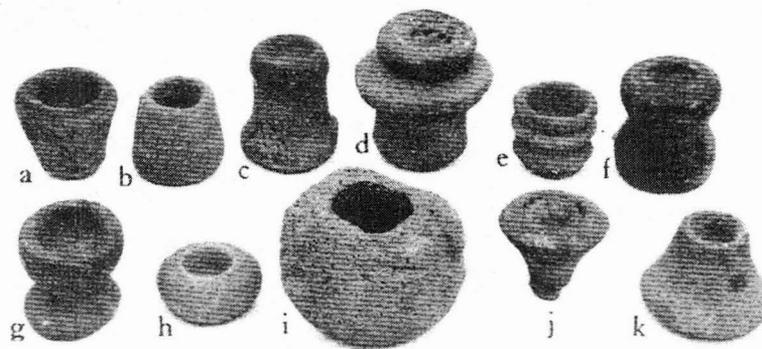


FIGURE 73.—Stone lamps: a, cylindrical with wider top; b, cylindrical, wider bottom; c, with rim and bottom flanges; d, flanged at middle; e, with three horizontal grooves; f, hourglass form; g, goblet form; h, ball-shaped; i, with carved human figures; j, from base of poi pounder; k, from shaft of poi pounder.

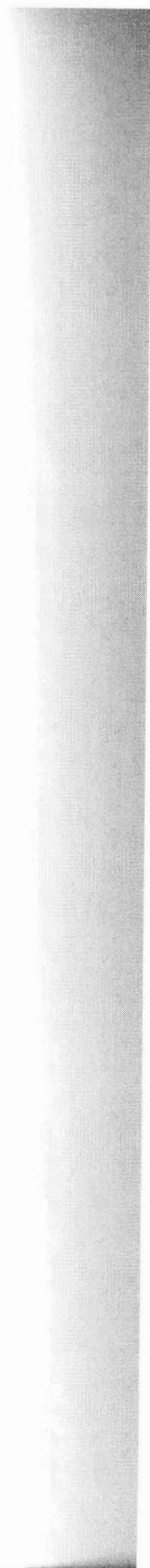
inches, but two are 5.0 and 5.5 inches respectively. The great majority range between 2.1 and 3.9 inches. This feature is found in 30 large lamps weighing more than 10 pounds, the rim diameters ranging from 1.8 to 4.8 inches. In the largest lamp, weighing 32 pounds, the rim diameter is 3.6 inches.

The cavities in 195 well-made lamps range from 0.5 to 3.9 inches in depth, but two lamps have a depth of 4.5 and 5 inches respectively. In 128 of the series the depths average 1.5 inches. In the lamp weighing 32 pounds, the cavity depth is 2.4 inches. In 15 percent of the series, a small hole 0.25 to 0.5 inch deep is found at the bottom of the cavity, possibly for the end of a *kukui*-nut

candle or the wick of an oil lamp, as I have pointed out. Double cavities, one at each end, are found in 15 lamps of the series. In some, both cavities have been used; in others, one cavity is poorly finished.

The form of the artificially shaped lamps varies considerably. Of the cylindrical forms, some are wider at the upper end, others are wider at the lower end; some have rim and bottom flanges; one well-made lamp has a horizontal flange encircling its middle; and a few rather roughly made lamps are ornamented by three horizontal grooves. Others include the hourglass form with a middle constriction and an attractive form with an expanded upper end and a smaller base, a sort of goblet shape. Some lamps of globular form approach a ball shape and others are slightly flattened. A unique specimen has a carved human figure looking outward on each side.

The commonest form is made from the base ends of broken poi pounders. There are 27 in the series, of which 20 have the cavity on the curved base and seven have it on the shaft end. The poi-pounder type is readily distinguished not only from its shape but from the close-grained basalt used. This form was evidently popular, for in six lamps it was copied in vesicular basalt. (See figure 73, *a-k*.)



The well-made wooden shark hooks of the Cook Islands (Buck, 1944a, pp. 239-241) resemble the Hawaiian hooks in the form of shank and point limbs and the U-bend, but they are one-piece hooks with an inturned point and a shank knob for the snood attachment. Hawaiian shark hooks in other museums follow the pattern described and are illustrated by figure 234, *a*. The grooved snood attachment with its textile cover is peculiar to Hawaii and forms an infallible means of identifying the Hawaiian composite shark hooks.

#### SIMPLE BONE SHARK HOOKS

Bishop Museum has two large bone hooks with inner barbed points. The larger hook (fig. 234, *b*) is 11 inches long and 5 inches wide. The bend is 37 mm. deep and 23 mm. thick. A smaller hook (6923) is 8 inches long and 3.9 inches wide. Both hooks have the grooved snood attachment with the textile covers exactly the same as in the wooden composite hooks, and these features confirm their identification as shark hooks.

### FISHING ACCESSORIES

#### STONE SINKERS

Stone sinkers were used with nets, fishing lines, squid lures, and ground bait; but the introduction of lead speedily led to their abandonment. However, large numbers have been picked up by collectors and the Bishop Museum collection, omitting the specialized squid sinkers, contains more than 200 specimens of various shapes and sizes. Apart from shape, a distinguishing feature of classification is the method of securing the line to the sinker. The common, widely spread methods were by grooves and perforations. However, two specialized forms were made in addition, and these have been termed in Museum parlance, bread-loaf sinkers and plummet sinkers. The bread-loaf sinker is a special form of grooved sinker, and the plummet is original in having a terminal knob with a constricted neck for the line. Thus Hawaiian sinkers fall into four groups: grooved, perforated, bread-loaf, and plummet.

#### GROOVED SINKERS

The grooved sinkers examined number 109 and, though a large number consist of rough pieces of unshaped stone, a good many have been chipped into some definite form. The commonest are elliptical with fairly rounded ends, and those with longitudinal grooves are about equal in number (16) to those with transverse grooves (17). It is probable that those with transverse grooves were used with nets and that the others were sinkers for fishing lines. Many of the longitudinally grooved sinkers are slightly wider and thicker at one end, which was probably the lower end in fishing line sinkers. A well-shaped basalt sinker

in Bishop Museum (1200) is from Molokai. It is 2.4 inches long, 1.7 inches wide in the middle, and 1.6 inches thick; the groove is 0.5 inch wide, and the weight is 6 ounces. In five additional sinkers of elliptical shape the groove is made around the periphery, producing a resemblance to pulley blocks. Two are circular balls, two have the transverse groove so deeply cut that they resemble dumbbells, and four have a transverse groove around a small end forming a knob. Three are converted *'ulumaika* (throwing disks), with a median groove on each surface and over the rim; and five are converted squid-lure sinkers, with a continuous groove over the flat under surface. (See figure 235, a.)

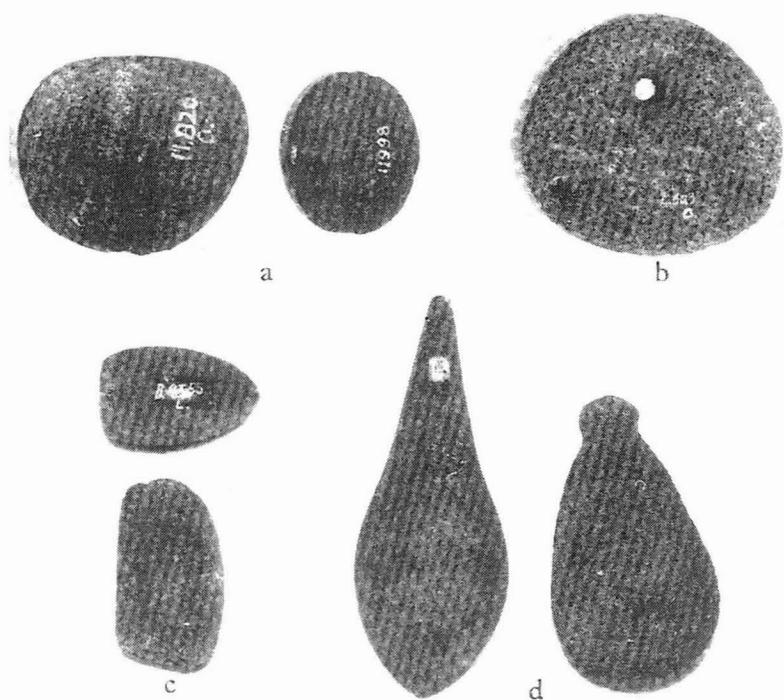


FIGURE 235.—Sinkers: a, grooved; b, perforated; c, bread loaf; d, plummet.

Most of the sinkers in the Museum collection are made of vesicular basalt, which is easier to shape and to groove than is the denser basalt. The weights vary considerably, the smaller ones for light lines or nets ranging from 1 to 6 ounces and the heavier ones for deep sea fishing ranging from 1 pound to 4.5 pounds.

Twenty percent of the grooved sinkers are made of reef rock and, owing to the softer material, are well shaped, mostly in the elliptical form with either

kind of groove. Four are of the pulley form, with peripheral grooves; and one is a converted squid-lure sinker. With the exception of one larger sinker, they range in height from 0.7 to 2.8 inches and in greatest width from 0.5 to 2.4 inches. With the exception of two sinkers which weigh more than a pound, the series is remarkably light, with weights ranging from 0.5 to 6 ounces. According to the Museum catalog, the light sinkers were used with nets.

All of the sinkers in Bishop Museum except the one from Molokai and one from Kauai are from the island of Hawaii.

#### PERFORATED SINKERS

The Museum's cataloged series of 26 perforated sinkers (fig. 235, *b*) is somewhat disappointing, for no fewer than 14 are flat circular disks with central holes. Of these, eight are made of vesicular basalt and six are of reef rock. With the exception of one large disk, they range in diameter from 1.8 to 3.0 inches and in thickness from 0.6 to 1.25 inches. The weight ranges from 1 to 6 ounces. It is most unlikely that such well-made disks were designed for sinkers. Rather, it is probable that they were the balance disks for teetotums or drills. Nor are the remaining 12 very convincing. Most of them are more or less globular with a hole drilled through the smaller end. One perfect specimen (B.238) is identical in shape with the northern type of New Zealand sinker, and probably came from there. Two are cylindrical sections, one is a throwing disk, and one is a converted food pounder. All but three made of reef rock are of vesicular basalt. They range in weight from 4 ounces to 2 pounds 4 ounces; but one of large, irregular shape weighs 6 pounds 14 ounces.

It is evident that the Hawaiians preferred grooves to perforations in the making of sinkers.

#### BREAD-LOAF SINKERS

Bread-loaf sinkers are a specialized form peculiar to the Hawaiian Islands, and their established use is indicated by the collection of 73 in the Museum. They have been likened to a loaf of bread because the upper part resembles the top of a loaf in shape and the lower part is shorter and narrower, as in a loaf of bread. The upper part of the sinker is convex lengthwise, and in the series it ranges from 1.7 to 4 inches. It is also curved from side to side; and the maximum width, which is toward one end, ranges from 0.9 to 2.4 inches. A continuous groove on both sides and around the ends separates the upper and lower parts. In a few sinkers, the broader end has been cut down vertically, eliminating the groove at that end. The length of the lower part is usually 0.3 inch shorter than the upper part, and its width is 0.4 to 0.7 inch narrower than the upper part. The under surface of the lower part is straight and flat, with a median groove extending along its full length. The weights range from 3 to 18 ounces. Of the series, 11 are made of reef rock; the rest, of basalt. (See figure 235, *c*.)

According to the Museum catalog, a number of the sinkers were for the lip nets used for catching *uhu* ('*upena uhu*), and it is evident from their shape that the bottom, grooved surface was fitted against the lower ends of the rod spreaders of the nets. Furthermore, it is probable that they were used on other forms of the dip net. A cord was tied to the rod at one end of the sinker, made longitudinal turns along the lateral grooves, and crossed obliquely around the rod at each end. The grooved under surface of the bread-loaf sinkers could well be fitted to the bottom rope of some nets, but I have no evidence that they were so used.

One of the squid lures in the Museum collection has a bread-loaf sinker fitted and lashed to the wooden stem of the lure; but as the squid lures had their own specialized form of sinker, it is likely that the bread-loaf sinker was used as a makeshift. One-third of the sinkers was collected on Lanai. All the other islands are represented, except Kauai.

#### PLUMMET SINKERS

Plummet sinkers (*pohakialoa*), another specialized Hawaiian type of sinker, were made to carry lines down to the bottom of deep fishing grounds. Kamakau describes them as being made like poi pounders but with the upper ends narrowed and surmounted by a small knob for the attachment of the line. In addition, the bottom end is globular instead of flat (fig. 235, *d*), resembling a large plumb reversed, the small end uppermost.

In the Museum series of 35 plummet sinkers, the weights range from 1 pound 14 ounces to 5 pounds 9 ounces, with the exception of one unfinished specimen which weighs 7.5 pounds. The average weight is 3.5 pounds. The length, including the top knob, ranges from 4.1 to 9.8 inches, with an average of 6.5 inches. Some of the sinkers are almost circular in section; but usually the maximum cross diameters differ slightly, a fair average being 3.5 inches. Two sinkers are converted poi pounders. A unique sinker (4788), 6.75 inches long, has two gill-like projections toward the lower end; and this may have been a fish-god symbol to ensure good luck. The terminal knobs in the well-finished sinkers are remarkably small. In one of the larger specimens (7452), 9.2 inches long and 3 pounds 1 ounce in weight, the knob has a diameter of 0.5 inch and a length of only 0.2 inch. Many of the knobs have pieces broken off; but in 23 of 29 measurable knobs, the lengths range from 0.2 to 0.9 inch. In the remaining six they range from 1 to 1.5 inches. The diameters, however, vary greatly, ranging from 0.5 to 2.7 inches. All have constricted necks for tying the line. Most have rounded ends, but a few are flat. A few of the wider knobs have a vertical groove, and one has two crossed grooves. Except for one sinker of reef rock, all are made of basalt.

