THE ISLAND OF LANAI

A SURVEY OF NATIVE CULTURE

BY

KENNETH P. EMORY

BERNICE P. BISHOP MUSEUM

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ERRATA

Page 4: Last paragraph, first sentence should be followed by *bordered by spurs which end in a coastal plain averaging a mile in width,* transferred from the sentence following.

Page 5: Last line, *Captain Clerke.*

Page 71: Footnote 7, first line, *was using.*

Page 124: No. 21 should read *Freycinet.*

[illegible] as part of an extensive field investigation of the Hawaiian population, and during the period July 12, 1921, to January 28, 1922, I had the privilege of making an archaeological and ethnographic survey of the entire island.

I was impressed by the number of ruins whose character can not be determined from written sources and about which it is very difficult to obtain accurate information from the natives. It is clear that the answer to many questions concerning the various objects and types of ruins can come only from present native informants or through a laborious compilation of indirect evidence.

During the search among the ruins the several natives who had some knowledge of them were too occupied or too feeble to accompany me on the rather long distances necessary to reach the locations. Consequently I planned to complete the field notes and then, using these records as a guide to questions and a check on answers, to spend some time with the informants. However, the time consumed by the preliminary quest far exceeded my expectations and the remaining several weeks of my stay on Lanai were inadequate for securing all the information desired. In view of the fact that the more intelligent and energetic of the old Lanai natives have moved to the other islands, principally to Maui, and that it is among them one should go for a wider and more exact knowledge on matters of

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The Island of Lanai

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By Kenneth P. Emory

INTRODUCTION

SCOPE AND METHOD

In the accounts of the Hawaiian islands, scant attention has been given Lanai. The outstanding changes since Captain Cook's advent (1778) are fairly well known (p. 5), but a satisfactory description of a Lanai native, or village, or custom is nowhere to be found. To lessen the ignorance concerning such a formerly well populated island, it is obviously desirable to conduct investigations while a few natives still survive, and before the ruins of the early life are obliterated by the modern improvements which have swept over the larger islands.

In 1920-21 physical measurements of the natives of Lanai were made by Louis R. Sullivan as part of an extensive field investigation of the Hawaiian population, and during the period July 12, 1921, to January 28, 1922, I had the privilege of making an archaeological and ethnographic survey of the entire island.

I was impressed by the number of ruins whose character can not be determined from written sources and about which it is very difficult to obtain accurate information from the natives. It is clear that the answer to many questions concerning the various objects and types of ruins can come only from present native informants or through a laborious compilation of indirect evidence.

During the search among the ruins the several natives who had some knowledge of them were too occupied or too feeble to accompany me on the rather long distances necessary to reach the locations. Consequently I planned to complete the field notes and then, using these records as a guide to questions and a check on answers, to spend some time with the informants. However, the time consumed by the preliminary quest far exceeded my expectations and the remaining several weeks of my stay on Lanai were inadequate for securing all the information desired. In view of the fact that the more intelligent and energetic of the old Lanai natives have moved to the other islands, principally to Maui, and that it is among them one should go for a wider and more exact knowledge on matters of

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general Hawaiian culture, as well as upon subjects dealing specifically with Lanai, it has seemed advisable to present what I have collected thus far and to leave the questioning of these natives for the time when investigations are being carried out on the other islands.

The willingness of the Lanai Ranch Company to have the survey proceed and their hospitality through Messrs. H. A. Baldwin and F. F. Baldwin, owners, and Mr. George C. Munro, Manager, has alone made the investigation possible. Mr. Munro's scientific interest in all things Hawaiian and his advice and constant help were of the greatest value. To his nephew, Hector C. Munro, to the immediate members of his family; and to Charles Gay, his sons Lawrence and Rolland Gay, and to the other members of his family on Lanai; and to all Lanai natives I am indebted for innumerable kindnesses in carrying out the field work.

Throughout this paper I have used the glottal stop (') in the spelling of Hawaiian words which possess this stop and which without it are liable to misinterpretation. Lanai, the name of the island, is properly Lana'i, but the incorrect spelling is so fully established that a change seems undesirable.

GEOGRAPHIC SKETCH

Lanai is one of the smaller of a group of four islands located centrally in the Hawaiian archipelago. It lies in the lee of the high island of Maui and eight miles to the west. To the north of Lanai is Molokai separated by a channel seven miles wide. Fifteen miles to the southeast is the little island of Kahoolawe. These four islands are so grouped as to form between them a partly enclosed and sheltered sea over which the native canoes freely plied.

As shown on the map (Pl. 1), Lanai is roughly triangular or pear shaped, its apex pointing northwest. Its length is seventeen miles; its extreme width twelve miles, and its area 140 square miles. As viewed from Maui, Lanai rises in a smooth curved ridge from the south point to a height of three thousand feet and then tapers to the north point. This contour of the island is the source of its name, Lanai (*la-na'i*), which means a "swelling," or a "hump" (2).

On its eastern side the ridge or backbone of the island is cut into by deep gulches. On the west side of the ridge the surface descends abruptly onto a great rolling plateau fifteen hundred to two thousand feet above the sea, forming a shelf which ends in a sea cliff bordered by spurs which end in a coastal plane averaging a mile in width. The lower slopes of Lanai present such a barren aspect to passing vessels that the island is described

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as rocky and parched. However, hidden deep in the gulches of the windward slopes and along the crest of the island is a luxuriant shrubby vegetation and on the deep soil of the plateau there survives a remnant of an extensive dry-land native forest. The rainfall on the top-lands is thirty-five inches a year and on the lower slopes, twelve inches, but the porous volcanic rocks hold the precipitation poorly. There are a number of mountain springs and in Maunalei gulch a small stream. This water may partly or wholly disappear in periods of drought under which Lanai suffers every three or four years. From September to November the rains are likely to appear in sudden local showers called *ʻaulu*. In the winter months the island is visited by southwest or *kona* rain storms.

Chester K. Wentworth, Bishop Museum Fellow, has supplied the following statement of the geology of Lanai:

> Like all the Hawaiian islands Lanai is composed wholly of volcanic rock. The original form of the island was that of a simple cone built up of a great number of relatively thin flows of olivine basalt. So far as known the lava issued from a single vent which was situated at a point somewhat southwest of the present summit of the island. The large area of gently rolling country which includes several deep, undrained basins and lies between one and two thousand feet above sea-level, is an unusual feature in Hawaiian topography and is the result of normal faulting by which considerably more than half of the original cone has slipped down and away from the undisturbed northeast portion. The faulting took place along a northwest-southeast line and has produced through the tilting of the down-faulted blocks about 26 square miles of territory having no surface drainage to the sea. This area together with the land which borders it on the north and west constitute the principal agricultural section of the island. Owing to its situation on the leeward side of Molokai, Lanai suffers little wave erosion on its northeast side but is most vigorously attacked by the sea on the southwest side. Molokai appears, however, to be much less of a barrier to the higher moisture-bearing winds than to the waves and Lanai suffers the most pronounced inland erosion on the northeast.

The number of people living on Lanai according to the census for 1920 was 185. I counted 102 Hawaiians in January, 1922, of whom 50 lived on the east coast and 52 on the top-lands. Ten of them were born on the other islands and not less than ten are obviously of mixed blood. The remaining inhabitants are Korean, Japanese, and Whites.

At the time of my visit Lanai was almost entirely under the ownership and control of the Lanai Ranch Company, which devoted its activities to the raising of Hereford cattle. The few natives not in their employ or with the ranch of Charles Gay, were engaged in fishing or small farming.

HISTORY

Lanai was first made known to the civilized world by the expedition of Captain Cook. Captain Cook himself did not see Lanai but his ships, the "Resolution" and "Discovery," sailing under Captain Clark, passed along

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the south and west coast of Lanai on February 25, 1779, close to Kaunolu point (33, p. 85). Lanai was described by Captain King of this expedition as follows:

> The country to the south is high and craggy; but the other parts of the island had a better aspect and appeared to be well inhabited. We were told that it produced very few plantains, and bread-fruit trees; but that it abounds in roots such as yams, sweet potatoes, and tarrow. (See 33, p. 115.)

For seven years after, no canvas sail was seen from the shore of Lanai. Then two ships appeared to the south on the morning of May 30, 1786. These were the "King George," commanded by Captain Portlock, and, following at a distance of six miles, the "Queen Charlotte," under Captain Dixon. Towards noon the vessels were off the southwest point of Lanai on their way to Oahu. A few canoes came out to the "King George," but "brought nothing of any consequence to barter." (See 40, p. 66; and 14, p. 52.)

The same night of May 30, 1786, the vessels under La Perouse passed midway between Kahoolawe and Lanai on their way to Alaska (38, p. 352).

The "Queen Charlotte" was again in Hawaiian waters the following year. She set her course from Hawaii to Oahu along the west coast of Lanai. At noon, on September 9, 1787, "the West end of Ranai bore North 10 deg. West, about ten miles distant. During the afternoon we had several canoes from Ranai alongside, which brought us a number of fishing lines, but little besides: these were purchased with small toes [toys]" (14, p. 251).

The American brig, "Hope," met with two double canoes off Lanai on October 9, 1791 (27):

> We shaped our course to run without Towrooa [Kahoolawe] and Ranai [Lanai]. Next morning we were off the west coast of the former. Through the day we had light air so that it was dark ere we came abreast of the west end of Ranai. However, in the afternoon we were visited by two double canoes which had nothing for sale except a few curiosities. The men in them soon knew the men we had taken from Mowee [Maui].

Captain Vancouver, who was the first to make extensive explorations in the Hawaiian Islands, did not land on Lanai. The barren rocky coast appeared to have few anchorages and only wells of brackish water; also, trade with the natives was poor. Vancouver's surgeon, Menzies, wrote of passing Lanai on March 6, 1792 (38, p. 22):

> Early next morning we passed to the southward of Kahoolawe and was at noon off the south end of Lanai, . . . the south point of which appearing a steep, sandy precipice bore N20E about four miles off. The wind being light and variable, with clear weather in the middle of the day, gave us an opportunity of

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observing the state and naked appearance of the island, which seemed thinly covered with shrivelled grass in a scorched state. No hamlets or plantations were to be seen, no trees or bushes adorned the face of the country, which swelled out gradually to a moderate height, so that we have reason to think that the island is but very thinly inhabited. A few canoes came off to us with two or three men in each, which we conjectured were a fishing party or led merely by curiosity, as they brought nothing to dispose of and had no women with them.

The trade wind freshening again at night enabled us to pass the west end of Molokai, which, like Lanai, presents a naked, dreary, barren waste, without either habitation or cultivation. . . .

To Captain King, thirteen years before, the island had appeared well inhabited. The cause of this change is explained by Kahekili's brother, Kamohomoho. He told Vancouver of the havoc wrought by the raids of Kalaniopuu in 1778. "Rannai [Lanai] and Tohowrowa [Kahoolawe], which had formerly been considered as fruitful and populous islands, were [1793] nearly overrun with weeds, and exhausted of their inhabitants . . ." (51, p. 180.)

Rev. William Ellis passed the southwest point of Lanai on July 2, 1823, in a small schooner belonging to Queen Keopuolani (15, p. 57). The vessel was bound from Honolulu to Lahaina, Maui, and then to Hawaii for sandalwood. Kekauluohe, daughter of Kalakua, one of the queens of the late Kamehameha I, requested the master to stop the schooner and put her ashore with three of her female attendants to collect shell fish at the base of the cliffs. After an hour she returned with a quantity of limpets and periwinkles.

Ellis makes no mention of the inhabitants along this coast, but he gives a reason why masters of vessels acquainted with navigation in the islands usually avoid this shore:

It is not unusual for vessels passing this way to be becalmed there for six, eight, or even ten days. The natives with the small crafts belonging to the islands usually keep close in shore, availing themselves of the gentle land breeze to pass the point in the morning; but this is attended with danger as there is usually a heavy swell rolling in towards the land.

In describing the island, Ellis says that notwithstanding its barrenness the ravines and glens are filled with thickets of small trees and to these many of the inhabitants of Maui repaired for the purpose of cutting posts and rafters for their small houses. "The inhabitants are few, probably not exceeding 2,000. Native teachers are endeavoring to instruct them in useful knowledge and religious truth, but no foreign missionary has yet labored on this or the neighboring island of Molokai (15, p. 23)."

The American ship "London" was wrecked on Lanai in the early part of 1826. The United States armed schooner "Dolphin," which was then

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in Honolulu, came to her rescue (1, p. 195). One or two years before the British ship, "Alderman Wood," had gone ashore on Lanai and become a total wreck (49, p. 30). Lawrence Gay of Lanai has given me a stone foreign to the islands used by the natives with an iron file to strike fire. This stone is supposed to come from the ballast of a vessel wrecked off Keomuku. There are evidences of several shipwrecks on Lanai. The top rail of a fence at Kahe'a is the boom of a large schooner. At the remains of a house on the Paomaii plateau is the carved panel of the bow of some ship. Interesting among the litter of objects which have drifted onto the eastern beaches is a half-buried forty-foot redwood log at Pookeana, three feet in diameter and sawed off at each end. It was such redwood logs floating down from the northwest coast of America, which furnished the material for the largest Hawaiian canoes.

In 1829, Kaahumanu, queen regent, visited Lanai exhorting the people to listen to the word of God (9, p. 375). It is not until six years later that we find the American Protestant missionaries themselves actively laboring on Lanai. During the year 1835, Rev. Dwight Baldwin of the mission station at Lahaina visited the island twice and Rev. William Richards of the same station, six times (3). In September, Richards spent nine days in touring the island, making a geographic survey. Twenty-seven sermons were preached before the year was up to a congregation of 300.

In 1837, Baldwin states that the population of Lanai was 1,200—the figure given by the census of the Kingdom for 1838. The government census for 1832 was 1,600, which is also only an estimate. Jarves (28, p. 238), gives 616 as the exact population for 1846. Is it possible that in the eight years between 1838 and 1846, there was a reduction of one-half the population? Or were the estimates for 1832 and 1838 too large? From 1846 the population remained stationary for the next seven years whence it began rapidly to dwindle. I have not so far been able to find an explanation in the missionary letters for the sudden decline immediately after 1838. This was a period of extremely rapid decrease among the other Hawaiian islands due largely to the conditions induced by the crews of the whaling fleets. Lanai suffered no loss of numbers from the epidemic of measles in 1848, or from small pox which was prevalent in the islands in 1853. I believe emigration to Lahaina, Maui, one of the principle causes operative in the decrease of population. Lahaina became the seat of Hawaiian government shortly after the death of Kamehameha I in 1819.

In 1837, there were three schools for children on Lanai and two teachers from the Lahainaluna Seminary. A stone school building was in

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progress on the north or east side of Lanai, probably at Maunalei, and a grass house had been erected on the high lands for Sabbath meetings. About this time the northwest point of Lanai had an exile colony at Kaena for women who had committed theft or adultery. From Maui the exiles were conveyed to Kaena Point in the schooner "Hooikaika" where the women were left, the men then being carried to Kahoolawe (48, p. 117). The penal settlement on Kahoolawe probably began about 1830 and lasted until November, 1848 (48 and 30).

Captain Wilkes of the U. S. Exploring Expedition, 1838-1842, said of Lanai: "It affords little ground for cultivation, and is only inhabited by a few fishermen, who have some temporary huts at its eastern end. It is alike destitute of cattle, water, and wood" (52, p. 296).

Two Protestant stone meeting houses were begun on Lanai in 1842. One of them was finished in 1851 and represents the ruin at Kihamaniania, near Koele. The other church, at Maunalei, seems not to have been finished in 1858.

In 1855 a number of Mormon elders had been on Lanai and hired land from one of the chiefs. A few foreign and native converts had gone there to live. The Protestant missionaries were somewhat alarmed by the activities of the Mormons, but in 1862 a school of seventy pupils in Palawai basin, the scene of the young Mormon colony, was taught by a member of the Protestant Mission. There were then four other schools on the island having altogether seventy pupils.

The arrival and residence of Walter Murry Gibson at Palawai basin in September, 1861, marked a turning point in the affairs of the island. Dwight Baldwin in his Mission report for 1863 speaks of Gibson thus:

> They [the Mormons] hold meetings on the Sabbath. Captain Gibson, as he is called, is said to be their leader. I can not learn that he labors much to proselyte the people to Mormonism, he seems to be engaged mostly in agriculture, raising poultry and sheep and trafficking with the natives. He has leased lands of the government from the chiefs and I suspect will soon have the resources of the island under his control.

Gibson became involved in difficulties with the authorities at Salt Lake City through refusing to deed to the Mormon church the lands in his control. Brigham Young immediately issued a "bull" cutting him off from the church in 1864. Such was Gibson's grip on the natives that he held out for awhile against the authorities at Salt Lake. It became gradually apparent that Gibson had control of the better lands on Lanai, and that his Mormon church had dissolved.

About this time, in the summer of 1869, J. M. Lydgate and Dr. Hillebrand landed at "the little native hamlet of Ka-hale-palaoa . . . of

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half a dozen grass houses with the traditional easy-going population of men, women, children and dogs, and none of them doing anything" (34, p. 69). They rode upward to Palawai basin, where they were Gibson's guests for several days while collecting botanical specimens. Lydgate remembered:

> A main grass house in which the family lived, I should say, about 20 by 30, another which served as a kitchen and dining room, about a third of that size, with a Chinese cook in command, and a third cottage of the same, somewhat farther detached, for guests, which was assigned to us.

Between the years 1863 and 1866 the population dropped from 600 to 378, owing to an exodus of Mormons. There is a tradition that in the time of Gibson many native Mormons removed from Lanai to Salt Lake City. In the six years between 1866 and 1872 there was a decline in the number of natives from 378 to 348, then a more rapid falling off to 177 six years later. The population in 1890 was practically the same, 174.

Upon Gibson's death in California, January 21, 1888, the Lanai lands were in his name and went to his daughter, Mrs. Talula Lucy Hayselden. Her husband, Frederick H. Hayselden, and others, formed the Maunalei Sugar Company, Ltd., with a base at Keomuku. A wharf was built at Halepalaoa and a railroad bed laid from the wharf along the coast to Keomuku and beyond. A five-million-gallon pump was erected at Keomuku; Japanese were brought in to work on the cane fields. The census for 1890 was 174, but in 1900 it jumped to 619 owing to the imported labor. The sugar company failed in 1901.

Between 1900 and 1903 the property on Lanai passed out of the hands of the Hayseldens, going under the control of Charles Gay and others, each holder adding many acres bought from the natives and from the government. It finally in 1910 became vested in the Lanai Company, Ltd. The population at that time was 131, again consisting almost entirely of natives.

The Lanai Ranch Company came under the exclusive ownership of Frank F. Baldwin and Harry A. Baldwin, March 3, 1917. In 1922 this company owned the entire island except for the ranch lands of Charles Gay and about 500 acres resting under native titles. In December, 1922, the interest of the Lanai Company was bought by the Hawaiian Pineapple Company, Limited, of Honolulu, who have operations well under way to put the plateau into pineapple fields, reserving the lower slopes of the island for cattle. Kaumalapau (Kau-ma'la-pa'u) is being converted into a suitable harbor from which a seven-mile macadamized road will lead to Lanai City, being erected near the mouth of Iwiole gulch and at Hokuao, below the slopes of Kihamaniania hill.

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NATIVE TRADITIONS

FORMATION OF LANAI

A tradition of the origin of Lanai was chanted by Pakui, the famous historian of the time of Kamehameha I. This song relates that all the islands of Hawaii were born of Wakea and his wives. When Wakea's wife, Papa, had given birth to Hawaii and Maui, she went back to Tahiti. Then Wakea took to wife Kaula-wahine and Lanai-kaula[1] was born to them (19, pp. 12, 18).

In the chant of Kahakuikamoana, which perhaps is a continuation of the Pakui chant, it is said that Lanai was "found and adopted" by a chief from Tahiti (19, pp. 2, 6). Another tradition (19, p. 20) states that long before the time of Wakea and Papa, the Hawaiian islands were pieces of coral caught on the hook of the famous fisherman Kapuheeuanui. At the advice of the priest, Laulialamakua, Kapuheeuanui offered a sacrifice and after a prayer called one piece of coral Lanai and threw it back into the sea from where it grew into the island of Lanai.

A Rarotongan tradition of the hero Maui gives a list of the places visited and fished up by him. Among them is Vaii, followed by Ngangai (42, pp. 147-8). Percy Smith thinks that Vaii is the Rarotongan name for Hawaii, and dates this visit of Maui about 50 A. D., and commenting on this tradition, says:

> . . . . Maui is stated to have called that group [Hawaii] Mauiui, in remembrance of his efforts in 'lifting up the heavens'; and he gave it another name, Vaii (for Vaihi or Waihi, known as such to both Tahitians and Maoris), and a third name he gave was Ngangai. Now, in Hawaiian this would be Nanai; and as the change from *r* and *l* to *n* is common in Polynesian, we may see the origin of the name Lanai.

As a matter of fact another form of the name Lanai was Nanai. The Hawaiians have a tradition in which the name of the spring on top of the island is known as Nanai-hale, and the summit of the island is now called Lanai-hale. Lawrence Gay informed me that an old woman on Kauai pronounced the name of the island Na-na'i, and I have heard a Hawaiian woman, Kaahaaina Naihe (age 90) so pronounce it distinctly. Andrews (2) gives the same definition for *nanai* as for lanai, proving they are variants of the same substantive. In the ancient prayer of Malaehaakoa, in the legend of Hiiaka, Lanai is rendered Nanai (16, p. 115; and 19*b*, p. 143).

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[1] Lanai-kaula, as the name of Lanai, is perpetuated in the name of a place on the east coast.

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FIRST HABITATION

Lanai was inhabited only by spirits until Kaululaau, son of the Maui chief, Kakaalaneo (who lived about 1400 A. D.[2]), killed off the evil spirits. The following legend of Wahanui (19, p. 516) deals with the pre-human age:

> . . . [The gods] Kane and Kanaloa together with their younger brother, Kaneapua, lived at Kaunolu, Lanai. They were three gods who sometimes changed into other forms, Kane and Kanaloa taking the form of a bird, while Kaneapua very often had a human form.
>
> Once upon a time they became very thirsty, so Kane and Kanaloa requested their youngest brother to go to the uplands of Lanai for water, at a spring called Nanaihale. Upon the arrival of Kaneapua at the spring with his water jug, he urinated by the edge of the spring before he stooped down to fill his jug; he did not know that his urine had run into the spring. When he arrived home and met Kane and Kanaloa, they reached out for the water jug and each took a drink. When they had satisfied their thirst they discovered that it was urine instead of water, so they flew off and left Kaneapua on Lanai.
>
> While Kaneapua was one day seated by the seashore on the Kaunolu point, he saw the double canoe of Wahanui, king of Hawaii, passing by. On learning that they were bound for Tahiti to "step on the breast of Kane and Kanaloa," he asked to be allowed to go with them. Twice he was refused passage and each time the canoe was overturned by a storm prophesied by Kaneapua. Then Wahanui perceived Kaneapua was a prophet and took him aboard.

The name of the rock island off the west bank of Kaunolu and, according to some, the bank itself, is Kaneapua. But Fornander's tradition (19*a*, p. 590) concerning the origin of the name does not connect it with the god, Kaneapua, but with Apua, younger brother of Aukelenuiaiku.

Apua and his brother came from Kahiki. The account is:

> They came and landed on Lanai on the east side of the pali of Kaholo [Palikaholo]. The name of the place now is Kaneapua [location correct]; it is derived from the name Apua.

It is not clear how Kaneapua is derived from Apua in this explanation, but in the legend of Aukelenuiaiku (19, pp. 52, 72) there is mentioned a brother-in-law, Kaneapua, who was a bird-man teaching Aukelenuiaiku how to fly. Thus it would seem that Apua and Kaneapua were one and the same person and that the rock on Lanai was supposed to be named after him. Kaneapua's cousin was Halulu, the bird monster, who lived in a cave in a cliff to which it carried men to be devoured for its food. The name Halulu is commemorated in the name of the temple adjacent to Kaneapua. Namakaokaha'i was the sister of Kaneapua and her name

[2] This approximate date is derived from the chronological list of Maui chiefs given by Fornander (19, *b*, p. 313). From King Kalakaua back to Kakae, brother of Kakaalaneo, is 17 generations. Using Smith's estimate of 25 years to a generation (42, p. 18) and taking 17 generations before the time of Kalakaua's birth, 1836, the date arrived at is 1411 A.D.

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is attached to a place in the same district of Kaunolu, but on the plateau.

Ellis states (15, p. 67) that:

> The people of Ranai . . . had a number of idols, but best known by the chief with whom I was conversing, were Raeapua and Kaneapua, two large, carved stone images, representing the deities supposed to preside over the sea, and worshipped chiefly by fishermen.

Story of Kaululaau

The tradition of Kaululaau is known in some detail by every adult native of Lanai, but I did not hear nearly as full legends as those collected by Judge Fornander (19, pp. 486-8; 19*a*, p. 542) or Mr. O. P. Emerson (17). Fornander's two accounts were written down some time ago by Hawaiians in the native language and therefore follow closely the old trend of native thought. I give Fornander's version of Relating to Kauluaau and Relating to Kekaa and follow it with comments on the differences and amplifications contained in Emerson's version.

Relating to Kaululaau

At last Kanikaniaula, the queen, was known to be with child and in due course of time she brought forth a son who was called Kaululaau, known as the one who pulled up the bread-fruit trees of Lele . . .

As Kaululaau grew to manhood, so also grew his playmates, and as he grew older he became more and more mischievous. His father, Kakaalaneo, was then still king of Maui. In those days it was customary for the boys with him to climb the bread-fruit trees and pick the fruit; and when the fruit got fewer and beyond their reach, Kaululaau would then pull up the trees with his hands. This was done so often that the trees became scarce in the district of Lele (Lahaina). At last the father took pity on the people, knowing that they would some day go hungry; so he ordered that all the boys be sent home to their parents, believing that this would make his son less mischievous, but instead of improving he grew worse. After considering the matter for some time, the father at last hit upon a course of action and thereupon told the queen and attendants to take Kaululaau and abandon him on Lanai with the spirits. This was agreed on by the chiefs and people and preparations were immediately made; the food and meat were cooked, kapa and other things were gotten ready and the canoes set out with Kaululaau. Upon their arrival at Lanai, Kaululaau was put ashore with all the things prepared for him and the canoes returned.

When Kaululaau landed on Lanai he entered a patch of reeds and slept there. While in his sleep his guardian spirit, *aumakua*, came to him and said: "Say, Kaululaau, get up and enter the cave with all your belongings." When Kaululaau woke up he looked about him and saw a cave opening near by; so he got up and entered it in obedience to the instructions given him in his sleep. Lanai was an island of spirits. No people could live on this island as the spirits killed and ate everybody who came there. Kaululaau was, however, an exception to this as he was not eaten up; but this was because he was too cunning in telling falsehoods, just like Punia.

That night Kaululaau slept in the cave and at daylight he left it and returned

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to the patch of reeds where he was found by the spirits, *akua,* who asked him: "Say, Kaululaau, where did you sleep last night?" Kaululaau replied: "In the small patch of thistles." "Is that so? No wonder you were not found last night," remarked the spirits. On the approach of the next night he again entered the cave, when the spirits went about looking for him all night. At daylight Kaululaau went to the beach on the dry sand and sat there where the spirits came and asked him: "Where are you going to sleep tonight?" Kaululaau replied: "In the large surf where it rolls high as a house. That is where I will sleep." On the approach of night Kaululaau would again retire to the cave, and at daylight go out on the sand where he would be met by the spirits who would ask him: "Where did you sleep last night?" "In the small surf; you were all at the large surf," Kaululaau would reply.

Through these deceiving answers the spirits got so overworked that they mostly died off, leaving but very few of them alive. Pahulu was one of the spirits that was saved, because he left Lanai and went over to Kahoolawe to live. Kaululaau after this kept a fire burning all the time he remained on Lanai. Kakaalaneo upon seeing the fire burning on Lanai so continuously asked the people: "Say, Kaululaau could not have been killed by the spirits?" "No," replied the people. Therefore Kakaalaneo sent some people in a canoe to go to Lanai and see if Kaululaau was indeed still alive or not. When the canoe arrived at Lanai, the people saw that Kaululaau was indeed still alive and he was still keeping the fire burning. The canoe then returned to Lele and the people told Kakaalaneo, the king, of what they had seen. When the king heard this he remarked: "Yes, he was sent to Lanai to be devoured by the spirits, but no! What does this mean? Well and good." He then ordered a double canoe to go and bring Kaululaau home. This is how Kaululaau was saved and his history and life on Lanai has become famous even to this day. (19, pp. 486-88.)

Relating to Kekaa

. . . One time this chief (Kakaalaneo) and his people planted bread-fruit trees. While they went ahead planting, Kaululaau (his son) followed after, pulling them up. Some of these trees, southwest of the Lahaina fort, were called the bread-fruit trees of Kauheana. This Kaululaau was banished to Lanai, where ghosts were plentiful, with the idea that he would be killed; but it did not turn out that way. After some time a fire was seen burning (on Lanai), therefore the chiefs wondered whether or not Kaululaau was dead on account of this lighted fire. The important point from these explanations is that Kekaa was the birthplace of Kaululaau, the famous one who travelled all over Lanai fighting the numerous ghosts, *akua,* there and made it a land fit to be inhabited by human beings as it is at the present time, January 24, 1872. S. Kaha. (19, *a,* p. 542).

Emerson's version of the Kaululaau tradition is based on the story as told by an old native, deacon of the church on Lanai. It differs from the version given by Fornander in the following respects:

Kakaalaneo is spoken of as a chief of Lahaina. Kaululaau pulled up banana sprouts and potato tops instead of breadfruit trees. Not even the famous *akua* of Lanai, Pahulu, escaped Kaululaau.

As related by Emerson, the story is amplified as follows:

When Kaululaau said he was going to sleep "out there in the curl of that big combing wave" many goblins perished in the surf looking for him. They asked

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him, when they met him on the beach, why he did not sleep there when he said he was going to, and he replied, "So I did, but you did not go out far enough." The next night they went further out and lost more of their number.

Then Kaululaau arranged a fishing excursion in which the goblins came to him one by one and he disposed of them by ducking them under water. There were still many left and he killed off all but two at one time by having a feast and entertainment for them, trapping them in the house by sealing their eyes with bird-lime as they lay prostrate with gorging and drinking, and then setting the place on fire.

Kaululaau had more difficulty disposing of the two goblins left. One came along with a big club and mistaking the banana stem carried by Kaululaau for a club of choice kauila wood, because of the apparent care bestowed on it, he offered to exchange clubs. When Kaululaau was in possession of the real club he was able to lay his opponent out.

The last goblin was his most formidable adversary, but by climbing into a hala tree over a spring, he induced this one to grapple with his reflection and then dropped upon him.

I was taken by Nami Makahanaloa to the spring, now a rock-lined well (Pl. I, 127) where Pahulu, the last of the *akua,* was tricked by Kaululaau. She told me that Kaululaau blocked up all the other places where Pahulu[8] could get water so that he would have to come to this one with the hala tree still leaning over it. The place where Kaululaau was abandoned now bears his name (Pl. I, 292). Maka-lau (Pl. I, 229), Four-hundred-eyes, has reference to the eyes of the multitude of searching goblins who, in the hopes of discovering Kaululaau, entered the patch of *puakala,* Hawaiian poppies, at that place. The cave in which Kaululaau found shelter was at Lae Hi, the promontory close to Makalau; and the dance hall where he entrapped the goblins and sealed their eyes with breadfruit gum was upon the mountain, Lanaihale.

GENERAL TRADITIONS

The Tomb of Puupehe

Puupehe is the name of the rock island off the west point of Manele Bay, Lanai. The present natives say that it is the name of the girl buried here by her lover who took her body from a sea cave where she was drowned. With the help of the gods he was able to scale the cliff with the body which he buried beneath the tomb-like structure so conspicuous on the summit of this sea tower. This structure is called Kupapau Puupehe, Tomb of Puupehe.

Gibson gives the tale (22) as learned from Piianaia, "the chief authority for tradition on Lanai." The following is an abstract of this story:

[8] Akua Laʻai. Akua ia Pahulu. Lanai has ghosts, it is inhabited by Pahulu (19, *a,* p. 428).

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The girl Puupehe was the daughter of Uaua, a petty chief of the king of Maui. A native of Lanai, Makakehau, captured her as the "joint prize of love and war." He was called Makakehau, Misty Eyes, because Puupehe's beauty had blinded him. His fear of losing such a beautiful girl led him to keep her in lonely places. One day, leaving her to prepare food in the sea cave of Malauea (Pl. 1, 239), he set out for the mountain spring of Pulou (Pl. 1, 249) to fill his gourd with sweet water. Returning, he saw the front of a Kona storm approaching the coast. He rushed down the slope (three miles) to rescue his wife, but the waves had dashed into the cave, killing her. He recovered the body, which was wrapped in kapa for burial in the grave yard at the Kupapau at Manele. But that night he took the body to the top of the rock island; his friends were astonished to see him working on the grave there the next morning. He placed the last stone upon it, and then stretched out his arms and wailed for Puupehe:

"Where are you, O Puupehe?
Are you in the cave of Malauea?
Shall I bring you sweet water?
The water of the mountain?
Shall I bring the *uwau* bird?
The *pala* fern and the *ohelo* berry?

"You are baking the *honu* [turtle]
And the red, sweet hala
Shall I pound the kalo of Maui?
Shall we dip in the gourd together?
The bird and fish are bitter
And the mountain water is sour.
I shall drink it no more;
I shall drink it with Aipuhi,
The great shark of Manele."

Ceasing to wail, Makakehau leaped from the rock into the boiling surge at its base. His body was crushed in the breakers. The people who beheld the sad scene secured the corpse and buried it in the *kupapau* of Manele. (See p. 74.)

Gibson's account compared with the unadorned story of a Lanai native of today, shows only difference in the amount of detail; the essentials are all present. I give the story as told by Nami Makahanaloa, age 35, and in her exact words:

Ua make o Puupehe mamuli i kana kane hoihoi ia ana i loko o ke ana pili i ke kai. Hiki mai ka ino komo ke kai iloko o ke ana a make oia oiai nae kana kane ua pii i uka aku o na kahawai i wai no laua. Ike mai la nae ke kane i ka ino hoi koke mai oia. I ka hiki ana mai ua make ka wahine. Ia po iho i lawe malu ai oia i ka wahine a kau iluna o kela puu. O ke kumu, aole makemake o ka ohana o ke kane o kana wahine kela.

The translation follows:

In the sea cavern Puupehe was dead before her husband could reach her. A storm came up, the sea completely filled the cave and she died while her husband had gone upland to a stream to fetch water for the two. The husband saw very well that the storm was coming. He hurried back [but] when he reached [the cave] his wife was dead. That night he carried her off secretly and climbed on top the island [to bury her]. His reason being that the family of the husband did not like his wife.

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Puupehe, Son of Kapokoholua

A Hawaiian on Maui, probably a native of Lanai, started to write for Fornander a Lanai story which he knew concerning Puupehe (19*a*, p. 554). He stopped before the story was really begun, for the hero was not yet born. However, there is enough in the legend to make a story differing entirely from Gibson's version. That Puupehe island was to be brought into the tale I have no doubt as the mother of Puupehe was Kapoiliili and the father Kapokoholua, both of which names are attached to places in the vicinity of the island (Pl. I, 55 and 56).

The father of Puupehe was a fisherman in the time of Kaululaau. While absent in his canoe, his wife had a strange experience. The child within her womb spoke, waking her out of her sleep, "Say, my dear mother, do thou awake; father is dead."

The woman was terribly disturbed. But the child had lied to her, simply because he was dissatisfied at their not having awa-root for him. To be satisfied he also needed fish, but he saw to it himself that his father caught an abundance. He went out [having the power to move about freely and invisibly] to watch his father fishing, and sent a great number of fish to bite the hook. When the father stopped in his lucky fishing to look shoreward, he noticed the land mysteriously covered with fog. This he felt, was a premonition concerning his wife, so he commenced pulling his line to go home. But the shark, Puaiki, grabbed the hook and pulled him close to Maui, from there he came again outside of Manele. He noticed that their house was surrounded by a many-colored cloud.

Then his hook and line were broken off; he returned to shore where his wife was anxiously waiting for him. On asking the cause of her alarm, she told him that their child had "acted the ghost" to her. He thought this a good sign for them.

They lifted the canoe; it was heavily laden inside with fish, reaching the house they salted the fish; the wife broiled some and when done the two prepared to eat; they prayed to this child as follows: "In the name of Puupehe, grant us eternal life. Amen. It is free."

While they slept, the child went out of the womb of Kapoiliili to wander about. The child called out to them to awaken and light the lamp. "You two smoke up some tobacco [an anachronism] for me, and chew my piece of awa root, it is above the door." While hastening to obey, when the child commanded them to pray, they uttered the same prayer. The child told them that this prayer would not save them when trouble came, but this one would:

"Here is food, O Puaiki
Curse those who deal falsely
Who are envious
Who wish us death.
Here I am, Kapokoholua,
Life for me until I walk with a staff
That is your life, O God."

So Puaiki, the shark, was to be their guardian spirit (*aumakua*).

The child had been in the womb of the mother thirteen months when it began to act in this ghostly manner. In this matter, they were greatly in suspense, and they were surprised at the mysterious actions of the child. It talked as if it were a shadow at a distance.

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The story was left unfinished at this point. How the island was to be brought in to the tradition can only be imagined.

If Puupehe possessed such powers as here described, he might have been sought as a spirit which one would have on his side. As such a one, an altar might be raised to him. The stone platform on the island does not mark a burial but it has the appearance of a religious structure.

Fire of Kawelo

W. M. Gibson's account (24)

In the district of Kaa, on the west side of Lanai, there are several tumuli, large stones, and some rude contrivances of sacrificial altars, surrounded by a lone wall enclosure. Here, three generations anterior to the reign of Kahekili, who was king of Maui and Lanai, lived the prophet Kawelo, who kept up a constant fire day and night on this altar; and a similar fire responsive to it was maintained by another prophet, Waha, on the opposite side of Molokai. Now Kawelo had a daughter to assist in keeping watch and to feed the sacred fires, and Waha had a son; and it was declared to the people by these prophets, that so long as the fire burned, hogs and dogs would never cease from the land. . . . .

The people, believing in this revelation, brought an abundance of fuel to feed the fire, and of swine and canines to feed the faithful servants of Hawaii's gods. The son, Nui, and the daughter, Pepe, did not have that faith in the fire. . . . . Nui would often cross the channel in his canoe to visit Pepe; one fine night as he watched his fire and saw the bright flame on Lanai, he observed it to leap very high and he thought he beheld his beloved Pehe. . . . . After piling up his fire with hard mamani wood, he ran to the beach, jumped into his canoe and pulled for Lanai. . . . . Their delight in each other's society caused them to overlook the fire, and by and by they observed that all was dark at the altar of Keahiakawelo, and dark also on Molokai. And they, fearing the anger of their fathers and of the people, fled in the canoe to Maui.

Kawelo was so chagrined, and also alarmed at the anger of the people, that he threw himself headlong over a precipice of Maunalei. And many natives of Lanai believe to this day that their native dogs and hogs passed away in consequence of the prophecy of Kawelo.

From a Lanai native I obtained a different tradition of the Fire of Kawelo:

He kaula o Keahikawelo. Oia ka mea nana i kii i ke kukae o Lanikaula i Molokai a lawe mai a hiki i Keahialoa a puhi ia i ke ahi. A ike ia mai e Lani kaula ua puhi ia kona kukae i ke ahi ia wa oia i iki ai e make ana oia ma kona wahi ma Halawa.

The translation follows:

Kawelo was a prophet who stole excrement, ***kukae,*** from Lanikaula of Molokai. Carrying it to Keahialoa he burned it on the fire. When Lanikaula knew his ***kukae*** was being burned in the fire of Kawelo, he realized that he was going to die at his place at Halawa. [The ceremony was a form of black art.]

Several Lanai natives tell that Kawelo concealed the stolen ***kukae*** of Lanikaula within sweet potatoes, in that manner transporting and burning the "bait" (***maunu***) which would procure the means of the prophet's death.

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The piles of three or four stones, set one on top the other, which are now seen on the ridge called Keahikawelo represent this sacrifice of Kawelo. It was the custom of natives passing up and down the ridge to build these cairns.

The death of Lanikaula as related to me by Kalokuokamaile (age 73) of Napoopoo, South Kona, Hawaii, includes a fuller tradition of the fire of Kawelo than any I heard from Lanai natives. He told me that he had learned of a rock in the sea off Halawa, Molokai, which was called Pohaku Pili. Here the famous prophet, Lanikaula, who lived in the time of Kamalalawalu, King of Maui, used to go secretly in his canoe to dispose of the wastes of his body, for he had enemies who would soon perform their incantations against him should they fall into possession of these wastes. The story continues as follows:

While Lanikaula with his three children was tending his plantation of sweet potatoes and gourds at Halawa, a famous prophet of Lanai, Kawelo, came to live with him as a friend. Kawelo's real purpose, however, was to discover where Lanikaula disposed his excrement that he might have the means of praying him to death through the ceremony of *ka lawe maunu*.[4]

Kawelo lived a long while with Lanikaula without succeeding in his plans, but one day while they were drinking awa together he saw a means of accomplishing his purpose. He induced Lanikaula to take enough of the beverage to make him drunk while he himself was careful to drink very little. Then Kawelo watched Lanikaula and for the first time was able to follow him to his tapu place. Before Lanikaula recovered from his stupor, Kawelo had taken his host's canoe, gone out to the rock island, and crossed to Lanai with some of the excrement of Lanikaula.

When Lanikaula missed him and on the following nights saw flames where stood Kawelo's altar on Lanai he said to his children, *"Ka lepo a'u ua puhi ia i ke ahi a Kawelo, a ua make au."* "The wastes of my body are being burned in Kawelo's magic fire and I shall die."

The oldest child then said, "Let me hide (*nalo*) your body when you are dead." The father then asked, "Where would you bury me?"

"I will take you out on the ocean and bury you in the deep." Lanikaula then said, "In that way I will not be removed from the danger of my enemies."

The second child now spoke up, *"Owau nalo no ia oe."* "Let me conceal your remains." "Where will you leave them?" "I will take them to the top of a certain high cliff and throw them where no one can go." Said the father, *"Aole nalo ka'u iwi."* "But someone will find my bones."

The third child asked, "Let me then bury your body."

"Where will you bury it so that it shall not be disturbed?"

"I will dig a pit with a *pahoa*, put your body in it and cover it with stones (*makia me ka pohaku*)." Lanikaula then answered with satisfaction, *"Nalo kona iwi au."* "Then my bones will surely be lost."

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[4] For a description of this ceremony see Emerson, J. S., Selections from a Kahuna's Book of Prayers: Haw. Hist. Soc. Ann. Rept., 1918.

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THE ORIGIN OF SOME PLACE NAMES

HAALELEPAAKAI

I ka wa kahiko pii kanaka me ua haawe paakai aluna o ke kuahiwi i ke kakahiaka nui loa. Ike aku i ka paa mai o ka hau ilalo o Palawai, haalele i ka lakou paakai iluna iho. Manao ka lakou paakai ia hiki ilalo. Puka ka la pau ka hau. Hoaa lakou i ka paakai ole. Oia ka mea i kahea ia ai kela wahi o Haalelepaakai.

The translation follows:

In ancient times men climbed up the mountain early in the morning with their bags of salt. When they reached the top, they saw below the dew on Palawai basin. They threw away their salt thinking that the whiteness below was salt, but when the sun came out the dew disappeared. Then they learned that it was not salt. That is the reason that the place is called "Vanishing Salt."

KAMOA

Ka mea i kapa ia ai ia wahi o Kamoa, he moa kupua i ka wa kahiko lawe ia i Honolulu e hoohakahaka i me ka moa o uka o Palolo, a lilo keeo i koonei moa.

The translation follows:

The reason this place is called Kamoa (the cock) is that a wizard cock was taken from here in early times to Honolulu to fight with a cock in the uplands of Palolo; he became the victor. [The traditional character of the place name and the barest facts are remembered.]

MAHANA

The boundary of the district, Mahana, was determined by a foot race. The man who was to be the *konohiki,* overseer of the district, was to have as much land as he could run around and mark off in a given time. Ma-hana, According-To-His-Effort, is the boundary as it is today.

