NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION NEWSLETTER

ARCHAEOLOGY OF HALAWA AND LAPAKAHI:

WINDWARD VALLEY AND LEEWARD SLOPE

P. Bion Griffin
Thomas Riley
Paul Rosendahl
H. David Tuggle
University of Hawaii

ABSTRACT

The Department of Anthropology of the University of Hawaii has conducted archaeological research in the dry leeward side of Kohala, Hawaii and Halawa Valley, a valley on the wet windward side of Molokai. Emphasis has been on describing man's cultural adaptation to variation in environment. The inter-relationships of population growth, changing resource systems, and settlement and social organization are being sought. We outline our research design, review selected data, and suggest possible conclusions.

INTRODUCTION

During the last three years the University of Hawaii, Department of Anthropology has conducted archaeological research in Halawa Valley, Molokai and at Lapakahi, North Kohala, Island of Hawaii. Research design has been varied but has generally emphasized the processes of Hawaiian cultural adaptation, with focus on systems of subsistence and social units. Cultural adaptation involves the non-biological behaviour that integrates a population of Homo sapiens with other components, social and natural, of the environment. In effect, this work has thus de-emphasized broad-scale, area-wide classifications in favour of concentrating on local environments and their differential interaction with the development of economic systems, spatial organization of social groups, and population size and growth.

The 1968 excavation at Lapakahi, directed by Richard Pearson and T. Stell Newman, was one of the early attempts in Hawaii to view

