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Tom Dye, Editor

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Editor's Note

It is difficult to remember the state of Hawaiian archaeology before the Society's Annual Conferences began over a decade ago. Begun at a time when the center of archaeological activity had nearly completed its dispersal to the many cultural resources management firms from its old centers at Bishop Museum and the University of Hawai'i, the conferences brought together archaeologists whose daily work rarely, if ever, did so. The sharing of information and ideas that are the goals of the conference have been enthusiastically embraced by the members—so much so that papers that once would have been offered at the old monthly (now quarterly) speakers' series are now routinely held back for presentation at the more prestigious conference. Most of us look forward to the conference and find it an exciting time, both intellectually and socially.

So it was at the 10th annual conference hosted by Pila Kikuchi, Nancy McMahon, and Martha Yent at Kaua'i Community College. Pat Kirch, Class of 1954 Professor of Anthropology at the University of California at Berkeley, gave the conference a rousing start on Friday night with a keynote address that, in just over one hour, managed to canvas our discipline's past and its present, and to speculate on what the future might hold. Pat's perspective, which has grown from his many years on the Mainland after a prolific career at Bishop Museum, was a fascinating mix of first-hand knowledge, detached observation, and academic politics that sketched the broad outlines of change in institutional terms. At the heart of the talk were Pat's opinions about the proper and necessary functions of four archaeological

institutions—the CRM firms, the State Historic Preservation Division, B.P. Bishop Museum, and the University of Hawai‘i at Mānoa Anthropology Department—and his conviction that the institutional balance that constitutes a healthy discipline has now been lost. From my position, after six intense and often trying years with the State Historic Preservation Division where it was frequently clear that *something* wasn’t right, much of what Pat said made good sense and I was captivated by the vision of institutional balance and harmony that he was promoting. It seemed that night like a very worthwhile idea to think about. So, when Rob Hommon and Pat approached me with their idea to submit a revised version of the keynote address to *Hawaiian Archaeology*, I quite happily agreed to the idea.

It wasn’t until the next week that I caught wind of a strongly negative reaction to Pat’s address. I was teaching a graduate seminar in historic preservation at Mānoa on Tuesday evenings and both faculty and students made it abundantly clear to me during some animated discussions that they were not at all swayed by Pat’s portrayal of their institution’s role nor did they agree with his assessment of their efforts. Not only did their institutional balances weigh with different scales, their interpretations of the discipline’s history focused on different events and highlighted other trends. With what I hoped was an editor’s eye to a potentially interesting clash of ideas, I decided to put together a forum on the topics raised in the keynote address and I invited responses from distinguished society members representing each of the institutions that Pat had singled out. I am delighted that Yosi Sinoto, Senior Anthropologist and Kenneth P. Emory Distinguished Chair in Anthropology at Bishop Museum, Bion Griffin, Professor of Anthropology and Department Chair at the University of Hawai‘i, Mānoa, and Ross Cordy, Archaeological Branch Chief at the State Historic Preservation Division all took time from their busy schedules to provide thoughtful essays on themes that Pat touched upon in his keynote address.

A fourth essay, solicited from a prominent member of the contract archaeology profession, was never written. Given the theme that runs through Kirch’s keynote address that contract archaeologists give back too little to the public, it might be tempting to read a lot into this situation. Is the unwritten essay another example of contract archaeology taking care of its bottom line first? Fortunately, this is not the story here. Instead, the archaeologist simply agreed with Pat so completely that in the end he could find nothing that he believed really needed to be said.

Soon after my invitations went out, I received a telephone call from Kēhau Abad, an archaeologist who is not a member of the Society, but whose

publications on Hawaiian prehistory I have read with interest. She expressed an interest in writing a response from the native Hawaiian point of view, and I quite happily agreed to this idea, too. Her essay with Eddie Ayau, former head of the State burials program, rounds out the responses to Kirch's keynote address.

I thank all of the commentators for responding to a draft of Kirch's keynote address. They took their tasks seriously and have written on important issues with courage, precision, wit, and commitment. Some minor editorial corrections to Kirch's draft were made prior to its publication. As far as I can tell, these did not change the substance of his argument in any way and they should not have any effect on the comments, either. If this somewhat disjointed editorial process did introduce errors, then blame the editor and not the authors. They worked too hard on the substantive issues to endure criticism for minor points of scholarship. Abad and Ayau's original draft contained detailed citations to Kirch's draft and I thank them for agreeing to remove these. The production process at *Hawaiian Archaeology* has no ready facility for cross-references to pages within the same issue.

The commentators betray a wide variety of opinions, but there is clear unanimity about several things—the desirability of cooperation among archaeologists and native Hawaiians, the pervasive influence of cultural resources management concepts, and the central role of the State Historic Preservation Division. In today's world, these issues are inextricably linked.

Although most of the essays are, at best, ambivalent about cultural resources management, one beneficial effect of having archaeology firmly embedded in the regulatory nexus is that the consultation evoked by Abad and Ayau's *oli kāhea / oli komo* metaphor is today routinely carried out as part of the environmental review required of development projects by Federal, State, and County agencies. As a key part of this consultation process, the SHPD performs an enormous service for which it receives little credit. Day in and day out the archaeological staff of the Division review development proposals for possible effects on historic sites. When an effect, or a possible effect, is identified, then the developer starts the historic preservation review process. This process, despite the lack of an administrative rule to guide it, does succeed in making historic preservation issues a matter of public record and this is accomplished today on a routine basis. It would undoubtedly be preferable to have an administrative rule in place, and the critics are certainly right that the lack of a rule might prove fatal to historic preservation concerns if push came to shove, but in fact the process generally works quite well. The archaeologists at SHPD deserve more credit than they usually get for this job.

One reason that the development review is rarely praised is that the public's interest in historic preservation is usually episodic and intense and does not extend to the more general issues surrounding management of the cultural resource base in the face of a development-oriented economy. The primary exception to this generalization is the public interest in human burials, which has been both sustained and extremely effective in changing the way that human remains in unmarked graves are treated in Hawai'i. But even here, there is a tendency to look away from the larger picture. There is no doubt in my mind that human burials could be better protected if burial areas were registered with the SHPD, so that they could be identified early in the development process, rather than discovered later, when the range of possible mitigation measures might be constrained or when damage to bones has already occurred. The effort to register burial areas is languishing at the SHPD and as a result, the consultation process is not fully utilized. One reason for this is undoubtedly the perception within the Hawaiian community that archaeologists mistreat the bones of their ancestors. Some of this sentiment was probably necessary to fuel changes in a long-established status quo and to marshal the energy needed to promote and implement the State burial law. Perhaps now that that battle has been won, and the status quo has changed forever, Hawaiians can find some aloha for the archaeologists who acted to save bones in unmarked graves. There is no doubt that the archaeologists' motives twenty-five years ago differed from those of the Hawaiian community today, but they aren't as different as Abad and Ayau make them out to be. As an active participant, I know first-hand that none of us believed that it was right to let bulldozers crush human bones and that we saw our actions as the morally right thing to do.

It also seems clear that consultation is just one piece of the puzzle. It was the case at Honokahua that consultation was memorialized in a memorandum of agreement among the developer, SHPD, and responsible native Hawaiians. Consultation also took place at a series of public meetings held by Federal agency officials and members of the Native American Graves Protection and Repatriation Act review committee prior to Bishop Museum's inventory of human bones collected from Mōkapu and Heleloa. The great unhappiness brought on by these projects, very clearly articulated by Abad and Ayau, indicates that consultation does not, by itself, lead to a spirit of cooperation among archaeologists and native Hawaiians. Clearly, the situation would be improved by a set of common goals, and it is in this context that I think Kirch's and Cordy's calls for educating native Hawaiians about archaeology should be interpreted. Abad and Ayau are, in my opinion, correct to stress that education is a two-way street. The important thing is to get on with the dialog and to make sure that it is nurtured and grows.

The same thing might be said of dialog within the archaeological community, and the degree to which archaeologists here communicate among themselves. Griffin complains, to my mind rightly, about the apparent willingness of archaeologists in cultural resources management to consign their work permanently to the great, grey, restricted distribution literature. The lamented demise of Bishop Museum Anthropology Department's publication series leaves just one cultural resources management firm that holds itself to the publication standard set by Bishop Museum. Sinoto makes it clear that the difference between a viable archaeology publication program and preparation of limited distribution reports is a matter of will, not money. I well remember the effort put into production of reports for *Pacific Anthropological Records* and the *Departmental Report Series*. Typically, the staff worked long into the night several days in a row, pounding away on IBM Selectric typewriters and redrafting figures by hand! There can be little doubt that the road to publication is much easier now than it was then. Development of the CD-ROM as a form of publication and of the Internet as a distribution channel means that production costs are likely to drop even farther than they already have. Is there any justification left for adding to the grey literature at the expense of an on-going dialog with the public, a dialogue that might stand to benefit our profession so handsomely?

T. D.

Obituary for Catherine Cooke Summers

Elaine Rogers Jourdane
State Historic Preservation Division

Hawaiian archaeology lost a great friend when Catherine “Cappy” Cooke Summers passed away on March 11, 1996, at the age of 77. Cappy’s knowledge of Hawaiian natural and cultural history earned her wide respect in the Hawaiian community. Those of us who were fortunate to know her, work with her, and be guided by her, miss her.

Cappy spent over 35 years in the Anthropology Department at Bishop Museum as a volunteer and researcher. Her life-long work in Hawai‘i was spurred on by her extreme curiosity about almost everything. In 1951, she and Dorothy Barrère met with Dr. Kenneth Emory at the Bishop Museum because they were concerned that Ulupō *heiau* in their Kailua neighborhood might be destroyed by the proposed Pali Highway construction. It took that one visit with Kenneth to enchant Cappy, and soon she began to volunteer at the Museum and on Kenneth’s digs on every island in the 1950s and 1960s along with Dorothy, Mary Judd, and others. Her association with Kenneth led to an impressive career of research and scholarship that contributed much to all of us who continue to study Hawai‘i’s past.

Cappy’s curiosity-driven research led her to publish several books and manuscripts on Hawaiian archaeological sites and material culture that continue to be used today, not only by the archaeological community but by students, teachers, and the interested lay public. Among her best known works are *Hawaiian Fishponds*, *Molokai: A Site Survey*, *The Hawaiian Grass House at Bishop Museum*, *Hawaiian Cordage*, and her co-authored volume with Elspeth P. Sterling, *Sites of O‘ahu*. Less well-known are the innumerable hours she spent researching and preparing as yet unpublished manuscripts on the Joseph S. Emerson Hawaiian Collection of Hawaiian artifacts at Bishop Museum and on the identification of Hawaiian shark teeth,

and her tireless assistance in the preparation of the important book, *The Works of the People of Old: Na Hana a ka Po'e Kahiko* by Samuel Kamakau. Her dedication to these works is known by all of us who saw her endure for many years the frigid air-conditioned manuscript room of the Museum library as she pursued her studies.

Cappy was a thorough researcher and where she went she generally left a trail of usefully organized materials. Not many know that Bishop Museum's "Ethnographic Photo File," a tremendous resource for all, was put together by Cappy. This incredibly valuable collection of photographs of Pacific artifacts housed in collections around the world is a valuable resource for anyone working in the Pacific. Much of her insight into the objects found in ethnographic collections came from hours of experimenting with replicas of the objects and the materials from which they were made. Cappy also put together a slide

series on various topics in Hawaiian culture, including the uses of Hawaiian plants, food resources and tools. She used existing slides, photographed objects for new slides, and wrote the text for a slide series to be used for educational programs.

One could write endlessly about the many other contributions Cappy made at the Bishop Museum and to her other interest groups. We who worked with her and benefited so much from the relationship can only thank her memory for enriching our lives through her strength and devotion. Bishop Museum acknowledged Cappy's deeds and once said of her *'A'ohē mea koe ma kū'ono* (Nothing remains in the corners), traditionally said of one who is extremely generous. Cappy's generosity has touched us all and through the legacy of her scholarship she will enlighten many generations to come. *Mahalo, Cappy.*

Neither Here Nor There: A Rites of Passage Site on the Eastern Fringes of the Mauna Kea Adze Quarry, Hawai'i

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Introduction

The archaeological study of religion and ritual, “denounced by the brave and avoided by the sensible,” (Orme 1981:218, quoted in Garwood et al 1991:v), is clearly one of the most neglected and, thus, underdeveloped areas of archaeological theory and practice.¹ The reasons for this are not hard to find. Chief among them is the vexed issue of how ritual is to be defined. Most archaeologists would probably agree with John Barrett in doubting that “a satisfactory definition could ever operate cross-culturally and at a resolution sufficient for detailed empirical study” (Barrett 1991:1). Catherine Bell has suggested that we in fact abandon the concept of ritual as a natural category of human practice with a single set of defining features and think instead in terms of “ritualization,” defined by her as “a way of acting that is designed and orchestrated to distinguish and privilege what is being done in comparison to other, more quotidian, activities” (Bell 1992:74). Bell’s concept, which should appeal to archaeologists because it is set forth in a framework of practical activity, is employed in the analysis and interpretation of a site (50-10-23-16204) situated on the eastern fringes of the Mauna Kea Adze Quarry (Fig. 1), some one-half km from the nearest source of tool-quality raw material in a flow located on the eastern side of the Humuula Trail (Fig. 2). The evidence suggests that this ambiguously located site, situated outside the quarry proper but still a part of it because of the activities that took place there, was the locus of initiation rites for apprentice adze makers who, because they were “transitional beings,” were outside the normal social structure and, thus, “neither here, nor there” (Turner 1967:97).

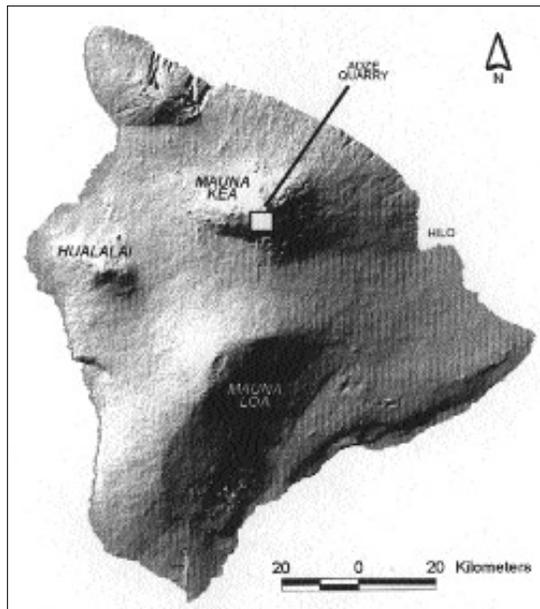


Figure 1. Location of the Mauna Kea Adze Quarry on the island of Hawai'i.

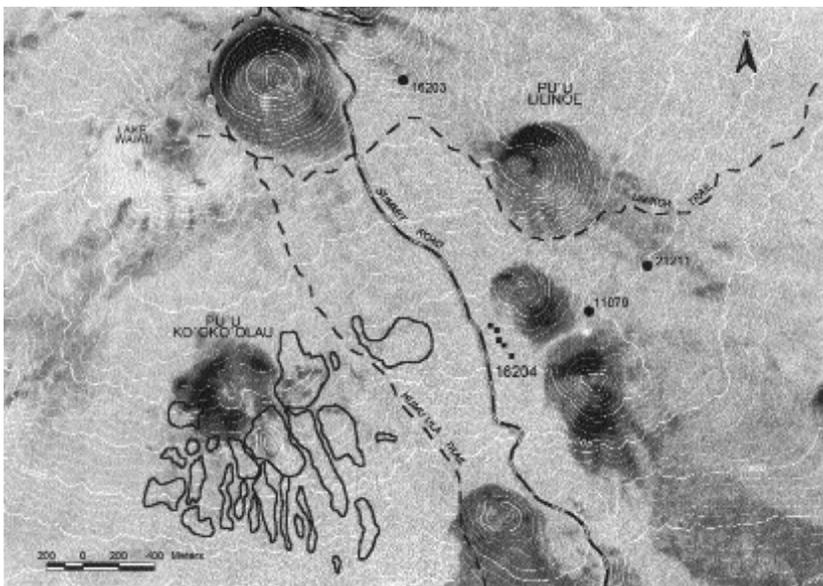


Figure 2. Location of Site 16204 (the position of the five shrines is shown here) and its relationship to the main quarry sites (outlined in black) around Pu'u Ko'oko'olau and other sites mentioned in the text.

I begin with a brief discussion of Bell's concept of "ritualization" and how I have used it in my analysis. This is followed by a general description of the site, its location, environmental context, and topographic setting. As the first step in developing my claim that this site was the locus of initiation rites I examine the question of why it is located where it is. This is followed by a description and discussion of the remains that comprise the site—shrines, enclosures and a diffuse scatter of adze manufacturing by-products. The evidence is then summarized and synthesized prior to offering some final interpretations regarding the structure of the rites that took place at this locale and the importance of this site to an understanding of the quarry socio-political structure.

Identifying Ritual Acts

John Barrett (1994:71), writing about the archaeological study of ritual, has noted that "Our knowledge is not grounded upon the material evidence itself, but arises from the interpretive strategies which we are prepared to bring to bear upon that evidence." The primary interpretive strategy that I have chosen to use in this study is based on Catherine Bell's concept of "ritualization" which is defined more fully as follows:

I will use the term 'ritualization' to draw attention to the way in which certain social actions strategically distinguish themselves in relation to other actions. In a very preliminary sense, ritualization is a way of acting that is designed and orchestrated to distinguish and privilege what is being done in comparison to other, usually more quotidian, activities. As such, ritualization is a matter of various culturally specific strategies for setting some activities off from others, for creating and privileging a qualitative distinction between the 'sacred' and the 'profane,' and for ascribing such distinctions to realities thought to transcend the powers of human actors (Bell 1992:74).

To illustrate the contrast between routine activity and ritualization Bell describes how a Christian eucharistic meal is distinguished from a regular meal by the "type of larger family gathering around the table to the distinctive periodicity of the meal and the insufficiency of the food for physical nourish-

ment” (Bell 1992:90). She goes on to note that the two forms of action play off one another and thus define each other. This leads to the important conclusion that the Christian mass is not a model for a normal meal, but rather a strategic version of one. It indicates, moreover, that “what is ritual is always contingent, provisional, and defined by difference” (Bell 1992:91).

Because ritual is not a natural category of human activity with a set of universal defining characteristics the question of what is to count as evidence of ritual in the archaeological record obviously has to be approached more obliquely. Using Bell’s concept of ritualization and the specific example of the two kinds of meals as a guide, I have made an effort to show how the enclosures and artifacts on this site differ from the more quotidian ones found in the quarry proper.

The Site: Definition, Location, Environmental Context and Topographic Setting

The site (Bishop Museum Site Number 50-Ha-G28-1; State of Hawaii Site Number 50-10-23-16204), which was found in July 1975 during the first field season of the Mauna Kea Adze Quarry Project and recorded using the site definition criteria employed in that research project (McCoy 1977:229) even though there was no local source of tool-quality stone, was described as consisting of four shrines,

Table 1. Shrine 1 Upright Characteristics

No.	Position	Dimensions			Form
		height (cm)	width (cm)	thickness (cm)	
1	fallen	47	24	20	pointed
2	fallen	50	28	9	pointed
3	fallen	55	25	13	flat
4	erect	59	35	15	pointed
5	erect	49	18	16	pointed
6	fallen	55	14	14	pointed
7	erect	43	24	18	flat
8	fallen	61	22	18	flat
9	erect	60	30	24	pointed

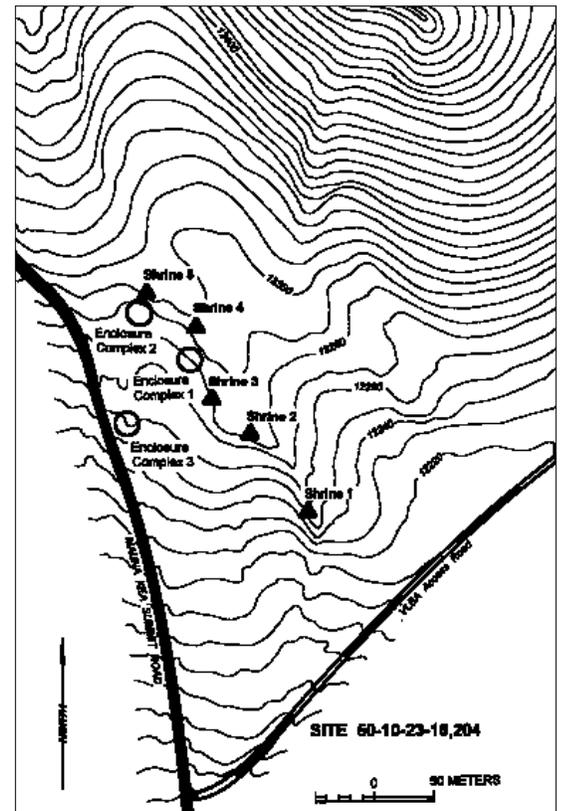


Figure 3. Topographic map showing the spatial relationship between the shrines and enclosures on Site 16204.

twenty five open-air shelters, and a diffuse scatter of adze manufacturing by-products (McCoy 1976:138; 1977:Table 1; 1978:Table 1).² For reasons outlined below, one group of shelters located on a separate ridge is now believed to be of probably modern age.

The spatial relationships among the other structural remains, which are spread out over a linear distance of roughly 244 meters (800 feet) between the 12,250 and 12,300 foot elevations on the top and western margin of a prominent ridge (Fig. 3), suggests the possible existence of two discrete clusters, each comprised of similar numbers of shrines and shelters, which are, moreover, arranged in the same manner, with the shrines located in an elevated position on the ridgetop and the enclosures directly below. Whether or not all of the shrines should be considered a part of this site is open to question, however, as will be discussed below.

The site is located in a stony alpine desert environment. The climate at this elevation, which is cold but

not cold enough to maintain glaciers, is periglacial. The primary evidence of a periglacial climate and geomorphic processes is the occurrence of permafrost (Woodcock, Furumoto and Woollard 1970; Woodcock 1974) and diverse forms of patterned ground, such as stone stripes and polygons, that are widespread in the cold regions of the world (Washburn 1956, 1979).

The vegetation at this elevation is predictably impoverished, consisting primarily of lichens, mosses and a few bunch grasses, such as *Trisetum glomeratum* and *Agrostis sandwicensis* (Hartt and Neal 1940). The soils in the summit region, like those in alpine environments generally (Retzer 1974; Birkeland 1984), are poorly developed (Ugolini ms.). In the absence of a vegetative cover and, thus, a surface organic layer, the ground surface in many places is a desert pavement (Cooke 1970; Cooke and Warren 1973:120–129; McFadden et al. 1987).

The ridge on which the site is located is a *roches moutonnées* (Davies 1972:171), commonly known as “whaleback ridges” (Porter 1975:247) and “mutton-back ridges.” Some parts of this ridgetop, which has been extensively abraded and exhibits classic examples of glacial striations, are mantled with a scattering of glacial drift boulders (see Fig. 6). Other parts of the ridgetop, primarily at the upper end, are wholly or partially concealed by stone-banked terraces and lobes (Davies 1972:49–51), which are variously described in the literature as either solifluction or gelifluction terraces and lobes. Here I follow Washburn (1979) and Embleton and King (1975:97) who have noted the advantage of the term gelifluction in clearly denoting a periglacial regime as opposed to other climatic regimes, including low elevation deserts, where similar forms of patterned ground are also found (Cooke and Warren 1973: 129).

Why Is This Site Located Where It Is?

Why is this site located where it is, some one-half km away from the nearest source of raw material but still in sight of the main quarry? In other quarries one might think of a number of possible explanations for peripherally located workshops, such as the desire to work alone, but in this high altitude environment with all of its attendant physiological stresses on the

human body, it is difficult to understand why people would remove themselves and their materials from the confines of the group basecamp where a good part of each day seems to have been spent (McCoy 1990:98–99). When viewed from the perspective of the natural environment and its effects on human productivity the location of this site appears to be irrational. Only when we begin to think in terms of cultural perceptions different from our own, to adopt a phenomenological perspective, where the key concern is “the manner in which people experience and understand the world” (Tilley 1994:11), can we begin to make sense of this site.

While the existence of shrines is an obvious indication of ritual, the first clue that this site was the locus of a particular kind of ritual is its isolated location. The anthropological literature on rites of passage indicates that transitions of any kind, but especially the middle or *liminal* phase of the tripartite sequence (separation, transition and incorporation) that characterizes such rites (van Gennep 1960), is filled with danger and that initiates are frequently isolated because they are regarded as polluting and dangerous to others. Edmund Leach, Mary Douglas and Victor Turner, amongst others, have repeatedly emphasized this point:

The general characteristic of such rites of marginality (*rites de marge*) is that the initiate is kept physically apart from ordinary people, either by being sent away from the normal home surroundings altogether or by being temporarily housed in an enclosed space from which ordinary people are excluded (Leach 1976:77).

Danger lies in transitional states, simply because transition is neither one state nor the next, it is undefinable. The person who must pass from one to another is himself in danger and emanates danger to others. The danger is controlled by ritual which precisely separates him from his old status, segregates him for a time and then publicly declares his entry to his new status. Not only is transition itself dangerous, but also the rituals of segregation are the most dangerous phase of the rites (Douglas 1966:96).

... one would expect to find that transitional beings are particularly polluting, since they are neither one thing nor another; or may be both; or neither here nor there; or may even be nowhere

(in terms of any recognized cultural topography), and are at the very least “betwixt and between” all the recognized fixed points in space-time of structural classification (Turner 1967:97).

The perception that initiates are polluting and dangerous is, I think, the most plausible explanation for why this site is so far removed from the quarry. A different but related question is why was this particular location selected rather than some other one in the general area? The answer appears to be that the topography of this particular ridge was ideally suited to the creation of a structured environment of fundamental oppositions and hierarchical relationships between, for example, a higher (spiritual) reality in the elevated shrines and a lower (mundane) one in the enclosures occupied by humans located below the shrines. The use of such artificially created schemes of binary oppositions and hierarchies is, as Bell has noted (1992:101–104), a common aspect of producing a “ritualized body through the interaction of the body with a structured and structuring environment” (Bell 1992:98).

The Shrines

General Characteristics

The quintessential characteristic of all the stone remains in the quarry and elsewhere on Mauna Kea that can be classified with confidence as shrines is the presence of one or more upright stones.³

Kenneth Emory, who was the first to note the presence of shrines in the quarry, in 1937, noted that:

The adze makers, clinging to the ancient form of shrine at which to approach their patron gods, have preserved a most important link with their ancestral home. Each upright stone at a shrine probably stood for a separate god. The Hawaiian dictionary describes *‘eho* as “a collection of stone gods” and this is the term which the Tuamotuanans, the neighbors of the Tahitians, used to designate the alignment of upright stones on the low and narrow platform at their maraes, or sacred places (Emory 1938:22).

The vast majority of uprights are naturally occurring, unaltered slabs of tabular rock of long-narrow shape

that were universally set on end (i.e., the long axis of the stone is vertical). The lateral edges of a few uprights bear flake scars, but with a couple of isolated exceptions these are normally of natural rather than human origin. Most range between 50 and 70 cm in length or height. Because most are tabular pieces of stone the sides are parallel or nearly parallel and the cross-sections either rectangular or triangular.

The only attribute that varies to any significant degree is the form of the top end when viewed in profile from the side. Little attention has been given to this attribute in the past in Hawaiian archaeology, although Emory did note it in this description of central rear uprights on Necker:

The central rear upright, that is, the upright having an equal number of uprights on each side, is conspicuously larger than the others in 7 out of the 12 *maraes* where it could be noted. In the remaining 5 *maraes* it is of equal size or even smaller. In Marae 26 and Marae 34, the central rear upright, which measures 4 feet high, 2 feet wide, and 2 feet thick, shows a deep front-to-back groove at the top, possibly an artificial notch (fig. 26). Of the other central rear uprights as many are almost flat on top as are definitely pointed (Emory 1928:63).

Emory did not comment on what the pointed and flat shapes might mean. Some ethnographic accounts, such as Raymond Firth’s description of the uprights (*noforanga*) on Tikopia *marae*, suggest that they might have had no meaning at all:

These stone *noforanga* in a *marae* were slabs of volcanic rock usually, of natural shape, several feet high, set up on end in the ground. Each represented an *atua*, occasionally more than one. In total, the arrangement of stones served as a map of the assembly of gods believed to be participators in the rites of the *marae*. The gods were not believed to sit upon the stones, but were said to use them as back-rests during the ritual, male deities sitting before them with cross legs, female deities with legs straight out, in the normal position of human Tikopia. Essentially the stones were ritual markers, to indicate in front of them the seats of chiefs and elders associated with those *atua* celebrated in the ritual and to serve as the points at which offerings could be laid and

streamers of bark-cloth trailed in acknowledgment of the specific gods. Tikopia religion was not highly iconographic. The importance of these stone 'resting places' was not in their actual shape, size and appearance, but in the fact that they were there, representing particular gods in relation to others, as indicators of participation. They represented the gods; the gods were not expected to look like them. So, while it might seem to a casual observer that the Tikopia were worshipping stones (cf. ch. 11, p. 306), it was the spirits that were being worshipped, with the stones as their place-markers (Firth 1970:120–121).

While it may be that the shape, size and appearance of *marae* uprights did not hold any meaning for the Tikopia, there is evidence that such was not the case in some East Polynesian societies, such as Hawaii, where there is a clear indication of sexual symbolism in pointed and flat stones. Martha Beckwith wrote in this regard that:

A slab-shaped or pointed stone (*pohaku*) which stands upright is called male, *pohaku-o-Kane*; a flat (*papa*) or rounded stone is called female, *papa-o-Hina* or *pohaku-o-Hina*, and the two are believed to produce stone children. So the upright breadfruit (*ulu*) tree is male and is called *ulu-ku*; the low, spreading tree whose branches lean over is *ulu-ha-papa* and is regarded as female. These distinctions arise from the analogy, in the shape of the breadfruit blossom and of the rock forms, with the sexual organs, an analogy from which Hawaiian symbolism largely derives and the male expression of which is doubtless to be recog-

Table 2. Shrine 2 Upright Characteristics

No.	Position	Dimensions			Form
		height (cm)	width (cm)	thickness (cm)	
1	erect	35	20	9	flat
2	erect	56	20	12	pointed
3	erect	44	20	12	pointed
4	erect	45	15	12	pointed
5	erect	46	20	15	flat
6	erect	77	35	30	flat
*7	fallen	60	17	6	pointed



Figure 4. Plan view map of Shrine 1.

nized in the conception of the creator god, Kane (Beckwith 1970:13).

If we assume that pointed uprights symbolize male gods and flat-topped ones female gods, then there is evidence that the adze makers on Mauna Kea worshipped deities of both sexes as is reported to have been the case for canoe makers (Malo 1951:82). One would assume that two local female deities, Poliahu, the snow goddess, and Lilinoe, the goddess of mist, were among those worshipped (McEldowney 1982). Not all of the uprights are either pointed or flat; there are also angled, gabled, rounded, and notched forms. The recurrence of a few distinctive forms suggests to me deliberate or purposeful selection, which is the reason that I decided to begin recording this attribute.⁴

In some cases it is difficult to determine accurately the number of uprights on a shrine because of (1) the effects of natural processes, such as erosion and perhaps windshear, that have resulted in breakage and the displacement of the stone from its original posi-

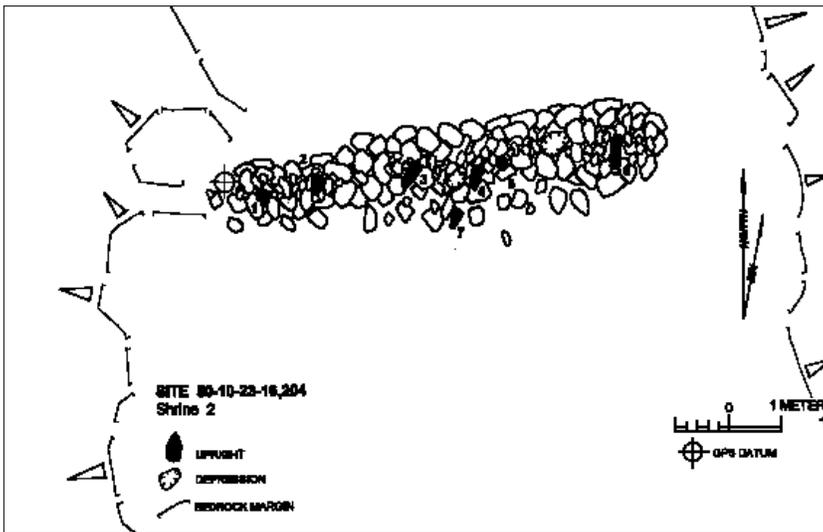


Figure 5. Plan view map of Shrine 2.



Figure 6. General view of Shrine 2 looking south. Some of the uprights can be seen against the skyline.

tion, and (2) uncertainty regarding whether a particular stone had been utilized as an upright, a bracing stone or a paving stone. Where such uncertainty exists an asterisk in the tables that follow denote that the stone is a “possible” upright.

Shrine 1

Shrine 1, the most isolated of all the remains on this site, is located at the c. 12,250 ft. elevation near the toe of the whaleback ridge (Fig. 3). There are nine uprights of rather uniform dimensions and mostly of pointed form (Table 1), all but one of which appear to have been aligned in a row over a linear distance

of 9.5 meters (Fig. 4). The alignment is parallel to the direction of the lava flow and within a meter of the top, upper edge on which the bases of the uprights rest. At the downslope end of this row of uprights is a short, crude “wall” two courses high. Upright No. 8 appears to have slid down the face of the ridge top into a narrow crack after it broke into two pieces (denoted on Fig. 4 as *a* and *b*). Upright No. 9 is roughly one meter lower than the others. A few scattered adze manufacturing waste flakes were observed below the shrine at the toe of the ridge.

Shrine 2

Shrine 2, located some 68 meters upslope of Shrine 1 near the high point of the whaleback ridge at the c. 12,285 ft. elevation (Fig. 3), is the best preserved structure on this site. There are six erect/semi-erect uprights and one additional possible upright (Table 2) on a roughly rectangular-shaped heap of stones that measures 9 m long, 0.9 m to 1.75 m wide and 0.5 m to 0.6 m high (Fig. 5). There is a difference of only 10 cm in the elevation of the “platform” surface between the two ends, in contrast to the width which is extremely variable (Fig. 5). The structure is oriented perpendicular to the long axis of the ridge and occupies nearly the whole breadth of the ridge, which at this point is densely mantled with glacial drift boulders and exhibits prominent glacial polish and grooves (Fig. 6). The incorporation of some of these boulders into the foundation of the platform may explain the irregular shape. Upright No. 6, on the eastern end (Fig. 7), is noticeably larger than the others (Table 2). If the possible upright is excluded, there is an even number of pointed and flat forms. No artifacts were observed in the vicinity of the shrine, but in the mid-1980s a fragment of a limpet shell (*opihī*) was seen next to the platform.

Shrine 3

This shrine, located 38 m northwest and at the same approximate elevation as Shrine 2 (Fig. 3), is the epitome of architectural design complexity in a small space. It is an example of what I called in an earlier report a Type 2 shrine, defined as a shrine with two or more physically discrete but proxemically close structural components or features (McCoy 1982). In this case there are two sets of remains (Fig. 8). The

main shrine, which is located on a rocky prominence at the edge of the whaleback ridge (Fig. 9), consists of two steps or tiers, each with a low platform, rough pavement and uprights, which suggests two separate “altars” (Fig. 8). The platforms parallel one another and are oriented perpendicular to the direction of the lava flow on which they are located. The two uprights (Nos. 2-3) on the lower platform are distinctive and somewhat unusual forms (Fig. 8; Table 3). Upright 2 is of a form that on current evidence appears to be relatively rare in the shrines on Mauna Kea. The sides diverge toward the top, which though somewhat jagged and irregular is overall rather flat.



Figure 7. Close-up of Shrine 2 looking west. The large upright in the foreground is number 6.

Table 3. Shrine 3 Upright Characteristics

No.	Position	Dimensions			Form
		height (cm)	width (cm)	thickness (cm)	
1	erect	45	20	15	flat
2	erect	50	72	9	rev. trap.
3	erect	75	44	7	gabled
4	erect	52	22	9	notched
5	fallen	47	19	10	pointed
6	erect	49	22	8	angled
7	erect	40	20	10	angled
*8	fallen	42	20	14	pointed
*9	fallen	57	33	9	pointed
10	erect	34	30	9	pointed

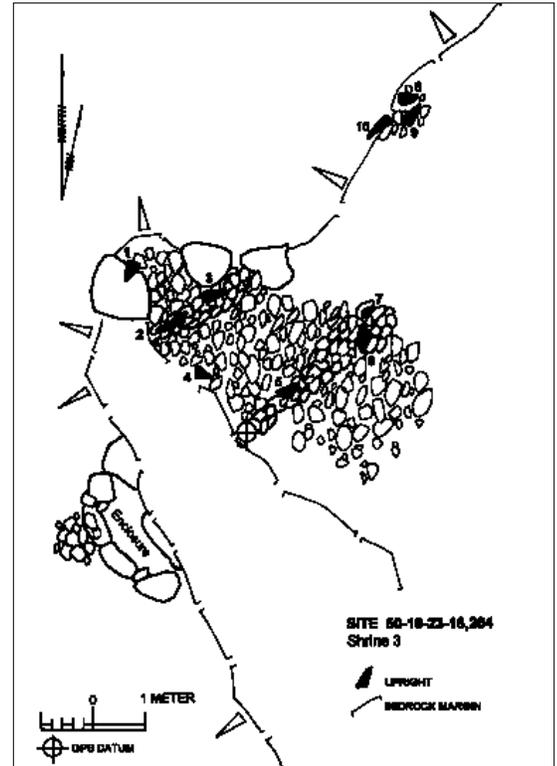


Figure 8. Plan view map of Shrine 3.

It resembles in a general way the wooden slab images on the Kaua'i *heiau* illustrated by Webber (see Emory 1928:108 for a discussion of this *heiau*). Upright 3 is a good example of a gable-shaped form that is occasionally found on other shrines in the quarry and elsewhere in the summit region. As with some other examples in the quarry, one edge appears to have been partially flaked (Fig. 10) to achieve the desired form, which with the clearly defined shoulders is suggestively anthropomorphic. Three uprights were found on the upper platform. The second component of this “composite shrine,” is a cluster of three uprights located a few meters distant on the north (Fig. 8). The relationship of this feature to the main shrine is unclear, but it is possible that it was added at a later time.

Situated roughly 3 m to 3.5 m below the main shrine at the base of the ridge is a small enclosure formed of a single course of boulders arranged in a semi-circular pattern against the outcrop (Fig. 8). The maximal interior dimensions are 1.5 m by 0.80 m. The enclosing wall has a maximum width and height of 60 cm. Outside the wall is a small pile of rocks two to three



Figure 9. General view of Shrine 3 looking west toward the main quarry area.



Figure 10. Uprights 2 (right) and 3 (left) on Shrine 3.

courses (47 cm) high with horizontal dimensions of 50 cm by 80 cm.

No artifacts were found on the main shrine or in the immediate vicinity of the dispersed uprights, but a small number of flakes were observed on the ridge-top nearby.