In addition to the large plummets, the collection contains five smaller ones which weigh from 1 to 14 ounces. Though they follow the shape of the larger

sinkers, they were evidently made for fishing in shallower waters. Of these, three are made of reef rock; two, of basalt.

The large plummets were for use in the deepest fishing grounds, 400 fathoms or so, and particularly, for lines carrying 10 or more fishhooks. These deep grounds are termed *pohakialoa* by Kamakau, and it is probable that they were so named after the plummet sinkers because the term, meaning long stone, is descriptive of the specialized sinkers.

#### HOOK-AND-LINE CONTAINERS

In the rest of Polynesia, including New Zealand, fishermen usually kept their hooks and lines in plaited baskets; but in Hawaii, plaited baskets were displaced by the general use of gourds as containers. Small gourds were used for hooks and large gourds for fishing lines, but some of the intermediate sizes were used for both hooks and lines. Of 50 containers in the Museum collection, 23 are for hooks and 27 for fishing lines. All these containers are fitted with covers, attached by various methods.

#### HOOK CONTAINERS

Hook containers (*ipu le'i*) are of two types, one with both container and cover made out of gourds and the other with a wooden bowl and a gourd cover. In six containers of the first type, the heights of the gourd bowls range from 4 to 7.75 inches and the greatest diameters range from 4.25 to 6 inches. The heights of the covers range from 1.75 to 2.75 inches; and the maximum diameter, from 3.5 to 5.5 inches. The rim diameters of the bowls are less than their maximum diameters, and the rim diameters of the covers are 0.5 to 1 inch greater than those of the bowls they cover. Thus the covers slip easily over the bowl rims. The covers are fastened with a short net surrounding the gourd and fixed to holes in the gourd or to the upper band of an *'aha hawele* support (fig. 236, *a*).

Of the second type of hook container, the Museum has 17 specimens, each with a wooden bowl mostly of *kou*, and a gourd cover. The bowls are well made, and most of them are fairly small. Their heights range from 4.1 to 8.25 inches; their greatest diameters, from 4.5 to 6.75 inches. However, one exceptional bowl has a diameter of 9 inches. The gourd covers vary a good deal in size. Many are low, like the covers of type 1, with a height range of 2 to 4 inches; but others range from 4.1 to 8.25 inches. The maximum diameters of the whole series range from 4.75 to 9.25 inches.

The covers of the second type are fixed in five different ways. One is fastened with a single string, another is carried in a bag, and three have *koko* nets similar to those used for carrying food bowls. The remaining 12 covers are fixed with a short net attached to the bowl in two different ways.

roots, flowers, seeds, or fruit of 15 local plants. A certain amount of magic entered into some of the recipes, such as one which was made from exactly five 'ilima flowers. One more or one less flower was held to render the preparation useless. Foreign ingredients introduced in later times figured in six preparations—red pepper, cinnamon, painkiller, kerosene, tobacco juice, and last but probably not least, a few drops of brandy or other available alcohol. In one recipe, salt was added to the ink sac before it was cooked.

This bait was applied to the tip of the hook and was held to be very attractive to fish. Emerson lists 16 kinds of fish which were caught with the ink bait and states that they were all small fish found near the shore. Thus the hooks used were small hooks requiring small portions of bait and the paste made from one ink sac was sufficient for the day's fishing. The small quantity of bait needed also accounts for the small size of the mortars used in its preparation.

#### STONE BAIT MORTARS

The small stone mortars (*poho*) used for pounding (*ku'i*) or mixing the squid-ink bait and some other ingredient were descriptively termed *poho ku'i palu*. The Museum collection contains 72 such mortars, of which some are not quite finished. With regard to material, 75.4 percent are made of vesicular basalt; 14.5 percent, of reef rock; and 10.1 percent, of close-grained basalt. The specimens made of close-grained basalt are 'ulumaika (throwing disks) which have a shallow circular cup formed on one surface. Those made of

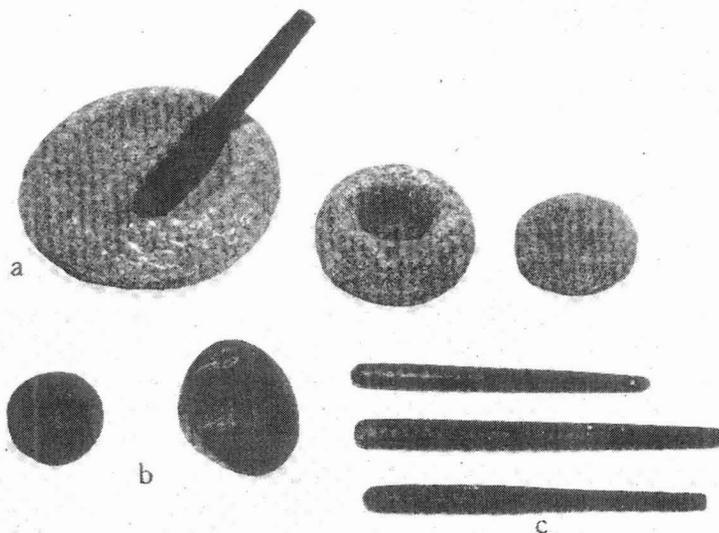


FIGURE 240.—a, stone bait mortars; b, coconut-shell mortars; c, wooden bait pestles.

vesicular basalt and reef rock are circular in shape with rounded rims and the bottom sufficiently flattened to enable them to rest upright.

An analysis of their measurements shows that they were comparatively small and shallow. The heights range from 0.5 to 2.5 inches with the great majority between 1 and 1.9 inches. Being mostly circular, their cross diameters are the same, except for the few that are slightly elliptical in shape. The greater diameters range from 1.7 to 3.6 inches with the majority around 2.5 inches. The depth of the shallow circular cavities is evenly distributed between 0.1 to 0.9 inch, with only five specimens between 1.0 and 1.3 inches. Their weights range from 2 to 18 ounces, the majority ranging between 5 and 6 ounces. Two, however, weigh 20 and 24 ounces respectively. From their light weight, it is evident that the mortar could be held in the left hand while the pestle was worked with the right hand.

A cavity on each surface was found in 16 mortars, of which 11 were from Lanai. Examples are shown in figure 240, *a*.

#### COCONUT-SHELL BAIT MORTARS

An alternative form of bait mortar was made by cutting off the distal, or pointed, end of small coconut shells. They were easily produced, with a ready-made cavity. In the Museum collection of 15, the heights range from 1.1 to 2.7 inches, averaging 1.7 inches. The rim diameters range from 2 to 3 inches, with an average of 2.6 inches (fig. 240, *b*). The short points which project from the natural shell have been cut off to form evenly rounded bottoms. Many of the specimens have been polished and are dark in color.

#### WOODEN BAIT PESTLES

Small wooden pestles (*la'au ku'i palu*) were used with both the stone and coconut-shell mortars. In 17 specimens, the lengths range from 4.9 to 7.4 inches, with an average of 6.3 inches. They are round in section, and the diameters in the middle range from 0.5 to 1.0 inch, with an average of 0.7 inch. Most are much the same thickness throughout their length, but a few are enlarged toward the rounded end used in mixing the bait (fig. 240, *c*). One abnormal, double-ended pestle is 8.9 inches long.

#### BAIT STICKS

Bait sticks (*la'au melomelo*) were made of hard, heavy wood that would sink, such as *kauila*, *koai'e*, *'a'ali'i*, or *pua*. They were usually cut from a section of the natural branch with the bark removed, many retaining the natural grooves and hollows. One end of the section was rounded and the other end was trimmed down to a point which was finished off with a small rounded knob, to the constricted neck of which the lowering line was attached. In shape they resembled

## SPEARING

Squids were speared in the shallows and about rocky ledges, where, according to Kamakau, they were countless in number and "the air was foul with them." These squid habitats were protected by a closed season, or tapu, which lasted four to six months after a *hau* branch was set up some time in January or February. During this closed season, it was prohibited for women to go to the beach or to fish with nets. Only the *konohiki* (overseer) and the watchmen were allowed on the beaches.

When the closed season neared its end, the watchmen made preliminary observations to determine whether it was time for fishing. Kamakau writes that at high tide the squid moved along the edge of the sea in files, marching as in procession, the tentacles arched and the holes in the head stretched out and used like gills, the blow tubes sucking and blowing like pumps as they swam along like real fish. At low tide, the whole sea floor was furrowed with burrows scattered in all directions and the squids lay spread out flat (*palaha*) "like lumps of dark earth" but moving their heads about slightly. Kamakau adds that when they saw a man, they squirted salt water at him; and if a canoe came too close, they held it fast.

If the report of the watchers was favorable, proclamation was made that the season was open. Men and women went down to the sea in canoes or on foot with light spears 1 or 2 fathoms long made from hard woods such as *walahe'e*, *'ulei*, *'a'alii*, and *uhiihi*. The men speared squids that lay with the tentacles sprawled out; and when speared, a squid twined its tentacles about the spear and came out of its hole. The fisherman killed it by biting it between the eyes or by stabbing it between the teeth with his spear. He strung his catch on a cord and laid the full cord on the floor of the sea while he gathered others, as many as four or five strings in all. When the tide came in, all the fishermen collected their catch and assembled at one place ashore, where the whole catch was then distributed, as many as 50 or 100 to each man. Kamakau says that a greedy person might hide his catch in the sea and go back for it secretly when the distribution was over.

## LURES

## KILO METHOD

The *kilo* method was carried out in shallow seas, from 6 to 10 fathoms deep, for the fisherman had to be able to see (*kilo*) the bottom. To become skillful, according to Kamakau, the fisherman had to learn all the ways of the squid. The squid that squatted outside its hole or lay there curled up in a ring was easy enough to detect, but says Kamakau, he had to learn about the squid that hid its burrow and built a mound of pebbles; that closed up its burrow leaving only a long tentacle outside; that mimicked the head of an eel; that turned

upside down exposing its teeth; that resembled a sea urchin; that moved in procession; or that hid in large crevices.

The fisherman paddled out in his canoe to a quiet place. He chewed some *kukui* nut and spat it onto the surface of the water, and the oil cleared the water and enabled him to see to the bottom. His implement consisted of a stick with a hook, a stone, and a tuft of ti leaves very like the squid lure but lacking a cowrie shell. The stone was any rough stone of suitable size.

When a burrow was located, the fisherman lowered the implement on a line to about a yard away from the burrow. When the squid saw the strange stone, its tentacles crept toward it, the body came out, and it drew toward the stone until it was directly upon it. Then the fisherman jerked the line and hooked the squid. The fisherman moved about in his canoe, observing the sea bottom with the aid of *kukui* nuts, of which he chewed a fresh lot for each change in position.

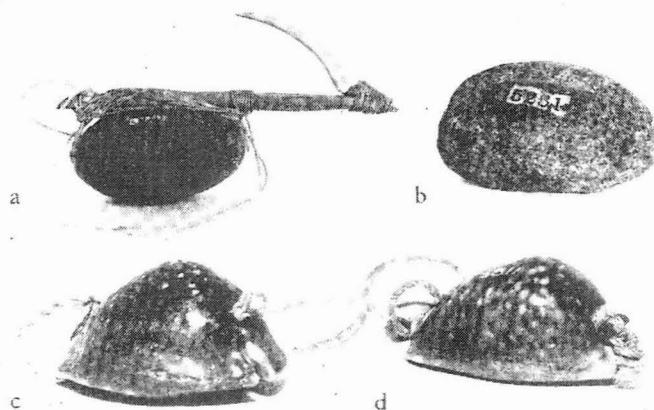


FIGURE 242.—a, *kilo* squid lure; b, stone squid lure sinker; c, lure with knot attachment; d, lure with crossbar attachment.

If the wind blew too strongly, ruffling the water, he ceased operations and paddled ashore.

As the squid was lured from its hole by the stone, the *kilo* implement may be conveniently termed the stone lure to distinguish it from the more complex and better-known lure made with the cowrie shell.

A specimen in the Museum collection (3791) has a wooden stem, a stone sinker, a bone hook, and no cowrie shell. It complies with Kamakau's description of the stone lure except that it has no tail of ti leaves (fig. 242, a). The stem is 5.3 inches long and 0.3 inch thick. The sinker is a circular, flat, waterworn stone, 2.4 and 2.9 inches in cross diameters and 1.3 inches thick. One flat surface of the stone is laid against the stem toward the front end and tied to it with an

*olona* thread. The thread is tied to the front end of the stem, passes back over the stone in the middle line, and passes around the stem at the back edge of the stone. The longitudinal turns backward and forward over the stone run diagonally to opposite sides of the stem. After a number of turns, the lashing is tightened by two longitudinal turns, which are made on the under surface of the stone to pass around the front and back ends of the lashing as they pass between the stone and the stem.