PAOMA'I

Paoma'i district also was determined by a foot race against time. The *konohiki* not only finished marking off the present bounds, but he crossed in a canoe to Lahaina, Maui, and took in the land next to the present wharf which is called Puu Lanai. He was completely exhausted and his district was named after him, Paoma'i, Sick Pao.

HALALALA

At Halalala, a place on the slopes of Lanai in Paoma'i, a father and his son were toiling upward. The father became tired and sent his son on for some sugar cane for refreshment. But when the son returned with the sugar cane his father was dead. The natives speak of the father as having "passed by a different way, *halalala.*" [A few struggling patches of once cultivated sugar cane are still to be seen on the slopes of Mahana and Paoma'i.]

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TRADITIONAL HISTORY

Early History

Fornander gathers "from the tenor of the legends with which he was acquainted" that Kakae and his brother Kakaalaneo, father of Kaululaau, appear to have ruled jointly over Maui and Lanai (20, p. 82), and as Kakae was born twenty generations ago from 1900 (19 *b*, p. 313) this would put their reign in the early part of the fifteenth century, allowing twenty-five years to a generation.

The source of Fornander's belief appears to be Kakaalaneo's banishment of his son, Kaululaau to Lanai, as told in two accounts: Relating to Kaululaau (p. 13) and Relating to Kekaa (p. 14). In these no specific mention is made of a ruler over Lanai—only that it was a land where no one could live because "the spirits killed and ate everybody who came there," and Kaululaau "made it a land fit to be inhabited by human beings." It is not fair, however, to assume that Fornander's only sources of information on this point are contained in the papers now published by the Bishop Museum (19, 19*a*, 19*b*).

Elsewhere, in summing up the history of Kauai, Fornander says (20, p. 94): "During the nine generations from Laamaikahiki to Kahakumakapaweo [1275 to 1500 A. D. on a scale of 25 years to a generation], the island of Niihau bore about the same political relation to the Moi of Kauai as the island of Lanai did to the Moi of Maui—independent at times, acknowledging his suzerainty at others." Fornander does not necessarily mean by this that Lanai bore the same relation, during the same period of years. He has already expressed the view that Lanai first came under Maui rule, probably, in the time of Kakae (about 1425 A. D.).

In his history of Kamalalawalu, King of Maui, who lived five generations after Kakae (about 1550-1600 A. D.), Fornander again dwells on the relation of Lanai to Maui and concludes that although there were no wars mentioned in the legends as having been undertaken by Kamalalawalu except the one against the king of Hawaii, yet "from certain allusions in the legends the inference may, with great probability, be drawn that the chiefs of Lanai became subject or tributary to Maui during this reign; but whether through war or negotiations is not apparent." (20, p. 207.)

I think I have found his reason for the last statement in the History of Kualii (19*a*, pp. 422-426), where it is said: "This was the cause of the hostilities between the chiefs (*na'lii*) of Lanai and the chiefs of Maui, and the reason why the *alii* of Lanai wanted to be independent and not be any longer under the chiefs of Maui. At this time the chiefs of Lanai were under the control of Kamalalawalu, king of Maui."

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But Fornander says that the incidents of this legend which refer to an expedition which Kualii of Oahu made to Lanai, "are so full of anachronisms as to render the whole account unreliable. That Kualii made an excursion to Lanai is quite probable and in accordance with the spirit and customs of the age, but that the excursion was made as related in the legend is quite improbable" (20, p. 282).

The anachronisms to which Fornander refers consist of introducing Kualii into the times of Lonoikamakahiki and Kamalalawalu who were active a century before. But the whole account strikes me as most illuminating the relations of Lanai with Maui in the early days.

Raid of Kalaniopuu, 1778.

During the wars between Kalaniopuu, Moi of Hawaii, and Kahekili, Moi of Maui, Lanai was also to suffer through being within Kahekili's domain. Kalaniopuu met humiliating defeat in the battle of the sand hills near Waikapu, Maui, in 1776. He then sued for peace with Kahekili and returned to Hawaii, but only to plan on retaliation for his great losses. The following year he was back on Maui, raiding Kaupo, but Kahekili was able to drive him off. He then sailed with his fleet of war canoes to Kahoolawe, doing all the damage he could on that helpless Island. Next he descended on Lahaina, Maui, believing that he might find the inhabitants unprepared. But the chief and soldiers resisted Kalaniopuu successfully at the fortified hill of Kahili between Kanaha and Kauaula valleys (20, p. 156-7).

Kalaniopuu then carried the war to Lanai. Kamehameha, then forty-two years old, accompanied him. The present natives remember this raid as that of Kamehameha rather than that of the aged Kalaniopuu. The translation of S. M. Kamakau's account (31) of the expedition to Lanai follows:

> Kalaniopuu carried the war into Lanai. It was a great fight which took place on Lanai at the fortified ridge called Hookio (Pl. 1, No. 36) where the chiefs and soldiers of Lanai were gathered. Hookio in the upper part of Maunalei gulch was the place of refuge for Lanai people in the time of war. It is a narrow ridge but it is possible to reach it with sling stones [hurled across the separating valley]. Because of this weakness the fortified place could not be held and also because the drinking water of the soldiers could be shut off. The chiefs and people at the fortification were slaughtered, and the people of every part of the island were slaughtered by the soldiers without mercy. In the district of Paoma'i, the people were up in the forests and in Kaohai at a place called Kamokupeu, there is the scar of the war in old times. [Meaning not clear.]
>
> One man was captured and tied by the hands and was being taken before Kalaniopuu alive. When they came near to the cliffs he said, "I am suffering from sickness." The victors loosened his bonds, being confident that he could not escape, as they could see the cliff on one side and they knew that the level ground was

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guarded. However, as soon as the native was freed of his bonds he jumped over the cliff. His name was Kini and he was famous for his skill in jumping over cliffs. He jumped over the high cliff of Kukaemoku at Iao, Olowalu, Maui. Because of his skill in leaping down cliffs his life was saved in this war on Lanai.

While Kalaniopuu stayed on Lanai the land suffered from a lack of food because of the great number of his men. There was nothing to eat but *kupala* (fern roots) and because they ate so much of this, they became sick. Therefore, the war on Lanai was called Kamoku-hi' [which is the name for the kind of sickness induced by a diet of *kupala*.]. This war is well remembered by the descendants of the Lanai natives.

Kalaniopuu thought he had better move on to Koolau, Maui, because there was an abundance of food there. He sailed to Kaanapali, Maui, and his chiefs and soldiers ate of the taro of Honokohau.

From Honokohau, Kalaniopuu went around on the north side of Maui to Wailua, Koolau, where Captain Cook saw him in November, 1778.

Story of Kaala

Kamehameha V visited Kaunolu in 1868 to enjoy the exceptional fishing at this famous resort of his grandfather, Kamehameha I. At that time he requested Gibson, who was then living at Palawai, to write down the story of Kaala and some of the other events connected with the visit and residence of Kamehameha I. These events, Gibson claims, were vouched for in conversations which he had with Kekuanaoa, once governor of Oahu, who was with Kamehameha the Great, in one of his expeditions to Lanai. It was evidently from Piianaia, of Lanai, that Gibson learned the story of Kaala. Omitting Gibson's literary touches his story (23) is here repeated:

After Kamehameha had conquered all the islands he visited the village of Kaunolu to fish and sport. His residence was on the bluff which forms the east side of the bay, overlooking the village, the temple and the bay. Natives came from all over the island to view the sports which would be held for Kamehameha's entertainment.

One of the events was a wrestling match between Kaaialii, warrior of Kamehameha, and Mailu, for the beautiful girl Kaala. Kaaialii was victorious, but the father of Kaala, Opunui, was not willing that he should have the girl, because Kaaialii had driven a friend of his over the cliff at Hookio in the battle of Kamokuhi.

Opunui succeeded in getting Kaala away by telling her that her mother was dying at Mahana. But instead of taking her to Mahana, he led her away to Kaumalapa'u and hid her in the sea cave with an under-water entrance, on the south side of the bay. This cave is called Puhi o Kaala, The Spouting Cave of Kaala.

Ua, a lover of Kaaialii, told him that Kaala would be hidden by Opunui. He immediately set out to find the father. When Opunui saw Kaaialii he fled for his life and was saved by being able to reach the heiau of refuge at Kaunolu a few moments before Kaaialii.

Kaaialii wandered over the island till at the spring Waiakeakua he met a priest from whom he forced the secret of Kaala's hiding place at Kaumalapa'u bay.

Kaala had tried to escape by swimming under water, but her strength was not enough. Kaaialii found her half drowned and so badly bitten by eels that she expired soon after.

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PLACE NAMES

ORIGIN AND IMPORTANCE

The meaning of the place names on Lanai have been studied with the purpose of learning to what extent Hawaiian place names may be interpreted and what service may be expected from such interpretations in adding to the knowledge of the culture or in linking these names with the place names in other lands.

Proper names have been attached to many localities. Some like Pahulu, are of legendary character; some, for example, Kilauea, are of geographic features on other islands; and one place, Hulopo'e, has been named for the man who lived upon it. Except for those which my informants state are proper names or traditional expressions, I have given literal meanings to the place names capable of reasonable translations. Without any doubt, among the place names I have literally translated there are many proper names. What may be hoped for in the translation? Usually the inaptness of the meanings makes apparent that these are at least not descriptive terms, presuming acquaintance with the locality named, and so justify belief that they are quite possibly proper names.

Rarely, simply through coincidence, a proper name affixed to a place, is liable to be translated in such a way as to apply descriptively.

The practice of contracting words in a name sometimes obscures the original meaning. The name Kahaawe literally means "the burden," but the natives say it is a shortened form of an exclamation, *kaumaha awe,* "alas, it is heavy!" which, because they frequently repeated this phrase near the end of the long rise on the trail from Maunalei on the coast to the plateau lands, became the name of that section. Most of the contractions are not so extreme, as Kehikawelo for Ke-ahi-a-ka-welo, Fire of Kawelo. Fortunately, names of this sort which are likely to be misinterpreted are rare. When the native thought and language underlying the giving of names is better understood from a study of hundreds of names on other islands for which full explanation can be obtained, the chances of assigning false meanings will lessen. Familiarity with traditions is one excellent check; acquaintance with the places named is still another, because most descriptive names will then readily be recognized, for example: Anapuka, The Arch; Ke-ala-kaha, The Beach Road; Ke-ana-noio, Tern Cave; Ke-one-heehee, Sliding Sands.

A source of difficulty which should be considered in translating lies in the archaic meaning of some names due to their tenacity throughout centuries of changing history and language. For instance, there is no

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longer a kukui tree at Kukui-kahi, Lone Kukui. At least 6.5 per cent of the names on Lanai describe the place as it was once. Again, even when a new name is given, the old one is often remembered, thus the ancient name for Kaapela, is Mauipapahu. It is also quite evident that after a place name enters into tradition and song it is not likely to be altered. Many Hawaiian names are so fixed.

An attempt to translate obsolete words and meanings often results in a very awkward or impossible sense, suggesting that very old forms are being tampered with. As an illustration, the word *moko* means to box, but Moko-lii, the name of the islet off Kualoa Point, Oahu, does not mean "Tiny Boxing," but "Little Lizard" (16, p. 91). *Moko* in Mokolii preserves the *k* of the old form of the word *mo'o*. This *k* appears regularly in the word for lizard, *moko,* of the Tongan and Maori dialects, but in Samoan it is *mo'o*.

In brief, the main reasons why it is often so puzzling to arrive at the meaning of Hawaiian place names are: some contain archaic words or meanings, some are abbreviated expressions, and some, although the fact may not be recognized, refer to people, legendary characters, traditions, and place names elsewhere. Lyons (35) and Thrum (46, 47) have discussed some of these difficulties.

If we group together the place names of Lanai having the same application, according to the interpretations given, these interesting results follow:

	Number	Per Cent
Descriptive names	148	45.8
Once descriptive names	21	6.5
Legendary names	21	6.5
Traditional names	4	1.2
Borrowed names	6	1.8
Personal names	3	.9
Names of entirely unknown application	120	37.1

More of the descriptive, formerly descriptive, and legendary names have probably been identified than of any others, which will account in part for the large number of them. Still there are undoubtedly some names of such application among the names, the meaning of which are unknown, and this consideration will reduce the possible number of traditional, borrowed, and personal names. From the table of percentages, I think the conclusion can be drawn that half the names on Lanai are descriptive, about ten per cent once descriptive and another ten per cent legendary, the remaining thirty per cent divided among traditional, borrowed, and personal names.

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Then, should the Lanai names represent a fair sample of Hawaiian place names, it is possible to identify the application of about sixty per cent of them, because half the names will be descriptive and we are sure to learn the application of a few of the others through traditions, which will leave a small group composed mostly of undetermined traditional, personal, and borrowed names, and, quite likely, some old descriptive names which have lost their meaning.

Obviously, in the group of words of undetermined meanings are the very names which if duplicated on other islands are significant in suggesting connections with them. Names elsewhere of similar descriptive application prove similarity of thought and language, but a shared traditional name is likely to reveal a closer relation. When, however, odd names, or those which convey no applicable meaning, are duplicated in another region, we may look for a once existing, intimate connection, inasmuch as we are dealing with names many of which are borrowed or cast in archaic language.

Profitable as it may be to compare by themselves those place names which are phonetically similar, as Gifford has already carefully done for Tonga (26), connections will be reflected only roughly by this method; but if the applications of the names also can be compared, it may be possible to establish very definite relationships. When a name has the same form on two or more islands it may be a coincidence, but when the application is the same it is quite reasonable to assume some connection and to estimate the probable character of the connection.

An example of the possibilities of tracing a connection through two similar place names is to be had in Puu Lanai (Puu Lana'i), the land about the old wharf at Lahaina, Maui, and the name of the island Lanai. Through tradition and meaning we know the name Lanai (Lana'i) was applied descriptively to the island and that the old form or an old form was Nana'i. But Puu Lanai, literally "Hill Hump," means nothing and in no way describes the flat piece of land on Maui. But if it is assumed that of two duplicate place names the non-descriptive is probably derived from the descriptive, a reasonable explanation follows, namely, that Lanai, in Puu Lanai is a proper name, borrowed from the island across the channel, and Puu Lanai means "Heap of Lanai" from the heaping up (*puu*) of the products of Lanai there, in trade between the two islands. This piece of land also was at one time politically a part of Lanai, belonging within the district, *ahupuaa,* of Paoma'i, on Lanai. Back of these two names Lanai and Puu Lanai was a definite cultural contact between the two places

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named and the relationship may be sensed purely through a study of the applications of the names.

Aside from the promise offered by place names in rediscovering pathways of culture, they have several other uses which need not await demonstration to prove their value. Polynesian folklore is permeated with place names and allusions to place names and unless the locations are known, much of its significance may be lost to us.

"A Nana'i Kaulahea,	On Lanai of Kaulahea,
A Maunalei kui ka lei. . . .	At Maunalei (Pele) plaits her wreath...
Ua ono o Pele i kana i'a,	And Pele eats with zest the flesh
O ka honu o Polihua."	From the turtle of Polihua.

Nana'i referred to in this *mele* (16, p. 115) is Lanai as it often sounds on the tongue of an old native. If one were not very familiar with the places on Lanai the first line might be translated "At Kaulahea, Lanai," and this has actually been done (19b, p. 493), but Kaulahea is an early king of Lanai. Maunalei means "Wreath Mountain" and so this is a fitting place to plait wreaths. Polihua is a beach on the north end of Lanai famous for its turtles which nested there, hence the name "Egg Nest."

Centering about many a place name is a tradition explaining the name which gives a glimpse into the life of the people. (See p. 20.) The distribution and application of the names disclose the geographic environment as it appeared to the native mind. The scattering of the Lanai names shows where the natives lived and moved on the island and such names as Wai-a-ke-akua, Water of the Gods; Ka-hili-ka-lani, Brushing the Heavens; Ka-imu-hoku, The Star Oven (a depression where a meteor fell); Kai-nehe, Murmuring Sea, express the environment in terms of native thought.

On the Hawaiian Government map of Lanai, of 1878, appear eighty names which by no means cover the places of importance in the early days. For convenience in referring to localities and because of the value of place names in ethnological study I sought every name obtainable, particularly since the people on Lanai wish to preserve them and many could still be readily had from a number of informants.

The list of names which I have prepared total 308, representing 324 places, 308 of which are shown in Plate I. Ten of the names are taken from the Index to Land Claims, 1861 and 1881, or from land titles; one name from Kamakau (31); and two names from the Government map of 1878. The other names were recorded directly from the present natives. I am indebted to fourteen natives for their active participation in forming the list as it now stands, namely: Kauhane and Jacob Apiki, Hoohuli, Keliihananui, Kauila, Henry Gibson, Kawelo (now dead), Pohano (now

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dead), Nami Makahanaloa, Kealakaa, Mrs. Awili Shaw, Mrs. Maka Kukololoua, and Namilimili.

I have altered a few names on the Hawaiian Government map, but strictly on the authority of at least three natives.

The gazetteer of Lanai (pp. 29-37) is an index to the map of Lanai (Plate 1, in pocket) and a guide to the pronunciation and meaning.

With each name is given the geographic feature named and the number locating it on the map, if the location is known.

The orthography followed in rendering the Hawaiian words is that used in A Dictionary of the Hawaiian Language, by Andrews and Parker, to which reference should be made for long and short vowel markings. I have hyphenated each name into its component words, when it may be so divided, and I have represented the glottal stop by (ʻ). The accent of each word falls on the penult unless I have indicated otherwise. *K* is always sounded *t* in Ohikupala; *w* is sounded *v* in Luahiwa, Iwiole, and Makaiwa. The older natives favor the *t* and *v* sound in place of *k* and *w* in many words.

For most of the names the meanings I have given are root ideas of the word or words composing the name. Whenever one of several meanings fits in with a tradition or aptly describes a place, this meaning has been set down. For a few names the natives actually know the origin or have a tradition of it. I have depended largely on the dictionary in translating the names but Mr. Thomas G. Thrum, Mrs. Lahilahi Webb, and Mr. Thomas K. Maunupau have kindly assisted me throughout.

The translations of the names are classified as applying descriptively if they describe the place named, otherwise they are regarded as commemorative and are classed as formerly descriptive, personal, traditional, or borrowed. Thus, a name describing some object originally at the place or some event commonly happening there, is classed as once descriptive. A name of a person who lived at or owned the place is considered as personal. If, however, the name refers to a single event transpiring at the place or if it is that of a legendary character, it is classed as traditional or legendary. If the name occurs elsewhere and its meaning does not fall within any of the above categories, it is classed as borrowed. Where the translation has seemed too conjectural, I have omitted a classifying term.

In the Gazeteer the following order is used: (1) the place name, (2) its translation, (3) its origin, (4) the geographical feature to which it applies, (5) comment, (6) its location as shown by numbers on the map of Lanai, Plate 1 in pocket. Numbers in parentheses refer to the bibliography on page 124.

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GAZETTEER OF LANAI

Ahua. Heap, pile. A tract of arable land in Kaunolu, (26a).
Ahu-pau. Last pile (many other meanings). A tract of arable land in Kaunolu or Kamoku (26a).
Ai-hua-lama. Eating lama fruit (once descriptive). Bend in valley. Lama trees grow here. 224.
Ai-lau. Leaf eating. Taro land in Maunalei, near Kaaealii, according to Namilimili.
Alani. Tree used for timber in fitting up canoes (Pelea sandwicensis, once descriptive). "The mountain on Lanai," meant for Kakaalani hill (?); from Andrew's dictionary. 184.
Ana-iki. Little cave. Taro land in Maunalei (26a).
Ana-puka. An arch (descriptive). Rocky point with arch. 68.
Ana-puka. An arch (descriptive). Rocky point with arch. 175.
Awa-lua. Deep harbor (descriptive). Bay. 287.
Awa-lua-iki. Lesser Awalua (descriptive). Bay. 288.
Awehi. Decoration. .Valley mouth. 118.

Ehoeho-nui. Large monumental pile of stones (probably descriptive). Plateau land on government map, 1878, not known by present natives. 245a.
Ei-alii. Chief's digging. Tract of arable land in Kamoku or Kaunolu. From a land title.

Haaiele-paakai. Salt thrown away (traditional meaning). Mountain summit. (See page 20 for tradition.) 250.
Ha-kelo-kelo. Hanging pendulant. Side valley where trail going up crosses gulch. 99.
Hala-lala. Gone, by a different way (traditional meaning). Halala on Government map. (See page 20 for tradition.) 268.
Hale-aha. Assembly house (once descriptive). Taro land. Head of water tunnel. 41.
Hale-mimimi. House of urination (once descriptive?). Beach. Name of the lagoon and a house site owned by Kamanuwai. 128.
Hale o Lono. House of Lono (once descriptive?). Bay. A house of worship to Lono was a common form of heiau. 290.
Hale-palaoa. Store house for ivory (once descriptive). Beach. 129.
Halulu. Low murmuring noise; name of a fabulous bird. Small valley. According to a native, Kawelo, the word alulu means quickly. 200.
Hao. Gather in. Mouth of valley. 198.
Ha'ua. Hit at. Valley and point. Valley back of Keomuku. 259.
Hauola. Healing water (descriptive?). Valley mouth. 48.
Hawaii-la-nui. Hawaii's big day (traditional). Section of gulch. Refers to Kalaniopuu's raid? (See page 22.) 275.
Hewa. Sin. Tract of arable land. A land title locates Hewa in Kaunolu.
Hii. Lifting (descriptive). Plateau land. The flat or bench between Kapano and Pohaku valleys. 31.
Hoku-ao. Morning star. Plateau land. 84.
Hono-pū. Gathering together, scorched ground (descriptive?). Bay. A deep dry gulch and a rocky bay. 66.
Hono-umi. Collecting place of Umi, ten stitches. Section of valley. Upper end of Maunalei valley, against precipice. 38.
Hono-wae. Bay. 286.
Honua-ula. Red earth (descriptive). Point. 272.
Hookio. Spread out. Ridge and section of valley. Fortified ridge. (See pages 22, 75 for traditions.) 36.

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Hoo-papa-lani. Beautiful shelf (descriptive). Hill. 262.
Hoopulupulu-a-moa. Strong smelling with chickens (once descriptive). Ridge. Stones and holes there where chickens were once cooked. 13.
Hua-kukui. Kukui (tree) nut (descriptive). End of short ridge. Kukui grove here. 181.
Hua-wai. Water gourd. Bay. 163.
Hulopo'e. Name of a man (personal). Bay. Hulopo'e lived here. 237.
Hulopo'e. Name of a man (personal and borrowed). Section of valley. Hulopo'e owned this beach for fishing rites. 266.
Hulu-puu-niu. Whirling feather hill. Plateau land. 78.

Iamo. A leap feet first into water. Beach. 50.
Iiiii-a-pu'a. The pebbles of Kapu'a (descriptive). A pebbly point. 114.
Ili-o-lono. Land section of Lono (personal). Plateau land. 25.
Iwi-ole. Without bones. Section of valley. Upper part of valley is called Kaiholena. 87.

Ka-á. The burning. A large district. Largest of 13 ahupuaas.
Ka'a. To roll. A point. 261.
Ka-ae-alii. The assent of the chief (borrowed or personal ?). Section of valley. Name of Lanai man known to old natives. 217.
Ka-ae-alii. The assent of the chief (personal ?). Beach. Name of Lanai man known to old natives. 232.
Ka-á-kaka. The smashed jaw. Plateau land. 245.
Ka'a-loko. Pond of Ka'a (descriptive). Bay, fish-pond. 260.
Kaana. Duplicating (descriptive). Cliffs. The slope from Kahilikalani to Kaumalapa'u. 24.
Ka-á-pahu. Drum of Kaá (descriptive). Hill. Just above goat pen on cliffs. 8.
Ka-á-pahu. Drum of Kaá (borrowed ?). Plateau land. Name perhaps borrowed from Ka-á-pahu in Kaá. 154.
Kaa-pela. Rolling over soft grass (once descriptive). Plateau land. Site of a school house; old name of place close by is Mauipapahu. 29.
Ka-aukuu. The heron (descriptive?). Ridge. The aukuu nest in the mountains. 149.
Ka-auwai-eli. The dug water course (once descriptive). Small valley mouth. 123.
Ka-e'a. The blowing sand (descriptive). Beach. On the Coast and Geodetic Survey Chart the name Kae'a is given to Palaoa Point. 2.
Kaena. The hot anger. Rocky point. 4.
Kaena-iki. Little Kaena (descriptive). Point and valley. Site of prison camp of exiled women. 5.
Kaha-awe. Heavy, causing one to groan (once descriptive). Plateau land. Heavy loads were dropped here by people walking up from Maunalei. Kaha-awe is a contraction of Kaumaha-awe. 187.
Ka-haule-hale. The house falling (once descriptive). Beach. 206.
Kahe'a. Fishing in shallow water (once descriptive ?). Beach. 294.
Kahe-manó. Place where sharks habitually run (descriptive). Beach. 116.
Ka-hili-ka-lani. Brushing the heavens (descriptive). Cliff. Highest point of Palikaholo and the slope of Kaumalapa'u. 132.
Ka-hinahina. Grayish color (descriptive ?). Ridge. 252.
Ka-honu. The turtle. Mouth of valley. End of Kapano gulch. 26.
Ka-hokeo. The lower of two gourds in a drum. Beach opposite school house at Keomuku. 258.
Ka-hokú-nui. The large star (once descriptive ?). Beach. A meteor once fell nearby. 197.
Ka-hoolanai. The bending (descriptive). Plateau land. 101, 223.
Ka-hue. The gourd (once descriptive ?). Bay. 270.

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Ka-iholena. The iholena banana (descriptive). Valley. 89.
Ka-iholena-iiiii. The small iholena banana (descriptive). Small valley. Favorable place for bananas. 32.
Kai-kena. Rustling sea (descriptive). Beach. 160.
Ka-ili-mahole. The peeled skin. Plateau land. 176.
Ka-imu-hokú. The star oven (descriptive). Beach. A pit in the sand where a meteor fell. 199.
Kai-nehe. Murmuring sea (descriptive). Beach. 156.
Kai-olohia. Choppy sea (descriptive). Bay. 201.
Kaka-alani. Splitting alani wood (descriptive). Plateau land. A tract of land beyond the gate to the upland. The word also means a breeze on Lanai. (Andrew's Dictionary).
Kakahe'a. Broken, dispelled. Plateau land. 46.
Ka-lae-a-hole. Rasping point (descriptive). Point. 7.
Ka-lae-o-ka-hano. The haughty point (descriptive). Cliff point. 54.
Ka-lae-o-kou. The point of Kou (descriptive). Rocky point. 94.
Kala-kala. Rough, as a rasp (descriptive ?). Beach. 51.
Ka-lama. The Lama tree (descriptive). Valley or ridge. Location approximate. 103.
Ka-lama-nui. The torch. Valley. 72.
Ka-lama-iki. The lesser Kalama valley (descriptive). Valley. 71.
Ka-lani-a-laa. The sacred heaven. Plateau land. 28.
Kala-puu. Ending Hill (descriptive). Hill. 20.
Ka-lihi. The edge (descriptive). Hill and plateau land. 23.
Kalua-ko'i. The adz pit (descriptive ?). Bay. 235.
Ka-lua-nui. The large depression (descriptive). Plateau land. 247.
Ka-lua-o-ka-opu. The cavity of the stomach. Plateau land. Three miles west of Koele.
Ka-lulu. The calm. A district. An ahupuaa.
Kama-iki. The small child. S. E. point of Lanai. 92.
Ka-makou (Kama-kou). Lamp with red flame (Andrews), young kou grove (Thrum). Spring. Location approximate. 168.
Ka-mao. The wild cotton plant. District. The plant mao grows everywhere on the coast.
Ka-moa. The fowl (legendary). Plateau land. (See page 20 for tradition.) 188.
Ka-moku. The piece cut-off (descriptive). District. The ahupuaa of Kamoku in Hamakua, Hawaii, was once cut off from a number of ahupuaas for the use of the whole district, hence its name. (C. J. Lyons, the Islander, 1875, p. 119.)
Ka-moku-puu. The piece thrust up. Plateau land. In Kaohai. (See p. 22.)
Kamiki. Ridge. 254.
Ka-nae-le. The mire (descriptive). Beach. 283.
Kanaenae. An offering to the gods. Hill. 27.
Kana-hau. Disagreeable, cold (descriptive). Spring. Gulch just south of Capt. Soule's place. 167.
Ka-nalo. The fly. Point, on main ridge. 150.
Kane-a-pua. The younger brother of Kane and Kanaloa (legendary). Rock, connected to shore. (See page 12.) 135.
Ka-nupa. The deep pit. Plateau land. The first level place going upland, from Maunalei. 192.
Kane-puu. Hill of Kane (legendary). Hill. 17.
Kane-uwau. Uwau (a bird) Kane (legendary). Hill. 62.
Ka-ohai. A flowering shrub (Sebania tormentosa). An ahupuaa.
Ka-okana. Beach. 277.
Ka-onini. The gentle breeze (descriptive). Beach. 281.

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Ka-onohi-o-ka-lá. The center of the sun (descriptive or legendary). Hill. A ridge, also a hill on the ridge. The name of a mythical character in the story of Laiefkawai. 155.

Ka-pano. Dark colored. Valley. 30.

Ka-pohaku. Stony (descriptive). Valley. 178.

Ka-piha'á. The driftwood (descriptive). Bay. 236.

Ka-pó. The night. Plateau land. 60.

Ka-poho. The mortar. .Valley. 95.

Kapo-iiiiii. Pebbles of Kapo (descriptive). Bay. Pebbly beach. (See page 17 for traditions.) 55.

Ka-poko-holua. The sliding worm, the father of Puupehe (legendary). Valley. Location approximate. (See page 17 for tradition.) 56.

Ka-pu'a. The bundle. Valley mouth. 45.

Ka-puka-loa. The long opening (descriptive). Head of valley. 18.

Kau-hale-iiio. Dog houses. Ridge. 212.

Ka-uhi-lua. The double veil (descriptive of rain). Taro land. 181a.

Kau-iki. The small portion (descriptive). Section of valley. This site now marked by a pump. 220.

Ka-ulu-laau. Name of the hero who killed the goblins of Lanai (legendary). Beach. (See page 13 for story). 292.

Kau-mala-pa'u. Bay. The Kekoewa family say this name should be Kamuela-pa'u; but Mrs. Awili Shaw says that her parents and grandparents called the place Kau-molo-pa'u. None of these names can be translated with any meaning. 73.

Kau-mai-ka-hoku. The stars are out (descriptive ?). Hill. Refers to the fact that above this spot there are usually no clouds. 79.

Kaú-nó-iú. To give property on a wager secretly, the akua of Molokai. Bay and district. In this word every vowel is accented equally. Incorrectly given as Kaunalu and Kaonolu. 169.

Kau-nua-kane. Upper part of valley. 280.

Kau-paku-e'a. Raised house ridge pole. Beach. From government map. 52.

Ka-waha-poko. The short mouth. Valley mouth. Incorrectly given on government map as Wahapuu. 121.

Ka-wai-a-ka-ahu. Water of Kaahu. Spring. 151.

Ka-walu. The milk. Valley. 33.

Ka-walu. The milk. Valley mouth. 91.

Ke-ahu-a-pupuka. The pile of stones of Pupuka (descriptive). Section of ridge. A cairn on the south side of the road. Pupuka was a chief of the ahupuaa of Mahana. 194.

Kea-aku. The standing root. Small valley. 81.

Ke-ahi-a-loa. The fire of Loa (legendary). Hill. Highest point on island as seen from Kaena point. 15.

Ke-ahi-a-loa. The fire of Loa (legendary). Hill. Name of a heiau, according to one native, but no ruins indicate it. 75.

Ke-ahi-kawelo. The fire of Kawelo, or the potato fire [kawelo—a variety of potato] (legendary). Hill. Ridge with bizarre rock formations and artificial piles of stone. The word has also the form Keahiakawelo. (See page 18 for tradition.) 16.

Ke-ala-kaha. Beach road (descriptive). Mouth of valley. 278.

Ke-alia-aupuni. The salt pans of the government. A district. Ahupuaa, one of the six Kealia districts which were reduced to two.

Ke-alia-kapu. The sacred salt pans. A district. Ahupuaa, one of the six Kealia districts which were reduced to two.

Ke-ana-nolo. The tern cave (descriptive). Sea cavern. 239.

Ke-ana-oiulo. Cave of the shipwrecked (descriptive). Cave. 203.

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Ke-ana-oiulo. Cave of the shipwrecked (descriptive). Cave. 208.
Ke-ana-papa. The flat cave (descriptive). Point. 6.
Ke-ana-puka. The arch (descriptive). A sea cave. In his story of Puupehe, W. M. Gibson calls this cave Malauea. 201.
Ke-ana-ula. The red cave (descriptive). A lava tube supposed to come out at Kolokolo. 171.
Kea-ohia. Plateau land. .107.
Ke-awa-kule. The bay of the kule fish (descriptive). Bay. 125.
Ke-awe-loi. Keawe making fun. Section of valley. Site of an old pump station. 218.
Kehe-wai. Rivulet (Mrs. Lahilahi Webb). Ridge. Ridge ending at Waiopae. 291.
Ke-kua-pehu. The swelling god. Small valley. 221.
Ke-o-muku. Digging stick. Village. If this word is Keo-muku, then the meaning is stretch of white. 257.
Keone. The sand (descriptive ?). Bay. A little sand here. 69.
Ke-one-heehee. Sliding sands (descriptive). Bare slope of a ridge. 19.
Keonii. Plateau land. 186.
Ke-ono-hau. The six hau [trees]. Small bay. 269.
Kiei. High. Bay. 70.
Kiha-maniania. Smooth Kiha (partly descriptive). Hill. A smooth hill covered with maniania grass. Ruins of Protestant church built in 1851. 85.
Kikala-paakea. White posteriors (descriptive). Sandy point. 210.
Kikiwi. Bending down (descriptive). Taro land. Kiki (26a). 219.
Kikoa. Tattooed. Rocky point. 122.
Kilauea. Plateau land. 139.
Kilo-hana. Hill used as resting place (Andrews) (descriptive). Prominent red hill, top of Puhielelu ridge. 251.
Kioi. Foot of ridge. Site of ancient prison where men were hanged. 146.
Kipapa. Pavement (descriptive). Foot of ridge. The start of the paved road from Maunalei, built about 1850. 195.
Koa. Koa tree (descriptive). Plateau lands. Area covered by koa forest. 106.
Koai'a. A variety of koa tree (descriptive). Valley. Koai'a forest formerly at this place. 45.
Koai'a. A variety of koa tree (descriptive). Valley. Koai'a forest formerly at this place. 105.
Koele. Place seized by a chief (descriptive ?). Village. Koele means also dry, but this is not a dry place. 88.
Kohe-maiino. The smooth vagina. Plateau land. 63.
Ko'i. Adz. A valley mouth. Place where adz material is abundant. 246.
Ko'i-ahi. Fire adz? Section of ridge. A quarry for adzes; flints in abundance. 147.
Kolo-iki. Small kolo, crawling always (descriptive). A steep, short ridge. 225.
Kolo-kolo. Loud rumbling (descriptive). Sea cave. Fresh water is supposed to be obtainable here. 134.
Kou. A kou tree (descriptive). Valley mouth. Kou trees are still common on the coast. 93.
Kou. A kou tree (descriptive). Valley mouth. 161.
Kou-lii. The little kou tree (once descriptive). Plateau land. 140.
Ku-ahua. Standing hillocks (descriptive). Beach conspicuous for sand dunes. 207.
Ku-ahu-lua. The two platforms (once descriptive ?). Bay. 174.
Kua-moo. Road (descriptive). Ridge. 273.
Ku-i'a. To stumble. Plateau land. Most conspicuous hill in region. 102.
Kukui. Kukui tree (once descriptive). A point. Kukui nuts wash ashore here. 209.

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Kukui. Kukui tree (descriptive). Small valley. 267.
Kukui-kahi. Lone kukui tree (once descriptive). Plateau land. Stump of kukui was standing here a short time ago. 21.
Ku-malo. Standing with malo. Hill. 34.
Ku-noa. Standing free. Valley. 42.
Ku-nuu-laau. Raised structure of wood. Beach. 196.
Ku-ula. The fish god, Kuula (legendary). Beach. 126.
Ku-waka-waka. Very rough stones (descriptive). Valley slope. 182.

Lae Hi. Flowing point (descriptive). Point. A point composed of limestone. 231.
Lae Paioio. Clay point (descriptive). Point. 289.
Lae Wahie. Fire-wood point (descriptive). Rocky point. 211.
Laia-koa. Koa branch. Plateau land. Site of Charles Gay home. 83.
Lanai. Hump (descriptive). The island. Also pronounced Nana'i, by the old natives especially. Properly spelled Lana'i.
Lanai-hale. House hump (descriptive metaphor). Highest point on Lanai, and spring. Name of spring is Nanaihale. (See 19, p. 516.) 153.
Lanai-kaula. Ancient name for Lanai as born of Wakea and Kaula-wahine (19, p. 12 ,18) (legendary). Beach. Also given as Lanai-kula. 256.
Lapa-iki. Little ridge (descriptive). Valley. 284.
Lei-no-haunui. Jump of Haunui (descriptive). Sea bluff. Present cattle chute. 240.
Lei-nu-kaiahua. Plateau land. 22.
Leie-haka. Altar ladder. Plateau land. Keliihananui'a place. 145.
Lopá. A tenant. Bay, village site. Old village site. 120.
Lua-hiwa. Sacred-black pit (descriptive). Field of black-bowlders. At one place bowlders are in a semicircle, near the heiau of Luahiwa (pronounced Lua-hiva). 177.

Mahana-punawai. Spring of Mahana (descriptive). Spring. 181.
Mahana. (Legendary.) A district. An ahupuaa. (See page 20 for tradition.)
Maka-iwa. Eyes like the frigate bird. Beach. Sand dunes. Maka-iwa is pronounced Maka-iva. Name of brother of Olepau, king of Maui in Hiiaka's time. 124.
Maka-iwa. Eyes like the frigate bird. Beach. 271.
Maka-lau. Four hundred eyes (traditional). Beach. Eyes of spirits of Lanai watching Kaululaau. 229.
Makaloa. Makaloa reed (descriptive ?). A cove in Kaunolu. Probably this reed formerly grew here. 230.
Maka-paia. Enclosed eyes. Plateau land. 82.
Maka-peapea. Crossed eyes. Arable land. (See 26a.)
Makole. Hot glare (descriptive ?). Point. 58.
Malau. Calmness. Plateau land. 185.
Malau-ea. Plateau land. 243.
Malu-lani. Heavenly shade (legendary). Bend in ridge. Malulani, sister of Pele and Hiiaka dwelt here. 14.
Mamaki. Name of bush from which mamaki tapa was made. Old village site on coast. 173.
Manele. A sedan chair (Andrews). Bay. 241.
Mauna Kui. Sharp-pointed hill. Hill. Location approximate. Hill overlooking cliff coast of Kaá. 9.
Mauna-lei. Wreath mountain (borrowed ?). Village. From name of valley. 234.
Mauna-lei. Wreath mountain (descriptive of valley). A district.
Miki. A basin on the plateau. 138.
Mauna o Umi. Hill of Umi (legendary). Hill. 113.

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Moano. A dark or reddish color. Plateau land. Moana (resting place) (26a). 64.
Moena-uli. Blue mat. Beach. 157.
Moku Naio. Turn island (descriptive). Rock inlet. 133.
Náha. Incest. Narrow valley. 97.
Nahe-hee. Gliding gentle breeze (descriptive). Channel to Lahaina, Maui.
Nahoko. The fleshy parts. Beach. 159.
Na-imu-hui. The joined ovens (descriptive). Plateau land. Many charcoal pits are here. 265.
Naio. The Naio tree (descriptive). Valley. 189.
Na-kala-hale. The gable ends of a house (legendary). Cliff. The resemblance to a house is pointed out by natives. 57.
Na-maka-o-ka-ha'i. Brother of Kaneapua, wife of Aukelenuiaiku (legendary). Arable land. In Kaunolu, (26a). 149.
Nana-hoa. On seeing a woman (descriptive). Four sea towers. The three islands nearest the shore represent the male sexual organs, and the island further out, the female. 65.
Nanahu-nui. Much charcoal (descriptive). Plateau land. 244.
Nau-paka. A plant belonging to class Scaevola. Valley hanging on cliff. 67.
Niho-keia. Projecting tooth. Plateau land. 143.
Ninini-wai. Pouring water (descriptive). Plateau land. 86.

Ohiku-paia. Beach. Pronounced Ohitupala. 158.
Opu. Stomach. Head of valley. 37.
O-ihu-ihu. The nose (descriptive). End of a ridge. Nickname used by the natives. 226.

Paao. The kahuna, Paao (legendary). Well, tapu to women. 170.
Pahulu. Where the goblin Pahulu was killed by Kaululaau (legendary). Well. Rock lined well now in use. 127.
Pakiki. Unyielding. Plateau land. 144.
Palahinu. Greased. Rocky point. Location approximate. 3.
Palaoa. Ivory. Point. 172.
Pala-wai. A district. Ahupuaa.
Palea. To be blocked (descriptive). Ridge. 253.
Pali-a-koa'e. Cliffs of the tropic bird (descriptive). Valley. 108.
Pali-hinuhinu. Shining as if anointed with oil (descriptive). Cliff. 193.
Pali-kaakaa. Rolling cliff. Bluff at head of valley. 214.
Pali-ka-holo. The moved cliff (descriptive). Cliffs. "Ua kapaia o Kaholo mahope o ka hanee ana o ka pali; it was called Kaholo after the sliding of the pali." (See Andrew's Dictionary under hanee and pohu.) 131.
Pali Paakai. Salt cliff (descriptive). Cliffs. Descriptive of the white mineral deposits. 227.
Pani-paa. Tight shut. Beach. 49.
Pao-ma'i. Coition, also sick Pao. A district. In this ahupuaa, a man might unite with a woman of his own blood relation. (See page 20 for tradition.)
Pao-pao. The beating. Point. Incorrectly given on the government map as Papau. 279.
Pao-o-ole. Digging without the digging stick (once descriptive). Plateau land In Kaunolu. 137.
Papala-hoomoe. Valley. The Lanai Co. has a mountain house here. 44.
Papa-loa. Very smooth (descriptive). Beach used as a burial ground. 53.
Pa'u-o-ka-lani. Waist-cloth of heaven. Plateau lands 227.
Pa-will. Fence of will. Plateau land. Sometimes given as Paawili. 164.
Pa-will. Fence of will (borrowed). A district. Sometimes given as Paawili.
Pepelao-huhu. Angry ear. Hill. 141.
Pilliamoe. Valley. 165.