Shrine 4

This structure, which is located some 58 m north of Shrine 3 (Fig. 3) at the roughly 12,295 ft. elevation, consists of a crude platform and “court” built on top of a gelifluction terrace complex (Figs. 11 and 12). The platform is situated on the rampart (front) of one terrace and the “court” on the terrace directly below. Many of the stones in the rampart, also called

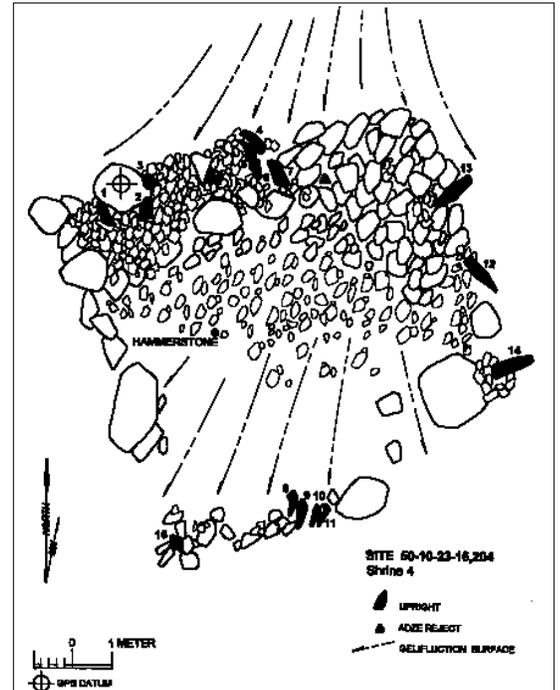


Figure 11. Plan view map of Shrine 4.

the riser or bank, are oriented at right angles to the direction of flow which has been arrested (cf. Davies 1972:33). The platform, which was built by adding stones to the rampart, measures roughly 10 m long, 2.0 m to 2.5 m wide and 80 cm high on the downslope side. The uphill side projects 30–35 cm above the upper terrace surface, which is roughly 10 m deep (front to back). Except for its unusual breadth, volume of rock, and several courses of stacked stone in the southwestern corner, there is little to distinguish this platform from a natural terrace front. The stacked stones in the corner appear to have been added for the purpose of creating a leveled surface on which to set several of the uprights that are located on this end of the platform. There are four and possibly as many as seven uprights on the platform (Table 4).

The “court” area is a loosely “enclosed” area of roughly rectangular shape demarcated by the gelifluction terrace rampart/platform wall on the north and a discontinuous alignment of boulders and cobbles on the other three sides (Fig. 12). Several uprights and possible uprights are located on the east and south sides (Fig. 11; Table 4). The edges of numbers 8 and 10 are partially flaked. The surface of the open

Table 4. Shrine 4 Upright Characteristics

No.	Position	Dimensions			Form
		height (cm)	width (cm)	thickness (cm)	
1	erect	55	20	10	flat
2	fallen	64	32	8	angled
3	erect	60	26	16	notched
4	fallen	76	29	20	angled
*5	fallen	58	30	11	pointed
*6	fallen	45	27	5	pointed
*7	fallen	46	20	4	pointed
8	fallen	57	30	7	pointed
9	fallen	77	26	6	rounded
10	fallen	47	23	4	pointed
11	fallen	58	29	6	pointed
12	fallen	95	29	14	pointed
13	fallen	69	25	10	pointed
14	fallen	72	26	16	flat
*15	fallen	61	29	7	angled

Table 5. Shrine 5 Upright Characteristics

No.	Position	Dimensions			Form
		height (cm)	width (cm)	thickness (cm)	
1	fallen	44	18	10	flat
2	fallen	34	20	10	pointed

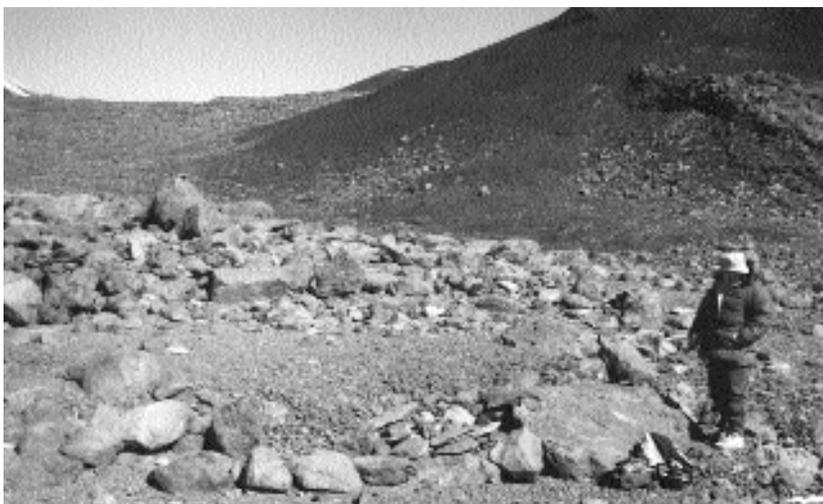


Figure 12. General view of Shrine 4 looking north toward the summit area. The open court area is in the foreground and the platform in the back.

area, which measures 7.5 m by 6.4 m, is primarily finely sorted patterned ground, except for the top end which has the appearance of a boulder pavement.

Two adze rejects⁵ were found in the platform fill. Both specimens are made on flake blanks that were minimally worked before they were discarded. They have all of the attributes of what I previously called a Stage 1 adze blank (McCoy 1986:11; 1991:85) but later described as a Techno-Morphological Type 1 adze reject (McCoy et al 1993:123): the front, back and sides of the incipient tool are indistinguishable, which means that the longitudinal and transverse sections are irregular. In most any other archaeological context both specimens would be described as “modified flakes.” The ventral surface of both flakes was used as a platform to remove other flakes, but only minimally before they were discarded, so that there is little indication of the tool-maker’s intention. A hammerstone and small number of dispersed adze manufacturing waste flakes of various sizes were found in the court area. No artifacts were noted on the upper terrace surface above the platform, thus indicating the high probability that these artifacts had been deliberately placed on the platform.

Shrine 5

These remains were first noted some years after the 1975 survey, but were not recorded until November 10, 1986 when my wife and I made a rough sketch map and took some photographs. The “foundation” is a cluster of cobble-size stones covering an area 3 m long and 50–75 cm wide aligned parallel to a shallow crack on the ridge top above Enclosure Complex No. 2 (see Fig. 14) at the c. 12,300 ft. elevation. There are enough stones to suggest that they may have been crudely stacked at one time to form a low platform. Two uprights, both fallen (Table 5), are located at one end of the crack. No artifacts are directly associated with the shrine.

Discussion

The five shrines on this site, like those elsewhere on the mountain, exhibit considerable variability in all of their formal characteristics, including (1) the type of foundation; (2) groundplan; (3) the presence/absence of courts and pavements; (4) orientation; (5) the number, size, shape and placement of uprights; and (6) the presence/absence of offerings.

It is impossible to tell if any of the shrines, but especially the ones with larger numbers of uprights, were single event constructions or were re-built over a period of time. Comparative data from elsewhere in Polynesia would suggest that new uprights were probably added over time as some gods fell out of favor. Shrines 3 and 4 are the most complex in terms of the number of different architectural elements and the arrangement of uprights. Shrine 4 is similar to the Necker Island *marae* described by Emory in the presence of a clearly defined court and uprights located in the lower right corner (Emory 1928: 60–61). Shrine 4 is also the only one of the group with adze manufacturing by-products, which I have elsewhere interpreted as offerings to the gods (McCoy 1981). The *'opihi* shell fragment at Shrine 2 may represent an offering, but when it was placed there is in doubt. Shell has not been found on any other shrines in the quarry or elsewhere on the mountain, thus suggesting that it is probably a recent offering. Shrine 4 is thus the only shrine that is unequivocally associated with the quarry. The proximity of all but Shrine 1 to the enclosures and the presence of adze manufacturing debitage in the general vicinity of all of the shrines suggests, however, that all of them are somehow related to the activities that took place on this site.

There are a couple of unusual characteristics displayed in the shrines on this site. First, the foundations and most of the uprights on all but Shrine 1 are oriented perpendicular to the long axis of the ridge (i.e., to the direction of the lava flow). Transversely oriented shrines are relatively rare elsewhere on the mountain. This may have something to do with a second unusual feature. The position of the court on the downslope side of the platform (“altar”) at Shrine 4 indicates that the celebrants of the rites that were performed here had their backs to the sea, which in Polynesia is typically the sacred side. This was probably the case, too, with Shrine 3 and, perhaps, Shrine 2 as well. Most, if not all, of the known shrines on the mountain with courts indicate that the approach was from the opposite direction, so that the backs of the celebrants were to the mountain. There may have been other factors at work here, but the act of doing the opposite or the reverse of what is done in ordinary circumstances is the kind of behavior frequently associated with rites of separation (Turner 1967; Zuesse 1987:417).

The Enclosures

General Description

Different terminologies have been employed in the past to describe the second class of structural remains on this site. The more general term *open-air enclosure* appears in the 1975 field notes in contrast to the somewhat more specific functional label *open-air shelter* that was used to encompass these and other similar structures in the initial site classification scheme that was developed for the quarry as a whole (McCoy 1977, 1978). A closer examination of the original site records prior to the 1987 fieldwork indicated that there was yet another problem in the failure to distinguish free-standing (i.e. “open-air”) structures from walls attached to bedrock exposures where there is a sufficiently deep recess to warrant classification as an *overhang shelter*. The free-standing category is itself variable in terms of whether the structure is attached or unattached to bedrock (see Figs. 13–15) so that what exists in fact is a continuum of enclosure “types” defined in terms of the extent to which there is a naturally occurring wall and/or roof. While it is useful to make such distinctions for the purpose of determining formal-functional relationships and their possible chronological significance, it is also necessary to describe the general characteristics of these remains, which explains why I have resorted to simply calling them “enclosures.”

The 26 enclosures on this site (see Fig. 3 for general location), including the isolated feature associated with Shrine 3, are similar in terms of their location on the lee side of a ridge, general architecture, and size. Complexes 1 and 2, which are located on the edge of the same ridge, consist of a number of small enclosures built amongst a jumble of large boulders.⁶ Most are only partial enclosures (U-shape and C-shape) and the few exceptions (oval to circular), like the others, are so low that one can without difficulty find a place to step over the walls onto the floor, which have a mean area of 1.6 m² in Complex 1 and 1.5 m² in Complex 2 (Tables 6 and 7). There are two examples of enclosures with two internal compartments that are only partly separated by a common wall, however. Except where the walls have collapsed inward, the interior ground surfaces are free of large stones, clearly corresponding to the well-sorted

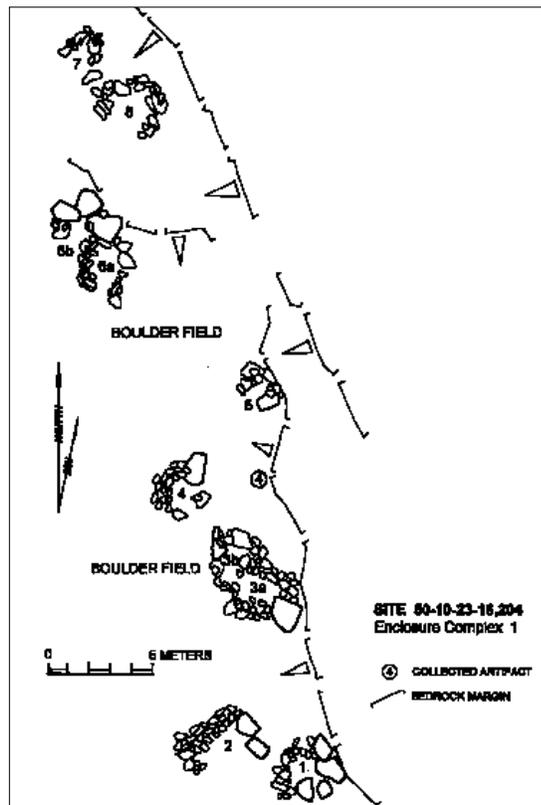


Figure 13. Plan view map of Enclosure Complex Number 1.

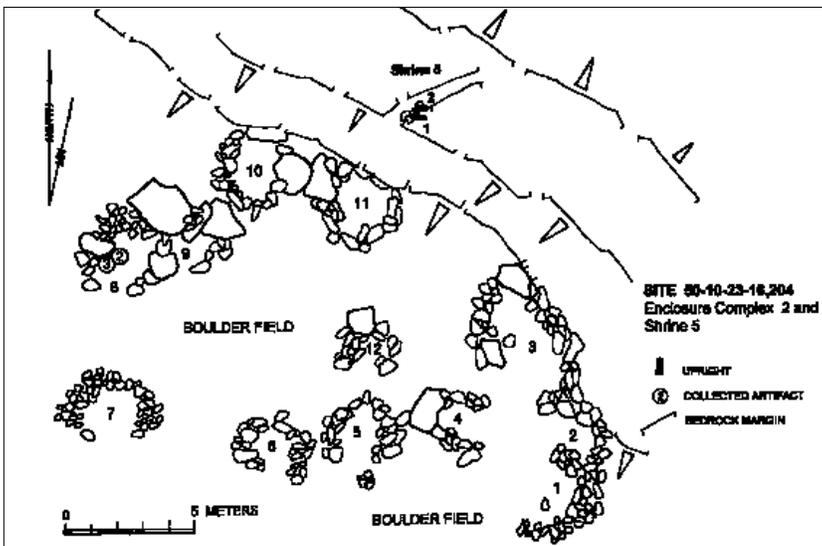


Figure 14. Plan view map of Enclosure Complex Number 2 and Shrine 5.

surface horizons of active gelifluction deposits. The walls, which have a mean height of 72 cm and 84 cm and mean width or thickness of 67 cm and 63 cm for Complexes 1 and 2 respectively (see Tables 6 and 7), are constructed of loosely stacked boulders and cobble-sized stones obtained from the immediate environs and exhibiting no unusual characteristics in terms of the frequencies of particular sizes or shapes.

Enclosure Complex No. 1

There are eight enclosures, including two of the larger variety with separate compartments, in this group, which encompasses an area of c. 250 m² (Fig. 13) on a boulder strewn slope.⁷ Within the larger grouping, there is the appearance of several smaller clusters of two to three enclosures each. The wall dimensions and floor areas are moderately uniform, though it is also clear that there are small and large extremes (Table 6). Few artifacts were observed in the vicinity of this complex. Two adze manufacturing waste flakes were found inside Feature 6a and

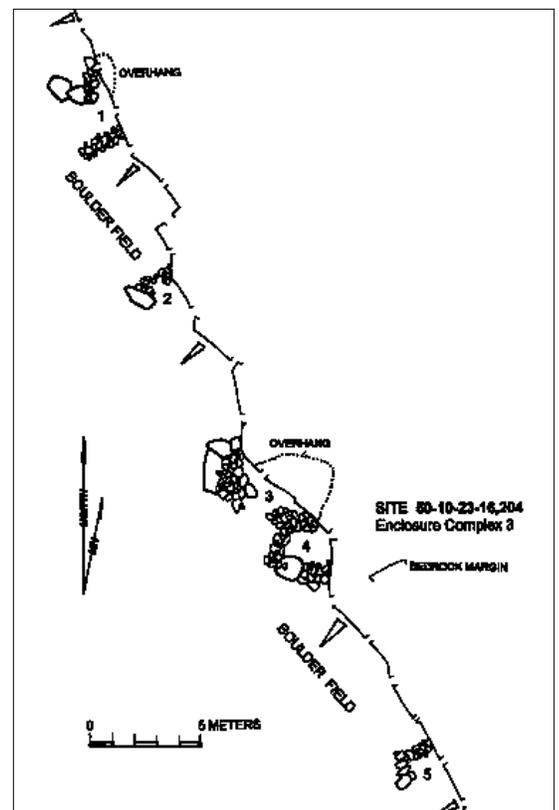


Figure 15. Plan view map of Enclosure Complex Number 3.

**Table 6. Enclosure Complex No. 1
Characteristics**

Feature No.	Floor		Wall		
	max. interior dimensions	area (m ²)	ht. (cm)	thickness (cm)	courses
1	1.8 x 1.8	1.3	67	100	4
2	2.9 x 1.0	3.0	55	75	3
3a	2.2 x 1.4	1.3	110	90	4
3b	1.3 x 1.2	1.0	100	60	3
4	1.6 x 1.3	1.0	80	80	5
5	0.8 x 1.4	1.0	70	30	2
6a	2.6 x 1.8	2.0	50	50	2
6b	1.1 x 1.5	1.0	60	60	2
7	0.9 x 1.0	0.5	75	65	3
8	1.9 x 1.9	2.5	75	70	3
9	1.5 x 0.8	3.0	60	60	1
		$\bar{x}=1.6$	$\bar{x}=72.9$	$\bar{x}=67.2$	

one inside Feature 6b, with more of the same on the slope below. Flake debitage and three adze rejects made on flake blanks were noted on the surface of the gelifluction lobe below Feature 3. The occurrence of debitage in the vicinity of the two compartmentalized structures (Features 3 and 6) may be significant. An adze reject was collected from the edge of the rubble above Feature 4 (Fig. 13).

Enclosure Complex 2

Complex 2 is comprised of 12 enclosures (Fig. 14; Table 7) that are aggregated in an area of roughly 375 m² on the same boulder strewn slope as Complex 1. Features 1–3 are adjoined. General form and dimensions are similar to those in Complex 1, but on the whole this group of enclosures is better preserved. There is a similar lack of artifacts at this locale. Small waste flakes were observed in the gelifluction lobe at the northeast corner of the complex above Features 8–10. In 1982 a reworked broken adze reject was collected from the surface of a gelifluction lobe some 20–30 m southwest of this enclosure complex. Two adze rejects noted in the 1975 survey were collected from the floor of Feature 8 beneath a stone forming the basal course of one side of the enclosing wall (Fig. 14). There are no waste flakes on the floor of the enclosure or other evidence

**Table 7. Enclosure Complex No. 2
Characteristics**

Feature No.	Floor		Wall		
	max. interior dimensions	area (m ²)	ht. (cm)	thickness (cm)	courses
1	1.6 x 1.0	1.0	100	70	3
2	1.7 x 1.5	1.5	160	90	3
3	2.2 x 1.6	2.0	110	60	3
4	1.7 x 1.3	1.5	45	50	2
5	2.4 x 1.4	2.0	65	70	2–3
6	1.7 x 1.5	1.5	75	60	3
7	1.7 x 1.9	2.0	70	80	3
8	2.4 x 1.6	2.0	50	80	2–3
9	1.3 x 1.4	1.0	85	45	3
10	2.7 x 1.5	1.5	58	60	2–3
11	2.2 x 1.1	1.5	125	60	2
12	.5 x 1.0	0.5	66	40	4
		$\bar{x}=1.5$	$\bar{x}=84$	$\bar{x}=63.7$	

**Table 8. Enclosure Complex No. 3
Characteristics**

Feature No.	Floor		Wall		
	max. interior dimensions	area (m ²)	ht. (cm)	thickness (cm)	courses
1	1.75 x 1.5	2.25	45	60	2–3
2	1.50 x 1.2	1.2	95	75	4
3	5.0 x 3.5	7.5	50	70	2–3
4	2.2 x 2.0	2.5	50	70	3
5	2.0 x .80	1.25	100	60	2

to indicate that these specimens were manufactured at this locality, thus suggesting a cache.

Enclosure Complex 3

This complex has quite a different appearance than the other two complexes both in terms of its topographic setting and the characteristics of the remains themselves. It is located on a younger lava flow that, though showing the same effects of glacial scouring and abrasion, is considerably less weathered and broken down. Five features, including two small overhang shelters (Fig. 15; Table 8) are located along a 35 m section of the southwestern, leeward side of the

flow which attains a maximum height of only two meters above ground surface (Fig. 15). Features 2 and 5 are small enclosed spaces defined by short, straight walls constructed between the edge of the lava flow and blocks of rubble (Fig. 15). The position of the walls in relation to the mouth of the two overhangs, Features 1 and 3, indicates an interest in utilizing the space back of the dripline, thus demonstrating that the overhangs were the determinant factors in the construction of the walls. A sardine can, other unidentified tin cans, brown bottle glass fragments and the bottom of an embossed Mogen David wine bottle were found at the entrance to the larger overhang. A single isolated adze manufacturing waste flake was observed on the ridge top near Feature 1.

Enclosure Complex No. 3 is now believed to be unrelated to the other two complexes and shrines. It is probably modern, not only because of the presence of modern artifacts, but also because of the lack of evidence to demonstrate a relationship to the quarry or other pre-contact activity. The walls may have been built during the construction of the road or by hikers. Test excavations should be undertaken, though, before any final conclusions are reached about this or the other enclosures.

Discussion

The enclosures on this site bear some general architectural similarities to enclosures in the main quarry, which does not imply a similar function, however. In contrast to the majority of walled enclosures in the main quarry, the structures on this site cannot be inferred to have functioned as open-air workshop shelters given the paucity of manufacturing by-products directly associated with the enclosures. Evidence of use as temporary over-night habitations is also lacking; at least there are no surface indications of fire hearths, in addition to the fact that the floor areas of many structures are too small to accommodate a person and a fire hearth. As I have noted elsewhere in connection with the rockshelters in the quarry (McCoy 1990), overnight stays in this high altitude environment, where the temperature goes down to or below freezing every night, are fundamentally unimaginable without a fire for warmth.

While all of the evidence seems to point to temporary, day-time use, the possibility that the enclosures

were occupied overnight by initiates wrapped in heavy kapas and curled up in a fetal position cannot be categorically dismissed. In his discussion of the “betwixt and between” or liminal period in rites of passage Turner noted that “[t]he symbolism attached to and surrounding the liminal *persona* is complex and bizarre” and that “[m]uch of it is modeled on human biological processes” (Turner 1967:96). He noted, for example, that “[i]n so far as a neophyte is structurally ‘dead,’ he or she may be treated, for a long or short period, as a corpse is customarily treated in his or her society,” and that neophytes, to whom are commonly applied metaphors of dissolution, frequently have to undergo ordeals such as being buried or “forced to lie motionless in the posture and direction of customary burial” (Turner 1967:96). Because neophytes are in Turner’s words “not yet classified,” they may also be “likened or treated as embryos, newborn infants, or sucklings by symbolic means.” Turner summarized all of this by saying that “The essential feature of these symbolizations is that the neophytes are neither living nor dead from one aspect, and both living and dead from another. Their condition is one of ambiguity and paradox, a confusion of all the customary categories” (Turner 1967:96–97). Whether the kinds of ordeals described by Turner were practiced here it is impossible to say, but because symbols of birth and death are so commonly employed in initiation rites I think it is possible that the small enclosures on this site, in which bodily movement was constrained to a significant degree, may symbolically represent both a womb and a grave. The occasional artifacts found in or near these enclosures may symbolize rebirth in the making of something.

The Artifact Assemblages

General Description

In addition to the previously mentioned artifacts on Shrine 4, the by-products of adze manufacture, primarily waste flakes, but also including the rare unfinished adze and hammerstone, were found dispersed over an area of roughly 1.48 ha (3.67 a.) between the 12,200 and 12,300 ft. elevations. An intensive survey would be required to establish the precise boundaries of this material and the number and location of individual clusters. The largest con-

centration of material is located on the same slope as Enclosure Complexes 1 and 2, but even here there is so little material (perhaps a total of only 100 to 200 flakes) as to preclude the unconditional use of the term *workshop*. This term, though rarely defined in the literature, normally implies in the case of reduction technologies, such as stone tool manufacture, a coherent structure amongst the various by-products of work (cores, waste flakes, rejected tools, etc.) that constitute this category of archaeological remains.

Surface Collection

Six artifacts were collected from this site in 1987, two from Feature 8 of Enclosure Complex No. 2 and four from general surface contexts. Five of the specimens are adze rejects; the sixth is a hammerstone. They are briefly described below.

Adze Rejects. Artifact 1, collected in the general environs of Enclosure Complex No. 2, is a reworked broken adze reject. More specifically, it is the mid-section of what appears to have been an extremely large rectangular and, perhaps square, adze. The cortex coverage, thickness and cross-section indicate that it was made on a tabular piece of rock.

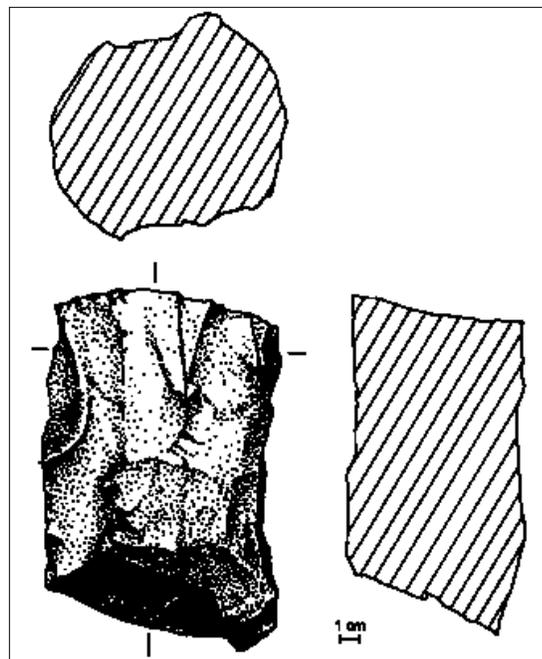


Figure 16. Artifact 1 (reworked broken adze) from the general area of Enclosure Complex No. 2.

the two broken ends is extremely irregular, appearing to be the result of a flaw in the raw material. The straight clean break on the opposite end is a classic example of an end-shock fracture (Crabtree 1972:60). The flat surface of this end was used as a striking platform from which a series of 7 to 8 lamellar ("blade-like") flakes were removed, thus giving it the appearance of a polyhedral blade core (Fig. 16). The transformation of a thick-sectioned quadrangu-

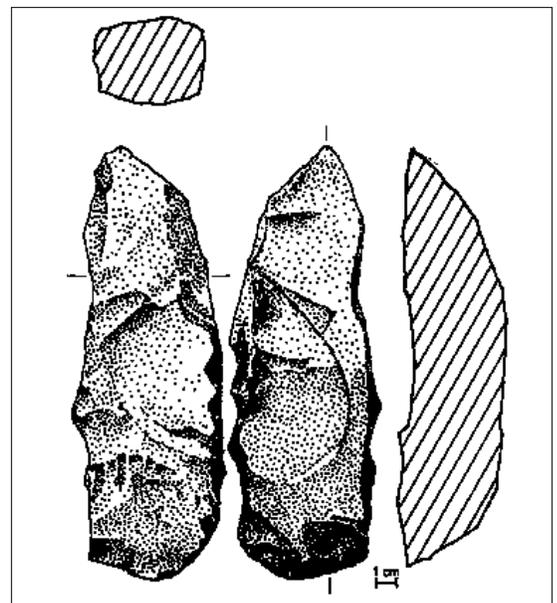
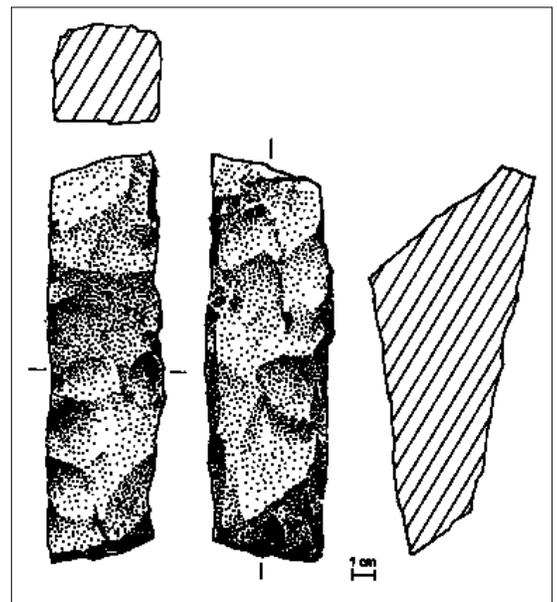


Figure 17. Artifacts 2 and 3 (adze rejects) from Feature 8, Enclosure Complex No. 2: top, Artifact 2; bottom, Artifact 3.

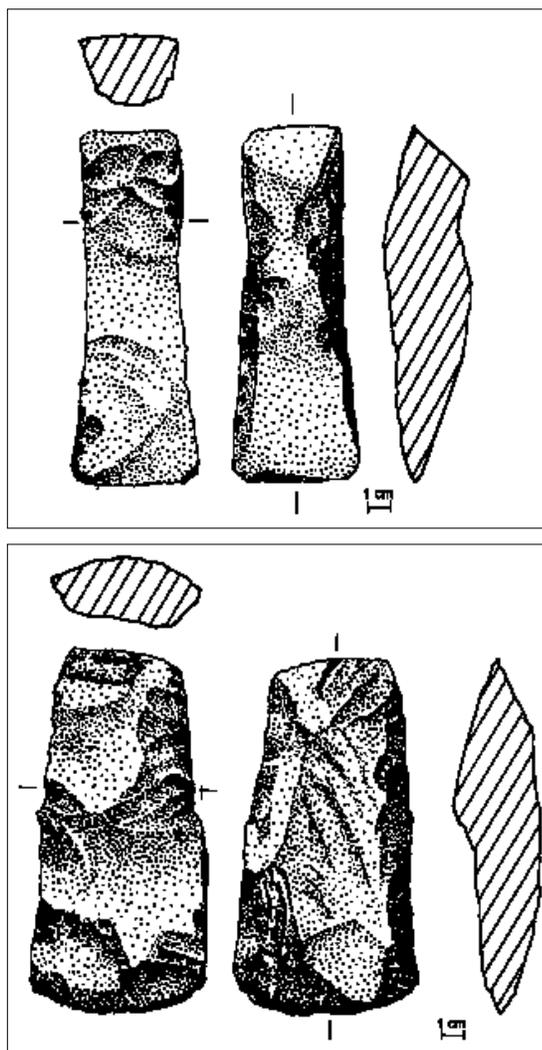


Figure 18. Artifacts 4 and 6 (adze rejects) from near Enclosure Complex No. 1 and Shrine 4: *top*, Artifact 4; *bottom*, Artifact 6.

lar adze blank fragment into something resembling a massive blade core weighing nearly two kilograms (4.4 lb.) at the time it was discarded is an oddity, even in this quarry where there is evidence for a variety of different reduction strategies and a wide range of morphological variability in early stage rejects. The intent or motive in the reworking of this blank is not readily apparent.

The two adze rejects from the “cache” in Feature 8 of Enclosure Complex No. 2 (Artifacts 2 and 3) are similar yet different in several respects. Morphologically, both fall into the thick quadrangular cross-section category, but Artifact 2 is tanged while the other

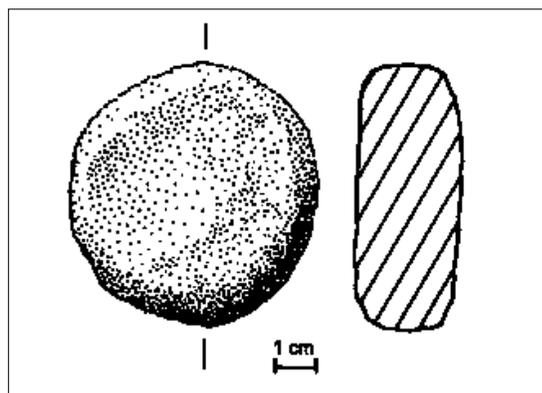


Figure 19. Artifact 5 (hammerstone) from the court of Shrine 4.

is not (Fig. 17). Artifact 4 is a late stage adze reject with a trapezoidal cross-section (Fig. 18, *top*). It was collected on the slope directly above Feature 3 of Enclosure Complex No. 1 (Fig. 13). Artifact 6 is a tanged rectangular cross-section adze reject (Fig. 18, *bottom*) that was found partially buried on the top of the whaleback ridge 23 m south of Shrine 4. The shoulder exhibits some small scratches and polish.

Hammerstone. Artifact 5 (Fig. 19) is a nearly perfectly shaped discoidal hammerstone of vesicular rock. It has a diameter of 6.76 cm and thickness of 3.46 cm. It was collected from the surface of the court area of Shrine 4 (Fig. 11).

Discussion

Perhaps the most important characteristic of this particular site assemblage is the fact that despite its small size it is comprised of a large variety of artifact classes, thus suggesting that there is no “sample size effect.” Notably absent, however, are cores, with the exception of a “secondary core” represented by the broken adze from which a series of lamellar flakes was removed. The relative proportions of artifact classes reveals an uneven distribution in which waste flakes predictably dominate. The majority of flakes are in the small to medium size range (10 cm in length or less) with little or no cortex remaining. This evidence, combined with the lack of locally available raw material and the absence of cores, indicates the importation of either late stage adzes (Cleg-horn 1982; Williams 1989) or medium-sized flake blanks with little or no cortex from elsewhere in the

quarry. The petrographic characteristics of most, if not all, of the artifacts on this site suggest that the raw material was imported from the main quarry just to the east of Pu'u Ko'oko'olau, which is roughly 1.2 km distant, rather than the nearest source area one-half km away on the east side of the Humuula Trail (Fig. 2).

Much of the uncertainty that presently exists regarding the meaning of the artifacts on this site is due to the long-term, cumulative effects of post-depositional erosion. A salient characteristic of frost activated mass-movement in periglacial environments is the abnormally low angle over which material is transported (Davies 1972:1), so that even seemingly level surfaces, like the ridgetop, are affected. The actual extent or degree of disturbance, which includes both horizontal and vertical displacement (burial in the geological matrix of gelifluction lobes and terraces), is difficult to determine without excavation. It appears that the most common result on this site has been horizontal disaggregation rather than the creation of new surface patterns (Schiffer 1983:678) with the aggregation of transported material at the ramparts of gelifluction lobes or terraces.

While an understanding of natural site formation processes (Schiffer 1983, 1987) helps to clarify some of the initial ambiguities, the study of environmental processes alone is inadequate for comprehending the meaning of this and, indeed, all archaeological assemblages. Such processes, for example, do not explain the cache in one of the enclosures. The concealment of artifacts undoubtedly means different things in different contexts, but in this quarry, where there is clear-cut evidence of high rank, there is reason to suspect the fear of contagion. Elsewhere (McCoy 1990:103), I have argued that the deposit in at least one rockshelter and probably more in the quarry are "ritual fill deposits that were intended to cap and thus remove from view the accumulated residues of meals and offerings to the gods that are polluting and thus dangerous to man in a sacred context" (Douglas 1966:160; 1975:xv). The same beliefs could possibly explain the paucity of adze manufacturing debitage on the surface of this site. Whether flakes and adze rejects in this particular context were considered "dirt" (matter out of place) and, thus, dangerous, is difficult to establish, but the fact that there is so little flake debitage on the surface

of the gelifluction lobes and bare ridgetop suggests the possibility of deliberate burial. On present evidence the amount of manufacture that took place on this site was extremely limited. As I have already suggested in the discussion of the few artifacts found in and near the enclosures, much of what is represented in this part of the site may be symbols of rebirth.

There are a couple of other aspects of the artifact assemblage that deserve comment. The number of tanged adzes found at this site is of interest because they are relatively uncommon in most areas of the quarry (Cleghorn 1982). Also of great interest is the one partially polished adze, since only a few adze rejects with polish have been found in the quarry to date. With regard to the workmanship of the few adze rejects on this site, there is a noticeable difference between those seen on the platform of Shrine 4, which I have described above as crude and having the appearance of "modified flakes," and those from other contexts that on the whole exhibit greater skill. The contrast between the quality of adze rejects on the shrine and those found elsewhere on the site is yet another kind of ambiguity that characterizes this site as a whole.

Summary, Synthesis and Further Interpretations

A description and interpretation of the formal characteristics of the shrines, enclosures, and artifacts that comprise this site has provided some general ideas regarding the function of the individual remains and the site as a whole. It remains to summarize and then synthesize the various strands of evidence to try to reach some further understanding of the form or structure of the rites.

To support my conclusion that this site was the locus of initiation rites I began by considering the location from a phenomenological perspective and arguing on the basis of anthropological data that the isolated setting was dictated by cultural beliefs related to the polluting and, thus, dangerous character of initiates. I then proceeded to describe and discuss the salient characteristics of the shrines and to compare them briefly to the shrines found in the quarry proper and elsewhere on the mountain. The

orientations of four of the five shrines on this site and directionality of the rites performed at two and perhaps more of them were found to depart from the “norm” and, thus, to conform to the inverted and abnormal behavior characteristic of the liminal period in transition rites. An analysis of the open-air enclosures disclosed other kinds of ambiguities and classificatory problems in terms of their probable function and use. The lack of evidence for actual habitation suggested that they might have been “occupied” in the process of undergoing ordeals typical of initiation rites and that the structures themselves may have symbolized birth and death. The artifact assemblages from the shrines, enclosures and general environs were briefly described and initially found to be as puzzling or ambiguous as the enclosures in terms of the small number of surface artifacts found in any one place and the apparent lack of a cohesive structure amongst the various by-product categories. The effects of post-depositional processes on assemblage size and structure notwithstanding, there is persuasive evidence that the artifact assemblages on this site represent various forms of “symbolic manufacture and use,” rather than the by-products of the “usual” form of adze manufacture found on quarry workshops where there is typically one or more sequential stages of work represented. The “workshops” found on this site are clearly out of the ordinary; indeed, they are “extra-ordinary” in the presence of bits and pieces of many different manufacturing trajectories or reduction sequences. To paraphrase the point made by Bell earlier in the paper, the adzes produced on this site are not models for a normal reduction sequence; they are strategic versions of them.

In order to obtain a fuller and more complete understanding of the rites conducted on this site it is obviously necessary to examine in more detail the relationship between the various remains, which up to this point has been largely assumed on the basis of proximity, rather than demonstrated. I begin by examining the relationship between the shrine and “workshop” artifact assemblages. How are these assemblages, which are similar and thus presumably related, to be interpreted? One of the functions of rites of passage is to educate the initiate (Meyerhoff, Camino and Turner 1987:383). In this context we can expect that this involved among other things

learning the names of the tutelary gods of adze makers and the appropriate ways to solicit their aid and honor them in the process. The following account of a Maori initiation rite for women weavers provides a clue about the possible use of artifacts in mediating the relationship between the initiates and the gods:

Another form of offering was connected with the initiation of women in the craft of weaving. The novice wove a small rough sampler of flax fibre beforehand, and the sampler was placed on the *tuahu* by the priest as an offering to the tutelary god of weaving after the priest had performed the initiation ceremony. The god was satisfied with the semblance and the gesture, but the priest fared better, for the initiate was in honour bound to present her first good cloak to the priest who had stood as her sponsor to the gods (Buck 1966:486).