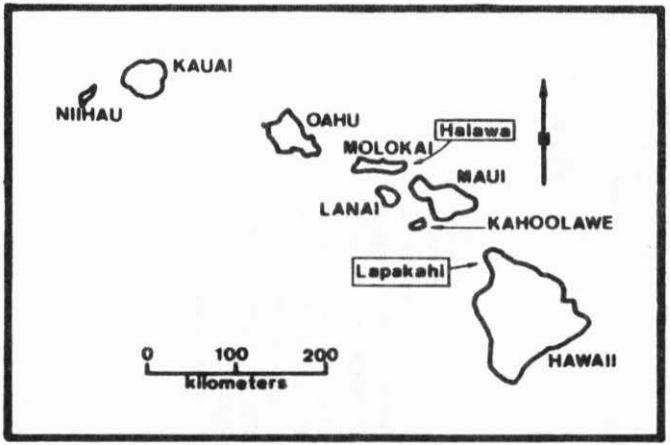

Fig.1 The Main Islands of Hawaii

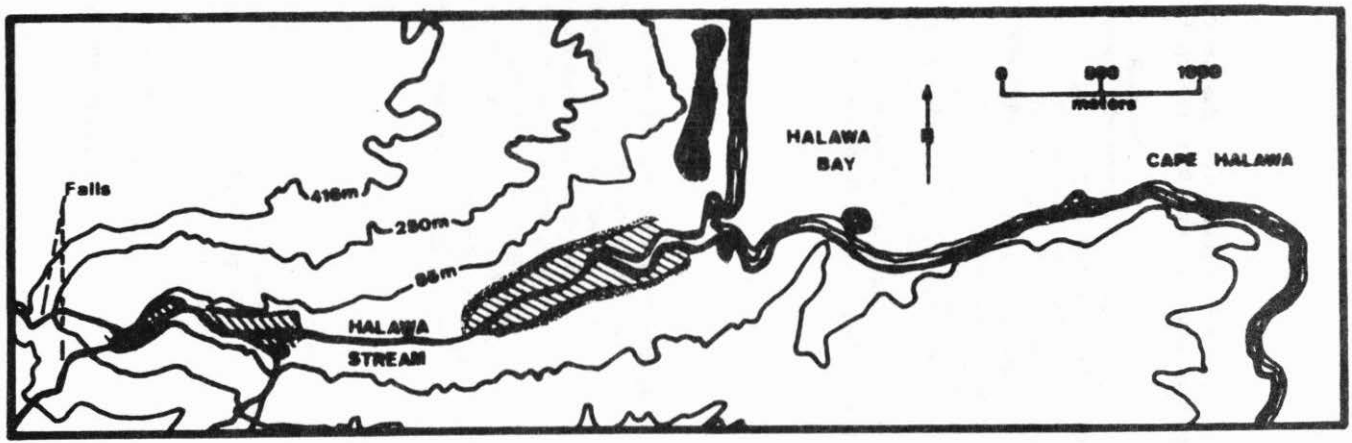

Fig. 2 Halawa Valley, Molokai

Irrigated

Late Prehistoric Settlement

Earliest Settlement

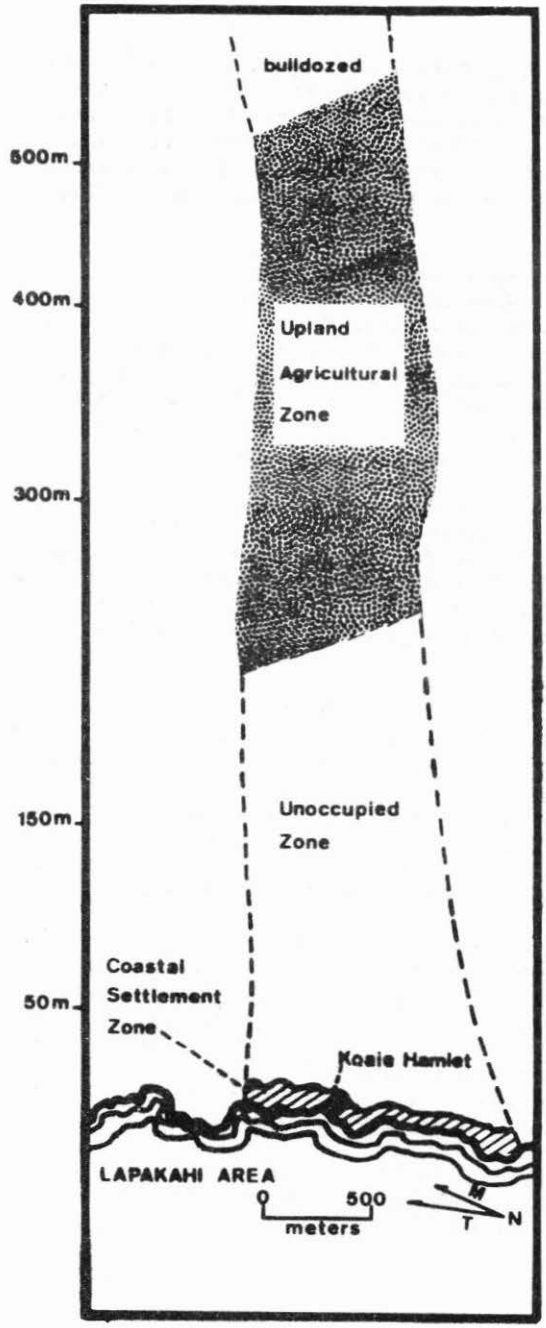

Fig. 3
Ahupua'a of Lapakahi, Kohala Hawaii (adapted from Newman 1970: Map 3)

archaeological culture in a systemic manner (Pearson 1968). Lapakahi was selected as one of the few remaining land units with both coastal settlements and upland agricultural-domestic remains still intact. Newman (1970) attempted to document changes in both marine and terrestrial adaptations, and his work has established a baseline interpretation of Hawaiian fishing and farming as of A.D. 1778, the date of Cook's arrival.

The 1968 excavations emphasized the coastal habitation concentration named Koaie, with somewhat less emphasis upon upland residence units and field systems, although the massive extensions of the latter were mapped from aerial photographs. The lowland excavations produced large samples of food remains which were recovered by fine screening and micro-analysis. Retrieval included not only large bone and shell remains, but quantities of fishbone, fishscales, shell fragments, and bones of small land vertebrates.

The 1969 Lapakahi season, under the direction of Roger Green, continued the emphasis upon systems of adaptation, but with an increased use of settlement pattern data as a basis for inferences concerning the interplay of economic resources, environmental variables, and social units. Work involved intensive survey of the coastal zone, followed by the excavation of a range of both lowland and upland architectural features.

