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TEST PITTING OF CAVE 1, KALAUPAPA PENINSULA,  
MOLOKAI, HAWAII

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INTRODUCTION

This brief paper presents a preliminary analysis of midden materials from Test Pits in Cave 1, Kalaupapa Peninsula, Molokai, which was carried out during the Anthropology 421 course in Laboratory Techniques at the University of Hawaii in the Spring of 1967, and by Mrs Freddy Harby at the B. P. Bishop Museum in the Fall of 1971. The sample was derived from a small excavation undertaken by students of the University for a total of four days during November 1966 and April 1967. It is hoped that the tentative conclusions reached here will lead to subsequent work since the initial excavation yielded meager results in terms of stratigraphic evidence or an artifact sample. Detailed mapping, which we were unable to undertake with our equipment and time limitations, should also be completed. Thanks are due to Mr and Mrs Richard Marks who assisted the survey and excavation teams in many ways.

THE SITE

Cave 1 is located on the Kalaupapa Peninsula which juts out from the north central coast of the island of Molokai (see Fig. 1). Geologically, the Kalaupapa Peninsula is the youngest volcanic formation on the island of Molokai, having been created in the late Pleistocene. The peninsula itself is a shield volcano formed by olivine basalt pahoehoe lavas extruded from the Kauhako Crater, which is located in the south central part of the present peninsula. Within the Kauhako Crater are walls and the remains of earlier garden patches. Along the western edge of the northern extension of the crater, a small dry shelter cave with an apparently undisturbed midden deposit which we did not test, was noted. Searches along the southern flank of the crater for a holua slide, which had been reported earlier, proved futile. It may have been destroyed by construction of a road which extends to the crater from the south.

Extending from the Kauhako Crater to the sea coast in a north-easterly direction is a large lava tube, the roof of which has caved in in a number of places. Other lava tubes apparently extend underground to the west. Cave 1 extends seaward from one of these latter tubes; at least three other similar accessible caves are part of the

same lava tube.

Cave 1, estimated to be approximately eight metres above sea level, is surrounded by naupaka (Scaevola frutescens), lantana, and ilima (possibly Sida fallax). The vegetation is stunted because of the extreme exposure to the north-east trade winds. Caves must have been particularly desirable habitats during the gusty winters in this area. Around the cave mouth was a series of walls and platforms suggestive of a living complex or perhaps even a small heiau platform. Remains of a stone pavement were found in the interior. The roof of the cave extends one or two yards west of the excavated area with a height varying from three to four feet above the surface of the ground.

#### FIELD METHODS

Cave 1 was partially mapped during the first trip, at which time one-yard squares were set up in preparation for excavation (Fig. 2). A total of five squares and one test pit were dug in the two field trips. Squares 2, 3, 4 and 5 of Trench 1 were excavated by artificial three-inch levels, because the soil was too moist and the cave too dark to enable recognition of the strata with the equipment at hand. The excavation of Square 7 of Trench 3 was attempted by natural layers. For the most part, sterile soil was reached at a depth of approximately 15 inches in each of the squares which were dug.

During the first session of the excavation in November, the cave deposit was dry enough to be screened easily. However, the April field trip, undertaken during a rainy spell, ran into difficulties with the sticky soil and had to sluice the soil through screens using the shallow sea water at the nearby shore. Most of the material recovered was shell, although fragments of worked bone and rare pieces of iron were also encountered. Coral and obsidian chips were also noted.

#### ARTIFACTS

Mrs F. Harby recovered the following artifacts in checking midden samples. From the surface of the cave, one basalt chopper, one grindstone, one hammerstone, a glass button, and a shoe sole were recovered. In Unit 1-4, at a depth of 2", a rim fragment of a historic, imported granite 'bowl', used on the obverse side as a sharpening stone, was recovered. Along the north-east wall of Unit 3-7, in the third natural layer, an ulumaika stone was recovered. Within the upper three inches of the same unit, two iron nails, a washer, a button apparently made of bone, and two glass bottle fragments were recovered.