A number of years ago I argued that the debitage and occasional manufacturing tools found on shrines in the quarry were offerings that had been placed on the shrine during rites of supplication to the gods for the purpose of supernatural assistance or intervention in a manufacturing technology with an inherently high degree of failure due to the physical properties of the raw material and human capabilities to work it into desired shapes and sizes (McCoy 1981; McCoy and Gould 1977). The Maori example, though perhaps indicating a different motive, helps us to understand why the adzes on Shrine 4 and perhaps many of those on shrines in the quarry proper are “crude” and do not exhibit the signs of great skill that one would expect of craft specialists or experts. They are “samples” of work made by the unskilled for the gods, who as Buck noted in the Maori case, were “satisfied with the semblance and the gesture.” Based on this line of reasoning, I would argue that the lithic scatters in the vicinity of the two enclosure complexes, are the “workshops” of initiates who were making “samplers” for an expert craftsman/priest to present to the gods on the shrine.⁸

In an earlier paper (McCoy 1990) I suggested that the two separate clusters of enclosures and shrines might represent a division based on occupational status and/or group membership at the community or chiefdom level, and that what we may in fact see here in the site structure is a symbolic linkage and

opposition between different communities and/or polities. This still seems to me a reasonable possibility, but how are Shrines 1 and 2, on the lower end of the ridge, to be interpreted, and should they in fact be regarded as part of this site? There are no easy answers to these difficult questions, but the fact that they are situated on the same ridge and within relatively close proximity to each other suggests that they are somehow related. It may be that they were used for different purposes than the shrines located directly above the enclosures. It may be, for example, that they were “stations” that were visited in a sequence, with different kinds of knowledge being imparted to the initiates at each shrine.

If my interpretation of Site 16204 is correct, this site is the first clear-cut archaeological evidence of apprenticeship in this or any other quarry in the Hawaiian Islands.⁹ The evidence, which indicates a high degree of organization and, perhaps, the existence of a guild, or guilds if the two clusters of remains on this site represent different communities or polities, supports my earlier contention that the craftsmen operating in this quarry were attached specialists.¹⁰ The date at which the appearance of status-graded specialists and rites of transition for apprentices first appeared is unknown, although it is unlikely to have been early in the quarry sequence when production was presumably in the hands of just a few individuals. Unfortunately, there appears to be little promise of ever dating the enclosures at this site unless there are buried deposits beneath some of the floors. Stylistic dating of the artifacts and shrines currently appears impossible given what we know about the range of variability that exists for each of these throughout the entire known history of the quarry industry, which dates to between about A.D. 1100 and 1800 (McCoy 1986, 1990, 1991).¹¹ The reasonably good condition of the shelters and several of the shrines suggests a later date for this site, perhaps in the time range of A.D. 1600–1800. On the other hand, if we assume that formal initiation rites for groups of apprentices would have developed at the height of the quarry industry when probably all of the major source areas were being worked simultaneously, then a date of c. A.D. 1400–1600 seems most reasonable.

This site is not the only one located beyond the limits of tool quality stone in the upper reaches of the

quarry. There are three other even more distantly located sites (16203, 11079 and 21211) on the eastern fringes of the quarry near Puu Lilinoe and the Umi Koa Trail (Fig. 2), all characterized by the presence of adze manufacturing by-products and an associated shrine. What distinguishes Site 16204 from these other sites, and points most directly to its “special purpose” function as a locale devoted to the reproduction of the social order in this quarry, are the two and perhaps three clusters of open-air enclosures where assemblies of novices gathered to go through a series of rites that made them into “ritualized bodies.”

Notes

1. The recent literature in Hawaiian archaeology, for example, shows that while there is a good deal of interest in the study of religious sites and the evolution of ceremonial architecture in particular (e.g., Kirch 1990a, 1990b; Kolb 1991; Graves and Ladefoged 1995), there is little or no interest in the study of religion and ritual per se. Indeed, in all of the studies just cited religion is regarded as epiphenomenal. Two recent exceptions are my study of a site at Hale Pohaku where I have suggested that a special category of bird cooking stones (*‘eho*) were used in rites of passage that involved a change in “status” from *kapu* to *noa* amongst a group of adze makers (McCoy 1991), and Kolb’s study (1994) of a shrine in upland Maui.

2. One shelter located below Shrine 3 was inadvertently omitted from the original inventory count. Additional fieldwork was carried out in 1987–88 (McCoy 1989) and again in 1995. The work in 1987–88 was undertaken as part of a larger survey of the Mauna Kea Observatories Access Road between Hale Pohaku and the summit. The major objectives of this new survey were to: (1) check the condition of the site against the 1975 field records; (2) obtain a consistent set of measurements for both the enclosures and the shrines, and (3) map and describe a previously unrecorded shrine that my wife and I had found in 1985. No test excavations were undertaken and no attempt was made to count and map systematically the locations of all artifact finds, which though hardly numerous by comparison to other sites in the quarry, occur in sufficient numbers over a

large area that an accurate and useful map would have required the investment of more time and labor than the small budget for this project allowed. A small surface collection was made, though, of what are on this particular site rare “diagnostic” artifacts—adze rejects and a hammerstone. In contrast to other parts of the quarry, where such artifacts occur in great abundance, the removal by collectors of even a few artifacts such as these would seriously affect the ability to interpret this site. The work in 1995, undertaken in conjunction with the development of an historic preservation management plan for the University of Hawaii management areas on Mauna Kea, consisted of obtaining more accurate locational data with a GPS and completing the recordation of upright data on the shrines.

3. In an earlier report on the shrines of the Mauna Kea summit region (McCoy 1982) I followed Buck in referring to the architecturally simpler and generally smaller structures as shrines (*kuahu*), which he considered “a convenient term to designate a simple altar without a prepared court” (Buck 1957:527). Some of the larger, more complex structures, including those with courts, I called *marae*, following Emory, who had used this term to describe structures on the island of Necker that he believed bore a close resemblance to the so-called “inland” type of Tahitian *marae* (Emory 1921, 1928, 1933, 1943, 1970). The use of the term *marae* in Hawai‘i obviously raises some questions and I now think it preferable to use the generic term “shrine” to describe structures that are not clearly *heiau*.

4. The recording of the shrines on Mauna Kea has evolved over the years and now includes a number of different variables and attributes. In this paper I have tried to present a general description of each structure and summary of just a few of the key upright characteristics (position, dimensions and form). The upright shape classification is still evolving and will undoubtedly change.

5. The term “adze reject” is used in place of blank and preform given the present confusion surrounding these terms (see McCoy 1986, 1991; McCoy et al 1993; Williams 1989 and Weisler 1990), and my own personal preference, following Crabtree (1972), to use the term blank to refer to what is essentially raw material form in recognizing that a tool can be made either from a core or a flake. I have thus taken

to using the terminology core blanks and flake blanks. Use of the term “reject” is based on the assumption that most of the adzes in this and other quarries were, with a few possible exceptions, intentionally discarded for obvious reasons, such as breakage, or sometimes less obvious ones like design flaws in the shape of the incipient tool. The primary example of the latter is asymmetry in the transverse and/or longitudinal sections, or the length:width:thickness ratio.

6. The jumble of boulders, amongst which the enclosures are located, is not shown on the maps of the enclosure complexes. The boulders were not mapped in during the fieldwork because of the inordinate amount of time and difficulty this task would have required and the opinion that such detail would have obscured the small enclosures.

7. The isolated enclosure below Shrine 3 has been included in this table as Feature 9.

8. According to Irving Goldman (1970:223), “Kahuna, a title for both professional priests and craftsmen, implied in both fields a ritual office. The crafts kahuna was its religious leader.”

9. Paul Cleghorn’s pioneering effort (1982, 1986) to distinguish the workshops of apprentices and those of experts based on production estimates and measures of differential skill in flake attributes is, unfortunately, open to many questions. One difficulty is that “Desired technical results are not obtained automatically. Materials vary, circumstances differ, and manipulations are hard to control” (Merrill 1968:585), so that even the most skilled craftsman on a given day can produce a pile of debitage that would appear to be the work of a novice. Another problem with Cleghorn’s thesis is the assumption that apprentices and experts worked apart. This seems doubtful based on what is known of Polynesian work habits, and the fact that apprenticeship implies a working relationship with a teacher. I would thus argue that the debitage assemblages on many workshops in the quarry are probably the combined output of apprentices and expert craftsmen. I have noted my disagreement with his conclusion that apprentices spent a part of each season working alone in the patchy bedrock exposures and glacial drift deposits in the lower part of the quarry because of an increasing scarcity of better quality raw material in the main

quarry area that he believes would have been reserved for the expert craftsmen. On current evidence the exploitation of the lower areas reflects a period of intensified production circa A.D. 1400–1600 and not the imminence of diminishing returns as might be conjectured in the inherently higher cost:lower yield ratio in working the smaller patches of raw material (McCoy 1990:100).

10. For a different view of the organization of quarry production see Lass (1994), who believes that the quarry was exploited on an occasional basis by independent specialists, defined by her as specialists that were neither sponsored nor supported by chiefs (Lass 1994:47).

11. The view that the shrines on Mauna Kea and in other remote places in Hawaii must necessarily be “early” because of their “archaic” form is an old idea, which I think is still mistakenly held to by some archaeologists today. A good example of such early thinking is found in Buck’s description of the introduction of a new form of religious structure with Paa. Buck wrote that “[h]e introduced the form of temple then vogue in Tahiti, and it was adopted either peacefully or after hostilities. The new form based on the later Tahitian type was locally named *heiau* instead of *marae*. The early temples were destroyed or altered in all the inhabited islands, but a few escaped destruction in isolated localities such as the mountain slopes of Mauna Kea and Mauna Loa on Hawaii (Buck 1957:531).

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author. In 1987 the author was assisted by Barbara Lass and Scott Williams. The work in 1995 was undertaken by myself and my colleagues in the Historic Preservation Division, Marc Smith, Holly McEldowney and Eric Komori. Eric produced Figures 1 and 2, and Marc the other maps and artifact drawings. I am extremely grateful to all of these individuals for their assistance. The photographs were taken by the author one winter a number of years ago.

References

- Barrett, Jon C. 1991. Towards an archaeology of ritual. In *Sacred and Profane: Proceedings of a Conference on Archaeology, Ritual and Religion, Oxford 1989*, ed. P. Garwood, D. Jennings, R. Skeates and J. Toms, 1–9. Oxford University Committee for Archaeology Monograph No. 32. Oxford: Oxford Committee for Archaeology Institute of Archaeology.
- . 1994. *Fragments from Antiquity: An Archaeology of Social Life in Britain, 2900–1200 B.C.* Oxford: Blackwell Publishers.
- Beckwith, Martha. 1940. *Hawaiian Mythology*. Honolulu: University of Hawaii Press.
- Bell, Catherine. 1992. *Ritual Theory, Ritual Practice*. New York: Oxford University Press.
- Birkeland, Peter W. 1984. *Soils and Geomorphology*. New York: Oxford University Press.
- Buck, Sir Peter. 1957. *Arts and Crafts of Hawaii*. Bernice P. Bishop Museum Special Publication 45. Honolulu: Bishop Museum Press.
- . 1966. *The Coming of the Maori*. Whitcombe and Tombs Ltd., Wellington. [First published 1949].
- Caine, Nel. 1974. The geomorphic processes of the alpine environment. In *Arctic and Alpine Environments*, ed. J. D. Ives and R. G. Barry, 721–748. London: Methuen.
- Cleghorn, Paul Lodge. 1982. The Mauna Kea Adze Quarry: Technological Analyses and Experimental Tests. Unpublished Doctoral Dissertation, University of Hawaii.

- . 1986 Organizational structure at the Mauna Kea Adze Quarry Complex, Hawaii. *Journal of Archaeological Science* 13:375–387.
- Cooke, Ronald U. 1970. Stone pavements in deserts. *Annals of the Association of American Geographers* 60:560–577.
- Cooke, Ronald U., and Andrew Warren. 1973. *Geomorphology in Deserts*. Berkeley: University of California Press.
- Crabtree, Don E. 1972. An introduction to flint-working. *Occasional Papers of the Idaho State Museum*, No. 28. Pocatello.
- Davies, J. L. 1972. *Landforms of Cold Climates*. Canberra: Australian National University Press.
- Douglas, Mary. 1966. *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo*. London: Routledge and Kegan Paul.
- . 1975. *Implicit Meanings: Essays in Anthropology*. London: Routledge and Kegan Paul.
- Embleton, Clifford, and Cuchlaine A. M. King. 1975. *Periglacial Geomorphology*. New York: John Wiley and Sons.
- Emory, Kenneth P. 1921. An archaeological survey of Haleakala. *Bernice P. Bishop Museum Occasional Papers* 7(11):237–259. Honolulu: Bishop Museum Press.
- . 1928. *Archaeology of Nihoa and Necker Islands*. Bernice P. Bishop Museum Bulletin 53. Honolulu: Bishop Museum Press.
- . 1933. *Stone Remains in the Society Islands*. Bernice P. Bishop Museum Bulletin 116. Honolulu: Bishop Museum Press.
- . 1938. The adz makers of Mauna Kea. *Paradise of the Pacific* 50 (4):21–22.
- . 1943. Polynesian stone remains. In *Studies in the Anthropology of Oceania and Asia*, ed. Carleton S. Coon and James M. Andrews, IV, 9–21. Papers of the Peabody Museum of American Archaeology and Ethnology 20. Cambridge: Harvard University.
- . 1970. A Re-examination of East-Polynesian marae: Many marae later. In *Studies in Oceanic Culture History*, Volume 1, ed. R. C. Green and M. Kelly, 73–92. Pacific Anthropological Records 11. Honolulu: Department of Anthropology, Bishop Museum.
- Firth, Raymond. 1970. *Rank and Religion in Tikopia*. London: George Allen and Unwin.
- Garwood, P. D. Jennings, R. Skeates and J. Toms (Eds.). 1991. *Sacred and Profane: Proceedings of a Conference on Archaeology, Ritual and Religion, Oxford 1989*. Oxford University Committee for Archaeology Monograph No. 32. Oxford: Oxford Committee for Archaeology, Institute of Archaeology.
- Goldman, Irving. 1970. *Ancient Polynesian Society*. Chicago: University of Chicago Press.
- Graves, Michael W. and Thegn N. Ladefoged. 1995. The evolutionary significance of ceremonial architecture in Polynesia. In *Evolutionary Archaeology*, ed. Patrice A. Teltser, 149–174. Tucson: University of Arizona Press.
- Hartt, Constance E. and Marie C. Neal. 1940. The plant ecology of Mauna Kea, Hawaii. *Ecology* 21:237–66.
- Kirch, Patrick V. 1990a. The evolution of sociopolitical complexity in prehistoric Hawaii: An assessment of the archaeological evidence. *Journal of World Prehistory* 4:311–345.
- . 1990b. Monumental architecture and power in Polynesian chiefdoms: A comparison of Tonga and Hawaii. *World Archaeology* 22:206–222.
- Kolb, Michael J. 1991. Social Power, Chiefly Authority, and Ceremonial Architecture in an Island Polity, Maui, Hawaii. Ph.D. Dissertation, University of California, Los Angeles. Ann Arbor, University Microfilms.
- . 1994. Ritual activity and chiefly economy at an upland religious site on Maui, Hawai'i. *Journal of Field Archaeology* 21:417–436.
- Lass, Barbara. 1994. *Hawaiian Adze Production and Distribution: Implications for the Development of Chiefdoms*. Institute of Archaeology, University of California, Los Angeles Monograph 37.
- Leach, Edmund. 1976. *Culture and Communication: The Logic by Which Symbols are Constructed*. Cambridge: Cambridge University Press.

- McCoy, Patrick C. 1976. The Mauna Kea Adz Quarry Project: A first analysis. *Proceedings of the First Conference in Natural Sciences [Hawaii Volcanoes National Park]*, 135–142.
- . 1977. The Mauna Kea Adz Quarry Project: A summary of the 1975 field investigations. *Journal of the Polynesian Society* 86(2):233–44.
- . 1978. The B. P. Bishop Museum Mauna Kea Adz Quarry Project. Department of Anthropology (Ms. 012778), Prepared for the Historic Preservation Office, Department of Land and Natural Resources, State of Hawaii.
- . 1981. Stones for the Gods: Ritualism in the Mauna Kea Adz Quarry industry, Hawaii. Paper presented at the 46th Annual Meeting, Society for American Archaeology, San Diego, California.
- . 1982. Archaeological reconnaissance survey. In *Cultural Resources Reconnaissance of the Mauna Kea Summit Region*, by Patrick C. McCoy and Holly McEldowney. Department of Anthropology, Bishop Museum.
- . 1986. Archaeological investigations in the Hopukani and Liloe Springs area of the Mauna Kea Adze Quarry (Ms. 092386). Department of Anthropology, Bernice P. Bishop Museum.
- . 1989. Archaeological survey of Site 1, Mauna Kea Adze Quarry Complex. Ms. in author's possession.
- . 1990. Subsistence in a “non-subsistence” environment: Factors of production in a Hawaiian alpine desert adze quarry. In *Pacific Production Systems: Approaches to Economic Prehistory*, ed. D. E. Yen and J.M.J. Mummery, 85–119. Occasional Papers in Prehistory, No. 18. Canberra: Department of Prehistory, Research School of Pacific Studies, Australian National University.
- . 1991. Survey and test excavations of the Pu‘u Kalepeamoia Site, Mauna Kea, Hawai‘i. Prepared for Facilities Planning and Management Office, University of Hawaii. Ms. on file in the Department of Anthropology, Bernice P. Bishop Museum. Honolulu.
- McCoy, Patrick C., and Richard A. Gould. 1977. Alpine archaeology in Hawaii. *Archaeology* 30(4): 234–243.
- McCoy, P., A. Makanani, and A. Sinoto. 1993. *Archaeological investigations of the Pu‘u Moiwi adze quarry complex, Kaho‘olawe*. Consultant Report 14. Honolulu: Kaho‘olawe Island Conveyance Commission.
- McEldowney, Holly. 1982. Ethnographic background of the Mauna Kea summit region. Report 1, In *Cultural Resources Reconnaissance of the Mauna Kea Summit Region*. Bishop Museum Department of Anthropology.
- McFadden, Leslie D., S. G. Wells, and M. J. Jercinovich. 1987. Influences of eolian and pedogenic processes on the origin and evolution of desert pavements. *Geology* 15:504–508.
- Merrill, R. S. 1968. The study of technology. *International Encyclopedia of the Social Sciences* 15: 576–589.
- Myerhoff, Barbara G., Linda A. Camino and Edith Turner. 1987. Rites of passage: An overview. In *The Encyclopedia of Religion*, ed. Mircea Eliade, 12: 380–386. New York: Macmillan Publishing Co.
- Orme, B. 1981. *Anthropology for Archaeologists*. London: Duckworth.
- Porter, Stephen C. 1975. Late Quaternary glaciation and tephrochronology of Mauna Kea, Hawaii. In *Quaternary Studies*, ed. R. P. Suggate and M. M. Cresswell, 247–251. Royal Society of New Zealand Bulletin 13. Wellington.
- Retzer, J. L. 1974. Alpine soils. In *Arctic and Alpine Environments*, ed. J. D. Ives and R. G. Barry, 771–802. London: Methuen.
- Schiffer, Michael B. 1983. Toward the identification of formation processes. *American Antiquity* 48: 675–706.
- . 1987. *Formation Processes of the Archaeological Record*. Albuquerque: University of New Mexico Press.

- Tilley, Christopher. 1994. *A Phenomenology of Landscape: Places, Paths and Monuments*. Oxford: Berg Publishers.
- Tricart, Jean. 1970. *Geomorphology of Cold Environments*. Translated by Edward Watson. London: Macmillan.
- Turner, Victor. 1967. Betwixt and between: The liminal period. In *The Forest of Symbols: Aspects of Ndembu Ritual*, 93–111. Ithaca: Cornell University Press. [First published in 1964 in The Proceedings of the American Ethnological Society.]
- Ugolini, Fiorenzo. n.d. Soils of the high elevations of Mauna Kea, Hawaii. Ms. in author's possession. University of Washington, Seattle.
- van Gennep, Arnold. 1960. *The Rites of Passage*. London: Routledge and Kegan Paul.
- Washburn, A. L. 1956. Classification of patterned ground and review of suggested origins. *Geological Society of America Bulletin* 67:823–865.
- . 1979. *Geocryology: A Survey of Periglacial Processes and Environments*. London: Edward Arnold.
- Weisler, Marshall. 1990. A technological, petrographic, and geochemical analysis of the Kapohaku adze quarry, Lana'i, Hawaiian Islands. *New Zealand Journal of Archaeology* 12:29–50.
- Williams, S. W. 1989. A Technological Analysis of the Debitage Assemblage from Ko'oko'olau Rockshelter No. 1, Mauna Kea Adze Quarry, Hawai'i. Master of Arts Thesis, Washington State University, Pullman.
- Woodcock, Alfred H. 1974. Permafrost and climatology of a Hawaii volcano crater. *Arctic and Alpine Research* 6(1):49–62.
- Woodcock, A. H., A. S. Furumoto, and G. P. Woolard. 1970. Fossil ice in Hawaii? *Nature* 226(5248): 873.
- Zuesse, Evan M. 1987. Ritual. In *The Encyclopedia of Religion*, ed. Mircea Eliade, 12:405–422. New York: Macmillan Publishing Co.

Palaeoenvironmental and Archaeological Investigations at 'Ōhi'apilo Pond, Leeward Coast of Moloka'i, Hawai'i

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A sediment coring and limited archaeological excavation project was undertaken within the former 'Ōhi'apilo Fishpond (State Site 50-60-03-891), Kalama'ula *ahupua'a* on leeward Moloka'i, State of Hawai'i (Fig. 1). This work was conducted as part of the 'Ōhi'apilo Wetlands Enhancement Project which is designed to provide 25.4 acres of optimal foraging, loafing and nesting habitat for two endangered endemic waterbirds, the Hawaiian stilt, or *ae'o* (*Himantopus mexicanus knudseni*), and the Hawaiian coot or *'alaeke'oke'o* (*Fulica americana alai*), with benefits for other migratory shorebirds and waterfowl.

Research Themes

The palaeoenvironmental research project was conceived after an initial inventory survey of the current wetland identified deep, waterlogged sediments with a high potential for the *in situ* preservation of palaeoecological remains (Shapiro et al. 1993). Some of these sediments were tentatively interpreted as being associated with the former fishpond. Four inter-related research themes were pursued during the subsequent investigations.

The first research theme focussed on establishing a palaeoenvironmental baseline from pre-Polynesian arrival to the present-day for this portion of the leeward Moloka'i coast. Numerous palaeoenvironmental investigations undertaken in Hawai'i over the last ten years, most as components of cultural resource management projects, are of direct archaeological relevance. These studies have attempted to reconstruct the effects of Hawaiian colonization, settlement and land use upon the pre-existing vegetation and environment (Athens et al. 1992; Athens 1997). This work

has yielded a relatively robust chronology for the transformation of O'ahu's vegetation from the mid-Holocene to the present (Athens and Ward 1991, 1993a and b, 1994; Athens et al. 1995; Denham et al. 1993; Hammatt et al. 1990; Wickler et al. 1991; Williams and Dye 1995), with less comprehensive datasets being completed for neighboring islands. Once a palaeoenvironmental baseline has been established for Moloka'i, changes to the pre-Polynesian vegetation and the settlement and land use chronologies can be charted and compared with those for O'ahu.

The second research theme relates to the use of palaeoenvironmental information to resolve some of the uncertainties associated with the chronology of

settlement on Moloka'i. Athens (1985) originally questioned the widely accepted settlement model for Moloka'i developed and promulgated by Kirch (1985). The conventional wisdom regarding the settlement of Moloka'i had been previously based on intensive excavations in Hālawā Valley on the northeast windward side (Kirch and Kelly 1975) and Kawela on the leeward south coast (Weisler and Kirch 1985). In general terms, the model Athens questioned implied that:

On the windward side of the island there is wet taro agriculture and early settlement while on the leeward side there is sweet potato cultivation and very late settlement (Athens 1985:12).

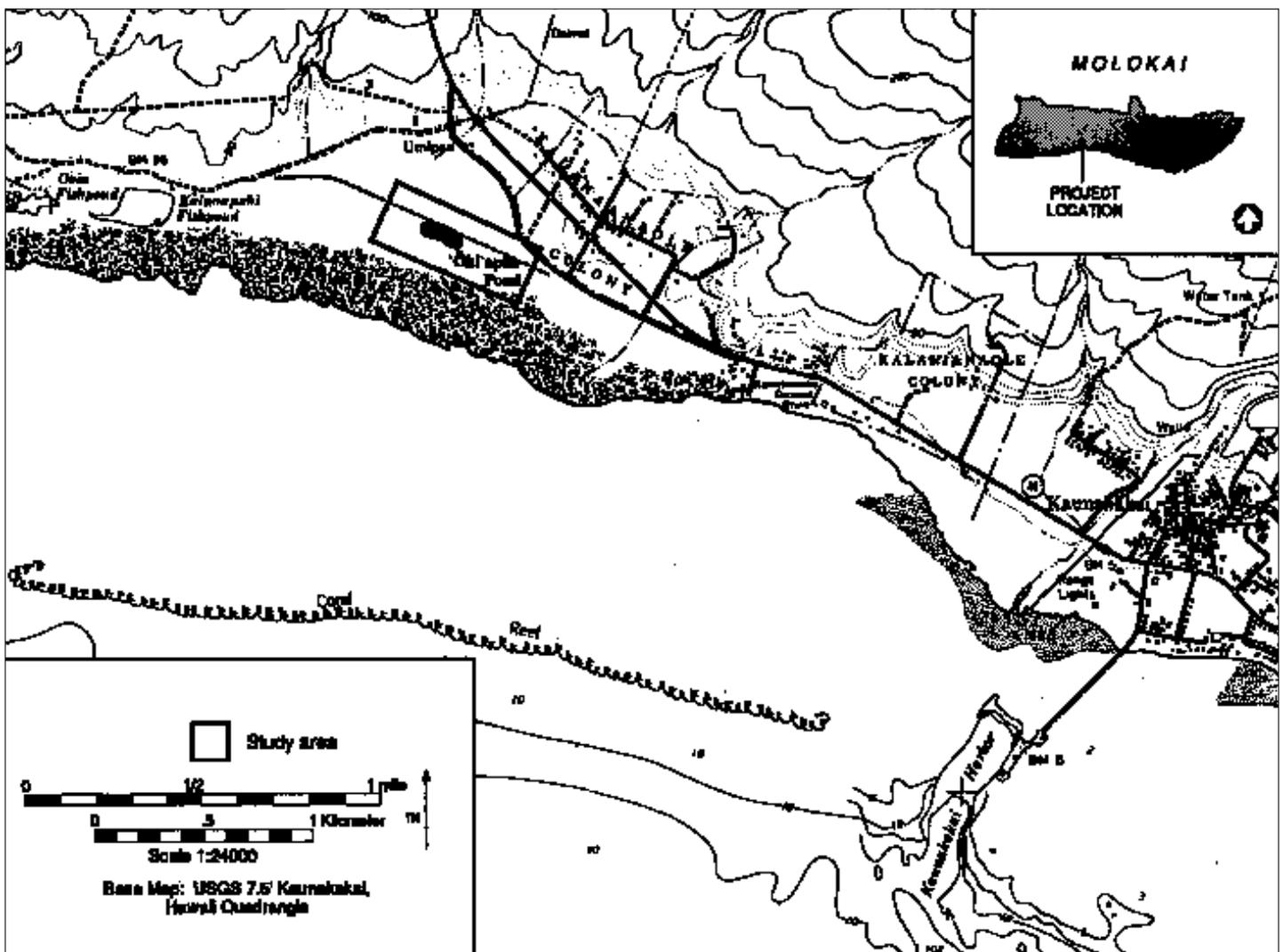


Figure 1. Project location map.

On the windward coast, a coastal dune with successive phases of occupation indicated that Hālawā Valley had been initially occupied by A.D. 650 (Kirch and Kelly 1975). Early shifting cultivation (successive relocation of agricultural plots within vegetated areas) occurred in the valley by A.D. 1350 with later intensified, pondfield/irrigated cultivation (Riley 1975:114). On the leeward coast, i.e., at Kawela, intermittent resource use and occupation occurred in the sixteenth century with an expansion into the uplands in the eighteenth century immediately prior to European arrival.

Following his excavation of a multi-period site (Site 800) in Kalama'ula, initially used as a temporary fishing camp around the fourteenth to fifteenth centuries,¹ Athens however concluded that:

The pattern that seems to be emerging is one in which the early inhabitants of Moloka'i were making use of the entire island at a[n] early time period—presumably by A.D. 1200 or perhaps earlier. They were not confined to the supposedly more favorable windward coasts and valleys, and areas having permanent streams. Rather the leeward areas were apparently viewed in a more favorable light by the early occupants of Moloka'i than what prehistorians have often assumed (Athens 1985:98).

Athens' interpretation for earlier leeward settlement has been supported by an early radiocarbon date for coastal Kaunakakai (reported in Weisler 1989:135). Following on from Athens' work, Weisler presented a more refined chronology for the settlement of leeward Moloka'i, although it was still based on similar environmentally driven premises as the earlier studies (Weisler 1989:123–128).

Tomonari-Tuggle proposed a more inclusive settlement pattern for Kalama'ula *abupua'a* that may be applicable to other portions of the leeward coast. Her survey and excavation identified 54 sites on the lowland slopes of the *abupua'a*. Most sites were interpreted as representing low intensity agriculture; short-term, sporadic and/or low intensity occupation; and, short-term military occupation (Tomonari-Tuggle 1990:34). She suggested that the unsurveyed coastal flat was the locus of prehistoric settlement within the *abupua'a*.

The palaeoenvironmental data may answer some of the questions concerning the initial settlement and use of the *abupua'a*. Existing interpretations of the initial settlement of Hālawā, Kawela and Kaunakakai are based on single radiocarbon dated features or deposits. Palaeoenvironmental data should illustrate how the landscape as a whole, rather than individual sites, have been used through time. Although restricted to the *abupua'a*, the connection between archaeological and palaeoenvironmental data may shed light on the patterns of land use for leeward Moloka'i generally.

The third research theme sought to combine archaeological and palaeoenvironmental data to determine the chronology of fishpond construction and use. The analysis of sediment columns, whether cores or monoliths, has proved of limited use in accurately determining the date at which fishponds were originally constructed. For a number of fishponds, the date of construction cannot be determined with any clear resolution due to a hiatus between pre and pond use sediments, e.g., the Kālia Fishpond Complex, Waikiki, O'ahu (Davis 1989). These problems can be augmented at the base of some ponds by the intermixing of sediments through cleaning or maintenance, and the burrowing of mollusks (Denham 1997).² A more secure chronology of construction may be possible by cross-correlating dates obtained from archaeologically secure contexts, e.g., fishpond walls, with those collected from sediment cores/columns.

The fourth theme focussed on using diatoms to reconstruct the changing water and soil conditions, and on identifying diagnostics associated with the fishpond itself. Pollen and basic sediment descriptions provide relatively low resolution data from which to infer water quality conditions within former ponds. Recent studies have identified a number of water quality characteristics in contemporary ponds (Wyban 1992; Hawaiian Fishpond Revitalization Project 1993; Wilcox et al. 1997). Diatom studies may enable the identification of similar conditions in former ponds. Integrating the results of the current project with previous studies in which diatoms have been used (Athens et al. 1995; Denham 1997) may eventually enable better diagnostics to be established for former fishpond sediments.³

Physical Setting

'Ōhi'apilo wetland measures approximately 32 acres and lies approximately 2 miles west of Kaunakakai in Kalama'ula *abupua'a* on the leeward coast of Moloka'i (see Fig. 1). It is situated south and *makai* of the coastal plain and lowland volcanic slopes, and north and *mauka* of an area of dense vegetation. Wetland boundaries are defined by Kalama'ula Landfill to the southeast, a light duty road that extends parallel and south of Kamehameha V Highway to the northeast, an unimproved road to the northwest, and a mangrove stand to the southwest.

The majority of the wetland is covered with pickleweed (*Batis maritima*) with some small pools of permanently standing water and an open, central open alkali flat (Fig. 2). The *Batis* flats are saturated, but not covered with standing water. The alkali flat is devoid of vegetation and consists of a thin, dry, light grayish brown crust overlying darker, semi-saturated sediments. Most of the wetland surface is only

slightly above mean sea level and the water table is subsequently at or near the surface for most of the year. Vegetation assemblages within and bordering the wetland include mangrove (*Bruguiera* spp.), *kiawe* (*Prosopis pallida*) and *koa haole* (*Leucaena glauca*).

The wetland soils are part of the Kealia Series (Foote et al. 1972: Sheet 77). Kealia silt loam, which occurs throughout the study area, is characteristically a poorly drained soil exhibiting a high salt content:

Ponding occurs in low areas after a heavy rain. When the soil dries, salt crystals accumulate on the surface. The soil has a brackish water table that fluctuates with the tides . . . (Foote et al. 1972:67).

Formerly a number of narrow, intermittently flowing gulches drained into the wetland from the leeward slopes of the East Moloka'i Range. These gulches brought fresh water and sediments down into the wetland. The widespread historic modifications to the inland drainage of Kalama'ula will have

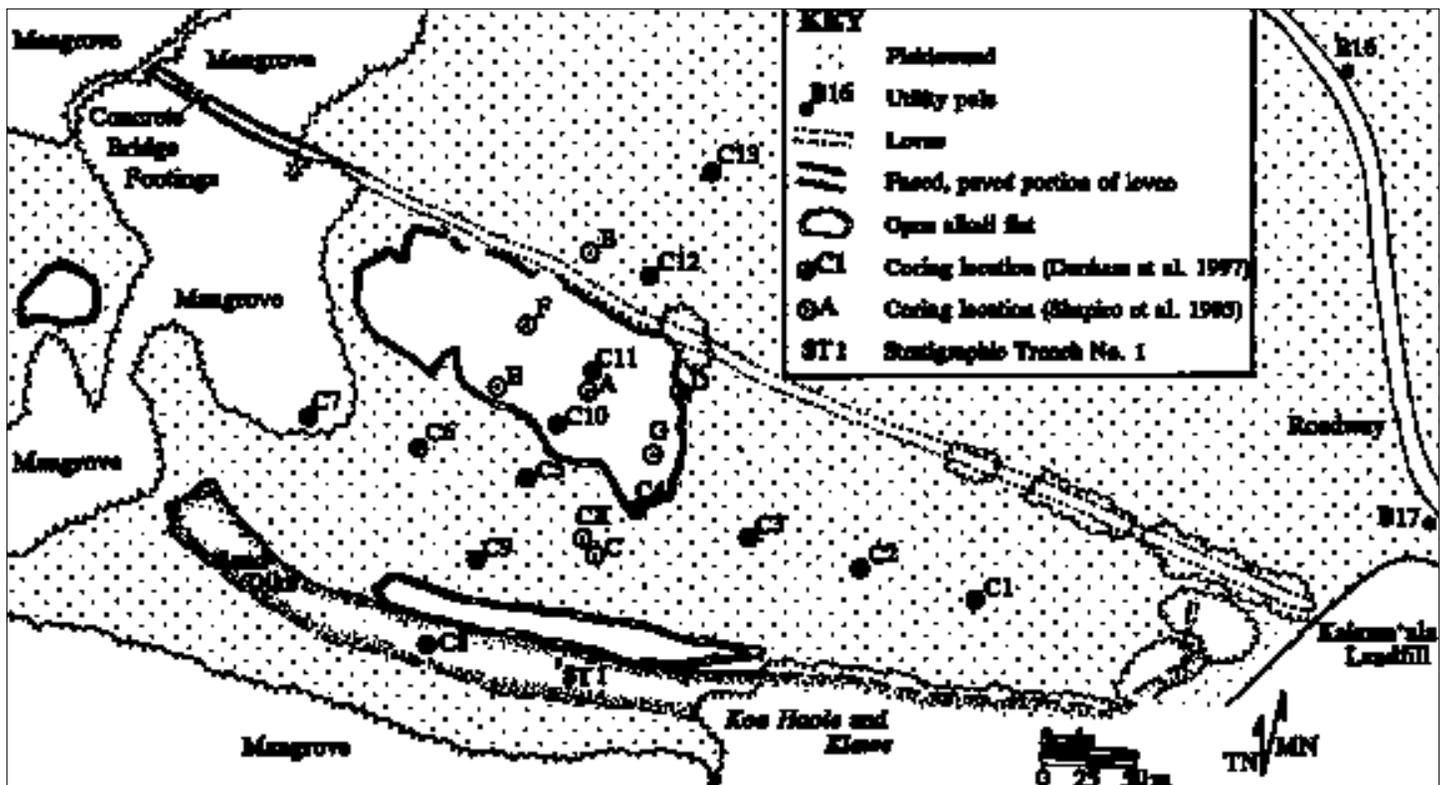


Figure 2. Coring location map, 'Ōhi'apilo wetland.

affected the water and sediment budgets of the wetland, as will the introduction and spread of mangrove along the coast.

Historical Overview of 'Ōhi'apilo Pond

The present-day 'Ōhi'apilo Wetland has formed from the infilling of at least three fishponds: 'Ōhi'apilo, Kahokai to the west, and 'Umipa'a to the east (State Sites 50-60-03-891, -117, and -119, respectively). Traditionally, this section of coastline was noted for its plentiful, small mullet (*'ama'ama* or *Mugil cephalus*) (Tomonari-Tuggle 1983:1). The coastal fishponds were probably constructed to take advantage of this natural phenomenon.

Maps of the vicinity clearly show historic transformations of the larger two fishponds, 'Ōhi'apilo and Kahokai,⁴ since the late nineteenth century (Denham et al. 1997:10–15). Records are less clear about the development of 'Umipa'a, which is referred to by Monsarrat as a “dry fishpond mauka of Ohaipilo”

(Summers 1971:84). In Cobb's survey of commercial fisheries undertaken in 1901 both Kahokai and 'Ōhi'apilo are listed, as are two other unnamed small ponds in Kalama'ula (Cobb 1902:429).

'Ōhi'apilo Pond lies northeast and inland of Kahokai Pond.⁵ On Monsarrat's map (Fig. 3), both fishponds are shown as being partially silted-in. A finger of land, presumably a spit, forms the southeastern boundary of 'Ōhi'apilo (Monsarrat 1886). This 1886 map clearly shows a wall separating the two ponds. From this map it is apparent that 'Ōhi'apilo is slightly cut off and protected from the marine environment by the spit and Kahokai Pond. The gulches intermittently draining the lowland slopes flowed immediately behind 'Ōhi'apilo Pond.