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Pili-pohaku. Stones clinging (descriptive). Foot of ridge. 228.
Po-aiwa. Ninth night. Valley. 205.
Poha-ke-kui'a. Smites the club. Valley mouth. 96.
Pohaku-laie. Laie stone. Large stone. 10.
Pohaku-lalani. Rows of stone (descriptive). Plateau land. 100.
Pohaku-loa. Very stony (descriptive). Point. 202.
Pohaku-loa. (descriptive.) Ridge. 98.
Pohaku-loa. (descriptive.) Valley. 242.
Pohaku-loa. (descriptive.) Point. 285.
Pohaku-o. Pointed stones (descriptive). Section of ridge. 190.
Pohaku-piii. Stones touching each other (descriptive). Name of rock islet off Halawa, Molokai. Beach. 233.
Poho-ula. Red hollow (descriptive). Plateau land. 263.
Po-ka-i. Name of a celebrity from Kahiki (Thrum) (legendary?). Old village site. Name of a land section on Oahu. 117.
Poli-hua. Egg nest (descriptive). Beach. A place famous for sea turtles. 1.
Pookeana. Beach. 282.
Poo-lali-lali. Greasy head. Beach. 204.
Poo-poo. Oval shaped mass (descriptive). Islet. 162.
Poopoo-pilau. Sterile (applied to pigs). Ridge. 12.
Pueo. Owl. Arable land. (See 26a).
Puhi-elelu. Black with roaches. Ridge. Ridge issuing at Lopa. 112.
Pulehuloa. Big roasting (Thrum). Hill. 80.
Pulou. Covered out of sight (descriptive). Spring. Makakehau, lover of the girl, Puupehe, was killed here. 249.
Puu Aalii. Aalii (tree) hill (descriptive). Peak. 152.
Puu-alealea. Hill of rejoicing (descriptive). Hill. This hill marks the end of the long climb from Maunalei village. 264.
Puu Alii. Chief peak. Point on main ridge. 35.
Puu-kauila. Kauila (tree) hill (descriptive). Plateau land. 74.
Puu-kilea. Hummock hill (descriptive). Hill. Incorrectly given on the government map as Puu Kukai. 183.
Puu-koa. Koa tree hill (descriptive). Plateau land. 76.
Puu Kole. Red or barren hill (descriptive). Point on main ridge. Back of Waiakeakua. 111.
Puu Mahana. Warm Hill (descriptive). Hill. Government map gives name as Puu Kau-wela. 216.
Puu Laau. Wood hill (descriptive). Hill. 179.
Puu-mahana-lua. Doubly warm hill (descriptive). Hill. Highest point on rim of extinct crater. (See government map.) 59.
Puu-maia-kahi. Hill of dropping bananas (descriptive). Hill. Very prominent crater cone. Gibson, in story of Puupehe, refers to banana groves of Waiakeakua which is below this hill. 110.
Puu-mai-ekahi. Valley. 11.
Puu Mamani. Mamani hill (descriptive). Hill. 213.
Puu Makani. Windy hill (descriptive). Hill. Platform of heiau covers the top. 61.
Puu Manu. Bird hill (descriptive ?). Hill. 104.
Puu Nana i Hawaii. Hill to view Hawaii (descriptive). Hill. 77.
Puu Nene. Goose hill (once descriptive). Hill. Feeding ground for geese. 90.
Puu Nene. Goose hill (once descriptive). Hill. Feeding ground for geese. 130.
Puu-o-miki. Hill of Miki (descriptive). Hill. 142.
Puu-pehe. Owl-trap hill, the hero Puupehe, the girl Puupehe (legendary or once descriptive). Islet. (See pages 15 and 17 for traditions.) 238.
Puu Ulaula. Red crater (descriptive). Hill. 136.

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Ua-punohu. Column of rain (descriptive). Section of valley. 40.
Ula-kolea. Red as a kolea bird. Head of valley. 215.
Umiki-li-loa. Head of valley. 274.
Wahane. Place of wailing spirits (traditional). Valley. 222.
Wahi-a-ahu. Place of an ahu (descriptive). Plateau land. 276.
Wai-a-hoo-lai. Calm waters, or water of Hoolai. Beach. 293.
Wai-a-ka-pua'a. Pig water. Valley mouth. 228a.
Wai-a-ke-akua. Water of the god (descriptive). Spring. There is another Waiakeakua in Waiapaa gulch. 109.
Wai-a-ka-iole. Rat water. Valley. 248.
Wai-aiala. Water of Lala, or glistening water (descriptive). Valley. Large tributary gulch to Maunalei on the east. Not Waialalá, as given in Andrews-Parker dictionary. 43.
Wai-a-opae. Shrimp pulluting waters (Thrum) (descriptive). Valley mouth. 255.
Wai-a-paa. Held water (descriptive?). Valley. 166.
Wai-ka-kulu. Tumbling waters (descriptive). Valley. 39.
Wailoa. Long water (descriptive?). Beach. 119.
Wai-lehua. Lehua water. Beach. A landing place on the north shore of Lanai. (19, p. 424.)
Wawae-ku. Foot print (Thrum) (descriptive of shape). Hill. 47.
Wili-wili-opu-hau. Grunting of a horse (descriptive). Section of ridge. At the water trough. A recent name. 191.

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DWELLING SITES

The signs of native habitations on Lanai are: (1) floor levels or terraces in the entrance of natural caves or under overhanging bluffs; (2) stone shelters; (3) house sites marked (a) by cleared ground, (b) by leveled ground, (c) by an enclosure, (d) by a terrace, or (e) by a platform. The presence of fireplaces, household utensils, and shells is supplementary evidence.

(1) Large caves and niches under bluffs not far from the sea and easily accessible are to be found at Kahue on the northeast coast, in Keone and neighboring gulches on the west coast, and at Huawai on the south

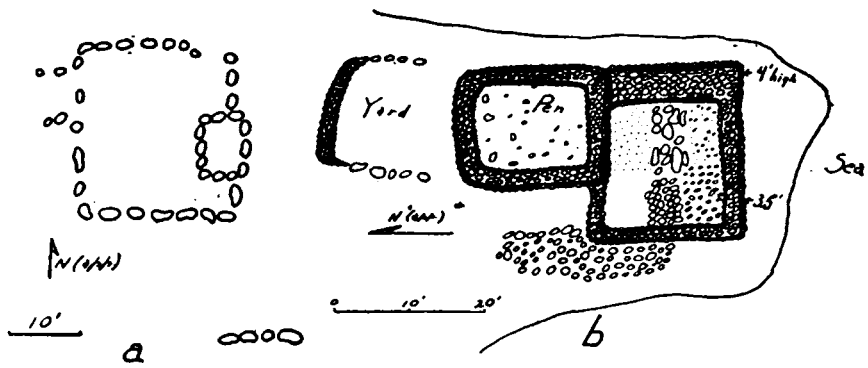

FIGURE 1.—House site plans: *a*, site near Puukoa, marked by line of stones embedded in soil; *b*, site at Kou, Kaohai.

coast. Their site is marked by broken gourds, broken implements and remains of mats and clothing. Some of these natural shelters are modified by levelling the floor or by extending the floor at the entrance by means of a stone or earth terrace faced with stone. Cave and bluff shelters were used mostly for the storing of goods or for temporary habitation. In many smaller, more inaccessible caves I found house-posts, canoe parts and implements stored or hidden.

(2) Along the coast, in the regions distant from villages, stone shelters are numerous. For protection from the wind, a semi-circular wall one to three feet high is built of rough stone. Advantage is taken of bowlders and outcropping ledges. Many of the stone shelters used as pens for animals are circular or rectangular. At Lae Wahie I discovered a bag of native salt and a large *lauhala* mat in a stone shelter. The shelters on the coast presumably mark the camping places of fishing parties.

(3) It was usual to indicate the bounds of a house site by at least a line of stones, unless stones were very scarce. Where stones were

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numerous and the ground level, many house premises were enclosed by a low wall. On sloping ground a level space was made by excavating and terracing, or by terracing alone. On rough ground platforms were erected.

(a) An example of a house site consisting of a cleared, naturally level space and including a fireplace may be seen on the edge of the sea cliff south of Kaumalapa'u. Stones were cleared from a wide ledge on Palaoa ridge, Kaunolu (Site 35, p. 58) probably for a house. I have seen a fireplace on level ground south of Kanepuu hill, which, it may be supposed, warmed a house of the high plateau.

FIGURE 2.—Sketch of house sites at Kiei, each division is 8 by 16 feet. (Drawn by Muriel Mattocks from photographs by Kenneth P. Emory.)

(b) Four shallow excavations for houses are visible on the gentle mountain slopes at Kukuikahi (Pl. 1, 21). Below the sweep of the wind on the leeward slope of the ridge, a mile north of Kukuikahi, a level space 15 by 50 feet was obtained by digging into the bank about eight feet and constructing in front a stone faced terrace, 2.5 feet high. The bank at the back of this level space is 2 feet high.

(c) Sites marked by a line of stones embedded in the soil are common on the top lands. There is a good example at Kukuikahi, another east of Puukoa (Pl. 1, 76, fig. 1, *a*) and one at Paooole (Pl. 1, 137). On the coast are the house sites at Kiei (fig. 2).

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Low, rectangular, stone-wall house site enclosures are to be seen at Moano, on the flat south of Paliakoae and at Kaunolu. (See Sites 18 and 27, pp. 55, 58.)

(d) The deep gulches of Kaumalapa'u, Kalamanui, and Honopu, on the central west coast, have the finest house terraces. The front walls are from 2 to 8 feet high (Pl. 111, *A* and fig. 3, *a*) the length of the terrace from 10 to 35 feet, the width from 10 to 15 feet. Some large terraces support smaller terraces a few inches high, and most of them against the back. A terrace at Keone extending east and west has its western half elevated a few inches higher than its eastern half.

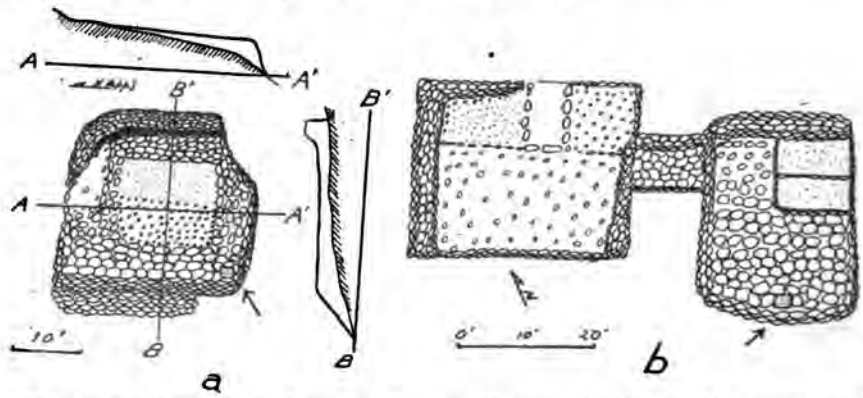

FIGURE 3.—House site plans: *a*, Site at Honopu; *b*, site at Keanapapa, with *ko'a* altars on east. Arrow points to *pupamu*.

(e) A platform is the most common sign of a house site. Some of the large platforms supported two houses, and as many as two or three house platforms joined together form part of some establishments. (See Sites 3 and 22.) But ordinarily there is only a single small platform, always rectangular.

HOUSE FOUNDATIONS

The house foundations of stone average a foot high at the back, but the height at the front is determined by the slope of the ground. They are built of the most convenient material in the vicinity; naturally flat stones or stream and beach bowlders which one man can lift are preferred for the facing of the platform. The stones are laid lengthwise or end on in the wall without much regularity, and the retaining walls are perpendicular, or slope a few degrees. The neatest work observed was that in the facing of a house terrace at Kaumalapa'u. (See Pl. 111, *A*.)

The raised house floors at the back of 26 of the 78 (33 per cent) house

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foundations at Kaunolu village are faced with a single course of fairly large stones. (See Pl. 111, *B*.)

Some pavements are of exceedingly rough small stones, so that grass or leaves must have been used to cover the house floor, but most of the pavements are of small, water-worn pebbles and fragments of coral and shell (when near beaches), and marked off by fine and coarse material into two, or rarely, three divisions.

At nearly all house sites, the part of the pavement made of the smallest stones is approximately in the center or at the back of the plaform and was undoubtedly occupied by the house. I am not sure whether at every site the finer pavement is co-extensive with the interior of the house, or forms only a part of the interior floor.

Some house platforms are divided into two levels differing in height from six to ten inches. In these the higher level is commonly the one most finely paved and the house was certainly set upon it. But in many sites it is not clear whether the house occupied the larger portion of the upper level, the entire upper level, or both the upper level and a portion of the lower, thus making of the upper level a raised platform within the house, at one end or at the back.

If the house always were built flush with the edges of the upper level, certainly two of the fireplaces in the middle front of the upper level of platforms at Kaunolu (Site 22, pp. 56, 62, and Pl. 111, *C*) and a third located at the middle back of the lower level of a platform at Kaunolu (Site 45), would be likely to set fire to the thatched house unless placed in the doorway. It would seem that these fireplaces must have been directly in front of or directly behind the door opening. If the fireplace was directly behind the door, the house would have overlapped the upper level of the platform.

In native houses of the mountain regions of Hawaii, Brigham (10, p. 114) experienced the warmth from fireplaces "which were found in most of the ancient houses . . . in the center, usually, and so opposite the door." Two fireplaces seen on platforms at Kaunolu (Sites 33 and 44) are located in the middle of the upper level and so correspond with Brigham's description. It therefore appears certain that in the house site at Kiei (fig. 2) of two otherwise identical divisions, the house stood in the division having the fireplace in the middle.

Brigham added that "this fireplace was not intended for cooking, which was done out of door in an *imu*, or buried oven." According to Malo (36, p. 50) cooking was anciently done in the eating houses but in an imu: "The man first started an oven of food for his wife (in the *hale aina*,

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woman's eating house), and when that was done he went to the house ***mua*** (men's eating house) and started an oven for himself."

Two old natives, Maihui and Edward Ahulii, of Kaupo, Maui, independently gave this information:

> The fireplace was usually close to a corner of the house at the opposite end from the ***nu'a*** or raised sleeping place of mats.[6] Because the fireplace was so near the side of the house the side walls were commonly of stone, as the ruins at Kaupo amply testify. The fireplace in the house was called a ***kapuahi.*** Some houses having a ***kapuahi,*** also had a smoke hole, a little opening in the wall just above the ***kapuahi.*** This ***kapuahi*** was used for some cooking as well as for warmth in cold weather; but not every native had his ***kapuahi*** for cooking within the house—it was sometimes on the lanai, the lounging place in front of the house, or in a separate cook house.

Mr. T. K. Maunupau has collected this note from Akamu, an old fisherman born and brought up in a grass house at Kailua, Hawaii:

> As a rule the ***kapuahi*** was made in the middle of the house, but in some it was placed in other parts, or on the lanai, or entirely outside the house. On either side of the house were sleeping places, and when there was no door at the back, at the back also. They slept always with their heads towards the fireplace in the middle which was kept burning during cold nights and banked at other times to preserve the fire. The ***kapuahi*** in the house was used for cooking a great many things, such as ***kukui inamona,*** kukui nut paste; ***luau,*** young taro leaves; ***popolo*** leaves and ***palula*** (sweet potato) leaves; taro, potato, pig, dog, and fish.

Mrs. Lovestead of Waimea, Kohala, Hawaii, remembers the fireplace used in the grass houses of the uplands. These fireplaces, which she says were called ***kapuahi,*** were located in a corner of some houses but in the center and close to the door of the majority. The fire was made outside the house, and the glowing coals transported to the ***kapuahi.*** Aaka, the dead wood of *Myoporum sandwicense* was chosen for this fire because it made very little smoke and gave out a pleasing fragrance. While the ***kapuahi*** served primarily for body warmth, some cooking was done upon its coals.

These accounts do not help much in determining whether the fireplace in the middle front of the rear division of the house platform, or in the middle back of the front division, was under, just within, or just outside of the front entrance of the house. Yet it is a fair sample of the present available information on such questions, and quite full compared to much of the data obtainable. Relying upon this information would lead to the expectation of finding generally on the ancient house platform a fireplace in the middle of the space occupied by the house, or somewhere on the lanai. Some fireplaces on Lanai have these positions, but most of them

[6] Mr. Thomas G. Thrum tells me he remembers sleeping in a grass house at Mahukona, Hawaii, in 1867, which had this arrangement.

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do not. Fireplaces are uncommon on house platforms on Lanai. The cooking, therefore, however it was carried out, must have been done more commonly off the platform, but doubtless where a *kapuahi* was on a platform, it was often used for cooking as well as for body warmth.

Supposing the fireplace to have been near the door and just inside it, it follows that the upper level of the platform was also within the house. Was this ever the arrangement? The raised portion of a few platforms without fireplaces, such as Sites 8, 39, and 47 are probably examples, arguing wholly from the disproportion of the houses—imagine a house 3 by 20 feet, instead of 8 by 20 feet! Brigham (10, p. 125) says, "Sometimes the *hikiee* [bed of mats] was placed on a slightly raised platform or *kahua* like an oriental divan, but I believe this a comparatively modern innovation. I have never seen such *kahua* in the ruins of the old houses that are dotted over the group." Are not these Lanai house platforms examples of a raised platform in the old house, for the bed space, *nu'a,* (the other portion of the floor where the people moved about and ate, I am told, was the *i-ku-ai*)? But the fireplaces I have described would not be placed on the bed of mats or against this bed, in fact, the only natural position for those *kapuahi,* near the door, seems to be a foot or two in front of it, and for the others, the middle of the house.

The extent to which the ancient house covered the finer paved division of the house platform, or the upper level of a two level platform is an unsettled question. House posts should furnish some evidence, but on none of the terraces or platforms on Lanai did I find any distinct indications of the position of the posts. It may have been that most of the houses, like those on Niihau, illustrated by Ellis (10, p. 105) had lean-to walls which did away with the need of post holes. But the rafter I found in a cave at Keone, the five rafters from Honopu, the side post found at Kapoho, and a number of rafters and side posts at Lopa, all belonged to houses with vertical walls. One of the corner posts at Lopa was still standing. Eight inches were planted in the ground at the corner of a small stone, coral paved platform. This post was 3 inches in diameter and consequently made a very small hole. At Kapoho ten inches of a charred post, four inches in diameter had been buried in the ground or platform. The rafter found on the heiau at Puu Makani (p. 88), however, might have belonged to a lean-to house.

The exact dimensions, the facing, and the position of the door (if in the middle of the side or the gable end) of all houses cannot be satisfactorily determined from a study of the house platforms, but an estimate of the shape and size of the ordinary house on Lanai can be made with

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reasonable accuracy. In the following list of house sites at Kaunolu the estimated width and length of each house were taken from a study of the map, from notes and from memory. According to this list of dimensions, the average size of the house at Kaunolu is 6.5 by 15.5 feet; the extreme length of a house, 25 feet; the extreme breadth, 20 feet; and ten per cent of the houses square.

HOUSES AT KAUNOLU

Site No.	Width in feet	Length in feet	No. of levels	Site No.	Width in feet	Length in feet	No. of levels
		In Gulch		22	12	20	two
1	15	23	one	23	12	25	two
1	15	23	one		10	18	one
				24	12	18	one
		West Bank			15	25	one
2	15	25	one	25	12	18	two
3	8	10	one	26	15	18	two
	10	15	two		15	25	one
4	5	12	two		10	20	one
5	9	12	one	27	8	18	one
	10	square	one		8	18	one
	12	20	one		10	square	one
6	10	square	one	29	10	12	one
7	15	20	two		6	10	one
8	7	20	two		12	18	two
9	8	18	one	30	6	12	two
10	9	square	one	31	10	15	two
11	12	20	one		8	15	two
	12	15	one	32	5	11	two
12	10	15	two	33	8	15	one
13	8	18	one	34	15	25	one
14	8	15	one	35	10	18	one
	6	15	one		10	25	one
	10	15	one		10	20	one
15	15	25	two	36	6	8	two
16	10	15	one	37	6	12	one
17	5	8	one	38	10	20	one
	5	10	one	39	8	10	two
				40	10	15	one
		East Bank		41	12	20	two
18	7	10	one	42	10	15	two
	7	10	one	43	10	20	one
	5	10	one		10	25	one
	5	10	one	44	8	15	two
	6	10	one		6	10	one
	6	square	one		8	18	one
19	10	20	one	45	10	square	two
	10	square	one	46	6	10	two
	10	square	one		6	10	two
20	20	25	two	47	8	15	two
	12	25	one	48	4	8	two
21	18	22	two	49	5	10	two

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Two platforms only at Kaunolu have places for steps shown as rectangular niches in the middle of the front walls (Sites 20 and 35, pp. 56, 58). There are no signs of the steps themselves. On the south bank of Hauola gulch (Pl. 1, 48) is a stone terrace 10 by 18 feet, with a vertical front 5 feet high, which rests against a larger terrace 3 feet higher and having a gentle sloping front. A niche 3 feet wide and 4 feet deep extends 10 feet into the middle of the first terrace. Possibly this feature served as an approach to the house on the upper terrace, although I have seen such a niche made for a tomb in the platform of Haleaha heiau at Lopa.

In general it may be said that the house platform or terrace on Lanai is low and rectangular, about 12 feet wide and 20 feet long and stands several feet above the ground. Its top surface is divided lengthwise into two approximately equal divisions. The division on the down-slope side has the coarser pavement and served for the lounging place in front of the house; the other division forming more or less of the house floor, is the more finely paved and at about a third of the house sites is raised 6 to 8 inches higher. The approach to the platform is indicated at two or three sites by a rectangular niche in the front wall. There are some fireplaces built at the middle front of the house floor division or in the center of it.

FEATURES ASSOCIATED WITH DWELLING AND VILLAGE SITES

The ordinary fireplace consists of flat stones set on edge, forming a box two feet square or smaller, and commonly resting on a stone slab (Pl. III, *C*) and sunk in the pavement. On one house platform at Lopa the place for the fire is a rectangular trench 3 feet wide and 1.5 feet deep placed transversely across the middle of a platform which was about 20 feet long, 15 feet wide and 4 feet high. Ashes were observed in the trench. Several platforms have a five-foot strip of stone slabs (fig. 1, *b*) or earth (fig. 3, *b*), across the middle of the fine pavement, on which an open fire may have been placed. Many oven pits containing charcoal and ashes have been exposed by wind erosion on the top lands. The most interesting one lies about a mile east of Kanepuu hill, in the district of Paoma'i. As described by George C. Munro, this pit is 3 feet 6 inches in diameter at the top, 3.5 to 4 feet deep with sides nearly straight. The rim had evidently been moistened and smoothed with the hand or an instrument, marks of which still remain, for about 12 inches into the pit. The plaster and hardened burnt soil thus made projected like the lips of a clay bowl about two inches above the natural surface of the wind-swept ground.

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Incorporated into the walls of house sites on the west coast, or standing near them, I found many stone shades. (See Pl. IV, *B.*) These were made of two or more upright stones covered with a stone slab, and enclosing a space protected from animals and from the sun. Within this space containers for water and food have been placed.

Stone platters or pans were found set in house platforms at a corner, and on many platforms there are rows of shallow holes for the game *konane* pitted on loose slabs placed in a corner or the middle front. (See figs. 3, *a-b,* Pl. IX, *D,* and p. 84.) Cylindrical water-worn stones a foot long and six inches in diameter lying on the part of the platform occupied by the house may have been used for seats or pillows. (See Site 32, p. 58, and Site 42.) Cup marks have been bored into flat-topped bowlders on the west rim of Miki basin (Pl. I, 138) and also at Koele. They are cone-shaped and average 2 to 3 inches in diameter, and 3 inches in depth. I have seen as many as eight on a bowlder 3 feet in diameter.

Attached to and near many house sites are low enclosures from 5 to 10 feet in diameter. These may have been garden patches or pens but the walls are seldom more than 1.5 feet high. Along the Kahikinui trail on Maui the pig pens are 7 to 10 feet in diameter and 3 feet high.

It is at first puzzling to note that most of the village sites and isolated house sites are far from springs or wells. The present natives say that in the days before sheep, goats, cattle and horses were grazing on the plateau lands, dew could be collected from the thick shrubbery by whipping the moisture into large bowls or squeezing the dripping bush-tops into the vessels. Oiled tapa was also spread on the ground to collect the dew. Water accumulating in natural depressions in rock or in cup marks was husbanded carefully.

Heavy dews, I believe, are confined to the plateau lands. On the southeast, east, and north coast brackish wells supplied enough water. On the west coast the situation was different. There were one or two wells at Kaena point, two in the central region, one at Kaunolu; and there may have been a few others maintained by native skill. These furnished more water than would at first be supposed. The well at Kaumalapa'u, in the central region, still exists. A redwood shaft, about 3 feet square and 10 feet deep was sunk into the well by Mr. James Munro, Jr., who has supplied the following data: When the casing was put in, the well was cleaned out as thoroughly as possible down to the old Hawaiian straw and mud "seal" on the lower side and bottom. About 25 gallons of water an hour flowed in from the upper, or inland side, and more rapidly as the tide rose.

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George C. Munro supplements this information with the statement that the well would hold perhaps not more than 30 gallons of water, and if it filled up in about an hour, according to Keliihananui, the capacity would be 720 gallons in 24 hours. The old native Keliihananui told Mr. Munro that about one hundred horses which grazed on the plateau lands nearer to the wells of Kaunolu and Kaumalapa'u than to the mountain springs, watered at those wells. Fifty or sixty people living permanently at Kaunolu in the middle of the 19th century, used this well and the people on the margin of the plateau lands above Kaunolu also relied upon it as a water supply.

The well or spring at Honopu was described to me as in the gulch so far within and around a bend in a cave that a piece of white tapa was used to reflect light into the corner; the silt must be dug into to reach the water.

In the winter months the grass on the west coast of Lanai becomes quite green from rains, and after the rare, heavy rains water collects in muddy pools at the mouth of ravines. Nine days after thunder showers on the night of January 4, 1922, I saw pools along the middle coast region of the following dimensions: At Oanapuka—one: 3.5 feet long, 2 feet wide, 6 inches deep; in the adjoining gulch—two: each 3 feet long, 2 to 3 feet wide, 5 inches deep; in the next gulch north—three: 6 feet long, 2 to 3 feet wide, 5 inches deep.

Such pools existing in all the ravines along the coast would furnish considerable water for two weeks after a heavy rain. The basin of some of these pools had been artificially deepened. By digging and damming a large water supply from winter rains could be had locally for a period of several months in the year.

Mountain springs are numerous, the principal ones are in Waiakeakua, Kawaiu, Kaiholena, and Maunalei gulches. The most permanent water is to be had in the great gulch of Maunalei, where there is a perennial stream. From a mountain spring one man on the coast can draw in a day at least six gallons (48 pounds) suspended in gourds on the ends of such a carrying stick as I found at Kalama-iki (Pl. V, *C*). This would be enough water to last three persons for sixteen days, allowing a pint a day.

The only unmodified native well seen on Lanai is at Wailoa. It is oval shaped, 9 feet long, the upper 3 feet lined with large stones. The bottom of the well was filled in with sand. By excavating some of the old wells it would be possible to learn the nature and extent of the caulking and plastering. Natives can still point out sites of many of the early wells.

Paved trails are rare, those shown on the map of Kaunolu and a trail

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entering Keone and Kapoho valleys are the only ones found. On entering a valley the trail is terraced. The paved roads at Naha and Maunalei are recent (1850). Routes taken by natives from the northern coast to the plateau lands can be traced by *opihi* shells. These trails followed the main and most direct ridges. To climb from the beach to an overhanging ledge a cairn of stones was sometimes used as a ladder. I am told that natives were let down by ropes over cliffs on the west coast, north of Honopu to gather the *opihi* shells which were in such abundance there.

The coconut tree, the leafy kou (*Cordia subcordata*), and the medicinal noni tree (*Morinda citrifolia*) were planted about the houses. I have seen the fish poisoning shrub, *auhuhu* (*Tephrosia piscatoria*), growing near sites at Kaunolu and Kaena point. On the east coast opposite Maui breadfruit groves have been planted, also groves of hala (*Pandanus tectorius*). The hala is found on the plateau but the natives claim that only when this plant is near salt water are the leaves sufficiently tough to be used in mat and basket weaving.

Slight terraces, small enclosures, and cleared lanes for yams, sweet potatoes, gourds, and the introduced water-melon, are found near all house sites. Cleared patches of land are sometimes attached to the house platforms and sometimes detached. None of the enclosing stone walls are high enough to keep out pigs. At Kapo are several acres of land marked by straight rows of stone cleared from the land forming lanes 8 feet apart. I was told that a kahuna could stand in one of these rows and so pray that rain would fall in only that one.

Terraces for taro are to be seen at the head of Maunalei gulch. On either side of the stream are a number of stone faced terraces averaging 25 feet long, 3 to 4 feet high, and 12 feet wide. They follow a contour on the side of the valley several hundred yards from the stream.

Fish ponds or traps are found only on the east coast, where the fringing reef is far from shore. I have seen only one true fish pond. The west point of Lopa beach (Pl. I, 120) has been bridged to the shore by a sea wall 217 feet long, forming a fish pond above sea level but fed by the wash of the waves at high tide and by the seepage of brackish water.

There are two fish traps on the island. The one at Waiaopae (Pl. I, 255) is a low stone wall extending from the south side of a sandy point and running out onto the shallow mud flat. It follows the shore northward, two to three hundred feet out, and returns to the shore at a point 1,472 feet from where it left. The wall is now so worn by wave action that only traces of it appear at low tide. The wall of the fish trap at Haua

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(Pl. I, 259) curves out from shore about 500 feet. The two ends are 1,480 feet apart on the shore. About 300 feet from each end of the wall is a break 12 feet wide on either side of which a wall extends at right angles out to sea for 20 feet, forming a lane in which the water is deeper.

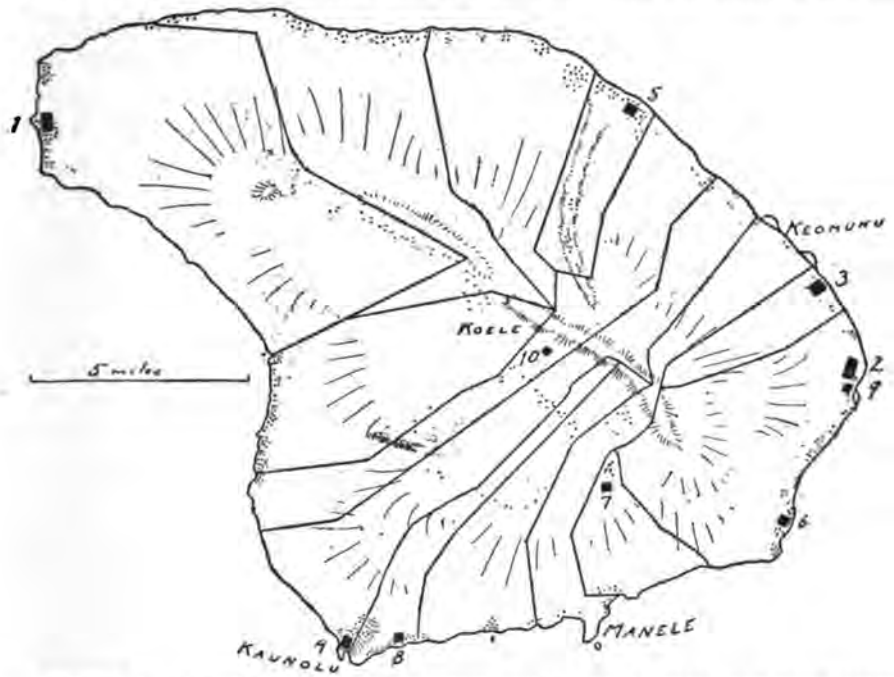

FIGURE 4.—Map of Lanai. Dots represent visible house sites; rectangles represent heiaus. Figures give the order of the heiaus according to size.

The wall is now a loose mass of stones submerged at high tide. Within the wall the deepest water at low tide is 8 inches and directly outside the wall, a foot deep. There are traces of the wall of a pond or fish trap at Naha (Pl. 1, 97).

Graves are sometimes intimately associated with the house sites. (See p. 73.)

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VILLAGE SITES

The house sites observed on Lanai number 489, distributed as follows (fig. 4):

District	No. of Sites	Grouping of Sites
North Coast	64	14 groups of 2 to 10 sites each, and 6 isolated sites.
East Coast	50	11 groups of 2 to 18 sites each, and 2 isolated sites.
Southeast Coast	51	14 groups of 2 to 8 sites each, and 1 isolated site.
South Coast	55	8 groups of 2 to 12 sites each.
West Coast, except Kaunolu	92	11 groups of 2 to 12 sites each, and 1 isolated site.
Kaunolu Village	86	
Maunalei Gulch	17	2 groups and 4 isolated sites.
Plateau	74	Distributed in about 50 places.

To understand these figures it must be borne in mind that the ground of the west coast is rough and probably every house site required a platform or terrace. Therefore, on the west coast the record of the houses which existed under the old native order should be nearly complete.

The next best record is found on the north and south coasts, where the land includes areas with rough surface and areas of level ground on which a few rocks are scattered. On such ground platforms were required for some houses; for others, a cleared space or an enclosure was sufficient.

At Kanaele, on the north coast, the fallen frame of a grass house rests on unmarked ground.

The east coast with its wide coastal plain has probably left a more imperfect record. On the other hand the rough and steep sides of Maunalei gulch must have caused all houses to be erected on platforms. The almost stoneless and level plateau lands have certainly left the fewest traces. On the flats about Kanepuu hill (Pl. I, 17) are quantities of household implements and a few fireplaces, which are signs of dwellings. But I found no platforms or enclosures.

Assuming that there were twice as many houses as house sites noted on the plateau lands, and half again as many as discovered on the east coast, and a fourth again as many on the north, south, and southeast coast, the total number of sites is 630. Such a number, it seems to me, is not an overestimate.

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An examination of the ruins, shows that the villages on Lanai were extremely small, rarely exceeding 10 houses. There were 60 of these communities along the coast and at least 20 inland, and both on the coast and on the top-lands solitary house sites were common.

A village constituted little more than a group of scattered houses at some spot favorable for cultivation or for the landing of canoes. No fixed order of arrangement is observable. The finest house sites occupied the best situations and were therefore the abodes of chiefs. Of communal structures there were canoe houses and heiaus. Associated with a few villages was a common burial ground for the lower classes.

Strangely enough, a distance of one or two miles or even more from the nearest spring or well seemed no deterrent in the choosing of a dwelling site. A place sheltered from the wind, having a good outlook over valley or sea, and a few minutes walk from the cultivation patch or canoe landing, was the first prerequisite. The floors of gulches were avoided on account of freshets if for no other reason.

The features observable in Lanai villages are more fully and clearly exemplified at Kaunolu than at any other village site. Because Kaunolu is also of interest in other connections, I have prepared a plan and description of all its ruins (Pl. II).

THE VILLAGE SITE OF KAUNOLU

The ruins of the village of Kaunolu, typical of a once vigorous fishing community, lie in the mouth and on the banks of a small, dry gulch which bisects the southwest cape, forming the narrow Kaunolu bay where canoes may ride at anchor or be drawn up the rocky beach. Immediately north of Kaunolu the sea cliffs tower to 1,025 feet (aneroid reading), but south of the village a coastal plain ends in bluffs 15 to 30 feet high.

Kaunolu has been deserted for fifty years. The last man to reside in the vicinity was Ohua, elder brother of Keliihananui, now living at Lelehaka, on the top-lands. Ohua occupied a grass house on a detached bluff at the head of Mamaki bay until his death, about 1900. The father of these two men was overseer (*konohiki*) for the district of Kaunolu under the old feudal system. Ohua was one of the men instructed by Kamehameha V in 1868 to hide the stone fish god Kunihi, which represented Kuula and stood on the stone altar in the gulch directly below the temple of refuge. His death is attributed to a mishandling of this image. I have heard various descriptions of the idol, all agree that it was not over three feet high and that it showed only crudely carved face and arms. Mrs. Awili Shaw, a blind native living at Lahaina, is accredited with

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knowing the hiding place, and D. K. Kaenaokalani of Lahaina told me after I had left Lanai that Kunihi was lying face down not more than a hundred yards up the gulch from the altar and against the west bank.

In the center of the gulch, 250 feet from the sea, is the site of the old Kaunolu well. A paved trail radiates from it to the villages on the east—Mamaki, Kuahulua, and Kou—for which also it was the source of drinking water. The well, known by the name, Paao, was tapu to women during their monthly periods. At that time, if they bathed in the sea and wanted fresh water to wash off with afterwards, it had to be drawn by someone else and brought to them away from the well. At other times they could not draw water from the well while wet with sea water, but must get the water before bathing. If these tapus were violated, the well would dry up.

About 1895, Mr. F. H. Hayselden, Sr., while erecting a windmill, tried to increase the size of the well. In so doing, he destroyed the native plastering and caulking and the well became brackish. Ohua then made journeys to Manele, four miles distant, for water. The well is now completely obliterated.

The boundary line between the districts (*ahupuaa*) of Kaunolu and Kealiakapu ran through Kaunolu gulch. (See Pl. II.) The village proper was on the east bank, on the west bank was the temple and place of refuge. In the gulch seaward of the well of Paao were the large platform of unknown purpose, the stone altar to the fish god, Kunihi, and a canoe shed called Hilinae; up the gulch are three house platforms and some short stone walls. Freshets make the valley bottom a dangerous place to reside.

The village consists of 86 house platforms, 35 stone shelters, at least nine piles of stones marking graves, and more than 30 detached pens and garden patches. The platforms, pens, and garden patches are spread for half a mile along the top of the east bank at intervals, taking advantage of every appropriate natural feature, but not modifying the surroundings by excavations or extensive removal of rocks. The trail upland lies along the east bank which may partly account for the presence on that side of the most numerous and finest house sites. On the west bank the eleven house sites north of the temple are in the most ruined condition of any in the village. The two largest are unusual in plan. The house sites south of the temple were probably those of chiefs and priests who officiated in the temple and are in the same state of preservation. The site of the heiau and place of refuge, *pahonua* (Lanai rendering), was most aptly chosen. The point on which it is located is

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surrounded on three sides by cliffs and beyond it on the north rises the magnificent cliff of Palikaholo, terminating in Kahilikalani crag, a thousand feet above the sea. The ocean swell entering Kolokolo Cave causes a rumbling like thunder, as if under the heiau. From every point in the village the heiau dominates the landscape. The walls are thickest and highest on the upland side, the side unprotected by cliffs, which bears out the defensive character of the heiau in serving also as a place of refuge, guarded by priests with the help of the gods.

The district of Kealiakapu, called the sacred lands, had a tapu, which insured within it protection of life. How this tapu was observed and enforced the present natives have not explained. That the land about a bay of such exceptional fishing privileges should acquire a sacred character is not surprising.

Gibson (23) locates the heiau thus: "[The heiau of Halulu] lies within the mouth of a deep ravine. On the top of the west bank is a stone paved platform called the Kuaha, or Floor of Offering. Outside of this and separated by a narrow alleyway, there runs a broad, high wall which quite encircles the *kuaha.*" In another article (25) Gibson calls this floor the altar floor or *kuahu.* He was at the heiau with the old kahuna, Papalua, "the old native priest and our guide" and although Gibson was faulty in his observation of the temple divisions, being thoroughly versed in Hawaiian, he was less likely to be faulty in the impression which Papalua gave him that the heiau not only included the structure on the west bank but also that in the valley, a great platform floor or pavement with the altar at the back for the stone image, Kunihi. (For a description of this heiau see p. 62.)

Description of Sites

To supplement the map of the ruins at Kaunolu (Pl. II) the following information is given to make the record fairly complete:

Site 1. (fig. 4*a*) *a,* Stone pavement, 110 by 30 feet by 18 inches, faced with water-worn bowlders of even size; *b,* unpaved house, floor 15 by 23 feet; *c,* pavement of wide, flat stones; *d,* low stone wall; *e,* stone altar, 15 by 25 feet, 8 feet high, with perpendicular face, at the base of which is a terrace 1 foot by 2 feet wide; *f,* shallow pit (no trace was found of coral or bones on the altar or in the pit); *g,* the crest of a long bowlder named Lohe[6]; *h,* a low wall sheltering a level space; *j,* wall 4 feet, 10 inches high, marks site of canoe shed, *halau,* open to the sea—10 feet wide by 29 feet long, large enough to store canoe with outrigger.

Site 2. Prominent house platform, 30 by 40 feet, 2 feet high, and backed by a wall 2 feet higher. The pavement is of small, rough stones and is large enough

[6] For a man to step on Lohe when approaching the altar with his offering of two fish, would bring him bad luck. The natives who were envious of the one who made the first catch would stand in the passage and slyly try to press him onto Lohe.

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for a house 15 by 25 feet, the long axis parallel to the shore. Behind the platform is the stone shade (Pl. IV, *B*), formed by several upright large stones, over which flat stone is laid. (See p. 46.)

Site 3. An irregular terrace of two main divisions, the eastern half for a house possibly 8 by 10 feet, the western and lower end for a house possibly 10 by 15 feet. In front of the lower terrace is a stone shade.

Site 4. Platform of two levels differing by a few inches. The house could have occupied a space 5 by 12 feet on the upper and paved division; the lower division rests upon a natural stone ledge. The small enclosed platform on the top of the rock tower Kaneapua, is described on page 71.

Site 5. A platform 9 by 12 feet connected by a pavement of a single row of flat stones to a larger platform for a house 12 by 20 feet. Adjoining is a small platform probably having a shed 10 feet square, to which a low circular wall is attached, forming a pen not more than 10 feet across. Fifty feet northeast is a pile of stones,

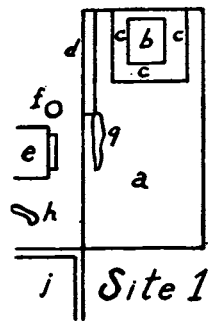

FIGURE 4*a*.—Sketch showing structures at Site 1, at Kaunolu.

which I believe marks a grave. Close to the margin of the cliff, stones and bowlders have been moved, leaving a trail 5 feet wide leading north to the Kahekili's Jump, a break 15 feet wide in a vertical ledge which forms a natural wall along the edge of the cliff. It appears as though the breach had been artificially made by prying out sections of the ledge between cleavage planes. In the breach there is a perfectly level, natural stone platform from which natives jumped (*lelekava*) 62 feet into 12 feet of water, clearing a 15-foot shelf at the base of the cliff. The name Kahekili's Jump is applied also to another far more thrilling jump of 90 feet directly over Kolokolo cave. The Kahekili referred to was a chief of Lanai, not Maui's great leader. There is a tradition (23) that Kamehameha I punished petty offences of his soldiers by forcing them to go over Kahekili's Jump—attended by some danger on account of the ledge below.

The jump faces the great cliff Palikaholo. Below the highest point, Kahilikalani, on a narrow strip of beach the chiefs played the game *konane* and I was told that a *papamu* (a stone slab pitted with rows of holes) might be found there.

Site 6. The first distinct platform south of Halulu heiau, on the bluff, has two *papamu* on a natural ledge which forms a pavement on the supper side of the platform. (See Pl. IX, *D*.) The larger *papamu* has 13 rows of 20 holes each. The platform is surrounded by shelters, pens, and walled-in patches of ground.

Site 7. These ruins are little more than stone heaps. One is a house platform of two levels with a heavy stone wall at the back and sides, and a pit in a corner

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of the wall. Two small pens, 5 feet in diameter, with walls 2 feet high, stand in front of the platform.

Site 8. Platform 22 feet long, of two levels, the upper level 3 feet wide, the lower, 5 feet wide. At the northeast end of this platform is a pen.

Site 9. A simple platform for a house about 8 by 18 feet, with pens or small garden patches.

Site 10. An indistinct platform large enough for a house 10 feet square with a division on the east, probably a lanai.

Site 11. Two adjoining terraces fitting into a turn in the bluff, probably each supporting a house. In the walls of these terraces are the petroglyphs described on page ?.

Site 12. A well paved terrace, its surface continuous with a cleared area on the west, the probable location of a house for which the platform served as a lanai.

Site 13. A house site marked by a cleared spot surrounded by a low line of stones.

Site 14. Two house sites marked by a rectangular line of stones; and a third consisting of two platforms joining at an angle, the larger and higher on the north.

Site 15. House site with *ko'a* attached. The house platform proper is 5 by 25 feet. It is probable that the house included a lanai which extended onto the rough pavement in front of this platform, and that the platform formed a raised portion within and at the back of a house which had the dimensions 15 by 25 feet. On each side of the rough pavement is a square pile of stones 6 feet high, slightly depressed on top. An area in front of this pavement is enclosed by a wall on the north terminating in another pile of stones, 3 feet high, and on the south, in a *ko'a* 11 by 20 feet, and 5 feet high. A space 8 by 9 feet is paved on top of the *ko'a* with an altar 4 feet wide, and a foot higher added to the west end. Large pieces of coral are scattered over the structure. A garden patch 25 by 50 feet is marked off on the north of the house site by a wall 1 foot high and 2 feet wide. At the southeast corner of the patch is a stone incised with a human figure 5 inches high, its left arm raised in a defiant position, as though warding off possible intruders. Back of the *ko'a* and against the inner side of the *ahu* next to it, is another such figure, but with its right arm upraised.

Site 16. A simple platform having an inner area, 10 by 15 feet, with a low wall at the back.

Site 17. Two small enclosures, 5 by 8 feet and 5 by 11 feet, with walls one foot high. These are filled with soil and are as likely to be garden patches as house sites; though garden patches are usually much rougher in outline.