In 1970 research continued in both the lowland and the upland areas, under the general direction of Griffin and Tuggle, with the upland work under the particular supervision of Rosendahl. The ecological systems orientation of the first two years was maintained, with more concentration on the spatial definition of social groups and on the integration of sub-regional and regional social units. Particular tactics included further control of fluctuations in settlement pattern and resource use along the coast and in settlement pattern and agricultural systems in the uplands.

Archaeological work in Halawa Valley was begun in the early 1960's by Patrick Kirch (1965, 1966). This has been followed up by two summers of research by Riley (1970), supplemented with further work by Rosendahl. Riley has selected site locations, temporal variation, use of agricultural features, and midden analysis to describe the development of the human population and the variation of carrying capacity through several adjustments. Rosendahl is involved in a Halawa-Lapakahi comparison of agricultural systems and domestic residence units.

Research is still ongoing, but the following three sections briefly describe the current state of affairs in the archaeological investigations of Halawa Valley and the lowland and upland zones of the ahupua'a of Lapakahi.

Halawa Valley

Halawa is a small valley located at the eastern tip of Molokai. It is well watered by a perennial stream emanating from two waterfalls at the valley head and in historic times was occupied by no less than 400 Hawaiians (Hitchcock N.D.) who were chiefly engaged in irrigated taro agriculture.

The initial research problems of Riley's programme in the valley centred around the articulation of residence patterns with the utilization of the valley's environment in subsistence activities. A model of this relationship has been offered for the Hawaiian Islands based on ethnographic and ethnohistoric evidence (Handy and Pukui 1958) indicating a mutual inter-dependence of marine and terrestrial resources and implying specialization with permanent littoral and upland residential clusters. This model has been extensively used by Sahlins (1958) in his characterization of the relationships between resource use and political elaboration in the Hawaiian Islands.

The excavation programme in Halawa was developed as a test of this model, its universal application to the Hawaiian adaptation, and its relevance to a small, irrigated valley occupation.

Three major areas of human activity were delineated in the course of the programme:

1. A coastal activity area consisting of four loci, two on the north shore of the valley stream and two on the south shore.

2. An agricultural area consisting of irrigated agricultural complexes along the stream flats and the alluvial fans of its perennial tributaries, and dry agricultural terracing on the talus slopes of the pali.

3. A zone of residence and related structures located in the dry agricultural terraces above the irrigated complexes.

Excavations were carried out in all three of these areas during the field programme. While it must be emphasized that the excavations in the valley were by no means exhaustive (two coastal loci and 19 structures excavated partially or completely, and three of eight terrace complexes excavated partially), a tentative sequence for the occupational history of the valley can be constructed based upon different articulations of residence pattern with resource use.

The initial occupation of the valley as represented by the excavations in an erosional remnant (50 Mo A1 3) at the southern coast of the valley appears to have been early in the archaeological record of the Hawaiian Islands. Economic activity during the early stages of occupation stressed the utilization of marine resources over terrestrial resources at this locus. While a continuing emphasis on marine resources to the termination of the occupation at the site @ A.D.1300 is indicated, an increasing stress on terrestrial resources can be seen in the increased numbers of mammal remains in the form of pig and dog (a tenfold increase in the quantitative sample from 145 gms in lower bed to 1117 gms in upper beds).

Dates for the inception of agricultural expansion are not available, but the increase in mammalian fauna at the coastal site probably correlates with the expansion of other terrestrial resources. Residence associations with the large mainstream irrigated complexes date from the 16th to the 19th Centuries A.D. At the same time one of the tributary irrigated complexes on an alluvial fan of the valley was shown in excavations to be inferior stratigraphically to a mainstream complex, indicating an earlier date for the construction of this particular tributary complex and perhaps for the tributary complexes in general. A shift in residence structures from high on the talus slopes for the prehistoric structures excavated to just above the irrigated mainstream complexes for historic structures might be related to an increasing emphasis on irrigated taro over dryland crops in the historic period.