The sediments collecting within 'Ōhi'apilo Pond would be expected to reflect a combination of marine and terrestrial environments of deposition. Given the pond's location adjacent to the base of volcanic slopes, it is possible that it was also spring-fed. Coastal fishponds are characteristically located adja-

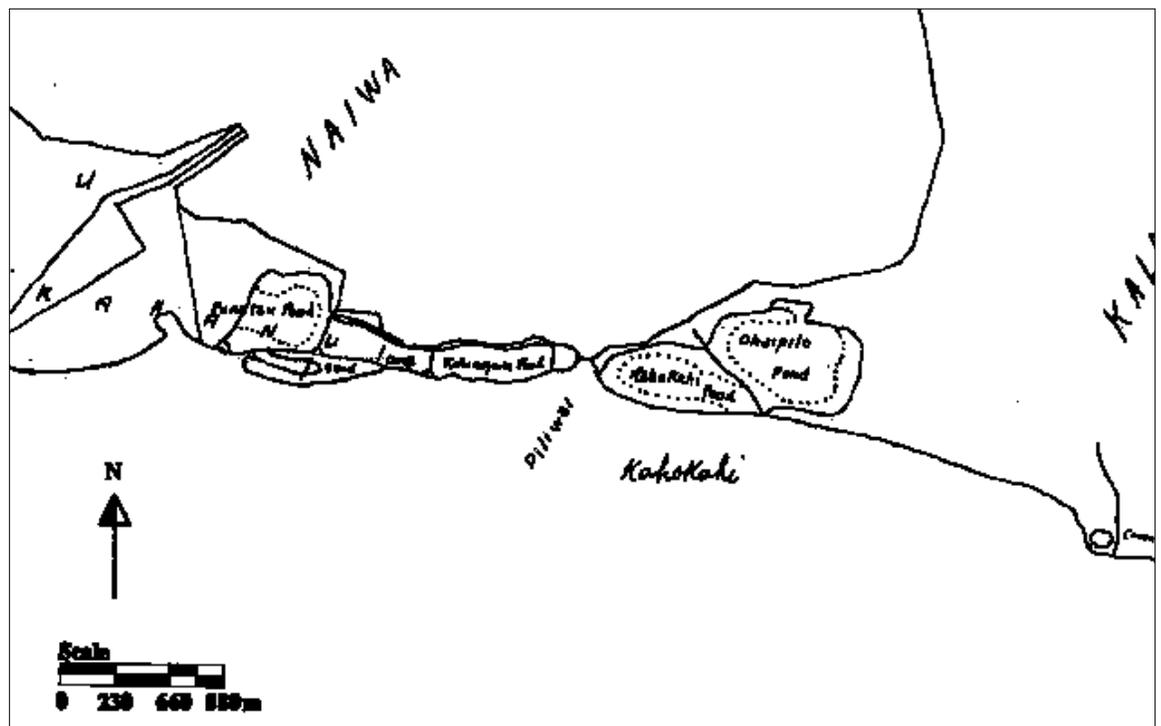


Figure 3. Portion of Monsarrat (1886) depicting 'Ōhi'apilo (spelled as Ohaipilo) and Kahokai (spelled as Kahokahi) ponds.

cent to the mouths of streams and encompass springs in order to create the environments that encourage the growth of algae upon which fish such as mullet and milkfish (*awa* or *Chanos chanos*) feed. No springs were identified during fieldwork.

Early twentieth century maps depict the ponds as being partially filled in with extensive sedimentation in the vicinity of the common wall (USGS 1922; Territory of Hawai'i 1938).⁶ Stokes had noted in 1909 that two-thirds of the 10-foot-wide wall at 'Ōhi'apilo was still intact (in Summers 1971:84). The history of use and abandonment of 'Ōhi'apilo during the twentieth century, though, is unclear. Tinker indicated that Kahokai and 'Ōhi'apilo were not in operation in 1901, but had been returned to use in 1939 (Tinker 1939). He described both ponds as "muddy."

During this century, both fishponds were abandoned and subsequently filled in. Any surface remains of the original pond walls were buried (Estioko-Griffin 1987; DHM 1989). Apple and Kikuchi (1975) did

not consider 'Ōhi'apilo Pond worthy of preservation. In their study, fishponds that had deviated least from their original working conditions were given the highest value rating for preservation.

Coring Methods

During an inventory survey in 1993, Shapiro et al. collected eight cores along two perpendicular transects across the wetland (Fig. 2). The deepest core extended to 280 cm below surface (cmbs). All cores were crudely collected by hammering PVC sections into the ground. These cores were sufficient to provide a stratigraphic overview of the wetland, illustrating the environments of deposition through time, but were unsuitable for palaeoenvironmental analysis.

During the subsequent data recovery project, 13 cores were collected from within the boundaries of the former 'Ōhi'apilo Pond (Fig. 2; see Denham et

Table 1. Sediment Descriptions for Core 11 (refer to Figure 4)

Layer	Depth (cmbs)	Thickness (cm)	Boundary	Color (moist)	Texture	Structure	Consistence (moist/wet)	Roots/Rocks	Comments
I	0–4	4	clear	10YR 4/3, brown	silty clay	massive	firm/sticky, plastic	micro, fine to coarse, 15%/0	surface of alkali flat
II	4–20	16	clear	7.5YR 3/3, dark brown	silty clay	massive	firm/sticky, plastic	micro, fine to medium, 10%/0	
III	20–46	26	clear	2.5Y 3/2, very dark grayish brown	sandy clay loam	massive	friable/slightly sticky, slightly plastic	0/0	
IV	46–110	64	clear	2.5Y 3/2, very dark grayish brown to 2.5Y 4/1, dark gray	loamy sand	structureless coarse, single grain	friable/non-sticky, non-plastic	0/0	brown and gray mottles, few charcoal flecks
V	110–224	114	gradual	2.5Y 3/1, very dark grayish brown	sand	structureless fine, single grain	loose/non-sticky, non-plastic	0/0	homogeneous color and consistency
VI	224–458	234	clear	2.5Y 3/1, very dark grayish brown	loamy sand	structureless very fine, single grain	friable/non-sticky, non-plastic	0/0	finer structure than Layer V
VII	458–580 (B.O.C)	122 (B.O.C)	(B.O.C.)	2.5Y 4/1, dark gray	loamy sand	structureless very fine, single grain	friable/slightly sticky, slightly plastic	0/0	extremely fine



Figure 4. Core extraction. Note open alkali flat in background.

al. 1997:Appendix A for full core descriptions). A manually operated, modified Livingston piston corer was used in the field (Fig. 4). This corer is designed to extrude relatively intact sediment cores from saturated sediments in wetland environments (Athens and Ward 1991:25). Coring in most cases continued until impenetrable layers were encountered. Depths ranged from 190 cmbs (Core 1) to 580 cmbs (Core 11). Core depths were much greater than those encountered during either the inventory survey, or during a preliminary coring project at Honouli Wai Fishtrap, Kahinapohaku Pond and 'Ualapu'e Fishpond (Burtchard 1994). Both Cores 11 and 12 exhibited a marked absence of coarse clasts in comparison to the other cores from 'Ōhi'apilo. The absence of coarser clasts suggested lower wave energy environments and a lower potential for secondary mixing following initial deposition. Core 11 was chosen for detailed palaeoenvironmental work as it was the deeper of the two.

Stratigraphy for Core 11

The sediment descriptions for Core 11 are presented in Figure 5 and Table 1. The stratigraphic sequence shows marine sediments at the base with an increasing terrestrial component up the core. In general terms, the sequence represents a prograding coastline. The sediments are discussed from the base of the core to the top.

Layers VII to IV were predominantly marine sands and loamy sands, with a coarsening of particles up the core. The general coarsening trend may reflect a

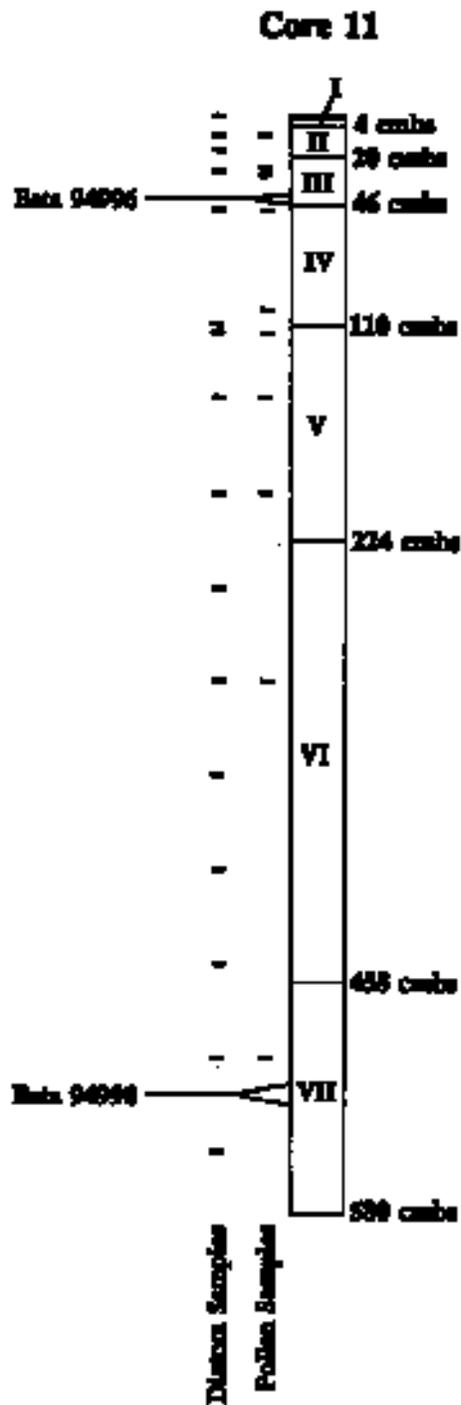


Figure 5. Core 11 stratigraphic profile depicting ^{14}C , pollen, and diatom sample locations.

transition from deeper to shallower marine environments. A small terrestrial component to these sediments would be expected given their offshore location. The texture of Layer III, with a higher component of silts and clays, seemed to represent a transitional sediment with a greater component of terrestrially derived sediments and entrained organic material. Based on their color and composition, Layers II and I contained even greater amounts of terrestrially derived silts and clays. Both these upper layers formed over the last 50 years since the pond fell into disuse.

Pollen and Charcoal Particles for Core 11

Ten samples were submitted for pollen and charcoal particle analysis. The pollen samples were submitted in three phases as the overall nature of the pollen rain through time became apparent and the principal periods of interest were identified and targeted. The provenience, pollen and charcoal frequency results are presented in Table 2 and Figure 6. All samples were prepared according to standard procedures (described by Ward in Denham et al. 1997). Pollen and spores were well preserved in all samples.

The core profile has been divided into four temporal zones (A–D) based upon shifts in major palynomorph types and the appearance of charcoal particles. The pollen was separated into major ecological groups: Herbs, Dry-Mesic Forest and Mesic-Wet Forest. The Pteridophytes were divided on the basis of morphology, whether monolete or trilete. The pollen diagram is dominated by Pteridophytes (largely comprising monolete, psilate and *Cibotium* spores) and to a lesser extent by Trees and Shrubs (mostly *Pritchardia* pollen). Herbs are only significant in the uppermost zones (Zones C and D).

The earliest pollen zone corresponds to a Pre-Polynesian pristine forest and records changes to lowland, leeward Moloka'i during the mid-Holocene (Zone A, 500–160 cmbs). Three samples were examined for Zone A (500, 300 and 200 cmbs). Dry-Mesic Forest pollen dominated. *Pritchardia* pollen is the largest individual species, accounting for approximately 25 percent, with cheno-ams, *Kanaloa* and *Dodonaea* following in lower proportions. Minor

signals were recorded for *Chamaesyce*, *Colubrina*, *Sida* and *Waltheria*.⁷

The basal sample (500 cmbs, Layer VII) is richest in native forest elements especially of the Mesic-Wet Forest group. Higher samples (300 cmbs, Layer VI and 200 cmbs, Layer V) show decreases in tree and shrub pollen, with a decline and disappearance of some Mesic-Wet Forest types including *Hedyotis*, *Platydesma* and *Tretraplasandra*. The shift in abundance may represent a slightly drier climate during the 300 cmbs interval with a slight recovery of Dry-Mesic Forest pollen evident in the 200 cmbs sample.

Zone B corresponds to the early Polynesian period, as evidence for colonization and disturbance is present (160–65 cmbs). Between the 200 cmbs and 150 cmbs interval a significant change occurs in the pollen diagram. There is a decline in tree and shrub pollen between Zones A and B. The frequency of Dry-Mesic species is greatly reduced within this zone with the disappearance of *Antidesma* and *Erythrina*.

The most conspicuous difference between Zones A and B are the indicators of forest disturbance. Principal among these is the rise in the frequency of *Cibotium* and the initial occurrence and subsequent rise in the frequency of charcoal particles. *Cibotium* is a gap colonizer and indicates forest disturbance and limited succession (Selling 1948). The first record of charcoal particles occurs in the 150 cmbs sample, and its frequency remains relatively low throughout Zone B. The relatively low levels of charcoal suggest only minimal fire use in the vicinity. Ferns show a slight increase in Zone B, such as *Polypodium pellucidum*-type, *Psilotum*, the granulate and perinate types, while others are in decline, e.g., *Adenophorous tamariscinus*, *Lindsaea repens*-type and *Selaginella*. The low-level of disturbance within this zone has created a wide species diversity reflecting the higher variability of habitats in comparison to the pristine forest (Zone A) or the heavily modified environment (Zone C).

By Zone C (65–20 cmbs), the *Cibotium* curve shows an abrupt decline while both grass and sedge pollen signals climb precipitously. This shift may reflect a degradation of the landscape through repeated disruption causing initial colonization of *Cibotium* spp., which in turn is replaced with continued and more frequent disruption. Pollen of cheno-ams, *Sida* and

Table 2. Palynomorphs from 'Ohia'pilo Pond, Core 11, Moloka'i.
Designations of naturalized and Polynesian-introduced taxa after Wagner et al. (1990). Core depth in cm.

Pollen Zone Species or type	D		C		B			A		
	10	26–27.5	30	50	100	114–116	150	200	300	500
Herbs										
<i>Boerhavia</i>	7	2	18		1	3		5	2	2
Cyperaceae (sedge)	72	98	63		1	5	1	3	3	4
<i>Ipomoea</i> sp.	1		2							
Lactuceae (nat)	5	2								
Poaceae (grass)	337	289	251	3	5	25		4	2	24
Portulaca			1					2	1	3
<i>Sesuvium portulacastrum</i>			1							1
Total Herbs	422	391	336		7	33		14	8	34
Dry-Mesic Forest										
<i>Acacia koa</i>	1									2
<i>Aleurites moluccana</i> (pol)		3	1							
Antidesma								1	2	
Asteraceae (high-spined)	1	5	2			1	2			
Bignoniaceae (nat)	1									
<i>Capparis sandwichiana</i>					1					
Caryophyllaceae		2	1						1	
Chamaesyce	1	9	5			5	3	3	6	6
Cheno-am (some nat)	86	189	77	1	12	84		18	4	27
<i>Cocos nucifera</i>				2						
<i>Colubrina</i>		3				4	3	4	2	1
<i>Diospyros</i>										1
<i>Dodonaea viscosa</i>	1	8	4			9	8	5	4	8
<i>Elaeocarpus bifidus</i> -type		4	1			8		1		
<i>Embelia pacifica</i>								2		
<i>Erythrina sandwicensis</i>		1				1		1	1	4
<i>Hibiscus</i> sp.							2	1		
<i>H. tiliaceus</i> -type									1	
<i>Kanaloa kahooolawensis</i>							2	7	4	13
<i>Kokia</i>					1			2	2	
Myrtaceae			1		1	2	4		2	1
<i>Pandanus tectorius</i>							2			
<i>Pisonia sandwicensis</i> -type (3C)				1	1	2		1	3	
<i>Pouteria</i>					1			1		
<i>Pritchardia</i>	4		4	1	38	16	85	141	203	154
<i>Sanicula</i>								1		
<i>Scaevola</i>						2				
<i>Sesbania tomentosa</i>		2								
<i>Sida fallax</i>	9	5	16		3	2	7	12	8	6
<i>Sida</i> sp. (triporate form)	1		1		1			7	2	12
<i>Solanum</i>						1				3

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Designations of naturalized and Polynesian-introduced taxa after Wagner et al. (1990). Core depth in cm. (continued)

Pollen Zone Species or type	D		C		B			A		
	10	26–27.5	30	50	100	114–116	150	200	300	500
<i>Tribulus</i>			1							
<i>Waltheria indica</i>	2	4	14			1				10
<i>Xylosma</i>			2						1	
Total Dry-Mesic	107	235	130	5	59	138	118	208	246	248
Mesic-Wet Forest										
<i>Alyxia</i>										1
Araliaceae (small type, ca 20 µm)			1			1			1	1
<i>Charpentiera</i>						1				
<i>Cheirodendron</i>		1								
<i>Coprosma</i>	1	2	2		1		1	2	1	
<i>Cyrtandra</i>			1			3	1			
<i>Freycinetia arborea</i>									1	
<i>Hedyotis terminalis</i>						1	1			
<i>H. sp.</i>						1				2
<i>Ilex anomala</i>					1	3	1		1	
<i>Melicope barbigera</i> -type		2								
<i>M. clusiifolia</i> -type						1				
Myrsine										1
<i>Perrottetia sandwicensis</i>										1
<i>Platydesma</i>									1	5
<i>Psychotria</i>						1				
Rubiaceae (triporate)				3				3	2	4
<i>Styphelia tameiameia</i>			1		1					
<i>Tetraplasandra gymnocarpa</i>		1				2	5			2
<i>T. oahuensis</i> -type		1								4
Urticaceae		2								2
Total Mesic-Wet	1	9	5	3	3	14	12	4	9	21
Unknown Pollen										
Monosulcate, echinate						1				
Tricolporate:										
Reticulate		2	1			3			2	
Reticulate, large ora - legume?			1							
Total Unknown	0	2	2		0	4		0	2	0
Total Pollen	530	635	473		69	189		226	265	303
Pteridophytes										
Monolete Spores										
Asplenium-type			1		2	5		1	1	
Marattia		4				38	9			
<i>Polypodium atropunctatum</i> -type	8	2	13	5	11	6	11	8	41	15

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Designations of naturalized and Polynesian-introduced taxa after Wagner et al. (1990). Core depth in cm. (continued)

Pollen Zone Species or type	D		C		B			A		
	10	26–27.5	30	50	100	114–116	150	200	300	500
<i>Polypodium pellucidum</i> -type	85	15	35	41	88	30	50	49	74	46
<i>Psilotum</i>	5		2		4		1	1		
Echinate, vermiculate		2	7		4					
Foveolate, large										3
Foveolate/granulate	32	4	20	2	1			2	3	1
Granulate	14	6	7	11	29	9	9	10	12	4
Perinate		10	6		9	29	15	3	3	4
Psilate	551	263	335	90	238	396	278	187	322	229
Verrucate, fine	3	1	4							
Verrucate	3			8	4	4	6	2	2	1
Total Monolete	701	307	430	157	390	517	379	205	458	303
Trilete Spores										
<i>Adenophorus tamariscinus</i>		2	6		1	5		7	15	13
<i>Cibotium</i>	77	24	59	87	333	285	229	156	216	104
<i>Gleichenia linearis</i>	57	9	34	5	23	40	27	15	19	10
<i>Doryopteris</i>						1				
<i>Hymenophyllum</i>						6				
<i>Lindsaea repens</i> -type		2	5		1	1	3	2	14	6
<i>Lycopodium cernuum</i>	20	5	7	1	3	8	2	5	2	6
<i>L. phyllanthum</i>			1		1				1	
<i>L. serratum</i>						1	1		2	
<i>Mecodium recurvum</i> -type		1			1	1			2	
<i>Microlepia</i>						6				
<i>Ophioglossum falcatum</i> -type	1		2							
<i>Pteris excelsa</i>	24	18	49	20	36	25	11	15	54	43
<i>Pteris irregularis</i>	8		17		10	5		2	10	7
<i>Selaginella arbuscula</i> -type		2			2	2	2	2	2	3
Trichomanes (sparse echinae)	4		10					2	3	5
Echinate (hirsute type)		1	3	2	5	15	5	5		
Echinate, fine (evenly distributed)	35		24			4		15	2	3
Psilate	47	16	31	8	33	10	3	7	12	13
Reticulate, ca 70 µm	3	1	4							2
Tuberculate			1				1	1		
Verrucate				2	1		1		1	
Total Trilete	276	81	253	125	450	415	285	234	355	215
Total Spores	977	388	683	282	840	932	664	439	813	518
Total Pollen and Spores	1,507	1,023	1,156	293	909	1,121	795	665	1,078	821
Markers	718	652	638	55	619	906	265	986	1984	523
Starting volume (ml)	4	4	8	4	4	4	4	4	4	8

Continued on next page

Table 2. Palynomorphs from 'Ohia'pilo Pond, Core 11, Moloka'i.
Designations of naturalized and Polynesian-introduced taxa after Wagner et al. (1990). Core depth in cm. (continued)

Pollen Zone Species or type	D		C		B			A		
	10	26–27.5	30	50	100	114–116	150	200	300	500
Markers/cc	6,271	6,271	3,136	6,271	6,271	6,271	6,271	6,271	6,271	3,136
Palynomorph concentration (grains/cc)	13,162	10,264	5,682	33,407	9,209	7,759	18,813	4,229	3,407	4,923
Other Palynomorphs										
Pseudoschizaea	2	3			3	1			5	3
Wrinkled spore, psilate			60		23	22		24		
Charcoal										
Markers	118	63	69	28	207	168	265	—	—	—
Starting volume	4	4	8	4	4	4	4			
Markers/cc	6,271	6,271	3,136	6,271	6,271	6,271	6,271			
Charcoal particles	834	1,374	892	514	135	1,122	128			
No. grid squares	5,333	2,391	3,167	1,803	539	1,447	230			
Total area (mm ²)	2.13	0.96	1.27	0.7	0.22	0.58	0.09			
Charcoal concentration (mm ² /cc)	113.4	95.2	57.6	161.5	6.5	21.6	2.2	—	—	—

Waltheria are main contributors to the Dry-Mesic Forest pollen rain. The increase in Herb pollen marks a localized transition from an open water environment to one with sediment infilling allowing the development of a sedge and grass community. Solid evidence for Polynesian arrival is seen in the identification of *Aleurites moluccana* (*kukui*) and *Cocos nucifera* (coconut) pollen and the high frequency of charcoal particles.

Zone D is limited to the 10 cmbs sample that contains plants known to have been introduced during historic times. Pollen from naturalized taxa were identified in this sample and included that of the Lactuacea tribe, Bignoinaceae and possibly a portion of the cheno-am signal. It is surprising that no *Batis maritima* pollen was present in this sample as it is known to have been introduced to Hawai'i in the mid-nineteenth century and dominates the contemporary wetland vegetation.

Diatom Analysis for Core 11

Diatoms are algae that produce a silica cell wall often preserved in sediments. Individual diatom species

have particular ecological preferences and provide information about the nature and quality of the water. Diatoms are sensitive to changes in their environment, both natural and anthropogenic, and any response is often recorded as a change in species composition. In contrast to pollen, which provides a more regional perspective, diatoms reflect very localized conditions and habitats. For these reasons diatom investigations of wetland sediments are a complement to pollen, mollusk, macrobotanical and sediment analyses and can often provide an additional component to the database of palaeoenvironmental information about a site, as well as changes in the environment over time. In this study, diatoms were analyzed in an attempt to show how the aquatic conditions changed through time and to identify the changed environmental conditions following construction of the fishpond.

The preparation of all 16 diatom samples followed standard procedures.⁸ Results of the diatom analysis are summarized in Table 3 and the counts are expressed as % relative abundance (Table 4; Fig. 7). There were 44 diatom species represented of which 36 are marine and 7 are found in shallow marine and brackish water habitats. Diatoms were present in all

Table 3. Summary of Diatom Analyses for Core 11

Sample Layer	Diatom No.	Depth Zone	(cmbs)	Diatom Summary	Comments	No. of Diatoms Counted	Palaeoenvironment
I	13	D6	0–1	almost barren, 1 brackish-marine species, <i>Nit. granulata</i>	some phytoliths	10	Brackish-marine alkali mud flat
II	1	D5	10	barren except one soil diatom— <i>Nav. mutica</i>	no sponges, many phytoliths	1	marshy mud flat
II	14	D4	16–18	15 marine and soil species	phytoliths and sponges	500	brackish-marine marshy mudflat or pond
III	15	D4	27.5–29	13 marine and soil species	Few phytoliths, sponge spicules	500	brackish-marine marshy mudflat or pond
IV	2	D3	50	28 marine species	sponge spicules	500	shallow, restricted marine
IV	3	D3	110	9 marine species	sponge spicules	500	shallow, restricted marine
V	16	D3	112–114	10 marine species	sponge spicules	500	shallow, restricted marine
V	4	D3	150	2 marine taxa—mostly <i>P. sulcata</i>	sponge spicules	500	shallow, restricted marine
V	5	D2	200	almost barren, <i>P. sulcata</i> only	sponge spicules	20	unknown
VI	6	D2	250	almost barren, <i>P. sulcata</i> only	sponge spicules	30	unknown
VI	7	D2	300	almost barren, <i>P. sulcata</i> only	sponge spicules	9	unknown
VI	8	D2	350	almost barren, <i>P. sulcata</i> only	sponge spicules	9	unknown
VI	9	D2	400	almost barren, <i>P. sulcata</i> only	sponge spicules	8	unknown
VI	10	D1	450	9 marine species	sponge spicules	500	shallow marine
VII	11	D1	500	6 marine species	sponge spicules	500	shallow marine
VII	12	D1	550	10 marine species	sponge spicules	500	shallow marine

of the samples, although in some only one or a few diatom cells could be found. Nine samples contained sufficient diatom remains to count 500 cells from each sample. From the composition of the diatom assemblages, the samples from Core 11 were divided into six zones (D1–D6 in Table 3).

The lowermost three samples, between 550–450 cmbs (Zone D1) contained diatoms typical of shallow, littoral marine conditions. *Paralia sulcata* was the dominant diatom throughout this interval, accompanied by typical marine species such as *Actinocyclus senarius*, *Auliscus sculptus*, *Grammatophora marina*, *Plagiogramma staurophorum*, and *Triceratium* spp. *Paralia sulcata* is a marine, nonmotile, bottom dweller, usually an epiphyte, that attaches itself to the substrate by means of a mucous pad. Although it is conditioned to a life on the bottom, it is also found among plankton in water deep enough to experience vertical mixing (Hendey 1964). *Paralia sulcata* is more competitive than many other

marine and brackish taxa occurring in warm water environments exhibiting greatly varying salinity levels, a minimum water depth of less than one meter, and fine-grained and organic-enriched sediment (Zong 1997). Small benthic diatoms were absent, possibly the result of turbid conditions. *Actinocyclus senarius*, a marine planktonic diatom that makes up 14 percent of the 450 cmbs sample, is restricted to this interval. It is common in oceanic plankton and is also found on muddy shores (Hendey 1964).

In contrast to the horizons above and below, the interval from 400–200 cmbs (Zone D2) was almost barren of diatoms. Some *P. sulcata* cells were found, but the cells were corroded and heavily diluted with sediment. Either the environment was not suitable for diatom growth, sediment influx being extremely rapid, or dissolution occurred in the sediment as a result of high salinities. The sediments corresponding to Zone D2, Layers V and VI, were both marine.

The paucity of diatoms prevents a more detailed interpretation of their environment of deposition.

Diatoms reappeared in abundance at levels 150 cmbs, 112–114 cmbs, and 110 cmbs, and the assemblages are composed mostly of *P. sulcata*. At 150 cmbs, 99 percentage of the assemblage consisted of *P. sulcata*. A more diverse marine assemblage, with fewer *Paralia* (42%) was recorded from 112–114 cmbs, but by 110 cmbs its proportion had increased to 94 percentage. This interval (Zone D3) was interpreted as a shallow, restricted marine environment, such as that existing behind a spit or in a lagoon behind a fringing reef.

The sample from 50 cmbs within Zone D3 contained by far the most diverse assemblage with 28 marine species, although *P. sulcata* is the dominant taxon comprising about a fourth of the population. This assemblage represented a combination of temperate to tropical epiphytes and benthic mud and sand species (Hendey 1964; Lowe 1974; Foged 1984, 1986; Krammer and Lange-Bertalot 1986; Ricard 1987; Round 1990). This assemblage was characteristic of a shallow, littoral marine habitat with some vegetation. A combination of marine and brackish-marine taxa suggested that the salinity may have varied or was somehow different from marine conditions. Open-water planktonic marine species were absent from this interval and *Fragilaria faciculata*, found in this sample only, was 5.4 percentage of the population. Blinn (1995) found that *F. faciculata* shows a positive correlation with elevated salinity and sulphate ions.

The interval from 29–16 cmbs (Zone D4) contained a moderately diverse shallow-water brackish-marine diatom assemblage representative of a marsh or marshy pond with species typically found in soils and damp places (*Hantzschia amphioxys* and *Navicula mutica*). The Layer III to IV boundary marks the transition from a restricted littoral environment to a more restricted infilling environment. The initiation of this infilling has been inferred from the pollen record for Zone C with the development of local sedge and grass communities.

The brackish-water species *Nitzschia granulata* represented 65 percentage of each assemblage. The 16–18 cmbs sample contained 86 percentage brackish-water taxa and 14 percentage soil diatoms, suggesting that

the habitat had probably been a marshy pond or brackish-water marsh that was dry part of the time. The dominant diatom from 29–16 cmbs, *Nitzschia granulata*, was a motile, edaphic (mud) form found in fine silt and clay sediments of salt marshes particularly under *Distichlis spicata* where it lives in the upper oxygenated layer (less than 2 mm) of the marsh surface, at salinities ranging from 6.7–49% (Sullivan 1977). This diatom, though, has a wide range of habitats and has been found: in littoral marine samples (Foged 1975); in scrapings from piers and concrete walls in fresh water (Foged 1987); and in fossil, calcareous tufa deposits (Caran et al. 1996).

A change in the composition of the diatom assemblage takes place between 16–10 cmbs. At 10 cmbs there was only one diatom and many phytoliths. This environment (Zone D5) was interpreted as a damp mudflat covered with emergent vegetation. In contrast, the surface sample (Zone D6) from the alkali mud flat contained only a few cells of *Nitzschia granulata*, a brackish-marine species that was all corroded. Within the broad mosaic of the littoral zone, the supra-littoral (the area above high tide that includes salt marshes, mud flats, pans, pools, ditches, tidal streams, etc.) was the most likely interpretation of the palaeoecology for Zones D4–D6. Taken in conjunction with the sediment descriptions, Layers III to I represent gradual sediment accretion and development from a marshy pond to marshy mudflat to alkali and *Batis*-dominated flats.

There was no diatom evidence of freshwater conditions in Core 11 similar to that found at 'Uko'a Pond on O'ahu (Blinn 1995). At 'Uko'a Pond, the diatom evidence indicated shifts between a shallow freshwater bog, and brackish conditions caused by seawater infusion. A comparison with diatom studies from freshwater habitats on the islands of Hawai'i (Hustedt 1942; Massey 1979; Fungladda et al. 1983; Rushforth et al. 1984; McMillan and Rushforth 1985) showed essentially no overlap between the assemblages described in this report and the diatoms reported from any freshwater habitats.

Freshwater diatoms, as well as brackish-marine species, were found in a diatom analysis of sediments from Ka'ihikapu Fishpond, Waikiki, Hawai'i (Winsborough 1995). None of the freshwater species reported from Loko Ka'ihikapu were found during the present study. The marine species *Amphora cof-*

Table 4. Diatom Abundance for Core 11

Name	Sample No.															
	13	1	14	15	2	3	16	4	5	6	7	8	9	10	11	12
<i>Achnanthes brevipes</i> Ag.					0.8											
<i>Achnanthes levanderi</i> Hust.					6.0											
<i>Actinopterychus senarius</i> (Ehr.) Ehr							0.2							14.4	1.0	1.4
<i>Amphora arenicola</i> Grun.					1.0											
<i>Amphora coffeaeformis</i> (Ag.) Kütz.					1.6											
<i>Amphora pediculus</i> (Kütz.) Grun.					5.8											
<i>Amphora proteus</i> Greg.				1.0												0.2
<i>Amphora veneta</i> Kütz.					1.8											
<i>Anorthoneis eurystoma</i> Cleve			0.4		8.8											
<i>Auliscus pruinosus</i> Bailey							0.4									
<i>Auliscus sculptus</i> (W. Sm.) Ralfs.						0.2								7.4	3.2	
<i>Cocconeis scutellum</i> Ehr.			0.2	1.2	7.8											
<i>Coscinodiscus lineatus</i> Ehr.					0.2											
<i>Dimerogramma cf. fulvum</i> (Greg.) Ralfs																1.6
<i>Dimerogramma minor</i> (Greg.) Rolfs.			0.4	1.0	4.6	0.6	7.6									
<i>Fallacia insociabilis</i> (Krasske) D. G. Mann					2.0											
<i>Fragilaria fasciculata</i> (Ag.) Kütz.					5.4											
<i>Grammatophora marina</i> (Lyngb.) Kütz.														3.0		5.0
<i>Gyrosigma</i> sp.					0.6											
<i>Hantzschia amphioxys</i> (Ehr.) Grun.			6.4	2.0												
<i>Hyalodiscus hirtus</i> Mann				4.6												
<i>Lyrella robertsiana</i> (Grev.) D. G. Mann														2.0		
<i>Navicula cryptolyra</i> Brockmann					1.8											
<i>Navicula implana</i> Hust.														0.2		
<i>Navicula jaernefelti</i> Hust.					0.2											
<i>Navicula mutica</i> Kütz.		100.0	7.2	3.0	0.2											
<i>Navicula nicobarica</i> Grun.																0.8
<i>Navicula platyventris</i> Meister					2.6											
<i>Nitzschia compressa</i> (Bailey) Boyer			9.6	6.0	5.2											
<i>Nitzschia frustulum</i> Kütz.					0.2											
<i>Nitzschia granulata</i> Grun.	100.0		65.4	66.0												
<i>Nitzschia panduriformis</i> Greg.					0.4											
<i>Opephora pacifica</i> (Grun.) Petit			1.8	1.2	4.6	0.2	15.2									0.4
<i>Paralia sulcata</i> (Ehr.) Cleve			5.8	11.8	26.0	94.0	42.4	99.4	100.0	100.0	100.0	100.0	100.0	71.4	83.8	81.6
<i>Pinnularia borealis</i> Ehr.			0.6	1.0												
<i>Plagiogramma staurophorum</i> (Greg.) Heiberg			1.4		4.4	1.4	25.2	0.6						0.8	10.2	4.0
<i>Plagiogramma wallichianum</i> Greville			0.2	0.6		0.8	3.8									
<i>Plagiogramma</i> sp.					3.8	0.8										1.2
<i>Rhaphoneis bilineata</i> Grun. & Cleve			0.4		3.0	1.8										

Continued on next page

Table 4. Diatom Abundance for Core 11 (continued)

Name	Sample No.															
	13	1	14	15	2	3	16	4	5	6	7	8	9	10	11	12
<i>Rhaphoneis castracanei</i> Grunow			0.2	0.6	0.6	0.2	5.2									
<i>Surirella armoricana</i> Per.					0.4											
<i>Trachyneis aspera</i> (Ehr.) Cleve					0.2											
<i>Triceratium favus</i> Ehr.														0.4	0.4	
<i>Triceratium zonulatum</i> Grev.														0.4	1.4	3.8
Number of species	1	1	14	13	28	9	8	2	1	1	1	1	1	9	6	10
Total cells counted	10	1	500	500	500	500	500	500	20	30	8	9	8	500	500	500

feaeformis, *A. veneta*, *Cocconeis scutellum*, *Opephora marina*, and *Paralia sulcata* were recorded from the upper part of the Ka'ihikapu section where freshwater diatoms were absent, and from the sample collected at 50 cmbs in the present study.

Radiocarbon Dating for Core 11

Two samples from Core 11 were submitted for radiometric age determinations. Based on the stable carbon isotope ratio, the upper sample (Table 5, Beta-94996) consisted of marine organics. This sample was collected from the base of Layer III, and may help date initial sedimentation following construction of the pond. This marine organic sample was calibrated using the best estimate of the apparent age for the ocean surface around Hawai'i (Dye 1994). This sample yielded a calibrated date range of A.D. 1320–1660.

A lower bulk sediment sample collected from near the base of the core yielded a calibrated age range of 2600–1950 B.C. (Table 5, Beta-94998). Based on the stable carbon isotope ratio, the organics within this sediment were terrestrial in origin.

Wet-screening of sediment plugs through a sieve tower failed to isolate any macrobotanical remains, e.g., seeds, wood or grass fragments. Consequently, the only materials dated were the mixed organics within bulk sediment samples including microscopic pollen, starch, leaf cuticles, charcoal particles, fungal palynomorphs and amorphous organic debris. Problems associated with dating undifferentiated organics

within bulk sediment samples stem from the uncertain origin of the material being dated. It is not possible to account for deposit formation processes and the origin of different fractions within the sediment. It is thus possible that materials will have entered the sediment by different pathways and may be of slightly different ages. These problems will not necessarily be obviated by the separation of organic fractions, as mixing of particles can be expected within each of them.

Fishpond Wall Excavation

A series of exploratory shovel test pits were excavated into a sand dike along the southern boundary of the fishpond. These pits encountered basalt stones and coral fragments beneath the sand. A stratigraphic test trench (ST 1, see Fig. 2) measuring 5 m long and 0.7 m wide was subsequently excavated through a portion of the sand dike. This trench exposed the former fishpond wall, as well as the stratigraphy under which the wall had been buried. The excavation of this trench facilitated the collection of samples for radiocarbon dating. Trench excavation was terminated at 113 cmbs once the base of the wall had been defined. The ST1 profile is presented in Figure 8 and the matching sediment descriptions are provided in Table 6.

All the layers exposed in profile are marine in origin; most consist of sands with coral pebbles and cobbles. The darkness and loamy nature of some sediments suggest the presence of organics and/or terrestrial material within the sediment matrix. The same lay-

Table 5. Radiocarbon Dating and Calibration Summary

Sample No.	Material	Provenience	Measured ¹⁴ C Age	¹³ C/ ¹² C Ratio	Conventional ¹⁴ C Age	Calibrated Age
Beta 94996	bulk sediment (marine)	Core 11 Layer III 40–46 cmbs	890 ± 70 B.P.	-19.7	970 ± 70 B.P.	A.D. 1320–1660 ¹ [1.00]
Beta 94998	bulk sediment (terrestrial)	Core 11 Layer VII 502–510 cmbs	3800 ± 90 B.P.	-24.4	3810 ± 90 B.P.	2470–1980 B.C. ² [1.00]
Beta 94999	coral (<i>Pocillipora</i> sp.)	Stratigraphic Test Trench 1 Feature 1 (wall)	430 ± 60 B.P.	+1.3	755 ± 60 B.P.	A.D. 1660–1950 ³ [1.00]

Notes: All samples calibrated using Method B, Radiocarbon Calibration Program, Calib 3.0, Quaternary Isotope Laboratory, University of Washington. The calibrated date ranges to two sigma have been reported. Although the resultant date ranges are broader than for one sigma, they are more robust and representative for discussion.

¹ Calibrated using the marine model to 10,000 cal. B.C. dataset (Stuiver and Braziunas 1993) with a marine reservoir effect of 110 ± 80 (Dye 1994)

² Calibrated using the decadal tree-ring 6000 B.P. dataset (Stuiver and Reimer 1993)

³ Calculated using the marine model to 10,000 cal. B.C. dataset (Stuiver and Braziunas 1993) with a marine reservoir effect of 188 ± 80 (Nees and Williams 1993). Nees and Williams (1993) calculated the marine reservoir effect for *Porites* sp.

ers were present overlying both sides of the wall indicating that they were deposited after the pond had fallen into disuse.

The wall was constructed of well-stacked coral heads and basalt cobbles and boulders between five and six courses high (Fig. 9). The wall was 87 cm high and 250 cm wide. A calcareous sand matrix filled the gaps between the basalt and coral, probably due to post-construction deposition rather than representing the intended method of construction. No artifacts or midden (including charcoal) were observed or collected during the excavation of the wall, although several pieces of coral were collected.

