ARCHAEOLOGICAL INVESTIGATIONS AT KAWAINUI MARSH, IN THE KUKANONO AREA, KAILUA, OAHU.

TMK: 4-2-13: 38

Earl Neller
State Historic Preservation Office
Dept. of Land and Natural Resources
June, 1982

Jeannett Simons

Marine Options Program

University of Hawaii

TABLE OF CONTENTS

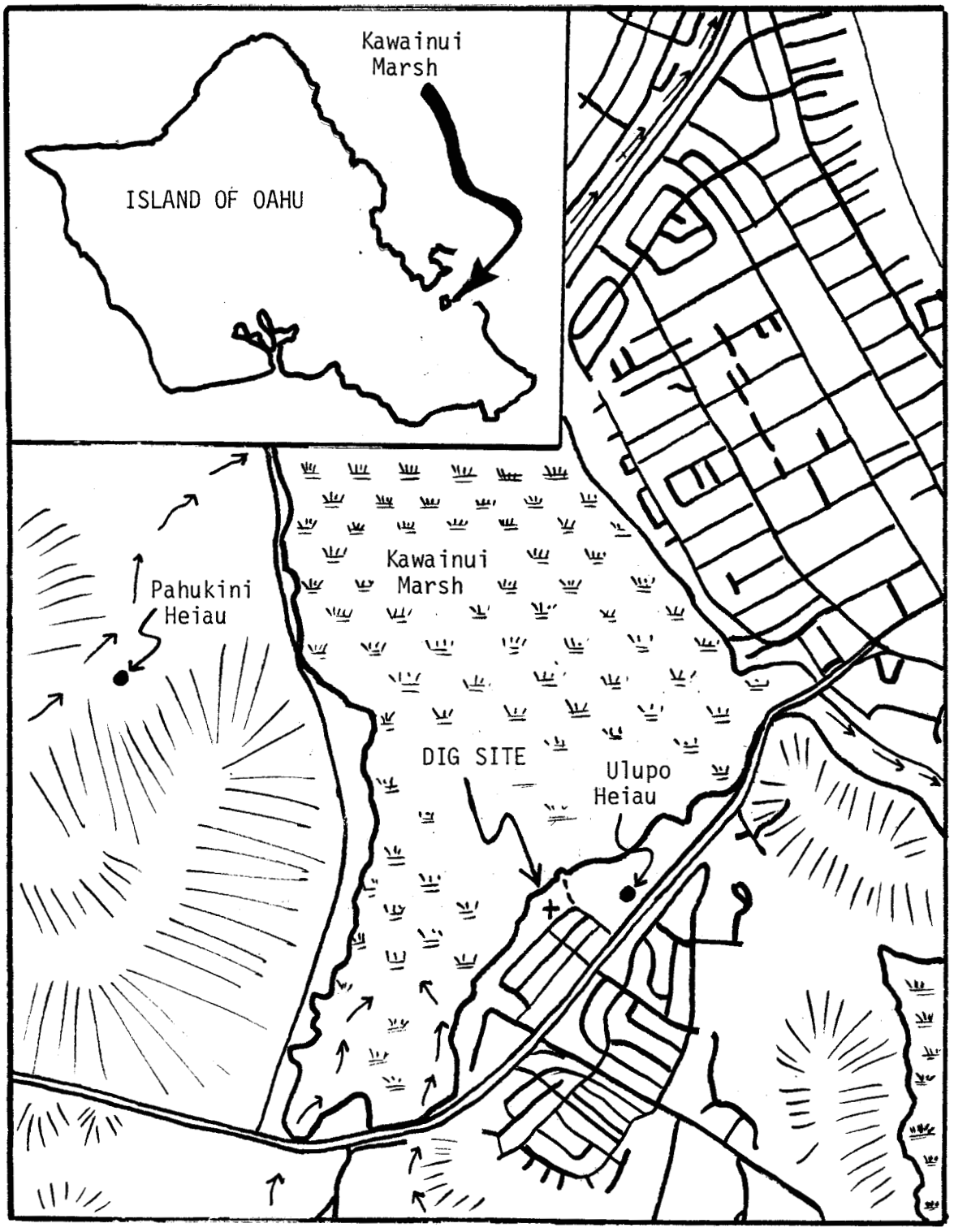


Figure 1. Location of the dig site on the edge of Kawainui Marsh, Kukanono, Kailua, Oahu.

field techniques. This is an ambitious undertaking for a two hour class, and proved difficult to accomplish. Another purpose was to document the history of human habitation in this part of Kawainui Marsh. Because of the site's prominent topographic location, it was hoped that artifacts would be collected related to all human populations who had lived in the area in the past. It was also hoped that this excavation would demonstrate the utility of conducting test excavations in disturbed areas.

The results of the February 14th excavation classes generated considerable interest among both the high school students and the archaeologist in charge, and it was decided to continue the excavation as time and volunteers were available. Subsequent fieldwork was conducted on April 10, 18, 28 and May 1. Charles "Doc" Burrows, science teacher at Kamehameha Schools was the overall coordinator for the project, and the one who really made it all possible. Sigried Southworth, librarian of the Hawaiian Collection at Kamehameha Schools, was also a primary organizer and supervisor of the project. Supervisory help was provided on various trips by Virginia Bail, anthropology teacher at Kamehameha Schools, Jason Ota, archaeologist for Division of State Parks, Denby Fawcett, Sierra Club, and June Johnson, University of Hawaii anthropology student. The excavators were too numerous to mention here, but I'll try anyway:

Adaline Kam	Chuck Burrows	Gail Hamada
Adrian Birch	David Almazan	Geri Lutu
Amberle Masuda	Danielle DeFreitas	Grace Sawai
Amelia Tangaban	Deborah Downey	Guia Melo
Andrew Lui-Kwan	Deborah Kunichika	Hillery Parker
Arthur Wilson	Denby Fawcett	Jana Spencer
Bob George	Denise Salazar	Janice Ikawa
Bob Weber	Donna Ashizawa	Jeff Peckham
Bonnie Wong	Earl Neller	Jeffrey Ono
Brandy Young	Ed Lee	Jeannett Simons
Carey Koide	Edwin Lindsey	Jenny Chan
Christi Ching	Eugene Park	Joanne Lee
Chu Weber	Frank Conkey	John Babila

John Cummings	Lon Renard	Robert Carter
Kaui Kaowili	Lorna DeSilva	Robert Norber
Kealoha Robles	Mark Chock	Roberta Gilbert
Keith Foo	Mark Lee	Ronette Furuta
Kenneth Hee	Mark Miller	Russell Meyers
Kevin Hee	Mark Morimata	Ryan Ku
Ladd Akeo	Mary Wong	Scott Kealoha
Lance Lynch	Mashuri Waite	Sharlene Rohter
Leigh Ganigan	Michael Doctolero	Sigried Southworth
Leo Goeas	Michael Nahoopii	Thomas Chun III
Lisa Keawe	Nanea Nahuina	Virginia Bail
Lindsey Lau	Renee Baldovi	Wendy Hee
Liza Melo	Richard Hertzog	Yvonne Ching
Lloyd Keliinui	Rick Saunders	+4 unknown diggers

Without their help, this report would not have been possible. The project also benefitted from the help of the Bishop Museum and staff members Toni Han, Steve Athens, Carla Kishinami, Laura Carter, and Virgil Meeker. Ms. Nishikawa and Norman Kawauchi, former residents of the area, provided interesting historical information. I would also like to acknowledge the cooperation and support provided by Gordon Wong, property owner.

