AN INVESTIGATION OF THE FRESH WATER SUPPLY
AT KOAIE VILLAGE AND ITS RELATIONSHIP TO
THE STRUCTURAL HISTORY OF THE COMPLEX

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INTRODUCTION:

During the summer of 1970, a study was made of the fresh water supply of Koeie Village, a Hawaiian fishing village located one-half mile south of Mahukona in the North Kohala district on the Big Island of Hawaii. 

This village was occupied both historically, after European contact, and prehistorically, with the earliest date of occupation being 1600 - 1650 A.D. This date has been determined by Carbon 14 dating, but it's believed that excavation during the 1970 project will yield dates predating this.

The intent of the study undertaken was not only determination of the fresh water resources but also the relationship of the availability of that water supply to the structural history of the village.

CLIMATIC CONDITIONS:

At present day, the climate of the area is quite dry with an average rainfall in January of 1 - 2 inches and in August of ½ - ⅔ inches with the yearly average of 10 - 15 inches. There is no archaeological evidence to indicate a drastic climatic change in the area so it's safe to assume that the climate during the initial occupation was fairly consistent with that of today.
METHOD:

Initial work during the first week of summer field school involved a visual inspection of the village in conjunction with reference to maps, site reports, and papers of the area prepared from previous excavations during the University of Hawaii's Archaeological Field Summer School of 1968 and 1969. Several features, thought to relate to the water supply had been mapped during the summer sessions although no further excavations had been conducted.

After the preliminary work, two sites were chosen which appeared related to the water supply:

1) A well designated site #7610 and an adjoining platform area. (Map #2)

2) A natural catchment area approximately 100 meters NE of the central village designated site #6730. (Map #3)

WELL AND PLATFORM EXCAVATION:

The well, prior to excavation, appeared as a stone rimmed depression which had been filled with larger stones, dirt, and rubble. It was decided to divide the well into 4 meter squares and excavate it in 10cm levels. If natural stratigraphy was encountered, excavation would change to natural levels. However, this did not occur and excavation was conducted in the initial manner.

Excavation of the well produced the following information:

1) The well was filled during the historical time (tentative date 1920-1930). This date
has been established from a study of artificial material recovered. (See artifact key)

2) The well was filled at only one time.

Materials recovered from the bottom levels were similar to ones found in the upper levels. In addition, no stratigraphic change was observed in the fill material.

A geological report prepared by Maurice Morgenstein, a geologist with the University of Hawaii on August 7, 1970 provided additional information on the well. He identified small lava gas tubes found leading into the bottom of the well which had been filled with a laterite material not indigenous to the well site. Mr. Morgenstein feels this material was probably transported via underground streams.

He summarizes his report as follows:

A probable reason for the well "drying up" is the closing of the underground stream-feed networks and the successive opening of other underground networks which are presently dumping fresh water into the juxta posed bay. There is no geological reason to suppose that in the short time span there has been any major fluctuation of the height of the water table. The encroaching plant life must also have some effect upon the surface drainage of this region. However, surficial overflow is not sufficient to fill a well of this size.

In conjunction with excavation of the well, the platform area to the ENE of that site was partially excavated.

This feature appears as a platform upon which is built a rectangular enclosure (feature #1305). Three pits were opened extending from the well into the platform. This
was done as an effort to determine the structural relationship of the well and the platform.

Excavation of the platform revealed an additional platform at a depth of 60cm. Large stones were uncovered which extended from below the bottom platform to the surface. There can only be assumptions made as to the function of these large stones, but it appears that they were the foundation for a large rectangular shaped structure approximately twice the size of feature #1305. An extensive excavation of the entire platform might clarify this. At a later date, it appears this first structure was filled in and the top or present day platform constructed.

Excavation between the original structure on the first platform and the well revealed a stair stepped stone effect leading away from the well. It is felt that these stair stepped stones were placed in such a manner as to allow for the construction of some type of covering, probably wooden, over the well.

This would have served as a logical solution for several problems:

1) It would have greatly reduced evaporation from the well.
2) It would have served as a safety precaution to prevent people, especially children, and animals from falling in.
3) The covering would also have prevented wind blown dust from entering the well.
NATURAL CATCHMENT EXCAVATION:

The last area to be excavated related to this study of the water supply of Koaio was a natural catchment in a stream bed approximately 100 meters to the NE of the central village in Kilometer 01, Hectare 53 of the grid system established by T. Stell Newman for the ahupua'a of Lapakahi in the summer of 1968.

This catchment area was a depression 1.75 meters in diameter. It had been altered by the placement of a three layered wall of stones across the downstream end to aid in the trapping of water. There was no cultural material present in or around the catchment.

The only associated feature to the catchment was a rock wall built on the stream bank 2½ meters south. This "L" shaped structure was averaged 45 cm in height with the EW leg 2.0 meters long and the NS leg being 1.6 meters in length. This structure was placed against a a natural rock wall having a slight overhang.

For excavation, the area enclosed by the wall was divided by an EW line into two parts. The northern half against the wall was then excavated. A wind blown deposition of dust 60 cm deep was removed before reaching bedrock. No cultural material was recovered.

A section was then removed running NS through the wall to the catchment to determine the structural relationship, if any, of the two features.
Excavation of the wall and area between it and the catchment failed to produce any cultural material. It was found, however, that stones had been placed in a stair stepped fashion between the wall and catchment. It's felt that this was placed there only as support for the wall.

As to the function of the walled enclosure, no definite conclusions were reached. There are, however, several possibilities. It could have been used as a food storage area, an agriculture feature, a sleeping area, or some unknown function. It seems more probable that it was a seasonal agriculture plot used during a "rainy" season, at which time water was trapped in the catchment and available for watering crops growing there. It seems unlikely that the area would have been used for a sleeping shelter since it's only a five minute walk to the village.

SUMMARY:

Investigation of the fresh water resources has led to the following conclusion:

Initial settlement of Koio village was most importantly controlled by the availability of water. The well, located in the central portion of the village, was more than adequate in supplying the necessary water. This well, being fed by underground streams, which in turn were formed in the mountainous region to the east of the coast, had a fairly constant supply of water. There have been floral changes in the area such as the
deforestation of the upland Lapakahi ahupua'a in the 19th century and the introduction of the kiawe tree during the first of the 20th century. However, to date there is no archaeological proof to indicate this has affected the water supply of the area.

Although work on the structural history of the village has not been sufficiently completed, certain assumptions can be made. Present evidence indicates initial settlement began with a scattered pattern of habitation sites along the coast where Koai'e village is located. This phase was followed by an increase of village size in which more building took place. Towards the middle of the 19th century, a structural decrease of the village took place with habitation structures once again centered near the well area.

Reasons for the abandonment of the village in the early part of the 20th century were manyfold. These included:

1) A gradual "drying up" of the well.

2) A depletion of the maritime resources along the coast due to extensive use of dynamiting practices for the catching of fish. This practice, which was a carry over of early Hawaiian poisoning methods, not only indiscriminately killed mature and immature fish but destroyed reef formations as well.

3) Economic opportunities on the windward side of North Kohala with the introduction of sugar cane operations in the latter part of the 19th century.

4) During this time, there might also have been pressure applied from ranches in the area using the land for cattle grazing to get people to move.