Site 18. Similar rectangular enclosures, one of which is half paved and is therefore not entirely a garden patch. On the bluff near these is the last of a group of noni trees once cultivated as a source of medicine and dyes. Dotting the slopes immediately below Site 18 are many imposing house platforms—ruins of what might be called the residential section of Kaunolu. Here six of the largest house sites are arranged approximately on the same contour but 30 to 250 feet apart. The houses on them were protected from the mountain winds by the rise of land and commanded a view of the whole village. The 50 or 60 natives which Keliihananui speaks of as living at Kaunolu in his day (about 1860) occupied some of these house sites and those on the slopes below, and a few sites in the mouth of the gulch. Scraps of hoop iron, square nails, broken bottles and earthen-

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ware have been found at only three of the larger house sites. I saw these modern signs only in the mouth of the valley, elsewhere in the village.

Site 19. A large low platform and a small high one, separated by a yard 30 feet wide. The larger platform is 30 by 45 feet, paved with large flat stones in front and at the sides; a space 15 by 25 feet in the middle is covered with coral and the back with small rough stones. There are many positions into which a house would fit. On the coral pavement were a number of hammerstones, squid-hook sinkers, grindstones, and stone platters (B. 4159). Scraps of iron and pieces of earthenware were also found here.

A grave platform, 5 by 8 feet and 1 foot high, had been inserted in the platform near the northeast corner. Excavation revealed this grave outlined by a single course of large stones, lining a shallow excavation, which had been filled in with small stones and dirt and paved with coarse coral sand. Strangely enough only a canine human tooth and one fragment of bone was discovered, at a depth of a foot and a half, indicating that the body had been removed. The other platform is approximately 15 feet square, and 3 to 4 feet high. The pavement is of two levels, the lower 3 feet wide, paved with flat stones, in the southeast corner of which was set a very heavy flat stone dish. Upon the upper level of the platform were 5 hammerstones and 10 finished squid-hook sinkers, most of them made of stone foreign to this locality. A pen, or small garden patch, was attached to the front of this platform, within a larger patch, or yard.

The walls enclosing yards in front of each platform were made with the stone cleared from the area.

Site 20. A house platform of three levels with a niche 10 feet deep and 5 feet wide in the middle of the lowest level or terrace denoting the approach to the house. Just east is a rectangular enclosure 15 by 30 feet which may have been a garden patch or a house site.

Site 21. A house platform of two levels; front face, 6 feet high; a large platform tomb attached to the east side and a yard to the front. The upper level of the house platform is 8 by 18 feet, other level 5 inches lower, is 15 by 20 feet; both are paved with fine pieces of rock and the upper terrace is faced with a single course of stones. (See Pl. III, *B*.) A low stone wall rises at the back. The tomb is a level platform 12 by 20 feet, 5 feet high on the lower side, one foot high on the upper; connected at the upper and at the lower corner to the house platform by walls several feet long. The tomb probably served originally as a foundation for a house. An area 9 by 14 feet in the middle was paved with dirt and coral. Six inches beneath was a layer of flat stones covering a stone lined chamber 1.6 feet wide and 6 feet long, lying north and south. The stones which outline the vault rest on the original level of the ground. Within the tomb charcoal and shells are mixed through the dirt; in the middle and at the north end were scattered human vertebrae and very much decayed fragments of bone. No traces of the skull or long bones were seen and a beer bottle was found a foot below the top of the chamber, at the south end (the natural location of the skull). In removing the body the coral of the pavement had become mixed with the debris within the tomb.

A hundred yards in front of this house site a wall not more than 6 inches high and 1.5 feet wide of small stones surrounds a garden patch 35 by 60 feet.

Site 22. Large house site with three platforms. The first, considerably higher on the slope than the others, probably represents a separate establishment; its yard abuts on the premises of the other platforms. It has two levels, the upper finely paved with coral and with a two-foot square fireplace set in the front center and filled with two inches of ash. The level in front is a foot lower and extends 8 feet

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emerging on a pavement of stone blocks 1 to 2 feet in diameter. Iron and earthenware at this site indicate modern occupancy.

Fifty feet southeast is a pile of stones 12 by 15 feet, 4 feet high, probably a grave. A stone shade has been built in one corner.

Site 23. A terrace placed in front of an opening of a lava tube. This tube-cave, 3 feet high, 15 feet wide and about 20 feet deep, has been used recently as a shelter; no objects of interest were found in the three inches of soil on the floor. The house terrace rises in three levels, the first at least 2 feet high, is only roughly paved on the eastern half and on it is growing a kou—a tree which was commonly planted near a house—the western half is finely paved and perhaps supported a small house; the second terrace, 1.5 feet higher, with a pavement of very large slabs of lava admirably fitted but unworked, probably served for the lanai; the third level, immediately in front of the cave, is unpaved.

Site 24. Platform with a vertical wall, 4 feet high, and 8 feet wide, at the back. A pen, 5 by 8 feet and 2 feet high, and open on the east, built on the platform against the back wall, suggests that the platform was no longer being used for a house.

Site 25. House platform with two equal divisions; the eastern half more probably supported the house, the western half serving as the court yard. Under the front of the terraced platform two upright bowlders are capped by a flat stone forming a large shade.

Site 26. A roughly paved platform two feet high and on the east an adjoining platform of two levels, 2 feet higher. The unpaved, eastern level of the higher platform is a little lower than the paved western end. It is not known on which division the house rested and which served as the court.

Six feet in front of the platform is a grave. No scraps of iron or pieces of glass were found about this house site to indicate that it had been occupied in modern times and I believe this grave to be ancient. A rough rectangular pavement, 6 by 7 feet, of small stones marked the burial. The body lay 12 inches under the soil stretched full length, on its back. The head pointed north, the hands touched above the hips. The bones of the pelvis only were in poor condition. The skeleton measured 5 feet, 7 inches; the smoothness of the super-orbital ridge of the skull, the small size of the teeth, and the wide pubic angle of the pelvis indicates female sex. No objects were found in the grave but small bits of charcoal and shell were scattered through it. Sample digging in the surrounding grounds showed no ashes or shell in the soil. Four feet to the west of this grave is another pavement, 5 by 12 feet, but lying east and west, which I did not excavate.

In front of the house site is a square rock tower, 5 by 9 feet, 6 feet high, with a rough platform, 10 by 10 feet, attached on the east. It was not excavated and nothing could be found which would give a clue as to its purpose.

Down slope from the last structure a lava tube which runs just under the surface has caved in. The upper part of the tube is a subterranean chamber, 4 feet high, 10 feet wide, and 50 feet long, receding to a mass of fallen rock. The tube below the entrance is clogged. Nothing of interest could be found in the several inches of dust on the natural lava floor of the cave, but a broken water gourd and fragments of cloth lay on the surface. The tube is known as Ulaula and is supposed to emerge at Kolokolo sea cave.

Although petroglyphs are plentiful on bowlders in the vicinity, none were found in the three caves known at Kaunolu. This is probably due to the roughness of the walls.

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Site 27. Three enclosures with natural rock floors strewn with shells are undeniably house sites. A platform, 5 by 15 feet, is attached to the front of one of these enclosures. Between the three sites a lava ledge is pitted with holes in 13 rows of 13 holes each, forming a 1.9 foot square, for the game of *konane*. On another ledge close by is a *konane* board 2 by 2 by 1.6 by 1.8 feet, arranged in 15 rows of 14 or 15 holes each.

Site 28. An enclosure, covered with soil. If this is not a garden patch the house must have filled the eastern end to avoid a large bowlder in the middle western part.

Site 29. A natural raised stone ledge was the platform for a small house. An indistinct stone wall on the south connects this platform to a platform of two levels sheltered by a wall on the east. On the west is another ledge of rock forming a house platform with a platform added for a lanai. Ten feet to the north is a low pile of stones of the sort which when excavated usually reveals a burial.

Site 30. A large oval enclosure, 20 feet greatest diameter, with a wall varying in height from 3 to 4 feet. Attached to the south side is a platform 8 by 10 feet with a rectangular area cleared in front, enclosed by a very low wall.

Between the house site and a rock tower just west was found the peculiar and large stone sinker described on page 81 (B. 4070). The rock tower is a natural outcrop 10 feet in diameter with a turret about 2 feet high erected on the crown. (See Pl. XI, *G*.) The north face of the bowlder is covered with petroglyphs. From this stone the valley floor is visible.

An old trail winds among these ruins; its upper end is marked by parallel rows of stones, its middle section by a space between platforms and garden patches and partly by a single line of flat stepping stones, and its lower end is indicated by a path cleared through the stony ground.

Site 31. House site with the northern half divided into two equal levels, the paved western level being lower; the southern half a higher, natural platform with a pen and a platform added to south side. Two garden patches are attached to the west side of the platforms.

Site 32. House platform with a low stone wall on the north and east. A pavement of smooth stones runs around the front and west side. The coral floor in the middle has its north end sharply raised a few inches. On the house platform are several water-worn stones, 1.5 feet long and 8 inches in diameter. Attached to the front of the platform is a rectangular patch in which lies a stone slab pitted for the game *konane*. Across the trail on the east is a small stone shade.

Site 33. House platform is on two levels; the lower level, more coarsely paved, faces the gulch. In the middle of the upper level which is 6 inches higher is a small, square, stone fireplace. Attached to the south is a small garden patch. In the rear of the platform is a cleared area and a shelter or pen built against a small bluff.

Site 34. The large enclosure upon a level rock surface is a house site with a *papamu* in the south corner.

Site 35. A low house platform with a large, irregular yard attached. The next house platform at the east has a niche for approach to the house in its middle front. The area south of the platform is a flat elevated ledge from which the stones have been cleared and deposited in a heap on the west.

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Site 36. A tiny platform attached to a rectangular garden patch. A house no larger than 6 by 8 feet could be placed on this platform. The trail from Mamaki, just south of Site 36, is typical for such country—a line of flat stones between parallel rows of upright slabs.

Site 37. A grave. Instead of a flat pile of stones this is a vertical tower, 12 feet in diameter, 3 feet high, of large stones. An inch under the soil at the south center was discovered a skull with its left side crushed by the weight of the stones over it; the body lay on its left side, knees flexed, the trunk pointing a little west of north. The left arm was across the back and probably the right also but the bones, which appear to be those of an old man, are badly decayed. Small bits of charcoal are mixed all through the soil in which the bones were found. Northwest of the grave is a small unpaved platform a foot high, and southwest is an unpaved house terrace.

Site 38. A garden patch. There are five shelters in this vicinity; two of them taking a large stone as a nucleus for short wall wings, the others consisting of a circular wall with the highest part into the prevailing breeze.

Site 39. Two small ruins: the northern one, a tiny house platform on two levels; the southern, a platform with a surface 5 by 8 feet. Nearby are two walled shelters and a small stone shade.

Site 40. A house site which from Gibson's description (23) was the fortified residence of Kamehameha the Great. Its defense must have consisted mainly in its strategic position. It is an unpaved house site with two-foot wall at back and sides inclosing an area 10 by 18 feet; also a lanai 10 by 25 feet projecting to the edge of the bluff by means of a stone terrace with a front 11 feet high. This stone terrace, extending along the edge of the bluff for 90 feet south of the house site, can be interpreted as the fortification to which Gibson refers. A paved trail, built down the bluff 50 feet south of the house site, passes a rude platform at the base of the cliff.

Site 41. Two shelters nestled among the rocks. A low unpaved house platform on two levels with a low wall bounding a large area on the south.

Site 42. House site built around an outcrop of rock. The platform is on two levels, upon the upper lay a flat, oblong, water-worn stone with grooves cut across both the flat faces (p. 84).

Site 43. Long terrace, probably contained at least two houses facing a large garden patch. A small shelter 10 feet in diameter is on the east.

Site 44. A platform in front of a slightly higher natural terrace, containing a fireplace five feet from the edge. South of this site is an unpaved platform for a small house; west is another small platform and a shelter.

Site 45. A house platform on three levels. The first level, the lanai, has a fireplace at the back center; the highest platform probably supported a small building.

Site 46. Two house platforms joining at right angles, each on two levels. East is a sleeping platform 5 by 5 feet in the lee of some bowlders, above is a house platform with a surface 5 by 10 feet.

Site 47. A house platform of two levels. A few feet south is a shelter platform 5 by 10 feet; east are two shelters and two small platforms joining at right angles, the larger 5 by 10 feet.

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Site 48. Smallest house platform of two levels: measures 8 by 8 feet, each level 4 feet wide. The lower level is neatly paved with small stone. If a house occupied the upper level its dimensions were 4 by 8 feet (not improbable). Several shelters surround this site.

Site 49. Large, smooth pavement 12 by 25 feet, adjoining on the north is a two-level platform against a small bluff. The area of the upper level, which is under the bluff, would not permit a house 3 feet wide to rest on it. It seems, therefore, that the house may have overlapped the upper level, and that the bluff served as the back wall. The only other ruins at Kaunolu are four small and ill-defined house sites back of the bluff a fifth of a mile towards Mamaki.

A record is on file at the Bernice P. Bishop Museum, which gives the location and brief descriptions of all the village and house sites and other ruins on Lanai.

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STRUCTURES FOR WORSHIP, HEIAUS

THE LARGE HEIAUS

Search on Lanai has revealed the sites of eleven large temples or heiaus —two in the center of the island and nine along the coast. (See fig. 4.) They are on prominences commanding a view over valley, village, and

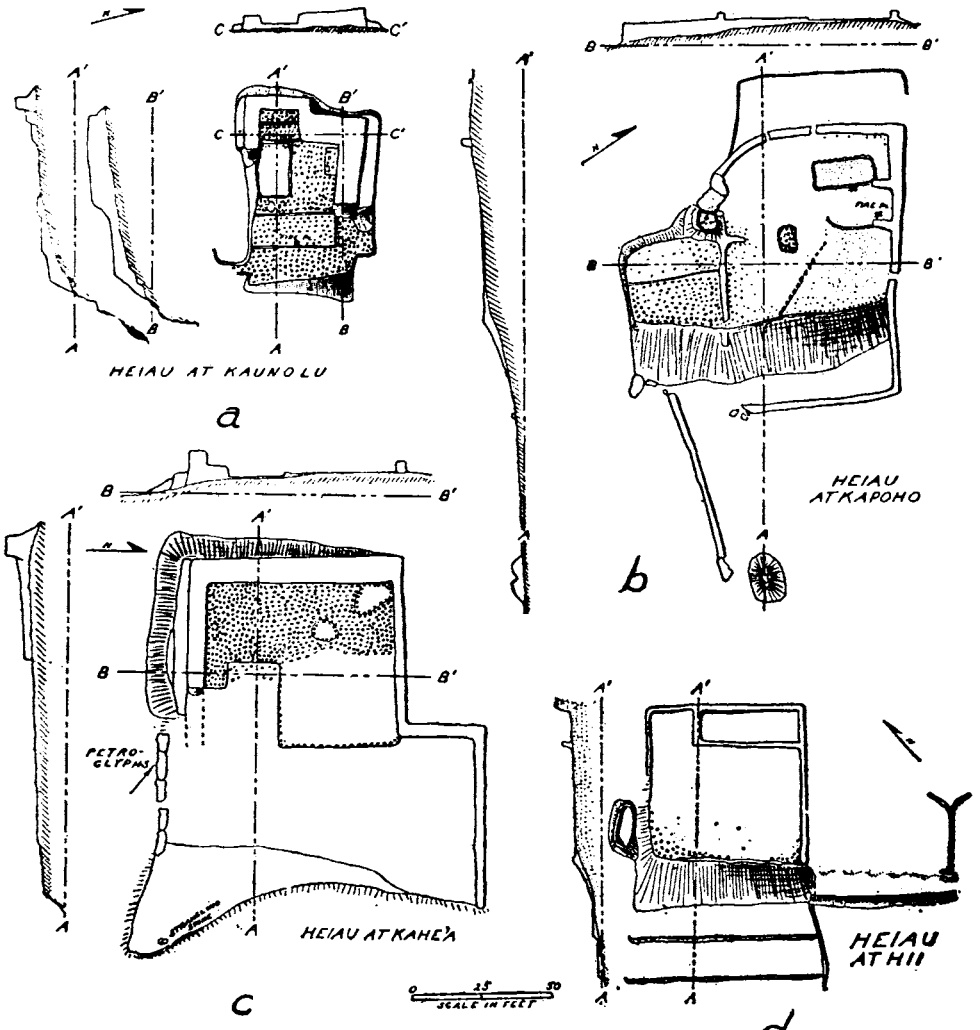

FIGURE 5.—Plans of heiaus at: *a*, Kaunolu, dot opposite "C" represents hole possibly intended for an image socket; *b*, Kapoho, mound of stone and coral to southeast is a *ko'a*, with pit in center; *c*, Kahe'a; *d*, Hii. Shading represents terrace slopes and dots represent stone pavements. Cross sections give idea of probable extent to which stones have been laid up above ground at any one point.

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ocean, and face either a valley or the ocean. Of the temples which stood on these sites there remains only the square or rectangular foundation platforms. Nine of the platforms are in a good state of preservation and all have walls along their rear edges; and some of them have walled enclosures in front and in back. Natives on Lanai know the location of the large heiaus and the names of some of them, but further details are only vague memories. The name of the heiau given is usually the same as the name of its location—for example, "Heiau of Kahe'a." I assume this to be the name of a heiau, but it is less ambiguous to say, "Heiau at Kahe'a," than "Heiau of Kahe'a."

Like other stone structures on Lanai the heiau platforms are built of uncut stone and small bowlders found in the vicinity, laid up in perpendicular or sloping walls. If the stones available are smooth and flat the face of the walls or terraces may appear even but the interstices of the facings are not filled in completely with smaller stones. In most of the stone work examined, there are no true perpendiculars, absolute levels, even slopes, straight lines, exact right angles, or orientation to the cardinal points, although the work at its best appears true to the eye. In recording the individual structures a hand compass and a tape were the only necessary instruments. The plans of the heiaus at Kaunolu and at Kaupo are based on a plane-table survey, whereas the others are based on measurements with a tape.

Heiau at Kaunolu

The most imposing ruin on Lanai stands upon the west bank of Kaunolu valley, two hundred feet from the sea (Pl. IV, *A*). It is the heiau and place of refuge named Halulu (25) which was still in use sometime between 1778 and 1810, when Kamehameha I was in the habit of visiting Kaunolu.

The plan of this heiau (fig. 5, *a*) shows a platform consisting of three main terraces, each a foot above the other. The first terrace is of loose stones 6 inches to 12 inches in diameter, the second of smaller stones, and the third of large stones. Sunken in the middle front of the second terrace is a fireplace 1.5 feet square and 8 inches deep (Pl. III, *C*) formed of four stones at right angles, placed upon the flat surface of a large stone. The fireplace is partly filled with ashes, dirt, small stones, a few bits of fish bones and a few shells. On the third terrace, against the north wall is a platform, 4 feet wide, 10 feet long and a few inches high, paved with large flat stones and small ones. The under surface of one flat stone is artificially grooved, the lines being similar to those on stones outside of the heiau upon which pictures have been carved. A stone was found inside the north wall and another inside the south wall with similar markings, but only three stones in the terrace front of the heiau have distinct figures. (See p. 100.) Opposite the platform an area of ground, 12 by 20 feet, has been left uncovered by the third terrace. Two small

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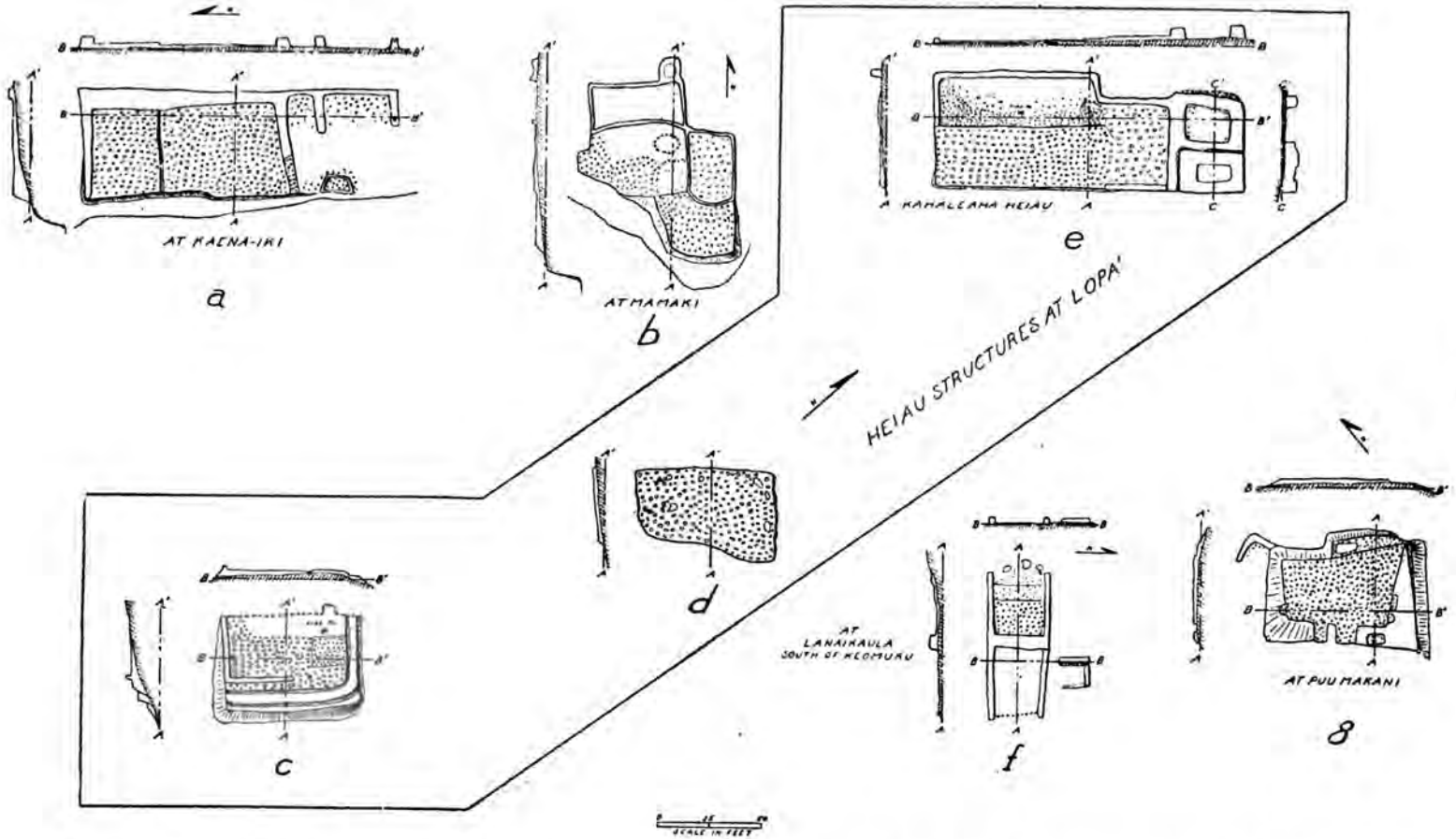

FIGURE 6.—Plans of heiaus at: *a*, Kaena-iki, dot opposite B′ represents a hole perhaps for an image on top of the wall; *b*, Mamaki; *c-e*, Lopa; *f*, Lanaikaula; *g*, Puu Makani. Shading represents terrace slopes and dots represent stone pavements. The cross sections give an idea of the probable extent to which stones have been laid up above the ground at any one point.

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terraces a foot high made of loosely placed stones are set in a rectangular recession of the back wall.

The wall of the heiau is perpendicular. Its maximum height is 8 feet and its width on top is 15 feet. Attached to the outside face of the wall on the north and on the south, is a bench, 3 feet high and 2 to 3 feet wide.

The main entrance to the heiau was probably the one which could be guarded on the north. The south side is open to a group of house sites, probably belonging to the priests. (See Pl. 11.) The great stone pavement on the floor of the valley (p. 53) may have been connected with the heiau.

Heiau at Kaena-iki

The stone platform, 55 by 152 feet, at Kaena-iki, is one of the two largest heiau foundations on Lanai.

The platform lies parallel and close to the edge of a bluff at the head of the bay, and on the north bank of the stream; the main part of the village is on the south bank. (See fig. 6, *a*.) The elevated pavement on the north is of very rough stones, in the northwest corner of which is a small hole probably intended for an image socket. The south pavement is of small, loose stones. Rock is abundant about the heiau, but smooth, water-worn stones from the shore below the bluff were found scattered through the structure. The walls are only two to three feet high; the small pen in one corner is two feet high. The south division of the heiau rests on bare ground. No natives have lived on this end of the island for a great many years, and no name for the heiau is remembered.

Heiau at Maunalei

In 1842 a Hawaiian Protestant church was begun on the site of the heiau at Maunalei. What remained of it was completely destroyed by Frederick Hayselden about 1880, who used the stone to build a cattle well. Judging from the amount of stone material, the heiau was not very large. It lay on a swelling of the coastal plain, 200 yards from the sea and parallel to it. Stokes (44) was told by natives on Hawaii or Molokai that the name of the heiau was Kahakunui. Kauhane Apiki, the last man living at Maunalei, gives the name Aikanaka.

Heiau at Lanaikaula

The heiau called Lanaikaula (fig. 6, *f*) is a fourth of a mile from the shore on the lower slopes of the ridge south of Keomuku and east a hundred yards from the graveyard. It is the smallest of the large heiau ruins.

The pavement of small, rough stones is less than 24 feet square and rises at the back into two small terraces. Towards the sea, the side walls of the platform continue for 30 feet, enclosing level ground. The small, three-sided enclosure on the north may be due to the activities of the Maunalei Sugar Company about the heiau. Only one native knew of this heiau.

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Heiau of Kahe'a

The north bank of Kahe'a valley ends in a bluff 12 feet high, 100 feet from the sea. The platform of the heiau called Kahe'a rests upon this natural terrace. The terrace may have been faced with stone and certainly the walls of the heiau extended to the very edge of the bank and probably out to the water's edge. Kukololoua, who lives on the property adjoining the heiau, remembers these walls before the Maunalei Sugar Company used the stones of the heiau in building a railroad. The natives attribute the failure of the company to this desecration of the heiau.

The plan of the structure as it now stands is shown in figure 5, *c*. The heiau rises from the bank by means of a gentle slope and one earth terrace to a pavement of large stones, now in confusion. The wall on the valley side is massive and rises by means of two steps to a height of 15 feet on the outside, construction of this wall conforms to a principle in native stone work followed wherever a wall of solid stone rises in benches or steps; each step is built up by laying stones against a wall which has already been faced, so if the step is torn down the wall is left standing. This method of construction was used in the heiau at Kaunolu and the small heiau at Lopa.

On the valley side the heiau wall runs into a chain of great bowlders which form the lower part of the continuation of the original wall. Upon one of these bowlders is an interesting group of petroglyphs. (See p. 105.) At the southeast corner of the bank, by the side of the windmill, there is a bowlder 4 feet long with a natural hole 3 inches in diameter through one end. This was the strangling stone for the victims to be sacrificed on the heiau altar.

Stokes (44) tells of a similar stone in Kona, Hawaii, below the heiau of Ohiamukumuku, the use of which was explained in the same manner as that described by the natives of Lanai—the victim was strangled against the rock by a rope tied to his neck and pulled through the perforation. In the account from Kona the stone is not connected with the heiau, but Stokes believes the connection probable. At Kahe'a the strangling stone is connected with the heiau. As the victims for sacrifice were usually if not always killed outside of the main court of the temple, I believe the heiau platform did not extend out this far. Natives spoke of another strangling stone which was removed from the beach by the Sugar Company. The victim, they explained, was strangled in some way on a rope between the two stones.

Heiaus at Lopa

Upon the north bank of Lopa valley two heiaus overlook the coconut grove and the sea. They are a hundred yards apart with a platform half way between. Perhaps all three structures were ceremonially connected, but all I could learn was the name of the largest structure, Kahaleaha.

The smaller heiau (fig. 6, *c*) is on the edge of the valley and faces the sea with a high terraced front, rising in two steps. The pavement is in confusion in the middle but the south end is smoothly paved with flat stones and the north end is raised into a platform which probably served for a lanai to a house the floor of which is indicated by the small fireplace several feet distant on the bare ground back of the platform. In the front center of the heiau pavement is a hole for a post or

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for an image. The platform between the two heiaus (fig. 6, *d*) is an irregular mass of stones, large and small.

The large heiau of Kahaleaha (fig. 5, *e*) is 55 by 150 feet—the same dimensions as the heiau at Kaena-iki—but the construction of a family tomb at the east corner may have altered the original size. The divisions of the pavement are individual, as usual. As the platform is at no place more than 3 feet above the ground, this heiau represents less labor than that at Kaena-iki.

There is one large terrace at the back of the platform partly paved with small stones. In the front center of the terrace is a small fireplace; the east corner has a pavement of large stones. At the north corner of the heiau is an unpaved enclosure surrounded by a high wall; probably the entire end of the heiau was one such enclosure. The recent tomb, which occupies the east corner, is a small rectangular enclosure surrounded by a thick, well-built wall. The burials were covered by filling the enclosure with rocks.

Heiau at Kapoho

On the edge of the east bank of the valley of Kapoho, 100 feet from the sea, is a heiau. Natives have recently lived on it, leaving on the main pavement a tapa beater, broken crockery, iron vessels, many hammerstones, and stone net and hook sinkers. Native fishing parties, also, have camped on the site. Such use of a heiau is unusual and throws some doubt on the statement that it was originally a temple. In spite of the trespassing the platform is in good condition. (See fig. 5, *b*.)

The face of the terrace is built up with loose, small stones and pieces of coral, at a slope of 45 degrees. The floor is paved with fine stones, coral and shells from the beach, which give it a dazzling, cleanly appearance. At the back of the main division of the platform is a house platform 8 inches high, paved with sand. A charred side post of a thatched house was found near the house platform (p. 88). The house must have been about 8 by 22 feet. A small sunken fireplace appears at the middle front edge of the platform—not on it. Another such fireplace is placed between the two short walls projecting from the main wall.

In the middle of the large division of the heiau is a pavement, 6 by 10 feet, of large stones. The bone pit between the two divisions of the heiau platform is 6 by 7 feet and 6 feet deep, the bottom is level with the outside ground. A fragment of a pig's jaw was found in the pit. There are breaks in the low walls on the platform but they may have been caused by trampling cattle. At the very back of the heiau is attached a line of stones marking off a rectangular area of level ground.

Heiau at Mamaki

The heiau at Mamaki is prominent because of its isolation on the east point of the bay, but it is like an ordinary, large house site.

The three divisions are irregular and the walls at the back are only 1.5 to 2.5 feet high. (See fig. 6, *b*.) The largest division has a coral pavement in the southeast corner for a house, in the rear of which is a circle of stones of unknown purpose. As at Kapoho, to the back of the heiau is added an enclosure, at the northeast corner of which is a mound of stone and coral, depressed in the center, but containing no fish bones. No name was learned for the heiau.

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Heiau at Hii

The heiau on Hii flats (fig. 5, *d*) is about two miles southeast of Koele, on the lower slopes of Puu Alii mountain. An excavation accommodates the back part of the heiau platform, which is 60 feet square.

The stone wall enclosure at the back of the platform and the small one attached to the west corner may have been corrals for pigs or sheep but are probably features of the heiau. No bones or implements were found in the surface soil on or about the heiau. Among the stones of the front terrace and of the walls pieces of coral have been strewn. Growing on the front of the heiau were two wauke bushes (*Broussonetia papyrifera*), the principal source of bark for tapa. These are the only bushes of this species I have seen on Lanai, and the heiau is a surprising place to find them. Thrum (45) lists among heiaus a temple for kapa beaters, dedicated to Hina-kuku-kapa (Hina-beating-tapa), at Puuomano, Lumae, Kauai, which is similar in size and shape.

There is a lower terrace, partly artificial, on the east of the heiau proper, which appears to be a house site. No signs of other dwellings appear within a radius of a mile.

Heiau at Puu Makani

The heiau at Puu Makani crowns the summit of the hill 1,500 feet above sea level. It overlooks the great basin of Palawai to the north and the ocean far off to the south. It differs from those on the coast in its location at the top of a hill distant from a village; in the absence of any walls on the platform; and in the attachment of very small platforms to the large one.

The south corner of the platform of local rough stone, rests level with the top of the hill and is partly unpaved. The plan of the pavement is trapezoidal with three small extensions, and two small platforms attached to it, also one platform unattached. (See fig. 6, *g*.) The platform on the north contains an unpaved space, as for a house. At the north corner of the heiau is a short wall enclosing a level space on which was found a notched pole (B 4509) 13 feet long, 2 inches in diameter at one end and 3 inches at the other and cut in the same way as the upper end of a rafter in a Hawaiian thatched house. Its unusual length together with the notch at the large end instead of the small end and the absence of a forked or mortised end makes this pole unsuitable for use in the vertically walled house. It might be a rafter of a lean-to house or a timber of the tower frame-work which stood on every important heiau. David Malo says (36, p. 211): "If the king was minded to worship after the rite of Ku . . . . the *lananuu* (tower) had to be made of *ohia*, ... if after Lono . . . . the timber used in the construction was *lama*." But the timber on the Puu Makani heiau is the hoawa (*Pittosporum sp.*).

SMALL HEIAUS

The ten structures here classified as small heiaus are simple enclosures or platforms, less than 40 feet square, removed from any possibility of inclusion among the temples offering human sacrifice. They are located in

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very small villages distant from the large heiaus and occupy a no more conspicuous place than the neighboring house sites. Presumably these heiaus were used in private family worship, or in the practices of an inferior order of the priesthood. Most of the structures for worship of this kind were single houses surrounded by a paling fence or a stone wall (36, p. 51), or a simple, unroofed enclosure—structures which would leave ruins similar to those of an ordinary house site, or so inconspicuous as to escape notice. Therefore, the heiaus described, in the following pages with the three exceptions noted, include only those which natives have pointed out.

Half a mile north of the valley mouth at Hauola on sloping, rocky ground is a heiau 23 by 32 feet, called Panipaa, which is also the name of the place. The long axis of the enclosure is parallel to the beach. The larger heiaus with enclosures in

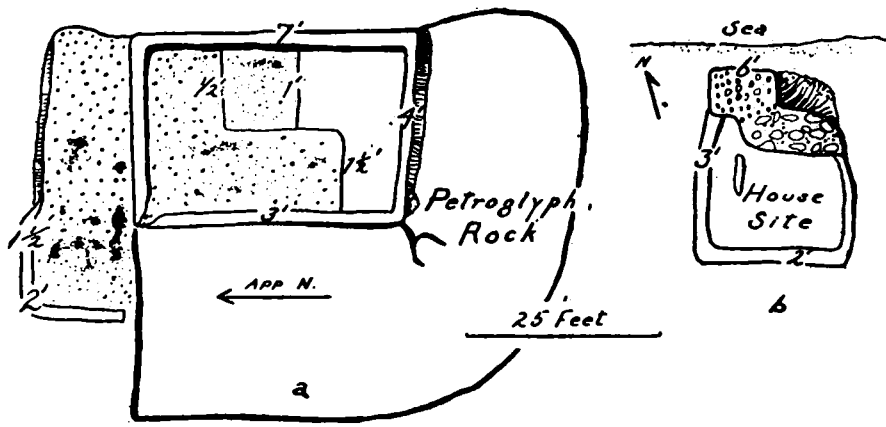

FIGURE 7.—Heiau and house site: *a*, heiau at Panipaa; *b*, house site and *ko'a* at Honuaula. Figures indicate elevation.

this position face the sea, but the walls of this small heiau have no break or entrance and it is not possible to say which way it faced. Two platforms within the enclosure are paved with small stones and coral. Attached to one end and one side is an area of level ground enclosed by a wall a foot high, while on the opposite end is a platform. (See fig. 7*a*.)

At Moenauli, inland from the windmill at Nahoko, on the lower slopes of a wide ridge, is a heiau enclosure 30 by 36 feet by 4 feet high, paved with large, flat stones. The long axis of the enclosure points to the sea. Adjoining the structure on the south is a pavement, 20 feet wide, of very rough stones. This is the heiau claimed to have been used by Luka, a woman, when she prayed to death a number of Lanai natives (about the year 1900) and was consequently jailed at Lahaina, Maui. The skeletons of eight pigs lay scattered about the platform.

Back of the coconut grove and graveyard at Kaululaau and against the bank is a stone terrace, 25 by 30 feet by 4 feet high, facing the sea. The north end is paved with large stones—the south end is filled with earth. The native and his wife who guided me called this platform a heiau to Kane.

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Several hundred yards from the main ridge near Keoneheehee on the flat grass lands is the site of a house used for worship. It is marked only by a line of stones in the ground forming a rectangle about 20 by 30 feet. The heiau was called Maluhie.

At the head of the ravine which rises among the petroglyph bowlders of Luahiwa several massive bowlders come together, forming the back of a circular terrace 8 feet deep with perpendicular wall, 5 feet high and 12 feet long. This was called the heiau of Luahiwa and was used for regulating the rain; it was particularly powerful because the rain clouds pass close above it. Keliihananui, who lives at Lalakoa, two miles away, stated that his father used this heiau.

At Hao, at the very back of the coastal plain, are two sheep pens. The northern pen is said to have been a heiau. Its present wall is 2 feet wide and 3 feet high and encloses an unpaved area about 30 by 35 feet.

North of Koa, below the trail which leads from Palawai basin onto the mountain bench of Kaohai is an unpaved terrace 30 by 45 feet, supported by a slope of stone which at one corner is 15 feet high. The long axis of the terrace points north. A pen 10 by 25 feet, with a floor of rough stones is located at the north end of the terrace and at the southeast corner is a circular pen, 7 feet in diameter. A native pointed out this structure as a heiau, but I have little faith in his statement.

Mr. W. J. D. Walker of the Hawaiian Pineapple Company reports a group of two small, circular, raised platforms, two house platforms, and three stone shelters half a mile up the parched slopes back of Kalaeahole, in the district of Kaa. The two circular platforms are placed on a raised ledge about 15 feet apart and in a line approximately east and west. The eastern platform, a little the larger, measures about 6 feet high and 6 feet in diameter. On the south side of the platforms and between them is a shelter formed by a low wall of stones against the ledge. West of the platforms are two small, terraced house sites and north, two more shelters; one under a low bluff, the other directly above it. It is not beyond possibility that these ruins represent a heiau and are the setting for the tradition of the Fire of Kawelo (p. 18), which burned at Keahialoa. "In the district of Kaa," Gibson (24) says, "on the west side of Lanai, there are several tumuli, large stones and some rude contrivances of sacrificial altars, surrounded by a lone wall enclosure." Here the prophet Kawelo is said to have kept his sacred fire constantly burning. A native, Kauila, informed me that Keahialoa, indefinitely located in Kaa, is the name of the high point to one looking upland from Kaena point. This would be at least in the vicinity of the lone ruins.

Two hundred yards west of Kapu'a gulch, on the foot slopes of a rocky ridge, a rough stone terrace 12 by 25 feet by 4 feet high, faces the sea. A wall 2 feet high bounds the west end. In the northeast corner is a pit (unfaced) 1.5 feet deep and 3 feet in diameter. This structure is so different from the neighboring house sites, which are coral paved, much lower, and without pits, that I am inclined to accept it as a heiau site. On the bowlders back of this terrace are the unique petroglyphs recorded on page 105.

On the east bank of Pohakekuia valley a terrace, 22 by 25 feet by 6 feet high, of very large and rough stones has been built over the side of the valley. The northern division of the terrace is 2 feet high and a little larger than the southern. A post hole appears in the southwest corner of each division. Compared with the house foundations in the vicinity this terrace is large and unusual and suggests a heiau.

These structures at Kalaeahole point, at Kapu'a and at Pohakekuia which perhaps represent heiaus, are but examples of many similar structures in a state of decay which does not permit a determination of their former use.

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HEIAUS OF FISHERMEN

On Lanai, fishermen's shrines, *ko'a,* are numerous and varied; some are rectangular enclosures or platforms, others are circular, and still others are simple heaps of stone. None are larger than 25 feet square. Coral, shells and fish bones are almost invariably associated with the ruins.

A typical and authentic *ko'a* stands at water's edge on the sandy point of Honuaula. (See fig. 7, *b.*) The irregular platform of stone and coral is six feet high, surmounted by low altar 6 by 12 feet, littered with shells, fish bones and fresh crabs. At the back of *ko'a* is an enclosure containing pine timbers suggestive of a recent shack.

Near Manele is a *ko'a* located at the foot of a ridge extending from Kaupakuea, about 35 feet from the sea. The shape of the platform is irregular, its sides measure 22 by 20 by 24 by 15 feet; its average height is 4 feet. At the back of platform are cowry shells, fish bones, crustacean remains, and bits of charcoal left from sacrifices. The cowry shells had not been broken to extract the meat. Most of the fish bones and crab shells are covered by a stone.

A *ko'a* located on the east ledge of the beach south of Kahue, consists of a low platform, 4.5 by 10 feet by 2 feet high, resembling a modern native grave. Its edges are of lava blocks and smaller rock, but its interior is filled with pieces of coral from 1 to 2 inches in diameter together with some larger lumps. A small pile of stones and coral rests against the west side. No human bones were found in the structure and no burial could have been made in the solid ledge beneath. The use of coral was intentional; there is no source of supply within a hundred yards, and stone in abundance is close at hand. Lobster shell-plates, spines of sea urchin, sea shells, and fish bones are scattered on the platform, and remains of lobsters and fish lie under a heap of stones next to the platform. Apparently small sacrifices of sea food were made on the coral area of platform, then covered with stone. Cockleburrs (*kikania, Xanthium strumarium*) are buried beneath the platform—plants supposed to be of recent introduction.

Two platforms are located near the east arm of Kahue Bay; one is on a sand dune a hundred yards from the beach, faced on the seaward side by large stones. Shells and fish bones found at either end of the pavement suggest that this structure is a *ko'a.* Two hundred yards from the beach is a similar structure, where no sign of fish bones were found. Nearer the mouth of Kahue valley is a conspicuous structure—an enclosure 8 by 15 feet, 5 to 6 feet high. On the pavement, which comes almost to the top of the enclosing wall, are shells, pieces of coral and charcoal, ashes, and fish bones. A low wall encloses a yard at the back. At the base of the north corner of the platform two stones a foot in diameter and three feet long have been set upright.

Two structures each having the appearance of a *ko'a* stand on the east bank of Polihua valley. One, erected on the sloping edge of gulch, is an enclosure 20 by 25 feet. Like the *ko'a* at Kaumalapa'u, this heiau is peculiar in that the wall maintains a uniform height even on the steep slope. The wall is six feet high and obstructs the view of the sea from the platform. The platform, made of large flat stones, is on a slope not so pronounced as that of the wall. An altar (one foot high) on the upper end of the platform is made of smooth stones and contains pieces of coral, sea shells (mostly unbroken cowry) and fish bones.

Twenty-five yards south of this structure is a pentagonal platform 10 by 15 by 10 by 14 by 6 feet, and 2 to 4 feet high. The pavement is depressed, but affords a view of sea. A hole in the pavement, 2 feet deep and 2 feet in diameter, is partly covered

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with a slab. Calabashes with offerings may have been placed in hole, but no shells, bones, or coral were found.

Several hundred yards from Bay of Honowai is a stone platform 15 by 15 feet and 4 to 5 feet high in a prominent position among sand dunes. The platform has a concave surface. It is unlikely that a grave would be so marked in the sand dune area, and I know of no house platform of these dimensions on the north shore. These facts suggest that the platform is a *ko'a,* though no shell or bones are found. Their absence may be due to the high wind which sweeps across this country.

A platform 23 by 30 feet is located in the valley of Keanapapa (fig. 3, *b*). On it is a *ko'a* altar, rising in two steps. Cowry and other shells, pieces of coral, and fish bones lie on this altar. The cowry shells have not been broken to extract the meat.

On the edge of a cliff at the first indentation of the coast south of Kaumalapa'u is an enclosure 20 by 25 feet, with vertical walls from 4 to 6 feet high, 2 to 3 feet wide. Its walls are of uniform height even on slopes. Its floor is paved with flat stones, and littered with pieces of coral, shells, fish-bones, and charcoal.[1] Joining the enclosure on the north is a house platform 26 by 35 feet, with a sheltering wall 6 feet high on its eastern side; a square stone fireplace is sunk in middle of this platform, another in the ground 8 feet south of the platform. The presence of charcoal at this *ko'a* suggests recent use.