The hook is an attached bone point, unperforated, but with a backward extension of the base to the stem near its far end, the lashing thread passing around the base extension and the stem. A cord is tied to the front end of the stem. When in use, the cord was tied to a line. It would have been easy enough to tie some strips of ti leaves to the far end of the stem with the hook lashing, as was done in the cowrie lures.

#### COWRIE SQUID LURE

The cowrie shell (*leho*) gave its name to the lure, which was called *leho he'e*. The process of fishing by shaking (*lu*) it up and down was termed *lu he'e*. The cowrie lure was made primarily for fishing in water 80 to 120 fathoms deep, much too deep for the *kilo* method. However, Kamakau says that squid fishing with the lure was an aristocratic sport in which the cowrie lure was commonly used when the squids came in close to shore.

The cowrie lure was a refinement of the stone lure, having one or two cowrie shells on the side opposite the stone sinker. In the Museum collection of 35 cowrie lures examined there is a good deal of variation. Furthermore, modern influence is apparent in the lead sinkers and metal wire hooks used; but despite foreign material, the methods of tying the sinkers and hooks to the stem follow those used in the older lures. The cowrie lure is composed of five parts: a wooden stem, a stone sinker, a cowrie shell, a hook, and a hackle (or tail) of ti leaves.

The stem is a wooden rod 6 to 9 inches long and about 0.5 inch in diameter. It is usually squared, and the lifting cord is toward its front end, with the hook at the back end.

Apparently, the sinker was any kind of stone. Kamakau gives the following nine names as being used for squid sinkers: *komano*, *pu'ukuna*, *maili*, *polipoli*, *pupukea*, *kalapaiki*, *'iole*, *kauaula*, and *'o'io* and states that there were many others. Malo (1951, p. 19), in a list of 24 names, gives some of the above and adds others. The large number of names indicates the attention which the craftsmen paid to varieties of stone as they saw them.

The sinkers are elliptical in shape, with an inner flat surface and an outer rounded surface with a longitudinal groove in the medial line of the longest diameter. A typical sinker is 3.8 inches long, 2.9 inches wide in the middle,

and 2.3 inches high in the middle (fig. 242, *b*). The flat surface is laid against the stem at its front end and is bound to it by an *olona* thread which makes several turns backward and forward in the sinker groove and around the stem in front and behind the sinker. Next, a couple of turns are made around the front and back ends of the lashing between the sinker and the stem. The last turns tighten the lashing. The method is the same as for the stone lures used in the *kilo* method of fishing.

The cowries were selected with great care. Kamakau lists the following four varieties as good ones: *ahi*, *'olupalaha*, *pauhu*, and *kupa*. He says that the *ahi*, which had well-shaped lips and was of a deep red color, was called the fire cowrie (*ahi*) because it was reddened in the fire. The *kupa* was a dark red which Kamakau likens to that of "a mountain apple ripened in the shade." He waxes eloquent about the cowrie when he states, "A well formed cowrie had the power of attracting squid just as a beautiful woman arouses desire in a man." The different varieties of cowrie were used at different periods of the day: the *ahi* in the morning before sunrise, the *'olupalaha* and *pauhu* after the sun rose, and the *kupa* toward noon.

The complete cowrie shell is used, and it has front and back holes drilled through the shell in the middle line about 0.8 inch above the natural indentations in the lip. The long sloping end of the shell functions as the front end. The lifting cord, about 0.1 inch thick, is attached to the shell by means of two holes. The fixation at the back hole is made in one of two ways. In the simplest and most general method, the end of the cord is pushed through from the inside of the shell and knotted on the outside with an overhand knot. The knot is larger than the hole and so fixes the cord at the back (fig. 242, *c*).

The second method is to lay a short crossbar of bone, *'ekaha* (sea plant), or *kukui*-nut shell against the outer side of the shell just below the hole. Some vertical rounds with a thread are made over the stick and through the shell indentation below and the hole above; then a couple of circular turns are made below the crossbar and tied. The lashing fixes the crossbar to the shell, and the circular turns raise it slightly above the surface of the shell. The end of the lifting cord is looped around the crossbar and tied to its standing part with a double overhand knot (fig. 242, *d*).

In the knot method, the cord passes directly forward from the back hole to the front hole. In the crossbar fixation, the cord passes through the back indentation and on to the front hole. In both methods, the course of the cord is inside the shell. At the inner side of the front hole, a short loop of the cord is pushed through the front hole. The cord then descends on the inside of the shell, passes outside through the front indentation, and turns upward to pass through the short loop on the outer side of the front hole. The slack is drawn taut, and the lifting cord is fixed to the shell with its long end extending upward from the front hole of the shell.

The Museum has three choice cowries from the Queen Emma collection and each has the lifting cord attached to it, with the knot fixation in two and the crossbar fixation in one. It is evident that a fisherman carried a number of shells with the lifting cord attached so that he could change them on the lure to suit the different periods of the day.

The long narrow opening of the shell is laid against the front end of the stem opposite the sinker. It is tied in front by a thread which makes vertical turns around the stem below and the junction of the lifting cord to the hole above. At the back, it is tied in a similar way with vertical turns around the stem below and the knot of the lifting cord or the crossbar above. The lashings are simple and allow for a quick change of shells. (See figure 243, *a*.)

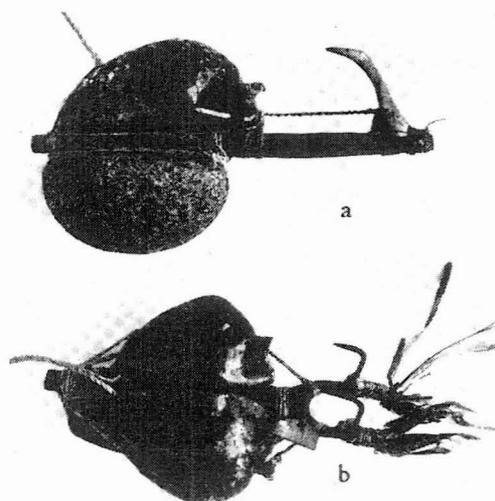


FIGURE 243.—*a*, single-shell lure; *b*, double-shell lure.

The hook is a curved point made from dog or human bone. It is attached near the back end of the stem on the same side as the cowrie shell, with the curve pointing forward. In two good lures, the bone points have an evenly expanded base with one perforation, like the bone points of bonito hooks. They are attached by a thread which makes several turns through the perforation and around the stem which serves as a shank to complete the hook. Some turns of the thread are carried forward from the perforation around the back lashing of the cowrie shell and finish off with some spiral turns around the longitudinal lashing. This lashing anchors the point and prevents it from slipping back over the stem end. The form of the point and the two lashings are so similar to the bonito hook technique that there is little doubt that the lure hook was copied from the bonito hook.

Another form of bone point has a backward extension of the base similar to that of the points in two-piece hooks. The back extension takes the place of the perforation, and the lashing turns pass around it and the stem.

The hackle is a cluster of narrow strips of ti leaf which are doubled around the front of the bone point below the perforation, brought back on the short end of the stem, and lashed to it with several turns of a thread passing around the strips above and the stem below. On the points with a back extension, the ti leaf strips are included in the lashing of the back extension to the stem and farther back with a second lashing. The ends of the ti leaf strips bunch out for 6 inches or so.

The double cowrie lure is represented in the Museum collection by 11 specimens, of which, nine have metal points and two have recently made wooden points. They both have sinkers of the bread-loaf type which properly belong to nets. The double cowrie lure evidently belongs to the later period, a period of over-elaboration. The sinker, whether bread-loaf shaped or elliptical, is tied to the stem like that in the single cowrie lure; but a short vertical rod is fixed to the back end of the sinker by the crossing turns of the sinker lashing. The two shells have short crossbars fixed to the back holes. The shells are fitted against each side of the stem and the sinker. The front ends are fixed by cords doubled through the front holes and tied together below the stem in front of the sinker. The back ends are fixed by cords doubled around the back crossbars and the vertical peg at the back of the sinker. The metal points have back extensions which are lashed to the stem in the manner of the bone points with similar back extensions. The ti leaf tail is attached as in the single cowrie lures. The lifting cord is tied to the front of the stem about 0.5 inch from its end. One of the double cowrie lures (3800) is unique in that the stem is forked behind the back of the sinker and the shells. The front ends of the shells are tied in the way already described, but the back ends are fixed by cords passing through the back holes and around the nearest limb of the fork. Each fork limb supports a single metal point and the usual ti leaf tail (fig. 243, *b*.)

The modern lead sinkers are more circular and flatter than the elliptical stone sinkers, but the back is grooved in the middle line for tying to the stem in the same way as the stone sinkers.

The metal points are made of wire or nails with a back extension before the point curves upward at an angle. In some single points the extension end is beaten out flat to form an end enlargement to keep the lashing from slipping back. The double metal points are made by doubling a piece of wire in the middle to make a double back extension, then bending each piece upward and outward from each other to form two separate points. The double back extension is lashed to the stem as in single points.

Kamakau writes that the days of Ku and Ole were the days when the squid were attracted by the merry dancing of the cowrie and the sinker, the cowrie

being the wife and the stone sinker, the husband. The fisherman tied the lifting cord of the lure to a line and let down two lures, one held by the toes and the other by the right hand. With the left hand, he used the paddle to keep the prow to windward. He jerked the two lines up and down to attract the squid; and when a squid pounced on the cowrie, the fisherman knew by the weight on the line and gave the line a jerk to impale the squid on the hook. If the squid was caught on the toe line he transferred lines; and as he drew up the squid line, he held it away from the canoe to avoid tangling with the other line. He lifted in the squid, pierced it with a light spear, threw it to the front of the canoe, and lowered the line again. By this time a squid had seized the other line, and so he went on using the two lines. In this way large catches were made. He sometimes stopped for fear of spoiling the brightness of his cowrie by too long immersion in salt water.

A fisherman bent on deep sea fishing but unable to obtain bait in the shallow muddy waters after a rain was forced to get his bait out at sea. One stand-by bait was the squid. The fisherman took a lure, dropped it in deep water and, when the lure touched bottom, drew up the line in a couple of overhand pulls. He jerked the line up and down and soon caught two or three squids which were enough bait for fishing farther out for deep-sea fish.

Some lures were named after ancestors or relatives, and many are famous in song and story. Kamakau says that some were so attractive that if they were merely shown over the side of the canoe, "squids came climbing in."

with a pob in front of each. The space between the players was covered with mats. The person who presided over the game called "*puheoheo*" and the whole assembly answered "*puheoheo-heo*." The tally keeper of one side, holding a *kilu* in his hand, addressed the opposing tally keeper in a low voice, saying that the *kilu* was a kissing *kilu* (*kilu honi*) and evidently giving the name of the player. The other tally keeper replied in a low tone and gave the name of a person on his side. The tally keeper then handed the *kilu* to the two players. Each of the players chanted an *oli* before casting the *kilu*. The object was to cast the *kilu* with a sliding motion across the mat and hit the pob before the other player hit it. If the man hit the pob, his tally keeper recited a chant with a double meaning deemed appropriate, and the successful player crossed over to claim the forfeit. The woman took her turn in playing after the man, so evidently a good deal of reciprocal kissing took place.

The term *honi* is the Hawaiian form of the general Polynesian term *hongī* which applies to the Polynesian greeting of pressing noses. In translating *honi* as kiss, it is not clear whether Emerson meant the foreign form of lip pressure or the old Hawaiian form of nose pressure. According to Emerson, the making of 10 points entitled the player to claim the same forfeit as was made in *ume* but, for the sake of propriety, the forfeit was not paid immediately but at some more convenient time. The personal forfeit, however, could be avoided by payment in land or some other possession if the victor was willing. The play was kept up until morning, and it may be assumed that others besides the two original groups of five were allowed to participate in the game.

Bishop Museum has but two specimens labeled *kilu*. One is a coconut shell (9310) cut lengthwise, 5.5 inches long, 4.2 inches in maximum diameter at the rim, and 2.1 inches deep. The other (896) is a section of the neck of a gourd with an upper diameter of one inch, a bottom diameter of 6.1 inches, and a length between the two openings of 3.3 inches. The gourd specimen does not comply with the description given by Malo and Emerson, hence it may have been used for a purpose other than that of *kilu*, perhaps for a funnel.

#### KONANE

The game of *konane* (checkers) was played on a board (*papa konane*) with rows of places for two sets of men, black and white. Any doubt as to its authenticity as an old Hawaiian game is dispelled by the fact that it was being played at the time of Cook's third voyage. King (Cook, 1784, vol. 3, pp. 144-145) describes the game as resembling draughts and as played on a board 2 feet long with 238 squares arranged in rows of 14. Black and white pebbles were moved from square to square. Ellis (1839, p. 213) also describes the game as being played on a board about 2 feet long with "upwards of 200 squares, usually 14 in a row." The two descriptions of the boards are practically identical.

but there is a possibility that Ellis quoted from Cook as regards the details of the board.