A sample of coral (*Pocillipora* sp., Beta-94999, Table 5) collected from within the fishpond wall was submitted for radiocarbon dating. The coral fragment was not waterworn and had probably been placed within the wall soon after its removal from its original growth position. The dated coral serves as a surrogate for the date of construction of the wall itself. The use of coral for dating archaeological features has been undertaken at the Kukuiokāne Heiau Complex, Kāneʻohe, Oʻahu (Nees and Williams 1993)

and in coastal Kanaio, Maui (Eblé et al. 1997). The coral was dated and calibrated to 1660–1950 A.D. (Table 5). This date would suggest that ʻŌhiʻapilo Pond, or at least this wall section, was constructed after the mid-seventeenth century.

Reassessment of Research Themes

ʻŌhiʻapilo Pond provides a record of environmental change for Molokaʻi since the mid-Holocene showing that forest transformations occurred in similar succession to lowland Oʻahu (Athens et al. 1992). Similar species were the main contributors to the pre-Polynesian pollen signal, e.g., *Pritchardia* and *Kanaloa*, with subsequent decline and replacement by indicators of increasing levels of disturbance. The diversity of secondary and lower-storey species accords with Athens' interpretation of a leeward lowland plant community (Athens 1997:258–259). The pollen record does change during the mid-Holocene, although the sampling frequency for this portion of the core hinders higher resolution interpretations.

Table 6. Sediment Descriptions for Stratigraphic Test Trench 1 (refer to Figure 8)

Layer	Depth (cmbs)	Thickness (cm)	Boundary	Color (dry)	Texture	Structure	Consistence (dry/wet)	Roots/Rocks
I	0–25	10–25	abrupt dark brown	10YR 3/3,	loamy sand	structureless fine to medium single grain	loose, non-sticky, non-plastic	micro fine to medium 35%/0
II	7–27	2.5–15	gradual	10YR 5/6, yellowish brown	loamy sand	structureless fine to medium single grain	loose, non-sticky, non-plastic	micro fine to medium 10%/coral pebbles and cobbles 15%
III	15–60	30–40	gradual	10YR 5/4, yellowish brown	sand	structureless fine to medium single grain	loose, non-sticky, non-plastic	micro fine to medium 05%/coral pebbles and cobbles 15%
IV	53–92	30–38	gradual	10YR 5/6, yellowish brown	sand	structureless coarse single grain	loose, non-sticky, non-plastic	0/coral pebbles and cobbles 10%
V	90–113 (B.O.E)	8–28 (B.O.E)	B.O.E.	10YR 4/1, dark gray	sand	structureless coarse single grain	loose, non-sticky, non-plastic	0/coral pebbles and cobbles 10%

seventeenth century. The calibrated date ranges for these samples do not overlap. It is possible that the dated coral fragment within the wall was placed there during rebuilding following hurricane or tsunami damage, or during regular maintenance and repairs. Further dating of samples from both the core and the wall would clarify the date of construction and fill out the land use chronology for the *ahupua'a*.

The use of diatom analysis during the present study has provided useful data. Although a number of sediments contained very few diatoms, most samples contained sufficient material for interpretation. The interpretation of palaeoenvironments has been based on the characteristics of the diatom assemblage as a whole, with a particular emphasis on indicator species which have narrow environmental tolerances. As inferred from their sedimentary character, Layers VII to IV indicate an increasingly shallow and restricted marine environment. The restricted environment has been taken to represent development of the fringing reef and/or development of a spit creating a more sheltered environment. Within this sheltered environment, a brackish-marine mudflat with marsh formed, which the Hawaiians modified to build fishponds. The character of the sediments and diatom assemblage changes in Layer III, representing an environment typical of a pond with more brackish

conditions and a greater input of terrestrially derived materials. In the last 50 years, the area has filled in completely.

In summary, the data recovery project at 'Ōhi'apilo Pond has provided comparative data for the palaeoenvironmental work undertaken on O'ahu.⁹ The palaeoenvironmental data has also contributed to an understanding of the settlement of Kalama'ula, and possibly leeward Moloka'i more generally. The date of fishpond construction has not been accurately determined because there is no overlap between the dates obtained for an inferred fishpond sediment and the pond wall. Building upon the results of studies on O'ahu, diatoms have been shown to be useful indicators for isolating fishpond sediments and reconstructing local palaeoenvironmental conditions.

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Notes

1. Athens's early date at Site 800 was obtained for a *Tellina palatam* sample (Athens 1985:89, Beta 11172), which recalibrates to: A.D. 1260–1490 using a Delta R of 60 ± 90 (Dye 1994:51); and, A.D. 1310–1640 using a Delta R of 110 ± 80 (Dye 1994:56). Both dates recalibrated to two sigma using Method B, Calib 3.0. The original calibration of this date produced a much earlier date range.

2. Other interpretive problems can be seen in the claims for fishpond construction around or before the twelfth century A.D. (Hammatt et al. 1985; Kennedy 1995; Spear 1995). The site formation processes at a number of these sites have been critically re-evaluated, bringing into question the claims for earlier fishpond construction (Denham and Cleg-horn 1995; Denham et al. 1997:7).

3. The absence of diagnostics for fishpond and wetland sediments has resulted in problematic, and possibly erroneous interpretations of stratigraphy at a number of sites: the early interpretations of fishpond development for Loko Kuwili at the mouth of Nu'u-anu Stream (McGerty and Spear 1995; Spear 1995); and the proposed early wetland agricultural complexes in West Loch (Goodfellow 1995; Goodfellow and Dunn 1995). The main problem stems from an inability to clearly differentiate pond or *lo'i* sediments from their unmodified counterparts.

4. A variety of names are used in historical sources to refer to the two larger ponds:

Source	Name	Name
Monsarrat, 1886	Ohaipilo	Kahokahi
Cobb, 1902	Ohaipilo	Kahokai
USGS, 1922	Ohiapilo	Kahokani
Hawaii State Tax Map, 1938	Ohaipilo	Kokokahi
Tinker, 1939	Ohaipilo	Kahokai, Kohokahi, Kahokahi, Kanokahi
USGS, 1967	Ohiapilo	not named

From this table it is apparent that 'Ōhi'apilo has only had two variants. 'Ōhi'apilo has been used because it is the current usage, thereby avoiding possible confusion over place names.

5. Both ponds have been classified by Kikuchi (Kikuchi 1973:10; 1976:251–254) as *loko pu'uone haku'one*. Based on historic cartographic evidence, the ponds seem neither to be isolated, nor to have formed following the development of barrier beaches through which ditches and sluice grates have been constructed. Monsarrat's map suggests that the ponds were adjoining and that, although the builders of the pond may have taken advantage of a pre-existing natural feature, presumably a spit, walls were built to demarcate some of the pond edges.

6. The 1922 USGS Kaunakakai Quad map depicts both Kahokai and 'Ōhi'apilo as infilled. By the late 1930's, a portion of both ponds were open (Territory of Hawai'i 1938) and in use (Tinker 1939). It is possible that the technique used in the 1922 survey mapped the shallow ponds as marshy ground. Alternatively, the ponds may have been cleaned out and brought back into operation during the intervening years.

7. *Waltheria* is suggested as possibly being indigenous (Wagner et al. 1990). If the record from this core is verified it would change the status of *Waltheria* in the Hawaiian flora.

8. Samples were prepared for microscopic analysis by boiling first in hydrogen peroxide and then in nitric acid. The oxidized, decalcified material was rinsed repeatedly until a pH of about 6–7 was reached. A few drops of the cleaned material was air-dried onto

glass coverslips and mounted on glass slides using HYDRAX resin. Slides were scanned at 1500x and, when feasible, 500 diatoms were counted from each sample.

9. The structural remains of the pond will be preserved during the enhancement project and additional sediment cores will be collected for permanent storage. These cores will be available for future research.

References

- Apple, R. A., and W. K. Kikuchi. 1975. *Ancient Hawaii shore zone fishponds: An evaluation of survivors for historical preservation*. Office of the State Director of National Park Service, U.S. Dept. of the Interior.
- Athens, J. S. 1997. Hawaiian native lowland vegetation in prehistory. In *Historical Ecology in the Pacific Islands*, eds. P. V. Kirch and T. L. Hunt, pp. 248–270. New Haven and London: Yale University Press.
- . 1985. Prehistoric investigations at an inland site on the leeward slopes of Central Molokai. Honolulu: International Archaeological Research Institute, Inc.
- Athens, J. S., and J. Ward. 1997. The Maunawili core: Prehistoric inland expansion of settlement and agriculture, O'ahu, Hawai'i. *Hawaiian Archaeology* 6:37–51.
- . 1994. Palaeoenvironmental investigations at Kekaulike, Nu'uaniu ahupua'a, Honolulu, O'ahu, Hawai'i. Honolulu: International Archaeological Research Institute, Inc.
- . 1993a. Palaeoenvironmental investigations at Hamakua Marsh, Kailua, O'ahu, Hawai'i. Honolulu: International Archaeological Research Institute, Inc.
- . 1993b. Environmental change and prehistoric Polynesian settlement in Hawai'i. *Asian Perspectives* 32(2):205–223.
- . 1991. Palaeoenvironmental and archaeological investigations, Kawainui marsh flood control project, O'ahu Island, Hawai'i. Honolulu: International Archaeological Research Institute, Inc.
- Athens, J. S., J. V. Ward, and D. W. Blinn. 1995. Palaeoenvironmental investigations at 'Uko'a Pond, Kawaihoa ahupua'a, O'ahu, Hawai'i. Honolulu: International Archaeological Research Institute Inc.
- Athens, J. S., J. V. Ward, and S. Wickler. 1992. Late Holocene lowland vegetation, O'ahu, Hawai'i. *New Zealand Journal of Archaeology* 14:9–34.
- Blinn, Dean. 1995. Diatoms. In: Athens et al. 1995, pp. 97–121.
- Burtchard, G. 1994. Moloka'i fishpond sediment study. Manuscript on file at International Archaeological Research Institute, Inc.
- Caran, S. C., J. A. Neely, B. M. Winsborough, F. Sorensen, and S. Valastro, Jr. 1996. A Late Paleoindian / Early Archaic water well in Mexico—possible oldest water-management feature in the New World. *Geoarchaeology* 11:1–35.
- Carlson, N. K. 1952. Palaau and the saltwater fishponds of Molokai. Manuscript received at the B. P. Bishop Museum Library on July 3, 1952.
- Cobb, J. N. 1902. *Commercial fisheries of the Hawaiian Islands. Report of the Commission for the year ending June 30, 1901*. Part XXVII, pp. 381–499. Washington D.C.: United States Fisheries Commission.
- Davis, B. D. 1989. Subsurface archaeological reconnaissance survey and historical research at Fort DeRussy, Waikiki, Island of O'ahu, Hawai'i. Honolulu: International Archaeological Research Institute, Inc.
- Denham, T. P. 1997. Palaeoenvironmental and geoarchaeological investigations at Loko Ka'ihikapu, Waikiki, O'ahu (manuscript). Honolulu: Garcia and Associates.
- Denham, T. P., and P. Cleghorn. 1995. Clams, snails and mud: a recipe for geomorphological change at Mokapu, O'ahu. Paper delivered at the 8th Annual Society for Hawaiian Archaeology Conference, O'ahu.

- Denham, T. P., P. Brennan, J. Ward, and S. Avery. 1993. Palaeoenvironmental reconstruction adjacent to the mouth of Halawa Stream: Monitoring report of the Waiiau-Makalapa No. 2 138 kV overhead lines (Phase II), Halawa ahupua'a, 'Ewa District, Island of O'ahu. Archaeological Consultants of Hawai'i, Inc.
- Denham, T. P., F. J. Eblé, J. Ward, and B. Winsborough. 1997. Draft report of palaeoenvironmental and archaeological data recovery investigations at 'Ōhi'apilo Pond, Island of Moloka'i, State of Hawai'i (TMK 5-2-11). Honolulu: Garcia and Associates.
- DHM, Inc. 1989. Hawaiian fishpond study: Islands of O'ahu, Moloka'i and Hawai'i. Honolulu: B. P. Bishop Museum.
- Dye, T. 1994. Apparent ages of marine shells: Implications for archaeological dating in Hawai'i. *Radio-carbon* 36(1):51–57.
- Eblé, F., P. Cleghorn, and P. V. Kirch. 1997. Report of archaeological reconnaissance survey conducted at the Hawaii Army National Guard Kanaio training area, on the Island of Maui, State of Hawai'i. Honolulu: Garcia and Associates.
- Estioko-Griffin, A. 1987. An inventory of fishponds, Island of Moloka'i. Manuscript on file at the State Historic Preservation Division, Honolulu.
- Foged, Niels. 1987. Diatoms from Viti Levu, Fiji Islands. *Bibliotheca Diatomologica* 14:1–195.
- . 1986. Diatoms in Gambia and diatoms in Volvo Bay, Greece. *Bibliotheca Diatomologica Band* 12, p.1–67.
- . 1984. *Freshwater and Littoral Diatoms from Cuba*. Vaduz: J. Cramer.
- . 1975. Some littoral diatoms from the coast of Tanzania. *Bibliotheca Phycologia* 16:1B127.
- Footo D. E., E. L. Hill, S. Nakamura, and F. Stevens. 1972. *Soil survey of the islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii*. Washington D.C.: United States Department of Agriculture Soil Conservation Service.
- Fungladda, N., I. Kaczmariska, and S. R. Rushforth. 1983. A contribution to the freshwater diatom flora of the Hawaiian Islands. *Bibliotheca Diatomologica* 2:1–103.
- Goodfellow, S. T. 1995. Agricultural development and intensification: A reconstruction of pondfield expansion in West Loch, O'ahu. Paper delivered at the 8th Annual Society of Hawaiian Archaeology Conference, O'ahu.
- Goodfellow, S. T., and A. Dunn. 1995. Archaeological data recovery program West Loch Estates residential increment I and golf course and shoreline park. Hilo: Paul H. Rosendahl, Inc.
- Hammatt, H. H., D. Borthwick, and D. Shideler. 1985. Archaeological coring and testing at Nu'upia Ponds, Kaneohe Marine Corps Air Station, Mokapu, O'ahu. Kailua: Cultural Surveys Hawaii.
- Hammatt, H. H., D. W. Shideler, R. Chogioji, and R. Scoville. 1990. Sediment coring in Kawainui Marsh, Kailua, Ko'olaupoko, O'ahu. Kailua: Cultural Surveys Hawaii.
- Hawaiian Fishpond Revitalization Project. 1993. *Hawaiian fishpond revitalization: A manual*. Honolulu: Hawaiian Fishpond Revitalization Project and the Oceanic Institute.
- Hendey, N. I. 1964. *An introductory account of the smaller algae of British Coastal Waters Part V: Bacillariophyceae (Diatoms)*. Koenigstein: Otto Koeltz Science Publishers.
- Hustedt, F. 1942. Susswasser-Diatomeen des indomalayischen Archipels und der Hawaii-Inseln. *Internationale Revue der gesamten Hydrobiologie und Hydrographie*, Band 42, Heft 1/3, pp. 1–252.
- Kennedy, J. 1995. Pehu's place: A small fry pond provides data on large issues in Hawaiian archaeology. Paper delivered at the 8th Annual Society for Hawaiian Archaeology Conference, O'ahu.
- Kikuchi, W. 1976. Prehistoric Hawaiian fishponds. *Science* 193:295–299.
- . 1973. Hawaiian Aquacultural Systems. University of Arizona: PhD. Dissertation in Anthropology.
- Kirch, P. V. 1985. *Feathered Gods and Fishhooks*. Honolulu: University of Hawaii Press.

- Kirch, P. V., and M. Kelly, eds. 1975. *Prehistory and Ecology in a Windward Hawaiian Valley: Halawa Valley, Molokai*. Pacific Anthropological Records No. 24. Honolulu: Dept. of Anthropology, B. P. Bishop Museum.
- Krammer, K., and H. Lange-Bertalot. 1986. *Susswasserflora von Mitteleuropa, Bacillariophyceae, 1 Teil: Naviculaceae*. Stuttgart: Gustav Fischer Verlag.
- Lowe, R. L. 1974. *Environmental Requirements and Pollution Tolerance of Freshwater Diatoms*. Cincinnati: U.S. Environmental Protection Agency.
- Massey, J. 1979. The diatoms of contemporary and ancient sediments from Lake Waiau, Hawaii, and their geochemical environment. *Review of Paleobotany and Palynology* 27:77–83.
- McGerty, L., and R. L. Spear. 1995. Archaeological excavations at Kuwili Fishpond, site of the proposed Liliha Civic Center, Kalihi-Palama, O'ahu, Hawai'i (draft). Honolulu: Scientific Consulting Services, Inc.
- McMillan, M., and S. R. Rushforth. 1985. The diatom flora of a steam vent of Kilauea Crater, Island of Hawaii. *Pacific Science* 39(3):294–301.
- Monsarrat, M. D. 1886. Map of Molokai: Middle and west section (Scale 1:24,000). Honolulu: Hawaiian Government Survey.
- Nees, R. C., and S. S. Williams. 1993. Delta-R values for calibrating radiocarbon dates on coral from the Hawaiian Islands. Paper delivered at the 6th Annual Society for Hawaiian Archaeology Conference, Moloka'i.
- Ricard, M. 1987. *Atlas du Phytoplankton Marin*. Vol. 2, *Diatomophycées*. Paris: Éditions du Centre National de la Recherche Scientifique.
- Riley, T. 1975. Survey and excavations of the aboriginal agricultural system. In Kirch and Kelly (eds.), pp. 79–115.
- Round, F. E. 1990. *The Diatoms*. Cambridge: Cambridge University Press.
- Rushforth, S. R., I. Kaczmarska, and J. R. Johansen. 1984. The subaerial diatom flora of Thurston Lava Tube, Hawaii. *Bacillaria* 7:135–157.
- Selling, O. H. 1948. *Studies in Hawaiian Pollen Statistics*. Part III. B. P. Bishop Museum Special Publication No. 39. Honolulu: B. P. Bishop Museum Press.
- Shapiro, W., P. Cleghorn, R. Quebral, and L. Shapiro. 1993. Archaeological inventory survey of the Mauna Loa Borrow Site and 'Ōhi'apilo Pond project areas for the Kalama'ula Landfill on West Moloka'i, Hawai'i. Kailua: BioSystems Analysis, Inc.
- Spear, R. 1995. Archaeological investigations at Loko Kuwili. Paper delivered at the 8th Annual Society for Hawaiian Archaeology Conference, O'ahu.
- Stuiver, M. and T. F. Braziunas. 1993. Modeling atmospheric ¹⁴C influences and ¹⁴C ages of marine samples to 10,000 B.C. *Radiocarbon* 35:137–89.
- Stuiver, M. and P. J. Reimer. 1993. Extended ¹⁴C data base and revised CALIB 3.0 ¹⁴C age calibration. *Radiocarbon* 35:215–230.
- Sullivan, M. J. 1977. *The distribution of diatoms in Mississippi salt marshes*. Mississippi State University, Mississippi State, Mississippi: Water Resources Research Institute.
- Summers, C. 1971. *Molokai: A Site Survey*. Pacific Anthropological Records No. 14. Honolulu: Dept. of Anthropology, B. P. Bishop Museum.
- Territory of Hawai'i. 1938. Tax Map 5-2-11. Honolulu: Taxation Maps Bureau.
- Tinker, W. 1939. Fishponds of the Hawaiian Islands. Manuscript on file at the State Historic Preservation Division, Honolulu.
- Tomonari-Tuggle, M. J. 1983. Archaeological reconnaissance survey of a road corridor in the ahupua'a of Kalama'ula, Island of Moloka'i. Manuscript.
- Tomonari-Tuggle, M. J. 1990. Archaeological inventory survey of a portion of Kalama'ula, Island of Moloka'i. Honolulu: International Archaeological Research Institute, Inc.
- USGS. 1922. Topography: Hawaii Island of Molokai, Kualapuu Quadrangle (scale 1:31,680). State of Hawai'i: Dept. of the Interior.

- USGS. 1967. Topographic map of Molokai, Kaula-kai Quadrangle (scale 1:24,000). U.S. Geological Survey.
- Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1990. *Manual of the Flowering Plants of Hawai'i*. Vols. 1 and 2. B. P. Bishop Museum Special Publication No. 83. Honolulu: University of Hawai'i Press and Bishop Museum Press.
- Weisler, M. 1989. Chronometric dating and late Holocene prehistory in the Hawaiian Islands: A critical review of radiocarbon dates from Moloka'i Island. *Radiocarbon* 31(2):121–145.
- Weisler, M. and P. V. Kirch. 1985. The structure of settlement space in a Polynesian chiefdom: Kawela, Molokai, Hawaiian Islands. *New Zealand Journal of Archaeology* 7:129–158.
- Wickler, S., J. S. Athens, and J. Ward. 1991. Vegetation and landscape change in a leeward coastal environment: palaeoenvironmental and archaeological investigations, Fort Shafter Flats sewerline project, Honolulu, Hawai'i. Honolulu: International Archaeological Research Institute, Inc.
- Wilcox, B. A., T. P. Denham, G. Ahlborn, K. Duin, and R. Palmer. 1997. Integrated resources management plan for the Nu'upia wetlands management area, Marine Corps Base Hawaii, Kaneohe Bay, Hawai'i. Honolulu: Garcia and Associates.
- Williams, S., and T. Dye. 1995. Dating the construction of Loko Kunana. Paper delivered at the 8th Annual Society for Hawaiian Archaeology Conference, O'ahu.
- Winsborough, B. 1995. Diatom based paleoenvironmental analysis of sediments for the Ka'ihikapu Fishpond, Waikiki, Hawai'i. Appendix in Denham 1997.
- Wyban, C. 1992. *Tide and Current*. Honolulu: University of Hawaii Press.
- Zong, Yongqiang. 1997. Implications of *Paralia sulcata* abundance in Scottish isolation basins. *Diatom Research* 12(1), 125–150.

Hawaiian Archaeology: Past, Present, and Future

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Aloha abiahi kākou. I would like to express my *mahalo nui loa* to the Society for Hawaiian Archaeology's (SHA) Board of Directors for inviting me to give this Keynote Address, which opens the Society's 10th Annual Hawaiian Archaeology Conference. Having served as the first President of SHA some years ago, it gives me real pleasure to see that the Society has matured into an organization that plays a significant role in the cultural life of Hawai'i *nei*. Many of the goals that some of us initially set out have now been achieved by the Society, such as these annual conferences for sharing data and ideas, the *Hawaiian Archaeology* journal, and the well-received Hawai'i Archaeology Week which is so important in making the public aware of Hawai'i's rich archaeological legacy. All of you who work so hard to make these things happen, often in your spare time, deserve our thanks.

When President Rob Hommon asked me if I would give the Keynote Address, I decided after some consideration that the 10th Annual SHA Conference was an appropriate venue for a sober review of the state of Hawaiian archaeology. Anniversaries are times for reflection, for looking back at where you have been, for assessing the current situation, and for thinking about what the future might hold. The topics I will discuss are serious issues for everyone who practices archaeology in Hawai'i, or who is concerned about the preservation of archaeological knowledge.

I will canvas the "past, present, and future" of Hawaiian archaeology, with regard to three main areas: first, the intellectual contributions that archaeology has made, is now making, or should be making towards enlarging our knowledge and understanding of Hawaiian culture and history. Second, I will discuss some aspects of archaeological practice in the islands; in particular, how the changing institutional structure of archaeology has affected the field and its contributions. Thirdly, I

want to raise the issue—now more vital than ever before—of the relationship between archaeology, archaeologists, and the public, particularly the Native Hawaiian public.

I will be giving you my own personal perspective on these issues, and I have no doubt that not all of you will agree with everything that I have to say. That is as it must be. But whether or not you agree or disagree with my opinions on the past, present, and future of Hawaiian archaeology, I nonetheless ask that you take the time to reflect on where our field has been and where it is going. There can be no worse enemy to the future of Hawaiian archaeology than a passive, unthinking acceptance of the present *status quo*. My talk is therefore very much in the spirit called for by Graves and Erkelens when they refer to the necessity of periodic “critical assessments of Hawaiian archaeology by archaeologists” (1991:13).

Before commencing, it might be well for me to list my credentials for the task I have outlined. One might not think such a recitation necessary given the extensive scholarly record of my research and publications in Hawaiian archaeology, were it not for the fact that I was accused by certain parties, after giving the Keynote Address on Kaua‘i, of being an interloping “neocolonialist” *malihini* (M. Graves, electronic letter generally distributed on the Internet, April 17, 1997). As some old-timers know, I was fortunate to get an early start learning archaeology in Hawai‘i, the State in which I was born. As a Punahou student in the mid-1960s, I was privileged to participate in field projects on the Big Island, Maui, and O‘ahu, under the oversight of the legendary Kenneth P. Emory of Bernice P. Bishop Museum. In these projects I had the opportunity to work with, and learn from, such scholars as Lloyd Soehren, Peter Chapman, Richard Pearson, Roger Green, and Douglas Yen. I continued my work in Hawaiian archaeology as an undergraduate (directing my own excavations in the Hālawā Valley, Moloka‘i), and as a graduate student participating in some of the early contract archaeology work in the islands. Later, after completing my doctorate at Yale, I returned to Bishop Museum and served as a member of its staff for ten years, directing major research and cultural resources management (CRM) projects in the Anahulu Valley on O‘ahu, at Kawela on Moloka‘i, and at Kalāhuipua‘a, Waimea-Kawaihae, and Kona on the Big Island. At the end of

this period I was in charge of all archaeology at Bishop Museum. In 1984 I left Hawai‘i for the Mainland, where I now reside, but I still consider myself a *kama‘aina*, and Hawai‘i has remained my primary field of research interest. Indeed, since 1994 I have been directing a major settlement pattern research project in Kahikinui, Maui. In short, beginning with those first Bishop Museum summer field seasons in the mid-1960s, I now find myself entering my fourth decade of archaeological work in Hawai‘i, a situation that gives me some historical perspective on our discipline. This long-term commitment to the field also gives me an obligation to speak out about problems that I see in the current state of Hawaiian archaeology.

Looking back over the past thirty-three years, I am amazed at the extent of changes in our field, a transformation that few of us anticipated. Some changes have been for the better, to be certain: improved methods and standards of field and laboratory work for one, a strong and professional State Historic Preservation Office for another. Other changes are more disturbing: the shift from research-oriented to exclusively contract archaeology at Bishop Museum, coupled with a lessened emphasis on Hawaiian archaeology at the University of Hawai‘i, leaving the State without a solid institutional context for cutting-edge research. This latter change, about which I will have more to say later on, is not uniquely my viewpoint: Michael Graves and Conrad Erkelens have also written that “the institutional setting in which archaeological research is pursued has shifted from Bishop Museum and the University of Hawaii to private archaeological consulting firms” (1991:1). But keeping in mind that what I write here is inevitably a personal perspective, let me now try to reflect on the changing configuration of Hawaiian archaeology: past, present, and future.

The Past: Where Have We Been, and What Have We Achieved?

I start with the past. Hawaiian archaeology in its infancy was intimately linked with the founding of the Bernice P. Bishop Museum in 1889, and with the first director of that institution, William T. Brigham. Brigham saw the Museum’s mission as the

discovery and preservation of knowledge about Hawaiian culture. It was Brigham who hired John F. G. Stokes to the Museum's staff, and who assigned Stokes the task of mapping and recording the monumental stone *heiau* sites of Hawai'i and Moloka'i. As Tom Dye has pointed out in his excellent introduction to Stokes' Hawai'i *heiau* monograph, Stokes was interested in cultural change as this might be encoded in *heiau* architecture (Dye 1991). Stokes was the first real archaeologist of Hawai'i.

While Stokes was a visionary who saw the potential for tracing cultural change in the material record of archaeology, those who came after him in the period from 1920 to 1950 tended to be unduly influenced by an ethnological perspective that minimized or downplayed culture change and culture history among Polynesian peoples. Archaeology thus became more of a secondary or ancillary approach. The island-wide site surveys by Wendell Bennett on Kaua'i, J. Gilbert McAllister on O'ahu and Kaho'olawe, Kenneth Emory on Lana'i, Winslow Walker on Maui, Alfred Hudson on East Hawaii and John Rienecke on West Hawaii were carried out largely as adjuncts to descriptions of a static, unchanging, "timeless" Hawaiian culture that was documented primarily through ethnography (Kirch 1985:13–15).

All this changed radically after World War II. Professor Edward Gifford of the University of California at Berkeley went to Fiji in 1947, where he carried out systematic excavations, uncovering a succession of cultural phases as indicated in changing ceramic horizons. Gifford's work, along with that of Alexander Spoehr in the Marianas Islands, inspired Kenneth Emory of Bishop Museum to begin excavations of his own in the Hawaiian Islands. Emory began work at the Kuli'ou'ou Rockshelter near Hawai'i Kai on O'ahu, using students from the University of Hawai'i to help excavate. The Kuli'ou'ou site yielded a rich variety of ancient artifacts such as bone and shell fishhooks. But it was the serendipitous discovery of the method of radiocarbon dating by physicist Willard Libby, half a world away from Kuli'ou'ou in his laboratory at the University of Chicago, that proved to have the greatest influence on Hawaiian archaeology. In Kenneth's words, "in May of 1950, word came of W. F. Libby's momentous discovery of a method for dating charcoal through measuring radioactivity" (Emory, Bonk, and Sinoto 1959:ix).

Emory sent Libby charcoal from Kuli'ou'ou and thus obtained the first "absolute" date for a Hawaiian archaeological site.

Radiocarbon dating revolutionized archaeology in Hawai'i and the Pacific Islands generally, and helped to spur a new phase of research in which archaeology would no longer take a back seat to ethnology. In the early 1950s, Kenneth Emory launched the Hawaiian Archaeology Program, and he was soon joined in this effort by Yosihiko Sinoto and Bill Bonk, and later by Lloyd Soehren and Bill Kikuchi. Their objectives were those of classic culture history—to develop a chronological sequence of change based on the stratigraphic record of material culture.

The 1960s brought sweeping changes to the objectives and practice of archaeology in Hawai'i. Roger Green's influential settlement-pattern approach, which he had so successfully pioneered in Mo'orea and Samoa (Green 1967), inspired a new direction in Hawaiian archaeology as well. Peter Chapman first tried to implement this approach at Kahikinui on Maui in 1966, and by the late 1960s settlement-pattern research projects were being carried out at Mākaha, Lapakahi, and Hālawa (Moloka'i). Roger Green himself joined the Bishop Museum staff at this time, and along with Douglas Yen infused new intellectual life into the Museum's Anthropology Department. At the University of Hawai'i, the arrival of young faculty members such as Bion Griffin and David Tuggle also livened up the intellectual debates, as these researchers brought with them new and at the time "radical" ideas of processual archaeology (then called "New Archaeology") from the American southwest. The University of Hawai'i's Lapakahi Project, initiated by Richard Pearson and Roger Green, was a model of innovative field research integrated with vital new theoretical and methodological approaches. The Lapakahi Project continued for several years, although its physical locus changed to incorporate the North Kohala valleys under the direction of David Tuggle. I recall the late 1960s and early 1970s as an especially exciting time in Hawaiian archaeology, when young researchers such as T. Stell Newman, Paul Rosendahl, Tom Riley, Ross Cordy, Rob Hommon, Tim Earle, and others were testing new ideas and models about culture change in Hawai'i (e.g., Cordy 1974; Earle 1977; Hommon 1976; Newman 1969; Griffin

et al. 1971). Both Bishop Museum and the University of Hawai'i were leading centers of Hawaiian archaeological research at this time. Both supported the publication of important research results, the Museum in its *Pacific Anthropological Records* series, the University in the *Asian and Pacific Archaeology* series. One of the tragedies of administrative changes at Bishop Museum was the forced termination of the *Pacific Anthropological Records* series, despite the fact that it was self-supporting through revenues, and had established an international reputation as a leading outlet for Pacific archaeological research. The National Park Service also carried out significant archaeological surveys and excavations, largely under the direction of Park archaeologist Ed Ladd, although these were confined to National Park properties, such as Hōnaunau.

The 1960s and 1970s were also a period of significant change in the way that archaeology was conducted in Hawai'i. Fundamental changes took place in the nature of archaeological practice. Prior to the mid-1960s, almost all archaeology in Hawai'i was conducted as "pure" or academic research, directed either by Bishop Museum staff members or by University of Hawai'i faculty. Funding was minimal, and most field labor was provided by volunteers. In Peter Chapman's Maui settlement pattern project of 1966, for instance, the only paid member of the six-person field crew was Bill Kikuchi! All of this was to change radically. In keeping with developments nationally, heightened interest in historic preservation led to the passage of antiquities laws at the federal and state levels, providing the legislative basis for what has come to be known as cultural resources management, or more popularly "contract archaeology."

The first archaeological contracts in Hawai'i were implemented in the early to mid 1960s, primarily by such agencies as the National Park Service, an example of which is Colin Smart's 1965 survey of Hawai'i Volcanoes National Park, contracted by NPS to Bishop Museum. By the late 1960s, however, Hawai'i was in the first stages of a massive development boom spurred by statehood and by the push to transform its economy from one dominated by plantations to one based on tourism (Kent 1993:164–85). Roger Green oversaw the first major, privately-funded contract archaeology project in the islands in 1968, when developer Chinn Ho laid out

plans for hotels, golf courses, and condos in Mākaha Valley, O'ahu. In Doug Yen's recollection, the Mākaha Valley Historical Project was the outcome of "a meeting of the doyen of business in Hawaii with the doyen in the business of research," and the resulting project "set high standards for future work by achieving several 'firsts' in Hawaiian archaeology" (Yen 1996:4–5).

By the late 1970s and early 1980s contract archaeology had come to dominate the practice of Hawaiian archaeology. A new ecological niche had been created, and a new species—the incorporated, for-profit archaeological consulting firm—evolved to fill it. Various experienced Hawaiian archaeologists who had been associated with Bishop Museum, such as Paul Rosendahl, Rob Hommon, Bill Barrera, and Steve Athens, set up their own consulting firms. Even the established research institutions began to jump on the contract bandwagon. I well recall the running debate that members of the Bishop Museum Anthropology staff had in the late 1970s and early 1980s about the Museum's role in contract versus "pure" research archaeology. Over often boozy evening sessions in the notorious Club Zeus in lower Kalihi, Doug Yen would staunchly argue that the Museum should stay out of contracts, which he saw as compromising the integrity of the research effort, while Yosi Sinoto would point out the economic necessity of tapping into the free-flowing contract funding supply. Pat McCoy and I would, I think, try to hold to a middle-ground, arguing that a mix of academically-funded research and contracts was the best path for the Museum. At least until the mid-1980s, that was the strategy that the Museum's Anthropology Department tried to implement.

Other organizational changes were necessitated or mandated by the surge in contract archaeology. One was the development of a regulatory apparatus for reviewing archaeological work and for assuring that developers complied with applicable laws. The State's historic preservation program grew from what had originally been a one-person operation in the late 1960s, to a separate Division of the Department of Land and Natural Resources in 1990, employing ten or more professional archaeologists on its staff. Various federal agencies such as the U. S. Navy, the Army Corps of Engineers, and the National Park Service, also hired full-time archaeol-

ogists. By and large, however, these Federal archaeologists were not mandated to carry out their own research, but rather to administer archaeological contracts carried out for them by private CRM firms, and to ensure compliance with all applicable laws and regulations.

I dwell on these changes because from the viewpoint of the present generation, a Hawaiian archaeology that is almost exclusively dominated by contract archaeology might seem to be the natural state of things. *Yet just two decades ago the field looked so fundamentally different.* Our field has changed radically, largely as a response to economic and political factors, both local and national. What has once changed so rapidly could do so again. As historians, we would be wise to keep the history of our own field in mind as we contemplate its future.

So much for a brief (and no doubt idiosyncratic) history of the changing practice of Hawaiian archaeology. Let us ask what is perhaps the more important question: what was accomplished in this earlier period of Hawaiian archaeological research? What did we learn from this work, whether academically-supported or conducted under the aegis of contract archaeology? What did archaeology contribute to fundamental knowledge and understanding about Hawaiian culture and history?

My own view is that archaeology has made some extremely important contributions to Hawaiian cultural history, that it has indeed given us certain kinds of knowledge and understanding that could not be achieved from other perspectives. First of all, archaeologists have given the Hawaiian past a firm chronological framework, an independent assessment of time depth and cultural change against which the more fluid, if equally valuable chronology of oral tradition can be situated. Accomplishing this has not been easy, and we owe a debt to such pioneers as Kenneth Emory, Yosi Sinoto, and Bill Bonk who struggled to develop a radiocarbon and artifact chronology in the 1950s and 1960s. Archaeology has also been able to put the discovery and settlement of the Hawaiian Archipelago into a broader Polynesian and Pacific-wide framework. Although the fine-grained details of Polynesian settlement history are still debated, the general trends are now well established. The discovery and settlement of the Hawai-

ian Archipelago represented the culmination of at least three and one-half millennia of seafaring exploration across the Pacific Ocean, beginning with the Lapita expansion around 1500 B.C. These archaeological contributions—chronology and origins—are probably those best known to the public at large, and indeed are of great interest to many people. Here we must also acknowledge the work of Ben Finney, Herb Kane, Nainoa Thompson and others who have seen the relevance of archaeological knowledge to their efforts at re-inventing Polynesian voyaging (Finney 1994). The intellectual collaboration between archaeology and experimental voyaging has been one of the more exciting aspects of Pacific cultural history in the second half of the twentieth century, and it is one that has engaged the attention of the public at large.

But we have learned far more than just the time depth of settlement and the solution to the question of origins. Archaeologists have also greatly expanded our knowledge of ancient Hawaiian culture in many ways. For example, the sophisticated dryland agricultural practices that supported large and dense populations in leeward Hawai'i, Maui, and other areas were little known or understood from classic ethnographic sources. Since these regions had been abandoned early after European contact, their agricultural landscapes remained for archaeologists to rediscover. Archaeologists have likewise made major contributions to understanding historical changes in the ecology and environment of these islands. We should not forget that it was archaeologists, such as Aki Sinoto and Bert Davis, who first discovered the fantastically rich bird remains at Barbers Point and other localities. These remains provided the materials for ornithologists such as Storrs Olson and Helen James to reconstruct the marvelous avifauna of the Hawaiian Islands. The work of many scholars, including Carl Christensen, Steve Athens, Jerome Ward, Jeff Clark, and others—much of it interdisciplinary—has greatly enhanced our understanding of what the Hawaiian environment was like at the arrival of the first voyaging canoes from central Polynesia, and how human actions changed that environment over time. Steve Athens' discovery that lowland O'ahu was once dominated by vast forests of *loulou* (*Pritchardia*) palms is a case in point (Athens 1997); who would have imagined such a scenario just a few

years ago? These discoveries, moreover, are of great importance not just to archaeologists and anthropologists, but to biologists, ecologists, and taxonomists.

Perhaps most importantly, archaeologists in their role as anthropologists, have added greatly to our understanding of the history and process by which Hawaiian culture developed over at least a thousand years or more, from an ancestral Polynesian base to the unique civilization exposed to the Western world by Captain James Cook in 1778. Fundamental transformations in social organization, political structure, and religious practice accompanied this history, and archaeology has been the primary source of information on these changes.

Thus, throughout the course of the twentieth century, but especially in the decades since 1950, archaeology in Hawai'i has accomplished a great deal. We can justly claim to have advanced fundamental knowledge and understanding of Hawaiian culture and history. At the same time, we ourselves—the archaeologists—have seen radical changes in our disciplinary structure and practices. I turn, then, to a consideration of the contemporary scene in Hawaiian archaeology. What goals and questions now energize us? What contributions do we think we are making? How are we institutionally organized? How do we relate to the public at large? How do the Native Hawaiians whose culture and history is the object of our studies perceive us?