The relationship between subsistence and settlement for the late prehistoric period in Halawa Valley differs considerably from the model upon which Sahlins based his (1958) interpretations of the relationship between land use and socio-political organization in Hawaii. The late prehistoric settlement pattern in the valley suggests a fairly stable pattern of residence in an optimal situation for the utilization of both irrigated and non-irrigated agricultural resources. The settlement is not nucleated and closely approximates what Flannery and Coe have called a "contagious distribution of settlement" (1968: 270), that is, a residence pattern situated in one environmental resource zone with a replication of subsistence activities from one household to another.

Coastal Lapakahi

Lapakahi is an ahupua'a, or native land division, extending from the coast to the interior of the island for a distance of about seven kilometers, with a width of about one kilometer. Located in the geologically old district of Kohala, Lapakahi has a zone of marine

oriented settlements along the dry coast (rainfall of less than 25 cm annually) and a broad zone of sweet potato agricultural fields and habitations beginning at about 250 mm of elevation. Rainfall is approximately 40 cm annually at the lower agricultural boundary and increases substantially as elevation increases. All of upland Lapakahi is one major agricultural field system. Between the upland area and the lowland coastal habitation is an uninhabited zone about 2 km across, an area too dry for cultivation and too far from the sea for marine exploitation. However, the two regions of habitation are linked by a series of trails cutting across this resourceless band. These mauka-makai trails are strong evidence for the social integration of the two zones of the ahupua'a, an integration with an economic component as shown by the marine-derived midden (shells, fishbone) and artifacts in upland habitations. It is probable that in certain periods of the history of the ahupua'a the upland area was occupied only seasonally by people with permanent habitation on the coast.

The major problem that the following discussion will focus on is population colonization and growth and the relationship to resource utilization. Archaeological remains along the coast range from pre-European platforms and midden deposits to mid-nineteenth century stone architecture. While these features are scattered along the coast, there is one concentration of activity, and this has been named Koaie Hamlet. Excavations of three summers have been concentrated here. Koaie is located on one of the better canoe landing areas along this rocky coast. The small bay enjoys generally calm waters and has an unusually large area of shallow water with concomitant abundance of fish and shellfish.

The lowest levels of Koaie have produced evidence of the earliest known occupation of North Kohala. However, the windward valleys which would be expected to be the first regions colonized have yet to be investigated. But there is good reason to believe that this may be one of the earliest areas of occupation of the dry coastal region. Trachyte hydration dating by a local geophysicist, Maury Morgenstein, places the beginning of the Koaie occupation about A.D. 1300. This early settlement had no platforms or stone masonry, but was characterized by pole houses, a large number of elongated firepits, and an extensive deposit of shell midden.

This area was abandoned about A.D. 1500 and habitation shifted a few meters closer to the sea. The new habitation was marked by the beginning construction of stone platforms, which were to be rebuilt several times with increasing elaboration, into the historic period. This new phase of construction was also marked by the erection of a monumental stone wall, some 40 meters long and $3\frac{1}{2}$ meters wide.

Partially demolished today, it may have stood three meters high. The major platform complex is on the sea side of this wall. It has been suggested that the wall was for protection against the apapaa wind. We suggest that of much greater importance than the practical aspect was the symbolic, the wall prodividing a symbolic isolation of the families occupying the platform complex. In the structure of this community, and in the manpower involved in the construction of the wall and platforms we see the first significant manifestations of socio-political power in the ahupua'a. Present evidence suggests that there was a major burst of agricultural activity in the upland at about the time of the wall and platform construction. If this is so, there is a growth of the political system in association with economic diversification and population expansion, and thus an integration of the ahupua'a.

Population appears to have expanded in dispersed homesteads along the Lapakahi coast in the early 1700's. It is probable that this was the time when the upland agricultural zone was at the height of productivity.