A wall, 5 feet high and extending south and west, forms a shelter on the summit of the rock island of Kaneapua (Pl. 11). The floor (15 by 24 feet) is paved with rough stones plentiful here. It is said that this steep rock was climbed to offer the first fish of a catch, but no fish bones are found, though pieces of coral are scattered on top of the island. The shelter is an excellent lookout station, as the depths of Kaunolu Bay can readily be scanned from it. A number of cairns have been set on the rim as on the sea tower, Puupehe.

An altar (25 by 15 feet, 6 feet high) built of large, water-worn stones, is located against the west bluff of Kaunolu Valley, upon a great platform near the sea. A step, one foot high, runs along the front of the altar where once stood an image of the god Kuula, patron of fishermen. Natives who claim to have seen this stone idol, called Kunihi, describe it as two feet high, with ears, eyes, nose, mouth and arms. Keliihananui's brother, Ohua, was one of several men instructed to hide the image by Kamehameha V during his visit in 1868 (23).

Three cairns of lime-stone slabs (the largest 12 feet in diameter and 3.5 feet high) (Pl. V, *A*) are located a quarter of a mile inland on the coral limestone ridge, which forms Lae Hi point; larger slabs are laid upright against the ridge. A Hawaiian who lives at Pohakupili says that these cairns are not graves, but *ko'a,* upon which the natives placed ferns, maile vines, and fish, then bowed their heads in prayer.

In addition to the *ko'a* described there are *ko'a* or structures resembling *ko'a* at the following places:

North coast: Pohakuloa, on the east bluff of the valley north of the peninsula, above two large house-sites—a cairn with coral; Kuahua, adjoining a house-site—a cairn with coral; Kukui, a quarter of a mile upland, associated with four house-sites—a platform 12 feet square, 6 feet high; Kahue, on the lower slope of the east bluff—enclosures forming one, possibly two *ko'a;* Kae'a—two cains. West coast: Kaena-nui, in line with the center of the bay, 100 yards inland—a cairn adjoining a

[1] Kenui, of Nuu, Maui, who wasing a *ko'a* (a rectangular platform, with an imu in the corner and a temporary hut in center) up to 1916, told me that nowadays the natives cook their fish sacrifices, and my field assistant, Maunupau, says that in Kona, Hawaii, practices differ widely according to purpose or dream-vision of the fisherman.

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house-site; Oanapuka, Kamoku, on the north point of the bay—a platform 15 feet square, 2 feet high; Kaunolu, on the west bank, opposite Kolokolo—a cairn adjoining a house-site. (See Site 15.) South coast: Kapoho (fig. 5, *b*); Kou, Kaohai, on the west point—a platform at the rear of a house site. East coast: Lae Hi, 100 yards from the point—a cairn adjoining a house site; Mahana, in the village—a cairn adjoining a house site.

STONES MARKING PLACES OF RELIGIOUS OR MAGICAL OBSERVANCES

On the great bowlders along the Keahiakawelo ridge many small monuments of three or four stones, one on top the other, have been erected by natives travelling up and down, to insure good fortune on their way. I am reminded of similar monuments which were set up along the trail at Ke-ahu-o-ka-holo in Haleakala (18, p. 250) to keep the fog from enveloping the travellers and causing them to lose their way. But the *ahu* at Keahiakawelo represent the *kukae* offerings of Kawelo. (See p. 19.)

Along the north and west coast particularly are scores of large bowlders crowned with stones, usually a rim of stones. The natives suggest that these were *ko'a,* but no reliable information has been obtained.

A quarter of a mile east of Hale o Lono, 9 stone slabs, 1 to 2.5 feet high, are aligned in an upright position a few inches apart (Pl. v, *B*). The purpose of these is unknown.

PLATFORM ON PUUPEHE ISLAND

On the southern coast of Lanai a bold point with a wide sandy beach on each side interrupts the middle of an almost continuous sea cliff. Standing off from the point about 150 feet is Puupehe Island, a sea tower, 80 feet high and about 70 feet in diameter. The platform on top of this island is described in tradition as a burial place (p. 29) but examination shows no signs of a burial and some features associated with it indicate use as a religious structure. Gibson (22) in 1869 observed "from the bluff that overlooks Puupehe, a small enclosure formed by a low stone wall upon the summit of this elevated islet."

Observed from the mainland the structure does appear like an enclosure, but on climbing the island I found that the structure is a platform 6 feet wide, 21 feet long and 3 feet high and on it, a little north of its center, is a stone 8 inches square and about 18 inches high set in an upright position. The platform stands in the center of the island with its longer axis trending northwest. All the stones on top of the island except small cairns on the south and east rims have been built into the platform.

Excavations into the two inches of soil which overlies bedrock revealed no human remains but within and under the structure and scattered over the top of the island were the bones of many birds, mostly terns, also many egg shells. Birds have been able to crawl into the platform between the stones, but some of the bird bones were under the bottom stones of the platform. Human bones would have lasted as long as bird bones which of course lay there when the structure was built. Also human bones would most likely have outlasted the well preserved stump of a bush, 10

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inches high and 2 inches in diameter, about which the stones of the platform had been piled.

The platform on Puupehe presents the same problem as the platform in the Pele Group, Haleakala, Maui (18), which is traditionally explained as a burial place, although no trace of a burial is to be found. At Haleakala there is no essential difference between the supposed burial platform and many similar platforms the purpose of which is unexplained. The burial platforms of this shape which I have examined on Lanai all have vaults; burial made in the earth is marked by a simple cairn. Perhaps the body was left upon these solid platforms, although such a custom has not been mentioned by early writers. It is also possible that the purpose of the structure was to mislead people as to the true burial place.

It has occurred to me that the platform on Puupehe may have been a shrine used by the bird hunters. So far as I know such shrines in Hawaii have never been specifically described, yet they certainly existed. Kamakau (32) tells where to find them and gives us a hint of what they were like: "The bird islands and the people who caught birds by trapping, smoking, and striking had *ko'a* [i.e., shrines like those of the fishermen] to sustain the land with plenty of birds." Puupehe was a bird island and its name, meaning Owl Trap Hill, may be a reflection of its use by bird hunters. Until a shrine of the bird catchers is pointed out, it is well to hold in mind the possibility that the Puupehe platform is such a structure. It is interesting to note that the similar platforms at Laie in the crater of Haleakala were described to me by one native as the burial places of the uwau catchers: there was an association in his mind between the bird catchers and these platforms.

BURIAL SITES

Burial grounds are revealed by the shifting sands of the coast a few hundred feet or sometimes a mile from the nearest house site. I came upon twenty flexed burials exposed on the sandy south bank of the wide valley of Kuahua. Each burial lay somewhat apart from the next over an area of two hundred square feet. Cattle had destroyed many of the bones and disturbed most of the original positions.

Mr. Stokes says that in sifting the sand about a number of flexed burials in the sand dunes at Awalua, he found a squid hook sinker, a boar's tusk, and a small shell ornament shaped exactly like the carved whale tooth commonly worn by the Hawaiian nobility.

Unmarked, flexed burials are frequently exposed in eroding banks on the plateau lands. The sides of Pohoula hill, near the summit, were used as a burial ground.

At Kaunolu a rough, circular, stone platform, 12 feet in diameter and 3 feet high, was erected over a very shallow flexed burial. (See Site 37.) West of Honuaula are nine similar platforms, near two house sites.

A burial in a straight position marked by a rude, rectangular pavement 6 feet from a house platform at Kaunolu is described on page 57. There are a number of like structures at Kaunolu and on the north and east coast and on the plateau are rectangular cairns which I believe designate burials. The natives now bury

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their dead in coffins and seal the burial by a rectangular platform paved with pebbles or fine coral.

There are a few platform tombs, all of them near house sites. A tomb platform at Pohakekuia is exactly like a house platform. It is 2 feet high on the face towards the sea, 12 feet wide and 15 feet long. The middle is paved with small stones and coral. Three inches under this pavement are two slabs of coral stone 4 inches thick taken from a coquina ledge on the shore and broken into pieces 2 by 3 feet. One of these slabs when removed revealed an earth chamber 3 by 3 feet by 4 feet, partly filled with stone and sand from which a bundle of long bones protruded—parts of one dismembered skeleton. Under this bundle were the skulls of a man, a woman, and a child, with the rest of the dismembered skeletons alongside. With the bones was part of a rotted black silk handkerchief and at one end of the vault was a piece of the gunwale of a canoe. Three house sites and several shelters and garden patches surrounded the tomb.

A tomb at Manele is a rectangular excavation 1.5 feet deep, 3 feet wide, and 6 feet long, lined on the sides with upright stones and vaulted with tree trunks 3 inches in diameter laid at right angles to the long axis of the grave. Over the grave is placed a low platform paved with coral. The tomb had been broken into and the bodies removed.

The platform on Puupehe island is described by native tradition (p. 15) as marking a burial but there is no evidence to support this view.

Burial in caves in the sea cliffs and valley bluffs was prevalent, but the locations of the graves is kept secret and I did not discover any. Pohano and Kawelo (both of whom died in 1923) knew jointly of a secret burial cave in Maunalei or Hauola gulch, and natives claim there are burial caves all along the west coast and at Kou and Huawai on the south coast.

On West Molokai I investigated a burial ground similar to those on Lanai. There were more than forty burials exposed. The five skeletons which I examined carefully had the legs and arms flexed, hands under chin, and all lay on their backs with the exception of one in an upright position. There was no orientation common to them. I found no trace of markers for these graves or any object which was meant to accompany the burial. There were only clean, well preserved bones.

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FORTIFICATIONS.

Ruins of fortified works are to be found at the head of Maunalei gulch on the crest of a sharp ridge, Hookio, which enters the gulch from the southwest. (See fig. 8.) For defense three artificial notches averaging 20 feet wide and 8 feet deep were cut near the nose of the ridge. The floors of these trenches were occupied by the fighters and their store of bowlders to be rolled over the cliffs on either side.

The two cuts nearest the end of the ridge are 50 feet apart, the third cut is 300 feet south. Ten feet from the first cut, about five tiers of stones the size of a man's head are banked against the ridge on the west side. Natural pebbles intended for throwing stones are scattered over the ridge. On the end of the ridge, shallow depressions have been scooped out probably for sleeping places. A few wiliwili trees which stand here is all the vegetation that has survived the denudation by goats. For the account of a fight which took place here, see page 22.

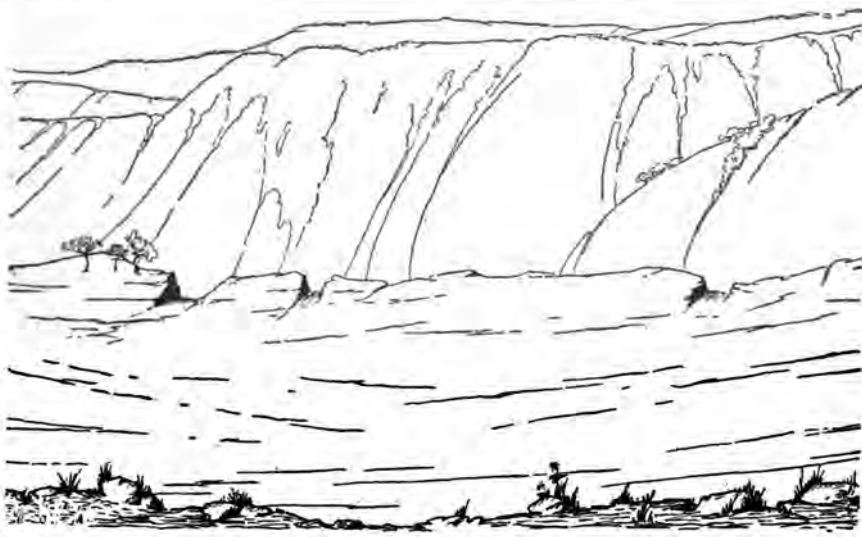

FIGURE 8.—Sketch of fortified ridge of Hookio, Maunalei Gulch. (Drawn by Muriel Mattocks from photographs by Kenneth P. Emory.)

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STONE ARTIFACTS

MATERIAL AND MANUFACTURE

Knowledge of the material culture of Lanai must be constructed largely from a study of ruins and of museum specimens. The specimens available are those in the collection of George C. Munro (referred to as Munro collection) and those in the Bishop Museum (indicated by the letter B or L). These objects all represent surface finds. The present Hawaiians have no heirlooms of the old life, except a few wooden bowls, and their knowledge of the manufacture and use of objects found is meager and indefinite.

The rock exposed on the slopes of Lanai is chiefly vesicular, gray basalt. A very heavy, close grained, bluish-gray to gray-green basalt, appears in several localities on the plateau. Along the coast are limestone ledges and coral reefs. The stone objects discovered on the island are made of local materials except some sinkers and hammerstones shaped from the ballast of ships wrecked in modern times, and a stone mirror which possibly is made of rock from Mauna Kea, Hawaii.

In addition to basalt and limestone there are on the island thin veins of imperfect black, basaltic glass, or obsidian. At each of several house sites on the west coast, I have picked up a handful of rough fragments which seem to have been flaked off in the manufacture of some obsidian object and on a platform on the south bank of Kaumalapa'u gulch I collected 13 chips within a radius of about two feet, averaging .6 inch wide (B 4142). The Munro collection includes an oddly shaped sinker (p. 81 and fig. 12, *c*) of very fine grained basalt so heavily permeated with hematite as to give the appearance of iron.

The processes employed in artificially shaping stone to the forms observable in the objects from Lanai reveal a knowledge of the fundamental principles defined by Holmes (*27a*).

Percussion fracturing, or breaking and chipping, then abrasion by grinding, whetting, and polishing include all the means by which the adzes and chisels of the non-brittle phonolite were made to assume their final form. In the objects of less compact basalt, the crumbling or pecking process has been depended upon for most of the shaping. The grooves in the unique hematite sinker (fig. 12, *c*) have been sawed by a sharp stone edge. The petroglyphs are made by pecking, or, when the face of the stone is soft, by the abrading process of scraping and also of scratching with a point as in engraving.

Small adzes or chisels in the rough (B 4127, B 4128, B 4131), also spalls from chipping (B 4137) have been found on a few house platforms of the coast, but the blocking out of adzes on a large scale occurred at several extensive work shops on the toplands. The most notable one is just north of the mouth of Pohaku (Stone) Gulch, at Ko'i (Adz), where spalls and

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rejects are scattered over area three hundred square yards among phonolite bowlders on the slopes of the north ridge. The corners of bowlders have been broken off to furnish the cores. On top of the ridge are mounds of small chips with no rejects among them. These may mark the place where the worker sat to perfect the forms selected.

At Ko'i no partly ground adzes, chisels and no grindstones were found; the finishing process probably took place at home. And neither here nor at the other work shops did I find hammerstones pitted with artificial finger holes. Most of these specialized hammerstones come from the coast and so perhaps found their use not in chipping but in the crumbling processes involved in forming pounders, sinkers, stone dishes, and game stones. They seem, however, to be adapted also to chipping.

From scattered distribution of unfinished specimens, it would appear that the making of pounders, sinkers, stone pans, and game stones was not

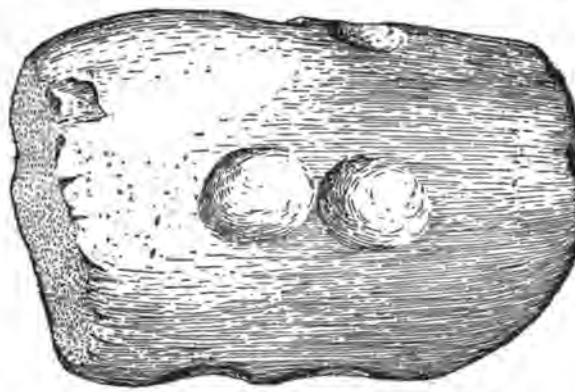

FIGURE 9.—Sketch of hammerstone, with two sets of finger-holds (B. 4065); length of stone, 5 inches; width, 3 inches; thickness, 2.1 inches; weight, 2¼ pounds.

confined to any one place, and it is unlikely to have been the work of one class of artisans.

At the adz factory at Ko'i, I did not notice whether or not there were marks resulting from testing or splitting the rocks by fire. This entire work shop deserves a special study for the knowledge it might give of the stone shaping arts in Hawaii.

HAMMERSTONES

Natural, water-worn stones and pebbles of basalt have been left on the ridge tops and about house sites. Some of these have battered surfaces indicating use as hammers. But there is a worked hammerstone of well defined form.

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It is a water-worn stone of compact basalt of a size to be held in the hand. It is pitted or slightly hollowed at the center of each side by pecking, to receive the grip of the thumb and the fingers and notched on the top and bottom for a hand-hold when the stone was to be held horizontally. (See fig. 9.) The head is naturally or artificially flattened. The opposite end is also flattened to receive the index finger as the hammer lies in the palm of the hand. When both ends are used for striking and the hammerstone is a long one, there are two complete sets of finger holds. To assist the grip some hammerstones are flattened at the bottom and others at the bottom and the top.

The usual size of hammerstones found on Lanai is illustrated in figure 9. A giant one (7.5 inches long by 4.5 inches thick; weight, 9¼ pounds) pitted with a single set of finger holds was found at Kaunolu. A hammer (B 1483) found on heiau of Kapoho is of foreign quartzite and has a single set of finger holds and a flattened back.

Finger holds have been cut in a number of quite irregular stones undoubtedly to assist in their use as hammers.

Discoidal stones of less than 3 inches in diameter, pitted at the center of each face in the manner of the hammerstones, are fairly common (B4172, and Munro collection 334-344). Slightly less common is the discoidal stone pitted on one side only (B4173 and Munro collection 326-333). All these stones are of vesicular basalt or coral and seem to have been used for rubbing rather than for hammering. The smoothly finished bowling stones, *ulumaika*, have sometimes a concavity on each side for a better grip. A large squid-hook sinker of diorite (B4068) has been converted into a hammer by the pecking of thumb and finger holds on the bottom and top. One hammerstone (B4182) has been converted into a sinker by the addition of a transverse groove, or is a sinker converted into a hammerstone.

ADZES AND CHISELS

Lanai adz heads and chisels include tanged adzes and tangless adzes and chisels. No sharp lines may be drawn between the groups and it may be difficult to determine from the tangless blades whether they were intended for adzes or chisels.

The blades available for study in the Munro collection and in the Bishop collection have in common a quadrangular cross section, the width of the inner surface, or back, never exceeding that of the front. They are made of phonolite shaped by chipping, by grinding at least on the bit, and by more or less polishing of the ground surfaces. The cutting edge is straight but often a little oblique. The tanged adzes far outnumber the other specimens, using Skinner's definition of tang or grip (41, p. 91) as, "constituted by the shaping of front and sides to hold the binding by which the adze is attached to the haft. It is a feature and not a region." In the Hawaiian adzes, however, the tang is shaped by the chipping of the front only.

The tanged adzes fall into three well defined classes: 1, The thick bladed adzes with tang chipped at a marked angle to the front of the blade, and sides diverging to the cutting edge which is more than 25 per cent of the length—in other words, a broad and heavy adz; 2, similar to 1 except that the sides are parallel or converging towards the cutting edge, or, rarely, slightly diverging but those with parallel or diverging sides, having the cutting edge 25 per cent or less of the length—in other words, a narrow, heavy, pick-like adz; 3, thin bladed adzes with tang chipped at a slight angle to the outer face, and sides diverging. The broad, thick-bladed type is well represented in all sizes of adzes, but most of the narrow, thick-bladed adzes are large, 8 to 11 inches long. The thin blade is more common among

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the medium and small adzes; one of these found at Kanepuu is only 1.2 inches long, 6 inches wide at the cutting edge, .2 inches thick, and weighs .2 ounces. Adz shown in figure 10 is a good example of the broad, thick blade. The tangless adzes and chisels examined are less than three inches in length, thin bladed, and often completely ground smooth. The sides diverge from the poll. A typical specimen,

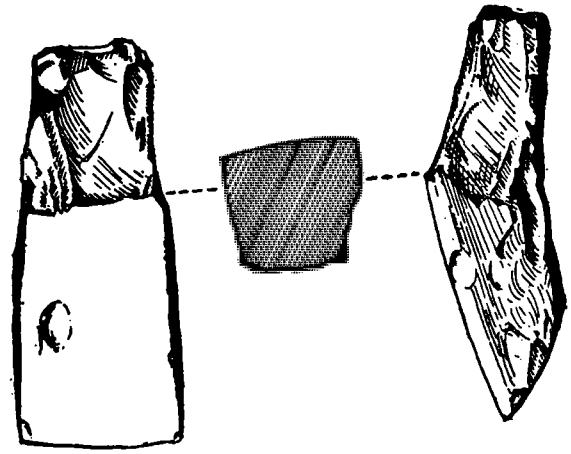

FIGURE 10.—Sketch of front, cross-section, and profile of adz from Awalua. Extreme length, 3.7 inches; width at cutting edge, 1.6 inches (38 per cent of length); extreme thickness of blade, 1 inch; width at poll, 1.1 inches; width at shoulder, 1.2 inches; weight, 6 ounces. Made of dark-blue dense basalt. Bit and front of blade ground smooth and polished; sides partly ground and polished, back transversely concave, front straight, sides slightly convex.

(Munro's collection 450) is 1.9 inches long, 1.1 inches wide at bit, .6 inches wide at poll, .3 inches thick, and 1 ounce in weight. The bit is formed by two rounded bevels meeeting on a plane one-third of the distance below the outer surface of the blade. The cutting edge straight and slightly oblique.

GRINDSTONES, WHETSTONES AND RUBBING STONES

Shallow depressions in the tops of bowlders at Kapoho, Pawili, and other village sites show the wear of the grinding of stone implements. At house platforms are many portable stone slabs which have been worn deeply by grinding, quite frequently on both surfaces. Grindstones have been worn completely through, then broken, and the pieces used as whetstones. Whetstones of hard grained rock and of irregular sizes and shapes, with one or all faces used, are common.

Over the stretches of plateau about Kanepuu hill numerous artifacts have been dropped, most of them distinguished as such, not because of any artificial shaping but because the stone is foreign to the region. Among these are flat and oval water-worn stones of vesicular basalt of a size fitting the hand (B 4178) and with both sides smooth and soft to the

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touch (B 4141), also thin, flat fragments of lava which probably served for rubbing wooden objects. Fragments of vesicular basalt or more commonly of coral are found which have been brought to the discoidal form by the crumbling process. They resemble bowling stones, but their irregular outline and signs of wear indicate use in rubbing.

A flat, rectangular polishing stone (L1985), exceptionally worked, 1 by 2 by 3.4 inches, lay near ruins at Kaumalapa'u: the bottom and sides had been ground smooth; the edges and corners left remarkably sharp.

On the plateau are numerous stream and beach pebbles of close, smooth-grained basalt having one or more sides highly polished by use, probably as burnishers.

KNIVES, AWLS, SCRAPERS, FILES

Sharp, thin spalls of dense basalt adapted for use as knives and scrapers, and sharply pointed flakes suitable for awls, are found at some sites and shelters. The flakes, irregular except along the working edge or point, seldom show any attempt at reworking.

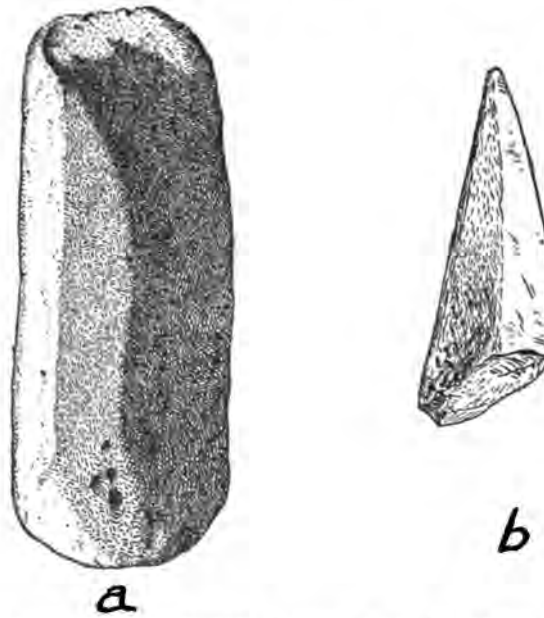

FIGURE 11.—Coral files: *a*, B 4091, 8 inches long; *b*, pointed file (B 4121), 2.9 inches long.

Files were made from pieces of coral ground so that the two faces met at an acute angle, forming a long, straight, sharp edge. An unusually long file of this type (fig. 11, *a*) was found with several partly filed pearl shells on a house site at Mamaki. Another type of file is a tapering coral point, rounded in cross section, or elliptical with somewhat sharp edges, commonly triangular; in some specimens even quadrangular (fig. 11, *b*).

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SINKERS

The simplest worked sinker is a naturally rounded oval stone of vesicular basalt, 3 or 4 inches in diameter and weighing 4 pounds, which has been partly or entirely encircled, transversely or longitudinally, by a pecked groove half an inch wide. In what manner these stones were used by the natives, I did not learn.

Specimen (B4070) from Site 30, Kaunolu (p. 58) differs from the simple form in being larger, having a deep groove 1 inch wide about the small end instead of about the middle, and having this end bisected by a half-inch groove. The stone, of vesicular basalt, is 8.5 inches long, 6.5 inches in diameter, and weighs 11.5 pounds. Three inches from the encircling groove, on one side is a half-inch groove at right angles to the plane of the end groove. The stone is not unlike the canoe breaker described by Brigham (11, p. 9), and differs from the *pohaku melomelo,* by the absence of a neck and by the presence of a proportionally much larger, grooved knob.

The *pohaku melomelo,* a stone smeared with bait and let down to attract fish. is shaped like a swollen pendent bluntly pointed: the neck is short and slender, ending in a more or less well formed knob. One from a house platform at Kaumalapa'u (B4117) is 7 inches long, 3 inches in greatest diameter, and weighs 4.9 pounds.

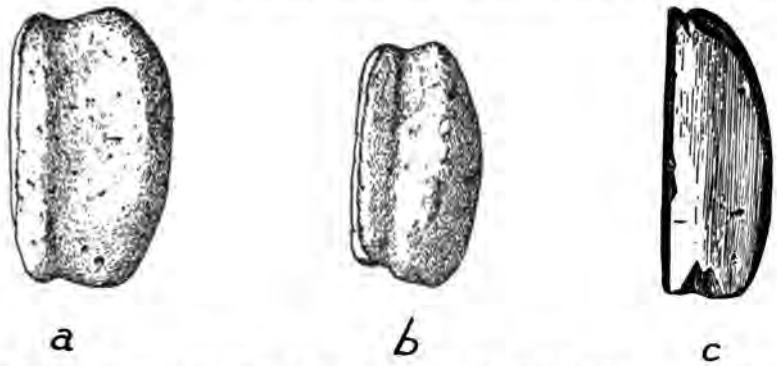

FIGURE 12.—Sketch of "bread loaf" sinkers: *a,* with rounded ends (B 4087); length, 2.8 inches; width, 1.7 inches; weight, 6.5 ounces; found in a cache with several common squid-hook sinkers in a wall of Kapoho heiau; *b,* with flattened end (B 4088); length, 2.3 inches; width, 1.3 inches; weight, 3.5 ounces; from Kanepuu; *c,* with flattened end notched (Munro 292); length, 2.7 inches; weight, 5 ounces; material resembling hematite.

The neck, 1.1 inches in diameter, is without a knob. The *luu hee,* commonly known as the squid-hook sinker, outnumbers all other forms on Lanai; it is elliptical when viewed from the flat botton or convex back. A longitudinal groove runs across the middle of the flat surface and over the back; in some crudely finished specimens the groove on the bottom is lacking, or is replaced by a notch at each end. Different kinds of material were used in making *luu hee* but coarsely crystalline basalts and a conglomerate composed of coral and basalt pebbles, was preferred. The largest sinker found (B4072), 4.2 inches long by 3.3 inches wide by 2.3 inches high, weight 2 pounds, 3 ounces, is of vesicular basalt and has a groove .2 inches wide made by the pecking process. The smallest sinker of this type (B4115), 2.6 inches long, weight 6.5 inches, is of coral conglomerate. One sinker (B4069 and B4077) differs from common form in having both bottom and back flatly convex. Another sinker has the normal form except for the grooving which runs transversely, instead of longitudinally, around the middle. It is of basalt and weighs 2 pounds, 6 ounces—

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a greater weight than any of the stones known to be hook sinkers. Its dimensions are: length, 4.3 inches; width, 3.5 inches; height, 2.2 inches.

Two closely allied types of sinkers are of unusual shape and size. They resemble narrow loaves of bread; their sides are concave, their bottoms grooved longitudinally. Both ends of one type are rounded; in the other type one end is flat, the other end a rounded point. (See fig. 12.) Brigham gives an illustration of the flat-end type (11, p. 97, fig. 96) and describes it as a squid or turtle hook sinker from analogy with a sinker of the rounded-ends type which is attached to the shank of a hook (B3792). A sinker of the rounded-ends type (B9921), presented to the Bishop Museum by Mr. A. F. Judd, was described to him by Captain Naopala as an *uhu* net sinker.

Of the three *uhu* nets in the Bishop Museum one has natural stone sinkers; two have modern lead sinkers. An old *uhu* net in the possession of Kalokuokamaile (age 73) of Napoopoo, Hawaii, has unworked stone sinkers, and S. M. Paahau of Hookena, Hawaii, a practiced *uhu* fisher, and well versed in the old methods, denies the use of worked stone net sinkers. However, a native at Kahakuloa, Maui, said that the rounded-ends sinker I showed him was used for the *uhu* net rods.

SLING STONES

Water-worn pebbles of dense basalt (B 4177), found on the fortified ridge of Hookio, were probably intended for throwing stones. They are of irregular shape, several inches in diameter and might serve equally well for hammers and rubbers.

The worked sling-stone, *maa,* is thick with blunt points, and resembles a lemon in size and shape. The largest one found (B4136) is 2.8 inches long, 2 inches in diameter, and weighs 8 ounces. The material is light-gray crystalline igneous rock, the same as that of the *pohaku melomelo* found at Kaumalapa'u. The average weight of the slingstones is 4 ounces.

POUNDERS AND PESTLES

From Keliihananui I obtained a pounder (B 4049) which he said was used in making sweet-potato poi.

The pounder is composed of the light-gray crystalline igneous rock found on the bowlder beach at Kaumalapa'u. It is 7 inches high, 6 inches wide at the base, 1.7 inches at the neck, 2.5 inches at the top, and weighs 8.4 pounds. The neck is circular in cross-section and expands above into the sharp rim of the top and below into the sharp rim of the base. Both top and bottom are strongly convex. The sides flare from the neck towards the base and towards the top. The shaping seems to have been by pecking and on the smooth sides, by scraping and rubbing.

The Munro collection contains a pounder of coral conglomerate, which is 5 inches high and 3.5 inches wide at the base, and the broken-off neck of a pounder of basalt (Munro collection 363) is concave on top but with a rim projecting in a flat flange .25 inches beyond the neck which is 1.5 inches in diameter. This collection contains also several slender pounders or pestles with gradually-diverging, non-flaring sides. One made of basalt (Munro collection 361) is 6.2 inches high and 2.7 inches wide at the base, with a neck which ends in the ordinary knob.

Water-worn stones about 6 inches long and 2 to 3 inches in diameter on the plateau of Kaa probably served for pestles (B4179 and B4193).

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An object from a house site at Lopa was explained by a native as a kukui nut pounder (B4050). In size, shape, and weight it resembles a *pohaku melomelo* except for the almost flat base, 1.7 inches in diameter. The greatest width of the pounder, which is near the base, is 3 inches, its height is 5.1 inches with the upper part of the neck missing.

LAMPS

Lanai lamps are globular or cylindrical with a shallow depression in the top and in some specimens a similar depression in the bottom also. The material is porous basalt.

A cylindrical lamp (B4063) from Ko'i, is 8.5 inches high, 6 inches wide at the base, 4.4 inches wide at the neck before it expands into lips. A slightly raised fret 1.5 inches wide runs around the base. The depression in the top is 3 inches in diameter and 1.5 inches deep. Another lamp (B4062) also from Ko'i, is shorter, wider at the top than at the base, has no fret. A globular lamp (B4064) from the plateau is 6 inches wide, 4.5 inches high, with a hole in the top 3.2 inches wide and 1 inch deep.

Some cylindrical lamps are ornamented with two or three coarsely grooved rings about their circumference and in one of these (Munro collection 316) the base below the bottom ring is divided into six lobes by three grooves intersecting on the bottom of the lamp. A slightly flat, globular lamp (B4061) from Kanaele, 8 inches in diameter, has three depressions pecked on the sides, giving the effect of a three-lobed vessel. In its top is a hole 3 inches wide, 2 inches deep, and in its bottom another hole 2.3 inches wide, .5 inches deep.

One lamp (Munro collection 317) is 4.5 inches high and shaped like an hour glass with an elliptical base. An unornamented lamp (Munro collection 318) 4.5 inches high with a flat bottom and convex sides, has a lateral knob 2.3 inches in diameter projecting an inch. Fixed in a house platform at Kahemano is the base of a pounder (B4051) converted into a lamp by pecking a depression in the bottom.

The seven small lamps or mortars in Munro collection average 2 inches in diameter and 2 inches high. Their tops are flat and their bases parabolic; the hole in the top of most of the lamps is small. The finely finished mortars are ground and polished on the lips (Munro collection 307 and B4146). The broken half of a mortar or cup 2.2 inches high and 3.5 inches in diameter at the rim (Munro collection 325), reveals in vertical cross-section a symmetrical concavity in the top about an inch deep and slightly wider within the cup than at its mouth. This characteristic is exhibited also in the fragment of a mortar or cup from Kaa (B4141), 1.7 inches high with a lip .8 inches thick and a concavity of 1.2 inches.

PANS

From village sites on the west coast Mr. Charles Gay recovered several rough stone slabs of basalt averaging 2.5 by 1.5 feet by 10 inches thick. A rectangular, flat surface has been chiselled about 1.5 inches deep on the top of each slab. Mr. Gay says they are salt evaporators. I saw two such pans in a corner of each of two house platforms at Huawai, the surface of the pan being level with the pavement. At Site 19, Kaunolu, one pan of this workmanship but of smaller size, was found sunken in the corner of a platform. Another small pan (B4159), which lay on a platform, is a very rough, cubical piece of cellular basalt measuring about 1.2 feet square, with a flat depression 2 inches deep; the sides of which slope

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abruptly. This shallow basin takes up the entire top of the stone except for a rim 2 inches wide.

WATER-WORN BOWLDERS ON HOUSE SITES

At many house sites along the coast are one or two flat, oblong, water-worn bowlders. These may be seats or pillows, but may as well have served other purposes.

One of these stones (B4012) from the middle of the platform at Site 42, Kaunolu, weighs 26 pounds and is 13 inches long, 6 inches wide, and 3 inches thick at the middle. Both of the flattened surfaces are concave longitudinally. This stone is unusual because of the lenticular gashes 1 to 2 inches long and about .3 inches deep cut at various angles on both of the flattened surfaces. One end of this bowlder has been polished in the center, probably by the grinding of implements upon it. The material is gray, somewhat vesicular basalt.

PITTED SLABS FOR THE GAME OF KONANE

On the platform of many houses, in the middle front or at a front corner (fig. 3, *a-b;* Pl. IX, *D*) are stone slabs pitted with rows of holes for the game of *konane*. The flat top of bowlders or the surface of a ledge near a house site may also be marked for this game. The dots average an inch apart, .2 of an inch deep and .5 of an inch in diameter. Such an arrangement of rows of pits is called a *papamu*.

The *papamu* brought from Naupaka (B 4048) is a slab of cellular basalt 3 inches thick, and 14 inches square. The rows of pits are 9 by 9, arranged, not very evenly, to occupy entire surface. The under surface of this board is fairly smooth, slightly concave, and the corners of one end rounded, strongly suggesting one-half of a broken platter.

In the *papamu* from Lanai the number of pits in a row varies from 8 to 20. Their arrangement is shown by the following examples: at Kalama, (three specimens) 9 by 13, 9 by 13, 11 by 11; at Kalamaiki, (two specimens) 9 by 10 and 10 by 10; at Keone, 8 by 13; at Kiei, 9 by 10; at Honopu, 11 by 13; at Keanapapa, (two specimens) 8 by 11 and 13 by 15; at Kuahua, 8 by 8; at Kaunolu, (three specimens) 13 by 20, 13 by 13, and 15 by 15.

As the game of *konane* has heretofore been described in little more detail than a game resembling checkers, I shall explain it as I learned it from a woman of nearly ninety years, Kaahaaina Naihe, from Kailua, Hawaii—the only native left who is known to be acquainted with the game.

The *papamu* used was a wooden board from the Kuhio collection in the Bishop Museum. It has 12 files of dots, 15 rows deep. The first board tried (B998) had evidently been cut down from a larger one, on which the positions were set quincuncially, and a modern molding added to the rim which rendered the board useless for playing as we soon discovered. But in the middle of this board is set a piece of bone or a human tooth which marked a very important position, the *piko*. The line of positions boardering the *papamu* is called the *kakai*.

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The "men" we used were flat, black beach pebbles an inch in diameter and white coral pebbles of the same size. Kaahaaina thought these pebbles too large, she preferred ones of half this size and a board with positions for fifty white and fifty black pebbles. The only *konane* pebble from Lanai (B4141) from a house site near Keomuku, is a black polished basalt pebble almost perfectly round, 1.2 inches in diameter and .5 inches thick.

In the game of *konane* the two players sit opposite with the *papamu* set end on between them. Both players participate in setting (*komo*) the pebbles (*ili*) on the dots until they are all covered alternately with the black pebbles (*ka eleele* or *ele*) and the white pebbles (*ke keokeo* or *kea*). Then it is decided who shall pick up the first *ili,* which must be one at the center (*piko*) one laterally next to it, or one at the corner. If the first person to choose picks up a black next to the center *ili,* then his opponent must pick up the white center *ili;* but, if he picks up a black corner *ili,* then his opponent must pick up a white one from one side or the other of the corner. If a player removes a black at the beginning he plays with the blacks and removes the whites which he jumps. *"Lawe ili keokeo, paani ka eleele."* (Removing the whites is playing with the blacks.)

The game now proceeds by each player jumping in turn. If a person can not jump in turn, the game is ended, and the blocked man loses. Jumping must proceed away from or towards the player, to one side or the other, but never in two directions in one move and never diagonally. One may jump over and remove a line of men of rival color, providing there is a vacant position at the end of the line and providing none of the men are separated by more than one vacant position. The term *holo* means to jump and *ku'i* (strike back) means to jump over the same course of the last move but in the opposite direction, thereby removing the man just placed by the opponent. To win is *ai;* to loose, *make.*

The betting in *konane* was sometimes very heavy and a large number of games played before determining the winner. Men and women often played together. The game was not tapu to the common people.

Kalokuokamaile of Napoopoo, Hawaii, says that the game was frequently played on the plaits of the *lauhala* mat and that the term *kaholo* meant the taking of many *iliili,* two, three, and up to five.

BOWLING STONES, ULUMAIKA

On the great flat, south of Kanepuu hill near Kapukaloa, is a level hard-packed strip of earth which seems originally to have been about 5 feet wide and more than 100 feet long. On this track the game of *maika* was played, judging from the several score of *ulumaika* stones gathered there by Mr. Munro and myself. There were also many broken *ulumaika* lying on or near the track. I am told by the natives that the game was also played below the hill Puu Nana i Hawaii.

The discoidal *ulumaika* range from 4.5 inches to 1.5 inches in diameter. More than half of the specimens are ground very smooth and some are polished. An average specimen (B4168) is 3 inches in diameter, 1.2 inches thick on the slightly convex rim, 1.7 inches thick at the center, and weighs 13 ounces. The material is basalt and entirely ground smooth.

Of the 17 fragments of *ulumaika* which I collected about the plateau (B4166 and B4167), most of them at the playing track, 14 are about half of a broken *ulumaika,* the result of a smart blow. In 5 of the stones the break is parallel to the sides, and in 9 transverse. Except for a few grass hummocks the ground was clear about

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the track, but I did not discover two fragments of one broken *ulumaika*. This may be an indication that the disc was travelling at great speed when the break occurred and that the fragments separated widely; it would hardly seem possible that the *ulumaika* would then always be broken about in half. Brigham states (11, p. 68) that in one form of the game the stones were rolled against each other. From the nature of the break it appears as though the *ulumaika* was deliberately broken in half as by a hammer stone, perhaps by another *ulumaika* used as a hammer stone. One explanation for the finding of unmatched halves is that the one half was retained as a trophy.

MISCELLANEOUS OBJECTS

In the Munro cellection is half of a stone mirror of close grained, dark-blue basalt, which had broken transversely. When completed the mirror measured 3.3 inches in diameter and about .5 inches thick.

Oblong, flat pebbles of vesicular basalt, averaging 2 to 3 inches long and .5 inches to 1 inch in diameter, were collected from house platforms. Informants say these were heated and inserted in small birds to be cooked. The material of at least one such pebble (B4144) is compact, dark-blue basalt not suited to heating.

One-half of a perforated coral disk .8 inches thick and 2.3 inches in diameter and weighing 1 ounce (B4124) was found on the plateau of Kaa. Its rim is somewhat rough and not perfectly circular but the sides are ground flat. The perforation which is not exactly centered, is a conical pit drilled into each side of the disk, meeting at the middle of the stone in a sharp edged orifice, .5 inches in diameter. The depression made in each face by the boring of the hole is 1.1 inches in diameter.

One specimen found (B4140) is an oblong, flat, water-worn pebble of compact basalt, 1.9 inches long, .7 inches wide, and .4 inches thick, with one end ground on both sides to an obtuse point .3 inches long. Another specimen (B4138) is an unusual gray-green stone which has been ground to the perfect form of a hen's egg 1.7 inches long, 1.3 inches in greatest diameter. The point seems to have been worn by battering.

A stone implement found by Mr. W. J. D. Walker on the Kaa plateau resembles the wooden breadfruit cutters from the Marquesas and Micronesia. It has a dull point at one end and a curved cutting edge at the other. The pointed end is thick vertically but thin horizontally and imperceptibly reverses to a rather thin, broad blade, flat on top and curved underneath. The implement is 6.2 inches long; its cutting edge 1.8 inches wide. The maximum width of the blade is 2.5 inches, which is at a distance of 2.5 inches from the cutting edge. The smooth grip fits the hand with comfort.

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SHELL AND IVORY ARTIFACTS

Two adzes (B4192 and L1071) cut from the side of a large cone shell (*Conus sp.*) .1 inches thick, were found on Lanai. Adz (L1071) has a length of 2.2 inches, a width at the convex cutting edge of 1.2 inches, and a width at the poll of .8 inches. Its weight is half an ounce. The bit is beveled on the under surface only, the sides are cut or ground flat and converge towards the poll. The under surface follows the natural curve of the shell as well as the outer surface.

Squid lures may be gathered by hundreds at house sites and along trails. They are large, cowry shells in the ends of which small holes have been broken or bored for the cord fastening it to the shaft of the squid hook (11, fig. 14). The smallest squid lure found is 2.2 inches long, the largest 4 inches long, which is the range in length exhibited in the squid-hook sinkers. Most of the bored cowry shells have had one lip broken for the purpose of extracting the meat which the natives used for food.

Many cowry shells and some opihi shells (*Helcioniscus*) have had one end cut straight across adapting the shell for scraping. A typical specimen (B4139) is 2.3 inches long with a cutting edge of 1.4 inches. Only one of these shell objects has a hole bored in the end opposite from the cut end and this, I believe, is a squid lure converted into a scraper.

On a house platform at Mamaki lay five pieces of pearly shells which have been filed in the process of making hooks. One fragment (B4154a) shows the upper part of the shank of a trolling hook (*pahiaku*) for *aku*, filed through on one side and half way through on the other. The width of this file cut is .28 inch and the depth .17 inch; the bottom of the cut is no wider than a thread. The sides of the upper part of the groove form a wide V, the sides of the lower part a narrow V. Into the wide, upper V fits perfectly the large coral file (fig. 11, *b*) found near this shell. The cut must have been started by this tool and then deepened with a very much narrower file. If completed this *pahiaku* would have been unusually large, with a shank 1.3 inches wide, the upper part including the cardinal tooth region of the pearl shell. The other four fragments of shell (B4154) on the platform have had pieces filed from them.