CULTURE HISTORY

The Kailua area is known in Hawaiian tradition as a place where the menehune (legendary race of small people) were assigned to live when they came to Oahu from Kahiki. Perhaps at that time the environmental conditions at Kawainui were not as favorable for settlement as were adjacent areas along the windward coast, and there was still plenty of undeveloped land available. However, in historic times, the land is known to have been highly productive and favored by the ali'i. Kailua had one of the most extensive continuous lo'i (taro patches, or pondfields) systems on Oahu, extending inland from Kawainui Pond for 1½ miles. The pond itself was known for its large awa (milkfish), its wild ducks and nene (Hawaiian goose).

The study area is part of L.C.A. 6099, a land commission award made to the Hawaiian Miomioi in 1854. The award consisted of two pieces; a houselot on the slope of Kukanono and a taro patch in the level land below. Kukanono is a small land division in Kailua ahupua'a, given to Queen Kalama during the Great Mahele. Miomioi was a commoner, and received his parcel under the Kuleana Act of 1850. His land was adjacent to the kuleana claimed by Kahele, also in Kukanono, which also included a house lot and some taro patches. Kapolo, Kaleiokane, Makea, and Ukikolo also claimed nearby parcels of land. Thus, in historic times, the immediate area around the dig site was known to be settled by maka'ainana (commoners). Figure 6 is a sketch map of the kuleanas in the dig area. The boundaries shown are approximate. Existing maps of the area do not agree on boundary details.

Not long after the Great Mahele, from 1860 to 1900, Chinese rice farmers were the major inhabitants of the Kawainui area, numbering about 100 in 1880. One of the parcels leased for rice farming was in the lowland area adjacent to the dig site, and suggests that Chinese rice farmers might have been living around the study area at one time. Kailua continued to be a rural agricultural area, where truck farming, dairying, and sugar cane were the major commercial activities for the next 50 years. Several Japanese-American families are known to have lived in the area,

Nishikawa and Nishimura in Kukanono, and Kawauchi in Pohakupu to the south. Nishikawa's well known fruit stand was nearby the dig site, on the road to Kailua. There was a trash dump in the area. Following World War II, Kailua rapidly developed into an urban residential area. In 1959 much of the Kukanono area became a housing development as well. All of these events contributed to the kinds of archaeological remains found in the study area.

METHODS AND PROCEDURES

An arbitrary grid was staked out adjacent to the wire fence that goes along the top of the Kukanono slopes (See Figure 2). Test excavation units of 2 meters by 1 meter (6 ft. by 3 ft.) were spread out over the study area. Students were given a brief introduction to archaeology, including a discussion of the results of previous archaeological research in Kukanono and an examination of Bishop Museum's salvage excavations on the slopes. The test pits were to be dug to the level of the first readily visible natural layer encountered, using shovels, and then all soil exposures were to be carefully trowelled and drawn. All dirt was to be sifted by hand using quarter-inch screens, and all remains of human activity in the area were to be saved in paper bags. The main idea was to move dirt, provide practical experience in the importance of archaeological context and the study of soil stratigraphy, look for pristine features beneath the disturbed soil layer, and get an artifact sample sufficient to derive a sequence of local culture history.

RESULTS

Stratigraphy.

Our test excavations substantiated the results of Bishop Museum's previous fieldwork. The entire project area had been disturbed by farming and grading. We found two basic stratigraphic units.

Horizon I was a dark brown clay layer, granular, sticky, and moist, with angular basalt pebbles. The layer contained a homogeneous mixture of both prehistoric and historic human remains. The artifacts were slightly concentrated in the upper half of the deposit, suggesting that erosion may have deflated the deposit to some extent.

Horizon II was a dark yellowish-brown clay layer, granular, sticky, and moist. The contact between horizons I and II was abrupt in parts of the study area, and probably represents an unconformity due to grading or erosion. Horizon II did not contain artifacts or archaeological features, with the exception of the anomalous soil feature in Test Pit 5, a sterile red earth area of undetermined origin. It is unfortunate that when our study ended we had not completed our excavation of this unusual red feature. Only two test pits, T.P. #2 and T.P. #5, were dug much below the cultural layer, so the probable existence of undisturbed archaeological features below the disturbed upper layer was never verified. We just didn't move enough dirt to get deep enough in most of our trenches. Consequently, the intended search for pristine features beneath the disturbed soil layer was never begun.

Artifacts.

In terms of artifact production, our dig was highly successful. We recovered a large enough sample of artifacts to provide a tentative sequence of local culture history, including Hawaiian and Japanese-American remains. Unfortunately, these remains were mixed and not excavated from a good stratigraphic context.

The prehistoric Hawaiian artifact assemblage was dominated by basalt waste flakes, made from an exotic source of dense, dark gray, aphanitic (no visible crystal structure) basalt. The local lava rock around the

dig site was also a dense, dark gray basalt, but it was more crystalline with many tiny dark crystals visible in the matrix. The artifact material may have come from such nearby sources as Ulumawao or Olomana; however, the only known Hawaiian basalt quarry on Oahu is in the Waianae range in Honouliuli. Another basalt quarry is known to exist in Waiahole, but it is small. It is conceivable that most of the basalt flakes found on prehistoric Hawaiian sites came from only a few important basalt sources. It is also possible that the Hawaiians mined many small, local basalt sources, and that these quarry sites have not been identified yet because such a small amount of our land has ever been surveyed for archaeological sites.

We found no poi pounders, stone lamps, or other kinds of stone objects characteristic of habitation sites, suggesting the area might have been a stone tool workshop (a place for making stone tools such as adzes), or an intermittent camping and foraging area. However, not enough of the study area was excavated to come to any firm conclusions. We know from historical records that Hawaiians were living in the study area in the 1800s.

Our excavations yielded two adz blanks (shaped rocks ready for grinding into adzes) and three small pieces of broken adzes. We also found two broken adz fragments on the surface downslope from the dig site. This suggests that gathering wood and woodworking were former activities at the site.

A number of basalt flakes on the site have slightly worn edges, suggesting they were used as tools. Archaeologists in Hawaii have recognized the significance and research potential of these basalt flake assemblages, and are investigating techniques of laboratory analysis that will improve our understanding of this class of artifacts. We found two broken hammerstones and a few stone abraders and polishing stones. This stone tool assemblage is best explained as the accumulated remains of continued foraging activities in the area, not necessarily associated with a permanent habitation site or horticulture.