European contact brought one major observable change: the construction of stone walls. Prior to 1800 the only walls in Lapakahi were the low C-shaped windbreaks in the upland and the great stone wall in Koaie. By 1850 the upland area witnessed the building of very large stone wall structures, enclosing garden areas against the ravages of cattle. The coastal zone was dotted with masonry structures: habitations, animal enclosures, canoe houses, and platforms covering crypt burials. Koaie remained a focus for the coastal area in terms of the number and size of enclosures and living structures, but population was quite dense along the whole Lapakahi coast. By the second half of the 19th Century, a major abandonment of Lapakahi had occurred. Epidemics, the field destruction by cattle and the beginning of a cash economy in other areas of North Kohala took their toll. While there was some sporadic occupation afterwards, by 1900 the economy of Lapakahi had collapsed. The population was decimated and the remnants had been drawn elsewhere.

The Hawaiian adaptation to Lapakahi may be summarized as follows: colonization by a small community, probably emigrating from a windward wet valley or from a more southerly dry area, with a settling in at Koaie by marine exploitation. This was followed by an expansion into the upland zone for the beginning cultivation of dryland sweet potatoes. The success of this may have allowed a continued population expansion with a resulting spread along the total Lapakahi coast. It is possible

that this period after 1740 was one of ecosystem balance with maximally efficient exploitation of all resources. We are in the process of developing a simulation model for this period, which will serve as a research base for future investigations.

Upland Lapakahi

Newman's work during the initial 1968 season at Lapakahi emphasized primarily the marine adaptation. Only 2-3 weeks were spent excavating an agricultural zone residential site, which proved to be historic. Newman's study (1970) does, however, present the environmental background relevant to the agricultural zone, and a preliminary description of the extensive aboriginal dry land agriculture field system.

Rosendahl's work, first begun at the suggestion of Roger Green during the summer of 1969, developed into a dissertation research topic: a settlement pattern approach to the study of aboriginal agricultural systems and domestic residence patterns in Hawaii. Most research has been centred at Lapakahi, supplemented by work done at Halawa Valley, Molokai, and Makaha Valley, Oahu. The major research objective was to identify the basic factors influencing the variations and differences found between the dry land and wet land agricultural systems and residence patterns of Lapakahi and Halawa, and to attempt to explain how these developed over time.

The specific research programme at Lapakahi consisted first of the detailed plane table mapping of all structural remains within a defined portion of the agricultural zone. The mapped area, a section 2.3 km long and averaging c. 300 meters in width, was defined by a series of curbstone-lined trails. On the basis of ethnohistoric documents and land grant records, the area mapped seems to represent a native land unit, possibly an 'ili, a subdivision of the ahupua'a. The mapping was done in conjunction with the excavation of examples of different types of residential structures, which were principally scattered, stone-walled, "C" and "L" shaped structures of various sizes, occasional raised stone platforms, and a few high-walled square or rectangular structures. Sometimes a number of these features formed complexes of associated residential and agricultural features. Structural remains other than residential features were identified as agricultural features, burial mounds and platforms, narrow, curbstone-lined trails, modified natural water catchments, and three possible heiau or religious sites.

Three major kinds of agricultural units were defined: rectangular field units, bound by low piled stone and earthen embankments; garden

areas, either open or enclosed by rather high stone walls; and animal enclosures or pens. These major units were further differentiated on the bases of local topographic conditions and associated agricultural features such as piled stone mounds, small clearings, agricultural windbreaks, planting circles, informal terraces, and simple water diversion features.

Eight residential sites, prehistoric and one early historic, were excavated; and while analysis and interpretation have not yet been completed, a summary of preliminary results can be made. General stratigraphy was found to be strikingly similar in all cases: a cultural deposit ranging in thickness from 10-80 cm, but lacking any definable internal stratigraphy; a shallow, poorly-developed overlying topsoil; and a claylike underlying sterile subsoil of volcanic origin. By far the most common non-portable features uncovered were the round to rectangular and square firepits with peripheries of set stones. One prehistoric, "C" shaped structure with maximum external dimensions of 5 x 7 meters contained 19 such firepits in different stratigraphic positions, while a somewhat larger but similar structure contained 36 such firepits, including a large imu, or underground oven, 1.5 meters in diameter and excavated approximately one meter deep into the sterile subsoil.