Two shell ornaments from Lanai duplicate the shape of the well-known whale tooth pendant carved into a hook. One of these (L1070) is 2 inches high with a shaft 1.2 inches long and .4 inches wide. The hole bored transversely through the base of the shaft is formed by two conical pits meeting at the center of a perforation .1 inch in diameter. The other shell pendant (B177) was found by Mr. Stokes at an old burial ground in the sands west of Awalua. It is 2.6 inches high; the shaft, 1.6 inches long and .7 inches wide. The hole through the shaft is .3 inch in diameter.

At the same location Mr. Stokes found also a perforated boar's tusk (B176). The tusk is 2.9 inches long and the perforation, 1 inch from the base, has been formed by the meeting of conical pits .2 inch wide at the surface, bored into the center of the ivory.

On a house platform at Keone I discovered a dog's tusk with a needle-like perforation at the base.

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OBJECTS OF WOOD

Objects of wood found on Lanai include house timbers, canoe pieces, canoe models, a carrying stick, tapa anvil and tapa beaters. Tentative identifications of the specimens have been made by Forest B. H. Brown.

HOUSE TIMBERS

A charred side or corner post (B4464) 4.5 feet high, of naio wood (*Myoporum sandwicense*) lay next to the house platform on Kapoho heiau—the only remnant of a thatched house in the vicinity. The carbonized surface runs up the back of the post from a clear ring 10.5 inches from the bottom and suggests strongly that the timber was attacked by fire while standing upright in the house, and indicates that about 10 inches of the post were planted in the ground and perhaps more as the end tapers as if once sharpened to a point which has broken off. The maximum diameter of the post, near the bottom, is 3.5 inches; the diameter at the top is 3 inches. The surface of the timber has been left in its natural shape.

The top of the post ends in a tenon 2.5 inches high, on the outside. The flat notch back of this prong, for the plate, is 1.6 inches wide. On the outside of the post below the tenon is a downward-curved transverse groove, beveled on the lower side, for the lashings binding the rafter and plate to the post.

The corner post standing at a house platform at Lopa (p. 43) is similar in form, and possibly in material.

In a hiding cave of Keone gulch with two strips of koa boards (p. 92) was a house rafter (B 4040) of ohia lehua wood (*Metrosideros sp.*). The rafter is 7.5 feet long and tapers from the mortised end, which is 2.8 inches in diameter, to 1.6 inches in diameter. The sides of the post are dressed by bevels. The heel on the inner side of the lower end of the post is cut half way into the post 1.5 inches from the end; the two lateral prongs of the fork on the outer surface are each 3.5 inches long, measured from the bottom of the notch between them.

A cache of five other house rafters in lava tubes at Honopu was found by Hector G. Munro. The sides of each rafter are partly dressed and each tapers from the mortised end and is otherwise shaped like the rafter from Keone gulch. Each rafter was naturally bowed slightly outward near the mortised end. Four of these rafters (B 7691, B 7692, B 7693 and B 7695) are of pua wood (*Osmanthus sandwicensis*) and their lengths are respectively 7.8 feet, 7.5 feet, 7.3 feet and 6.7 feet. The fifth (B 7694) is 7.5 feet long and is made of lama wood (*Maba sandwicensis*).

The large end of a slender, trimmed hoawa trunk (*Pittosporum, sp.*) on the heiau at Puu Makani has been adzed flat on one side 3 inches from the end, and a transverse groove made on the opposite side, partly by cutting and partly by the wear of lashings. This end is formed exactly as the top of a rafter in an ordinary house, but the post (B 4509) is unusually long, 13 feet, and the large end, 4.5 inches in maximum diameter, instead of the small end, 2 inches in diameter, is the top of the rafter. Also, the bottom end of the timber is not cut in the fork of the lower end as is the rafter found at Keone. Possibly the lower end was naturally forked but probably the rafter rested on the ground in a house without upright walls.

Several timbers of a grass house lay on and about a platform directly seaward of the heiau of Haleaha at Lopa. Among these I observed one very unusual piece which probably once served as the lintel to a door. At Hauola I discovered an identical piece.

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The "house of Lono" on a heiau sketched by Webber (13, also 1, p. 108) has a door lintel not dissimilar to the one from Lanai. The upper edge of the lintel is represented as straight, the lower edge concave to form an arch over the door, each end of the arch supported by a flat upright. No molding is indicated along the top rim on the outside of the lintel. Freycinet (21; and 10, fig. 65), however, seems to represent a thick fret along the outside, top rim of a lintel of one of Chief Kalaimoku's houses.

The lintel from Hauola is a piece of naio wood (*Myoporum sandwicense*) 26.8 inches long, 4.5 inches wide, and 1.2 inches thick.

In one piece with the lintel is a sply molding exactly 1 inch wide and projecting 1 inch. The fillet is .5 inch wide and the fascia is set at an angle of 45 degrees: the shape and measurements of the molding are suggestive of European influence but the two lashing holes in the top of the back of the lintel, the rectangular socket at each end of the arch for the forked supporting posts, and the arch of the bottom of the lintel are native characteristics. The piece is adz hewn and, I should judge from the short, rounded chip scars on the edges, cut by stone adzes. The outside, lower edge of the lintel is bevelled. The back and top of the lintel is cracked and warped by weathering and hence one might suppose this part to have faced the elements while over the doorway, but the face having the molding is of the heart wood and therefore more resistent to weathering, and the subsequent exposure of the lintel after the demolition of the house, is not known. In considering the age of the specimen I attach no importance to the cluster of nails in the middle back of the lintel, 4 inches from the end: no nail holes appear elsewhere on the piece nor did any appear in the lintel at Lopa.

The socket for the supporting side-post is .9 by 1.9 inches and about an inch deep. The left lashing hole on the back of the lintel is 6 inches from the end; the right, 3.8 inches. The perforation consists of two rectangular slits an inch wide, one on the top and one on the side, meeting at right angles. The purpose of the lashing holes is not known.

CANOE PIECES AND CANOE MODELS

While searching for a spring rumored to exist in Honopu gulch, Hector Munro climbed to a small cave half way up its side. Within the cave were two tapa beaters, two house rafters, and a side plank of a canoe. In another very small cave nearer the mouth of the gulch he found three house rafters and three canoe end pieces, all very well concealed. These objects had all been used and had been stored in hiding to await some future contingency. In a small hole in the vicinity of these caves, Munro uncovered also a carefully worked end of a side plank of a large canoe model. I was able to add to this collection an end piece from Keone gulch which had been washed down by freshets, and the outer ends of a pair of badly damaged bow pieces from Kapoho. I also picked up a thwart at a Keone cliff shelter.

These discoveries are fortunate: they permit a description of those features of the early Hawaiian canoe regarding which information has heretofore been lacking.

No one has lived in these valleys for fifty years at the very least and

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it is altogether probable that the specimens date from the time of the pure native culture. The arid bluff caves are most favorable for the preservation of material.

The canoe usually seen today has a bow or stern piece carved out of a single block of wood and united to the side boards by a simple framed joint. The end pieces and side planks are nailed together and to the canoe body. The bow and stern pieces of the Lanai canoe consist of a left and right half which extends inward to form a very much larger share of the gunwale than do the modern pieces. The pair of end pieces were lashed to each other and also to the side planks with which they were joined in a variety of ways, and the whole was tied to the underbody of the canoe, the lashings being visible on the inside and, to a less extent, on the outside. The lower border of the end pieces is horizontal and curved to fit the curve of the canoe body; the upper border not only curves inward towards the outer end, but also upward and the whole piece leans inward to form half the bridge over the end of the canoe.

The dimensions and material of the canoe end pieces and side planks are given in the following table:

SPECIMEN NUMBER		LENGTH IN FEET	WIDTH IN INCHES	THICKNESS IN INCHES	MATERIAL	LOCALITY
B 4041	Right stern	8	2 increasing to 4.4	.7 (av.)	ahakea (*Bubea sp.*)	Keone
B 7687	Right stern	7.6	2.1 increasing to 8.5	.9 (av.)	aiea (*Byronia sandwicensis*)	Honopu
B 7688	Left bow	8.9	1.4 increasing to ?	.6 (av.)	aiea	Honopu
B 7689	Left bow	7.85	1.7 increasing to 8.5	.7 to .9	undetermined	Honopu
B 4464a	Bow pair	....	? increasing to 6.5+	.5 (av.)	hoawa (*Pittosporum, sp.*)	Kapoho
B 7690	Side plank	7.35	1.5	.7	alaa (*Sideroxylon sandwicense*)	Honopu

Difference in the technique of fitting indicates that each piece is from a separate canoe, with the possible exception of B 7689 and B 7690, but these two are fashioned out of entirely different woods. The fragments represent the trimmings of five or six canoes.

The two pieces (B 4041 and B 7687) have holes near the inner end for boom lashings, which alone would point to these as stern pieces because the rear boom of the Hawaiian outrigger is usually at a smaller distance from the stern than the forward boom is from the bow. But the absence of lashing holes along the upper rim near the outer end of the pieces for the short deck which is placed only over the forward end of the canoe, also indicates stern pieces. Conversely, the presence of ordinary lashing holes along the upper rim in B 7688 and B 7689, prove conclusively that these are bow pieces.

Each canoe piece is rabbeted on the lower inner edge to fit over the outside edge of the canoe body. The rabbet averages .4 inch deep and .4 inch wide. (See fig. 13 and Pl. VI, *D*.) Bordering the rabbet, at every six or eight inches, varying on each specimen and on different specimens, are the lashing holes for the cords binding the pieces to the dugout.

These lashing holes on B 4041 are formed by pairs of slits .7 to .8 inch long and .2 inch wide, meeting at right angles behind the rabbet and exposed by a rectangular cut in the rabbet as illustrated in figure 13. Through the slits run three, three-strand plaited coconut fiber cords.

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On the other canoe pieces the lashing slits while not so long are cut in the same way, with the exception of B 7688, which has in place of the slits, oblique holes pierced by an instrument which may have been a nail. But at one of these holes the worker had commenced the piercing by a slot which allows for three wrappings of the cord. The oblique holes are just large enough to permit the passage of a two-strand twisted olona fiber cord which is still in place. On B 7687 and B 7689 lashing cords were also in place; always sets of three, either of two-strand twisted coconut-fiber cord, or two-strand twisted olona. The coconut fiber has lasted the better.

The boom lashing holes are rectangular, .6 inch by .9 inch, and 1.4 inches apart in B 7687, and 2.9 inches apart in B 4041. (See fig. 13.)

The pair of end pieces were lashed together at their outer ends by cords passing through five complementary pairs of slots .4 to .6 inch long, .1 inch wide, and .2 inch apart (Pl. VI, *D*). The ridge formed by the juncture of the upper rim of both pieces of a pair and running back about 20 inches, is bound together by lashings through complementary pairs of the same type of slot. Where the pair of bow

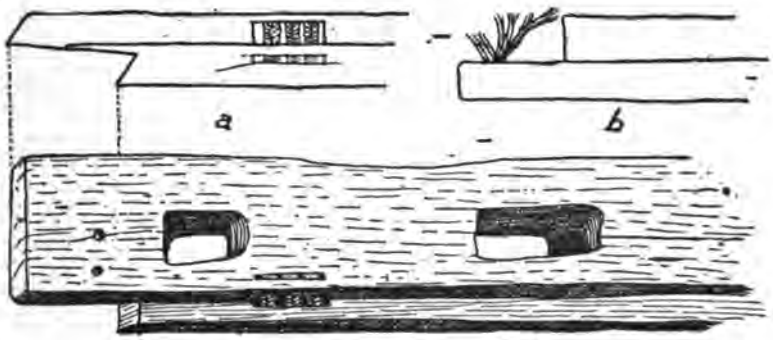

FIGURE 13.—Sketches of joints of canoe side planks: *a*, inner end of right stern piece (B 4041), inner and bottom view showing lower border rabbeted, two large holes for *iako* lashings, the set of three sewing cords of three-strand braided coconut fiber; *b*, another type of joint with lashings in place, of two-strand twisted *olonâ* fiber

pieces begin to separate, a line of single, oblique, rectangular lashing holes runs along the upper inner edge for the bindings of the platform which decked over a space of two feet between the forward gunwales. The holes are .2 inch below the rim and several inches apart.

To fit the left and right bow or stern pieces more firmly together, a vertical fret is left .3 inch from the end of one, and a complementary groove in the opposite piece. Another flange or groove for the same purpose may run along the upper, inner edge (Pl. VI, *D*).

The inner ends of the bow and stern halves are cut in various ways to form tight joints with the side planks. Specimen B 4041 has a flange projecting 1.5 inches to form the inside half of a framed joint. The ends of this joint are bevelled towards the inside (fig. 13, *a*). The same flange, without the bevelling, is to be seen on B 7687 and B 7689, but it occurs on the outside to form the outside half of a simple framed joint. (See fig. 13, b.) The left bow piece (B 7688) and both ends of side plank (B 7690) have a tenon to form a mortised joint. The tenon of the bow piece is formed by bevelling the inner and outer sides to a sharp edge intended to fit into a vertical groove; the tenons of the side plank are stout, rectangular projections, one from the center of each end. All these joints are fastened together by means of a vertically set pair of lashing holes.

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The canoe model side plank found by Hector Munro has still another type of joint, a spliced joint made by cutting the inner end from above downward and backward so as to form a pointed projection 1.8 inches long and .5 inch wide at the base. The joint was fastened by two wooden pegs (one is still in place) driven from the upper rim of the side plank.

This model side plank is 14.8 inches long, .5 inch thick, 1.6 inches wide at the inner end and .6 inch wide at the outer end. The upper rim is horizontal, the lower rim curves upward near the outer end and is rabbeted on the inside by a groove .3 inch wide and .3 inch deep. The entire piece is curved to fit the inwardly curved rim towards the end of a canoe. The wood, which is yellow-brown and soft, is from some rare tree.

In the middle of this side plank an inverted U-shaped cut has been made from the bottom, almost severing the plank, evidently to allow the passage of the boom lashings. On each side of the notch are the usual lashing slots. There are well marked traces of black paint along the upper rim of this side plank.

Mr. Charles Gay has the two canoes (Pl. VI, *A*) of a double canoe model which a native woman took from a cave at Kaumalapa'u and presented to him with the information that to sail such canoes was a pastime in the early days.

Each canoe is now detached and the connecting booms and lashings are missing. The canoes measure 11 inches long, 4 inches in maximum width, and 5 inches in maximum height. The side, bow, and stern pieces are carved in one with the canoe. Each canoe has three pairs of cleats for seats and possibly for the attachment of thwarts although the cleats are not bored with lashing holes. Directly over each cleat and through the gunwale is a pair of perforations for the boom lashings.

Two stripes of koa board found with the rafter in a cave of Keone gulch are each 17 feet long, averaging 2.5 inches wide and .9 inch thick, very skillfully planed with an adz. Undoubtedly these pieces were to be worked into canoe side boards. A sample piece 4.5 feet long has been preserved (B 4042).

With these pieces the total of native woods used in canoe trimmings is brought to seven, ***hoawa, aiea, alaa, koa, ahakea,*** and two unidentified.

The canoe thwart (B 4045) illustrated in Plate VI, *C* was in the same cave with the tapa anvil described from Keone (p. 93). It is of some heavy, dark wood evidently closely related to the *Araliaceae.* The reach of the arms is 11.8 inches. The right angle notch at each end of the bottom is intended to fit onto the canoe cleat. The curve of each end should fit the curve of the sides of the canoe. At the base of the upward, inner curve of each arm is a transverse flange, a feature which does not appear on any other thwart in the Bishop Museum. Judging from its position the flange is intended to hold the cleat lashings in place. The thwart had been submerged in salt water a long time as it is permeated with salt and its specific gravity is too great for it to float.

CARRYING STICK

In a small cave back of the beach at Kalamaiki lay a pole 2 inches in diameter and 5 feet 9 inches long of aiea wood (B 4046).

The end of the pole at the mouth of the cave had rotted, but the other end was well preserved and had a human or dog head neatly carved in the round (Pl. V, *C*). The diameters of the pole and of the carved end are uncommonly large for a carrying stick; nevertheless, the wood is very light, and the stick is curved and notched in the manner of carved Hawaiian carrying poles. Only the forehead, eyebrows, face, and cheeks of the figurehead are indicated and these simply by bevels meeting in a median line.

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TAPA ANVIL AND TAPA BEATER

Under an overhanging south bluff at Keone gulch is a dwelling platform back of which is a cave about 8 feet deep, in which were stored a tapa anvil of aiea wood and the canoe thwart (B 4048).

The anvil (B 4044) is 4.8 feet long, the flat top 2.9 inches wide, and the convex sides 4.3 inches wide. The bottom of the log is 4 inches wide and is grooved its entire length by a rough V-shaped cut averaging 1.5 inches wide and 1.5 inches deep. The lower two-thirds of the ends of the anvil are bevelled, the bevelled surface extending back 5 inches from the end plane. Both the top and the sides of the anvil have been rubbed down.

A tapa beater of ordinary form was obtained from the old native Keliihananui, living on the plateau, and in a search among the bluffs of Honopu gulch Hector Munro was fortunate in discovering in a small cave a set of two kapa beaters. All of them are made of koaia wood.

The beater obtained from Keliihananui is 14.7 inches long, and 1.9 inches square on the four faces which are grooved longitudinally. Nineteen straight grooves have been cut to the inch on two opposite sides, and 20 grooves on each of the other two sides. The handle is 7.2 inches long and tapers to the rounded butt which is .7 inch in diameter. The sides of the handle are bevelled by 16 faces. The beaters found by Mr. Munro have much narrower (1.3 inches wide), longer (8.5 inches long) faces and have a greater variation in the number of grooves. The grooves of one beater number 3 to the inch on one side, 4 on the adjoining right side, 6 on the next, and 11 on the remaining side.

The face having the fewest longitudinal grooves has also a few left and right diagonal grooves in the middle of the beater, which intersect at the longitudinal grooves. The handle of this specimen is round and smooth, tapering only a little. The other beater has longitudinal grooves numbering 4, 18, 16, and 6, taken in the same order. The handle is bevelled and tapers. The tops of all the beaters are flatly convex.

On the heiau of Kapoho, I found a beater of the same type and material as those found by Munro. It has a tapering, round handle; the outer end has been destroyed by fire.

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PETROGLYPHS

INTRODUCTION

The finding and reporting of petroglyphs on Kauai by Farley, Judd, and Stokes (43); on Oahu by Mathison, Judd, Stokes (43), and me (at Nuuanu and Moiliili); on Molokai by Kramer, Fornander, Judd and Stokes (43); on Maui at Haleakala by Forbes (7, p. 56); at Lahaina, Kaupo, and Nuu, by me (1922); at Kahakuloa by Mr. Hollis H. Hardy in 1924 (fig. 14); on Hawaii by Ellis, Westervelt, Stokes, and Baker (5, 7, 43), establishes the drawing of animal and partly conventional human forms in caves and on bowlders and cliffs everywhere, as a stereotyped practice.

On Lanai human and animal forms are carved on bowlders and cliffs, about village sites and along old trails both on the coast and on the plateau lands. The forms are not numerous and are identical with many found elsewhere in Hawaii. They have become inconspicuous on account of the growth of moss and lichens and the effects of weathering. The present natives lay no claim to such pictures as their handiwork although many of them are fond of carving their names along trails now in use. These picture carvings or petroglyphs seem to have escaped the attention of the younger natives. A few of the oldest natives remembered seeing them but only two attempted an explanation.

C. N. Forbes, Botanist of the Museum, saw petroglyphs at Kaunolu, in 1913, and George H. Munro, Associate in Ornithology, has long known of petroglyphs at Luahiwa and Palawai. They were the first to report the existence of these interesting carvings on Lanai.

It is hoped that a rather full description of the petroglyphs on Lanai, while long and tedious from lack of variety, will emphasize the extent and manner of the practice and serve as a guide in the comparative study of Hawaiian petroglyphs.

I have used the following descriptive terms: bruised, meaning shaped by rubbing; abraded, meaning shaped by hammering and rubbing; and pecked, meaning shaped by hammering with a sharp-pointed instrument.

PETROGLYPHS AT LUAHIWA

Petroglyphs are widely distributed on Lanai. Those at Luahiwa, although not the largest group, exhibit nearly every form. They are inscribed on twenty bowlders scattered over an area of three acres at the base of the steep slopes leading into Palawai basin, on either side of the

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boundary line between Kealiaaupuni and Kealiakapu. (See fig. 15.) Nowhere on Lanai is there such a variety of forms or such a crowding of old and new petroglyphs or so many examples of stratification but nowhere has weathering been more active. A painstaking study of bowlders 8, 12, 13, and 14, after one had become thoroughly acquainted with Hawaiian forms of petroglyphs and accustomed to distinguish between the

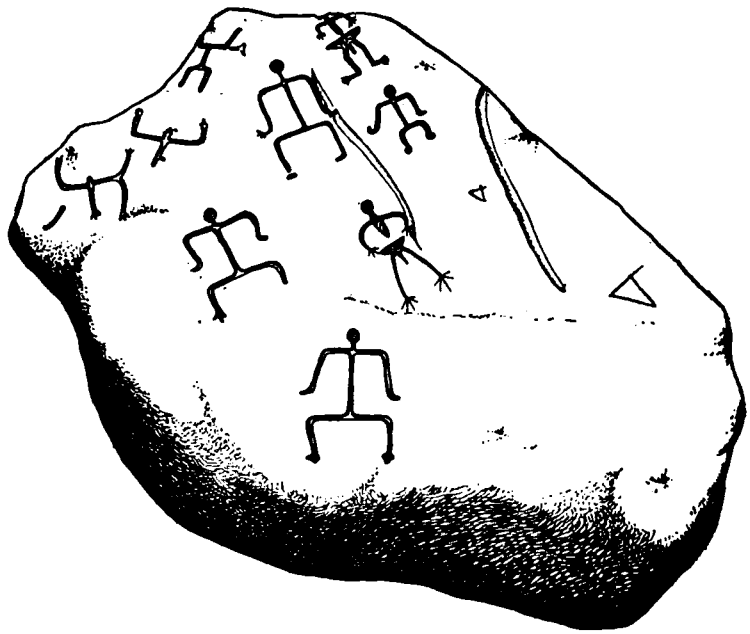

FIGURE 14.—Sketch of under surface of flat bowlder, weighing 2 tons, plowed up in pineapple field near Kahakuloa, Maui. Petroglyphs appear on this surface only. Shoulder width of bottom figure is 4.5 inches. Weathering of the stone and its original location indicate it had been deliberately overturned and had long lain face down. (Drawing by Muriel Mattocks from photographs and sketches by Kenneth P. Emory.)

natural and artificial, undoubtedly would reveal many familiar and many unique forms and throw light on the relative age of those forms.

In the following description of petroglyphs the form of each figure is human unless otherwise stated:

Bowlder 1. See Plate VII, *A*.

Bowlder 2. Thirteen linear figures on down-hill face (Pl. VII, *B*) and 2 small linear figures on top.

Bowlder 3. Face much softened by weathering. Three dogs at one end in a row all facing in, above them 2 linear male figures, and off to one side, another dog. In middle of rock face a large, square-cornered D which appears again as solitary

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mark on bowlder in center of field. At other end of rock 4 triangular figures, 2 having one arm raised as if in dancing pose. Also 1 dog.

Bowlder 4. Single linear figure, one arm up, and several figures so faint as to be unrecognizable.

Bowlder 5. See Plate VII, *D*.

Bowlder 6. Several linear figures.

Bowlder 7. Two figures with spindle-shaped, solid bodies, left arms upraised, straight lines for hands and feet (fig. 17, *m*). Two simple linear figures between. Another spindle-shaped figure below and a dog, mouth open, to left of it. Spindle-shaped figures seemingly made by same person, or else perfectly imitated.

Bowlder 8. Twelve feet high and 11 feet in circumference. Many figures cut from time to time, only those deeply cut or isolated are traceable. Only 7 linear, 4 triangular (one riding a horse), and 2 columnar figures could be made out on the uphill face; and 1 linear, 2 columnar, and 10 triangular (another on a horse) figures on great north face. This north side has a maze of lines over an area of 2 square feet which I have not attempted to reproduce. It is possible to chalk them for photographing in a dozen different configurations, none of which are intelligible and

FIGURE 15.—Sketch showing position of petroglyph bowlders at Luahiwa. The numbers refer to bowlders described in the text.

so not in keeping with known forms of Hawaiian petroglyphs. It is not unreasonable to suppose these lines, which are 8 feet above the ground, may have been caused by the broken end of a waving tree branch; I have seen deep scarring made on a soft bowlder face in this way. But 12 inches to left there is a triangular figure (fig. 16, *c*) with streamer from each arm, also 8 feet above the ground. Other figures are 5, 6, and 7 feet above the ground, indicating that soil at base of bowlder has washed down; that a stone or tree or the shoulders of another person were used as a prop; or that the person who made the petroglyphs was of full stature. There are 3 other bowlders at Luahiwa with numerous lines which I have not been able to interpret: 2 of these mazes are shown in Plate VIII, *B, E*. Judging from several which with study have resolved themselves into simple overlapping figures, there is no cause to take them as mysterious symbols. These puzzles cannot be studied fairly from sketches or photographs unless incised on rock that is hard and the resulting lines unmistakably artificial. West face of bowlder is the most extensive but being hard and uneven, is the most unfavorable for carving: and near top a large figure of dog, mouth open, lightly but clearly bruised. To make this picture it was necessary to stand on a natural shelf half way up the face. The south face of bowlder has evenly distributed, 11 linear and 4 triangular human figures, and 4 dogs. Three or 4 linear figures on flat top of the bowlder. Most conspicuous figure on south face, a wedge-shaped triangular body, 6 inches wide, at the top 2 feet long, with muscular legs attached, similar to form in Plate VII, *F*. At one corner of bowlder is linear human figure with body partly buried by soil, which has crept

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down onto this side of bowlder. Removing grass and digging down a few inches revealed legs, shown in Plate VII, *H*.

Bowlder 9. Four distinct and 4 indistinct linear human figures. A few feet east, small stone with linear figure.

Bowlder 10. See Plate VII, *F*.

Bowlder 11. See Plate VII, *E*.

Bowlder 12. Twelve feet high on down hill face and 14 feet in circumference, about 135 figures. West, or down-hill face, and north face scarred by many carvings in manner similar to Bowlder 8, but including large number of distinct figures. (See Pls. VII, *C*; VIII, *A-D*, and fig. 16, *d*.) To right of figures illustrated in Plate VII, *C*, are 3 outlined figures, left arm upraised; and to left, are 2 dog figures, 2 linear and 5 triangular figures. About 30 feet southwest of this bowlder is a stone with dog figure and several indistinct figures; west, stones with several faint triangular figures; and north on a stone at corner of Luahiwa shrine for causing rain, 3 triangular horseback riders cut upon other figures in soft rock.

Bowlder 13. A columnar human figure occupies solitary position on south end of bowlder, which is outside picture (Pl. VIII, *E*).

Bowlder 14. When in the field I could make out clearly only 2 figures, an animal and a canoe (Pl. VII, *G*). I have since distinguished with certainty from photographs the unique row of forms in figure 17, *c*, a dog with a spiral tail superposed on the canoe, and human figures elsewhere.

Bowlder 15. See Plate VIII, *F-G*.

Miscellaneous bowlders. Near top of slopes a large bowlder has a few linear figures. Other bowlders in vicinity are without trace of petroglyphs.

THE PETROGLYPHS AT KAUNOLU

For half a mile along the edge of the banks of the little valley which opens onto Kaunolu bay are numerous clumps of small bowlders, the smoother of which have petroglyphs. For purposes of description I have separated this bowlder-strewn region into four areas. (See map, Plate II.)

AREA 1

On floor of large house platform is a figure cut on under side of a small stone:

The body, an inverted triangle, is 9 inches wide at shoulders, outlined by a lightly but sharply scratched line and filled in solid by tiny gashes made by pecking with pointed stone. The head, resting on shoulders, formed entirely by pecking Arms absent and legs, if ever present, are on the part of rock which has split off. Stones on insides of the platform have figures cut after platform was built or which were noticed when the stones were set in the platform, as figures are all in an upright, conspicuous position.

A stone (B 4156), from side overlooking valley, has solitary triangular figure vaguely bruised upon it. The bruising did little more than erase black weathered surface of rock, revealing brown undersurface. This suggests that color of fresh mark was depended upon to give form to the picture. As freshness of the bruise disappears, so will the figure. This may account for the fact that the linear form with limbs at right angles, left arm upraised, on the northwest cornerstone of the

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platform scarcely shows either head or body; but arms and one leg are deeply channeled, while only a slight depression marks body and head. Two figures appear on middle stone of north wall (Pl. IV, *B*, fig. 16, *e*) and in house platform a few other stones with faint marks which are possibly traces of petroglyphs now weathered beyond recognition.

Ten yards north of platform at beginning of a clump of petroglyph bowlders, the first has on east face, form illustrated by figure 16, *h*. On west face, among some scratches which are attempts at human figures, are forms reproduced in figures 16, *k*, *i*. South face shows figure 16, *g*.

On the south face of next bowlder are five figures bunched together, arm or foot of one shades into next, a common occurrence in a group of human figures. Four bodies are triangular, one rectangular. On north are two indistinct, bruised figures and two incomplete, scratched ones. Third bowlder has three solid triangular figures in row, ranging from large to small, arms joining, middle figure almost rectangular, others distinctly triangular. On small stone back of this bowlder a male form with a long left arm and a missing right arm. (See fig. 16, *l*.)

At first shelter on map (Pl. II) are ten petroglyph stones, among them a rock with two sides at right angles, freshly and evenly cleaved. Cut in the top of the rock are twelve roughly parallel lines from one to one and a half inches apart and running at right angles to the edge. At first sight, I supposed these lines marked places to cleave the stone, but as dressed stone appears in no structures on Lanai and as many bowlders have cleaved naturally in halves and quarters, I believe these marks are simply the beginning of a checker board like the one shown in Plate IX, *H*. The lines are the same distance apart, though a little deeper than in the last checkerboard. A stone in west part of shelter abraded with figure in Plate IX, *A*. Stone adjoining has male linear figure with left arm and leg joining the right arm and leg of another figure having an oval-shaped body, sex not indicated. Several scratched, triangular, outlined figures, on a large slab under wall of the shelter, prove their existence previously to the time of its erection. A stone which stands at lower end of shelter has deeply abraded figure cut through yellowish surface of the rock into dark core. On opposite face two abraded outlined triangular figures have long necks with heads marked by usual cup-shaped depression. On a small bowlder west of shelter is figure 16, *n*. East of shelter on smooth, fresh surface of a bowlder which has split away from one above it, is one triangular outlined and one indistinct bruised figure; painted in white lead across these petroglyphs is name, "D. K. Kaenaokalani." The paint was brought into the valley in 1895 for use on windmill, as I learned from Kaenaokalani, aged 55, living in Lahaina. It was lavishly used by a few natives in repeating their names along both sides of bluff. There are native names deeply carved on the bluffs, but the name "D. K. Kaenaokalani" is the only one I have seen away from the bluffs. Kaenaokalani did not remember noticing in 1895 any of the petroglyphs, not even the two across which he painted his name. On the weathered side of this same bowlder are forms shown in Plate IX, *B*. On bowlder towards house site (background Pl. IX, *B*) is one bruised triangular figure, arms down, head on pedestal. On north face are two slightly scratched triangles, one abraded triangle and possibly one or two bruised figures.

Rock slab few feet from southeast corner of house site has solid triangular abraded figure, with flipper-like arms as in figure 16, *o*, and to left, several haphazard, very deep scratches. On the corner rock of house site are one pitted and abraded figure, and one scratched, triangular, headless figure.

On stone under south wall of house site is one abraded triangular figure with muscles on the left arm, right arm and legs indistinct. On three other stones under house site are five figures, four scratched and one male figure with muscles and a head marked by a horizontal sharp cut. These petroglyphs were of course made before the house platform was built. On east side of platform is figure 16, *o*. Ten

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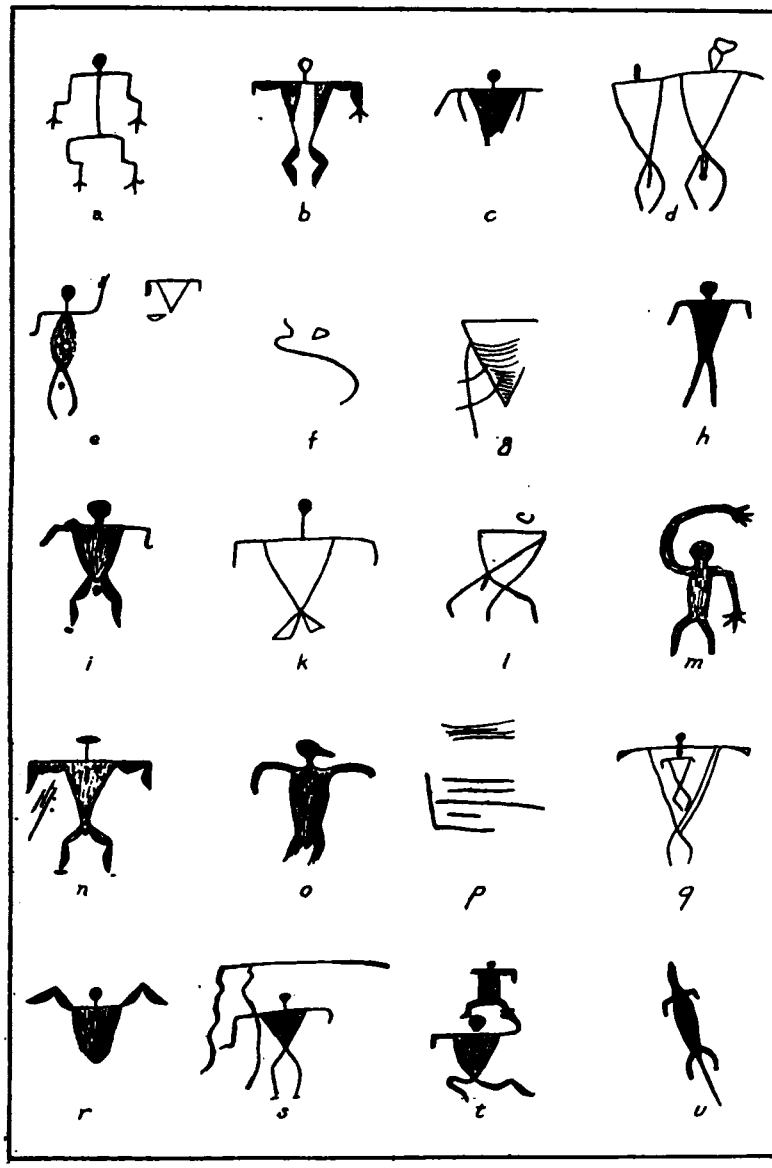

FIGURE 16.—Drawings of petroglyphs: *a*, from Hawaii; *b-t*, from Lanai; *u*, from Maui: *a*, Kamooalii, Kau, Hawaii (from photograph by Rev. A. S. Baker); *b*, Kaunolu, made by pecking, legs disjoined at hips; *c*, Luahiwa, bowlder 8, streamer from each arm; *d*, Luahiwa, figures found at the right of those shown in Pl. VII, *C*; *e*, Kaunolu, Area 1 (Pl. IV, *B*), figure on right outlined by scratches, muscular arms and legs were being added when cutting stopped; figure on left, pitted, barrel-shaped body, head and limbs abraded, brings out contrast of color between surface of rock and its interior; line usually indicates male sex, dot perhaps intended for same purpose; *f*, Luahiwa, bowlder 13 (Pl. VIII, *E*); *g*, marks sharply cut with lines draped across [human figure at Puako, Hawaii, has lines filling triangle but running vertically (6, p. 51)]; *h*, Kaunolu, Area 1, hammered out deeply; *i*, Abraded, dot representing male (?) sex, lump on shoulder caused by weathering; *k*, Kaunolu, Area 1, scratched; *l*, Kaunolu, Area 1, male form with long left arm across left leg; *m*, Kaunolu, width, elbow to elbow, three inches; *n*, Kaunolu, Area 1, muscles on arms and legs; *o*, Kaunolu, Area 1, pitted male, beaked figure, flapper-like arms; *p*, Kaunolu, Area 1, scratches probably made in trying point of an instrument, larger scratches an inch apart; *q*, Kaunolu, Area 1; *r*, Mamaki; *s*, Kaunolu, Area 1; *t*, Kaunolu, Area 2, man running. (Compare fig. 17, *u*.) Baker (6, p. 50) illustrates similar figure at Puako, Hawaii; *u*, lizard on cliff, Kaupo, Maui, painted with red ochre.

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inches to right, on another stone, is similar figure with beak not so distinct; the body is longer and the legs, akimbo, touch at feet. A stone on top of house platform has small, scratched, triangular outlined figure. On north side of house site are two great flat stones lying embedded in soil pitted with holes for *konane*. (See Plate IX, *D*.) On flat bowlder a few feet away is an abraded solid triangular figure with flapper-like arms. Nearby was stone with an abraded triangular figure (B 4158). Lying parallel to west side of platform is bowlder with three figures: one linear with flipper-like arms, one triangular with arms and legs at right angles, and one indistinct. Twenty feet below north-east corner of house site are two petroglyph rocks one on top the other; upper has a solitary, triangular, male figure, muscles on limbs, arms at right angles, legs akimbo; lower rock shows figure 16, *s*.

Two stones are set in front wall of heiau platform and another at base of south-east corner, each with very carefully cut triangular figure, right side up, facing the outside. One of these is shown in figure 17, *h*. I had not the means of overhauling the tons of rock in the heiau, but a short search resulted in finding two marked stones. Within the south wall one stone showed traces of pecking and abrading. On small platform against north wall was flat stone later used as grindstone, with unmistakable traces of petroglyphs on underside: one small abraded outlined triangular human figure, shoulder width 3 inches, and one animal figure. It would be necessary to assume that the slab on the altar was in this position originally to state conclusively that the triangular-bodied petroglyph was a form in existence prior to 1780. Evidence so far seems to point to a date which was within the old regime of native culture.

The first group of bowlders southwest of heiau has only four petroglyphs that are clear: outlined triangle on one stone, and three triangular bruised figures on another, one of which has a single horizontal line drawn under it—a mark which accompanies a number of human figures. Clump of large bowlders just west of the heiau have the most interesting petroglyphs at Kaunolu in form, execution and evidence of relative age. First bowlder is illustrated in Plate IX, *C* and *E*.

On section of bowlder shown in Plate IX, *E*, are one abraded, outlined figure and several indistinct, pitted figures. The face on the bowlder opposite shows two triangular figures, one linear figure, and deep scratches shown in figure 16, *p*. Back of same bowlder has two triangular figures; one bruised and one incomplete, scratched. Next bowlder has a solid triangular abraded figure, muscles on legs only; on another face is abraded figure, shoulder width three inches, with arms curved down as shown in Plate IX, *C*. North face of bowlder next up hill has solid triangular bruised figure, shoulder width four inches, another surface has a large scratched triangle. Northernmost bowlder is pictured in Plate IX, *F;* just east is a flat stone with five figures: three triangular scratched, one linear bruised, one rectangular bruised. One of the triangular figures has small, complete figure within. (See figure 16, *q*.) Facing last stone is bowlder shown in Plate IX, *I*.

Next bowlder south has two figures pitted and abraded: triangular body, arms missing on account of weathering, legs with muscles; columnar body, legs curved. Southernmost bowlder of the group has one incomplete, scratched figure and one figure apparently in relief. (See Plate IX, *G*.) Of three bowlders isolated to the south of this group, the first shows two solid triangular figures three inches apart; the second, a solid triangular figure; the third, a figure with arms upraised.

On the cliff below the heiau and about fifty feet north of it, are only two figures: linear bruised figure, both arms raised; an armless triangular bruised figure. The bowlders above this part of the cliffs have a number of human figures—nine on nine different bowlders; four of which are bruised, four abraded, and one scratched. One bowlder has a male and two figures on which the sex is not indicated. Among rough bowlders on top of the bank in direction of sea cliffs, are four bowlders which display a total of five small, bruised figures.

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Area 2

First bowlders on south and at edge of valley have a large and a small triangular figure, bruised.

Flat top of adjoining bowlder shows two figures (fig. 16, *t*). On side a triangular, male figure showing five fingers is deeply cut into soft rock. Four bowlders north is a triangular figure. (See Pl. x, *E*.)

Above this figure, on another stone, is pitted male figure shown in Plate x, *A*. Above this stone and to left, on the top surface of another bowlder, is an outlined triangular figure, pitted in broad lines; many others scratched below. Three bowlders farther north, a single figure pecked in broad lines with arms down. Below this on north face of an upright bowlder is a solitary pecked figure with left arm upraised; muscles represented on legs. The opposing face of next bowlder shows two bruised triangular figures holding spears over their heads; back of this stone appears a checkerboard. (See Pl. ix, *H*.)

About the middle of the clump of bowlders, on the valley side, one face of a bowlder has triangular figure, right arm up, and appears to be freshly bruised. Around corner is linear figure shown at extreme left (Pl. x, *C*). Immediately below last figure is an incomplete triangular figure unchalked and, therefore, not showing in the photograph (Pl. x, *C*). Group of three figures showing in center of photograph abraded through a red patinated surface into a light gray. Figure of a dog abraded on very rough rock at left, one of the few at Kaunolu, is nine inches from nose to tip of tail. Most bowlders with coarse, irregular surface skipped by petroglyph artists. To the right of the dog shown in Plate x, *C*, is a linear figure, measuring six inches from elbow to elbow and posed with right arm upraised; grooves have been rusted giving it red color in bright contrast to the surrounding black, of course, unintentional. Below red figure is upper part of triangular figure, lower part faded away by weathering.

Bowlder on the north end of area has bruised triangular figure with arms and legs missing. Among the middle northern bowlders are six solid triangular figures pecked on tops of five embedded bowlders, one, a male figure, is shown in Plate x, *G*. Stone fifteen feet north of checkerboard has one solid triangular pecked figure, a few feet farther north is another with muscles indicated and still further on is an abraded outlined figure, legs indistinct.

Area 3

Bowlders are as plentiful at Area 3 as at Area 2 but are less suited to carving.

Bowlder at north edge of paved house platform (Pl. 11) has three bruised triangular human figures with bruised figure to left. These marks very fresh but are so crude that forms are not clear. On opposite side of clump of bowlders, on the most favorable rock for cutting pictures, are four distinct, bird-like figures. (See Pl. x, *F*.)

On rock below, not visible in the picture, are pecked four large triangular figures with muscular arms and legs. Opposite spear man on stone not visible in picture is a third man holding a spear over his head. Stone lying detached at southwest corner of bowlder pile has several deeply scratched triangular figures, lowest having five toes. A stone next south has two pecked triangular figures enough alike to represent twins, are similar to the bird-like figures Plate x, *F*, except that no bill is represented; may have disappeared through weathering. In middle of terrace on

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the edge of the valley was a small stone with one scratched, triangular, outlined human figure (B 4154) with muscles clearly shown as in figure 17, *h*. Another stone in terrace has a scratched male triangular figure, outlined. At foot of terrace two solid triangular figures are bruised, larger one holding spear horizontally over head. The spear is represented sometimes held with one end higher, sometimes the other. A stone on top of terrace has three outlined triangular figures pecked, arms of two of them are upraised.

Below southeast corner of house site is bowlder face in Plate x, *B*.

Along the upper face of bluff first figure to attract attention is a large solid triangular form with muscles. A line drops from the left arm as with a petroglyph in Plate VIII, *A*, and figure 16, *c*. A little farther on the name Kuuhoa (translated: my friend) is pecked. Fifty feet farther four bruised figures, one outlined and one solid triangular male figure are holding spears horizontally over their heads.

Another fifty feet farther north, bowlder half way up bank has at least two spear men, abraded; outlines not clear, the grooves appear to have weathered as much as surface of rock; on another face abraded solid triangular figure both arms up, a line attached to the head extending upward four inches, under the left arm is a smaller figure, bruised.

The bluff above this bowlder has two linear figures, bruised, one having both arms up. On a large bowlder below last a single solid triangular figure.

Two hundred feet up valley on edge of bluff is a solid triangular human figure with muscles. Fifty feet farther on, above cave (Pl. 11) are two pitted linear figures; one has left arm raised and has five fingers. Necessary for native to stand on a ledge a few inches wide, seven feet below top of the highest of the two figures in order to make these last two petroglyphs. This fact excludes possibility that these petroglyphs were made by children.