The non-stone objects from our excavations were minimal, but more characteristic of what one might expect to find at a habitation site. There was one piece of cut bone that was probably a fishhook blank (to be

made into a fishhook), and probably made from human bone (tibia). There was one bone fragment that had been used as a tool, perhaps a scraper.

The majority of artifacts recovered in our dig came from the historic period. There were a large number of black glass sherds (broken pieces of dark green glass) that date to the 1800s, and a few other aquamarine and pale green sherds that likely date to the 19th century as well. Three black glass bottle finishes (the mouth of a hand-made bottle) were found, and a portion of a "J.J. MELCHORSWZ COSMOPOLIET SCHIEDAM" gin bottle, all dating to the 1800s. It is a good possibility that these glass sherds and some of the ceramics are the remains of the native Hawaiian farmers who were living in the area in the 1850s.

We also recovered a large number of artifacts related to a more recent occupation of the site area, around the forties and fifties. These remains include amber glass sherds from Clorox bottles and Seagram's whiskey flasks, a Diamond Head soda bottle embossed with "MADE IN JAPAN," a John Walker whiskey bottle, other glass sherds, pieces of metal, and a few ceramic sherds. Some of these items may be the remains of local community trash dumping in the area, some may come from the ruins of the nearby Nishimura family house and farm. Our ceramic sample was small, but enough to suggest that Japanese wares were prefered by the local Japanese-American farmers, who probably did a lot of their shopping at small neighborhood stores run by Japanese-Americans. I also noted a slight difference in paints and glazes that may become important for dating historic period sites in Hawaii. Concrete conclusions will have to wait until a larger sample of ceramics is excavated from a good archaeological context.

There was little or no trash related to the Chinese rice farmers who lived somewhere in the area in the late 1800s.

A detailed description of the artifacts found is provided in the Appendix.

An intriguing discovery was the presence of a large amount of unworked, waterworn coral in Layer I. The students had collected 7.8 pounds (3533.1 gm) of it before I told them not to save anymore. There were also a few waterworn, broken, marine shells found. All of the shells were bivalves characteristic of a moderately shallow marine environment. They looked

more like a waterworn beach component than part of a human midden deposit. It seems possible these remains are a remnant of a former beach deposit related to the Waimanalo 25-foot shoreline of 120,000 years ago. Beach conglomerates of the Waimanalo stand are abundant on Oahu, and sometimes weakly cemented and easily confused with later deposits.

Perhaps our most exciting moment was Ladd Akeo's unexpected discovery of the large grinding stone on the Kukanono slopes, completely overlooked by all of us who had been to the area previously. The large stone provided graphic proof that stone tools were being made at the site.

EVALUATION OF RESEARCH

Our fieldwork suggests the research potential of the study area is greater than we had anticipated. The presence of the large grinding stone and the abundance of basalt flakes in the area show that continued excavation is warranted. The nature of prehistoric Hawaiian habitation in the area is still sketchy. Further excavation may not encounter undisturbed archaeological features and deposits (though it seems probable at this point), but certainly they would provide a better understanding of the limits of the basalt debitage area, the total stone tool assemblage, the technological process involved in stone tool making, and perhaps a few basaltic glass dates.

We did not move enough dirt to verify the presence or absence of buried, undisturbed archaeological features in the study area. The abundance of artifacts in the disturbed cultural layer verifies the former use of the area by prehistoric Hawaiians, 19th century native Hawaiian farmers, and 20th century Japanese-American farmers, and suggests that habitation sites existed somewhere in the immediate area. The disturbed layer is relatively thin, and it is a good possibility that undisturbed portions of house foundations, trash pits, fireplaces, and other archaeological features will be found once a large enough area is excavated. It should be noted that from historical records we know that the Hawaiian Miomioi had a house in the study area in the 1850s. And from ethnographic accounts we know that the Nishimura family had a house in the study area in the 1940s and 50s. Both additional archival research and excavation seems warranted.

The study area produced more artifacts than we expected, but not enough to provide comparative collections sufficient for the study of ethnic differences, culture change, human migration and adaptation, and so on. However, the possibility is tantalizing. Our dig's modern ceramic assemblage strongly reflects the Japanese heritage of the area's' recently departed farmers. There is an aspect of archaeology that depends on luck. Excavating a small number of additional test pits in the study area is not likely to improve our ceramic sample much. In my opinion,

however, large scale excavation of the study area would provide data sorely needed for the development of historic archaeology in Hawaii.

This field investigation was intended to provide high school students with practical experience in field techniques and stratigraphic interpretation. We got bogged down by too many artifacts, and not enough tools or time. I question whether this kind of field training is a good idea. My reservations are numerous.

Most of the excavations were not as neat as they should have been. Good excavation technique comes from practice and experience. It takes time, time that we didn't have. There is a learning process involved. It can't be done in a few hours or a day. Most of the students never had the benefit of watching professional excavation as it is supposed to be done. I just didn't have the time to give each student the necessary guidance and supervision. I didn't have enough time for class preparation or on site demonstrations. Good excavation technique also takes the right equipment. Every student needs his own set of tools. Our lack of sufficient equipment seriously impaired the value of the educational experience we were trying to provide. I saw several instances of frustration due to lack of proper tools. The students did not take their own field notes. They didn't clean up their tools afterward. They didn't wash, sort, and analyze the artifacts they collected. They didn't write up the results of their fieldwork. They didn't curate their artifacts or make a museum display. All of these activities should be a part of any teaching exercise in field archaeology, and it takes more than an eight hour day to fit them all in.

I believe this kind of field exercise is dangerous because it helps to reinforce a couple of bothersome public misconceptions about archaeology that I have to struggle against everyday: 1) the idea that the goal of archaeology is to collect artifacts, and 2) the idea that archaeology is the art of digging. These two aspects of archaeology form a very small part of the archaeological process. I have come to realize over the last few years that the layman's failure to recognize the true nature of professional archaeology is responsible for an inordinate amount of wasted time, wasted money, lost sites, and hostile feelings. In part,

it is the archaeologists themselves who often help to promote the wrong public image by catering to the public's demand to be included in the archaeological process at the digging stage. I believe that amateur archaeology is just as dangerous an idea as amateur brain surgery. I believe those people who want to take part in the excavation phase of the archaeological process need to make a stronger commitment than spending a few hours digging for artifacts.

Now that I've tried to clear the air a little, let me say that I think it's very important to the survival of our dwindling archaeological resources to include high school students in the archaeological process. On the positive side, we got our hands dirty, we had fun, and we made some significant discoveries. I would like to see this continue. But I think we need to change our approach. I have in mind three field exercises that would provide worthwhile training without the extensive commitment required for an excavation.