The Present: Hawaiian Archaeology at the End of the Twentieth Century

As the twentieth century draws to its close, the practice of archaeology in Hawai'i *nei* has taken on an organizational structure which, I fear, is asymmetrical, lopsided, or to use the Hawaiian expression, *kapakahi*. I am referring to the dominance of CRM or contract archaeology, and its corollary, the demise of research archaeology. Now, it is not my intention to “talk stink” about contract archaeology or the people who practice it. There is a great deal of sound, professionally-competent work being done by CRM archaeologists in Hawai'i. My concern is rather with the absence of a balance. About fifteen years ago, Roger Green gave an evening talk to the Society for

Hawaiian Archaeology, in which he assessed the same situation. Making an explicit comparison with archaeology in New Zealand, Roger argued that it was important to have not just professional archaeological consultants operating in the State, but also the following: first, an active university program in archaeology, at both the undergraduate and graduate levels; second, a strong museum program; and third, a well-organized State agency for the regulation of archaeological laws and programs.

Unfortunately, in Hawai'i today we have lost this important balance. The fault does not lie with the contract archaeologists. It lies with those institutions that have traditionally led the field in Hawaiian archaeology, but which in recent years have ignored their mandate to provide the essential counter-balance to contract archaeology. Let me begin by considering the current status of Hawaiian archaeology at the University of Hawai'i. About a decade ago, under the leadership of then Chairman Ben Finney, the University's Anthropology Department hired several young archaeologists, with the expressly stated goal that UH Mānoa would again become a leading force in Hawaiian archaeology. A decline in University's role in Hawaiian archaeology had resulted in part from the successive departures of David Tuggle and Matthew Spriggs from the University faculty. Despite that effort, the University has in recent years had only a low profile in Hawaiian archaeology. While its faculty does offer courses in this area, and while there have been some modest research efforts by graduate students and faculty, the University has not had the kind of presence in the field that it did have in earlier decades. With the end of the long-running Lapakahi-Kohala Project under the successive guidance of Green, Pearson, Griffin, and Tuggle, there have been no new major, sustained field projects under the University's direction. Field schools in Hawaiian archaeology are more often than not taught by graduate students, or visitors from the mainland. In the spring of 1997, the basic undergraduate course in Hawaiian archaeology was taught by a visiting faculty member from the State Historic Preservation Office.

My colleagues at the University might counter that they have been active in other parts of the Pacific and Asia, and that the University should not be constrained to focus exclusively on Hawaiian archaeol-

ogy. Certainly that is true, and Barry Rolett's important research on the Marquesas, for example, has made significant contributions to Polynesian archaeology as a whole. But I would nonetheless argue that as the major center of research and higher education in the State, the University of Hawai'i has in recent years not done all it might with regard to archaeology in Hawai'i. UH should be providing intellectual and pedagogical leadership in the field, should be training students of the highest caliber to work in CRM archaeology in Hawai'i, and its faculty should be on the cutting edge of research questions in Hawaiian prehistory and history.

The situation is considerably worse in lower Kalihi Valley, home of the venerable Bernice P. Bishop Museum. The Museum was founded in memory of the last Kamehameha—the Princess Bernice Pauahi—and mandated by the terms of its Deed of Trust as an institution for furthering knowledge of Hawaiian and Polynesian ethnology. For many decades, Bishop Museum was the leading force in Hawaiian and Pacific anthropological and archaeological research, and its reputation was international. Indeed, by carefully “leveraging” its modest research funds through the appointment of many visiting scholars and research associates, Bishop Museum achieved a record of scholarship and publication that rivaled that of much larger institutions, such as the

American Museum of Natural History in New York. Tragically, however, since the Museum's administration underwent a change in the mid-1980s, its institutional mission seems to have become focused more on trendy, “canned” traveling exhibits than on maintaining a world-class research institution. Moreover, the “bottom line” on contract archaeology spreadsheets has become a driving force at Bishop Museum, and the Hawaiian archaeology program therefore something of a “cash cow” supporting many of the Museum's other operations.

The long history of Bishop Museum's H-3 Highway CRM program reveals how far the Museum has fallen from its former world-class status as a premier research institution. Reviled by Native Hawaiians for its mis-handling of the supposed *bale o Papa* site, the butt of piercing editorial cartoons in the Honolulu newspapers (Fig. 1), the Museum has spent by some accounts more than 17 million dollars of taxpayer money on H-3 archaeology (R. Cordy, pers. comm., 1997). Yet there is not a single archaeological final report that has been made available to the public on the results of this massively expensive undertaking. As I write this in June 1997, the draft final report of the survey “inventory” phase of the Hālawa Valley portion of this project has just been released for professional review. Mitigation work, including “salvage excavation,” was conducted before the basic inventory survey reports were finished, in a fundamental violation of accepted CRM practice. It is a basic tenet of archaeology that excavation without publication is tantamount to destruction. The professional archaeological community, not to mention the tax-paying public, has been patiently waiting, Director Duckworth, for those reports.

Moreover, Bishop Museum has not just made a bad job of the biggest CRM project ever to be undertaken in Hawai'i, it has completely abdicated its former role as a major player in Hawaiian archaeological *research*. The only staff member who in recent years had at least a portion of her time allocated to research recently quit the Museum for a position in New Zealand; to my knowledge she has not been replaced. In the 1960s and 1970s, Bishop Museum regularly sought and was awarded significant research grants from the National Science Foundation for Hawaiian and Pacific archaeology; it's only

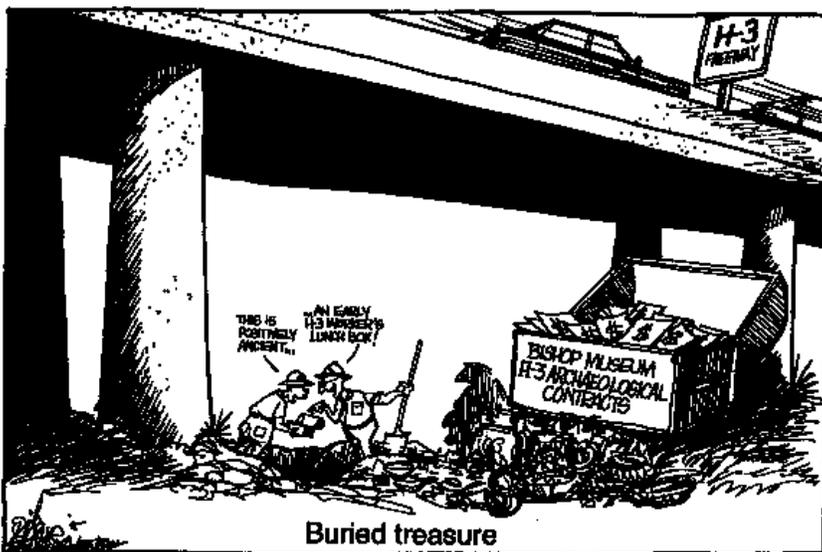


Figure 1. Honolulu Advertiser editorial cartoon courtesy of Dick Adair.

current NSF archaeology grant is for work in Jordan, half a world away!

I do not wish to imply that everyone working at Bishop Museum is responsible for this sad state of affairs. There are hard-working, competent archaeologists on the Museum staff, struggling daily against an administration that appears to have lost its institutional history, lost its sense of the Museum's once proud history of leadership in Hawaiian research and scholarship. Unfortunately, these staff members are swimming against a strong current, and until there is a fundamental change in the Museum's leadership, I predict that their efforts will be in vain.

The Museum is also neglecting its mission in another area aside from research, and that is in public education with regard to archaeology. Although it has received millions of dollars in public funds for contract archaeology, the Museum has no concerted program to exhibit the results of this work, or to develop these CRM findings in its educational programs. If the archaeological finds along the H-3 Highway corridor have been so significant that the Museum can justify the expenditure of 17 million dollars to recover them, why has it never hosted a public exhibition of these finds? The Museum's administration can find the funds to bring a tent full of motorized, plastic dinosaurs to Kalihi, prehistoric creatures that are utterly foreign to the natural and cultural history of Hawai'i *nei*, yet its exhibition and education departments neglect the archaeological heritage of its own Native peoples. Bishop Museum should be a significant force for public education with regard to Hawaiian archaeology; presently, it is not.

If the University and the Museum are now neglecting their historic leadership roles, what about the State? Here, I am pleased to say, the situation is relatively healthy. The State Historic Preservation Division has developed over the past decade or so into a top-quality agency, with some of the best and brightest archaeologists on its staff (many, indeed, are former Bishop Museum staff members who fled from the situation in Kalihi). Under the overall direction of Ross Cordy, the archaeology section has made important innovations in site recording and inventory, such as the implementation of a Geographic Information System database that now includes more than 25,000 sites statewide. Their archaeologists

have an enormous burden in review and compliance, trying to assure that not just minimal standards, but in fact important research issues, are addressed whenever archaeological work is undertaken in Hawai'i. Unfortunately, the daily load of such administrative work is such that there is little time left for the State archaeologists to prepare overviews, syntheses, general research designs, or other projects of this sort. The current State budgetary crisis has put additional strains on the office. Moreover, with the current conservative political trend towards deregulation, the State Historic Preservation Division is in danger of being slashed by our politicians, even as it comes under repeated attacks by certain radical Native Hawaiian ideologues. The program that has been carefully built up over the past decade or so is fragile and endangered. This trend is not just local, but national, and the same ideological and anti-regulatory tendencies also continue to threaten archaeology as practiced through the various Federal agencies, such as the Advisory Council, National Park Service, Corps of Engineers, and so forth.

To sum up the current situation, the organizational or institutional basis for archaeology in Hawai'i has become lopsided, incomplete, and hence inadequate. The CRM archaeologists are busy doing archaeology-as-usual, responding to the legislatively-mandated need for surveys, mitigation, management plans and the like. Much of what they produce is excellent, a good deal is mediocre, and some is unquestionably bad. The State and Federal archaeologists struggle with their task of review and compliance, trying to keep the quality of archaeological work up to a certain standard, and to assure that private developers and government agencies undertake the necessary studies. What is missing is intellectual leadership, synthesis and interpretation of results, as well as sufficient public outreach, roles that by right should be filled primarily by the University and the Museum. As long as this situation persists, Hawaiian archaeology cannot achieve its full potential.

Before I leave the subject of contemporary archaeological practice in the islands, I must make a couple of other observations. These concern the ultimate "end-products" of archaeological work. The end-products of archaeology consist basically of two kinds of things: the first is *information*, or data, in the form of reports, survey records, maps, pho-

tographs, and so forth. These materials represent the fruit of our intellectual labors, and will provide future generations with information that they will doubtless value, just as we value and rely on the notes and records left by Stokes, Walker, Emory and other pioneers in our field. The second class of by-products consists of the tangible, material objects recovered by archaeology: the artifacts, samples of faunal material, charcoal, *kukui* nut, or whatever. These also are an invaluable legacy for future generations. My great worry is that in the current situation, all too little attention is being paid to the long-term preservation of both kinds of precious materials, to assuring that they will indeed be available for future generations. Unfortunately, existing laws may call for the mitigation of impacts to an archaeological site from a golf course, hotel, housing development, or highway, but they do not sufficiently deal with the issue of long-term curation or preservation of these materials once the mitigation work has been completed. *The fact is that there is no coherent organizational structure for the preservation of these invaluable records—archival and material—at the present time.* The State Historic Preservation Division maintains a library of reports, but the basic field and laboratory records for most CRM projects remain with the for-profit firms that undertake the work. Likewise, artifacts and samples are dispersed throughout many different storage locations, most not meeting even minimal curation standards. Some are in the garages and closets of CRM contractors; others are in hot and humid warehouses. What is the fate of these materials? Will they survive intact into the next century? Will the next generations of Hawaiian archaeologists—and of Native Hawaiians—praise us for leaving them a well-organized legacy of our work, or curse us for not taking adequate care of these precious, non-renewable resources?

The question I raise is not just about future generations of archaeologists having access to essential data and information. We are now well into the era of NAGPRA, in which Native Hawaiians now have a federally-mandated basis for making claims on cultural property. I believe that we are presently at a critical point, a cusp, with regard to the materials that archaeologists produce. We can anticipate the future, be creative, and work with Native Hawaiian organizations to see that both the archival records and the material remains that we have been accumu-

lating are thoughtfully preserved for the future. Or, we can continue to ignore the mounting problem, until under NAGPRA or some other aegis we are forced to confront it. We may not like the consequences of the latter alternative.

Let me now leave the issues of archaeological practice, and consider for a few minutes the current intellectual questions that are driving Hawaiian archaeology. I mentioned earlier that in the late 1960s and early 1970s archaeology in Hawai'i was re-energized by several new intellectual approaches and questions, deriving largely from what is now usually called "processual archaeology." Questions of settlement pattern, land use, ecological adaptations, technological change, and socio-political development came to the fore, largely (though not completely) supplanting the older interests in cultural origins and chronology. What concerns me is that twenty years later, most archaeologists in Hawai'i still seem to be addressing these same processual questions. The "post-processual" movement in archaeology seems to have passed Hawai'i by without much of a trace. Some of you might think this is all to the good, but I am not so certain.

To be sure, there have been some important new initiatives in Hawaiian archaeology. One is the application of new methods (such as pollen and charcoal analyses) to the long-standing processual questions of paleoecology and human impacts on the Hawaiian environment. Another is the application of coring to Hawaiian fishponds, in an effort to situate those important but chronologically enigmatic structures into a cultural historical framework.

But it seems to me that there are many other kinds of research questions that archaeologists in Hawai'i could be asking and addressing, even through routine CRM work, yet they are not. For example, the whole topic of "household archaeology," which has been so important in the post-processual movement, has been largely ignored in Hawai'i. Indeed, the archaeological study of social agency and change in general seems to be of little note, except from the rather out-moded neoevolutionary perspective. Take also the matter of local and regional exchange. While there is increased interest in the "sourcing" of lithic materials on Hawaiian sites, using XRF and other methods (e.g., Weisler 1990), such work when

undertaken seems to be without the benefit of sophisticated theoretical models of exchange within complex societies. Or what about the problem of regional variation with the Hawaiian archipelago, in such matters as artifact styles, ritual architecture, settlement patterns, and so forth? A few years ago I suggested that this was an issue to which archaeology could make significant contributions (Kirch 1990), yet I do not see much effort expended in this direction. These are just a few examples of the kinds of research that CRM and research archaeologists could be addressing in Hawai'i, but are not.

In short, Hawaiian archaeology of the late 1990s is still by-and-large addressing the same suite of questions as Hawaiian archaeology of the late 1960s and early 1970s. New methods have been applied, but the questions and theoretical frameworks within which they are posed have remained largely static (cf. Graves and Erkelens 1991). Now, it is not that these are not interesting and valid questions. It is simply that we could be doing so much more, making new and interesting intellectual contributions. Why is this not the case? The answer, I believe, lies precisely in the structural and organization changes that I outlined previously. The current *kapakahi* nature of Hawaiian archaeology, the lack of synthesis and of self-critique, the lack of intellectual leadership, all of these are contributing factors.

Finally, I want to say a few words about the current relationship between archaeology and the Native Hawaiian community. This is a subject that is not often enough addressed, yet it is of fundamental importance, for after all, archaeology in Hawai'i is about the history and culture of the Native Hawaiian people. Here too, I think that the current situation has changed considerably from what it was ten or twenty years ago. Some changes are positive, others less so. On the positive side, there have been important efforts to bring Native Hawaiians themselves into the field of archaeology; the University of Hawai'i certainly deserves credit here, as does my own institution of U. C. Berkeley, both of which currently have Native Hawaiian students enrolled in undergraduate and graduate programs in archaeology. There are now a number of professional archaeologists at work in various capacities in the State who are of Native Hawaiian ancestry, as well as several Native Hawaiian students currently working on doc-

toral degrees in the field. This is extremely important, for it is vital that the practice of archaeology be infused with an indigenous perspective. On the other hand, I fear that the general perception of archaeology by many Native Hawaiians has taken a turn for the worse. While she may speak for only a radicalized segment of Native Hawaiians, scholar-activist Haunani Kay Trask's voice is certainly heard loud and clear throughout the islands, by Hawaiians and *haole* alike. Here is what Trask has to say about archaeology:

First, all anthropology and archaeology on Hawaiians should stop. There should be a moratorium on studying, unearthing, slicing, crushing, and analyzing us.

Second, while this moratorium is in place, there needs to be some discussion among anthropologists and archaeologists about their political roles, their place in Hawai'i, and their responsibility to the Hawaiian people

Third, there needs to be an independent investigation into Bishop Museum Serious questions remain concerning the quality and professional integrity of their contract archaeology, including questions of falsification of reporting on sites and mismanagement of State funds

Fourth, anthropologists and archaeologists working in Hawai'i need to acknowledge and address the racist inheritance of their fields. . . . For many Hawaiians, including myself, archaeologists who dig up our ancestors for money or glory are *maha'oi haole*, that is, rude and intrusive white people who go where they do not belong (Trask 1993:172–73).

Not exactly a warm reception for the work we pride ourselves in doing.

In part, the current attitudes of Native Hawaiians toward archaeology stem from the lopsidedness of Hawaiian archaeology that I mentioned earlier, from the over-emphasis on contract archaeology, coupled with a lack of sufficient public outreach and education. The H-3 Project has been a public relations disaster for archaeology, and it came on the heels of the no-less disastrous Honokahua burial excavation. Many Native Hawaiians are getting the idea that the

main business of archaeologists is to facilitate development, and to make some profit for themselves in the process. What has happened to the idea that archaeology is about discovering the past, about building knowledge concerning past cultures and peoples, about preserving cultural legacy? This is not being sufficiently appreciated in contemporary Hawai'i, and archaeologists have no one to blame other than themselves.

But the perception of archaeology and archaeologists by Native Hawaiians need not be negative, indeed should not be negative. I would like to give a modest example of recent collaboration between archaeologists and Native Hawaiians. For the past three years, three teams of archaeologists have been carrying out archaeological surveys and research in the Kahikinui District of Maui (Kirch, ed., 1997). Boyd Dixon of the State Historic Preservation Division has been surveying a large area to be opened up for *kuleana* homesteads by the Department of Hawaiian Home Lands. My own group from Berkeley is studying the settlement patterns of two *ahupua'a* within the core of Kahikinui. Michael Kolb of Northern Illinois University has been researching the *heiau* of Kahikinui. All three of our groups have been welcomed at Kahikinui by Ka 'Ohana O Kahikinui, an activist organization that has successfully lobbied the Department of Hawaiian Home Lands for the right to resettle Kahikinui and to develop a community based on traditional Hawaiian values. Members of Ka 'Ohana O Kahikinui and the archaeologists have worked closely together, and both groups understand that we have much to learn from each other. From the archaeologists, members of the 'Ohana have learned how the *'aina* of Kahikinui was settled and utilized in the past. Moreover, by demonstrating through archaeological research that Hawaiians once lived successfully and in large numbers on the *'aina malo'o* of Kahikinui, we have bolstered the argument of Ka 'Ohana O Kahikinui activists to the Department of Hawaiian Home Lands that they can do it again in the future (Mo Moler, pers. comm., 1996). From the 'Ohana, we archaeologists have learned about traditional Hawaiian perceptions of the land and the community, about how the present generation of Native Hawaiians value their cultural heritage, and yearn to practice and transmit this heritage to the next generation.

In Kahikinui, the relationship between Native Hawaiians and archaeologists has been based on mutual respect and *aloha*. We need to develop more relationships just as this, with archaeologists and Native Hawaiians in *partnership* to learn about the past and to preserve that legacy for the future.

The Future: Where is Hawaiian Archaeology Headed?

I promised that I would speak not just of the past and present, but of the future as well. Archaeologists are experts at retrodiction, not prediction, and I therefore decline to paint a definitive portrait of what our field will look like ten, twenty, or thirty years from now. Like Ebenezer Scrooge in *A Christmas Carol*, however, we might be shown various futures that could be or might be, but will they come to pass? In reality, what will come to pass is what we make of the future, what we ourselves in our daily actions design for ourselves. If we are complacent, or simply reactive, rather than proactive, if we do not think about where we have been and where we are headed, if we do not recognize the problems and issues of the day, and try to create solutions to resolve them, we might not like what the future brings us. On the other hand, there is so much yet to accomplish in the field of Hawaiian archaeology, that with a little foresight and planning, the next generation will write our history in a positive light.

I think I have made it clear that a positive future for Hawaiian archaeology demands that the current imbalance in the organizational structure of our field must be corrected. We need to restore intellectual leadership, we need a strong role for archaeology in higher education, and in research uninfluenced by political or land management considerations. We need as well a strong museum presence, for the things that museums are uniquely configured to do: maintain and preserve collections for future generations, public outreach and education, as well as research. These roles cannot be handed over to the private CRM firms or to the State Historic Preservation Office, at least in its current configuration. The question is: will the existing institutions rise to meet this challenge? Or, can they be induced to do so? If not,

can new institutional structures be created to fill the voids? Perhaps we need some creative thinking here.

Like old Ebenezer, in my nightmares I have glimpsed a scenario of a possible future of Hawaiian archaeology, and it is one that I fear could all too readily come to pass. It looks something like this. Over the next ten to twenty years, archaeology as we have known it in Hawai'i might cease to exist altogether. How would this happen? The Bishop Museum administration would continue to see archaeology as merely a "cash cow" and make no investment in research or intellectual leadership. They would continue to neglect their role in public education with regard to archaeology, preferring to invest their limited resources in a huge new planetarium and "science center," developments that are already past the planning stages. The University of Hawai'i faculty would continue to focus their attention on Asia or areas outside of Hawai'i, not realizing how significant their local intellectual contribution must be. They would not organize major, long-term research programs in Hawai'i or aggressively train new students who will play key roles in CRM work.

Well, you say, this might well happen, but what about CRM archaeology, which has been so strong for the past two decades? New political winds are blowing, not just in Hawai'i but nationally. A strong anti-regulatory mood now exists in Congress, and we have in the past few years already seen several efforts to gut historical preservation laws and agencies. House Speaker Newt Gingrich and his partners in Washington D.C. are not going to give up easily. Economic factors are also at work. Hawai'i continues to suffer through its worst recession ever. The State is essentially bankrupt. Developers complain to politicians, to whose war chests they contribute, that things would be so much easier without all this archaeology getting in the way. Couldn't the State's rules be eased up, they ask the lobbyists and politicians?

Well, you argue, surely the Native Hawaiian community will come to the defense of archaeology if such changes are proposed in the State legislature, if the Historic Preservation Division is gutted of its staff, if funding for CRM work starts to dry up? But will they? Or will they remember H-3 and the *hale o Papa*, and the fact that archaeologists have done all

too little to give back to the Hawaiian people the knowledge that we have supposedly gained through our research? Certainly, the radical ideologues among the Hawaiian community will not shed any tears over the demise of archaeology in the islands. Haunani Kay Trask, Lilikalā Kame'eiehiwa, and Eddie Ayau are not the only Hawaiians who have outspokenly called for an end to Hawaiian archaeology as we have known it.

You might think that this scenario could not come to pass, that twenty years from now Hawaiian archaeology will be in better shape than ever, that I am being far too much of a pessimist. Perhaps you are right. But I continue to be amazed at how much our field has changed in the thirty-three years that I have been involved with, it. *And this historical perspective makes me certain of just one thing: it will continue to change and evolve.* Whether the changes that are to come will be positive or negative remains to be seen. I can only urge, once more, that we archaeologists in Hawai'i be continually self-critical, that we see the obstacles on the road ahead, plan for them, and be constantly proactive. We must engage and form working partnerships with the Native Hawaiian community and the tax-paying public, who are the ultimate means of our support. Then, perhaps, my nightmare will not become reality. Then, perhaps, the next generation will benefit from and appreciate the work we are doing today and have been doing for so many years. Then, perhaps, we will be able to look back with pride at the lasting contribution we will have made to the cultural life and spirit of Hawai'i *nei*.

Once again, *mahalo nui loa* for the opportunity to share these thoughts. *Aloha kākou*, and *mālama pono*.

References

- Athens, J. S. 1997. Native Hawaiian lowland vegetation in prehistory. In *Historical ecology in the Pacific Islands: Prehistoric environmental and landscape change*, ed. P. V. Kirch and T. L. Hunt, 248–70. New Haven: Yale University Press.
- Cordy, R. H. 1974. Complex rank cultural systems in the Hawaiian Islands: Suggested explanations for

- their origin. *Archaeology and Physical Anthropology in Oceania* 9:89–109.
- Dye, T. 1991. A reputation unmade: J.F.G. Stokes's career in Hawaiian archaeology. In *Heiau of the Island of Hawai'i*. Bishop Museum Bulletin in Anthropology, 2, ed. T. Dye, 3–20. Honolulu: Bishop Museum Press.
- Earle, T. 1977. A reappraisal of redistribution: Complex Hawaiian chiefdoms. In *Exchange systems in prehistory*, ed. T. Earle and J. Erikson, 213–29. New York: Academic Press.
- Emory, K. P., W. J. Bonk, and Y. H. Sinoto. 1959. *Hawaiian archaeology: Fishhooks*. Bernice P. Bishop Museum Special Publication, 47. Honolulu: Bishop Museum Press.
- Finney, B. 1994. *Voyage of rediscovery: A cultural odyssey through Polynesia*. Berkeley: University of California Press.
- Graves, M. W., and C. Erkelens. 1991. Who's in control?: Method and theory in Hawaiian archaeology. *Asian Perspectives* 30:1–18.
- Green, R. C. 1967. Settlement patterns: Four case studies from Polynesia. In *Archaeology at the Eleventh Pacific Science Congress*. Asian and Pacific Archaeology Series, 1, ed. W. G. Solheim, 101–32. Honolulu: Social Science Research Institute, University of Hawai'i.
- Griffin, P. B., T. Riley, P. Rosendahl, and H. D. Tuggle. 1971. Archaeology of Halawa and Lapakahi: Windward valley and leeward slope. *New Zealand Archaeological Association Newsletter* 14:101–12.
- Hommon, R. J. 1976. The formation of primitive states in pre-Contact Hawaii. Ph.D. Dissertation, University of Arizona, Tucson.
- Kent, N. J. 1993. *Hawaii: Islands under the influence*. Honolulu: University of Hawai'i Press.
- Kirch, P. V. 1985. *Feathered gods and fishhooks: An introduction to Hawaiian archaeology and prehistory*. Honolulu: University of Hawai'i Press.
- . 1990. Regional variation and local style: A neglected dimension in Hawaiian prehistory. *Pacific Studies* 13:41–54.
- . ed. 1997. *Na mea kahiko o Kahikinui: Studies in the archaeology of Kahikinui, Maui*. Oceanic Archaeology Laboratory Special Publication, 1. Berkeley: Archaeological Research Facility, University of California.
- Newman, T. S. 1969. Cultural adaptations to the island of Hawaii ecosystem. In *Archaeology on the Island of Hawaii*. Asian and Pacific Archaeology, 3, ed. R. Pearson, 3–14. Honolulu: Social Science Research Institute, University of Hawaii.
- Trask, H.-K. 1993. *From a native daughter: Colonialism and sovereignty in Hawai'i*. Monroe: Common Courage Press.
- Weisler, M. 1990. Sources and sourcing of volcanic glass in Hawai'i: Implications for exchange studies. *Archaeology in Oceania* 25:16–23.
- Yen, D. E. 1996. Obituary for Chinn Ho. *Hawaiian Archaeology* 5:4–5.

He Pane Ho'omāmalama: Setting the Record Straight and a Second Call for Partnership

C. Kēhaunani Cachola-Abad
Hui Mālama I Nā Kūpuna O Hawai'i Nei

Edward Halealoha Ayau
Hui Mālama I Nā Kūpuna O Hawai'i Nei

He leo wale nō (Only a voice)

In accordance with Hawaiian protocol, a visitor to an area offers an *oli kāhea*, a chant asking for permission to enter. Such permission, if appropriate, is granted through an *oli komo* clarifying that the visitor is a guest and allowed entrance only by approval of the host. A historic problem with archaeology in Hawai'i and elsewhere is that archaeologists failed to understand the need to obtain permission from the living descendants of those they sought to study.

Today, archaeologists often consult with local Native Hawaiian communities as part of their work. Yet vestiges of archaeology's colonial origin continue within the discipline, a reminder of the need for growth and improvement. Patrick Kirch's "Hawaiian Archaeology: Past, Present, and Future" displays a disparaging colonial approach in his discussion of the current relationship between archaeology and the Hawaiian community. This may not have been problematic if Kirch described what archaeologists think of Native Hawaiians, but instead he attempts to identify what Native Hawaiians think of archaeology. Significantly, he never consulted with the Native Hawaiians he names.

We are Native Hawaiians and provide this response to Kirch in this capacity. We both have dealt extensively with archaeologists and from this experience offer our own voice to describe Native Hawaiian perceptions of archaeology and Hawai'i archaeologists.¹ We agree with Kirch that relationships between archaeologists and Native Hawaiians should be improved. We disagree with Kirch, however, regarding what he identifies as most troubling to Native Hawaiians and what he believes will achieve improved relations between archaeologists and Hawaiian communities.

Native Hawaiian Historic Preservation Concerns

Kirch's Perception of Native Hawaiian Historic Preservation Concerns

Kirch identifies three reasons why Native Hawaiians might harbor negative attitudes about archaeology and archaeologists in Hawai'i: 1) some archaeologists do not properly store materials acquired and generated through their research; 2) there is an "over-emphasis on contract archaeology"; and 3) there is a "lack of sufficient public outreach and education." One knowledgeable about Hawaiian communities would have emphasized more important concerns that form the basis for Native Hawaiian criticisms of archaeology. Nonetheless, in response to Kirch's first point, we note that indeed data records and artifacts generated through archaeological activities should be stored properly. However, it is more significant for archaeologists to view data recovery and storage as a last resort to "preserve" sites when recommending treatment. From a Hawaiian perspective, site restoration and cultural use is preferable.

Addressing Kirch's second issue of an "over-emphasis on contract archaeology," we are again in accord. Contract archaeology dominates field work in Hawai'i and too often facilitates development. Kirch suggests that to balance this, research-oriented institutions should engage in large scale field work to discover and preserve the past.² We agree that Native Hawaiians appreciate archaeology that yields results of greater cultural interest than the formulaic, superficial reports that contract archaeology often produces. However, the issue is not only whether archaeology provides knowledge about our past or even whether that knowledge is preserved, but that archaeology is guided in a Hawaiian culturally-appropriate manner that respects those who created the archaeological record and their living descendants.

Indeed, not all archaeologically-derived knowledge is desirable from a Hawaiian cultural perspective. Respecting our ancestors is a higher priority than knowing about all aspects of our past. We are satisfied with what we may learn from our ancestors through *pule* (prayers); *moe 'uhane* (dreams); *oli, mele*, and *hula* (chants and dances); and *mo'olelo* (history and traditions).

These Native Hawaiian perspectives call into question Kirch's third perceived source of a rift between archaeologists and the Hawaiian community, i.e., the need for archaeologists to provide "sufficient public outreach and education." Here Kirch implies that Native Hawaiian concerns regarding archaeology result from ignorance about it. On the contrary, Hawaiian communities have recognized the benefit of varied archaeological endeavors.³ Native Hawaiian critiques of archaeology are often rooted not in ignorance but in a growing understanding of the limitations of archaeologists to reliably and accurately describe aspects of our past.

Similarly, Kirch believes Native Hawaiians are concerned that "archaeologists have done all too little to give back to the Hawaiian people the knowledge" they gained through research. While this may be true, it is not among our greatest concerns. Native Hawaiians are more distressed by archaeologists studying aspects of our past about which we never inquired and in ways that are culturally damaging. For instance, Native Hawaiians have not urged archaeologists to dig up and study our ancestors so that we might learn about them and their burial practices. Nonetheless, archaeologists including Stokes, Bennett, Emory, Newman, Ladd, Bonk, Sinoto, Soehren, Kikuchi, Rosendahl, Cordy, McCoy, Dye, and Neller, together with anthropologist Bowles, have intentionally disturbed thousands of ancestral Native Hawaiians without requesting permission from living descendants. Kirch recognizes the contributions these individuals have made to Hawai'i archaeology but fails to point out that by damaging the ancestral foundation, our people and land were inflicted with physical and spiritual harm.⁴

Our Historic Preservation Concerns⁵

The causes Kirch emphasizes regarding why Native Hawaiians remain critical of archaeology fail to address our primary concerns. Highest among Native Hawaiians' list of priorities for archaeology is that it be practiced in Hawai'i with knowledge of, sensitivity to, and respect for Hawaiian culture. Such respect must derive from the perspective of our *kūpuna*.⁶ While Kirch recognizes that archaeology should "be infused with an indigenous perspective," he fails to note that the lack of such in many cases has been most responsible for archaeology and archaeologists

earning the ire of Native Hawaiians. An associated pivotal issue that Kirch ignores is that archaeologists with limited knowledge of Hawaiian culture are provided greater authority than Hawaiian cultural practitioners in identifying, describing, and determining the treatment of Hawaiian cultural sites.

One glaring example of archaeologists not adequately considering cultural evidence, and having the power to choose not to, is the case of Kukuiokāne Heiau. Trask's (1993) comments,⁷ which Kirch liberally quotes, were originally presented in March of 1990 in part as a response to the situation that was then unfolding regarding Kukuiokāne Heiau. Hawaiian historians and cultural practitioners such as Lilikalā Kame'eleihiwa and Frank Kawaikapuokalani Hewitt affirmed that site G5-86, situated along the H-3 Kāne'ōhe corridor, was Kukuiokāne Heiau and not a dry-land agricultural terrace, as Bishop Museum archaeologists contended.⁸ Despite appeals from the Hawaiian community to divert H-3 and save Kukuiokāne Heiau, State Historic Preservation Division (SHPD) archaeologists approved the Bishop Museum archaeologists' determination which, with the Office of Hawaiian Affairs' concurrence, facilitated Kukuiokāne's destruction. By June of 1990, the SHPD let bulldozers level the top of Kukuiokāne Heiau and cover it with dirt and gravel making way for H-3.

As a result, the *mana*, meaning, and cultural use of Kukuiokāne has been lost to Native Hawaiians forever. Our main criticism of archaeology derives from archaeology-facilitated cultural loss, not from the issues Kirch stresses.

Three months before Kukuiokāne's destruction, Trask (1990:9–10; 1993:172–173) called for a moratorium on archaeological activities during which anthropologists and archaeologists could discuss “the impact of their work on living Hawaiians” and enter into a dialogue with Hawaiian leaders.⁹ She also demanded an evaluation of Bishop Museum's work. If Trask's recommendations were followed, perhaps the Bishop Museum's lead archaeologist at G5-86 would have disclosed his re-evaluation of the site in time to save it from the bulldozers. Today he is “convinced” he made a mistake and that the site was in fact part of Kukuiokāne Heiau (Williams 1991:7).

Kirch's lack of regular contact with Hawaiian communities is further evident in his failure to recognize

one of Native Hawaiians' most pressing archaeology-related concerns—problems systemic to the SHPD in the historic preservation process. The foundation of a successful State historic preservation program is a set of formally adopted rules to which all affected parties must refer for standards and guidelines relating to archaeological activity at the State and county levels. To date, administrative rules governing the overall historic preservation process at the State level are non-existent. This is more than 20 years after the State historic preservation program was mandated to adopt rules to carry out the purposes of the State historic preservation law, Hawai'i Revised Statutes (HRS) Chapter 6E, which was originally enacted in 1976 (HRS §6E-3(15)).

The most comprehensive administrative rules governing State-level historic preservation processes¹⁰ were developed by the SHPD Burial Sites Program. The rules were formally promulgated in 1996 after only six years of the program's existence. They were largely prepared by Native Hawaiians, including co-author Halealoha whose integral role in that process would cast doubt on Kirch's characterization of him.

Without administrative rules to guide the historic preservation process, the archaeology branch of the SHPD not only fails to provide requisite leadership, but creates uncertainty, inconsistency, a lack of accountability, and the inability to enforce even minimal standards. For example, at present there is no legally binding definition of, nor minimal standards for, a “qualified archaeologist” under State law. For these reasons, Native Hawaiians, private landowners, governmental agencies, archaeologists, and developers have been calling for the SHPD to promulgate archaeology program rules for years. As such we disagree with Kirch that “the situation is relatively healthy” at the SHPD or that it has “developed over the past decade or so into a top quality agency.”¹¹

Let us not forget that the SHPD was in large part responsible for creating, facilitating, and approving of the “bad job” done with the H-3 project that Kirch singularly blames on the Bishop Museum. In 1977, then State Historic Preservation Officer (SHPO) Jane Silverman (1977) “concur[red] with the recommendations” of the Bishop Museum archaeologist that “no further archaeological work need be done at [that] time” since none of the seven

sites then discovered in North Hālawā Valley were “worthy of inclusion on the National Register of Historic Sites” (Dye 1977:20). In 1981, Historic Sites Section Director Ralston Nagata (1981) confirmed that the Bishop Museum “completed archaeological surveys of the entire [H-3] alignment in 1976.” Such communications led the Board of Land and Natural Resources to grant a conservation district use permit to the federal and state departments of transportation allowing them to proceed with plans to construct H-3 through conservation lands in Kāneʻohe and North Hālawā. By 1987, the SHPO and others acknowledged that previous H-3 archaeological surveys were far from complete, leading the SHPO to sign a memorandum of agreement (MOA) that allowed archaeological survey to be “conducted in conjunction with clearing and construction activities” (U.S. Federal Highway Administration, Hawaii Branch 1987:Attachment B:1).¹² The terms of the MOA and the previous inaccurate SHPO assertions are at the core of why H-3 remains a “public relations disaster for archaeology.”

Lacking rules to regulate archaeological activities in Hawaiʻi, reason might dictate that Hawaiʻi archaeologists defer to a code of professional standards subscribed to by the Society for Hawaiian Archaeology (SHA). However, the draft SHA Code of Ethics and Standards of Performance (Code) (SHA 1980) has never been formally adopted, leaving archaeological activities in Hawaiʻi without guiding standards. SHA, in fact, was waiting for the SHPD to promulgate archaeological rules commanding enforcement authority.

While not legally binding, the Code could have acted as an internal control for archaeologists to monitor their discipline in Hawaiʻi. The Code, among other things, instructs members to 1) “be sensitive to, and respect the legitimate concerns of, groups whose culture histories are the subjects of archaeological investigations;” 2) “not engage in any illegal or unethical conduct involving archaeological matters;” and 3) “report knowledge of violations of [the] Code to the Society for Hawaiian Archaeology,” presumably for SHA to take corrective action (SHA 1980:2–3). However, lacking an approved Code or for other reasons,¹³ SHA failed to initiate corrective action following Athens’ (1994) defiance of the Code and violation of HRS sections 6E-11 and 12.

In January 1994, without SHPD authorization, International Archaeological Research Institute, Inc. contracted osteologist Michael Pietruszewsky to assess the age, sex, and ethnic affiliation of human skeletal remains inadvertently discovered at Piʻikoi Street in Honolulu. Athens also sent a sample of the remains to the Beta Analytic Laboratory in Florida for radiocarbon dating. In our opinion, this act violated HRS 6E-12(b)(2) which requires a written permit from the Department of Land and Natural Resources (DLNR) to remove human remains from the jurisdiction of the State. In addition, the radiocarbon dating process destroyed the ancestral remains, in our opinion a violation of HRS section 6E-11(b).