A study of existing boards does not support any evidence of an established pattern. Each of three *konane* boards in Bishop Museum is 26 inches long, but the arrangement of holes representing the "squares" for the men differs considerably from that described by King and Ellis. The smallest board (866), with small holes filled with white coral, has 10 rows which alternate seven and six holes, making the low total of 65 places. In this board, the central hole is inlaid with a human molar tooth, the crown flush with the board surface. Another

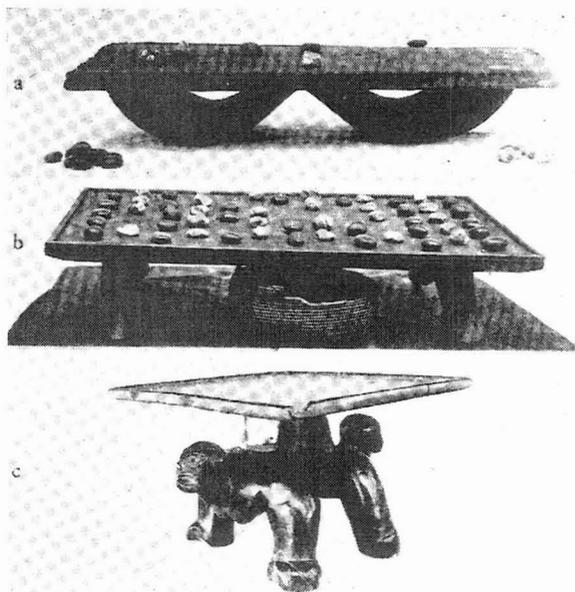


FIGURE 245.—a-c, *konane* boards; c, from Forbes Cave.

board (867) has 12 rows of 15 holes each, making a total of 180. It is evident that the holes in this board were inset with human teeth originally, but only those in the central hole and in 11 others remain in position. The third board resembles the second in having 12 rows of 15 small holes, but the construction of the two boards is so similar that they were probably made by the same person. The three boards have raised rims of narrow pieces fixed to the edges, and the boards are raised on curved legs to a height of 4.25 to 5.75 inches. All three boards are of post-European make. (See figure 245, a, b.)

An old board in the Forbes collection which was found in a cave in Hawaii with other artifacts is only 13.2 inches long and 10.2 inches wide. It is supported by carved human figures to a height of 8 inches. The holes are very small and total 156. (See figure 245, c.)

Sets of *konane* holes were also made on slabs of lava and flat pieces of basaltic rock. Nine specimens in Bishop Museum range in length from 15.5 to 32.5 inches, in width from 10 to 21 inches, and in thickness from 3.2 to 7.5 inches. One slab is limestone. In many the holes were worn down by previous exposure to the weather. The normal holes are about 0.5 inch in diameter and about 0.2 inch deep. The spacing between holes is fairly regular in each slab but varies in the series from 1.0 to 1.6 inches. In a few the alignment of rows is irregular.

Emory (1924, p. 84) counted the rows and holes in 14 *konane* stone slabs on the island of Lanai. The number of pits in each row ranged from 8 to 13, and the rows, from 8 to 15. In 12 slabs the total number of pits ranged from 64 to 195; and in the other two they totaled 225 and 260 respectively. Emory also found that the flat tops of boulders or the surface of a ridge near a house site were marked out for the game. The variability in the number of rows and holes indicates conclusively that there was no established number of rows and holes for the *konane* boards, and evidently the playing of the game was not affected by changes in the boards. Apparently any increase in the size of the board merely influenced the length of the game. Ellis (1839, p. 213) states that *konane* was a favorite game of old men and cites a game which started in the morning and barely finished before the end of the day.

The men used in the game consisted of small black and white pebbles termed *'ili 'ele'ele* (black skinned) and *'ili kea* (white skinned). Ellis (1839, pp. 212-213) describes the beach of Haloa near Ninole in Hawaii as being celebrated for the black and white pebbles used in the game. The black pebbles were formed of close-grained basalt and the white pebbles, of pieces of branching coral. Both were ground to the requisite size and polished by the constant action of the waves. The pebbles in the large collection in the Museum vary in size and shape. Some flat, circular pebbles are 1.3 inches in diameter and 0.6 inch thick, but others are thicker, and still others are spherical.

An alternative name for the game was *mu* and for the board, *papamu*. Brigham (1906b, p. 18) gives a rather fanciful origin for the name *mu*. He points out that the *mu* was the official appointed to capture men for sacrifice or for the ends of justice and that therefore the *papamu* meant simply the board or flat surface on which the *mu* captures his men. In New Zealand, there was neither an official executioner named *mu* nor a game resembling draughts. However, when draughts was introduced by Europeans, the Maoris took it up with great enthusiasm. They made their own boards easily enough but used makeshift men of pieces of pumpkin rind, potato peelings, or other material. Not having a name for the game, they had to coin one. In watching Europeans play, they heard the word "move" frequently repeated and, concluding that was the name of the game, coined the word *mu* to represent the English word "move." It is possible that the Hawaiian *mu* had a similar origin.

Early writers who saw the game did not attempt to describe how it was played. However, Emory (1924, pp. 84, 85) had the good fortune to have the game demonstrated to him by Kaahaaina Naihe of Kailua, Hawaii, a woman then nearly 90 years of age and the only living person who knew the game. According to her, the middle of the board termed the *piko* (navel) was marked by an inset human tooth. The row along the borders of the board was termed the *kaka'i*. The board was set between the two players who laid out (*komo*) the pebbles on the dots.

#### 'ULUMAIIKA

The game of *'ulumaika*, or simply *maika*, was played on a prepared course (*kahua*) with stone disks also named *'ulumaika* or *maika*. The two methods of play are thus described by Ellis (1839, p. 198): ". . . Two sticks are stuck in

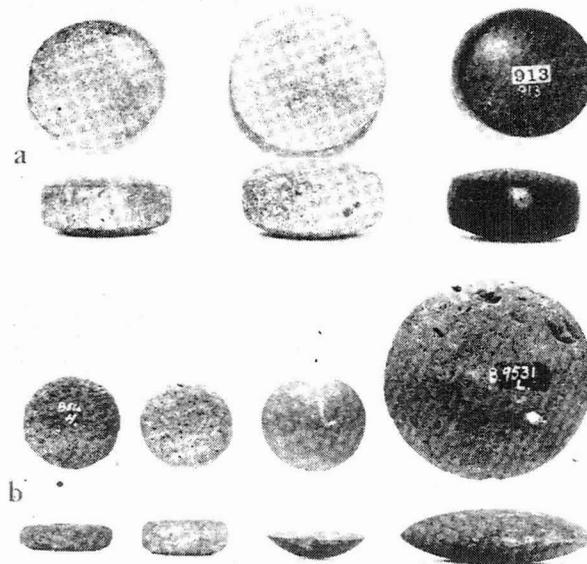


FIGURE 246.—a, *'ulumaika*; b, quoits, or pitching disks.

the ground only a few inches apart, at a distance of thirty or forty yards, and between these, but without striking either, the parties at play strive to throw their stone; at other times, the only contention is, who can bowl it farthest along the *tahua*, or floor."

The disks were made of various kinds of stone (fig. 246, *a*). The periphery formed a narrow flat edge, and the two surfaces were slightly convex making the disk thicker in the center than at the edges. The convexity on each surface was even to make the disk run true. However, Emerson, in a note to Malo's

text (1951, p. 221), states that some were made "one-sided" to enable them to follow the bend of a curved track. I assume that by "one-sided," Emerson means that one side was convex and the other flat. He says that he saw a curved track on the plains back of Kaunakakai on Molokai and that he had heard of two other similar tracks.

Wooden disks were used in the Cook Islands (Buck, 1944a, p. 252), and children played with disks cut from green breadfruit. In Samoa (Buck, 1930, p. 565) throwing disks were made of coral or green breadfruit. A circular slice of breadfruit, 1.5 inches thick in the center, was trimmed at the edges to make it 0.25 inch thinner at the periphery. In Hawaii the breadfruit was also used in its half-grown globular form, according to Emerson (Malo, 1951, p. 221), and he contends that the 'ulu (breadfruit) was used first and that the stone disk termed *maika* was made later. The process of evolution is evidenced in the name 'ulumaika.

#### PITCHING DISKS

A number of stone disks in the Bishop Museum collection are cataloged as quoits without further details. I have gathered no information about a pitching game from Hawaiian sources, but fortunately Cook (1784, vol. 2, p. 237) has the following reference: "They [the Hawaiians] also use, in the manner that we throw quoits, small, flat, rounded pieces of the writing slate, of a diameter of the bowls, but scarcely a quarter of an inch thick, also well polished." But the bowls which Cook mentioned were the 'ulumaika (throwing disks) which he had just described.

Of the 16 Museum artifacts labeled "quoits," 11 are flat, circular disks, resembling *maika* except that the two surfaces are flat instead of convex. Seven are of vesicular basalt or lava, four of gray basalt and unpolished. They range in diameters from 1.5 to 3.3 inches, in thickness from 0.6 to 1.2 inches, and in weight from 2 to 7 ounces.

A group of four disks forms a different class. They are circular in shape, with a diameter ranging from 2.7 to 3.1 inches. One surface is perfectly flat, the other convex, and they meet at the circumference in a sharp edge. The thickness in the center ranges from 0.7 to 0.9 inch. They are all of close-grained gray basalt, and a peculiarity in all four specimens is a small well-formed notch on the edge of the disk. This notch fits against the forefinger and appears to suit a back-hand pitch with a spin. The disks, except for their smaller size and the notch, resemble the shape of some of the canoe rubbers. (See figure 246, *b*.)

A single disk (B.9531), with both surfaces convex, has a sharp edge and no notch. It too, is made of gray basalt, but is larger than the other disks. Its diameter is 5.3 inches; its thickness in the center, 1.6 inches; and its weight, 2 pounds.

Except for the biconvex disk, all the specimens are light; so if they were used for pitching, it was probably for a short distance onto a mat, like the

wooden pitching disk of Mangaia, termed *tupe* (Buck, 1934, p. 254). In Samoa coconut-shell disks, also termed *tupe*, were pitched onto a mat in the game of *lafonga* (Buck, 1930, pp. 563-564).

#### PAHE'E

*Pahe'e* was played with darts or javelins thrown along a prepared level ground termed a *kahua pahe'e*. The dart was thrown underhand so that it slipped or slid along the course, hence the name of *pahe'e* (to slip, or slide). Ellis (1839, pp. 197-198) saw the game being played on a course 50 or 60 yards long and writes that it was a favorite amusement with farmers and common people in general. He describes the game as follows:

The páhe is a blunt kind of dart, varying in length from two to five feet, and thickest about six inches from the point, after which it tapers gradually to the other end. These darts are made with much ingenuity, of a heavy wood. They are highly polished, and thrown with great force or exactness along the level ground, previously prepared for the game. Sometimes the excellence of the play consists in the dexterity with which the páhe is thrown. On these occasions two darts are laid at a certain distance, three or four inches apart, and he who, in a given number of times, throws the dart most frequently between the two, without striking either of them, wins the game. At other times it is a mere trial of strength; and those win, who, in a certain number of times, throw their darts farthest. A mark is made in the ground, to designate the spot from which they are to throw it. The players, balancing the páhe in their right hand, retreat a few yards from this spot, and then, springing forward to the mark, dart it along the ground with great velocity. The darts remain wherever they stop, till all are thrown, when the whole party run to the other end of the floor, to see whose have been the most successful throws. This latter game is very laborious; yet we have known the men of whole districts engage in it at once, and have seen them playing several hours together, under the scorching rays of a vertical sun.

This excellent description by an eye witness leaves nothing to add but a query as to the system of counting. David Malo (1951, p. 222), in his meager account of the game, states that the farthest throw counted and that "he who first scored ten won the game." The system of counting 10 wins occurs in other parts of Polynesia and is probably correct for Hawaii.

Some confusion exists in Museum records as to the terms *pahe'e* and *moa* applying to the same game. Whereas Ellis describes the darts used as being 2 to 5 feet long, there are in the Museum collection seven darts ranging in length from 34.5 to 67 inches. They conform to Ellis' description in being thickest about 6 inches from the point and then tapering off to the other end. Their greatest diameters range from 1 to 1.5 inches. Some are cataloged as *ihe pahe'e* (*ihe*, spear), which is an appropriate term, based on their shape and length. On the other hand, some of them have been termed *moa* sticks.

Also in the Museum collection and cataloged as *moa* sticks are 13 short, thick darts, resembling the *pahe'e* spears except for length. They range in length from 10 to 22 inches, the majority being around 14 inches. They are thickest toward the point and taper off toward the other end. Their greatest diameters range from 1 to 2.4 inches. The Andrews-Parker dictionary (1922), with its usual lack of

## SLEDDING

Sliding down a hillside on some object which prevented abrasion of the skin was common throughout Polynesia and New Zealand. The simplest form of sled was the leaf-head cluster of a ti plant with part of the stalk. The individual sat on the leaves and held the stalk which was passed forward between the legs. This form of ti-leaf sled was used by boys in Hawaii, but adults developed the pastime into the aristocratic game known as *holua*, which called for a highly specialized sled and carefully constructed runways. Traces of old runways are to be seen throughout the islands; but the wooden sleds have vanished, save for one sled and some runners preserved in Bishop Museum.

The game is somewhat briefly described by Malo (1951, p. 224) and with more detail by Ellis, who found the pastime in practice in several places during his visit in 1823. He describes the sled as follows (1839, pp. 299-300) :

. . . The *papa*, or sledge, is composed of two narrow runners, from seven to twelve or eighteen feet long, two or three inches deep, highly polished, and at the foremost end tapering off from the under side to a point at the upper edge. These two runners are fastened together by a number of short pieces of wood laid horizontally across. To the upper edge of these short pieces two long tough sticks are fastened, extending the whole length of the cross pieces, and five or six inches apart. Sometimes a narrow piece of matting is fastened over the whole upper surface, except three or four feet at the foremost end, though in general only a small part for the breast to rest on is covered. At the foremost end there is a space of about two inches between the runners, but they widen gradually towards the hinder part, where they are distant from each other four or five inches. . . .