One is visiting construction sites and writing a report on the archaeological data exposed in the construction trenches. Such reports would be legitimate contributions to the archaeological literature and the study would provide the proper framework for understanding what archaeology is all about. And the potential for exciting discoveries is always there. The bottle hunters have made some of their best finds in backdirt piles at construction sites.

Another useful field exercise would be to focus on an isolated, individual ruin and study it, map it, photograph it, and rehabilitate it for public use, including trail building, landscaping, and making signs. There are a lot of ruins around that could use this kind of public care and attention.

A third kind of field exercise I would like to promote is an ongoing site survey designed to locate and record the thousands of archaeological sites in Hawaii that need to be studied before they're destroyed by development. Probably less than 5% of the land area in Hawaii has ever been surveyed for archaeological sites. Such a field exercise could be quite exciting as Ladd Akeo's discovery of the grinding stone and the broken adzes has shown. Such an exercise would provide students with a

better model of the archaeological process and provide more personal feedback in terms of a tangible finished product. And the resulting site reports would become a permanent part of Hawaii's statewide inventory of archaeological sites. Survey work needs to be done in every part of the state, and this is an exercise that would be appropriate wherever the Ecology Camp might be held in the future.

TABLE 1

Weight of items collected by students at the dig site.

basalt rocks*	48.5 lbs	21984.8 gm	4561.2 g/m^3
coral*	7.8 lbs	3533.1 gm	733.0 g/m^3
stone flakes and tools	7.1 lbs	3212.4 gm	666.5 g/m^3
metal	7.4 lbs	3347.4 gm	694.5 g/m^3
concrete/bricks	5.0 lbs	2282.2 gm	473.5 g/m^3
broken glass	4.4 lbs	1996.9 gm	414.3 g/m^3
ceramics	11.0 oz	313.9 gm	65.1 g/m^3
bone and shell	2.5 oz	72.2 gm	15.0 g/m^3

Total volume of cultural layer excavated = 4.82 m^3

Total volume of dirt excavated = 7.21 m^3

*does not represent total amount excavated since a 100% sample was not saved.

TABLE 2

Densities of items collected by students.

basalt flakes & tools	106	22.0/m^3
glass sherds	516	107.1/m^3
ceramics*	56	11.6/m^3
bone	13	2.7/m^3

*includes surface collection

Total volume of cultural layer excavated = 4.82m^3

TABLE 3

List of stone artifacts recovered from dig site.

74	basalt flakes
27	basalt flakes with visible edge wear
1	basalt flake with abraded point (drill)
3	basalt adz fragments
2	basalt adz blanks
1	basalt hammerstone
2	basalt abraders*
1	basalt scraper*
45	waterworn basalt beach pebbles
2	basalt adz fragments (surface collection)
4	basalt abraders* (surface collection)
1	basalt hammerstone (surface collection)
2	small basalt polishing stones (surface collection)
1	gray gneiss sharpening stone (from historic period?)
3	weathered coral files (?)

All basalt flake tools and adz fragments were made from a dense, dark gray, aphanitic basalt with a fair conchoidal fracture. It came from an exotic source and was different from the basalt found in the local area. It was slightly magnetic. There was one basalt flake made of a very fine grained dark gray basalt with a good conchoidal fracture, also from an exotic source outside the dig area.

*The asterisk denotes basalt tools made from a dense, dark gray basalt with tiny crystalline inclusions and a weak conchoidal fracture. It is the kind of basalt found in the local area, and is the kind of basalt used in the building of nearby Ulupo Heiau. It is slightly magnetic.

TABLE 4

Bone material from the dig site.

7 - tiny fragments of burned bone
1 - bird bone fragment, left coracoid, gallinaceous bird, probably a pheasant or large chicken
4 - unidentifiable bone fragments, including one probable broken bone scraper
1 - bone fishhook blank, possibly made from a human tibia

Table 5. Glass artifacts.

70	black glass sherds, mold-blown bottles, mostly ale bottles, a few case whiskey or gin bottles, glass surface has a pebbly appearance and "whittle marks", three applied finishes with sloping collars characteristic of brandy containers. Mid-1800s.
23	pale green glass sherds, olive green glass sherds, includes a champagne bottle fragment and two case gin bottle fragments from a J.J. MELCHORS WZ COSMOPOLIET SCHIEDAM bottle. Late 1800s.
13	aquamarine glass sherds. Probably late 1800s.
7	clear glass sherds with irredescent weathering. Early 1900s.
10	green glass sherds. 1900s, modern.
208	amber glass sherds, includes Clorox bottle fragments, several whiskey flask fragments of JOS E. SEAGRAM & SONS LTD 9404-L 149 68 (1) 100 Federal Law Forbids Sale or Re-use of This Bottle. 1900s, modern.
185	clear glass sherds, includes cut glass fruit bowl fragment, mustard jar fragments, window glass, Canada Dry soda bottle fragments, two interesting surface finds DIAMOND HEAD BEVERAGES PROP. OF C.C. BOTT. CO. HON. LTD. MADE IN JAPAN 68, soda bottle, and a whiskey bottle JOHN WALKER & SONS LTD KILMARNOCK SCOTLAND 4/5 Quart Federal Law Forbids Sale or Reuse of This Bottle. 1900s, modern.
4	marbles, cats eye type except for one older type with gold and white swirls probably meant to look like marble. 1900s, modern.

Table 6. Ceramics.

Earthenwares.

I. White improved earthenware. Sherds have a white paste which is porous, looks chalky, and sticks to the tongue. Probably both American and European wares are represented. Probably from 1800s.

1 - plate fragment, blue on white underglaze, dark blue-violet with diffuse edge, crackled glaze (Plate 15, c.)

1 - bowl fragment, blue on white underglaze, light blue-violet, crackled glaze (Plate 15, d.)

12 - tableware fragments, white, crackled glaze (Plate 15, e.)

1 - plate fragment, light green glaze (Plate 15, f.)

1 - plate fragment, blue on white underglaze, transfer print, crackled glaze (Plate 15, g.)

II. Common pottery. Buff, porous paste with crushed rock temper. Salt glaze with pitted surface. Probably from 1800s.

1 - fragment of large jar or crock, blue on white underglaze, dark blue (Plate 15, a.)

III. Yellow wares. Tan paste and glaze, crackled glaze with occasional dark inclusions.

4 - tableware fragments, thick sherds (Plate 15, b.)

Stonewares.

Buff to gray (cream) paste, vitreous, will not stick to the tongue, probably from the 1800s.

3 - water or wine bottle sherds, thin sherds, clear glaze, one sherd is gray with a clear glaze that has tiny white inclusions (Plate 15, h.)

Porcelain.

White paste, vitreous. Clear glaze with very tiny bubbles. Probably all made in Japan, 1940s and 1950s.

2 - bowl fragments, blue on white underglaze, blue-violet, parallel horizontal lines (Plate 15, j.)

