SUMMARY OF RESULTS OF PRELIMINARY INVESTIGATIONS AT THE HILINA PALI PETROGLYPH CAVE AND ASSOCIATED SITES*

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Introduction

Archaeological investigations at the Hilina Pali Petroglyph Cave and associated sites were conducted by members of the Department of Anthropology, B. P. Bishop Museum, under contract with the National Park Service in March 1975. The primary goal of this work was to record the Hilina Pali Petroglyph Cave, a newly discovered site. It appeared that this site might provide the unique opportunity of placing Hawaiian petroglyphs in direct stratigraphic context, in that a number of the petroglyphs extended below the floor deposit. One of the objectives, then, was to conduct test excavations to uncover buried petroglyphs and to recover datable material with which to assess their age. In addition to the work at the main petroglyph cave, the immediate area was to be surveyed and any sites encountered were to be recorded.

Location and Setting

The survey area is located within the Hawaii Volcanoes National Park, in the Ka'ū District, on the island of Hawaii. Specifically, it lies on the plain below Hilina Pali, approximately 3 km from the coast. The main petroglyph cave, centrally located in the cluster of recorded sites, is at the 1,000-ft. elevation on a gently sloping, grassy plain.

Rainfall for this region is less than 40 inches per year (Carlquist 1970:77). Although there are no specific data for the Ka'ū Desert, Carlquist thinks that this area is probably drier than the rainfall figure suggests, due to excessive evaporation and low humidity (1970:79). Another factor affecting the availability of moisture is the seasonality of rainfall. Kona (southerly) storms, occurring primarily in the winter months, account for most of the rainfall in this region. They can be heavy over a short period of time, or fail to appear for one or more entire winter seasons.

*"Phase I Archaeological Survey of the Hilina Pali Petroglyph Cave and Associated Sites, Hawaii Volcanoes National Park" (Ms. 051576) is on file at the Dept. of Anthropology, B. P. Bishop Museum, Honolulu, Hawaii.
As a result of this aridity, the area's vegetation comprises xerophytic scrub and forest, giving way to open, dry grasslands and barren, recent, lava fields. The grasslands are made primarily of the indigenous pili grass (*Heteropogon contortus* [L.] Beauv.) and various *Andropogon* grass species, with scattered 'ōhi'a-lehua trees (*Metrosideros collina* [Forst.] Gray). It is probable that the introduction of goats into the area in the early 1800s resulted in decimation of certain native plant species. The endemic and indigenous flora of the area may thus have been somewhat more diverse and abundant prior to European contact.

The Hilina Pali Petroglyph Cave (Site 50-HV-383)

Description

The Hilina Pali Petroglyph Cave consists of a N-S-extending lava tube with a collapsed section of roof permitting access into both the N and S portions of the tube. The S section extends for 145 meters from the collapse and shows little evidence of use and few petroglyphs. The N section contains abundant petroglyphs for about 17 meters from the collapse.

The collapsed area is roughly circular, c. 9.6 meters in diameter, with a maximum depth of 2.7 meters. Located within the collapsed area is an irregularly shaped platform, that is roughly paved and contains a square, stone-lined fireplace (FP-2), constructed by placing five stones on edge.

Just off the N edge of the platform is another fireplace (FP-3), marked by a circle of five stones. A flaked basalt cobble was found on the surface within the circle of stones.

On the E side of the collapsed area a 1-meter-wide rampway leads from the plain into the N section of the tube. This rampway is partially bounded on the E by a retaining wall, and on the W by a free-standing, multiple-stacked wall.

Across the 7.8-meter opening of the N extent of the tube is a free-standing, multiple-stacked wall that rests upon a pavement of small, angular, basalt cobbles. The pavement extends approximately 9.0-meters into the tube; its exact extent could not be determined because of extensive roof-fall. A probable fireplace (FP-1), consisting of four stones placed in a square, and a fifth in the center, is located within the tube atop this pavement.
Petroglyphs

The N section of the tube abounds in petroglyphs. The majority of the petroglyphs are relatively near to the opening, although a few occur as far as 17 meters into the tube, which is the approximate limit of daylight. Approximately 550 were recorded in detail, and the number still to be recorded on the ledges to the E and W of the opening may be even greater.

The tube has numerous natural ledges running along the sides for almost its entire length. These ledges are shiny, smooth, and almost glazed. These smooth surfaces are thin and cover a relatively porous and soft basalt. The production of petroglyphs in this surface must have been relatively easy and the glyphs exhibit a delicate, or fine-lined, light-handed style that is unusual for Hawaiian petroglyphs.