The complete sled in the Museum (320) is old. Some wornout lashings have been replaced with trade string, and others are missing. Also, the matting cover has decayed in parts, but enough remains to indicate the original construction of the sled.

The runners are 11 feet 6 inches long and their width or depth at the front holes is 2.3 inches; in the middle, 2.3 inches; and at the aft end, 2 inches. The maximum thicknesses at these three points are 1 inch, 1.1 inches, and 0.6 inch, whereas the thickness at the upper edge at the same points is 0.6, 0.6, and 0.4 inch respectively. The lower edge is rounded off for smooth running. Below the upper edge 11 pairs of rectangular holes have been pierced for the lashing of a similar number of cross pieces. The distance between the fore and aft holes indicates the length of the platform, which is 8 feet 6 inches. The aft ends of the runners are cut vertically just behind the aft pair of holes. The fore ends of the runners extend beyond the front pair of holes for another 3 feet and curve upward to end in a short horizontal piece 7.5 inches long, 0.5 inch deep, and 0.5 inch thick. The forward curve and horizontal piece resemble the pattern of the fore end of a canoe outrigger float, from which they were undoubtedly copied. The upward curve prevents the fore end of the runners from digging into the runway (fig. 249, *a*).

The cross pieces consist of an upper horizontal bar with a downward projecting leg on each side to fit onto the upper edge of the runners above the paired holes. The upper bars average about 0.8 inch in depth and 0.8 inch in thickness. They extend outward slightly beyond the outer edges of the legs, with which they form external notches. The legs are about 0.8 inch thick by 1 to 1.2 inches wide and about 1.1 inches in length. The upper edge of the crossbars is thus 1.9 inches above the upper edge of the runners. The outside width between the legs of the crossbars regulates the width between the runners, which are 3.7 inches apart in the front cross piece, 4.4 inches apart in the middle, and 4.75 inches apart in the aft cross piece. The forward inward slant of the runners brings the

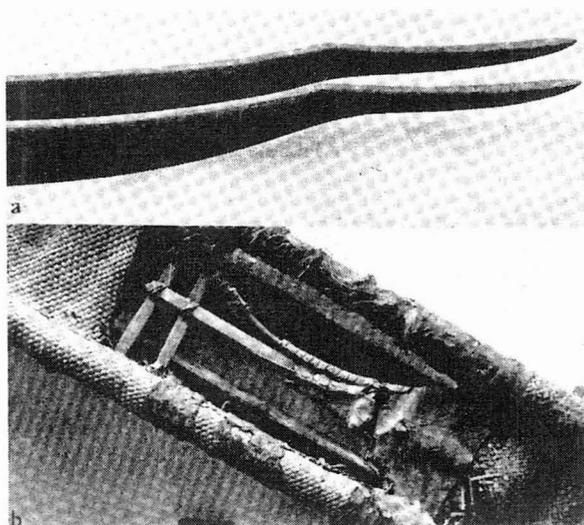


FIGURE 249.—*Holua* sled: a, runners; b, cross pieces.

forward ends closer, with an intervening space of 2.5 inches. As the cross pieces were placed in position, they were lashed to the runners by a cord which passed from without inward through one runner hole, crossed diagonally over the top of the cross piece to enter the second hole from without inward, and then crossed the first diagonally above the cross piece to enter the first hole from without. By repeating the turns on each side, the cross piece was firmly bound to the two runners.

The two rails, which rest on the outer ends of the crossbars, are rounded poles 8 feet 8 inches long, projecting an inch beyond the fore and aft crossbars. They are 0.5 inch thick at the fore end and gradually increase to 0.8 inch at the aft end. The rails are fixed the proper distance apart by a number of pieces of split bamboo which are 0.5 inch wide and range in length from 4.9

to 5.5 inches. The bamboo pieces are lashed to the under side of the rails at intervals of 1.5 to 2 inches. Corresponding in position to the front of each crossbar on the runners, longer bamboo pieces with lozenge-shaped ends take the place of the other bamboo type. All were lashed to the under side of the rails, with the slightly concave inner surface upward, by a fine two-ply cord. The cord was looped around the long pieces and crossed diagonally above the rail in four turns and then made a horizontal turn around the lashing between the rail and the bamboo piece. The cord was carried on to the next ordinary [?] piece, formed loops around the bamboo piece on the outer and inner sides of the rail and over it, and after a horizontal turn around the lashing, passed on to the next piece. In this way all the bamboo cross pieces were lashed and the two rails fixed in relation to each other. The ends of the short bamboo pieces were flush with the outer side of the rails but the lozenge-shaped ends of the longer pieces projected beyond them.

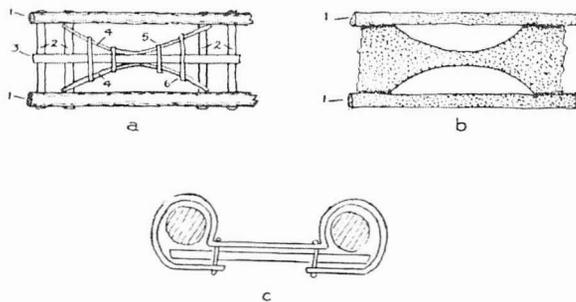


FIGURE 250.—*Holua* sled: **a**, details of construction, showing (1) side rails, (2) bamboo cross pieces, (3) median bar, (4) slender rods tied to median bar, (5, 6) cross pieces; **b**, covered median frame; **c**, technique of wrapping rails.

A space 6.5 inches long was left clear of bamboo cross pieces at a distance of 3 feet 3 inches from the front cross piece. The space was treated to form side openings, as shown in figure 250 and described below.

In the framework (*a*) the side rails (1, 1) and two bamboo cross pieces (2, 2) at each end bound the space. The outside width between the rails (1, 1) is 5.2 inches, and the length between the nearest cross pieces is 6.5 inches. A bamboo piece (3), similar to the cross pieces but 9 inches long, is laid in the middle line on the pairs of cross pieces (2, 2) at each end and tied to them. Two slender, pliable rods (4, 4) are tied by their middles to the middle of the median bar (3), one on either side, and their outer ends are tied to the nearest cross piece (2, 2) on each side. The two curved rods are fixed by two cross pieces (5, 6) of bamboo lashed to them and the median piece. This completes the frame.

The median frame has a piece of thin, pliable leather sewed over the original matting (*b*). The middle part is cut to shape, and the curved borders are sewed to the curved side rods. Thus semi-elliptical openings are formed to enable the rider's hands to grasp the side rails (1, 1).

The rails are wrapped with spiral turns of white tapa and also thin blue cloth. A matting cover with 12 wefts to the inch is spread over the upper surface of the rail frame in front and behind the hand-grip openings. The side edges of the matting are carried around the rails, enclosing the ends of the bamboo cross pieces, and overlapping on the under side (c).

A long thread is laid longitudinally on the upper surface of the matting in the angles formed with the side rails. Another thread is run along the under surface and, in the intervals between the cross pieces, is pushed up through the double thickness of matting, making tight cross loops over the upper thread, and thus sews the overlap together and fixes the matting. Where the long, lozenge-pointed cross pieces occur, the matting is pushed in over the points to lie close to the rail and the lozenge-pointed ends project outside the matting. (See figure 249, b.)

The platform formed by the two rails and the matting cover was now laid on the crossbars connecting the runners. The projecting ends of the lozenge-shaped cross pieces fitted against the front of the crossbars with their projecting notches. Though the lashings have completely disappeared, there can be no doubt that cords were tied around the notches in the bamboo cross pieces and the corresponding notches in the crossbars. The long bamboo cross pieces were not used with the front and aft crossbars, for firmer lashings were made around the projecting ends of the side rails and the end crossbars. The completed sled (fig. 251) is unique in its narrow width which required the greatest skill to manipulate.

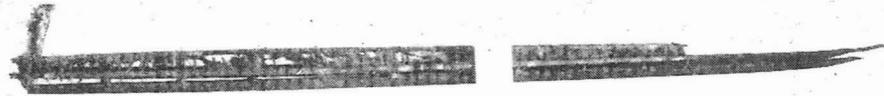


FIGURE 251.—Complete sled.

The detached runners in the Bishop Museum collection consist of two matched pairs and three singles. The length of the runners, including those of the complete sled, range from 11.6 to 13.5 feet. The widths, or depths, at the foremost pair of holes range from 2.1 to 2.7 inches; in the middle, from 2.1 to 3.0 inches; and at the aft end, from 2.0 to 2.4 inches. The thickness varies in the same runner, the range being 0.6 to 1.3 inches. The upper edge thins off with a range of 0.4 to 0.9 inches, and the lower edge is rounded in all runners.

The rectangular holes for the cross-piece lashings, are about 0.3 inch below the upper edge and are spaced in pairs with, usually, a single hole at the fore end. The holes are 0.5 inch horizontally and 0.3 inch vertically with an interval of 0.5 inch between the pair. In one runner (C.5972), pairs and singles alternate, with six pairs and seven singles. In the series of six runners, the number of cross pieces provides for ranges of 11 to 15 and the spacing of holes ranges from 7.75 to 10.75 inches. The last holes are close to the aft end of the runners;

and the total distance between the fore and aft holes, which denotes the length of the platform, ranges from 8 feet 6 inches to 10 feet 6 inches.

The fore ends of all the runners follow the pattern of the complete sled, sloping gradually upward and ending in a short horizontal projection. The uncurved length in front of the fore holes ranges from 2 feet 8 inches to 4 feet, of which the short horizontal part ranges from 6 to 10 inches.

According to Malo (1951, p. 224), the woods used for the runners were *mamane* and *uhiuhi*.

The sledding track (*kahua holua*) was made on the side of a hill by building up rocks for the foundation and then covering them with earth which was beaten down hard to form a level sloping surface. When in use, the surface was covered with grass to facilitate the smooth running of the sled. The track was narrow with room for only one sled at a time, and it ran out onto the plain



FIGURE 252.—*Holua* track at Puu Hinahina, Hawaii.

below. The length of the track depended upon the length of the slope of the selected hill. The picture of a track at Puu Hinahina, South Kona, Hawaii, shown in figure 252, gives some idea of the construction.

According to Ellis (1839, p. 300), the person about to slide grasped the sled firmly by the right hand grip, ran a few yards to the starting place, grasped the other hand grip with the left hand, threw himself forward with all his strength, falling flat on the sled, and slid down the hill. His hands retained their hold on the hand grips, and his feet were braced against the last cross piece on the rear end of the sled. Much practice and skill were necessary to keep an even balance. An expert could slide with velocity and apparent ease for 150 or

200 yards down the gradual slope of the hill, and the velocity carried the sled for some distance along the flat at the end of the descent. In competitions, the sled that went the farthest won. The tracks were too narrow to admit of racing to a side by side start or to allow of one sled passing another.

A form of wooden toboggan with the fore end turned upward has been described for New Zealand by Best (1925, p. 83). One of the Maori names given to it is *horua*, which is dialectically identical with the Hawaiian *holua*.

#### SURFING

From remote times, Polynesians have shown their mastery of the waves (*nalu*) by riding them no matter how high or how rough. Body surfing without boards was termed *kaha nalu* by the ancient Hawaiians; but it was with boards that surfing (*he'e nalu*) reached its unique development in Hawaii, where it is still a popular sport. In other parts of Polynesia the boards were comparatively short and were clasped with the arms while the breast rested on the aft end. In Hawaii the boards were larger and experts could kneel or stand erect upon them as they rode the forward slope of the high waves.

Hawaiian surfboards (*papa he'e nalu*) were divided into two classes, the shorter termed *alaia* and the longer termed *olo*. Ellis (1839, p. 369-371) describes the boards he saw on the island of Hawaii as being "generally five or six feet long, and rather more than a foot wide, sometimes flat, but more frequently convex on both sides . . . usually made of the wood of the *erythrina* (*wiliwili*), stained quite black, and preserved with great care." He adds that after use they were left in the sun until perfectly dry, rubbed with coconut oil, and hung up in the dwelling house. Not infrequently they were wrapped in cloth.

Tom Blake, who wrote a book on the Hawaiian surfboard (1935), notes that there is considerable variation in descriptions by various authorities with regard to the wood from which the two types of boards were made. The consensus appears to be that the shorter *alaia* boards were originally made of *koa* or breadfruit wood and the longer *olo* boards were of *wiliwili*, which is very light. To this general rule, there were exceptions, as in the short boards made of *wiliwili* described by Ellis and the two long *olo* boards made of *koa* which belonged to Chief Paki and which are now in the Bishop Museum. The Bishop Museum collection consists of 25 boards ranging from a child's board of breadfruit wood, 34.25 inches long, weighing 2 pounds 10 ounces to a modern redwood board, 17 feet 2 inches long, weighing 174 pounds.

The *alaia* boards evidently ranged from 6 to 9 feet. A fair specimen (293) is one collected by J. S. Emerson in Kailua, Hawaii, in 1885 (fig. 253, *a*). It is 6.5 feet long, 0.6 inch thick, and weighs 11 pounds. The fore end is curved convexly, the aft end cut off square. The widest part near the fore end is 14.75 inches and the narrower, aft end is 10.75 inches. The wood is *koa*.