Area 4

A bowlder on edge of valley has bruised dog and solid triangular human figure; bowlders in middle of group have score of triangular human figures, some outlined and others solid; some bruised or abraded, others scratched. Two bowlders on south edge are covered with linear bruised figures, shown in Plate XI, *A*.

Other Petroglyphs at Kaunolu

Site 15 (Pl. 11) has a bowlder with one abraded, solid triangular figure, right arm upraised; few yards in front a stone has another such figure with left arm upraised; third stone has two linear bruised figures, both arms raised.

Petroglyphs on east bank few and scattered.

Two hundred feet from sea, on bluff, is form, figure 16, *b*. The name P(?)uhiea pecked below it, appears as much aged by weathering as form. A hundred feet farther up valley another form has been cut at base of cliff, a solid, triangular male figure with initials written across it and many names about.

At left of trail as it bends to leave the valley is form, figure 16, *m*, shoulder width three inches. Farther along on cliff are abraded human and dog figures and

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still farther up valley on edge of the bank a number of bowlders display crudely bruised human figures. Here also is located stone, Kanemakua, with large figure (Pl. x, *H*); base of stone also has several forms.

A rock tower (Site 30, Pl. 11) covered with small bruised figures (Plate xi, *G*). At head of trail into Kaunolu valley are two bowlders with figures bruised on them. Among house Sites 18 and 26 (Pl. 11) are bowlders with bruised figures; a few figures are to be found on Palaoa hill. One bowlder used as part of shelter has many indistinct bruised forms (Pl. x, *D*).

A mile up the trail, just below the pipe line and fifty feet east of trail a large bowlder displays one dog figure, two pecked linear human forms. A few bruised figures even further up trail.

All petroglyphs seen at Kaunolu and not herein described are included in Table 1 (p. 107) and Table 2 (p. 112).

PETROGLYPHS ELSEWHERE ON LANAI

The petroglyphs at the first two small village sites along the coast east of Kaunolu are a repetition on a smaller scale of those at Kaunolu. The paved trail which dips into the cove of Mamaki, passes between rough bowlders a few of which have triangular bruised figures. But on east bank, several hundred yards from edge, is large clump of bowlders shown in Pl. xi, *D*, displaying a few new types.

At Kuahulua, on bowlders topping the west bluff, thirteen bruised triangular figures within radius of fifteen feet; not more than two petroglyphs are on one bowlder face; on the east bank are five more such petroglyphs, one with an arm upraised. On foot of the south bluff of Kaumalapa'u bay seven figures spread over a distance of twelve feet, largest six inches high, freshly bruised and rudely made; the bodies are triangular, arms down, four figures outlined. Kalamanui has only one petroglyph, on bowlder face next to trail where it crosses the stream bed. (See fig. 17, *a*.) Kalamaiki bay has one bruised linear figure on a bowlder near stream bed, but at cave dwelling near top of north bank are two outlined triangular human figures and one dog. The largest figure has left hand upraised; four fingers on each hand and a line extending upward from shoulder as in the central figure of Plate XI, *D*.

At Kaena point proper I have seen only one petroglyph—a human figure, faintly bruised, but a mile south along the coast at Kalaehole bay is a group of petroglyphs on the north side of the valley on the largest bowlders. Here the first petroglyph is an unmistakable picture of a rooster (fig. 17, *r*); on the next bowlder face are six bruised, triangular human figures; one has five fingers and short streamers from each arm similar to fig. 16, *c*; one has form shown in 17, *e*, A bowlder twenty feet up valley has four human forms and four goats, so recently scratched that the marks appear as fresh as though just drawn. (See fig. 17, *t*.)

Several hundred yards southeast of Luahiwa on the foot-slopes of the ridge which bounds Piliamoe gulch are two marked bowlders at head of four artificial terraces. (See Plate xi, *B* and *C*.) A hundred feet out on the flat below the last bowlders and a hundred feet northeast of the watering trough, a rough bowlder has twelve linear figures distributed on all four faces, two of them shown in figure 17, *o*; extra bend in leg occurs in two other figures on this bowlder. At foot of ridge bounding Piliamoe gulch on south and at edge of a kukui tree grove is bowlder with two animal figures. (See Pl. XI, *E*.) A flat-topped bowlder on the south edge of the grove and at the mouth of Koi valley has two large linear figures deeply grooved. A bowlder at the very edge of the water course has an outlined triangular figure. Near mouth of Koi gulch, south several hundred yards, are two

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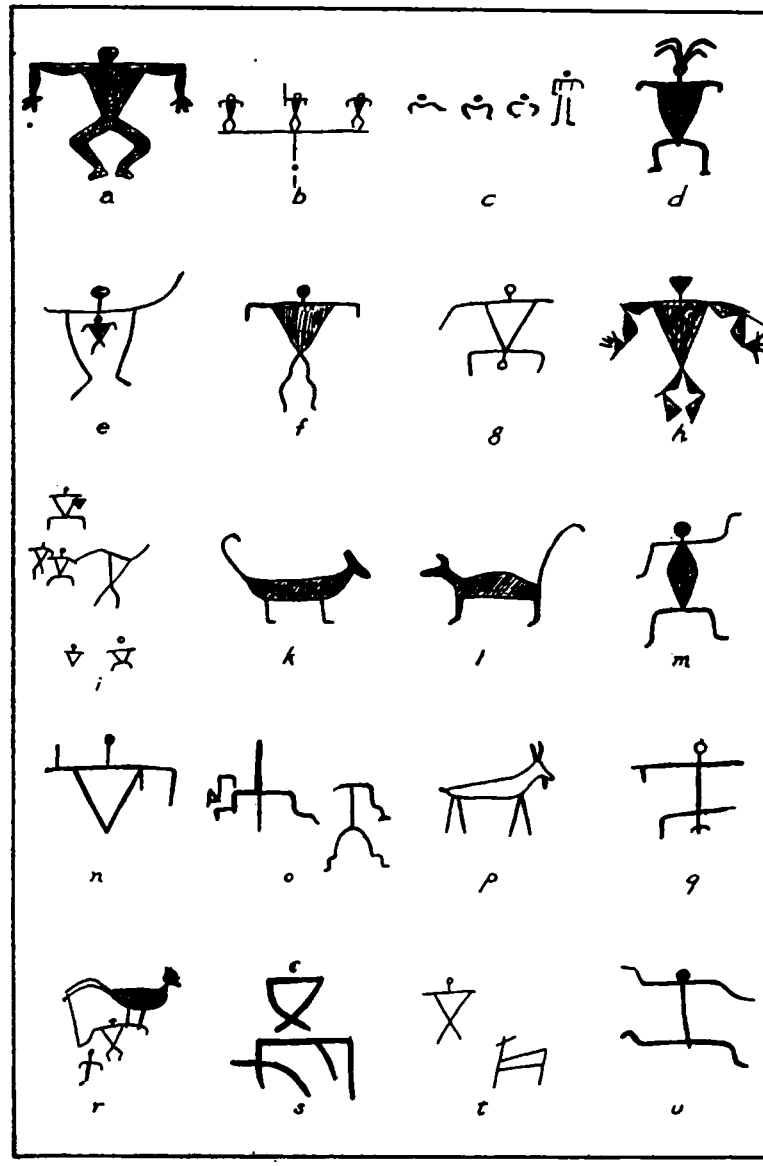

FIGURE 17.—Drawings of petroglyphs from Lanai except *b*, *p*, and *l*,: a, Kalamanui, width elbow to elbow, 10 inches, deeply and carefully pecked; *b*, gourd design, representing a native dance, from illustration by Choris (12, p. 103); *c*, Luahiwa, bowlder 14; *d*, Kapu'a, man with headdress, arm width 6 inches; *e*, Kalaeahole, legs unjoined at hips, human figure within; *f*, Kahue (compare wavy legs with wavy lines, figure 16, *s*); *g*, Mamaki; *h*, Kaunolu (B 4155), from front wall of Halulu heiau platform; *i*, Mamaki, on inside of rock shelter; *k*, Kahue, length 7 inches; *l*, Nuuanu, Oahu, dog; *m*, Luahiwa, bowlder 6, height, 6 inches; *n*, Poaiwa; *o*, Piliamoe; *p*, tattoo design, goat, from illustration by Choris (12, p. 107); *q*, Poaiwa, height, 9 inches; *r*, Kalaeahole, body of rooster 9 inches long, overlaps a human form, both bruised; *s*, Panipaa (fig. 7 *a*), possibly a crude representation of man riding horse, grooves badly weathered; *t*, Kalaeahole, man and goat, shoulder width of human figure, 4 inches; *u*, Lopa, man running, height 4 inches.

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petroglyph bowlders. One has twelve triangular human figures and the figure of a dog. (See Pl. XI, *I.*) A bowlder face opposite has a solitary triangular human figure.

Search among numerous bowlders of upper Kaohai and Kamao districts resulted in finding only one stone with petroglyphs. (See Pl. XI, *F.*) This stone is shaped like a turtle's back and lies west of the trail in the middle of a hollow.

Two hundred yards west of Kapu'a gulch, on the southeast coast, near foot of hill slope, and directly behind a stone platform (p. 69) are seven men carved on two bowlder faces. One form on each face has the plumed head piece shown in figure 17, *d*. West bluff of valley has several triangular and linear figures, and one dog figure. One solid triangular human figure has a short streamer from each arm. At Awehi valley is a solitary bruised linear figure, four inches high, on bowlder near stream bed at base of west bluff.

At Lopa, one hundred feet towards sea from Haleaha heiau, bowlder faces shore with two bruised linear figures, six inches high, hands upraised. On top of another bowlder fifteen feet away is running man (fig. 17, *u*). A bowlder embedded in the south bank of Kahe'a heiau (fig. 5, *c*) is carved with figures in Plate XI, *H*.

At south corner of Panipaa heiau on northeast coast (p. 68) a bowlder has abraded marks shown in figure 17, *s*. Several bowlders in lower margin of village site at Kaimuhoku have human figures; the flat top of the first has three linear male figures; next bowlder northwest has solitary triangular bruised figure; the next bowlder, southwest, a linear figure, left arm upraised on both the south and west faces. Figures faint, suggest may have been many more which have not withstood the sand blasting to which bowlders are exposed. On north bank of Poaiwa valley against a house site at the foot of ridge are eight or nine faintly abraded petroglyphs on lee side of three bowlders; middle bowlder has linear man (fig. 17, *q*), the south bowlder has triangular form (fig. 17, *n*).

An upright bowlder and the most conspicuous several hundred yards back of Keonohau bay, has five bruised linear figures; two male; all have arms down where arms can be clearly made out. About three hundred yards up Kahue valley on east bluff, four animals are abraded: two are similar to that shown in figure 17, *k;* in two, tail curves down as with the animal petroglyphs of Nuuanu, Oahu, shown in figure 17, *l*.

Stone on the edge of bluff overlooking two house sites farther down the valley has one animal and two linear human figures. A hundred yards from bluff are sixteen bruised triangular figures on four bowlders, seven outlined. Fifty yards toward the sea are three bowlders with five or six linear and two triangular human figures, one with unusual legs is shown in figure 17, *f*. (Compare wavy lines in figure 16, *s*.)

METHOD OF MAKING PETROGLYPHS

Stone hammers, pointed stones, and irregular flakes of basalt were certainly the usual tools by which the petroglyphs on Lanai were made, and may often be picked up at petroglyph bowlders. Most of the workmanship of the carvings is quite crude. A hard surface was chiseled or hammered with a pointed stone and the form left with the pits showing, or else scraped down, probably with the same point, leaving a well abraded surface. Soft stone was sometimes scratched with a very sharp flint, but if it yielded a color change upon slight abrasion it was often simply bruised.

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The method of making petroglyphs by bruising was employed especially in filling in solid the body or head of a figure.

REPRESENTATION OF HUMAN FORMS

The configuration of all petroglyphs discovered on Lanai having a humanlike form are recorded in Table 1, in which the numerals indicate

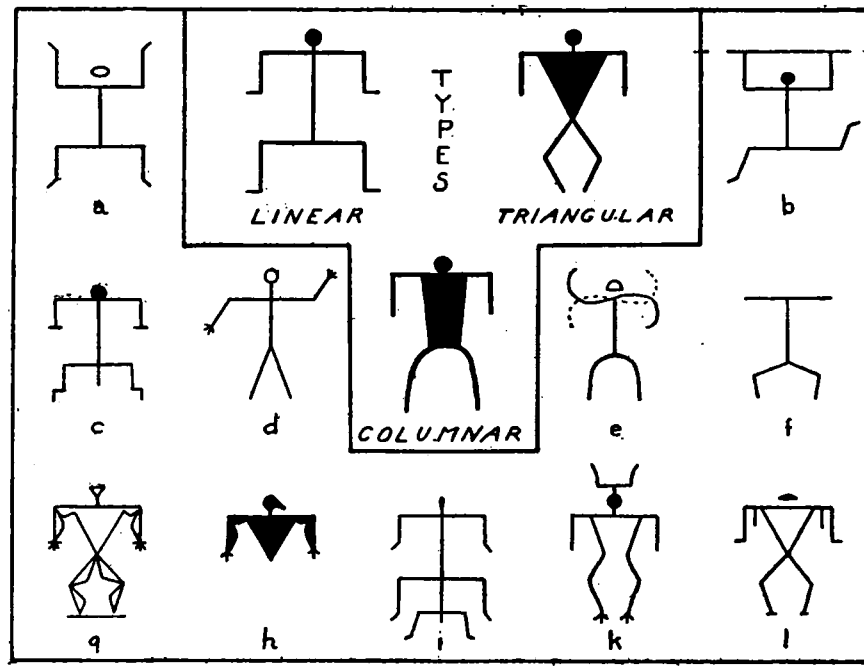

FIGURE 18.—Types and variations of human petroglyph forms on Lanai. Variations in form and position of head, neck, limbs and other features do not necessarily occur in the combinations shown.

the number of examples observed. Table 2, based on Table 1, gives the common types and variations of the human forms and the unusual variations. (See fig. 18.)

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TABLE I. HUMAN FORMS OF PETROGLYPHS

LINEAR		Kaunolu (60)	Elsewhere W. Coast (5)	Luahiwa (91)	Elsewhere Plateau Lands (14)	S. E. Coast (27)	N. E. Coast (19)	Island of Lanai (216)
HEAD	Common Type	round (22) solid (27) on shoulders (11) or short neck (10)	round (4) solid (3) on shoulders (4)	round (21) solid (54) short neck (21)	round (6) or vertical (5) solid (4) short neck (3)	round (12) solid (10) short neck (5) or on shoulders (5)	round (5) solid (4) on shoulders (4)	round (70) solid (102) shortneck (40) or on shoulders (37)
	Variations	absent (7) vertical line (5)		oval (10) vertical line (11) on shoulders (11) or long neck (10)	detached (1) on shoulders (2) outlined (1) long neck (1)			
	Exceptions	oval (1), or semicircular (1) long neck (3) or detached (1)		absent (2) detached (3) triangular (1)	absent (1) triangular (1)		long neck (1) short (1)	vertical line (16) or oval (11) or absent (10) semicircular (1) outline (1) long neck (15) detached (5)
SHOULDERS	Common Type	straight (58)	straight (5)	straight (65)	straight (13)	straight (25)	straight (5)	straight (151)
	Exceptions	curved (2)			curved (1)	curved up (1) or down (1)		curved (5)
ARMS	Common Type	at right angles (30) both down (23)	at right angles (3) both down (3)	at right angles (50) both down (30)	at right angles (11) both down (12)	at right angles (21) both down (6) or both up (5)	at right angles (5) both down (16)	at right angles (120) both down (80)
	Variations	curved (10) both up (10) holding spear (11) horizontal (5)		both up (9) or left up (7) or right up (4)		right up (5)		both up (35)
	Exceptions	at other than right angles (2) right arm up (3) left up (3)	absent (1)	at acute angle (2)	curved (1) both up (1) right up (1)	none (1) + at other angles (1)		curved (11) holding spear (11) angles other than right (5) right arm up (13) left arm up (12) none (2)
HANDS	Common Type	absent (29)	absent (3)	line outward (37)	line outward (11)	absent (17)	absent (3) or line outward (3)	absent (60) line outward (59)
	Variations			absent (8)		line outward (4)		
	Exceptions	line outward (4) line (2) or four fingers		line upward (2) or downward (3) four fingers (1)	line (1) line downward (1)	line slanting down (1)		line down (5) or line (3) or line up (2) fore fingers (3)
LEGS	Common Type	at right angles (21)	at right angles (3)	at right angles (53)	at right angles (11)	at right angles (15)	at right angles (5)	at right angles (108)
	Variations	curved (7)				straight (5)		
	Exceptions	straight (4) akimbo (1) absent (2)	curved (1)	akimbo (1)	curved (2) straight (2)	curved (3) running (1)	akimbo (1)	curved (13) straight (11) running (1)

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TABLE I—CONTINUED

FEET	Common Type	absent (11) or line outward (9)	absent (2)	line outward (36)	line outward (8)	absent (8) or straight line outward (8)	absent (3) straight line outward (2)	line outward (65)
	Variations			absent (6)				absent (32)
	Exceptions	line slanting down (2)	line slanting down (1)	line slanting down (3) line out and down (2)	absent (1) line slanting down (2) step-like (4)			line slanting down (8) step-like (7)
SEX	Common Type	not indicated (39)	male (2)	not indicated (44)	not indicated (9)	not indicated (30)	male (6) not indicated (9)	not indicated (141)
	Variations	male (11)	not indicated (3)	male (12)	male (5)	male (7)		male indicated (45)
MARKS		bruised (28) grooved and pitted (2) grooved (9) grooved and bruised (1) pitted (7)	bruised (5)	all grooved or pitted	grooved & pitted (14)	grooved and abraded (24)	bruised (10) grooved and abraded (1)	
COLUMNAR		Kaunolu (11)	Elsewhere W. Coast (5)	Luahiwa (9)	Elsewhere Plateau Lands	S. E. Coast (2)	N. E. Coast	Island of Lanai (28)
HEAD	Common Type	round (7) solid (7) long neck (2) or short (2) on shoulders (2)	round (5) solid (5) on shoulders (3)	round (7) solid (7) short neck (6)		round (1) solid (2) on shoulders (2)	round solid on shoulders	round (21) solid (22) on shoulders (10)
	Variations			long neck (3)				neck (14) short (7) long (6)
	Exceptions	outlined (1) vertical line (1) oval (1)	long neck (1)	absent (1)				outlined (1) vertical line (1) oval (1)
SHOULDERS	Common Type	straight (9)	straight (3)	straight (9)		straight (2)	straight	straight (24)
	Exceptions	curved (1)	curved up (1)					curved (2)
ARMS	Common Type	at right angles (5) or both curved (4) both down (5)	at right angles (4) both down (4)	at right angles (7) both down (6)		straight angles (2) both down (2)	at right angles both down	at right angles (19) both down (18)
	Variations			curved (2) left arm up (4)				curved (7)
	Exceptions	acute or abtuse (1) absent (1) left arm up (1)	curved (1) both up (1)	right arm up (1)				left arm up (5) or right up (1) or both up (1) at other than right angles (1)

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HANDS	Common Type	absent (3)	absent (5)	absent (6)		absent (2)	absent	absent (17)
	Variations			straight line outward (2)				
	Exceptions	straight line outward (1)		line slanting down (1)				line out (3) line slanting down (1)
BODY	Common Type	solid (10)	solid (5)	solid (9) columnar (4) barrel shaped (3)		solid (2)	solid	solid (27)
	Exceptions	outlined (1)		hour-glass shape (1)				outlined (1)
LEGS	Common Type	curved (4)	at right angles (2) or absent (2)	curved (5) or at right angles (4)		at right angles (2)	curved	curved (10) or at right angles (9)
	Variations	akimbo (2)		akimbo (1)				
	Exceptions	at right angles (1) straight (1)	straight (1)					akimbo (3) straight (2) absent (2)
FEET	Common Type	absent (11)	absent (4)	line outward (4)		absent (1) or line slanting down (1)	absent	absent (21)
	Variations			line slanting down (2)				
	Exceptions		line (1)					line outward (4) line slanting down (3) line (1)
SEX	Common Type	not indicated (9)	not indicated (3)	not indicated (9)			not indicated	not indicated (22)
	Exceptions	male (2)	male (1)			male (2)		male (5)
MARKS		pitted (3) abraded (5) bruised (1)	bruised (5)	pitted and abraded (9)		abraded (2)	bruised	abraded (19) bruised (7)

TRIANGULAR		Kaunoĺū (247)	Elsewhere W. Coast (53)	Luahiwa (95)	Elsewhere Plateau Lands (13)	S. E. Coast (9)	N. E. Coast (24)	Island of Lanai (441)
HEAD	Common Type	round (70) solid (93) short (50) or long neck (44)	round (25) solid (15) long neck (17) or short (12)	round (29) solid (53) short neck (21)	round (10) solid (6) short neck (4) head on shoulders (4)	round (8) solid (8) on shoulders (4)	round (15) solid (12) long neck (12)	round (157) solid (187) short neck (93) or long neck (90)
	Variations	oval (23) absent (18) on shoulders (16)	absent (6) oval (5) on shoulders (5)	oval (12) vertical line (7) on shoulders (6) outlined (5) long neck (16)	triangular (3)	short neck (3)		oval (40) absent (39) on shoulders (36)
	Exceptions	triangular (6) vertical line (5) semicircular (2) detached (2) horizontal line (1) outlined (2) beak (6)	outlined (1)	detached (6) absent (3)	outlined (2) long neck (1)			vertical line (12) or horizontal (1) triangular (9) semicircular (2) outlined (8) detached (8) beak (6)

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SHOULDERS	Common Type	straight	straight (49)	straight (66)	straight	straight (8)	straight (20)	straight
	Exceptions		curved down (1)					curved down (1)
ARMS	Common Type	at right angles (70) both down (59)	at right angles (30) both down (18)	at right angles (22) straight (66) both down (21)	at right angles (11) both down (10)	at right angles (8) both down (6)	at right angles (9) both down (9)	at right angles (150) both down (123)
	Variations	absent (21) at other than right angles (17) curved (12) both up (11) left up (14)	curved (7) none (5) right up (5) left up (6)	at other than right angles (10) left up (8) or right up (4) or both up (9)				at other than right angles (31) curved (19) absent (27) left up (28) both up (20)
	Exceptions	holding spear (6) right arm up (5) spear horizontal (14) with left hand higher (1) or right (1) streamers attached (1)	both up (3) at other than right angles (3) streamer attached (1)	holding spear or paddle above head left arm higher (3) streamers (3)	absent (1) left down (1)	streamer attached (1)	at other than right angles (1) streamer attached (1)	right up (9) streamers attached (7) holding spear (6)
HANDS	Common Type	absent (72)	absent (33)	absent (19)	absent (10)	absent (8)	absent (19)	absent (161)
	Exceptions	line (7) or line outward (3) or slanting downward (3) four fingers (1) three fingers (4) five fingers (2)	four fingers (3)	line outward (2) slanting down (2) five fingers (2) four fingers (1)			line (1)	line (8) line outward (5) line downward (5) three fingers (4) four fingers (5) five fingers (4)
BODY	Common Type	solid (143)	solid (27) or outlined (20)	solid (39)	solid (8)	solid (9)	outlined (10)	solid (228)
	Variations	outlined (60)		outlined (44)	outlined (4)		solid (5)	outlined (115)
LEGS	Common Type	akimbo (55)	akimbo (27)	akimbo (39)	akimbo (11)	at right angles (5)	absent (9) straight (5) straight angles (4)	akimbo (138)
	Variations	curved (23) or at right angles (13) or straight (15)	straight (8) at right angles (6)	straight (10) or at right angles (8)		akimbo (3)	akimbo (3)	straight (33) right angles (27)
	Exceptions	disjoined at hips (1)	absent (3) curved (2) disjoined at hips (2)	curved (3) absent (1) disjoined at hips (2)	curved (1)		curved (1)	curved (7) absent (4) disjoined at hips (3)
FEET	Common Type	absent (63)	absent (18)	line outward (15) or absent (14)	absent (8)	absent (4)	absent (8)	absent (115)
	Variations	line outward (9)	lined (3) line outward (3)	line slanting down (6)		line (2) line slanting down (1)		line outward (28)
	Exceptions	line (1) line slanting up (1) line slanting down (1) three toes (3) five toes (1)			line slanting down (2)		line outward (1)	line downward (10) line (7) extra line down (7)

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MUSCLES	**Variations**	on arms (25) on legs (33) solid (27)	arms and legs (2) solid (2)	on arms (6) on legs (12) solid (8)				on arms (33) solid (37) on legs (47)
	Exceptions							outlined (5)
SEX	**Common Type**	not indicated (79)	not indicated (45)	not indicated (39)	not indicated (7)	male (5)	not indicated (19)	not indicated (190)
	Variations	male (15)	male (4)	male (10)	male (3)	not indicated (1)	male (2)	male (39)
MARKS		scratched (40) bruised (64) abraded (35) pitted (33) bruised and pitted (13) scratched and pitted (4) scratched and bruised (6)	bruised (41) abraded (2)		abraded (10) pitted and abraded (2)	bruised (2)	bruised (20)	

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TABLE 2. VARIATIONS OF HUMAN FORMS. (SEE FIGURE 18.)

COMMON TYPE	LINEAR	COLUMNAR	TRIANGULAR
Head	round, solid, short or long neck	round, solid, on shoulders	round, solid, short or long neck
Shoulders	straight	straight	straight
Arms	at right angles	at right angles	at right angles
Hands	line outward or absent	absent	absent
Body		solid	solid
Legs	at right angles	curved or at right angles	akimbo
Feet	line outward	absent	absent
Sex	not indicated	not indicated	not indicated
Marks	abraded	abraded	bruised
NORMAL VARIATIONS			
Head		short or long neck	oval (a) on shoulders (c), absent (f)
Arms	both up (a) (fig. 18)	curved (e)	at other than right angles (d) curved (e) absent (f) both up (a)
Body			outlined (g)
Muscles			on arms and legs, solid (h)
Legs			straight (d) at right angles (a)
Feet	absent(d)		line outward (c)
Sex	male indicated (c)		
Marks	bruised	bruised	abraded or scratched

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TABLE 2—CONTINUED

UNUSUAL VARIATIONS			
Head	outlined (a), oval (a), vertical line (i), semicircular (e), triangular (g), long neck (d), detached (a), absent (f)	outlined (a) oval (a) vertical line (i)	outlined (a) horizontal line (l) vertical line (i) triangular (g) semicircular (e) detached (a) beak (h)
Shoulders	curved (e)	curved (e)	
Arms	curved (e) at other than right angles (d) right or left arm up (e) none (f) holding spear (b)	at other than right angles (d) left or right up (e) both up (a) absent (f)	right up (e) holding spear (b) streamer attached (l)
Hands	line downward (i) or up (a) a line (c) four fingers (d)	line out (l) or downward (i) line (c)	line out (l) or downward (i) line (c) three (h), four (d), or five (g) fingers
Body		outlined (g)	
Muscles			outlined (g)
Legs	curved (e) straight (d) akimbo (f)	straight (d) akimbo (f) absent (h)	curved (e) absent (h) disjoined at hips (k)
Feet	slanting downward (a) extra line down (c)	line outward or downward (a), line (l)	line downward (a) line (l)
Sex		male (a)	male (a)
Marks	bruised		

In addition to outstanding linear and triangular human forms are a number of petroglyphs of naturalistic treatment having a more or less columnar trunk for the body which could not be placed in either of the above classes. I have grouped these together for convenience in description.

Most variations of head form and of hand, feet, and limb positions are used interchangeably between the three body types. However, it is the purpose of Table 1, which is a quantitative record, to prove that certain of the variations of features are confined to each type and that others are more commonly found with one or the other of the three types. Of the linear figures studied, the limbs are arranged at right angles in 88 per cent,

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the hands in 84 per cent, and the feet in 86 per cent of those which have hands and feet. Straight lines representing hands are found in 80 per cent of the linear figures, practically all of the remaining ones have no hands designated. The legs of triangular figures are akimbo, which is consistent with the triangular body; hands and feet are absent but they are no longer necessary to give human character. Curved arms and legs are more often

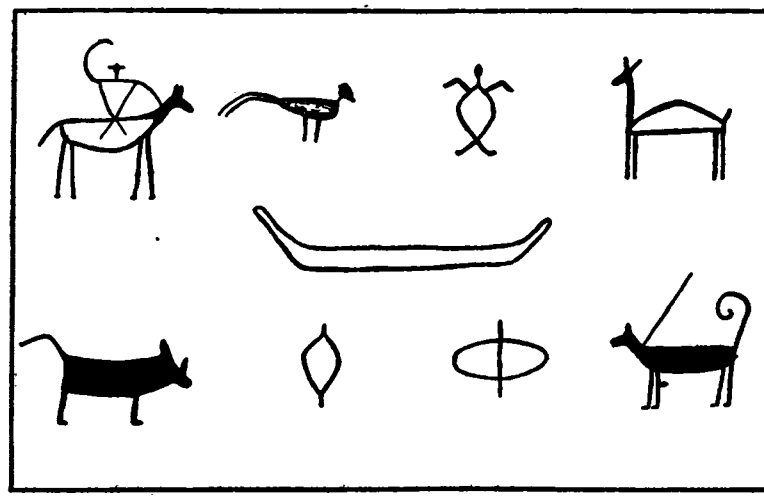

FIGURE 19.—Non-human forms of petroglyphs on Lanai: the dog, the most common of animal forms represented, is characterized chiefly by a long spiral tail curved over the back; in most figures feet are shown also, in some a line connects the neck of the dog to the hand of a human figure. Some dog-like figures may have been intended for cats. A goat or deer is shown with a short tail turned up and a horse with the tail turned down. The representations of turtles, rooster and boar are unmistakable. A canoe (?), the only inanimate object known to have been represented, is shown with outrigger absent. Circles and rectangles very rare forms. Circle with line through it, from Keaohia bowlder; diamond-shaped form from bowlder 15, Luahiwa.

carved with the columnar body than with any other, because that type allows for a more realistic presentation of the human figure.

The male sex is indicated on the linear type more frequently than on the others, for it is more readily suggested and may even be accidently represented by a prolongation of the trunk.

When the frequency of all variations has been determined from the table, it is apparent that certain variations are arbitrary—long and short necks, outlined and solid heads, hands pointing downward or upward. There are other variations which appear rarely and which give a pose or character to the figure: for example, when one or both hands are upraised, or one leg is uptwisted, or the hands hold a spear, or a line is drawn under the feet. Concerning these it is learned from Table 1 that the left

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arm is raised as often as the right in the triangular figures, so that it seems an indifferent matter which arm is raised, but in the linear figures the left arm is upraised three times more often than the right. Both arms are raised as often as one arm. In five-sixths of the figures no sex is indicated, the remaining figures represent males.

Certain variations which give character to a figure occur in only one type. Step-like feet and a multiplicity of limbs are found only in the linear type; muscles, headdresses, streamer from arms, three and five fingers, are found only in the triangular type. Some missing members are to be accounted for by weathering and some by the purpose or neglect of the artist. (See p. 116.) Petroglyphs other than those of human form are illustrated in figure 19.

AGE OF THE PETROGLYPHS

From the observations of early visitors it can be said positively that the practice of carving human and animal figures and circles was well established in the Hawaiian islands before 1820. Mathison (37) saw and recorded in 1822 triangular human forms, animal forms, and circles on an embedded stone of legendary interest—the platter of the cannibal chief, Aikanaka, at Halemanu, Waialua, Oahu. "The surface [of the platter] was very smooth, and upon it I discovered many rude representations of men and animals. . . Many were defaced. . . ."

Ellis (15, p. 346) in 1823 saw at many places along the southern coast of Hawaii "a number of straight lines, semicircles, or concentric rings, with some rude imitations of the human figure cut or carved in the compact rocks of lava."

Human and other figures of the same configuration as petroglyphs were also in existence as design elements before 1820. In 1816, Choris (12) made a sketch of a large gourd decorated with stained, solid triangular human forms with legs akimbo, in groups of three in a row (fig. 17*b*) and of a water gourd ornamented with goats and flint-lock rifles like the pictures cut in the lava at Honokohau, Kona (5, p. 134). Choris gives also a sketch of a Hawaiian man with two goats (fig. 17*p*) tattooed on the right upper arm.

J. Arago (4) in a sketch made in 1819 shows a row of tattooed goats in a circle around the neck of a native woman, and in other sketches shows men tattooed with birds, goats, checkerboards or *papamu,* star-fish, and circles. Of the tattooed designs he remarks, "In general the designs represent birds, fans, draft-boards, and circles with several diameters; but more frequently numerous rows of goats. . . . Frequently, from some

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inconceivable whim, they leave a design unfinished, as if the painter had been discouraged or the person who desired thus to ornament himself had changed his mind in the middle of the operation." In tattooing therefore as well as in petroglyph making, forms are left incomplete.

Goat and flint-lock rifle forms could not have been used before 1777, when Captain Cook gave the natives the first chance to see them.

One Hawaiian tradition regarding petroglyphs dates a human form in bas-relief at Kahaluu, Hawaii (44, p. 258) as being made about 1600 A. D. (according to Fornander). The story relates that Kamalalawalu, King of Maui, was killed in battle, his body brought to Kahaluu, and a picture of it made on the rocks before the body was sacrificed in the nearby heiau of Keeku. There is no positive proof that animal and human forms were carved on rocks before the arrival of Cook, but if the practice was universal before 1822, as it would seem from the existence at that date of the same type of petroglyphs on Oahu and Hawaii, it is reasonable to suppose that the practice existed before Cook opened the islands to new influences. Many of the petroglyphs which Mathison saw in 1822 on Aikanaka's platter were already faint and D. D. Baldwin, who saw the stone in 1848 (8) "did not observe on it any sculptural representations," although he says they may have escaped his notice. The few petroglyph forms which must have owed their origin to introduced objects are conspicuous both by their scarcity and by their local distribution. Flintlock rifle petroglyphs have been noted only on Hawaii, men riding horses only at one place on Lanai, and no "modern" petroglyph forms have been reported from Molokai, Oahu, or Kauai. The discovery of petroglyphs at Kaunolu, Lanai, under structures which were probably associated with the heiau and place of refuge in operation about 1780, strongly suggest that petroglyphs of human form were made in days before Captain Cook. These petroglyphs, it should be added, are of the triangular form, which is probably a later development on Lanai than the linear human type (p. 117).

If the carving of human and animal figures was as well established as the evidence indicates it is to be expected that the practice would survive to times within the memory of present natives. Therefore, it is not surprising to find many petroglyphs on Maui and especially in the outlying district of Lanai no more weathered than are many of the names on nearby rocks which were carved at least twenty-five years ago. On Lanai the names cut at petroglyph localities are usually at the edge of an area covered by figures and those that come in contact with these pictures are superposed. I have no doubt that with the introduction of writing on Lanai

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about 1835 the practice of making petroglyphs began to decline and, judging from native accounts stopped altogether about 1870. (See p. 119.)

Relative Age of Linear and Triangular Human Figures

The evidence seems to indicate clearly that the triangular form on Lanai was a later and probably quite recent development. (See Table 3.)

Table 3. Showing Number and Distribution of Linear and Triangular Types

	West Coast		Plateau Lands			
	Kaunolu	Elsewhere	Luahiwa	Elsewhere	S.E. Coast	N.E. Coast
Linear	60	5	91	14	27	19
Triangular	247	53	95	13	9	24

It will be seen that the triangular type is greatly in excess at Kaunolu and elsewhere on the west coast, but that it rapidly descends to an equal or minor position inland and on the southeast and northeast coasts, whereas the linear type, although not numerous, is more evenly distributed—a suggestion that it is the basic and older form. But the most numerous of the linear figures are at Luahiwa, where many bowlder faces are entirely covered with carved and recarved figures indicating a spot favored by many generations of workmen. The stronghold of the triangular type is at Kaunolu where there is very little overlapping and crowding of figures, from thence it seems to have spread over the west coast but did not have time to become as firmly established inland or on the east coast before the practice of making petroglyphs came to an end.

All the variations of the linear type with the exception of curved shoulders, a multiplicity of limbs, and step-like feet, are found in the triangular type. Even the usual features associated with the linear type are frequently observed in the triangular, but the reverse of this statement is not true. The arrangement of the legs is an example: Right-angle legs, characteristic of the linear type, are present in the triangular type in sixteen out of every hundred figures; but akimbo legs, belonging with the triangular type, are found with the linear in only one or two petroglyphs out of a hundred. Variations of the triangular type are never found with the linear to any extent. It appears, therefore, that the linear was the first type and that variations which developed in the linear have survived in the triangular type, in which variation has been carried much further.

It is safe to assume that on any carved bowlder the oldest petroglyphs will be on the most favorable surfaces for carving and that later petroglyphs will occupy less desirable positions or be superposed. On Bowlder 12,

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Luahiwa group, two figures of the triangular type are superposed on linear figures and at each petroglyph area the triangular forms occupy, in general, the less favorable positions. Representatives of men on horseback at Luahiwa prove the use of this type after the introduction of horses in 1803, and the triangular body figure is used on gourds of the last century (figs. 17 *b*, and 20).

THE MEANING OF THE PETROGLYPHS

The survival of petroglyph making after the coming of the white man is sufficient proof that the practice, whatever may have been its origin, is truly Hawaiian.

Mr. L. A. Thurston of Honolulu (personal communication) reports the following conversation on November 20, 1921, with Keliihananui, a Ha-

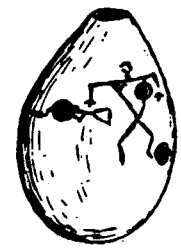

FIGURE 20.—Gourd whistle (B. 951) with human figure and rifle burned upon it; height, 2 inches.

waiian aged 76 years, who was born and raised on Lanai and who lives a mile from the Luahiwa petroglyph bowlders. Thurston asked, "Do you know about the pictures, *kii*, on the stones?"

"Yes, I know about them."

"Have you seen those at Kaunolu?"

"I have not, only those at Luahiwa."

"Were they there when you were a boy?"

"Some of them, the others were made during my time."

"What were they made for?"

Keliihananui answered emphatically, "*Paani wale no* (for play only)."

"If they were made for play why are they so alike?" The native could not say.

"What about the animal pictures?"

"There are none."

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Kealakaa, age 55, living at Lahaina, Maui, said to me, "I was born at Luahiwa, Lanai, in 1867 and I have seen those pictures on the stones. They were made about 1870 by students from Lahaina-luna school whom the Lanai boys brought home with them during vacations. The students were from Hawaii, Maui, and the other islands. They were taken on horseback all over the island. The pictures at Luahiwa were of cats, dogs, horses, and men."

"If the students made these pictures why did they not also carve letters?"

"I suppose they were only intent on making pictures."

What Kealakaa says corroborates Keliihananui's statement that some of the pictures were made since his boyhood.

If the Lahaina-luna students made pictures on Lanai, it seems they would also make them about that school at Lahaina but I found pictures only on one bowlder. This bowlder at the beginning of the trail into Kanaha valley shows three pecked, outlined, triangular figures similar to the men represented riding horses at Luahiwa, Lanai. Many names were carved around and across the three human figures.

Speaking of the numerous painted and carved pictures on the bluffs at Nuu, Maui, Kenui, a man more than 60 years old, said, "I had never seen pictures until my foster brother, Napeha [still living] went there with some other children about fifty years ago and pecked (*kimomo*) some and painted other pictures representing men and animals. This they did for amusement."

An alert native, Alapai Kapaeko, more than 90 years old, whom I interviewed with Kenui in June, 1922, said that he had passed his whole life at Nuu but had not noticed the pictures.

The Hawaiian very often finds it convenient to attribute unexplainable or forgotten works to the activities of the menehunes, the little men who swarm about at night. On Lanai I had the opportunity of observing the spread of this tendency. A group of natives at Keomuku were very much interested in my description of petroglyphs but were unable to account for them. In this group was Alika George Nicholas, the half-Hawaiian and half-Greek blind parson, head of the Hawaiian Church of "Reasonable Service," who remembered having seen the petroglyphs on Oahu at Waiakaaiea, Puu Kohelepelepe (Koko Crater), in the cave at Awaawamalu Bay. He said, in perfect sincerity, "Those pictures were cut by the menehunes and likewise the pictures on Lanai." The natives present accepted his explanation.

Childish as the petroglyphs may seem, many of them at least were made

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by adult natives who used these same forms in tattooing and in the decoration of objects. (See fig. 20.) Pictures of boats, of men, and of horses which I have seen made on bowlders by the present native children of Lanai are simply fantastic scrawls scarcely bruising the surface. But a good many of the old petroglyphs have been wrought out with a man's patience and strength, and I have noted some at Luahiwa and Kaunolu which are out of reach of children.

The motive which led the Hawaiians on Lanai to carve pictures was certainly not story portrayal. Nine-tenths of the petroglyphs are individually isolated, and the majority of the forms are repetitions of the simple human figure, arms down. The number of forms and their variations on Lanai is potential material for picturing simple events or stories. But only on Hawaii, where there is a richer variety of forms, is there any good indication that events have really been pictured. The most that can be said for picture writing among the Hawaiians is that it was in an experimental stage. Certain places and bowlders were favored for the carving of petroglyphs partly on account of the suitableness of the rock and partly, no doubt, because the practice had there gained a start. No special significance need be attached to the location of the petroglyph centers except perhaps that they were places often visited by the travelling native. According to the legend of Kalaina's feet at Moomomi, Molokai, (43, p. 286) after that woman had carved a pair of feet, visitors from other parts of Molokai and from other parts of the islands were accustomed to leave their marks in similar form when travelling along the road.

The Keaohia stone on Lanai is an example of a favorite bowlder. Remote from temple or village site, it is covered with petroglyphs while the equally good bowlders on every side have not a single carving.

An unusual petroglyph form which occurs at one area is likely to occur at another. In some cases the resemblance is so exact as to suggest that the petroglyph was made by the same person. A few unusual forms are to be seen only at one area. Distinctly bird-like figures (Pl. X, *F*) are found only on the west bank of Kaunolu. Perhaps there is no connection, but the name of this bank, Kaneapua, is the name of a mythological bird-man (19, p. 72). The name of the heiau at the same place is Halulu, the name of another bird-man, and a cousin of Kaneapua.

Variations of human figures such as one arm up, arms holding a spear over head, and streamers hanging from the arms, probably had well known meanings. These character variations deserve special study. But there is no esoteric meaning in such modern forms as goats, horses, and flintlock

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rifles associated with human figures. The modern forms are found at the same places and carved in the same manner as the older designs.

A hundred years ago, Rev. Wm. Ellis was keenly interested in the petroglyphs as perhaps the "first efforts of an uncivilized people towards the construction of a language of symbols." He was exceptionally observant and able to converse in Hawaiian, and had an opportunity to learn at first hand. Information as to the motive which led to the making of those petroglyphs he saw on the island of Hawaii doubtless applies to all the Hawaiian petroglyphs but it throws little light on the specific meaning of the forms. Ellis says (15, p. 346):

> Along the southern coast, both on the east and west sides, we frequently saw a number of straight lines, semicircles, or concentric rings, with some rude imitations of the human figure, cut or carved in the compact rocks of lava. They did not appear to have been cut with an iron instrument, but with a stone hatchet, or a stone less frangible than the rock on which they were portrayed. On inquiry, we found that they had been made by former travellers, from a motive similar to that which induces a person to carve his initials on a stone or tree, or a traveller to record his name in an album, to inform his successors that he has been there.
>
> When there were a number of concentric circles with a dot or mark in the centre, the dot signified a man, and the number of rings denoted the number in the party who had circumambulated the island. When there was a ring, and a number of marks, it denoted the same; the number of marks showing of how many the party consisted; and the ring, that they had travelled completely around the island; but when there was only a semicircle, it denoted that they had returned after reaching the place where it was made.
>
> In some of the islands we have seen the outline of a fish portrayed in the same manner, to denote that one of that species or size had been taken near the spot; sometimes the dimensions of an exceedingly large fruit, etc., are marked in the same way.