2 - plate fragments, blue on white underglaze, light blue-violet, hand painted, floral and geometric patterns, indented rim with brown stripe (Plate 15, k. & l.)

1 - plate fragment, blue on white underglaze, blue-violet (Plate 15, m.)

2 - bowl fragments, blue on white underglaze, light blue-violet, stripe and scroll design, hand painted, bubbles in glaze clearly visible, may be older, may be Chinese (Plate 15, n.)

2 - plate fragments, blue on white underglaze, dark blue, geometric and floral design, hand painted, bubbles in glaze clearly visible, may be older, may be Chinese (Plate 15, o.)

1 - shallow bowl fragment, polychrome underglaze, orange-brown on rim, natural design, dark blue-violet and dark orange-brown (Plate 15, p.)

2 - rice bowl fragments, interior design is blue on white underglaze of unknown pattern, a light blue-violet color, exterior design is vertical converging stripes, like grass, dark blue-green color, hand painted (Plate 15, q.)

1 - rice bowl fragment, exterior has a smokey white glaze, interior is white (Plate 15, r.)

1 - tea cup fragment, green on white underglaze, horizontal green bands that are slightly recessed (Plate 15, s.)

13 - tableware fragments, white

1 - plate fragment, design painted overglaze, oxidized in fire to orange color (Plate 15, u.)

1 - bottle fragment, dark brown glaze (Plate 15, t.)

4 - bathroom facilities, thick sherds, glaze crackled with tiny white inclusions, white (Plate 15, i.)

Table 7. Metal objects, and other items.

2	cartridge cases, brass centerfire 30-06, F A 20 and F A 35, from Frankford Arsenal, 1920 and 1935
24	nails, various
4	iron staples
2	bolts
1	hexagonal nut
1	barbell
1	wire
2	braces
3	hinges
2	bearings
1	washer
11	can fragments
3	pipe fragments
1	fastener
1	sardine can key
1	hose clamp
106	miscellaneous iron fragments
2	aluminum tube (shampoo)
1	plastic credit card, ANDREW A. NISHIMURA 1959, Standard Oil of California, Chevron National Credit Card
5	miscellaneous plastic, toy fragments
1	plastic record fragment
4	rubber
4	linoleum

TABLE 8

Marine shells found at the dig site.

1	Cerithids, probably Plesiotruchus luteus
12	Ark shells, Barbatia sp.
3	Toothed pearl shells, Isognomon perna
4	Rock oysters, Chama iostoma
3	Lucinids, Lucina edentula
1	Tellens, Tellina crucigera
5	unknowns

53 landsnail shell fragments were also found. It is assumed they were all recent and modern.

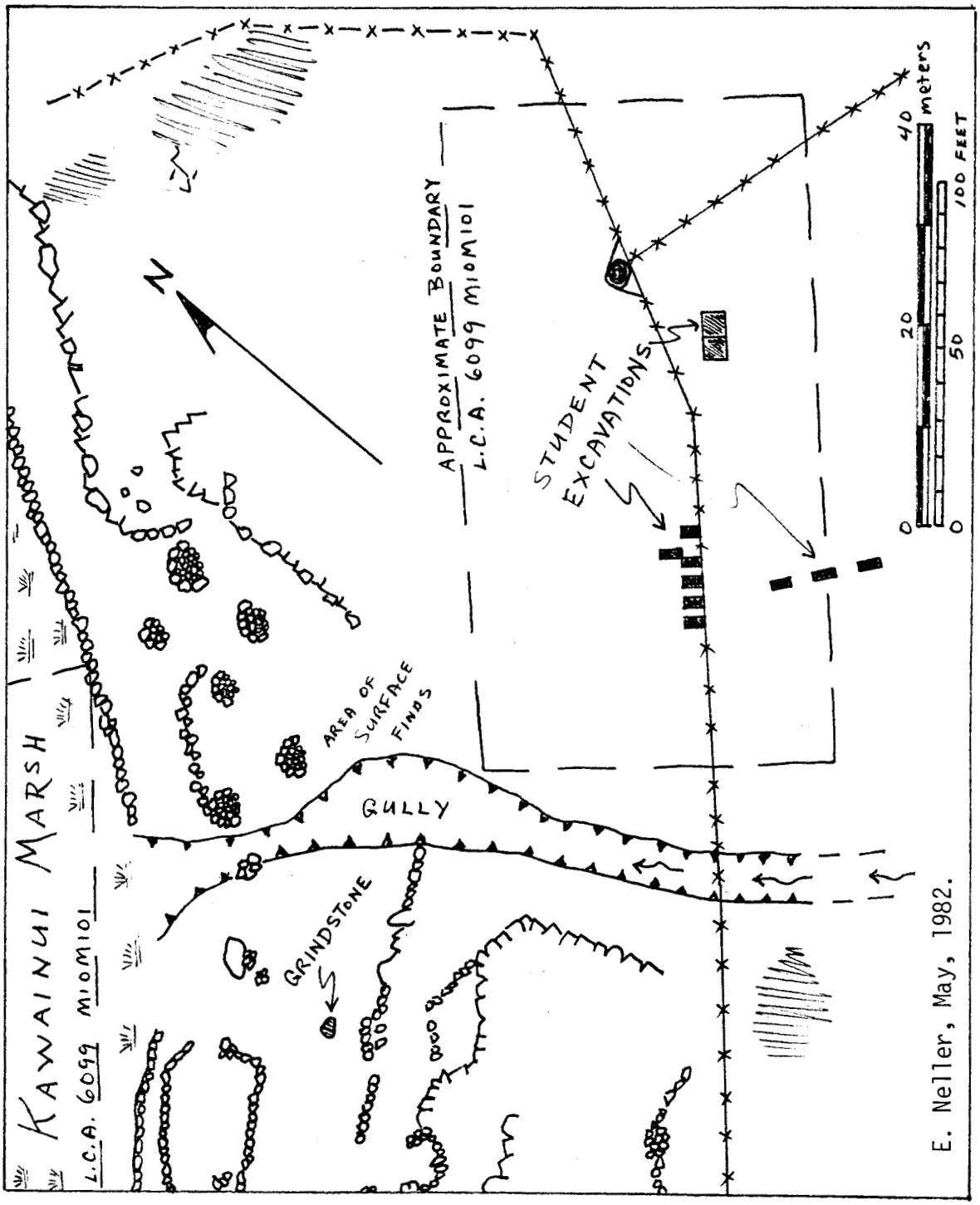


Figure 2. Location of dig site within site 50-Oa-G6-32, feature cluster 4. Sketch map based on BPBM map (Clark, 1980).