The short sticks, ranging from 7 to 10 inches in length, are between 0.8 and 1 inch in their maximum diameter in the middle. The ends are usually 0.2 inch less in diameter than the middle, and this gives them a somewhat spindle-shaped appearance, as is remarked upon by Helen Roberts. In some sticks, one end is 0.1 inch or less in diameter than the other end. They are eight in number and all are made of dark *kauila* wood. (See figure 266, *b*.)

The sticks greater than 10 inches in length range in middle diameter from 1 inch to 1.8 inches, the thickest being 37.4 inches in length. Thus none of them approaches the length or the thickness described by Ellis. However, the large size may have been the fashion in Maui at the time. The longer sticks are practically all of *kauila* and most resemble the short sticks in that they are thickest in the middle.

#### FOOTBOARDS, OR TREADLES

Footboards (fig. 266, *c*) were used to keep time with the right foot in conjunction with the beating of two sticks (*ka la'au*). Two specimens in the Bishop Museum are described by Roberts (1926, p. 54) as 12 inches long, 7 or 8 inches across the middle, and narrowed to 5 inches at the ends. They are 1.5 inches thick in the middle and 1.0 inch at the edges. One surface is convex and the other flat or slightly concave. Some players use a cross piece below so that the footboard is moved like a treadle.

In Cook's description of the two sticks (1784, vol. 2, p. 234) he writes that while beating the sticks, the player beat time with his foot on a hollow vessel which lay inverted on the ground.

For some hula dances, the player stamped on a flat stone either flat on the ground or leaned against another stone.

#### STONE CASTANETS

Stone castanets were used in the *hula 'ili'ili*. The dancer held two in each hand and clicked them together during the steps of the dance, much as castanets are used in some of the Spanish dances (fig. 266, *d*). The name *'ili'ili* (Maori, *kirikiri*) implies that the stones were water-worn pebbles in which nature had done the shaping. However, Bishop Museum also has three sets of stones, cataloged as having been used in the *hula 'ili'ili*, which are not water worn. Two sets of heavy stones identified as hematite have been shaped and polished into rectangular form. One stone (11288) is 1.9 inches long, 1.7 inches wide, and 1.1 inches thick. The others are of similar shape and size. The third set (C.14) is slightly smaller but shaped and polished in rectangular form like the others and described as being made of manganese. Thus though water-worn pebbles were the original form, some dancers thought enough of their material to have them shaped from a heavier stone that probably gave forth a louder click.

A good specimen figured by Oldman (1940, vol. 49, pl. 129, no. 549) is made of heavy black wood and the head—6 inches long and 4.25 inches thick—is formed from a natural root (fig. 283, *e*). This club, which has a perforation near the butt, is 12.25 inches long. Another good example in the British Museum, figured by Edge-Partington (1890, 1-57-3), is 10.5 inches long and has a wrist-loop perforation near the butt (fig. 283, *f*). The perforations in these two specimens appear to be round.

#### STONE-HEADED CLUBS

In the Hewitt collection, acquired in the Hawaiian Islands during the Vancouver expedition (1790-1795), is the only perfect specimen of a stone-headed club lashed to a wooden handle. It is figured by Read (1892, p. 105) and described by him as follows:

Hand club, the handle of hard brown wood, the head of basalt, bound on with neatly plaited sinnet. This is a very practical weapon, of unusually perfect workmanship and uncommon form. It is no doubt of Hawaiian make, both from the shape of the stone head, and from the character of the wood forming the handle. Where the stone head joins the wood it is circular in section, and at the end it suddenly widens so as to produce a rim  $\frac{1}{16}$  inch wide; towards the other end it gradually merges into a square section, each angle being of an oviform character, and these angles project at the end, where they are used to prevent the sinnet lashing from shifting. . . . The end of the handle has a plaited rope passed through it, with a loop at the end for the wrist, and thus to prevent the weapon from being torn from the grasp.

It is evident from Read's illustration (fig. 284, *a*) that the "oviform character" of each angle was produced by a deep longitudinal groove made down the

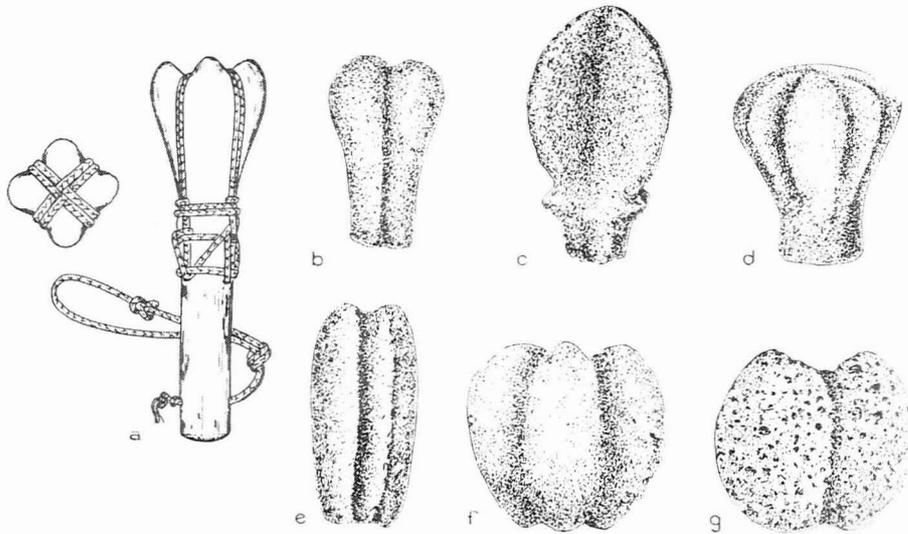


FIGURE 284.—Stone-headed clubs: *a*, head lashed to wooden handle, after Read; *b-g*, variations in shape of heads.

middle of each of the four surfaces and continued over the distal end of the head. The wooden handle, round in section, is fitted to the lower end of the stone head. The sennit lashing turns pass through two transverse holes in the wooden handle near the junction and along the longitudinal grooves of the head to cross over the far end. Three sets of transverse turns are spaced over the longitudinal turns, the middle set probably being above the projecting rim at the lower end of the head and so preventing the turns from slipping down. The two ends of the wrist loop appear to pass through on the same side of the hole in the lower end of the handle and thus comply with the common Hawaiian technique. No mention is made of the shape of the hole but it is probably square or rectangular. Read gives the length of club as 9 inches and the width of each surface as 2 inches. This is the only club, so far reported, that has been preserved complete with its wooden handle still attached.

The type club gives the key to the identification of a number of grooved stone objects in Bishop Museum. One (4789) closely resembles the head of the type specimen with four "oviform" flanges formed by four longitudinal grooves continued over the distal end of the head (fig. 284, *b*). It has a long neck which is rectangular instead of circular, with the edges rounded off, and the lower end has a narrow rim or flange about 0.2 inch wide. The length of the head is 4.1 inches; the maximum head diameter, 3 inches; the diameter near the lower end, 1.3 inches; and the diameter of the rim, 1.35 inches. A wooden handle could be attached as it is in the type club.

Another specimen (C.4454), from a cave in Kohala, Hawaii, has four very deep grooves; but the distal end is somewhat pointed (fig. 284, *c*). It is 5.5 inches long and has a maximum head diameter of 3.3 inches and a lower end diameter of 1.25 inches. It has a marked transverse flange 2.6 inches in diameter above the lower end.

A stone head (4656), 4.25 inches long, maximum diameter 3.25 inches, has 11 grooves and flanges (fig. 284, *d*). The lower end has a flange 1.7 inches in diameter, whereas above it a groove has a diameter of 1.6 inches. The Museum catalog states that this is a stone to crush *noni* (*Morinda citrifolia*), but the lower flange shows it was probably meant for attachment to a handle.

Three other specimens lack the lower flange but are hollowed out slightly, evidently for fitting the upper end of the handle into the hollow before the lashing turns were made. One well-polished specimen (4790) is 4.2 inches long and 2.1 inches in maximum diameter. The hollow at the lower end is 0.6 inch deep (fig. 284, *e*). Another club (C.9044) is 4 inches long and 4 inches in maximum diameter, and the shallow hollow at the bottom is 0.2 inch deep (fig. 284, *f*). The third of this series (C.5404) is made of vesicular basalt. It is 3.5 inches long, and the maximum diameter is 3.4 inches. The depth of the shallow hollow is 0.6 inch (fig. 284, *g*).

## STONE PIKOI WITHOUT HANDLE

Stone *pikoi* without handles are represented by a number of specimens in Bishop Museum. The selected type (C.3276) is marked at its broad end by a median vertical groove which divides it into two rounded knobs not unlike the two wooden specimens shown in figure 290, *b, c*. The length is 6.5 inches, and the broad end is 3.8 inches wide and 3.2 inches thick. The narrower end is squared off and has a hole pierced through it for the cord. Two oblique grooves radiate from the hole on each side. When found in 1900 in a cave in North Kohala, Hawaii, it had a decayed *olona* cord 30 inches long, run twice through the hole and separated into strands which passed along the grooves level with the hole and were tightened between the lobes. The technique is not clear. (See figure 291, *a*.)

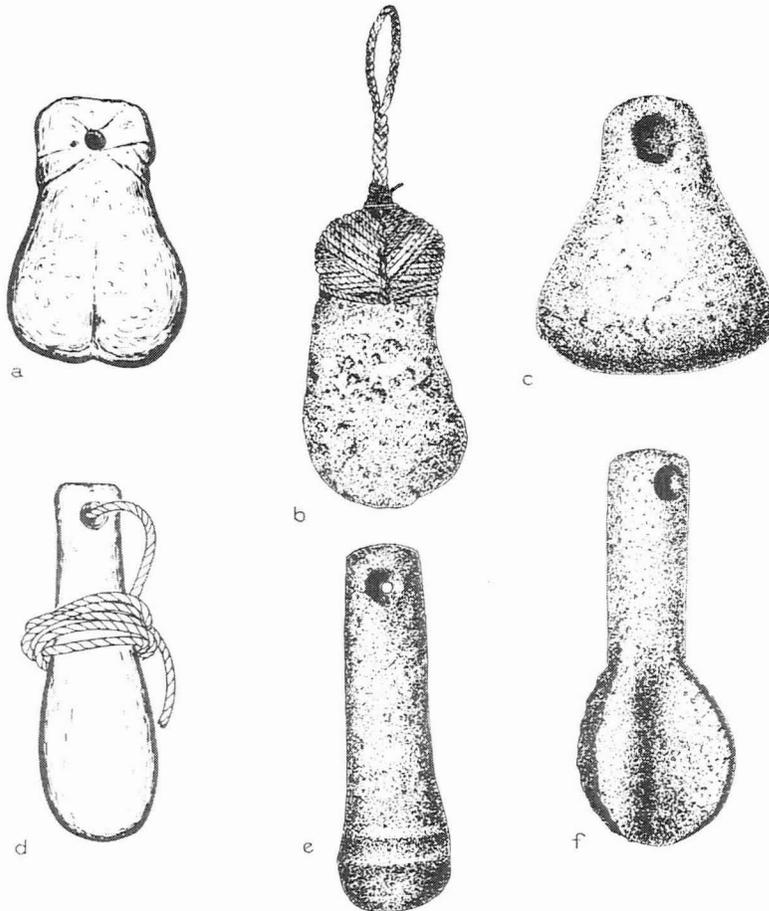


FIGURE 291.—Stone tripping clubs: a-c, without handles; d-f, with handles.

A stone head (4810) with an elaborate lashing at the upper end to support a loop is cataloged as a *pikoi* and is figured by Edge-Partington (1898, III-7-1). However, the identification is not very convincing, as the cord is made of coir fiber instead of *olona*. It is included here with reservations as to a Hawaiian origin. The stone is a natural flat piece that has been roughly shaped. (See figure 291, *b*.)

A third specimen (11051), found at Waiohinu, Hawaii, was originally a stone food pounder. After the upper knob broke off, a funnel-shaped hole was bored through the neck of the pounder for the throwing cord (fig. 291, *c*). The length is 4.8 inches.

#### STONE PIKOI WITH HANDLE

Stone tripping clubs with handles are represented in Bishop Museum by three fine specimens. Two of them are cataloged as *nawa* (clubs) and they could be used equally well as such. The selected type (4786) is from Honomalino, Kona, Hawaii. It has a long head with maximum diameters of 2.9 inches by 2.3 inches in cross section. The head slopes gradually into the handle with a slight shoulder, the butt diameter of the handle being 1.6 by 1.25 inches. A large funnel-shaped hole is pierced transversely through near the butt end, and an end hole is pierced from the butt end surface to meet the transverse hole. A length of rope was passed through the hole. The length of the club is 9.2 inches, and the weight is 46 ounces (fig. 291, *d*).

Another well-made club (10721) from Kauai was donated by A. M. McBryde. The head is shorter and more circular than the type specimen, the cross diameters being 3 inches. The far end is somewhat flattened. The head slopes into a thick handle, the cross diameters at the butt end being 1.95 inches by 1.8 inches. A large funnel-shaped transverse hole near the butt is 0.8 inch in diameter at its outer edge. The length is 9.4 inches and the weight 73 ounces. There is no cord to indicate the special function of the club (fig. 291, *e*).