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SUMMARY

Prior to the raid of Kalaniopuu and his Hawaiian warriors in 1778, Lanai was, in the words of a Maui chief (p. 7), "a fruitful and populous" island. Captain King passed close to Lanai a few months after the plundering (p. 6) and described it as appearing to be well inhabited, even guessing a population of 20,400 (33, p. 129). His remarks are surprising in view of the statement of Menzies' (p. 6) thirteen years later, that "no hamlets or plantations were to be seen, no trees or bushes adorned the face of the country, which swelled out gradually to a moderate height, so we have reason to think that the island is but very thinly inhabited."

This much is certain, Lanai was inhabited to such an extent that even the most inhospitable regions show ruins of house platforms, bluff dwellings and garden patches. Since all natural features were taken advantage of as dwelling sites, during periods of maximum population doubtless all the house sites except those under a tapu, were occupied. Ceremonies of purification might be employed to lift the tapu (36, pp. 130, 212). The number of house sites therefore may be used to form an estimate of the population. I counted 489 house sites, and making allowance for sites which would leave no trace (p. 50), I arrive at 630 sites as a conservative total figure.

On Maui and Lanai I observed that the average number of natives living at a house was five and as the house sites on Lanai are very small, averaging about 6.5 by 15.5 feet at the largest village, Kaunolu (p. 44), I was led to believe that five persons for each house is a reasonable estimate. Afterwards I found that Ellis (15, p. 91) had used the same figure in estimating the population of Hawaiian villages in 1823. Captain King (33, p. 128) allowed six persons to a house in giving the population of Kealakekua bay, Hawaii: "From the frequent opportunities I had of informing myself on this head, I am convinced that six persons is a very moderate allowance."

Allotting five persons to a site, 3,150 is the number around which the population fluctuated before 1778. Rev. William Ellis (15) estimates a population not exceeding 2,000, in 1823.

However long Lanai has been inhabited, enough time elapsed for the development of a population of not less than 3,000, a number which would strain the resources of the island under the native culture. There had been sufficient time, also, for the spread of dwellings to every part of the island and the establishing throughout of large temples of public worship (fig. 4). This condition may have existed for some time, but none of the ruins sug-

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gest a great age. Fortunately, genealogies and traditions tell approximately when the island first began to be inhabited by important numbers. Twenty generations ago (about 1400 A. D.), in the time of Kakae, King of Maui, Lanai is pictured in tradition as frequented only by gods and cannibal spirits (p. 21). But Kaululaau, nephew of Kakae, drives off the evil spirits and makes the island habitable. All the traditions of real people on Lanai date during or since the time of Kaululaau. From his period on, Lanai was under the rule of Maui chiefs or under their dominance and probably received from Maui the principal contribution of the ancestors of the historical inhabitants. The island occasionally sheltered a settler like Kalapanakuioiomoa, a chief serving Keliiokaloa, son of Umi and king of Hawaii sixteen generations ago (about 1500 A. D.), and the only chief who escaped the usurper, Keaweikekahialii (19a, p. 262-64). Kalapana fled to "Maunalei, Lanai, where he settled down and made his residence. After he had been in Lanai for some time, he took unto himself a wife there and lived as a commoner, tilling the land and going to the uplands for water."

In the consciousness of the Lanai natives and their neighbors, in historic times, they are one with Maui; and in considering the political division of the land, the heiaus, the village ruins, the petroglyphs, or any other manifestation of culture, I have not been able to detect anything in the gross characters which would differentiate Lanai from Maui. The difference in details which exists may prove to be chiefly the outcome of Lanai's own geographic environment and the inevitable variation which appears when groups are at all isolated. These are points which can be settled only by a detailed comparison of Lanai with the other Hawaiian islands.

At present cultural differences do not seem to be great enough to set aside any important known feature as distinctive from Maui, or to warrant suspecting Lanai to be the receiver and disseminator of any special influence into the Hawaiian group. Everything seems to characterize Lanai as an out district of Maui: much more sparsely populated, poorer in every aspect of culture, but with the political and religious system of Maui entirely superposed.

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EXPLANATION OF PLATES

PLATE I.—MAP OF LANAI (IN POCKET).

PLATE II.—MAP OF KAUNOLU (IN POCKET), BASED ON A PLANE TABLE SURVEY 1920, BY W. L. EMORY AND K. P. EMORY.

PLATE III.—HOUSE PLATFORMS AND FIREPLACE IN HEIAU.

A. Side view of terraced house platform at Kaumalapa'u (from west).

B. House platform, Site 21, Kaunolu (from west).

C. Fireplace in pavement of Halulu heiau, at Kaunolu, 1.5 feet square, 8 inches deep.

PLATE IV.—HEIAU AND STONE SHADE.

A. Heiau of Halulu, at Kaunolu (from east).

B. Stone shade at Site 1, Kaunolu, and house platform with petroglyph stones indicated by arrow (from northeast).

PLATE V.—ALTAR, UPRIGHT SLABS AND CARRYING STICK.

A. Fishermen's altar, or ko'a, at Lae Hi.

B. An alignment of upright slabs at Hale o Lono. The largest stone is 2.5 feet high.

C. Figurehead of carrying stick (B4946) from cave at Kalamaiki; width of head, 4.5 inches.

PLATE VI.—CANOE MODELS, CANOE PIECES AND DOOR LINTEL.

A. Two canoes of a model double canoe belonging to Mr. Charles Gay, from a cave at Kaumalapa'u. Length, 2 feet, 11 inches.

B. Door lintel of thatched house, length 2 feet, 3 inches, tipped back slightly to show socket for supporting post.

C. Canoe thwart (B4095); length, 11.8 inches.

D. Inside view of end of left canoe bow piece (B7689) from storage cave at Honopu. Maximum height, 8.5 inches.

PLATE VII.—LUAHIWA PETROGLYPHS.

A. Bowlder 1. Male figure shoulder, width 8 inches, almost joins hands with figure projecting pair of extra legs, a form similar to one at Kalae, Molokai (29, p. 183) and one at Nuuanu, Oahu, seen by me. Figures covered with moss and lichens removed by scraping grooves clean with hand pick.

B. Bowlder 2. One of few groups in which figures all of same kind, made in same manner and, roughly, in same proportion. Only in such groups, pictures likely to portray story, for all figures may have been carved by one man; arrangement with this purpose in mind not apparent here.

C. Bowlder 12, east face. Six-inch ruler. Only two turtle pictures found on Lanai, bodies elliptical and outlined, heads small on long necks, forward and hind flippers represented by lines bent back towards body. In center of rock face a rider wearing a hat.

D. Bowlder 5. Top row: triangular outlined body, legs disjointed at hips as at Kaena (fig. 17, *e*), and Kaunolu (fig. 16, *b*); circle over head possibly extension of

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right arm. Left arm uplifted to line projecting from head. Below this figure one with abnormally short legs and spur projecting from middle of each, hands extended by extra line pointing downward. Feet of linear figure in middle of picture and one on extreme left continued in same way, a variation seen by Rev. A. S. Baker (personal communication and photograph) at Kamooalii, Kau, Hawaii (fig. 16, *a*). At extreme left linear headless figure with anklets or 3 toes. Dog in upper left corner has line attached to head. Square figure in lower right probably right side of a linear figure, hands on hips. Lines on this rock about which there is uncertainty, left untouched—moss from others removed.

E. Bowlder 11, west face. Form duplicated at Honokohau, Hawaii (5, p. 132); probably derived from figure in Plate VII, *A*.

F. Bowlder 10. Triangular body and muscular legs of human figure. Two feet long. Not retouched for photographing.

G. Bowlder 14. The two more recent and clearest of the many figures on this much-weathered face.

H. Bowlder 8, south face. Diagonal line represents former level of soil.

PLATE VIII.—LUAHIWA PETROGLYPHS.

A. Bowlder 12, west face. Continuation north of Plate VIII, B. In upper center a triangular male figure with short streamer hanging from each arm. At center of rock face native children have drawn pictures and scratched names which in no way need be confused with deeply cut, carefully abraded, and badly weathered older figures. Right arm of large human figure (shoulder width 2.4 feet) superposed on linear figure, right hand up, and on another curious figure. Man on horse at bottom of bowlder superposed on disappearing lines of canoe (?).

B. Bowlder 12, west face. At extreme right two horses, one riderless; rider represented by conventional triangular outlined figure, right arm holding whip curving over head, as in nine of twelve riders in Luahiwa group. To left of horse is end of canoe(?), superposed on middle a triangular figure resembling one holding line from head in Plate VII, *D*. On both sides of curious double-bodied triangular figure in the center of the face are numerous deep cuts of figures overlapping figures. These occupy most favorable part of rock where probably first figures made. Large animal figure on left resembles cow, a large dog shown above it and small dogs in front and below. Large figure highest on bowlder face, seven feet from ground; highest mark made is nine feet above ground.

C. Bowlder 12, north face. Two large figures seem to have been carved regardless of previous petroglyphs. Native who chiseled out name, KAI, over the middle large triangular body probably did not realize he was intruding on a figure. His name so overgrown with moss that difficult to recognize. Only one other deeply carved name in Luahiwa group: on south face Bowlder 8, cut across several human forms. The peculiar head on left large triangular figure is more intelligible when one realizes the linear figure, arms down, just to right, is not part of it. A line appears to represent a beak on each of the large figures. Small linear man in middle would seem to have another head attached to right shoulder, but no necessity of considering little circle with line pointing down, as part of it.

D. Bowlder 12, and small bowlder at northeast corner. Six-inch ruler. Left figure arms upraised holding paddle, right figure has legs more clearly disjoined and arms (unchalked) curved out to side, as in tiny figure on opposite bowlder. On main bowlder another human figure holding what may be a paddle, this figure headless, outlined, and hips unjoined, a peculiarity noticed in Plate VII, *D;* knees disjointed as in "broken knee" human figure at Kahaluu, Hawaii (43, p. 37).

E. Bowlder 13, west face. Surface of this rock firm, artificial lines have been preserved and show that whole area of this face has been covered. Dogs (or cats)

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with spiral tails and lines leading from neck sometimes to hand of human figure. Four men riding horses. Parallel groove (unchalked) in center and over large dog at right. The (unchalked) figures between two triangular forms at lower left corner suggest nothing in particular. Directly above chalked figure in this corner is a triangular form. Above rider at lower center of bowlder are two marks, figure 16, *f*. Many other lines left unchalked as too much latitude for fancied combinations.

F. Bowlder 15, north face. Conventional representation of rider. One man has five fingers, the other four. Triangle above dog an incomplete human figure. *G*. Bowlder 15, south face. Pecular U-shaped headdress, compare with figure 17, *d*. Diamond figure in center of picture may be an abbreviated turtle form. (See fig. 19, bottom row.)

Plate IX—Kaunolu petroglyphs.

A. Area 1. (Pl. II). Semicircular head or helmet. Width ten inches.

B. Area 1. Deeply cut. Compare figure having long body with Plate VII, *D-E*. Form on left edge outlined in dots. Notice two small triangles having same base on rock to left; also the scratched inverted figure holding a spear or similar object.

C. Area 1. Two linear human figures deeply pitted and abraded. Lower figure, sloping shoulders and forked projection from legs, width from knee to knee, seven inches. The inverted position of figures is due to fact that they were carved before bowlder was split off from one behind it (Pl. IX, *E*).

D. Area 1. Pitted with depressions for the pebbles in the game of konane.

E. Area 1, west of Halulu heiau. This stone face half of original, other half split off and shown in Plate IX, *C*. Note line under triangular headed figure and dots at extreme right. Four-fingered man (elbow to elbow 9 inches) with a three-fingered human form as the head, made after bowlder split and hence after two linear figures in Plate IX, *C*, if it is taken for granted that the eight sharp notches on edge of bowlder (indicated by chalk marks) were made by same implement. Because these marks, which are of same depth and sharpness as those of petroglyphs, cut not only into top surface of rock but into the freshly cleaved surface also, this could not have happened until after the bowlder split. On side of this bowlder several figures are carved, overlapping each other. An outlined, deeply scratched figure with muscles on arms and legs appears to overlap a triangular human figure with another triangle within (similar to fig. 16, *q*).

F. Area 1. Deeply abraded, solid triangular figure with flipper-like arms, curved legs resting on a line. Elbow to elbow, 12 inches.

G. Area 1. Figure in relief, shoulder width four inches, seems to represent bird with long mandible turned to left. Only figure in relief on Lanai. Stokes (43, p. 34) shows a human figure in relief at Kahaluu, Hawaii.

H. Area 2. Checkerboard, thirteen spaces square, 1.6 by 1.5 feet. Water collecting in middle has caused grooves to weather away. To right, scratched quadrangle and three human figures, two joining arms.

I. Area 1. Incised figures of goats and a very uncommon outlined columnar figure, one hand on hip. Elbow to elbow, seven inches.

Plate X—Kaunolu petroglyphs.

A. Area 2. Pitted male figure joining hands with small figure. Surface of rock reddish brown, figures strikingly black. Two crudely scratched human figures.

B. Area 3. Large three-fingered man; fifteen inches, elbow to elbow. One of twelve human figures linear, some of others outlined, some solid. One dog. Large figure on left compares with petroglyph, shown in Plate X, *H*, which is on rock directly opposite this part of gulch; style of pecking same in both.

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C. Area 2. Figure at extreme upper left abraded in very black rock: upper portion outlined in chalk, a deposit of red mineral which seems to have been formed in artificial grooves, but may have been originally there, suggesting the form. Have seen many almost perfect human figures made by accidents of weathering, may have had something to do with beginning of idea of carving human figures on rock surfaces.

D. Palaoa hill shelter.

E. Area 2. Pecked human figure, weathering has distorted body and arms and caused legs almost to disappear. Elbow to elbow, twenty-four inches.

F. Area 3. Bird-like figures bruised on rock. Triangular figure lower left corner, imposed on linear bruised figure holding spear. Upper left, another figure, holding spear eight inches long.

G. Area 2. Nine inches, elbow to elbow.

H. West face stone called Kanemakua. Large figure, elbow to elbow fourteen inches. Two small figures under each arm.

PLATE XI.—PETROGLYPHS FROM LANAI.

A. Kaunolu. Area 4. Figure at lower left, five inches wide.

B. Piliamoe. Probably parts of human beings. Surface of stone soft, cuts deeply gouged.

C. Piliamoe. Illustrates overlaying of figures; grooves of large linear figure (shoulder width nine inches) coincide with those of a small linear and a small triangular figure.

D. Mamaki. Middle stone representation of lizard, compare with figure 16, *u*. Human figure with five pairs of lower limbs, is odd variation of forms at Kaunolu and Luahiwa; distance between upraised hands, ten inches. Bowlders in center form shelter, on inside walls are forms shown in figure 17, *i*. On faces of bowlders, turned away in picture, are forms shown in figures 16, *r* and 17, *g;* also a bruised, muscular form having a beak, exactly resembles bird figures shown in Plate x, *F*.

E. Piliamoe. Animal on left, very animated deer (or goat) and form on right a dog, a line connected to the neck. Show signs of weathering as much as any petroglyphs at Luahiwa.

F. Keaohia. Dogs about 8 inches long. Only bowlder carved out of hundreds in vicinity.

G. Kaunolu Rock tower at Site 30, Plate 11.

H. Kahe'a heiau (fig. 5, *c*), picture of boar at lower right corner superposed on linear human figure. Figure to left of boar's tail, nine inches high. All grooves show effects of much weathering. Natives living next heiau had never noticed petroglyphs.

I. Koi. Unchalked bowlder. Twelve triangular human figures and a dog, abraded. At left edge a number of zigzag lines.

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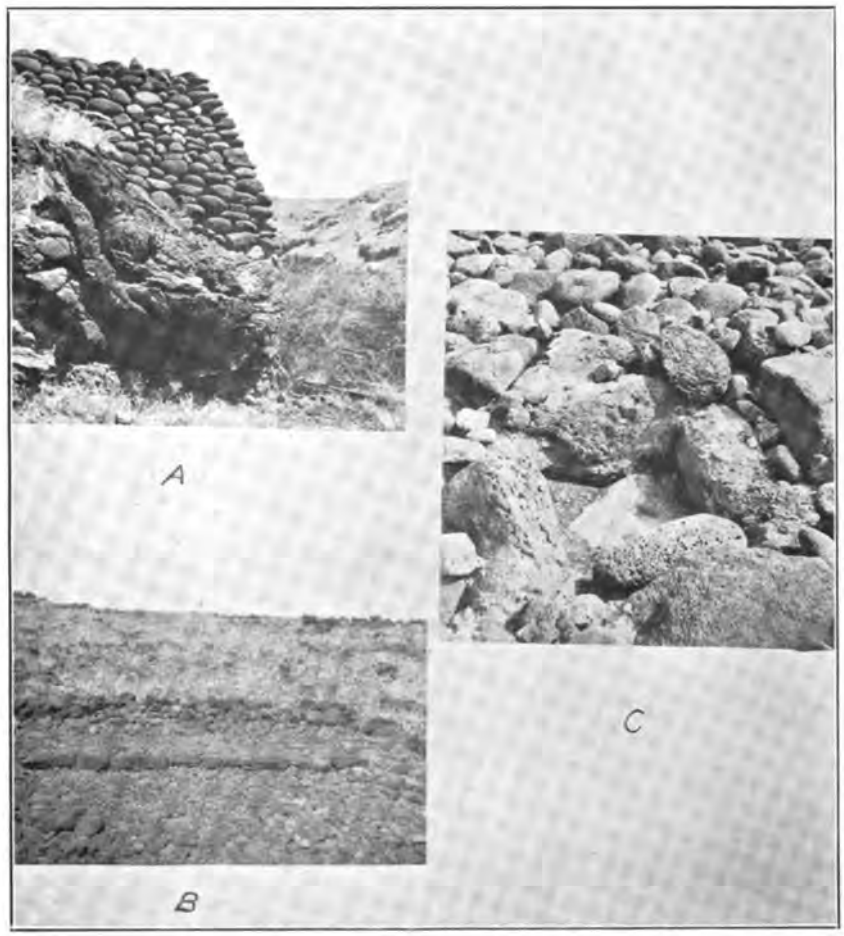

HOUSE PLATFORM AND FIREPLACE IN HEIAU

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HEIAU AND STONE SHADE

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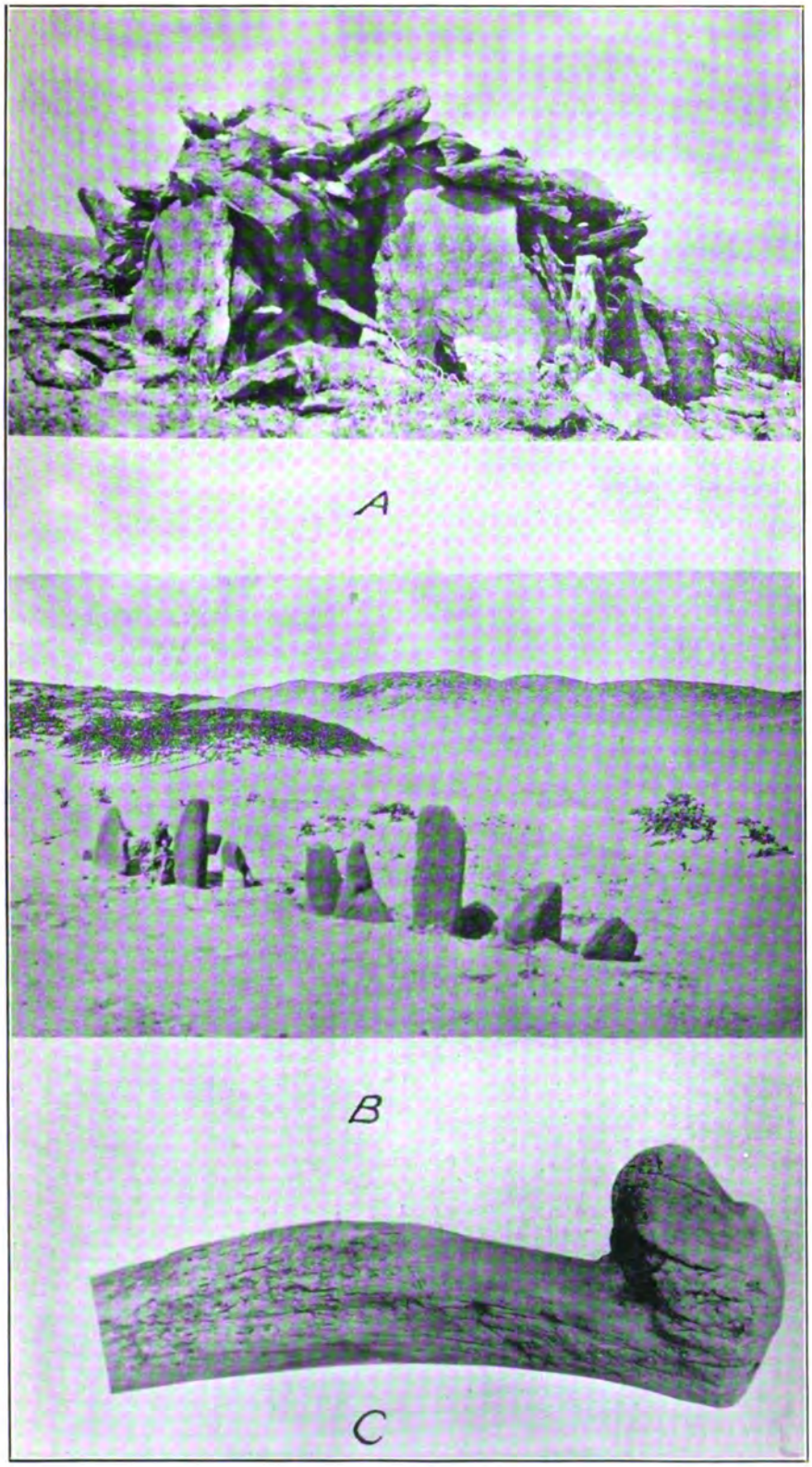

ALTAR, UPRIGHT SLABS AND CARRYING STICK

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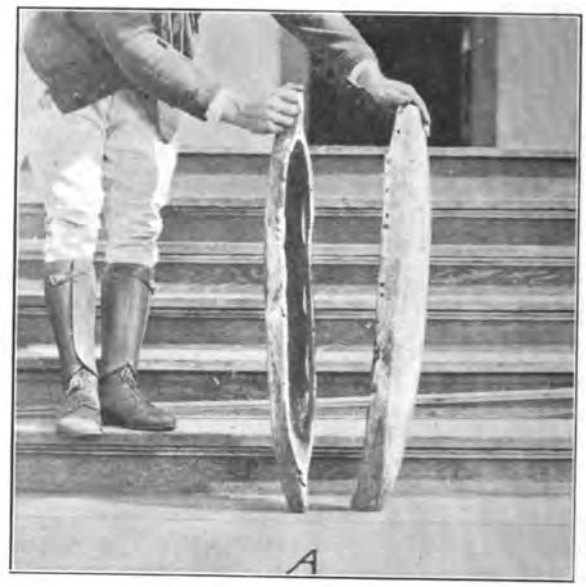

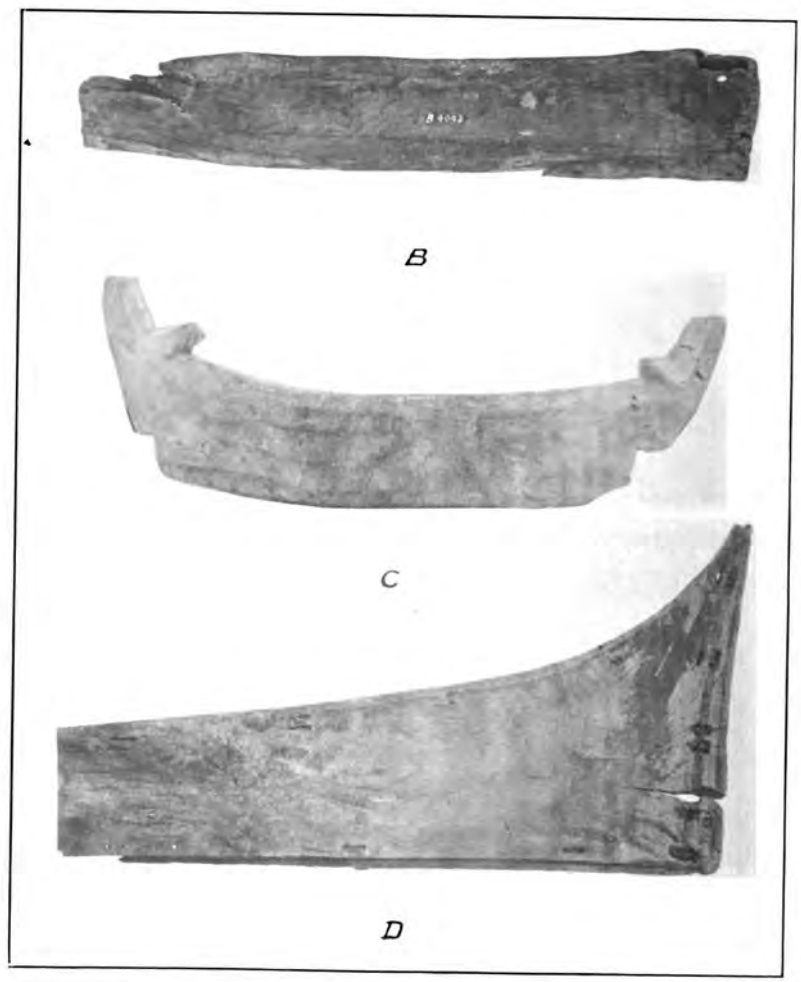

CANOE MODELS, CANOE PIECES AND DOOR LINTEL

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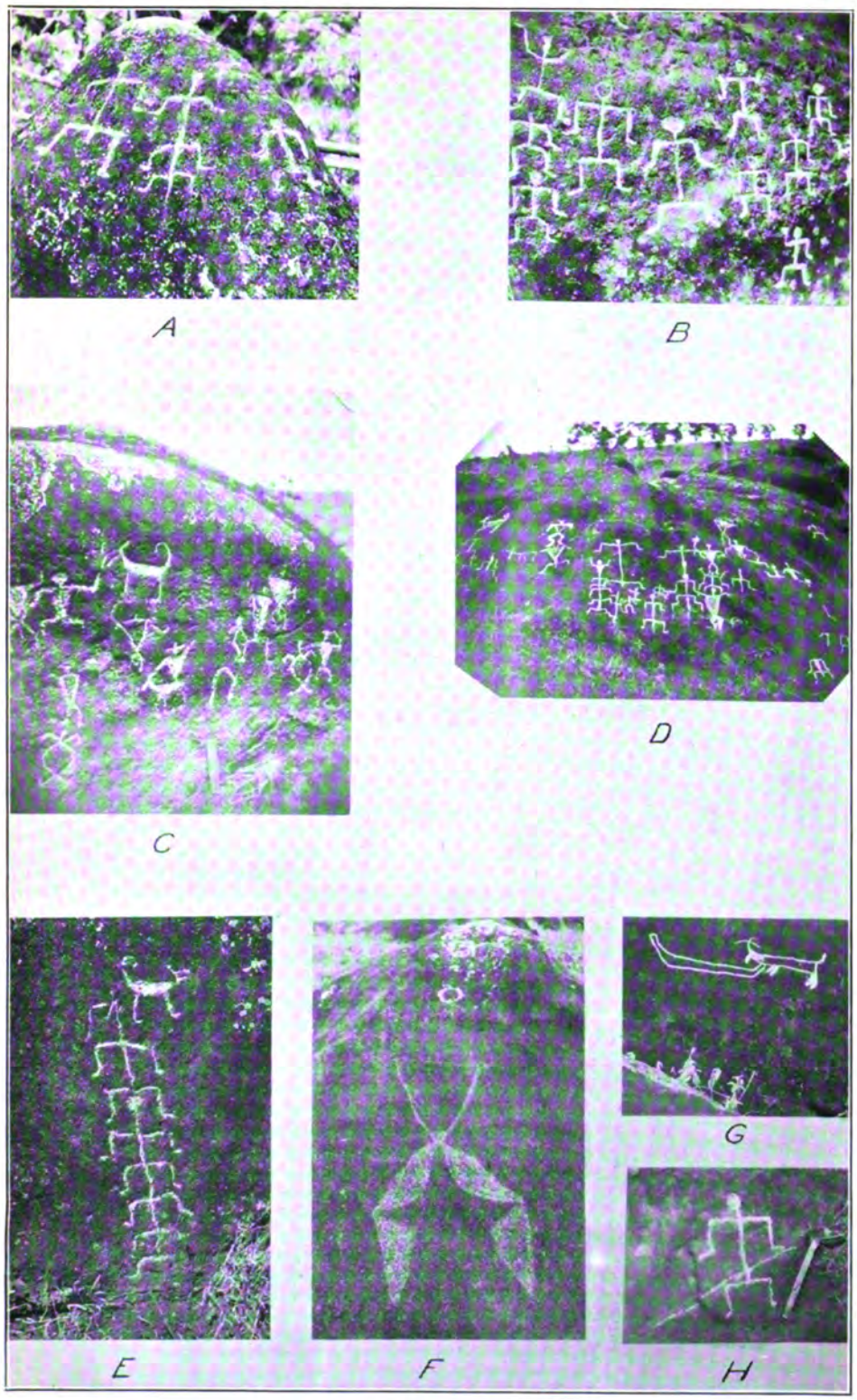

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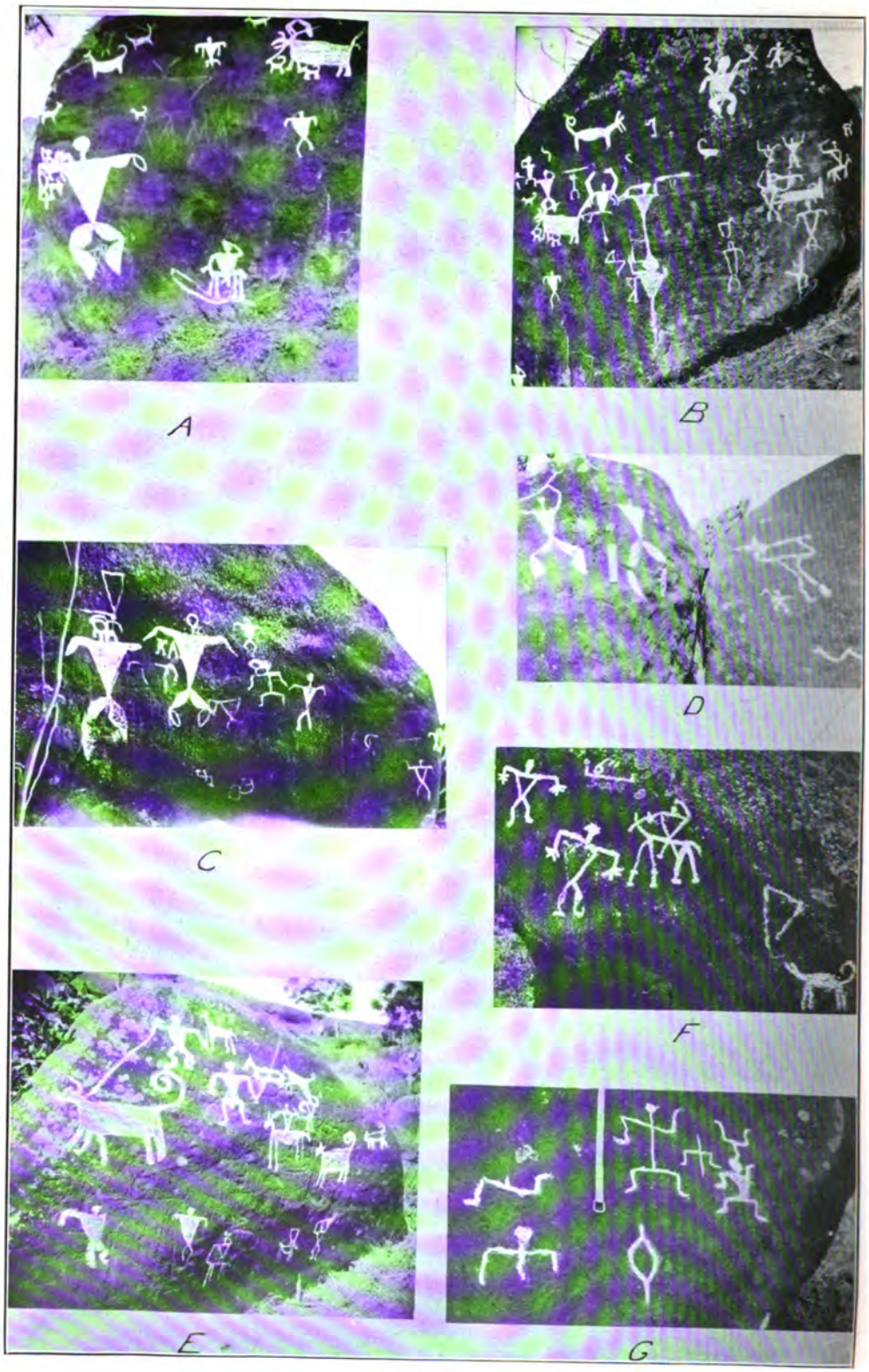

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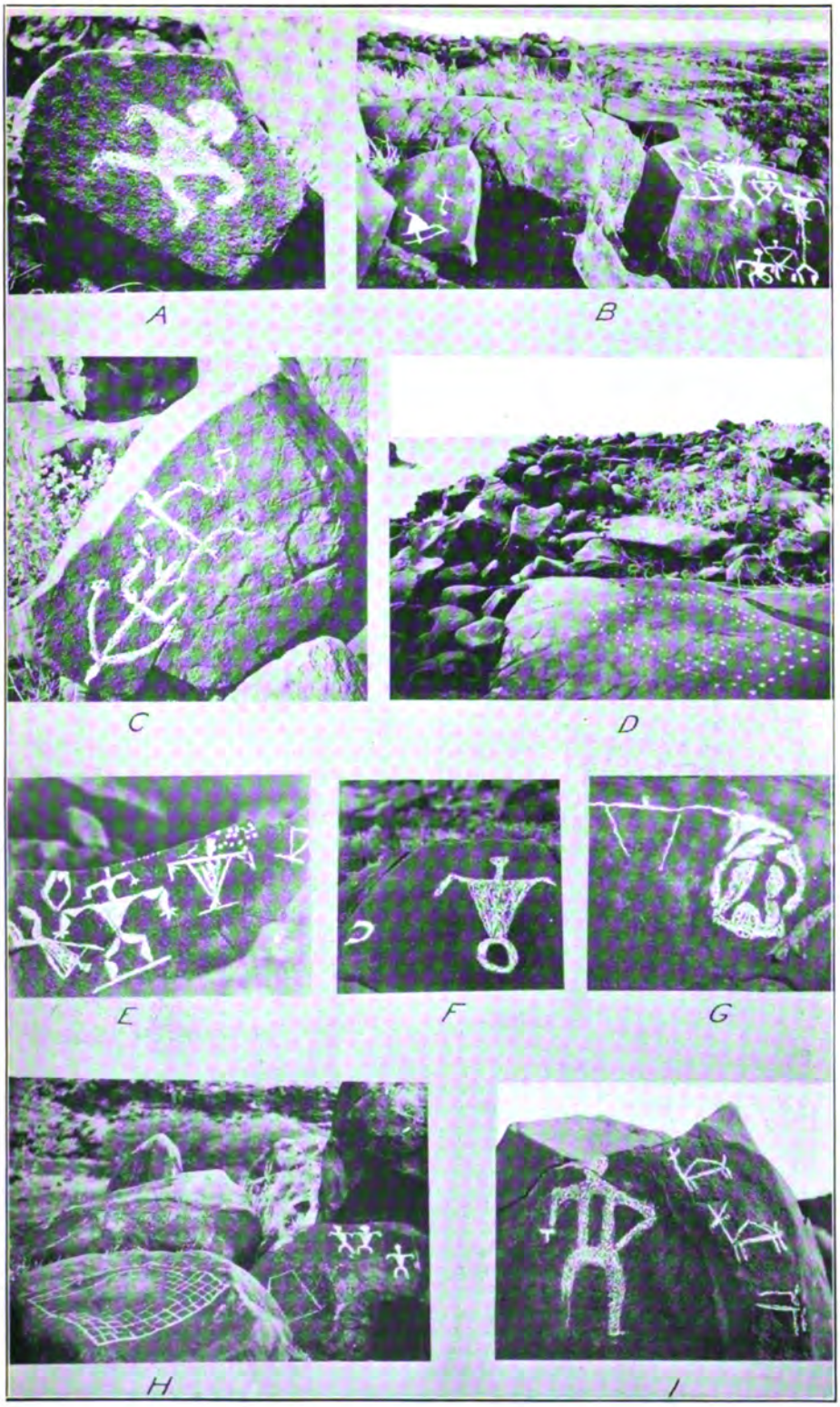

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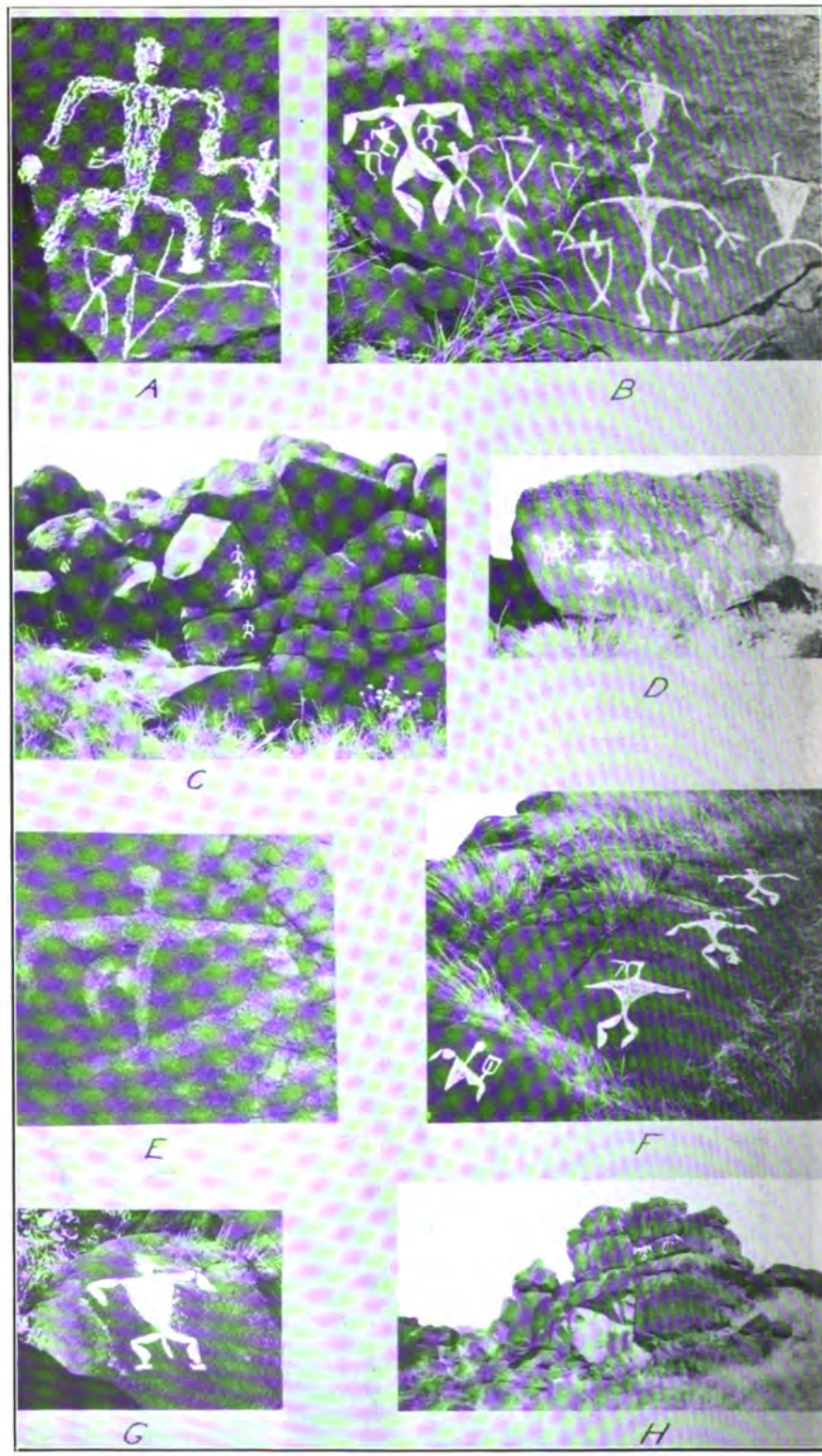

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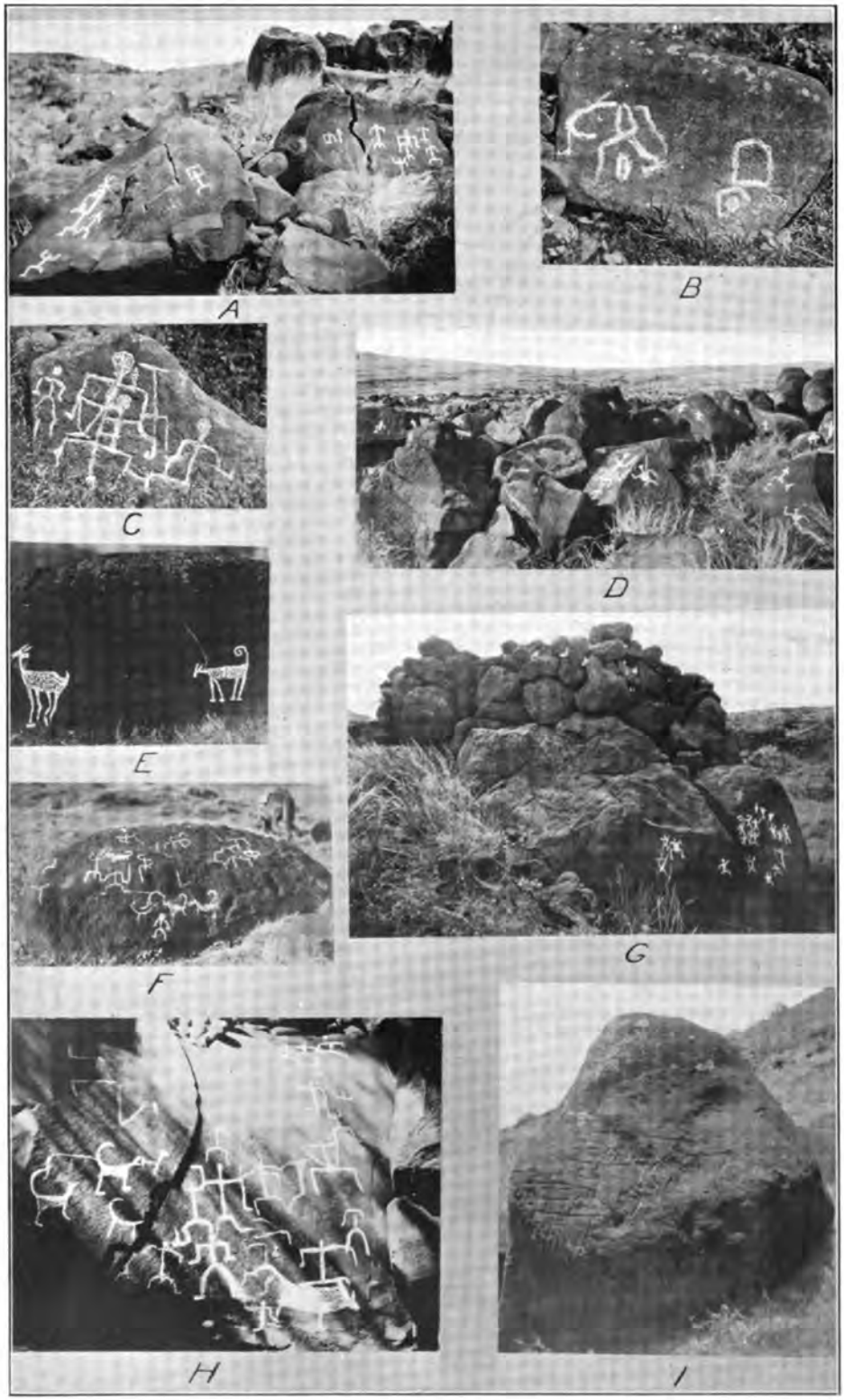

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