The only formal sanction Athens received for his flagrant violations was the outcome of Native Hawaiian efforts. Following DLNR Chairman Wilson’s refusal to prosecute Athens, Hui Mālama I Nā Kūpuna O Hawaiʻi Nei and Hui Alanui O Makena filed suit. The suit was quickly settled.¹⁴ Nonetheless, SHA failed to intercede in any way to hold one of its members to its implied standards and the provisions of State law.¹⁵ Neither SHA nor Kirch seem to accept the responsibility for monitoring the conduct of their colleagues in terms of Hawaiian cultural matters.

The Role of Native Hawaiians in the Future of Archaeology in Hawaiʻi: Native Hawaiian Legislative Efforts

Kirch’s depiction of a future state of archaeology in Hawaiʻi also lacks understanding of Native Hawaiians’ past and current positions, and hence paints an improbable picture of our future role in shaping archaeology. Kirch asserts that the H-3 problems and the “no-less disastrous Honokahua burial excavation” might have Native Hawaiians believe “that the main business of archaeologists is to facilitate development.” He builds on this assertion, erroneously suggesting that Native Hawaiians would therefore not “come to the defense of archaeology”¹⁶ if developers and legislators attempt to “gut historic preservation law” and if the “Historic Preservation Division is gutted of its staff.” Kirch’s preview of the future is unrealistic, as indicated by Native Hawaiians’ past legislative efforts to strengthen the historic preservation program and maintain its staffing.¹⁷

In 1990, on the heels of the most insidious archaeological activity in recent history (i.e., the Honokahua nightmare),¹⁸ Native Hawaiians did not turn our attention away from the legislature nor call for the demise of archaeology. Instead Native Hawaiians drafted and successfully lobbied for amendments to HRS Chapter 6E that revised the treatment of inadvertently discovered human skeletal remains (§43.6), created five island burial councils which in part determine the appropriate treatment of previously identified Native Hawaiian burial sites (§43 and §43.5), and substantially increased the penalties for violations (§11 and §12). Significantly, the legislative record is devoid of testimony from archaeologists on the proposed amendments to the historic preservation law.

Similarly, in the wake of the H-3 fiasco, Native Hawaiians did not press the State legislature to end or limit archaeological work in Hawai'i, as Kirch suggests would be the case.¹⁹ In fact, the legislative record indicates otherwise. In 1993, Native Hawaiians drafted HB 1501/SB 1398 which among other things would have provided local communities with greater ability to participate in and strengthen the historic preservation process. The bill's drafters were partnered with University of Hawai'i (UH) archaeologists Michael Graves and Terry Hunt who submitted written and personal testimony. Lilikalā Kame'elehiwa, representing the UH Center for Hawaiian Studies, also provided supporting testimony as did other Hawaiian and non-Hawaiian community leaders. The SHPD and developers blocked this legislation. That year Native Hawaiians were more successful at the Honolulu City Council. They drafted and saw enacted Ordinance 93-55 that established the legal framework for a Honolulu City and County historic preservation program.

Frustrated by a historic preservation process that only provided developers the right to appeal SHPD decisions on section 6E-8 projects, Native Hawaiians instigated discussions with the SHPD in 1995 which resulted in further revisions to Chapter 6E to address this shortcoming.²⁰ The amendments provided members of the general public an equal opportunity to appeal SHPD decisions (§8) and authorized the Historic Places Review Board to hear such appeals (§5.5).

As the discussion of our legislative activity suggests, Native Hawaiians will lead efforts to oppose legislation that negatively impacts our cultural resources. Nonetheless, Kirch portends that such Native Hawaiian "radical ideologues" as Haunani-Kay Trask, Lilikalā Kame'elehiwa, and co-author Halealoha would "not shed any tears over the demise of archaeology" in Hawai'i under the legislative ax. In fact, the opposite may be true.

In 1997, the SHPD introduced HB 1749 which if enacted would have 1) relinquished the SHPD's authority to halt plans for projects receiving State or county funds that would have an adverse effect on historic properties; and 2) abolished the recently established right of any person to appeal SHPD decisions in such cases. Native Hawaiians testified against this bill and blocked it. Regardless of the negative impact HB 1749 would have produced for contract archaeology and the SHPD, no archaeologists testified against the bill. Indeed, the question that Kirch should have asked is not whether Native Hawaiians "will come to the defense of archaeology" in the event historic preservation laws are on the legislative chopping block, but whether archaeologists would join Native Hawaiian efforts to protect and strengthen such laws.²¹

A Second Call for Partnership

What is evident from the previous discussion is that Native Hawaiians are intensely committed to protecting our ancestral burial sites as well as preserving and learning from Hawaiian cultural resources. As such it behooves us to secure a partnership with archaeologists who are working toward similar goals, a "partnership . . . in which archaeologists learn from Hawaiians, who in turn learn from archaeologists" (Ayau 1992:8).²² We welcome this as a means to discover more about our past, to apply archaeological tools to preserve our culture, and to monitor ongoing archaeological activity throughout Hawai'i.

For archaeologists studying Hawaiian cultural resources, a successful partnership with the living descendants of their subjects begins with understanding Hawaiian culture and displaying requisite respect for the values central to it. Such behavior

would be analogous to the deference Hawaiian guests in times past afforded their hosts through their *oli kāhea* and their continued respect for their hosts who replied with an *oli komo*.

If such a foundation is built, Native Hawaiians and archaeologists can begin a dialogue to achieve consensus on key issues, including: 1) establishing administrative rules to govern the historic preservation process under HRS Chapter 6E; 2) coordinating efforts to forward overlapping areas of interest; and 3) determining a process to resolve conflicts that may arise. The future for Hawai'i archaeology holds promise for those willing to accept the *kuleana* and challenge that come with valuing cultural diversity.²³

Ola nā iwi

Notes

1. We recognize that archaeologists in Hawai'i might study historic properties deriving from numerous cultural traditions. The archaeologists we address in this paper are those conducting activities which affect Hawaiian burials and cultural resources.

2. Kirch is silent on the issue of the archaeology conservation ethic (Lipe 1977) which should have moderated his enthusiasm for large scale archaeological activities. After all, when subsurface sites are excavated, they are destroyed and recorded only in ways archaeologists deem important at that time. Following both the archaeological conservation ethic and Hawaiian cultural considerations, Hawai'i archaeologists should be concerned that they "leave as much of [a] site or sites as possible for [the] future," whether this be for tomorrow's archaeologists or for Native Hawaiians (Lipe 1977:41).

3. Examples of this are reports the Protect Kaho'olawe 'Ohana, Kaho'olawe Island Conveyance Commission, and the Kaho'olawe Island Reserve Commission used to aid in their restoration of Kaho'olawe. Such reports involved archaeological survey (Hommon 1980), site interpretation (McCoy, Makanani, and Sinoto 1993), palaeoenvironmental reconstruction (Allen 1983; Athens, et al. 1992; Graves and Murakami 1993), ethnohistorical documentation (Reeve 1993), and site management

recommendations (Graves and Abad 1993; McCoy, Makanani, and Sinoto 1993).

4. Notably, over the past seven years, co-author Halealoha has reinterred ancestral remains disinterred by the archaeologists Kirch identifies.

5. The space limitations for this presentation prevent a complete discussion of our concerns and suggestions regarding archaeology in Hawai'i. We offer here a brief summary of such concerns and tailor our comments to respond to points Kirch raises.

6. Dye (1997) seems not to understand this fundamental premise. Hui Mālama I Nā Kūpuna O Hawai'i Nei requested that Dye destroy the portions of the inventory of human skeletal remains from Mōkapu, O'ahu (Tatar, Collins, Armstrong, and Han 1994) that included osteological information, since such exposure amounts to anguish and pain for the ancients and us. Dye responded, "I believe that the remains of the past are a potential source of pride for the people of Hawai'i; that this pride can be realized through study and contemplation of the remains; and that study of the past is an act of deep respect" (Dye 1997). Yet to respond are archaeologists Collins, Han, and Jourdane.

7. Trask's (1993) paper, "What do you mean 'we' white man? Anthropology and Archaeology in Hawai'i," was originally presented on March 12, 1990 in a University of Hawai'i-Mānoa Social Science Forum.

8. See Cachola-Abad (1996) for a discussion of the problems of assessing site functions based on limited knowledge of Hawaiian culture and sites.

9. Trask's (1990:10; 1993:172) call for a dialogue between archaeologists and Native Hawaiians was excised from the quote Kirch chose to include in his discussion. This desire on her part to engage in discussions with archaeologists, rather than to simply draw conclusions without the benefit of having dialogue, stands in opposition to Kirch's willingness to frame her views according to his own perceptions.

10. Administrative rules governing the practice and procedures of the State Historic Places Review Board and the Hawai'i and National Registers of Historic Places programs were both promulgated in 1981 and amended in 1989.

11. Kirch's comments and our critique of those statements are both focused on the archaeology branch of the SHPD.

12. Native Hawaiians were equally incensed that the Office of Hawaiian Affairs concurred with the terms and conditions of the MOA.

13. Perhaps some SHA members condoned Athens' activities. Such an interpretation is suggested by SHA's publication of photographs of ancestral Hawaiian remains in its Hawaiian Archaeology journal (Pietrusewsky and Ikehara-Quebral 1996:Figs. 1-3). As with Athens' (1994) offense, SHA's exposure of *nā iwi kūpuna* is contrary to repeated condemnation of such photography conveyed by Hui Mālama I Nā Kūpuna O Hawai'i Nei, the island burial councils, and Native Hawaiians testifying on proposed burial rules.

14. A condition of settlement involved a public apology by Athens (1997):

In January 1994, International Archaeological Research Institute, Inc. was hired to remove human skeletal remains inadvertently discovered during construction activities at the corner of Pi'ikoi Street and Kapiolani [*sic*] Boulevard in Honolulu. Thereafter, we submitted a small portion of these ancestral remains for radiocarbon dating.

We sincerely apologize for any harm caused by our actions to this ancestral native Hawaiian and for any distress caused to living native Hawaiians.

15. Pursuant to the Archaeological Resources Protection Act (ARPA), the transport of human remains over state lines combined with a state law violation may amount to a federal violation. In our opinion, Athens' transportation of human remains to Florida in breach of HRS section 6E-12, violated ARPA.

16. Kirch's intimation that Native Hawaiians might not "come to the defense of archaeology" as it relates to potential legislative cuts to the historic preservation program suggests that he believes such historic preservation laws are in place to advance archaeology. We submit that the laws are there for the "preservation and enhancement of historic and cultural

property" to benefit the larger "public good" (HRS ¶6E-1).

17. Significantly, when recent State budget tightening resulted in the DLNR cutting several positions within the SHPD, Native Hawaiians were able to acquire funds through the Office of Hawaiian Affairs to continue two Burial Sites Program positions.

18. The largest archaeological excavation of Native Hawaiians occurred at Mōkapu and Heleloa on the island of O'ahu. This resulted from a joint venture between the Bishop Museum led by Kenneth Emory and the University of Hawai'i Department of Anthropology led by Gordon Bowles. As with Honokahua, the Kāne'ohē and He'eia excavations were conducted absent consent from living Native Hawaiians.

19. Kirch first suggests that "radical ideologues" Trask, Kame'eiehiwa, and Ayau "would not shed any tears over the demise of archaeology in the islands" and further that they have "called for an end to Hawaiian archaeology as we have known it." Without additional explanation provided, the two thoughts in concert intimate that the changes these individuals seek in archaeology are ones that most archaeologists would see as detrimental, given Kirch's use of the term "demise." We suggest that the changes these individuals have supported are beneficial to the discipline.

20. The first version of this bill (SB 639 SD-1) included stronger language. It was drafted by the SHPD but, under the direction of DLNR Chairperson Wilson, was opposed by the SHPD when it went to hearing. The final version of the bill (SB 639 SD-2 HD-1) reflects an intensive effort on the part of Native Hawaiians to develop and lobby for compromise language that would forward the intent of the original bill.

21. Kirch has not participated in any way in the legislative efforts described in this paper.

22. Co-author Halealoha closed his 1992 presentation to SHA at Puhi, Kaua'i with this call for a partnership.

23. The productive dialogue we engaged in with editor Tom Dye in negotiating a few aspects of our

paper illustrates the possibility of ongoing discussion creating successful partnerships between archaeologists and Hawaiians in which both are enlightened.

References

- Allen, M. 1983. Report on the palaeoethnobotanical remains recovered from Kaho'olawe Island. In *Kaho'olawe archaeological excavations, 1981*, by R. J. Hommon, pp. 153–167. Honolulu: Science Management, Inc.
- Athens, J. S. 1997. Letter to Hui Mālama I Nā Kūpuna O Hawai'i Nei and Hui Alanui O Makena. May 19.
- Athens, J. S., J. V. Ward, and D. J. Welch. 1992. *Paleobotanical investigations, Kaho'olawe Island, Hawai'i*. Consultant Report 2. Honolulu: Kaho'olawe Island Conveyance Commission.
- Athens, J. S., C. Erkelens, J. V. Ward, R. H. Cowie, and M. Pietruszewsky. 1994. *The archaeological investigation of inadvertently discovered human remains at the Pī'ikoi and Kapiolani Intersection, Kewalo, Waikiki, O'ahu, Hawai'i*. Honolulu: International Archaeological Research Institute, Inc.
- Ayau, E. H. 1992. Cultural Perspectives on Hawaiian Burial Issues. Paper presented at the Fifth Annual Society For Hawaiian Archaeology Conference, Honolulu, 27 March. MS. on file with authors.
- Cachola-Abad, C. K. 1996. The significance of *heiau* diversity in site evaluations. *Culture Resource Management* 19:11–16.
- Dye, T. S. 1977. *Archaeological phase I survey of the leeward portion of proposed Interstate H-3, North Halawa Valley, Oahu*. MS. on file, State Historic Preservation Division, Department of Land and Natural Resources, State of Hawai'i, Honolulu.
- . 1997. Letter to Kūnani Nihipali, Hui Mālama I Nā Kūpuna O Hawai'i Nei. 11 August.
- Graves, M. W., and C. K. Abad. 1993. *Preservation of historical resources on Kaho'olawe: Responsibilities, natural and cultural impacts, and priorities*. Consultant Report 7. Honolulu: Kaho'olawe Island Conveyance Commission.
- Graves, M. W., and G. M. Murakami. 1993. *The identification of charcoal from archaeological assemblages on Kaho'olawe: Implications for reconstructing prehistoric vegetation*. Consultant Report 8. Honolulu: Kaho'olawe Island Conveyance Commission.
- Hommon, R. 1980. *Kaho'olawe: Final report of the archaeological survey*. Honolulu: Hawaii Marine Research, Inc.
- Lipe, W. D. 1977. A conservation model for American archaeology. In *Conservation Archaeology: A Guide for Cultural Resource Management Studies*, edited by M. B. Schiffer and G. J. Gumerman, pp. 19–42. New York: Academic Press.
- McCoy, P., A. Makanani, and A. Sinoto. 1993. *Archaeological investigations of the Pu'u Moiwī adze quarry complex, Kaho'olawe*. Consultant Report 14. Honolulu: Kaho'olawe Island Conveyance Commission.
- Nagata, R. 1981. Letter to Roger C. Evans, Planning Office, 11 February.
- Pietruszewsky, M., and R. M. Ikehara-Quebral. 1996. Cultural alteration of human bone in Hawai'i. *Hawaiian Archaeology* 5:13–28.
- Reeve, R. 1993. *Nā Wahi Pana o Kaho'olawe "The Storied Places of Kaho'olawe": A Study of the Traditional Cultural Places of Kaho'olawe Island*. Consultant Report 17. Honolulu: Kaho'olawe Island Conveyance Commission.
- Silverman, J. 1977. Letter to Ralph T. Segawa, Federal Highway Administration, 3 November.
- Society for Hawaiian Archaeology. 1980. Draft SHA code of ethics and standards of performance. MS. on file, Department of Anthropology, University of Hawai'i, Honolulu.
- Tatar, E., S. Collins, L. Armstrong, and T. Han. 1994. Inventory of human skeletal remains from Mōkapu Peninsula, Ko'olaupoko District, Kāne'ohe and He'eia Ahupua'a, O'ahu Island, Hawai'i.
- Trask, H.-K. 1990. What do you mean "we" white man? Anthropology and archaeology in Hawai'i. Presented at the University of Hawai'i Social Science Forum Series, March 12. MS. on file, University of Hawai'i Center for Hawaiian Studies, Honolulu.

———. 1993. What do you mean “we,” white man? In *From a native daughter: Colonialism and sovereignty in Hawai‘i*, pp. 161–178. Monroe, Maine: Common Courage Press.

U.S. Federal Highway Administration, Hawaii Division. 1987. Memorandum of agreement. MS. on file, State Historic Preservation Division, Honolulu.

Williams, S. 1991. The sound of one head banging: Kukuiokāne Heiau one year later. Paper presented at the Fourth Annual Society for Hawaiian Archaeology Conference, Honolulu, 25 May.

Thoughts from the Chaotic Midst of Hawaiian Archaeology

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Tom Dye asked me to comment on Pat Kirch's keynote address to the 10th Annual Society for Hawaiian Archaeology conference in any way I see fit. Pat's talk certainly has stirred plenty of controversy. It is an interesting and well thought out perspective from someone long involved in Hawaiian archaeology.

Pat and I are contemporaries in Hawaiian archaeology. He started a few years earlier than I as a Punahou school volunteer at the Museum, while I started just out of high school in 1968 at the first Lapakahi project. He and I spent the Spring 1970 semester together at the University of Hawaii as sophomores, and in the early 1970s we worked on projects together and published and exchanged many ideas. After a gap of more than a decade, I have had the opportunity to work with Pat again and have thoroughly enjoyed it, helping put together a cooperative research effort at Kahikinui among the University of California at Berkeley, the State Historic Preservation Division, and Northern Illinois University. As classmates, colleagues, and sometimes critics, Pat and I have experienced the same run of Hawaiian archaeology for 30 years. I share many of his views.

My perspective of Hawaiian archaeology over the last ten years or so has been very different from Pat's. I cope daily with the chaotic core of today's Hawaiian archaeology, an archaeology dominated by historic preservation laws. This view involves day-to-day reviewing development projects and requiring archaeological surveys when needed, arranging for data recovery work and preservation agreements, reviewing the mass of archaeological reports from all the contract firms, overseeing my staff and the Hawaiian Homes survey program, doing my own field and archival research, and attempting synthetic work. I get to see nearly all the archaeological work in Hawaii long before almost everyone else, but the pace is frantic, at best.

Periodically in this job, I have stepped back from the job, tried to assess where my office and I were going in a bigger picture, and then re-entered the chaos. Stepping back enables one to realize that there are many things one does not know and there are mistakes one has made. Hopefully, it enables one to see different directions that might be taken. I agree with Pat that we archaeologists need to assess where we are going. I hope that each of us would do this far more frequently than once every 10 years.

The Late 1960s to Mid-1970s

I agree whole-heartedly with Pat that the period from the late 1960s to the mid 1970s was an exciting time in Hawaiian archaeology. We charged out of a focus on origins and cultural phases and into a broad settlement pattern focus, which opened wide many doors to new ways of studying and better understanding the past in Hawai'i. We became involved in exciting work on agricultural systems, the development of complex societies, local social organization, including activity areas and household organization, and on social ranking. The University of Hawaii and Bishop Museum worked together closely for a while in this period. Undergraduate and graduate students obtained lots of field experience, which seems regrettably lacking now. It was an exciting time. It was a time when archaeology was more focused and we archaeologists shared many interests.

As Pat emphasized, that was also a time when the University and Bishop Museum dominated archaeology, working with a balance of research and contract archaeology funds. The State Historic Preservation Office (SHPO), contract archaeology firms, National Park Service and others agencies played a relatively minor role in research archaeology. Federal archaeologists were practically absent in Hawaii until the late 1970s.

The Players in Hawaiian Archaeology Today

Today, as Pat noted, Hawaiian archaeology is much different. It is now dominated by compliance with historic preservation laws, and by the large amount of money that funds it. The historic preservation laws written in the late 1960s, which were eventually implemented in the late 1970s and only rigorously applied over the last decade, focus on finding the important sites through survey and treating them in the face of development through salvage archaeology, now called "data recovery," or preservation. Most of this archaeological work has been done by contract archaeologists with government agency archaeologists serving as watchdogs over it.

Indeed, at least 95% of the archaeological work in the state is done by individuals employed by institutions, either contract firms or government agencies, that participate primarily in historic preservation work. There are 13 active contract archaeology firms in the State—Bishop Museum is now simply one of those firms, albeit with a collections role that seems to be run separately from its archaeological research. Government archaeologists oversee most archaeological research and often do the work themselves—the SHPO in the statewide arena, and federal agencies at the Corps of Engineers and the Navy on federal lands. While university instruction in archaeology continues at the Mānoa campus of the University of Hawaii, and perhaps less well known at the Hilo and West O'ahu campuses, and introductory level courses are offered at Leeward and Maui Community Colleges, neither the university faculties, nor their students, are currently playing focal roles in Hawaiian field research. However, recently Mānoa graduate students have entered the contract arena as field directors and in some cases as government managers, and the University of California at Berkeley—as an outside university—has begun to conduct field research work, notably in Kahikinui. Obviously, there are other archaeologists in the State, too. The National Park Service and State Parks Division have archaeologists, but they are largely managers within their parks, and are doing relatively limited field research at this time.

Thus, I would argue we have three key institutions in Hawaiian archaeology today—contract firms, government agencies, and universities. The number of archaeologists employed by these institutions is far greater than it was 20 years ago.

Pat discussed what he sees as problems at the University and Bishop Museum and indicated corrective steps he believes are needed. I want to focus on two institutions where I have influence—the SHPO and contract firms. Also, I want to emphasize that historic preservation is actually much more than contract archaeology. It has always been founded on the principles of quality research and public education, even though those principles may not have been implemented.

Quality Research

I think quality research and leadership in research should not be viewed as the sole role or *kuleana* of any institution. There are too many top-quality archaeologists in the different institutions to assume that any one institution, such as the University, can any longer claim the lead in research. I disagree slightly with Pat's presentation in that sense, although I agree that the University has fallen back a bit in fieldwork-focused research and needs to step up to re-establish balance.

I believe that all the institutions should have the goal of doing quality research as one of their basic tenets. If you are at the university, it is your obligation not only to teach, but to conduct quality research. If you are with a contract firm, you are not just a business; contract work is funded to learn more about the past—to do research. If you are a government manager, your role is not only to protect your resource and process contracts, it is to do and stimulate quality research—to better understand and protect the resources. Publications, making money and counting projects processed might be part of today's archeology, but if your institution does not have a goal of doing or stimulating quality research, I personally feel your institution is failing Hawaiian archaeology and the public that largely supports you.

I strongly believe in this view. It was a focus of my training at Bishop Museum and the University in the

1970s. I spent 1978–1981 in Micronesia at the Trust Territory SHPO as their Archaeologist. There, the SHPO gave historic preservation grants and development contracts to contract firms, universities and museums, with the emphasis always on research, not just finding and describing sites, but analyzing the finds and learning more about the past for the public's benefit. The SHPO there participated in this research work also, carrying out field projects and publishing synthetic analyses. In Micronesia, we were able to establish a strong research focus among all the institutional groups participating in the archaeology of the region—the SHPO, the contract firms, universities, and museums. It was highly successful and created a boom in Micronesian research. It was an exciting time for those involved in Micronesian work.

This excitement and focus on research unfortunately has been, and is, missing in Hawaiian archaeology. All institutions in Hawaiian archaeology need to try to change this situation. I have been Branch Chief for Archaeology in the Hawaii SHPO for over a decade now. When I started at the SHPO in 1985, I was appalled at the lack of research focus in the SHPO and the horrible quality of research work done by many contract firms. I was appalled that the SHPO simply allowed many development projects to proceed, with the bureaucratic code words “no known sites,” resulting in the destruction of hundreds, if not thousands, of archaeological sites without any recording. I was also appalled at the quality of archaeological reports that were routinely and automatically approved. A few reports of the time described sites well, attempted functional interpretations, and followed interesting research ideas, but many were barely worth the paper on which they were written. A number of firms were not adequately surveying project areas. Two to three firms could not even describe sites. Site interpretations were without thought or justification. Basically, there was little research in historic preservation archaeological work in Hawaii. In the mid-1980s, two firms, Paul H. Rosendahl, Ph.D., Inc. (PHRI) and the emerging International Archaeological Research Institute, Inc. (IARII) were the two brighter spots in archaeological work.

One of my concerns was to establish balance in quality research in Hawaiian archaeology by attempting

to upgrade both the SHPO program and contract work. For better or worse, the SHPO is an extremely pivotal and powerful agency in today's Hawaiian archaeology, as all archaeologists know and may possibly dislike. As its archaeology branch chief, I tried to move the SHPO away from a bureaucratic, rubber-stamping, non-research focused agency which approved poor quality work, toward one staffed with highly competent researchers who do leading research, apply stringent minimal standards yet are flexible, and encourage research by contract firms. My colleagues and I have tried to change the quality of work by contract firms through our review power and by example. We have tried to make these changes without dictating what research approaches and views can be used. We have tried to maintain an easy-going and pleasant staff. My impression is that the SHPO has adequately shifted to a top quality research institution. This can be evaluated by the quality of SHPO staff over the last decade, their publication records, and their strong presence in Society for Hawaiian Archaeology conferences. I suppose it can be evaluated by the comments several years ago of an archaeologist, who was with Bishop Museum but now teaches abroad, who complained that the SHPO archaeologists were doing too much research. In this light, I appreciate Pat's recognition of the SHPO's role as a quality research institution.

Through its review powers, the SHPO has changed the quality of contract archaeology reports and research by establishing minimal reporting standards. All firms must now do background archival work to identify *ahupua'a* settlement patterns and likely site patterns in the project area. This background work helps to predict what site types might be present and to interpret sites when they are found. It also establishes a strong research context for survey, if used properly. Some firms have grown to do excellent work, taking settlement pattern analysis well beyond the minimal standards. Basic description standards were established and most firms now achieve or exceed minimal standards. The SHPO also requires that functional interpretations of sites be justified with a presentation of the basis for interpretations. Archaeology is supposed to be a science in which we reach conclusions based on evidence. Many firms are now better at justifying interpretations, although this improvement often comes after extensive revisions to

draft reports. I think that the application of these standards has improved the quality of contract reports.

There are still problems in the quality of contract archaeology research and reporting, however. I and my colleagues at the SHPO remain disappointed in the brevity of the concluding sections of survey reports. These are pathetically minimal in many cases. I was astonished in the late 1980s to hear one Ph.D. archaeologist, now the head of a contract firm, tell me that his university did not train him to write extensive analysis sections in contract survey reports. It is in these concluding sections that considerable contributions to Hawaiian research can be made through thoughtful analysis of the findings. Another problem is that data recovery projects are often rote, boiler-plate studies. Many are simply larger scale surveys in which more information is gathered, minimally analyzed, and reported. However, data recovery projects are supposed to go beyond inventory surveys to evaluate research questions and improve our knowledge of the past.

To address these concerns, you will see the SHPO start to push contract firms to expand the concluding sections of survey reports to include thoughtful research analyses. We hope the firms will do this voluntarily. The SHPO has already switched its focus in reviewing data recovery plans. We now request that these plans focus in detail on just one or two questions relevant to the sites in the project area, review what is known about the answers to these questions, indicate what information is needed to address them and what field and laboratory work are needed to collect this information. We hope that this change will make firms focus, think, and more creatively explore different approaches to learning about the past. Already, some interesting approaches have been developed. Examples include analyses of microenvironments and elevational differences in dryland field systems, household activity areas, and refining the dating of fishponds.

The above comments are not to say that quality research is not occurring in historic preservation work. The major contributions to Hawaiian archaeology in the last decade have come from individuals working in the historic preservation arena for contract firms or government agencies. A few examples

are paleo-environmental studies such as those of Athens and Ward at International Archaeological Research Institute (IARII), fishpond studies pioneered by Dye at the SHPO, Denham at Biosystems, and Athens at IARII, Kolb's work at the SHPO and Northern Illinois University with religious structures and sacrificial faunal offerings, and J. Allen's work with agricultural fields when she was with Bishop Museum. Regional syntheses of my own and by Tuggle and Burtchard of IARII are providing new perspectives, as are emerging island syntheses, such as Kolb's for Maui and mine for O'ahu. Many methodological innovations have come from the contract arena, including botanical species identification of charcoal, pollen studies, the up-and-down and maybe up again history of volcanic glass dating, backhoe trenching, and coring. New research is not missing, but more quality research is needed. This is not just an issue of returning to balance. It is an issue of achieving and maintaining quality research among all the institutions. Individuals do make a difference in this situation. Athens' commitment to research has made a difference at one contract firm, as have others such as Robbins, Denham, Burtchard, Tuggle, Tomonari-Tuggle, and J. Allen. Also, the individuals at the SHPO have made a difference there.

I do not have as bleak a view as Pat that the SHPO and historic preservation will end in the near future under Republican conservatism. To end, the historic preservation laws would have to be abolished, which seems unlikely to occur. Funding for archaeological work might severely drop, but the SHPO and contract firms will likely persist. However, my worry is that in today's Hawaiian archaeology, the SHPO is one of the most vulnerable points. It can be all too easy for the SHPO to lose its current staff and slide back into a non-research focused bureaucratic agency. In turn, the standards applied to firms' work could be lowered or not applied. Society for Hawaiian Archaeology members need to be aware that the institutional foundations are fragile, in that they are made up of individuals and those individuals' commitment to research. Pressure on institutions is needed to keep research focus a priority in Hawaiian archaeology.

I would like to emphasize that the push to do research should be done in the spirit of cooperation. It must be realized that neither the University, the

SHPO, nor certain firms are the elite in research. Intellectual leadership does exist in Hawaiian archaeology, with leaders in all three institutional areas. Our goal must be to work together to achieve top quality research, to grandstand less in some cases and to work together more in others. One of the problems with archaeology in general since the 1970s is the tremendous segmentation of the field and a loss of direction. If we meet or work together more on larger research goals, maybe we can bring some feeling of excitement and coordinated direction back to Hawaiian archaeology.

Education—Sharing Findings

I believe that we are all in the education business. We need to do two things. First, we must share information from projects with other professionals, and second we must get the information on what is being found back to the public, most notably the Hawaiian public.

Findings at the academic level are presented at scientific meetings, in journals and scientific publications, and in technical reports or manuscripts. These are accessible in libraries should the scientific community and public desire to read them. This form of reporting is important. All of us do this work. The tremendous success of the Society for Hawaiian Archaeology conference and wide participation by many archaeologists in these meetings is evidence of improved dissemination of ideas. Also, the holdings of the SHPO library are now extensive and easy to use. In brief, the technical literature is available.

An equally important educational obligation, however, is reporting to the general public. This is an area of reporting that has been pitifully carried out by archaeologists in Hawai'i. You are deluding yourself if you think that Archaeology Week or the Society for Hawaiian Archaeology conference are adequate approaches to get information to the general public. The Society for Hawaiian Archaeology conference is too technical, and Archaeology Week is 51 weeks too few a year.

What do you say when someone of Hawaiian ancestry, who you care for dearly, attends the Society for Hawaiian Archaeology meetings, becomes extremely

upset with you and says, “All of you talk and talk to each other. Where were you when I was in school? Why didn’t you come and talk to our classes? We are all interested in our history. It would have opened our eyes and got us interested in archaeology and history—and in school. Why aren’t you going to the Hawaiian community and sharing the findings? We are all interested. You are selfish.” I had to swallow hard, be ashamed, and agree.

For over two decades, I have believed that we need to do more to share archaeological findings with the Hawaiian public. Getting information to the Hawaiian public can be done in several ways—by teaching university classes, giving talks to school children, making public presentations, and publishing for a lay audience. All of the more senior archaeologists in Hawaii do one or more of these things—at least I hope we do. For example, I have taught Hawaiian Archaeology and Pacific Archaeology for a number of years as a lecturer at the University of Hawai‘i’s West Oahu campus, and sometimes at the Mānoa campus as well. University students want more of these classes and others relating to Hawaiian and Pacific archaeology, oral history, and history. I also give talks each year to 30–40 K–12 classes. These kids enjoy learning about local history, and seeing artifacts and slides. Only a small percentage of the kids are reached in this way, and those are mostly on O‘ahu. The K–12 grades can have expanded archaeology and history programs too, if we help. I prepared a 2-week archaeology curriculum for the Leeward District several years ago. Aki Sinoto and Eric Enos started a class in archaeology last year at Waiānae High School. Eric, Aki and I are working with the Nānākuli schools now. Many groups, such as Hawaiian Civic Clubs and other Hawaiian groups, like talks about their area. General publications for the public on archaeological sites or information are desperately needed. Pat’s book, *Feathered Gods and Fishhooks*, is the only summary by a professional. I hope to get out a Hawai‘i Island overview this year. There is room for many other public summaries.

I do not expect everyone to do each of these things—some have little time, feel uncomfortable in classrooms, or do not like to teach—but, collectively, we should be able to improve our sharing of information. I would urge the Society for Hawaiian Archaeology to focus effort in this area. Do away with

Archeology Week and the peer review and ethics committees. Focus more on a year-round effort of sharing information with the Hawaiian public, with many Society for Hawaiian Archaeology members participating. Also, all of us have the obligation to write brief non-technical summaries of our projects for the Hawaiian public. Expect the SHPO to require such summaries in the near future.

Education—Preserving and Interpreting Hawaiian Sites

Another important area of public education is to preserve and interpret archaeological sites. When I started in this office in 1985, virtually no Hawaiian sites were being preserved and interpreted as a part of development projects. The SHPO and firms were not promoting preservation. However, by 1987, about 20% of the sites were being preserved, either for interpretation, for cultural concerns (e.g. burials), or for long-term research.

Many of you have been involved in preserving sites as part of the mitigation work for your projects. The SHPO has approved this site preservation with a larger vision—that for each traditional district or group of traditional districts we need to preserve archaeological landscapes with fields and associated houses and smaller sets of sites and interpret them as they relate to historical themes, such as past use of the land or settlement on the land, or as royal centers or religious sites. These landscapes and sites become linked historic parks, documenting the history of each district. This policy is not yet written down, although it has been in place for a decade. We hope to put it in writing this year.

In these preservation efforts, we must work with local Hawaiian communities. They must be participants in the development of preservation plans for the sites in their areas. Ideally, they should be consulted during the preparation of the plans, or be partners in that preparation. Minimally, they should be able to comment on drafts of the plan. This is a SHPO policy now.

One of the unique aspects of Hawaii is its long occupation by Polynesian people. We all know that archaeological ruins associated with this history cover

the landscape where it is unaltered by sugarcane, urbanization, and the like—sometimes these ruins even survive in those contexts. The public generally does not know this. Yet, the members of the public are fascinated when they can go out into an area and walk through fields once planted by their ancestors and see and touch the terrace walls and *'auwai*. Or some will sit on a house platform and look across the landscape and feel a little of how people lived and what life was like. Archaeological site preservation enables people to step back into the past, just as when a *kupuna* tells stories about what life was like.

We need to take a stronger preservation stance to preserve sites and their landscapes before they are lost. Many of us have sat by while golf courses and housing tracts have eaten up our open spaces and the archaeological remains of the past. Preserving and interpreting large landscapes provides open spaces for educational purposes, for alternative approaches to schooling, for the local public to enjoy and use in the face of an ever increasing urbanism, and for cultural learning programs. They provide the open-space of an older Hawai'i. We must strive to identify and preserve these areas before it is too late, before Hawai'i's lifestyle becomes too much like California's or Japan's. Not too many years ago, more than 20 golf course plans just for O'ahu were submitted for review. Golf courses are the urban blight of the 1980s—an artificial open-space, restricted to the few who golf and can afford it. If we want to help preserve the essence of an older Hawai'i, its open spaces and use of the land, and its history, we need to help preserve Hawaiian landscapes that are rich with archaeological sites and accessible to all.

Forging Links with the Hawaiian Community

I agree completely with Pat that we need to build strong ties with the native Hawaiian community. We are working at their sites, whether they own the land now or not. We are studying their history. The Hawaiian public and archaeologists are the two main groups concerned with protecting Hawaiian sites. Together, we can be strong advocates for preservation and learning about the past. Apart, we are weaker.

We need to build better bridges. We need to reach down into the classrooms and get information to kids, to excite them about the past and about archaeology and history. We need to have the University offer more classes to Hawaiian students and to recruit and train these students so they can become professional archaeologists. We need to keep the Hawaiian students and their parents and grandparents posted on work that is being planned and being done. We need to involve them in preservation plans. We need the Hawaiian community to realize that archaeologists are finding and helping to protect the burials of their ancestors.

If the Hawaiian communities and archaeologists work together, the chances of preserving and protecting Hawaiian sites will greatly increase. We have to work together and realize that there is a larger picture, that occasional mistakes by both sides will always occur and that these errors should be worked out without losing sight of the larger aim of jointly preserving sites and promoting learning about 2,000 or so years of Hawaiian history.

The End

Well, enough said. I liked Pat's presentation. Critical views are needed. We need to think about where our field is going and take some action.

Hawaiian Archaeology: A Post-Colonial History

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*Lost, is it—buried? One more missing piece?
But, nothing's lost, or else: all is translation,
And every bit of us is lost in it.*

—James Merrill

My first and earliest encounter with Hawai'i was as a child, age unremembered, listening to the old Sears Roebuck radio spilling forth, in a cold, wintry, New England, "Webley Edwards' Hawai'i Calls." Instead of buying only the platters of Elvis, a teenager PBG bought Hawaiian records—one still owned.¹ Ah, Hawai'i called, and like so many ancestral New Englanders (Father Bond of Hallowell, Maine and Kohala was an ancestral neighbor), I too answered the call. Arriving in August, 1969, with the 69th Ph.D. degree in Anthropology awarded by the University of Arizona, I must have been an outrageous *malihini*, and along with Dave Tuggle a year later, part of the new archaeologists come "like invading hippies" who "stormed and raided . . . our [Bishop Museum] storehouse and . . . such knowledge as is lodged in the brains of our staff" as argued by that venerable doyen of *kama'aina*, Keneti, in a 1971 memo.² No flowered aloha shirt, but flowered bell-bottom pants—what can one expect?

Now, there is no question that I might remember the history differently than a *kama'aina*, view the institutions differently, and predict the future differently. Hawaiian archaeology has led a far more checkered history than is *revealed* by Pat Kirch's assessment in this issue of *Hawaiian Archaeology*. Such is his choice, but in my invited reflections on the rather straightforward if somewhat self-serving essay, I will raise alternatives for discussion, even if some points are not as sober as Pat advocates.

The world of Hawai'i in 1997 is not the world of 1969, or any of the decades earlier. As Pat points out, we live with great institutional changes, changes in power bases, prestige sources, academic agenda, and notions of the business of heritage. In 1969, the Department of Anthropology at the University of Hawai'i at Mānoa was only beginning to emerge from the Museum's shadow, an emergence not uncontested by the "Mother Institution." Bishop Museum in 1969 was still a colonial institution that desired no competition, and did not, I would argue, encourage local non-haole archaeologists, but did have a most "traditional" view of the Hawaiian people. The Museum, as Pat chronicles, has a history of illustrious "archaeologists," but folk history certainly paints a less than congenial internal history, and one that qualifies the glamorized view. What Hawaiian archaeology would, or could have been, but for a colonialist, internally divided and divisive research staff—and how much earlier a profitable growth of the University.