This fine technique made smaller figures possible. Many of the same forms that are found on the surface sites in the vicinity are reproduced in miniature here. The largest petroglyph recorded in the cave was 52 cm long. A few others are over 40 cm in length, but the majority are less than 30 cm, and many are less than 10 cm. Even the smallest glyphs are executed in surprising detail--toes, fingers, and hair or headdresses are common.

The most common petroglyphs recorded are non-human forms, the majority of which are dots and lines. Some of the lines may be incomplete human figures. Seven turtles, nine human feet, and one probable dog were also recorded.

Human forms compose the bulk of the remaining petroglyphs. Almost the full range of body types are represented: open-body, linear, and triangular-body forms. Only the columnar-body form was not recorded.

The open-body type of glyph has the lower part of the torso left open. The feet, legs, and torso are formed by one continuous incised line. The head is often a part of this line and when it is, it is usually of the hawk-headed type. Alternatively, the head is depicted by a bruised dot above and separate from the torso. Arms and hands are incised lines appended onto the torso. Fingers and toes are often depicted. The male sex is shown on one figure with an arrow in the opening of the torso. Another open-body figure has a dot at the base of the torso and may represent a female. Several of these figures are depicted in a squatting position with the knees upraised.
Linear figures are depicted by incised lines, with one vertical line representing the torso. The arms and legs are shown in two ways—wth elbows and knees bent at right angles, or with arms and legs formed by curved lines. A combination of these two styles is also present. Arms are depicted as being either upraised or down or a combination of the two. The majority of the linear figures have fingers and toes; the number of appendages ranges from two to four. The male sex is often shown simply by an extension of the torso line below the juncture of the legs, sometimes with a swelling or widening at the end. The head of the figure is always depicted as a dot at the upper end of the torso line.

Triangular-body figures are those in which the torso is formed by a triangle, apex down. The triangle usually has its entire center bruised, although there are some figures in which the triangle is formed by an incised line. The arms, attached to the base of the triangle, and the legs, attached to the apex, are usually curvilinear. The head is depicted as a dot, either separate above the torso, or connected to it by a line. Fingers and toes are often represented and some figures have hair or headdresses. A few glyphs even depict muscles on the arms and legs. Sex is not usually depicted on the triangular-body figures.

Pictorial groupings or multiple units are generally considered rare in Hawaii (Cox with Stasack 1970:43-51). At least two such groupings were found at the petroglyph cave. One group consists of two tiny, detailed, fighting cocks inside a circle, with three small human figures positioned as spectators. The other group is a cluster of six, almost identical, triangular-body figures.

No petroglyphs of European motif, such as letters, dates, or sailing vessels, were observed at the petroglyph cave.

Test Excavations

Four test pits were excavated at the Hilina Pali Petroglyph Cave. Three were excavated to reveal partially buried petroglyphs, while the fourth excavated FP-3 in order to obtain a carbon sample for dating the terminal occupation of the site.

The test excavations uncovered 107 petroglyphs, some of which extended down to 62 cm below the surface. All forms were represented; 37.4 percent were human forms, with linear figures predominating.

In addition, test pits 2 and 3 revealed the modifications that had been made in the petroglyph cave. The modifications are characterized as the building up of a raised and paved
floor throughout much of the inner portion of the N section of the tube, which increased the total usable floor space in both the sheltered area and in the open sink. The sequence of modification involved the utilization of large roof-fall blocks, some up to the size of small boulders as a base layer. In some areas smaller boulders and cobbles were laid so as to provide a relatively level surface. The final layer was a paving of soil and small cobbles. Atop this pavement, across the mouth of the cave, the free-standing wall was built. Interestingly, and perhaps uniquely, some of this building activity resulted in the burial of petroglyphs on the lower cave walls.

Radiocarbon Age Determinations

Two carbon samples from the Hilina Pali Petroglyph Cave were submitted in order to determine the temporal span for the occupation of the site and, more importantly, to obtain absolute dates for the sub-deposit petroglyphs. This is the first time that direct archaeological dating of petroglyphs in Hawaii has been possible.

One carbon sample, from the base of test pit 2, yielded a corrected date of A.D. 1540-1720 at 1 standard deviation (corrected dates based on Ralph et al. 1973). The carbon sample from Fireplace 3 yielded a corrected age of more recent than A.D. 1655.