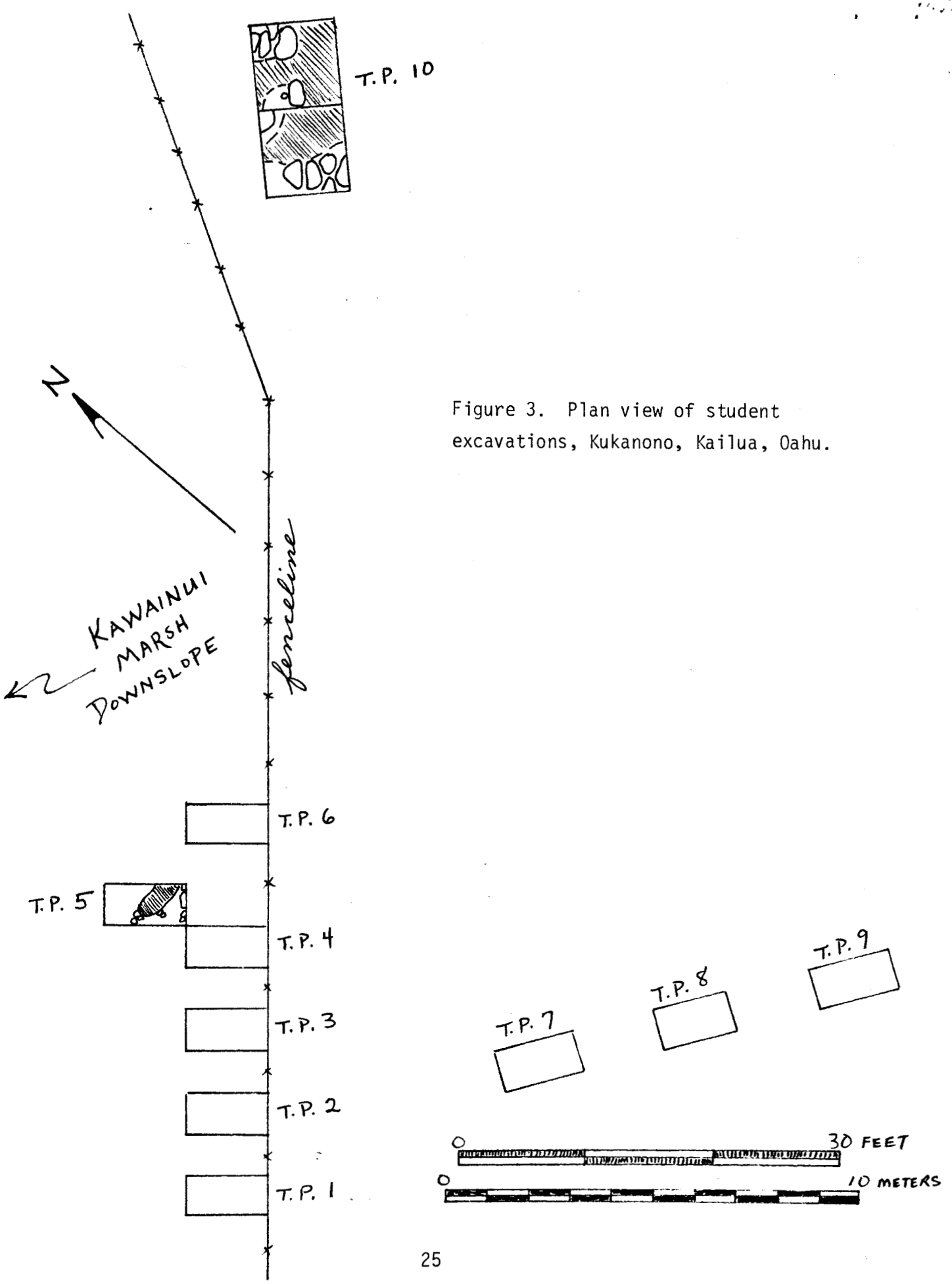


Figure 3. Plan view of student excavations, Kukanono, Kailua, Oahu.

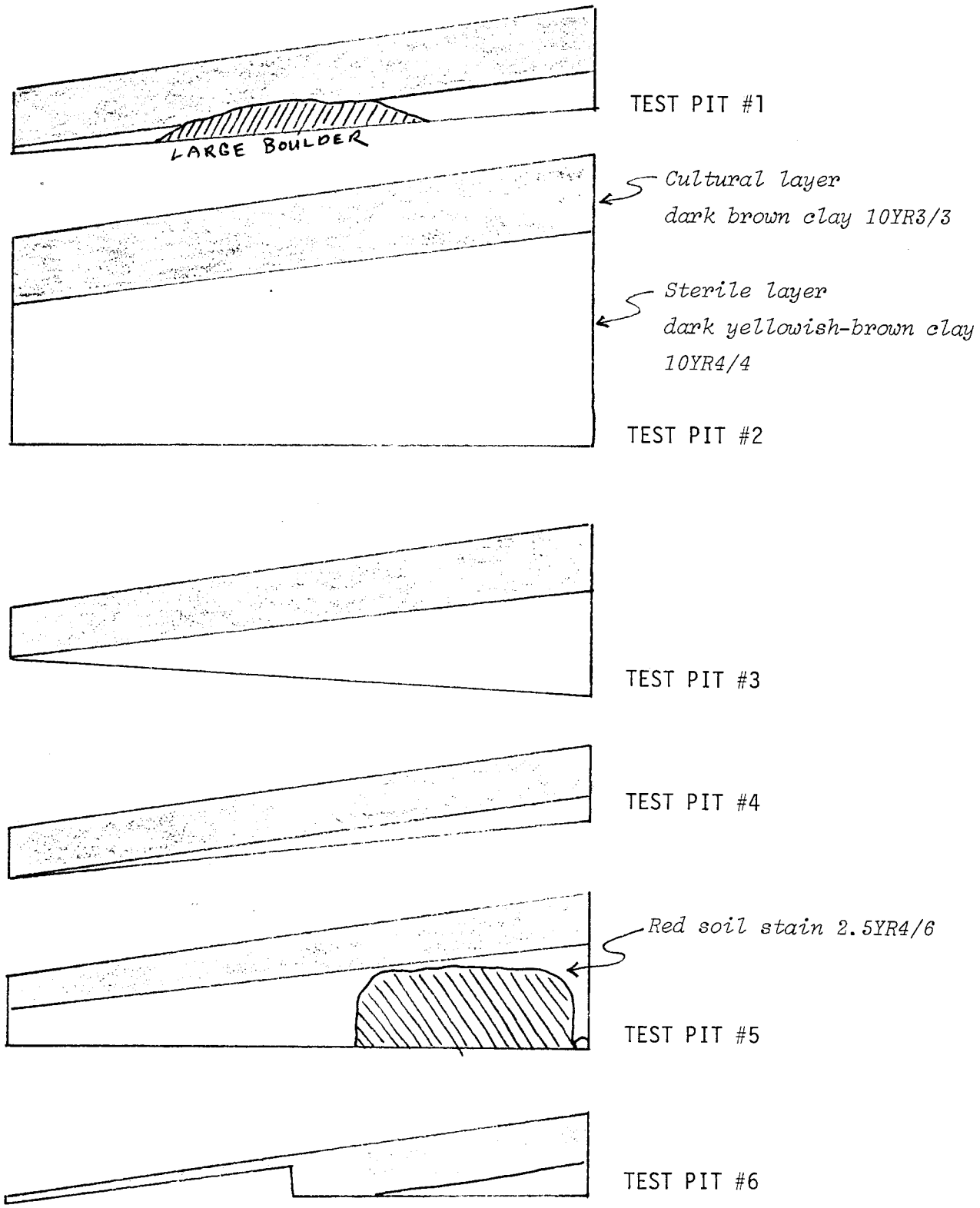


Figure 4. Soil profiles of test pits, looking northeast. Kukanono, Kailua, Oahu.