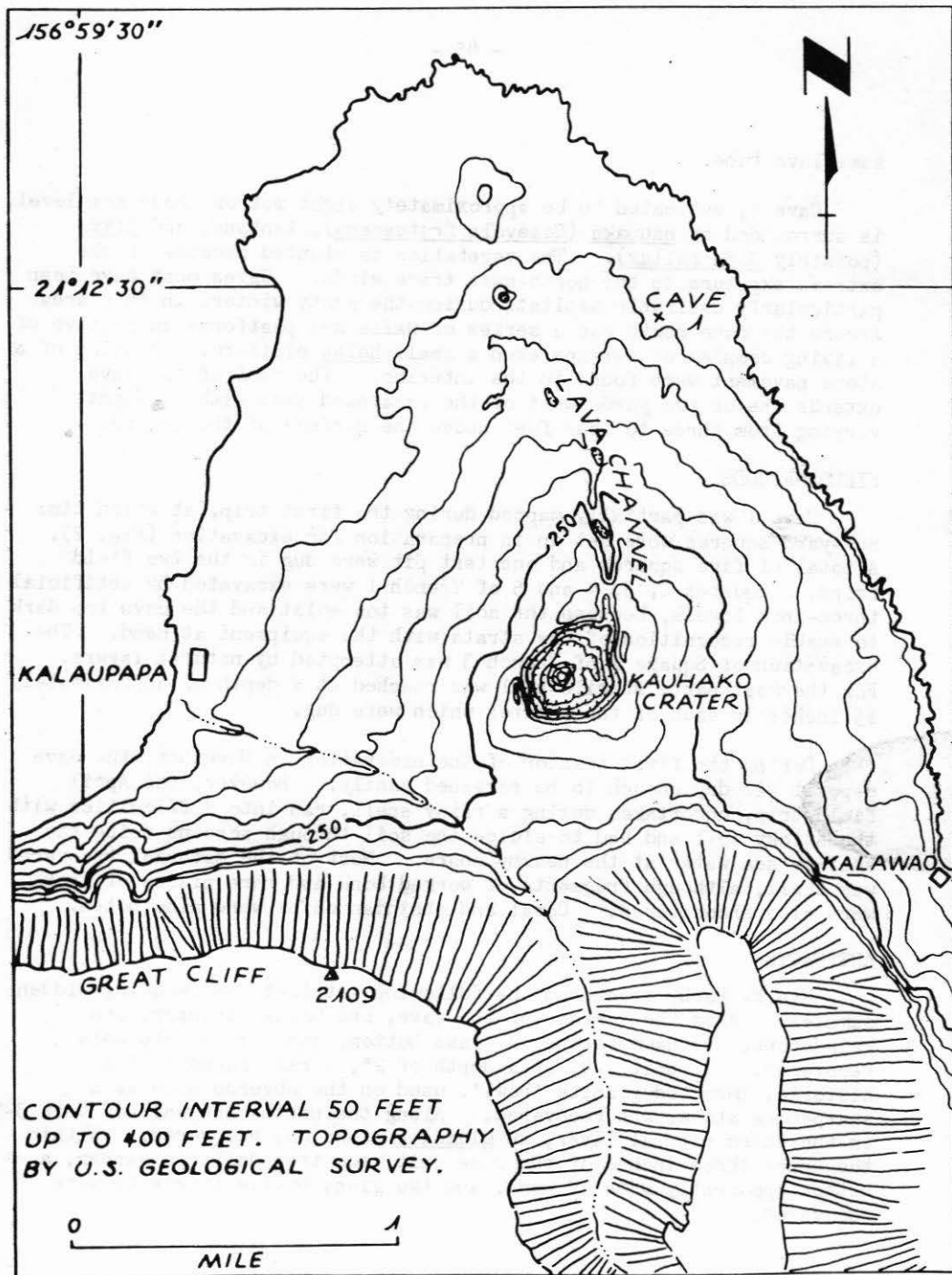


Figure 1. Approximate location of Cave 1, Kalaupapa Peninsula, Molokai.

## LABORATORY ANALYSIS

The midden material was washed and the shells were sorted by genus. Five genera were singled out for quantification - Nerita, Heliconiscus, Littorina, Drupa, and Cypraea. These shells were weighed according to the level from which they came. In addition, random samples weighing 200 grams were counted to see if the average size of the individual shells varied within the site. For this analysis, two genera were selected - Nerita and Heliconiscus.

## DISTRIBUTION OF SHELLS

The density of shell varied within the cave. Square 2, which was located at the entrance of the cave, produced the lowest number of shells, while Square 6, located in the middle of the cave floor in Row 3, was somewhat more productive (see Table 1). By far the most productive squares were both along the cave wall, where material would be likely to accumulate, and within the protective confines of the cave shelter. There appears to be a general although somewhat uneven trend for the density of the shell to be greater in the upper layers compared with the lower layers, which might reflect factors such as an increase in the number of individuals occupying the site, or greater compaction of the surface layer, or perhaps some kind of unrecognized natural-stratigraphic discontinuity.