The absence of historic-period artifacts and petroglyphs indicates that this site was abandoned prior to significant European contact. Therefore, a temporal span for the occupation of the petroglyph cave can be approximated as A.D. 1600-1800.

Artifacts

Seventeen portable artifacts were recovered from the surface and from test excavations at the petroglyph cave. These artifacts can be separated into four functional classes (fishing gear, domestic implements, tools, and miscellaneous) that represent both extraction and maintenance types of activities (Binford and Binford 1967:71). The artifacts found consist of one finished and one unfinished fishhook, a tapa beater, two patellid scrapers, a birdbone pick, abraders of basalt, coral, and echinoid-spine, a grinding stone, a flaked basalt cobble, a utilized basalt flake, and drilled shell and worked bone.

Contact with the coast is indicated by the artifact collection. The patellid shells were gathered at the coast, and fishing and fishhook manufacture are also indicated by the complete and unfinished fishhooks, the pieces of cut bone, and the abraders.
Midden Analysis

Quantitative analysis was performed on the midden material recovered from the excavations. The majority of this material consists of limpets, Cellana esarata Nuthall (Hawaiian 'opihi). Small quantities of other shellfish species—Conus, Drupa, Cypraea, Nerita, etc.—were also recovered. Bone of dog, pig, bird, and fish was sparse. The inhabitants were probably also utilizing food that does not appear in the remains, such as poi, bananas, or breadfruit.

The inhabitants of the site evidently subsisted primarily on marine resources that could only have been gathered some 3km. away. The results of the midden analysis suggest intermittent use of the site, or at least frequent contact with people from some coastal area.

Associated Sites

In addition to the petroglyph cave, sixteen additional sites were recorded in the area. These included surface petroglyph fields, shelters, trail segments, and three additional lava-tube sites.

One of the lava-tube sites (HV-393) contained 50 concentrations of gourd remains in addition to 78 concentrations of sticks, grass, and charcoal, and two ash deposits. The remnants of a wooden bucket with a metal bail and half of a coconut shell (endocarp) were also found. All of this material was probably associated with water catchment. The gourds most likely had been placed under drips from the roof and the wooden bucket and coconut shell presumably served the same function. The sticks, grass, and charcoal could be the remains of torches, and the ash deposits are probably the result of small fires used for light.

A carbon sample from this site yielded a corrected date of more recent than A.D. 1655. It seems likely that this site was utilized in the late prehistoric period, with probable sporadic use into early historic times.

Conclusion

Based on the results of the survey, excavations, and the radiocarbon dates, some tentative conclusions regarding chronology of sites in this area and the settlement pattern may be attempted. Two alternative hypotheses concerning the nature of occupation of the Hilina Pali Petroglyph Cave can be formulated on the basis of the stratigraphy and the variety of artifact types and midden material recovered: (1) the site was used intermittently, but frequently,
for temporary shelter during trips between coastal fishing sites and the dryland forest or the more distant upland forest of the Kilauea area; or (2) the site was used for longer periods, during the wet winter season, when the water-catchment gourds in the damper caves would have needed regular tending. It is also conceivable, of course, that the site was used in both ways. The latter hypothesis appears preferable, however, especially when the gourd materials in the neighboring cave sites, particularly Site HV-393, are considered.

The petroglyph cave (HV-383) was occupied and a variety of modifications made in it, over a time span of approximately 200 years, c. A.D. 1600-1800. The modifications are characterized by the building-up of a raised, paved floor, which considerably increased the total usable floor space. This building activity resulted in the burial of petroglyphs on the lower cave walls.

Utilization of HV-383 evidently terminated prior to European contact. No historic artifacts were found at the site, either on the surface or from test excavations. Furthermore, none of the glyphs recorded or observed were of European motif. We thus feel justified in concluding that this site and its petroglyphs date entirely to the indigenous Hawaiian period.

The water-catchment site (HV-393) was utilized in late prehistoric times and into early historic periods as evidenced by the historic artifacts.

Contact with the coast is indicated by the midden material and by the artifacts associated with fishing and fishhook manufacture. The fresh water collected in the tubes may have been transported to the coastal settlements along the arid coastline.

In summary, the survey area was utilized in late prehistoric and early historic periods, and at least two activities account for the seventeen sites: (1) travel between the coast and the upland forest; and (2) collection of fresh water for coastal settlements.
Literature Cited


