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POSSIBLE FOOD STORAGE PITS IN HAWAII

A preliminary report on the results of a surface survey at Hana, Maui, Hawaii

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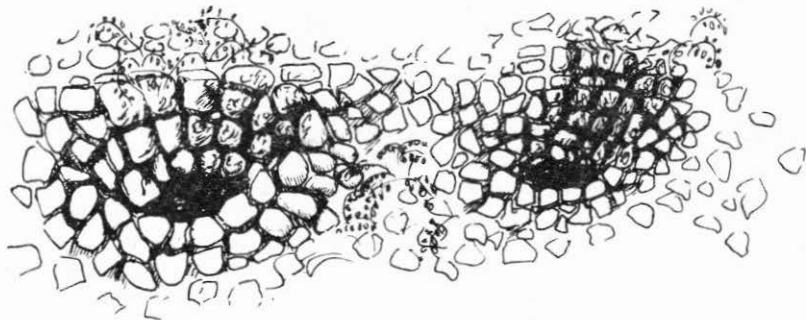
In the course of the one-man survey of archaeological sites in the Hana, Maui area undertaken by the author in June and July 1969, one structural type, occurring in three separate locations, proved most puzzling. Stone-lined pits, ranging in size from $2\frac{1}{2}$ meters wide and $1\frac{1}{2}$ meters deep, to 1 meter top width, and .6 meter depth, contiguous with one another and located in two cases on a slope, seemed to have no prototype in the literature about Hawaii. The third occurrence of this structural type was around the base of the Kaluamui Heiau, at Hamoa, where what appears from a distance to be a wall surrounding the Heiau on the south and west sides, about one meter from the base of the Heiau structure itself, is in fact a series of holes or pits, narrowing sharply from top to bottom. These do not share one feature of the former type, in that those at the base of the Heiau are stone-lined at the bottom as well. A system of approximately 30 pits in a valley above Kipahulu, and another system of some 15 pits located 40 M. S.W. of Kaluamui Heiau at Hamoa, are in all cases stone-lined only to the bottom. The floor in the latter cases is a horizontal circle of earth. Occasionally, Kukui (Candlenut) trees were noted growing out of the pits, but they seemed limited to trees of 10 or 15 cm. in diameter.

Maui informants were most often as puzzled as I was about the purpose of the structures. One non-Hawaiian suggested that they were for defence, but that made no sense ethnographically. Another suggestion, offered for the pits adjacent to the Kaluamui Heiau (those which were stone-lined throughout) was that they were repositories for the entrails of sacrificial animals. This would be in keeping with accounts by Thrum and David Malo, but it is not a likely explanation for the larger pits. A Hawaiian informant in July had a ready explanation when he heard a description of the pits and saw a diagram of them. He was certain that it was a method of dry land taro cultivation, keeping weeds down, channelling rainwater in on the plants and, by growing eight or ten tubers in a small space, allowing for easy harvesting once one tuber had been removed.

Winslow Walker, in his manuscript of a survey of the Maui area in 1928-29, mentions that the pits were planted in papaia, at that time. He claims that in ancient times they were used for the cultivation of Wauke, or paper mulberry (Walker, 1931: 192).

Here, then, are four possible explanations, with varying degrees of plausibility.

An account by Queen Emma, on the cultivation and culture of taro offers a fifth, indirectly. She describes the cooking of taro in a pit by the following method. First, the makings for a fire were arranged in a pit; then thin slabs of porous (lightweight) lava rock were arranged precariously over the top. The fire was lighted and, when thoroughly heated, the rocks were knocked in upon the fire, the taro and a quantity of water on that, and the whole mass covered with banana and ti-leaves - thus steaming the taro until cooked (Queen Emma, MS.5). While the pits cited would suit the purpose, there would be no reason for such profusion. Cooking pits may be used over and over again. Storage facilities presented a more tempting explanation, but the literature gives only vague reference to the existence of such structures. David Malo, for instance, mentions that the common people would not desert a chief "while they think there is food in the storehouse" (Malo, 1903: 257).