Both the Museum and the University owe much to Roger Green and his vision(s) (see Graves 1996 for a detailed discussion), for his thinking came to dominate, inspire, and guide much of Hawaiian archaeology, to a greater extent than even Pat advances. Just in July, 1997, Roger and I reflected on the states of the art in 1969 and now, and I again saw his grasp of and insights to central problems. Roger continues to think theoretically. But we have come far from the glory days of Mākaha and Lapakahi, even as we return to those same lands. Part and parcel of the coming, and the present and its troubles, adhere to the practice of contract archaeology/Cultural Resources Management (CRM)/heritage management that began in those same days of the late 1960s.

A colleague and I, not long ago, mused over my remark that "We didn't know what a monster we would create"—the monster of CRM in Hawai'i. For this American monster has variously nurtured us, devoured us, and spit us out, leaving us with the charge of creating more offspring for future (in)digestion. Like it or not, there it is. In the late 1960s and early 1970s, the Museum and University archaeologists made annual pilgrimages to the State Capitol to testify for ever stronger preservation laws, for some teeth in Chapter 6E (HRS), and for respect for the past. Roger, Dick Pearson, Dave Tuggle, myself,

haoles all, with aloha jackets (remember those artifacts? No, Dave did not have one, as I recall) but with *aloha* for preserving Hawaiian sites and burials. No Hawaiian civic clubs came forth, but then we didn't ask. This was the domain of the Museum and the University at a time when any archaeologist was assumed by the public to be with the Museum.

The state apparatus was timid and without teeth or claws; administrators, developers, and government lackeys either tolerated the archaeological enterprise as they saw fit or could be harassed into decisions. Francis Ching, a Hawaiian and extremely underappreciated, even denigrated, archaeologist, held forth alone in the Department of Land and Natural Resources. Considered an upstart and outsider (a Hawaiian) by most others, he by force of will put in place the basic apparatus that has become the Department of Land and Natural Resources (DLNR) State Historic Preservation Division (SHPD). He also made many innovations, once ridiculed, now widely adopted. Succeeded by Stell Newman, with his new Ph.D. from UH, based on Kohala research, the program gained substantially in data base generation, inventory, and official concern. Still, the program stumbled along, and is still stumbling far more than Kirch's account would have us see (my alternative history, you remember). After Francis left the DLNR, he, and CRM, still had a friend in the Administrator of DLNR, the late and fondly remembered Joe Souza. This was a time in Hawai'i's past before so-called "rules and regs," a time when a friendly talk with Joe might enable a project to be mandated, funded, and completed. Without nostalgia, I historicize that it was still an older Hawai'i with some *aloha*.

Eventually, Joe Souza retired and new administrators arrived, stronger laws were enacted, and a few additional personnel were added to handle the processes. Pat Beggerly and Rob Hommon, with Farley Watanabe, all did their stints in the State office, trying to maintain an evenhanded, professional set of standards. Wendell Kam and Buddy Neller brought their own visions to the program. And still the program grew, as did consulting firms, which were born and died as the economic health of the state waxed and waned, as their owners indulged in more or fewer trappings of executive lifestyle, and as the laws were interpreted strongly or weakly.

After years of lobbying (how I hated doing it) for a separation of the historic preservation program from the Division of State Parks, SHPD was birthed. One should be cautious of dreaming; the dreams may come true, and one learn that fantasy is always better than reality. For, *contra* Pat Kirch, I see the history into the present with SHPD much of the problem and not the steadfast force for archaeological good he argues. We—the research archaeologists, the CRM consulting firms, the developers, and citizens of Hawai‘i—have suffered unduly from the phony set of “rules and regs,” never taken to hearing, never held up for scrutiny, but used as law to enforce SHPD visions of proper archaeology. (I believe these visions narrow and dated. For other comments see Dye 1997:3–7). Admittedly, they were *trying* to “do good,” but like the IRS of today, they placed themselves above the law in refusing to bring the rules and regs to hearing and acceptance. The professional staff of SHPD is, in fact, both victim and victimizer. The executive branch and administration are uninterested, the infighting within the Division debilitating, and the effect on the archaeological community demoralizing and financially draining. Some of the most professional staff have left, and others may leave when jobs come along. The Burial Program folks have been impossible to integrate into the Division’s overall mandate to preserve the Hawaiian past. The contention generated by them and the reciprocal disdain by the archaeologists have made the Division unlivable. The place is in deep trouble.

Interestingly, SHPD is not the only regulatory game in town. Historic preservation is guided by, in addition to the State’s Chapter 6E, the Federal National Historic Preservation Act, many other federal laws and regulations, and the counties’ various rules and permitting processes. The Army Corps of Engineers, the Army, the Navy, the National Park Service, and the Natural Resources Conservation Service all adhere to or ignore State or Federal law as legally appropriate, and operate with their own CRM priorities. Indeed, professional archaeologists in non-State government positions now outnumber SHPD staff members. The implications for the maintenance of professional research archaeology have yet to be explored. I myself place more importance on these agencies than, I infer, Pat does.

The CRM contracting crowd, both for-profit and non-profit, has a very spotty record. Business is tough. As Vice President (Research) of Archaeological Research Center Hawai‘i (ARCH) in the late 1970s, resigning in the early 1980s, I saw the extreme difficulty of working with hostility emanating from the state offices, from the business community, and from competing consulting firms, including the Museum. One can’t operate losing money, and being professional doesn’t necessarily bring in the profit. I will never forget Francis Ching, President, ARCH, telling me, “We won’t cut corners to save money and we will show them by doing quality work.” ARCH even maintained its own publication series! This happened at the time the state office in DLNR actively discouraged our work and the political hacks called, demanding serious campaign contributions! ARCH is no longer in business. *Na kau a kau* indeed.

Contract archaeology has been a dog-eat-dog world, and no incentives to feed the public, to pay back the public’s dollars have been seen. Only someone with as much courage and brass as then University of Hawai‘i professor Matthew Spriggs was able to amass the collective unpublished CRM manuscripts and duplicate them for the UH and SHPD libraries. He also published in the Department of Anthropology’s *Asian and Pacific Archaeology Series* the concomitant complete bibliography (Spriggs and Tanaka 1988).

Emory, in the memorandum noted above, spoke of the 1960s glory days of University-Museum cooperation, and feared the new different points of view of the 1970s. This is curious, or even disingenuous, since the only Hawai‘i-oriented archaeologists at the University before 1969 were also Museum archaeologists, led by Emory as teacher and researcher. Bill Bonk had already disappeared into Hilo, never to emerge again, and the renowned Asianists Bill Solheim and Dick Pearson comprised the regular archaeological faculty. Both dabbled in Hawaiian archaeology, but dabbling it was. Roger Green, as noted, provided the first real bridge between Bishop Museum and the University, but in spite of efforts to bond him more strongly and wholly to the University, his loyalties were demanded by and were given to the Museum until he got out of Dodge for Auckland.

One era of cooperation between the Museum and the University began with the Coordinating Committee of Hawaiian Archaeology, an ad hoc group of the professionals and senior students then operating in Hawai'i. To be sure, Emory's memo predates the flowering of the Coordinating Committee, but the frequent meetings, reporting of activities, and social encounters were a high spot in the history of our field. The committee died with the explosion of numbers of archaeologists and of the CRM archaeology-for-profit mode. One could not coordinate competing businesses, and the bad blood of competition ultimately soured cooperation. The University, after flirtations with contract archaeology, decided to stay out of the fray, instead concentrating on teaching and research. The Museum, as Pat ably notes, was already into the field, and instead of bowing out, decided to "dig for gold," going head-to-head with other consulting firms. The Museum at that time was still staffed by "island trained, tried, and true" archaeologists, and they, not the present Director, initially sent the Museum down the path, a path then trod also by Patrick Vinton Kirch. Not long after, the appearance of Michael Graves, followed by Terry Hunt and Barry Rolett, led to an unprecedented (since the earliest 1970s) interaction among Museum and University archaeologists operating at a personal and professional level. This interaction continues with ever-increasing strength today. In fact, I would assert that personal and research relations among University and Museum archaeologists are at an all-time peak of strength. Our students routinely work with Museum collections and archaeologists. Museum archaeologists teach in our program and serve on student committees.

In the 1990s CRM archaeology is fitfully gaining professional respectability through good research designs (self-generated, not through the "rules and regs") and through increasing publication in refereed journals or production of quality monographs. Yet, most CRM work remains buried in unpublished reports to funding clients. A sense of professionalism is seen in the work of, for example (others could be cited) International Archaeological Research Institute, Inc. (IARII) (Athens *et. al.* 1996, Athens and Ward 1993, 1997, Goodwin *et. al.* 1994) and Archaeological Consultants of the Pacific (Kennedy 1997, 1994). Within the SHPD, Tom Dye (now

moved to IARII) has always maintained a professional level of publication (Dye 1994a, b, 1990a, Dye and Komori 1992) as well as being prominent in managing the Society for Hawaiian Archaeology (SHA). Bruce Masse, once with the SHPD and the U.S. Navy, maintained a stellar research agenda while still doing his job (Masse 1997, Masse and Tuggle n.d.). Ross Cordy has managed to publish in spite of overseeing the archaeology section of SHPD (Cordy 1996, 1995). Others contribute, but both quantity and quality are in short supply. Dave Tuggle (1997) has continued to publish the highest quality research since returning to Hawai'i and IARII.

In an unprecedented spurt of collective action, SHA was birthed, with the founding meeting at the Ather-ton Halau, Bishop Museum, in 1980. Contract archaeologists, Museum employees, University professors and students, and various government professionals all joined and began several years of profitable activities that promised a new, collegial and cooperative era in Hawaiian archaeology. Alas, it has been downhill as of late, with increasingly few members shouldering the burden. Contract firm CRM archaeologists have been conspicuously absent from the officer roles, especially as President (excepting Joe Kennedy of Archaeological Consultants of the Pacific), with SHPD, Bishop Museum, and University personnel manning the barricades (Martha Yent of State Parks has done more work than any one person except Tom Dye, who has turned a defunct journal into a showpiece). Annie Griffin and I have run five of the last ten SHA conferences, which aside from the journal may be the only really successful aspect of SHA.

The SHA movie promoting Hawaiian archaeology did have a generally favorable impact on the public, but soon one realized that it was both dated and unfortunately representative in its presentation (SHA 1982). Indiana Jones did not have a beard, but the image of the bearded *haole* archaeologists, the rugged male from a dominant institution, comes through loud and clear. Introduction of a Hawaiian voice was realized only with protests after an initial "beta" screening. SHA has since sporadically mused over a re-make, but has never found the will, a lack reflecting the general disinterest of the profession in the non-paying public.

What was the University doing during this historical period and into the present? Or, have the University archaeologists fallen from a former status, losing their vision and their way? What are those (we) privileged few up to and why? Pat Kirch notes that the archaeologists at UH have not done all they might have, a truism in any situation, but one may question the priorities Pat believes important, or his assessment of what actually has been done, as well as the “greatness” of the University’s and Museum’s mega-project past. We all look back fondly to the days of our youth, when our projects were large, well-funded, and seemed to be establishing a new order. The truth is that for all the successes, Lapakahi, Mākaha, and others of the time were both giant messes and fraught with error and omission. Like later field schools, graduate students often had their way with the data, coordination among senior staff was desultory, and consideration of the long term minimal. Lapakahi data were taken from the University by State Parks in an especially sordid chapter of our history. Most of the materials were promptly lost; thank goodness for the retention of Myra Tomonari-Tuggle’s map of the Kohala field system, which is critical to ongoing University research.

The Mānoa Department of Anthropology has over the last four decades never committed to the same area focus as has the Museum, nor has it seen its mission as others have seen it, or thought it should be. The Museum is first and foremost a museum of Hawai‘i and Hawaiian culture. Its expansion into Polynesia and Melanesia has been primarily an effort to find the ancestors of the Hawaiian people. The Society Islands, the Marquesas, and even the Western Polynesian groups have been noteworthy as they inform us concerning Hawai‘i. If the Museum has strayed from its mission, it has strayed with “right” in mind. The University archaeology program never saw its mission as limited to, or even *dominated* by Hawai‘i and Hawaiians. In fact, as noted above, its Hawaiian involvement was initially a matter of following a Museum lead. Instead, the Department joined, in the 1960s, the rest of the University, in a commitment to Asia, the ancestral home of many of Hawai‘i’s people.

In addition, the Department has been committed to multi-area training and instruction in method and theory of graduate students, believing that expertise

in only one area or topic led to provincialism, narrow interests and to a lack of advantage in an international job market. Like most research universities, the University of Hawai‘i, correctly or incorrectly, saw its reach as pan-Pacific and Asia, and spoke to those audiences. In doing so, those more locally committed saw and see an inappropriate lack of benefits to Hawaiian archaeology. They see the University as not training enough B.A., M.A. and Ph.D. students to fill the ranks of CRM archaeology and not enough feed-back to the people of Hawai‘i.

These are legitimate issues to debate, although my opinion is that the diversity of academic backgrounds the CRM practitioners bring to Hawaiian archaeology is essential for a healthy field. Also, in spite of the lack of large, multi-year projects, a rather amazing amount of Hawaiian archaeology has been undertaken and published at the University, and many top-flight students graduated and entered into professional careers. The archaeology field school has continued yearly since “time immemorial” (Spriggs 1993; see also Luomala 1968/69) except for one year in 1996 with the UH budget collapse, a late commitment by the instructor, and Murphy’s Law (K. O’Leary, personal communication). Even Hawai‘i has not been sacred as a field school location, with Dave Tuggle and Karl Hutterer leading one to the Philippines in 1971 (the year of the invading hippies) while leaving Tom Riley to hold down the local fort and 5-O at Kaupō Cave Shelter. The influence of the Museum appeared again in 1972 and 1973, with Yosi Sinoto leading students on Teti’aroa in the Societies.

Should field schools be conducted by regular faculty, by graduate students or by visiting instructors? Field schools, other than those in “sand box” sites, should be conducted with proper attention to archaeological ethics, research design, and publication, and, like other projects, these are “regulated” by SHPD. It seems to me that whether a field school is best as a one shot deal managed by a graduate student with great personal interest (her or his research) or as part of a large, multi-year program is a difficult call. Students easily get lost in complex, ongoing research, yet profit from interaction with teams of specialists. Where schools are offered seems even more important—on O‘ahu or off island. Off-island schools cost the University and the students an often prohibitive amount of money. Living at home may not be

romantic—no getting drunk by the campfire—but it doesn't cost much. And, the relationships of field school training to shovel bum employment on CRM digs remains unresolved. The problem of the who, what, where, how and why need discussion within our community. Clearly the days of the late 1960s, when the Museum believed it should do the research and University stick to the training, are over. The University is now the best research game in town, our graduate students come from top flight programs, and most students get their training on research projects in Hawai'i, Tahiti, the Marquesas, Samoa, Fiji and, of course, Asia. They also get their training in the classroom and labs. Mānoa offers one of the most comprehensive and theoretically sophisticated instructional programs in archaeology for both undergraduates and graduates.

Like Emory, Sinoto, and Kirch of Bishop Museum, early (1970s and 1980s) University archaeologists indeed failed to stick to Hawai'i. (Note that the three Museum archaeologists named above are best known, in fact, for their work outside these *nani* islands.) Tuggle spent years in Kohala, but also worked in the Philippines. I interspersed work in Hawai'i with longer stints in Southeast Asia (Philippines, Indonesia, Cambodia) and in doing ethnography. Dick Gould took on small projects in Hawai'i ranging from Queen Emma's Summer Palace to Rathje-esque rubbish, and continued his pre-eminent Australian work. Spriggs conducted no major projects in Hawai'i, but made a great impact through many small efforts, ranging from field schools to interaction with the Hawaiian community. He even joined Ka Lāhui Hawai'i (Lāna'i Chapter). Of course, he was better known in academic circles for his Melanesian researches. Michael Graves brought pan-Pacific (Micronesia/Mariana) experience to Hawaiian archaeology, working on Lāna'i (Graves and Ladefoged 1991) and resuscitating the Nualolo Kai excavations, never reported by Bishop Museum, and has also turned his attention with Kēhau Cachola-Abad to *heiau*. Most recently he has taken UH back to the sweet potato fields of Kohala (Ladefoged, Graves, and Jennings 1996)! And two fully-committed Polynesia scholars joined UH in the persons of Barry Rolett and Terry Hunt. Their research in Polynesia has both theoretical and substantive implications for Hawai'i (Rolett 1996, Rolett and Conte 1995, Terrell, Hunt, and Gosden 1997).

They have consistently trained Hawai'i students in both Hawaiian and Polynesian archaeology. In addition, both Graves and Hunt have "stuck their necks out" in commenting on CRM research and historic preservation issues, and have actively recruited Hawaiian students. Most recently, Kathy Morrison and now Miriam Stark have renewed the flagging effort in Asian archaeology created with the retirement of Bill Solheim. In fact, we might argue that the Asian focus, not the Hawaiian focus, was temporarily most diminished. The last ten years of Hawaiian archaeology at the University have been amazingly productive, given the limited access to CRM funding.³ Since 1987, three doctoral dissertations *focusing on Hawai'i* have been accepted, plus seven M.A. theses. The former include Pat Beggerly (1990), Ann Garland (1996) and Bert Davis (1990). The latter include Conrad Erkelens (1993), Jo Lynn Gunness (1987), Jim Adams (1994), Maurice Major (1995), Laura Carter (1990), Thegn Ladefoged (1987), and Carol Kawachi (1989). Note that all these scholars remain professional archaeologists. Faculty at Mānoa have edited two volumes of *Hawaiian Archaeology*, one special issue of *Asian Perspectives*, and two other volumes (Graves and Green 1993, Kirch and Hunt 1997).

So, what really is lacking, or what are the problems facing the University as we move into archaeology in the future? Should the University rethink itself and get on the ball? First, I do not think we have a problem with theoretical conceptualization—working with up-to-date theory and problem orientations. In fact, the Department is varied almost to the point of contention, with unreformed but "new and improved" processual archaeologists (the old new archaeology updated), with Darwinian evolutionists, and with environmentally oriented culture historians. To be sure, no one is doing "household archaeology," which in its traditional form grew out of settlement pattern archaeology with a smattering of processual archaeology thrown in, something of a mix as seen in K. C. Chang's *Rethinking Archaeology*, which L. Binford mentioned (personal communication) as "retarding archaeology," and might conceivably be related to the household archaeology and household material culture of S. Binford (Bright 1984). Anyway, a unified acceptance by all of important problems and issues in archaeology is less a University problem, where diversity is encouraged, than

one of SHPD, CRM, and apparently Berkeley, given the codification into “rules” as to what constitutes necessary and appropriate data and interpretation.

Second, we at the University emphasize the enduring topics of Hawaiian archaeology where we are seeing the cumulative effects of focusing our work efforts. These include the origins of Hawaiians and the timing of human settlement (Graves and Addison 1995, 1996; Hunt and Holsen 1990), the use of artifact variation to explore stylistic and functional variability in Hawai‘i and elsewhere in Polynesia (Cachola-Abad 1993, 1996; Pfeffer 1995, 1997; Moniz *et. al.* 1997), the roles and forms that agriculture took in prehistory (Ladefoged 1987, 1991, Ladefoged *et. al.* 1987, 1996), and changing patterns of subsistence strategies (Beggerly 1990, Davis 1990, Gordon 1993, Moniz 1997). Also included are the development of social complexity and its relationship to monumental architecture (Cachola-Abad 1996, Graves and Ladefoged 1995, Graves and Sweeney 1993), advancements in dating archaeological materials (Graves and Ladefoged 1991, Graves and Cachola-Abad 1996), paleoenvironmental reconstruction (Athens, Ward and Wickler 1992, Graves and Murakami 1993), paleodemography and population collapse (Ladefoged 1991, Sweeney 1992), and the nature and extent of change during and after the arrival of Europeans and Americans in Hawai‘i (Carter 1990, Garland 1995, 1996). The training and research program and the graduate students are healthy indeed.

The University does need to assist further the process whereby the Hawaiian people gain their share of the voice of archaeology in the state. As Matthew Spriggs pointed out in a SHA oral presentation and as Roger Green elaborated (personal communication) concerning Aotearoa, where the Maori call the shots, the faster the Hawaiian people gain respectable authority concerning the study of their past, the healthier archaeology will be. And we are doing this with more Native Hawaiians and minority Americans majoring in anthropology and pursuing graduate work at Mānoa than at any other institution in the United States.

So, what more can be said of the future in this post-colonial history? Hawai‘i is hardly de-colonized, of course. Both the SHA film and Pat’s review point to

the ambiguous or subordinate roles of non-*haole* and women in the study of Hawai‘i’s past. Recently, Mānoa has been increasingly successful in encouraging and supporting women and Hawaiian scholars. Cachola-Abad’s (1993) paper is among the most frequently cited references by preeminent archaeologists. We are still, however, locked into a rather traditional university culture, and need more than a dash of “liberation anthropology” and outreach efforts. But, we can be sure there will never again be the “mega-project” of the sorts seen in the 1970s, anymore than the H-3 extravaganza in CRM is likely to be repeated. Archaeology as heritage is more popular than ever, more valued by more people than surely was the case in 1970 or 1980. We, the practitioners, have not paid our dues to the public, at least not in Hawai‘i, and future research will, I believe, bring a blending of the low and high technologies now known with a variety of theoretical foci and with the call for relevance and appropriateness by the Hawaiian community. The Mānoa Department of Anthropology does not exist to replicate its present self. We are moving into the Pacific and Asian millennium, working hard to build an increasingly vigorous program.

Auwē, pīha ka ‘eke, Ho‘i kākou

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Notes

1. *Hawaii Calls: Waikiki!* Presented by Webley Edwards with Al Kealoha Perry. Capital Records EAP 2-772.

2. Memorandum dated March 1, 1971 and signed by Kenneth P. Emory. In possession of P. Bion Griffin, Dean Hall 211, University of Hawai‘i.

3. I gratefully acknowledge here information provided by Michael Graves concerning numbers, references, and contributions by UH faculty and students, as well as reminding me of the many foci of research and training I have reported.

References

Adams, J. E. 1994. The changing economic patterns of Kukuipahu in a global perspective: An archaeological consideration of Kukuipahu and Awalua, North Kohala, Island of Hawai'i. M.A. Thesis, University of Hawai'i, Mānoa.

Athens, J. S., and J. V. Ward. 1993. Environmental change and prehistoric Polynesian settlement in Hawai'i. *Asian Perspectives* 33:19–56.

———. 1997. The Maunawili core: Prehistoric inland expansion of settlement and agriculture, O'ahu, Hawai'i. *Hawaiian Archaeology* 6:37–51.

Athens, J. S., J. V. Ward, and G. M. Murakami. 1996. Development of an agroforest on a Micronesian high island: Prehistoric Kosraean agriculture. *Antiquity* 70:834–46.

Athens, J. S., J. V. Ward, and S. Wickler. 1992. Late Holocene lowland vegetation, O'ahu, Hawai'i. *New Zealand Journal of Archaeology* 14:9–34.

Beggerly, P. E. P. 1990. Kahana Valley, Hawaii, a geomorphic artifact: A study of the interrelationships among geomorphic structures, natural processes, and ancient Hawaiian technology, land use, and settlement patterns. Ph.D. Dissertation, University of Hawai'i, Mānoa.

Bright, S. 1984. A talk with sex pioneer Sally Binford. *On Our Backs* 12:12, 13, 38–43.

Cachola-Abad, C. K. 1993. Evaluating the orthodox dual settlement model for the Hawaiian Islands: An analysis of artifact distribution and Hawaiian oral traditions. In *The evolution and organization of prehistoric society in Polynesia*. Monograph, 19, ed. M. W. Graves and R. C. Green, 13–32. Auckland: New Zealand Archaeological Society.

———. 1996. The significance of heiau diversity in site evaluations. *Cultural Resources Management* 19:11–16.

Carter, L. A. 1990. Protohistoric material correlates in Hawaiian archaeology, A.D. 1778–1820. M.A. Thesis, University of Hawai'i, Mānoa.

Cordy, R. H. 1994. *A regional synthesis of Hāmākua District, Island of Hawai'i* Honolulu: Historic Preservation Division, Department of Land and Natural Resources, State of Hawaii.

———. 1996. Rise and fall of the O'ahu kingdom: A brief overview of O'ahu's history. In *Oceanic culture history: Essays in honour of Roger Green*, ed. J. Davidson, G. Irwin, F. Leach, A. Pawley, and D. Brown, 591–613. Auckland: New Zealand Archaeological Society.

Davis, B. D. 1990. Human settlement in pristine insular environments: A Hawaiian case study from Barbers Point, Southwestern Oahu. Ph.D. Dissertation, University of Hawai'i, Mānoa.

Dye, T. 1994a. Apparent ages of marine shells: Implications for archaeological dating in Hawai'i. *Radiocarbon* 36:51–57.

———. 1994b. Population trends in Hawai'i before 1778. *The Hawaiian Journal of History* 28:1–20.

———. 1997. Editor's note. *Hawaiian Archaeology* 6:3–7.

Dye, T., and E. Komori. 1992. A pre-censal population history of Hawai'i. *New Zealand Journal of Archaeology* 14:113–28.

Dye, T., and D. W. Steadman. 1990. Polynesian ancestors and their animal world. *American Scientist* 78:207–15.

Erkelens, C. 1993. Archaeological investigation of the Kukanono slope, Kawainui marsh, Kailua, Ko'olaupoko, O'ahu. M.A. Thesis, University of Hawai'i, Mānoa.

Garland, A. W. H. 1995. An archaeological predictive model for the Mission Houses site in Honolulu and its value. *Hawaiian Archaeology* 4:34–44.

———. 1996. Material culture change after Euro-american contact in Honolulu, Hawaii, circa 1800–1870: A selectionist model for diet and tablewares. Ph.D. Dissertation, University of Hawai'i, Mānoa.

- Goodwin, C. 1994. *A Kalaupapa sweet potato farm: A report on archaeological data recovery operations, Kalaupapa airport improvement project, Kalaupapa, Moloka'i, Hawai'i*. 2 vols. with contributions by C. Erkelens, C. Favreau, C. H. Fletcher III, G. M. Murakami, M. Tomonari-Tuggle, and A. Ziegler. Honolulu: International Archaeological Research Institute, Inc.
- Gordon, E. A. 1993. Screen size and differential faunal recovery: A Hawaiian example. *Journal of Field Archaeology* 20:453–60.
- Graves, M. W. 1996. An overview of the contributions of Roger Green to method and theory in Oceanic archaeology. In *Oceanic Culture History: Essays in honour of Roger Green*, ed. J. Davidson, G. Irwin, F. Leach, A. Pawley, and D. Brown, 167–82. Auckland: New Zealand Archaeological Society.
- Graves, M. W., and D. J. Addison. 1995. The Polynesian settlement of the Hawaiian archipelago: Integrating models and methods in archaeological interpretation. *World Archaeology* 26:380–99.
- . 1996. Models and methods for inferring the prehistoric colonization of Hawai'i. *Bulletin of the Indo-Pacific Prehistory Association* 15:3–8.
- Graves, M. W., and C. K. Cachola-Abad. 1996. Seriation as a method of chronologically ordering architectural design traits: An example from Hawai'i. *Archaeology in Oceania* 31:19–32.
- Graves, M. W., and R. C. Green, eds. 1993. *The evolution and organization of prehistoric society in Polynesia*. Monograph, 19. Auckland: New Zealand Archaeological Association.
- Graves, M. W., and T. Ladefoged. 1991. The disparity between radiocarbon and volcanic glass dates: New evidence from the Island of Lāna'i, Hawai'i. *Archaeology in Oceania* 26:70–77.
- . 1995. The evolutionary significance of ceremonial architecture. In *Evolutionary archaeology: Methodological issues*, ed. P. A. Teltser, 149–74. Tucson: University of Arizona Press.
- Graves, M. W., and M. Sweeney. 1993. Ritual behavior and ceremonial structures in Eastern Polynesia: Changing perspectives on archaeological variability. In *The evolution and organization of prehistoric society in Polynesia*. Monograph, 19, ed. M. W. Graves and R. C. Green, 106–25. Auckland: New Zealand Archaeological Association.
- Gunness, J. 1987. Archaeological investigations at Kualoa Regional Park, 1875–1985. M.A. Thesis, University of Hawai'i, Mānoa.
- Hunt, T. L., and R. M. Holsen. 1991. An early radiocarbon chronology for the Hawaiian Islands: A preliminary analysis. *Asian Perspectives* 30:147–62.
- Kawachi, C. T. T. 1989. Pua'a 2: An upland habitation and agricultural complex in North Kona, Hawai'i Island. M.A. Thesis, University of Hawai'i, Mānoa.
- Kennedy, J. 1994. The archaeological recovery of smallpox victims in Hawai'i: Scientific investigation or public health threat? *Perspective in Biology and Medicine* 37:499–509.
- . 1997. Into the netherworld of island earth: A reevaluation of refuge caves in ancient Hawaiian society. *Geoarchaeology* 12:641–55.
- Kirch, P. V., and T. L. Hunt, eds. 1997. *Historical ecology in the Pacific Islands: Prehistoric environmental and landscape change*. New Haven: Yale University Press.
- Ladefoged, T. 1987. Settlement pattern analysis and relational data bases: An archaeological study in Hawaii Volcanoes National Park. M.A. Thesis, University of Hawai'i, Mānoa.
- . 1991. Architectural transformations during the early historic era. *Asian Perspectives* 30:117–32.
- Ladefoged, T., M. W. Graves, and R. P. Jennings. 1996. Dryland agricultural expansion and intensification in Kohala, Hawai'i Island. *Antiquity* 70: 861–80.
- Ladefoged, T., G. F. Somers, and M. M. Lane-Hamasaki. 1987. *A settlement pattern analysis of a portion of Hawaii Volcanoes National Park*. Publications in Anthropology, 44. Tucson: Western Archaeological and Conservation Center.
- Luomala, K. 1968–1969. Imponderabilia for a history of anthropology at University of Hawaii, 1922–1946. *News of the Pacific* 19:1–32.

- Major, M. 1995. The cultural construction of culture reconstruction: An ethnography of Hawaii archaeologists in the contract era. M.A. Thesis, University of Hawai'i, Mānoa.
- Masse, W. B. 1997. The celestial basis of civilization. *Vistas in Astronomy* 39:463–77.
- Masse, W. B., and H. D. Tuggle. In press. The date of Hawaiian colonization. *Rapa Nui Journal*.
- Moniz, J. J., M. S. Allen, and M. W. Graves. In press. Methodological issues in artifact analysis: Stylistic variability in Hawaiian fishhooks. In *Archaeology of stylistic variation in Oceania: Exploring applications and expanding method and theory*, ed. M. W. Graves and E. E. Cochrane. Salt Lake City: University of Utah Press.
- Pfeffer, M. T. 1995. Distribution and design of Pacific octopus lures: The Hawaiian octopus lures in regional context. *Hawaiian Archaeology* 4:47–56.
- . In press. Chronological assessment of Hawaiian octopus lure weights from primary-use contexts along the south shore of O'ahu, Hawai'i. In *The archaeology of stylistic variation in Oceania: Exploring applications and expanding method and theory*, ed. M. W. Graves and E. E. Cochrane. Salt Lake City: University of Utah Press.
- Rolett, B. V. 1996. Colonization and cultural change in the Marquesas. In *Oceanic culture history: Essays in honour of Roger Green*, ed. J. Davidson, G. Irwin, F. Leach, A. Pawley, and D. Brown, 531–40. Auckland: New Zealand Archaeological Society.
- Rolett, B. V., and E. Conte. 1995. Renewed investigation of the Ha'atuatua Dune (Nukuhiva, Marquesas Islands): A key site in Polynesian prehistory. *Journal of the Polynesian Society* 104:195–228.
- Society for Hawaiian Archaeology. 1982. Hawai'i's endangered past. 16 mm film and video. Copies in the University of Hawai'i Library, Honolulu.
- Spriggs, M. J. T. 1993. University of Hawai'i Archaeology Field Schools 1950–1984. *Hawaiian Archaeology* 2:18–27.
- Spriggs, M. J. T., and P. L. Tanaka. 1988. *Nā mea 'imi ka wā kahiko: An annotated bibliography of Hawaiian archaeology*. Asian and Pacific Archaeology Series, 11. Honolulu: Social Science Research Institute, University of Hawai'i.
- Sweeney, M. 1992. Settlement pattern change in Hawai'i: Testing a model for the cultural response to population collapse. *Asian Perspective* 31:39–56.
- Terrell, J. E., T. L. Hunt, and C. Gosden. 1997. The dimensions of social life in the Pacific: Human diversity and the myth of the primitive isolate. *Current Anthropology* 38:155–95.
- Tuggle, H. D. 1997. The 'Ewa Plain. *Hawaiian Archaeology* 6:8–36.

Some Comments on “Hawaiian Archaeology: Past, Present, and Future”

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At the 10th Annual Meeting of the Society for Hawaiian Archaeology held on April 11, 1997 in Kaua‘i, Patrick V. Kirch gave a keynote address entitled “Hawaiian Archaeology: Past, Present, and Future.” Based on my 43 years of involvement in Hawaiian and Pacific archaeology, I would like to comment on some of the points Pat made, especially those regarding Bishop Museum.

In the central section entitled “The Present: Hawaiian Archaeology at the End of the Twentieth Century,” Pat stated that “the practice of archaeology in Hawai‘i *nei* has taken on an organizational structure which, I fear, is . . . *kapakahi* . . . referring to the dominance of CRM or contract archaeology, and its corollary, the demise of research archaeology.”

A comparative discussion of past and recent activities of the University of Hawai‘i, Bishop Museum, and State Historic Preservation Division was presented along with perceived institutional decline in research oriented archaeology at the Museum and the University. I agree with much of what Pat had to say.

I have been with the Bishop Museum during the administrations of four different directors and one acting director and was Chairman of the Department of Anthropology from 1970 to 1989. During that period, it was a constant struggle with the administration to gain support. Without administrative understanding and support for departmental objectives, implementation was an uphill battle. We somehow survived the yearly budget crises to fund several long-range programs of research in Hawai‘i, as well as other areas of the Pacific. However, such struggles have unfortunately culminated in recent years with the demise of social science funding and an initiative on the part of the Museum administration to do away with the “non-revenue generating” research component of the Museum. I’m afraid

that our once great institution, like many others, has gone the way of private hospitals converting to HMOs where the financial bottom line, needed to support a top heavy organization, is the primary concern.

Regarding my departmental initiative, Pat stated that “Yosi Sinoto would point out the economic necessity of tapping into the free-flowing contract funding supply.” This was certainly true, but I must emphasize here that in the late 1960s and early 1970s there were no other organizations or individuals in Hawai‘i able to undertake such contract archaeological projects. It was naturally the Museum’s responsibility to cope with such demands. I was confident that we could undertake contract archaeology as well as research projects at the same time.

One thing we realized then was that contract archaeology was a business and it had to be undertaken within that concept. At the same time, there were substantial benefits to be gained from contract archaeology that could be used to operate the department and support the research staff. I will not go into the details here. However, the Museum’s administration took a long time to realize the benefits. I think that they still do not fully appreciate the potential benefits of a well-managed contract archaeology program. I believe this has hampered development of the department’s research programs, and also those of the Museum in general.

When I returned from the field in 1987, I found out that the Applied Research Group (ARG), a contract department, was established by the new administration using staff members from the Anthropology Department. Thus, the operational aspects of the contract program, as well as the benefits, were taken away from the Anthropology Department. Over the next several years, ARG was successful in generating a large flow of operating revenues. The administration saw ARG as a “cash cow” and demanded more revenues. This eventually led to the dismissal of the department head and contracts manager in a dispute over rate increases proposed by the administration in 1991.

That incident marked the beginning of the end for ARG, which was later placed back into the Anthropology Department under the direction of a staff

that had no concept of contract administration, much less the necessary familiarity with local business culture and contacts. Other than the H-3 contract and a few other continuing projects, there were no more substantial, new contract projects that were procured by the Museum. At the same time, many of the experienced and able staff archaeologists had been fired or left the museum.

Unfortunately, the last staff archaeologist with nearly 20 years of experience in Hawai‘i and Polynesia left the Museum in the summer of 1997.

Besides myself, although I had been transferred to the Natural Science Department until this fiscal year, there are no experienced archaeologists specializing in Hawai‘i and Polynesia left at the Museum. Thus, there are no archaeologists who can bring in grant money to do research in Hawai‘i. Also there is no replacement in sight for the senior archaeologist’s position which has been vacant since last year.

The Museum administration’s concept of what makes a great institution appears to be good collections in good storage facilities with space to house “canned” traveling exhibits from elsewhere. Currently, the human factors of experience, knowledge, and sense of institutional history in staff members are being totally discounted. Institutions like the Bishop Museum need continuity of tradition and acquiring of knowledge by experienced researchers for longevity. The current director has made his views known in the public media when he stated that archaeologists don’t need regional experience to be able to do a good job.

I believe it will take at least 20 years with a supportive administration to restore Bishop Museum’s reputation of academic excellence, a reputation built up over nearly a century and ruined in less than a decade. The termination, under the guise of centralizing all publication activities, of universally well-received scholarly publications, formerly published by the Anthropology Department, including the *Pacific Anthropological Records* (39 volumes published between 1968–1989), *Departmental Report Series* (45 reports published between 1970–1987), and other monographs, as well as the demise of the Bishop Museum Press, are distressing signs of institutional decline. Slick coffee table books authored and pub-

lished by outside sources have largely replaced the venerable *Bulletins* and *Occasional Papers*.

With the absence of contracts and lack of researchers, I wonder if the Department of Anthropology will be dissolved in favor of a collections management department following the completion of the H-3 contract in the near future. As Pat stated, “until there is a fundamental change in the Museum’s leadership,” I doubt that we will see a return to the mission envisioned by William T. Brigham, its first director; “the discovery and preservation of knowledge about Hawaiian culture,” in a manner accountable to Charles Reed Bishop’s will.

Every once in a while, we all need a little push to reflect on the past, present, and future of our profession. Pat Kirch, being intimately familiar with the archaeology scene in Hawaii, yet distant enough to make broad assessments, is the right person to give us that nudge. I hope that his views remind all of us to strive to meet our professional obligations and improve our interaction with each other, as well as to enhance the dissemination of knowledge to the interested public, especially the Native Hawaiian people.

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In citing radiocarbon dates, *Hawaiian Archaeology* uses the following conventions: B.P. (before 1950) indicates an uncalibrated radiocarbon age; CRA (conventional radiocarbon age) indicates a radiocarbon age that (i) uses 5568 as the ¹⁴C half-life, (ii) was measured against the NBS oxalic acid standard, (iii) uses 1950 as the zero date for radiocarbon time, (iv) is normalized for $\delta^{13}\text{C}$, and (v) has not been corrected for reservoir effects; B.C./A.D. indicates a measurement that has been calibrated to calendar years.

Cover image

A Man of the Sandwich Islands, with his Helmet, 1779. Engraving by John Keyse Sherwin after a drawing by John Webber. Courtesy of Barbara Pope.