A third specimen (4785), from Waimea, Kauai, is of the flanged type with four deep grooves dividing the circular section of the head into four curved flanges of which two are broken (fig. 291, *f*). The maximum diameter between two opposite flanges is 3.8 inches. The flanges with longitudinal convex curves meet the shaft at obtuse angles. The shaft is rounded, the diameter at the flange junction being 2 inches; at the butt end, 1.6 inches. A funnel-shaped hole is bored transversely through the handle near the butt. The total length is 12 inches, and the weight is 3 pounds 2 ounces. These clubs appear to be somewhat short in length and thick in the grip to have been made as hand clubs, whereas they would make excellent throwing clubs. However, the fact remains that they could have been either or both.

## STONE HAND CLUBS

In Bishop Museum are three stone clubs of peculiar form which may be regarded as unique to the Hawaiian Islands. They average 5 inches in length, and a constricted grip in the middle flares out gradually to form two expanded ends. One is circular in section throughout, but the other two are slightly flattened at the flared ends.

The circular specimen (4794), which is evidently the most advanced pattern, has no recorded history. It is 4.95 inches long, the middle grip diameter is 1.6 inches, and each of the two end diameters is 2.5 inches. The specimen of basalt is well made and polished (fig. 292, *a*).

The largest specimen (B.2604) has no recorded history. It is 5.2 inches long, and the middle grip diameters in cross section are 1.7 inches by 1.4 inches. The middle thickness of 1.4 inches is the same at both ends, but the width is 2.9 inches and 3.0 inches respectively. The weight is 1 pound 5 ounces. The specimen (fig. 292, *b*) is not so well polished as the preceding one.

The third specimen (4793) is from Waimea, Kauai; and while it is the only one with a recorded locality, it is also the crudest of the three inasmuch as it is made of vesicular basalt (fig. 292, *c*). It is also flattened, the thickness in the

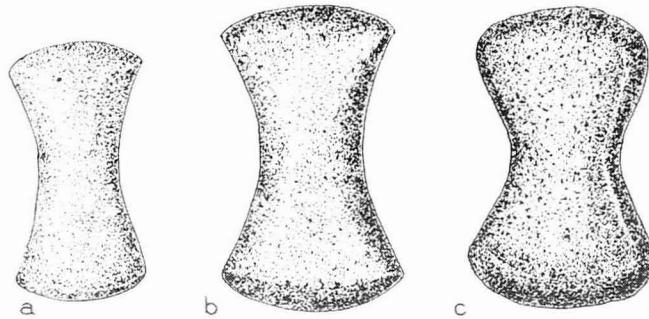


FIGURE 292.—*a-c*, stone hand clubs.

middle being 1.7 inches and at the ends 1.8 and 1.9 inches respectively. The width in the middle is 1.7 inches which makes the grip perfectly circular. The two ends, however, flare out to 2.9 and 3.0 inches respectively. The length is 5.1 inches and the weight, 14 ounces.

It is evident that these weapons were grasped by the middle grip. As the average width of the human palm is 3.5 inches, the flared ends of the stone objects protruded both above and below the closed palm. The ends of the weapons are also convex, and severe or fatal blows could be delivered either forehand or backhand.

## SLINGS

Slings (*ma'a*) were used in Hawaii as well as in other parts of Polynesia. King (Cook, 1784, vol. 3, p. 152) says: "The slings have nothing singular about them; and in no respect differ from our common slings, except that the stone is lodged on a piece of matting instead of leather." The difference between matting and leather is considerable from the technical point of view. However, the statement that the stone was lodged in matting conveys the information that the pouch of the sling was plaited. Polynesians in various island groups made their sling pouches by plaiting some fiber elements in the form of a narrow band of the desired width and then narrowing each end by bringing the longitudinal strips together in pairs. The strips were finally plaited in a three-ply braid at each end to form the strings to the pouch. In the Cook Islands and the Marquesas the slings were made of coir fiber.

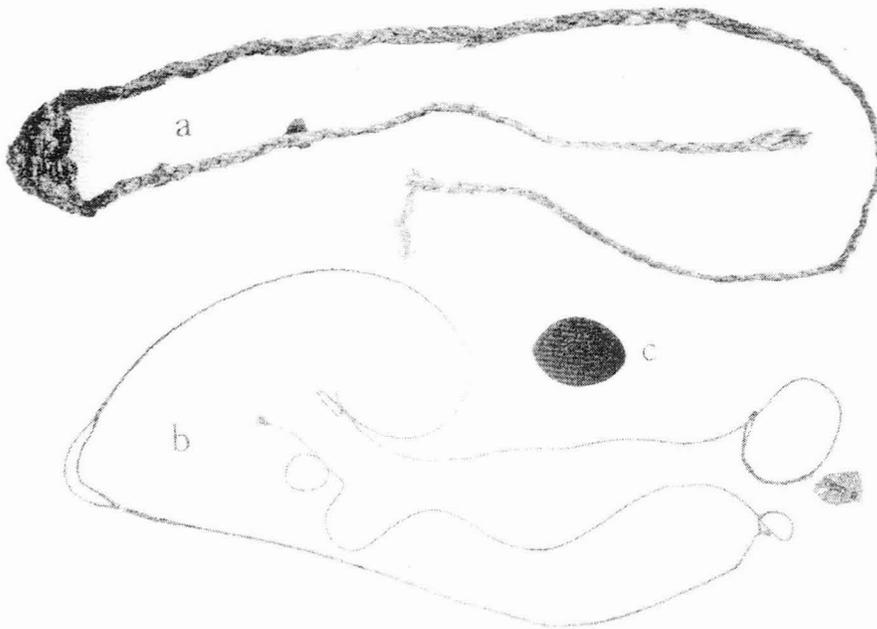


FIGURE 293.—a, sling of *hau* bast; b, model of sling; c, sling stone.

The Museum has no old Hawaiian sling, but one of modern make is here described in the hope that it carries some elements from the past. This specimen (293, a) is poorly made of strips of *hau* bast, longitudinal strips being crossed by other strips in check to form a pouch 2.5 inches wide in the middle. The pouch is narrowed down toward the ends by combining two longitudinal strips

into single wefts. When the now elliptical-shaped pouch has reached a length of 5.3 inches, the strips at the ends are divided into three plies which are braided to form the strings of the sling. The strings are 0.3 wide by 0.2 inch thick near the pouch, but they then thin off. One string is 35 inches long; the other is broken. This sling is described by Stokes (1917, p. 44), who looked upon it as a hasty and untidy job. A second specimen (B.7131) is even poorer.

A model of another form of sling described by Stokes (1917, pp. 46-48) was made in Kona, Hawaii, for Edgar Henriques, who presented it to the Museum (fig. 293, *b*). The pouch is replaced by two pieces of braid which are kept separate for a length of 4.5 inches. At each end, the plies of the two braids are combined in one braid for about 0.6 inch and then changed to three-ply twisted cords to form the strings of the pouch. One string, 41 inches long, ends in a large knot; and the other, 39 inches long, ends in a loop 1.5 inches long. The two short braids in the middle are separated to form an open pouch on which the spindle-shaped sling stone was placed with its long axis across the length of the open pouch.

#### SLING STONES

Cook (1784, vol. 2, p. 248) suspected the use of slings from obtaining "some pieces of . . . stone artificially made of an oval shape, divided longitudinally, with a narrow groove in the middle of the convex part." He was wrong in this identification, for the pieces described were undoubtedly the stone part of squid lures. However, he goes on to say: "We likewise saw some oval pieces of whetstone well polished, but somewhat pointed toward each end, nearly resembling in shape some stones which we had seen at New Caledonia in 1774, and used there in their slings." This second description adequately describes the shape of the Hawaiian sling stones.

Bishop Museum has a number of sling stones collected from various parts of the Hawaiian Islands. They are spindle-shaped with sharp ends, and the length between the ends is greater than the maximum diameter of the middle, except for a few which are practically round from the blunting of the ends. Cook's word "whetstone" may be interpreted as sandstone, but the Museum specimens are made of pieces of basalt, trimmed artificially by grinding to an established pattern (fig. 293, *c*).

Of the 20 sling stones examined, the lengths range from 1.8 inches to 3.4 inches, with an average of 2.2 inches; the middle diameters range from 1.45 inches to 2 inches, with an average of 1.6 inches; and the weights range from 2.5 to 10 ounces, with an average of 4.4 ounces. One specimen was practically round.

#### STRANGLING CORDS

Hawaii differed from the rest of Polynesia in having an established public executioner, who was termed the *mu*. His duties consisted of executing those who had broken tapu laws, preparing victims for sacrifice, and removing those

Though we have no clear history of the Fuller image, it is also probable that it completes the pair which stood on each side of the altar in the Hale o Keawe.

A curious type of temple image is illustrated by a specimen found buried in mud in a rice field at Waipahu, Oahu, and now in Bishop Museum (6816). It is a complete human figure with a rectangular headdress carved with three rows of triangles. The curious feature is a high rectangular slab, extending upward from the back of the head, in which crescentic and triangular openings are cut. The part below the human figure extends into a pointed prop. (See figure 310.) The side view shows that the upper head slab is a continuation of the body and that the head is formed by a forward projection. The total height is 5 feet 5.5 inches, of which the actual figure occupies 21.5 inches.

Two images of a similar type were found at Kahuku, Oahu. Both have the high head slab, one plain and the other with triangular and lozenge-shaped openings (fig. 311, *a, b*). Each has a pointed prop and each is more than 5 feet tall. The image with the slab openings was destroyed by fire, and the other is in a private collection. Fortunately, the Museum has field photographs, from one of which the figure was drawn. A much-worn image of the same type, obtained from Kahoolawe (C.8314) is shown in figure 311, *c*.

#### STONE IMAGES

Hawaiian stone images (*ki'i pohaku*) are disappointing as works of art. Probably this was due to a preference by good craftsmen for wood and featherwork as worthy symbols of their gods. However, stone was used a good deal to represent family or craft gods (*'aumakua*). Some individuals were content to use pieces of unworked stone, whereas others made rough representations of the human figure. It should be remembered that it was not the workmanship but the prayers and offerings which gave a material object power (*mana*) and converted it into a god, no matter what the form. Thus any individual could make a stone god for himself; and the manufacture of gods, particularly by fishermen, continued for some time after the acceptance of Christianity. On the other hand, many stone images were made which never functioned as gods. Some were used by the Hale Naua Secret Society established by King Kalakaua to create a Hawaiian atmosphere in their modern ritual, and others were made for sale to collectors.

The Bishop Museum collection of stone gods numbers 85, of which 15 are of unworked stone, 28 are authentic gods, and 29 are of modern manufacture. Included are two shaped as fish, two perforated anchors said to have functioned as gods, one shaped like a helmet, and eight casts. In addition to stone images, there is one piece of unworked coral, one piece of worked shell, and several seaurchin spines with one end neatly carved into the form of a human head. Records of five stone gods in other museums were also available for study.

## UNWORKED STONE GODS

The 15 unworked stone gods (*pohaku 'aumakua*) consist of fine-grained basalt, with the exception of one piece of natural lava. Some are water-worn beach stones, and five have been polished to a shiny black, probably by rubbing with oil. They range in length from 3.2 to 10 inches, except for a few which are medium-sized boulders and one in the rough shape of a shark 45 inches long. One specimen (325), 5 inches long, was bought on Oahu by J. S. Emerson, who stated that scrapings from the stone were credited with warding off malign influences (*'aumakua 'ino*). However, the polished black basalt stone shows no signs of having been scraped. Another stone (4063), 3.2 inches long, was purchased by J. S. Emerson at Kailua, Hawaii, in 1885 from an old fisherman who kept it wrapped up in tapa and prayed to it to bring him an abundant supply of fish. A third specimen (4067) is a dull water-worn beach stone, 5 inches long, which was highly prized by Queen Emma, who kept it wrapped up in tapa and in a special casket.

A very large stone, lying in the open near a heiau at Puuepa, Kohala, Hawaii, is credited with being a shark god. It is 7 feet 8 inches long, 2 feet 2 inches wide, and has a lateral curve. One end has a face formed by shallow grooves outlining the margins of two elliptical eyes and a horizontally curved mouth with an upward convexity resembling a shark's mouth.

Most of the unworked stone specimens functioned as fish gods (*akua lawai'a*) and were symbols of Kuula, the tutelary deity of fishermen.

## WORKED STONE GODS

Worked stone representing the human form in part or in whole was termed a *ki'i pohaku* (stone image), and it was only after the necessary ritual that it became an *akua pohaku* (stone god). After the general acceptance of Christianity, many keepers of the stone gods hid them, either from lingering sentiment or because they were afraid to destroy them by breaking them up. Thus they have been found in caves, in concealment cavities in stone piles, in taro swamps, and buried underground. Some were kept by families, particularly by fishermen, who saw no contradiction to Christianity in keeping a good luck talisman which increased the supply of fish.