Still puzzling over what to make of these structures as I worked on my report, I returned to Maui in January 1970 to have another look. A very dry fall season had considerably reduced the foliage cover in the jungle west of Kaluanui Heiau, rendering the area accessible. Trees overhead still prevented aerial surveillance, but now the network of vines and honohono weeds lay wilted and drying on the surface of the rocks, revealing similar contiguous stone-lined pits over the terrain. Unlike the rough examples noted in Kipahulu, and in the area south of the Kaluanui Heiau, these pits were symmetrical, and similar in depth and width. Those closer to the back of the heiau were, in general, larger (approximately 2½ M. wide at the top, 2 M. deep, and 1 M. wide) at the earthen bottom. Smaller pits, 40 meters up the hill to the west, were also approximately 1 M. in diameter at the bottom.

Seldom was there more than a rock or two out of place in these pits - perhaps the network of vines actually helps to hold them together. The drawing shows just two of the pits, and their approximate distances from each other in the complex. The side view gives an idea of the profile but, since no excavating was done, it cannot be said whether the ground level follows the upper limits of the rockwork, whether it is even with the bottom of the pits, or if it is somewhere in between. Indications are that the first is not the case since grass does not grow through the rocks in the complex. This has indirectly served to save the pits from destruction by cattle in an adjacent pasture. There is no fodder to tempt them to clamber around and destroy the site. One complex of pits under a breadfruit grove in the mountain area of Kipahulu is barely discernable because the cattle have torn the place apart in foraging for breadfruit, apparently.

An informant, a woman in her sixties who has lived all her life in a house not 100 M. from the larger pit complex, said that she did not know of the pits. She claims descent from the Alii of the Kaluanui Heiau, but she, like most Hana people in historic times, avoids the environs of the heiau. The jungle, too, as I have said, makes the pit area almost impossible of access. Hearing my description of the pits, and viewing a sketch I had made, the woman matter-of-factly stated that the pits were designed for taro storage. Her nephew concurred in this explanation, saying that the stonework kept the pits cool, the ground floor kept the taro moist, and that mats spread over the tops of the pits protected the taro from sun and rain for long-term storage.

Although David Malo and Queen Emma never describe such structures, these pits are not contradictory to the system of food storage described by these early ethnographers (Malo, 1903: 188, 257).

What I was looking for in Hawaiian ethnographic literature was a description like this:

"The sides of some pits are faced with rough stones to a distance of two or three feet below the surface to prevent loose soil from falling in, but the interior of the pits seems not to have been stone-lined."

and "The ma pits used by the families at present are circular, about three feet in diameter and three to four feet deep. All of them are dug in stiff clay soil which prevents infiltration of ground water, and most of them are near the house."

"Many of the great communal pits were built in the village and were placed as a rule in or near the tribal assembly place. Additional pits were built high up in the hills, in secluded places, where they would be safe from an enemy and could provide food for the tribe if it were driven out of the valley. The natives set no limit on the length of time that ma could be preserved in one of these great pits. It darkened with age and probably lost much of its nutritive value, but would still be edible after fifty years."

(Linton, 1925: 103)

This account, which fits the Hana structures quite well, is from Ralph Linton's Archaeology of the Marquesas Islands. Ma, or fermented breadfruit, was prepared by first peeling and coring fresh ripe fruit and reducing it to a pulp. The pulp was left a week to ten days in suspended containers of coconut leaf matting, until fermented, and then "buried in pits lined with leaves and covered with a thick layer of leaves weighted with stones." (Linton, 1925: 102)

This is not the only association made between Hawaiian and Marquesan Polynesian culture, so that alone is not surprising (Sinoto and Kellum, 1965). This author regards the explanation of the pits as a food storage facility as the most plausible so far presented. But several questions remain answerable only by excavation, if at all. If the pits were designed for storage, what was stored there? Taro was the Hawaiian staple, it is usually conceded. Dry land taro was cultivated in an area approximately half a mile from the site up the mountain slope until as recently as 1935 according to five separate informants. However, a large stand of breadfruit trees (about ten mature 75-foot tall trees) is located adjacent to the former taro

land. Other patches of breadfruit were noted by the survey at locations within a mile of the site and, as has been stated, the remains of a pit complex can be seen beneath a breadfruit grove in Kipahulu today. Either commodity might have been stored there, but the neighbouring informant who described the use of the pits so explicitly claims it was indeed taro.

Excavation may reveal the needed vegetable remains to indicate one commodity or the other. In addition, the possibility of Wauke or taro cultivation must also be examined.

In any event, excavation of a portion of the Hamoa complex appears to be the next logical step.

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