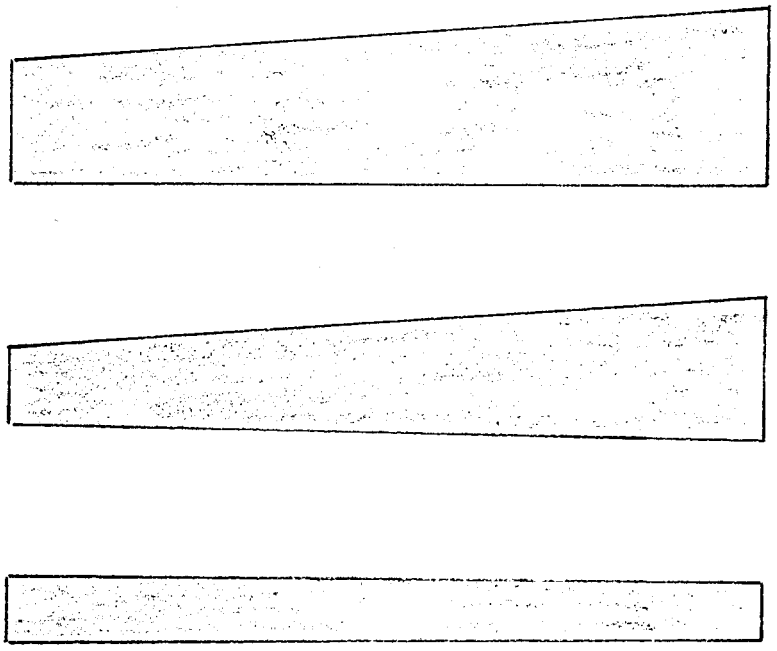
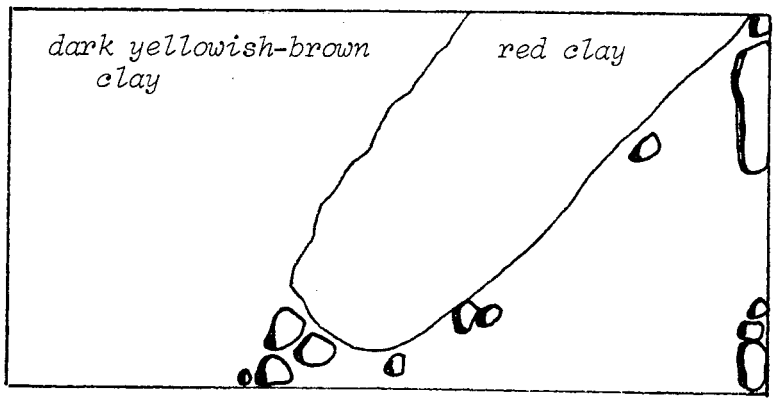


Figure 5. Soil profiles of test pits, looking northeast. Kukanono, Kailua, Oahu.



TEST PIT #5
Plan View at S.D. 39 cm.

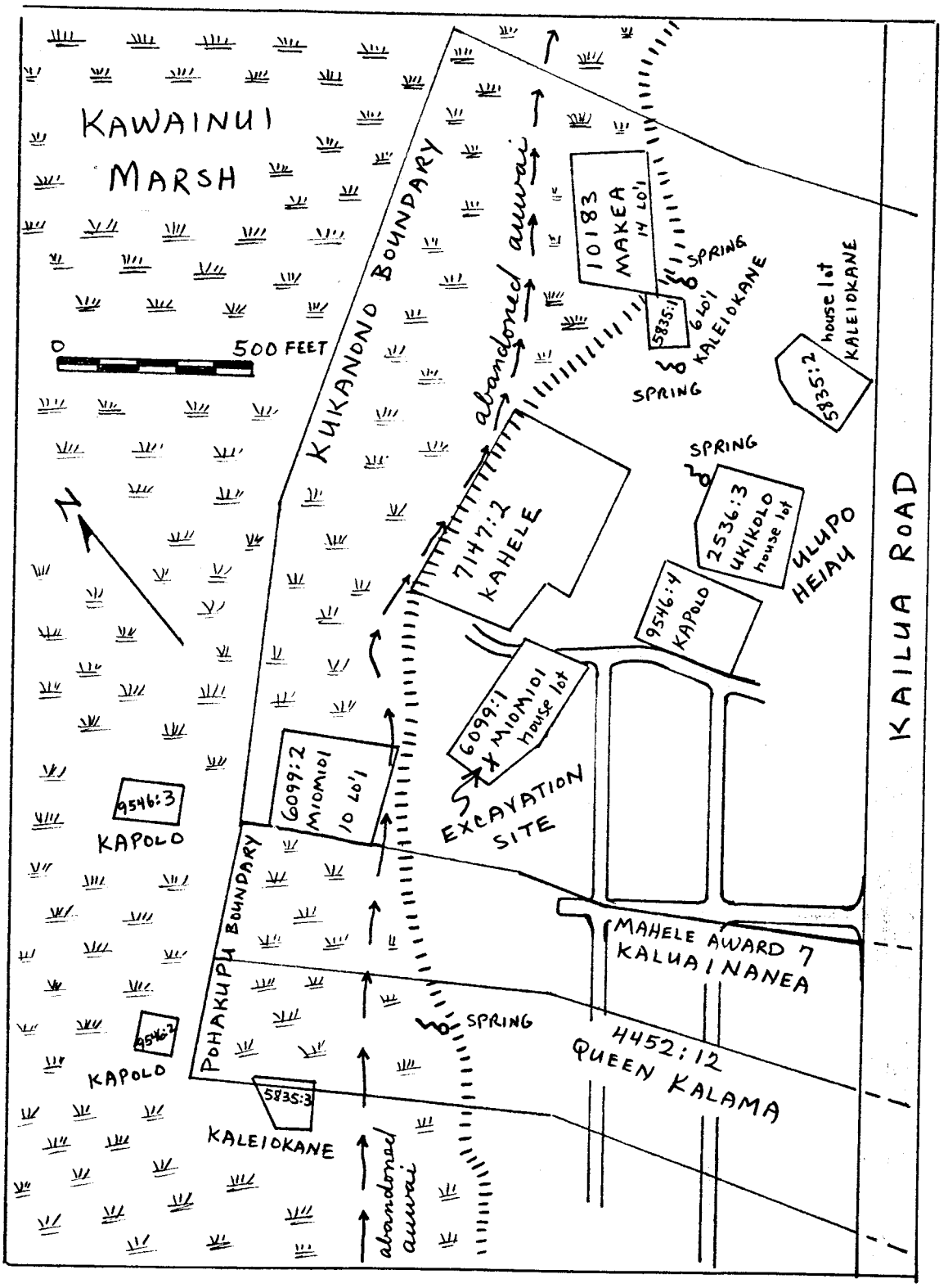


FIGURE 6. SKETCH MAP OF LAND AWARDS RECORDED IN THE DIG AREA.