Some of the hidden gods are alleged to have been located when the god made his material location known to some medium. A stone god in Bishop Museum (C.8815) has the following history, as told by James Poai to Lahilahi Webb. James and his sister Sarah lived with an old man named Wahinenui at Kawaihae, Kohala, Hawaii, in a house near a fish pond. Wahinenui became peculiar and began to wear only a *malo* and a shirt. One night he woke up the household and told his son Hueu to take a net and procure three mullet from the fishpond. He told Sarah to chew one mouthful of *'awa* and James to get a bunch

of coconuts from a neighboring tree. Wahinenui wore a shirt, a necktie, a Prince Albert coat, and a *malo*; and he had a long knife at his side like a sword. They went to a neighbor's place 100 yards away; and none of the neighbor's dogs barked, nor did the neighbors wake up. Wahinenui pointed out a spot to dig and marked the size of the hole. They dug with picks and shovels until they came to water, but Wahinenui ordered them to keep on until the pick struck something hard. They struck a heavy stone god and waked their neighbors to help them remove it from the hole. Wahinenui poured the cup of 'awa past the mouth of the image as an offering, placed the three mullet before the image, and hung the bunch of coconuts around its neck. Then they carried the stone inside their neighbor's gate and left it there. Wahinenui told them that the stone's name

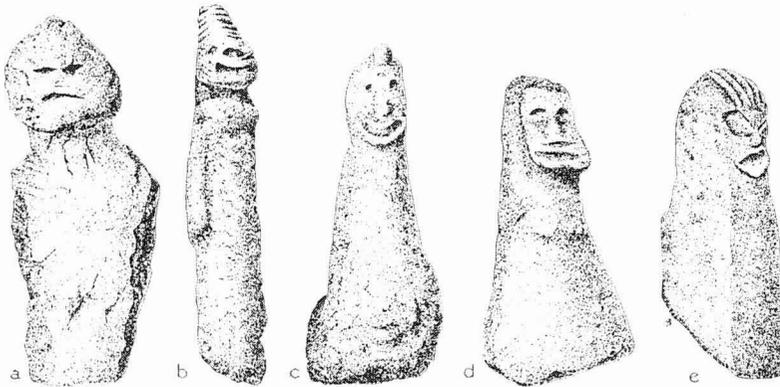


FIGURE 312.—Large stone gods: **a**, Kane from Kawaihae, Hawaii (note hollowing of eyes and mouth); **b**, from Kailua, Hawaii, showing grooved vertex; **c**, showing head with low median crest and crescentic mouth; **d**, with projecting face; **e**, with raised eyes and lip, after cast in Berlin Ethnographic Museum.

was Kane and that he, himself, would soon die. He died three days later. This event took place in about the year 1885.

The excavated stone god is shown in figure 312, *a*. It is 58 inches high, 21 inches wide, and 28 inches thick. It is a natural piece of basalt with one end carved to form a human head, having two round hollows for eyes and an elliptical hollow for the mouth. The chin and neck are defined, and the head slants forward from the neck.

It was an accepted teaching that if offerings were not made from time to time to the symbols of the gods, the gods punished the family for its neglect, usually by afflicting it with sickness. Thus instances have occurred in comparatively recent times of a sickness in a family being attributed to some stone in its possession. As the family had kept the stone from a feeling that its possession gave them some prestige from its connection with the past and as professing

Christians could not very well make placatory offerings, the only course left was to get rid of the stone with its malign influence. The method of disposal sometimes posed a problem. Edward Hosaka, when on the Museum staff, was approached by a family in such a dilemma. After they decided to throw the offending stone into the sea off Diamond Head, a spirit appeared in the night and said, "Do not throw me into the sea for it is cold. Put me in Bishop Museum." Thus the family got rid of its jinx and Bishop Museum received an addition to its family of neglected gods. The 28 worked stone figures which probably functioned as gods, may be conveniently divided into two groups according to size, large and small.

The large figures, ranging from 24 to 58 inches in height, are long slabs of stone with the upper end roughly carved to represent a face, no attempt having been made to define the body and limbs. This group is illustrated by five specimens described below.

The first, with hollowed eyes and mouth, is the god Kane which was dug up in Kawaihae (fig. 312, *a*). In the second specimen (fig. 312, *b*) the head has a

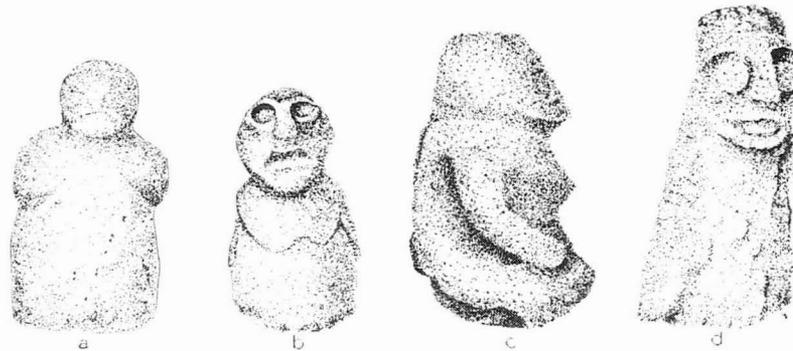


FIGURE 313.—Small stone gods in Museum collection: *a*, Halawa Valley, Molokai, height 10 inches; *b*, no data, height 7 inches; *c*, Nuuanu, Oahu, dug from taro patch, height 18 inches; *d*, Honokaa, Hawaii, height 21 inches.

conical vertex, grooved horizontally and curved downward at the back. The eyes, nose, and mouth are formed by hollows. This image was found in a cave at Kailua, Hawaii, during the blasting of a road. In the third specimen (fig. 312, *c*) the head has a low median crest and a crescentic mouth, and the eyes and nose are somewhat obscure; details are not available. In the fourth specimen (fig. 312, *d*) the lower part of the rectangular face projects forward, the eyes and mouth are hollowed, and the nose is raised. The last drawing (fig. 312, *e*), taken from a cast of a specimen in the Berlin Ethnographic Museum, is from Kahuku, Oahu. It differs from the Hawaii specimens in having raised elliptical eyes; a small, raised nose; a hollowed mouth with a raised upper lip; and a sharp chin.

The small figures, which form a series of no fewer than 21 out of the total of 28, range in height from 6 to 13 inches, with the majority between 6 and 8 inches (inclusive). An intermediate figure 21 inches high is included in this series.

In these small figures there is little or no improvement in the treatment of the head; but the shorter part below the head is more compact and the arms are represented, usually by grooves. The characteristic feature of these figures is the absence of the free individual legs which are constant in the wooden gods, though a few have poorly represented legs marked off by grooves. In six of the series only the head is depicted, one being double-headed, another having a head on one side and a fish on the other. Most of the figures are of vesicular basalt, some are fine basalt, and one head is of limestone. Some examples are shown in figure 313, *a-d*.

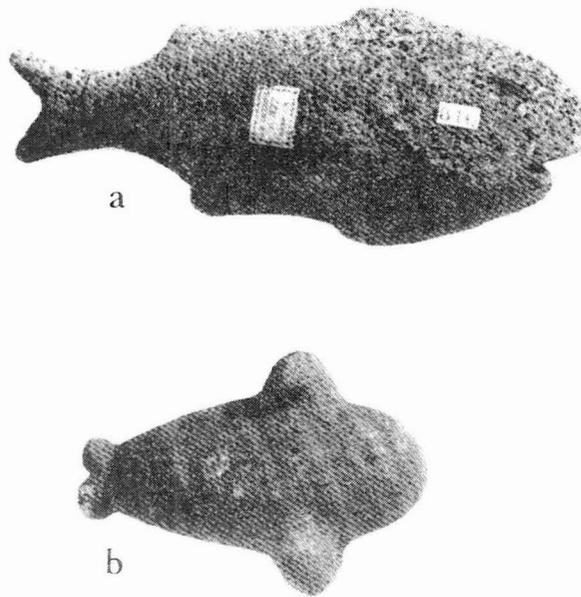


FIGURE 314.—**a, b**, stone fish gods.

#### FISH FORMS OF KUULA

Two fishes carved in stone represent forms of Kuula, the fish god (fig. 314). One Museum specimen (316) was found on a shrine (*kuahu*) on Kauai. It is made of vesicular basalt and is 9.1 inches long, 3.85 inches deep, and 2.8 inches thick. The eyes, mouth, and operculum are defined, as are two short fins on the dorsal edge, two short ventral fins, one anal fin, and a forked tail. When found, it was resting on an elliptical stone stand, also in the Museum (317). The stand is concave on the upper surface. 21 inches long, 12.3 inches wide, and 5.5 inches

in depth. Offerings of food and flowers were placed in the concavity. The second stone fish (B.6913) has one upper fin, one lower fin, and a forked tail. It is 5.2 inches long, 3.6 inches deep, and 1.8 inches thick.

A large stone bowl from Oahu in the Museum collection (6796) was used for offerings. Brigham calls it a temple dish. He writes (1902, p. 52): "It was found on Molokai and is well known to be an offertorium of a rude stone fish-god which is with it in the Bishop Museum. Its form is peculiar in that it is very thick (6 in.) in proportion to its diameter and has a projecting band around most of its circumference interrupted only by the handle-like projection on which the idol rested. The greatest diameter including this band is 13 in., the least 10.5 in." [Brigham's fig. 52, p. 54.]

#### MODERN STONE IMAGES

In the Museum series of 57 worked stone figures, a sizeable number are cataloged as "modern" or "fakes" and a few cataloged merely as gods bear evidence of recent manufacture. The total number of these modern images in the collection is 29, all of them of vesicular basalt. The clean-cut lines and fresh appearance of the stone surfaces indicate that metal tools were used. Furthermore, 16 of the 29 are complete human figures, with head, body, and limbs clearly defined and with the two separated legs projecting downward in a normal position. In some of these complete images the eyes have evidently been bored with a drill to form small conical pits, differing markedly from the eye technique used in authentic gods. Three specimens have no legs and four have only the head and neck. In four, natural rounded stones have been freshly incised to form faces and two are fresh, unfinished specimens.

#### NECKER ISLAND STONE IMAGES

Stone images obtained from a temple on Necker Island have been described in detail by Emory (1928, pp. 100-105). As the people who once lived on this deserted island must have gone there from the occupied islands of the Hawaiian group, the stone images may represent some early stage of Hawaiian culture. On the other hand, their peculiar form may have been a local development.

The Bishop Museum collection contains two complete images, two with the arms broken off, one with the arms and legs broken off, and five fragments. Two perfect images in the British Museum were obtained on Necker by officers of H.M.S. *Champion* in 1894. All the images were made of vesicular basalt by pecking, but two in the Bishop Museum series have had the surfaces ground smooth. The heights of the four Bishop Museum images with legs range from 14.5 to 16.1 inches. These are shown in figure 315.

In making these images the craftsmen evidently started with the rounding of the upper part of the head, leaving lateral projections for the ears, then commencing the outward curve of the shoulders from just below the ears. The

outer side of each arm is carried down vertically for the required distance. The inner side of the arm is defined by grooves ground from the front and the back, a slight vertical ridge on the body showing where the front and back grooves meet. The free, pendent arms without hands are cut off square at about the level of the hips.

The lower part of the face from the ears down is cut on a curve so that the chin is well down on the chest and there is no neck. The chest and abdomen form a continuous flat surface in front with a rounded projection at the lower end to represent the penis. The back is also flat, but the lower end is curved slightly in some images to represent the gluteal region, which is grooved to indicate the gluteal cleft. The front and back edges, formed in separating the arms from the body, are continued downward to the hips and thus form flat



FIGURE 315.—Necker Island stone images.

lateral surfaces. As a result, the chest and abdomen are quadrangular in cross section.

The legs are separated in the middle line, having been ground from the front and back. The outer line of the thighs in some images slants slightly outward as far as the knees, where an angle is formed with the vertical legs. In other images the thighs are vertical, but a slight horizontal edge is formed at the knee by the backward slope of the front surface of the leg. The lower ends of the legs are usually truncated, but in two images feet are represented by forward projections. In one of these there is also a short backward projection for the heel.

The back of the head is rounded, and the ear projections are trimmed thinner vertically, rounded on the outer ends, and hollowed slightly on the front surface. In one Museum image (7541) the ears project outward for 1.25 inches, and their front concavities are very marked. The features of the face were

probably the last dealt with. Two curved edges are cut down to form the eyebrows and the narrow, raised part between forms the bridge of the nose, which extends downward with the same narrow width throughout and finishes with a blunt lower end. The eyes are cut square in relief, but some show slight rounding at the corners. The mouth is in raised relief, with the upper border straight and the lower border convex. Two horizontal grooves define the upper and lower lips, the tongue between them.

The Necker Island images follow the one pattern, and all are males. The peculiar features are the absence of a neck, the position of the chin down low on the flat chest, the square eyes, the flat abdomen, the cut-off pendent arms without hands, and the practically straight legs.

#### SHELL GOD

A unique piece of carved marine shell in the Museum collection (324) is cataloged as a form of Kuula, the fishermen's god (fig. 316). It consists of two heads facing outward from each end of a connecting bar, the chins projecting outward. From the chin side of the bar, a vertical projection has been drilled with a large hole but a small section of the part surrounding the hole

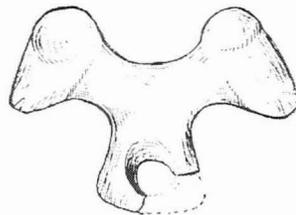


FIGURE 316.—Fisherman's god of shell.

has been broken off. The features of the two faces are indistinct; but two brows and a curved mouth are evident on one, a curved mouth, on the other. The width between the projecting chins is 2.3 inches, and the greatest thickness of the shell is 0.6 inch.

The specimen was originally bought by J. S. Emerson in Kailua, Hawaii, in 1885 for six dollars. He describes it as "Ku-ula, a double pig-headed god made of bone." The shape of the heads could represent a dog or a human being equally well.

#### CARVED SEA URCHIN SPINES

Carved spines of the "slate pencil" sea urchin (*Heterocentrotus mammilatus*) were found by J. F. G. Stokes (McAllister, 1933b, pp. 35, 36) at the Kamo-hio fisherman's shrine on the island of Kahoolawe. One (C.3526) has a perfect