The artifact assemblage, totalling 219 items in all, was typically Hawaiian in content; but the number and range of artifacts was quite unexpected, compared to the almost total lack of artifactual material recovered from residential sites previously excavated by other researchers in the agricultural areas of Halawa and Makaha Valleys. The artifact assemblage encompassed the following: a wide range of tools, including adzes, abraders, hammerstones, a basalt drill point, a sharpening stone, and utilized basalt and trachyte (volcanic glass) flakes; fishing gear, including a bone hook, bone hook blanks, an octopus lure, and an octopus lure sinker; domestic equipment, including bone picks and awls, limpet shell scrapers, a stone lamp, and a knobbed stone pounder; shell ornaments; and a limited range of historic material, principally glass and ceramic ware.

The midden material contained a wide range of faunal and floral remains. Mammalian species identified were Polynesian rat, dog, pig, and Hawaiian monk seal, as well as some historically introduced species. Bird remains identified included a form of duck; various medium-sized birds, including chicken, Hawaiian coot, short-eared owl, and a shearwater; and a number of small water or shore birds, but no small forest birds.

Marine forms identified included small and medium-sized fish (of species as yet undetermined) and echinoids, and at least 32 different molluscan species. Though a number of species present in the coastal midden material were absent in the upland sample, some 7-11 marine species not identified at the coast were identified, as well as a single species of freshwater mollusc.

A great deal of carbonized plant material, much of it fragmentary and unidentifiable, was recovered; however, it was possible to identify a number of species. This material was of particular value because it represented direct evidence of aboriginal agriculture. Identifications, ranging from tentative to confident, were made by Douglas Yen, Bishop Museum Ethnobotanist. Species identified included a fresh or brackish-water sedge, coconut, bitter yam, candlenut, at least three cucurbits, and sweet potato. Specimens from four of the eight different sites were identified as sweet potato; and all but one of the sites has been securely dated to the prehistoric period.

A total of 54 carbon and trachyte flake samples have been dated. The 10 radiocarbon estimates yielded a time range of A.D. 1400-1800, while the 44 trachyte hydration dates yielded a time range of A.D. 1430-1760.

Currently in process is a detailed quantitative analysis of all structural remains located in the plane table mapped area. This analysis will attempt to use the numbers and distribution of residential sites, and projected agricultural yields based on agricultural acreage and various crop and crop combinations, to estimate possible population dimensions.

In summary, then, the upland survey and excavation results at this point seem to suggest the recurrent occupation of periodically abandoned residential sites, and an agricultural system based on the extensive dryland cultivation of edaphically and climatically suited species such as the sweet potato. Quite possibly the pattern represented is a form of shifting cultivation.

REFERENCES

Flannery, Kent V. and Michael D. Coe 1968 Social and Economic Systems in Formative Mesoamerica. In New Perspectives in Archaeology, edited by Sally R. and Lewis R. Binford, Aldine Publishing Co., Chicago.

Handy, E. S. Craighill and Mary Kawena Pukui. 1958. The Hawaiian Family System of Ka'u, Hawaii. The Polynesian Society, Wellington.

Hitchcock, R. N.D. Molokai Station Reports. American Board of Commissioners for Foreign Missions, Typescript, University of Hawaii Library, Honolulu.

Kirch, Patrick V. 1965. Halawa Valley, Molokai: A Survey of Native Culture. MS (On file at Bernice P. Bishop Museum, Honolulu.)

1966. Archaeological Investigations at Site MHa 1, Halawa Valley, Molokai. MS (On file at Bernice P. Bishop Museum, Honolulu.)

Newman, T. Stell. 1970. Hawaiian Fishing and Farming on the Island of Hawaii in A.D. 1778. Division of State Parks, Department of Land and Natural Resources, State of Hawaii, Honolulu.

Pearson, Richard (ed.). 1968. Excavations at Lapakahi: Selected Papers. Division of State Parks, Department of Land and Natural Resources, State of Hawaii, Honolulu.

Riley, Thomas J. 1970. Settlement, Subsistence, and Environment in Halawa Valley. In Molokai Studies: Preliminary Research in Human Ecology, edited by Henry T. Lewis. Department of Anthropology, University of Hawaii, Honolulu.

Sahlins, Marshall C. 1958. Social Stratification in Polynesia. University of Washington Press, Seattle.