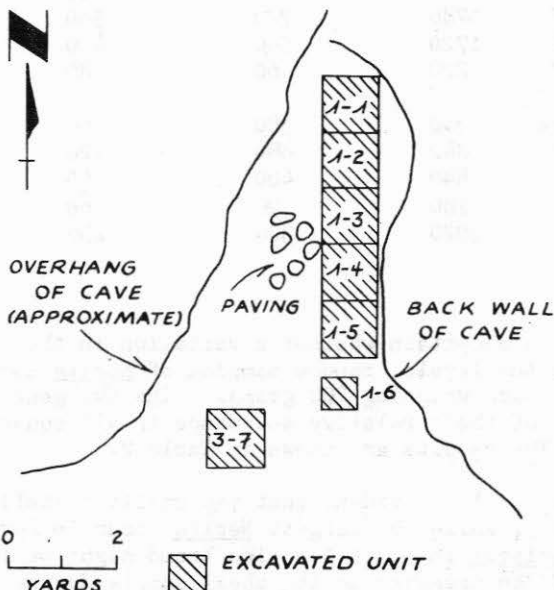


Figure 2. Test excavation units within Cave 1, Kalaupapa, Molokai. (Base map from MacDonald, G. A. and A. T. Abbott, 1970, Volcanoes in the Sea. University of Hawaii Press.

TABLE 1. DISTRIBUTION OF FIVE MOST COMMON SHELL GENERA, CAVE 1  
KALAUPAPA (GRAMS)

		<u>Nerita</u>	<u>Heliconiscus</u>	<u>Littorina</u>	<u>Drupa</u>	<u>Cypraea</u>
Unit 2	0"-3"	530	200	80	60	130
	3"-6"	270	110	70	60	40
	6"-9"	240	80	70	30	80
	9"-12"	160	40	40	30	20
	12"-15"	180	60	50	30	50
Unit 4	0"-3"	1380	1320	200	180	400
	3"-6"	1420	880	240	260	240
	6"-9"	1900	1000	360	220	240
	9"-12"	430	200	100	20	60
Unit 5	0"-3"	1440	1060	220	180	280
	3"-6"	2000	1140	320	280	340
	6"-9"	660	240	160	80	100
	9"-12"	1780	720	560	330	260
	12"-15"	1720	540	460	180	260
	15"-18"	220	60	80	60	20
Unit 6	Surface	300	380	60	110	160
	A	840	480	120	140	110
	B	840	400	240	140	130
	C	180	90	60	50	40
	D	1020	300	280	160	220

In order to ascertain whether a variation in the size of the shells occurred among the levels, random samples of Nerita and Heliconiscus were selected, each weighing 200 grams. The two genera were selected simply because of their relative abundance in all squares of the excavation. The results are shown in Table 2.

From Table 2 it is evident that the smallest shells of both species occur in Level 5, while the largest Nerita occur in Level 2 and the largest Heliconiscus in Level 1. The trend might be inferred to reflect a lessening of the pressure on the shell supply during the time period of the upper levels.

TABLE 2. NUMBER OF SHELLS PER 200 GRAM RANDOM SAMPLE IN EACH LEVEL

		<u>Nerita</u>	<u>Heliconiscus</u>
(Square 5)	Level 1	385	80
	2	360	100
	3	430	95
	4	415	105
	5	600	120
	6	400	100*

\*Projected from a sample of 70 grams

Whether this is the result of human activities relating to the shellfish or to an internal dynamic within the shell population is difficult to determine. Fragments of iron were noted in the upper levels; it could be that in the historic period, the human population of the peninsula dropped because the area was used for a colony for victims of Hansen's Disease. Seeds of tobacco, a European introduction to Hawaii, germinated in the screened soil from the first field trip, when it was exposed to the winter rains, at the mouth of the cave.

It would appear that settlement and cultivation on the Kaluapapa Peninsula were relatively late in the sequence of Hawaiian pre-history. If this turns out to be the case after adequate exploration is carried out, it would fit into the general hypothesis of human ecological succession, now being suggested, that the marginal areas of the Hawaiian Islands were inhabited relatively late in the pre-historic sequence.

The artifacts have been deposited in the Bishop Museum, Honolulu.