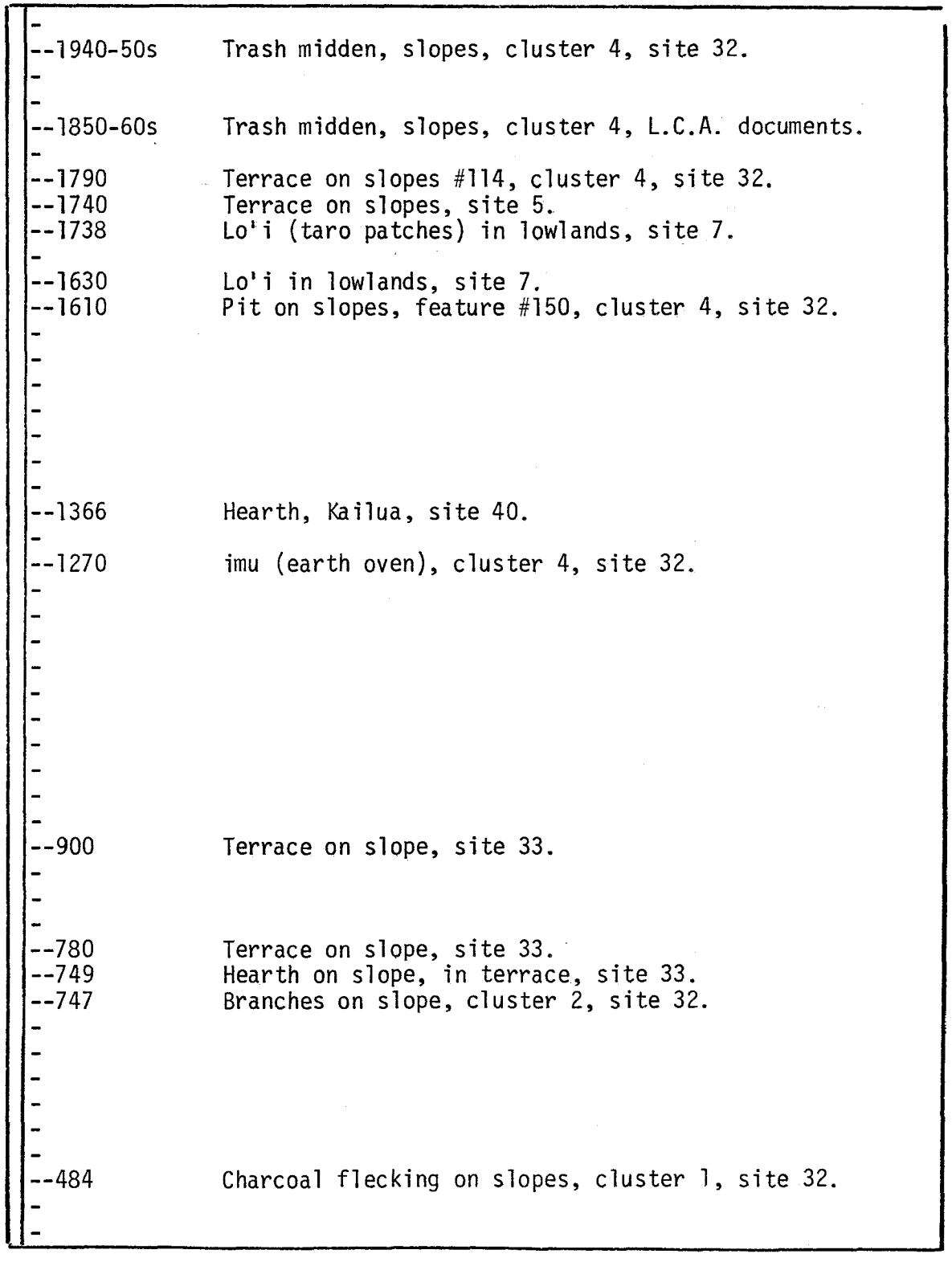


Figure 7. Graphic presentation of arithmetic means of basaltic glass dates and radiocarbon dates from Kawainui Marsh area.

ARCHAEOLOGICAL DATING AT KAWAINUI MARSH

In a recent press release (May 12, 1982) the Environmental Center at the University of Hawaii announced that Dr. John Kraft's geological research at Kawainui has led to conclusions that "have disrupted earlier established theories as to when, where, and how the first polynesian pioneers arrived and settled in these islands," and that "the Kawainui area is one of the most significant and earliest shore zones settled by the first polynesian pioneers in Hawaii, perhaps as early as 300 A.D." The press release includes one of Dr. Kraft's illustrations showing the former coastline at Kawainui with the location of archaeological site G6-32 with the notation "earliest Hawaiian site, 339-669 A.D."

In a recent memo (June, 1982) to DPED, architect Bob Herlinger reported that "now archaeology has substantiated the antiquity of the oral traditions, as the oldest known Hawaiian agricultural sites, ca. A.D. 239, have been discovered here."

Sounds good, doesn't it? Let's look at the evidence.

There are now 17 dated carbon and basaltic glass samples that have been excavated from archaeological sites in the Kawainui Marsh area. (See Figure 7. Not included are dates from a geologic context and one anomalous date.) Only one of these dates is early enough to be considered the earliest archaeological date in the Hawaiian islands. This is reported in Table 5 of Jeff Clark's April 1980 draft survey report: (Sample) HRC #333, (Site) #Oa-G6-32, Test Pit #7, (Radiocarbon years before present) 1500±145, (A.D. date corrected for atmospheric variation) 484±145, and (Range A.D.) 239-629. It should be noted that the date A.D. 239 is a typographical error, and should be A.D. 339. The correction was made in the final published version of the report, but the false A.D. 239 date persists, as does the common public reference to A.D. 300 rather than A.D. 484±145.

The continued use of this lone date as proof that Kawainui Marsh is the oldest archaeological site in the Hawaiian islands is a reflection of the public's misunderstanding of the nature of the radiocarbon dating technique and the proper use of the technique to date archaeological sites.

Given the nature of the technique, it is entirely possible, in fact, highly likely, that the carbon sample with the early arithmetic mean A.D. 484±145 is exactly the same age as the two other samples dated in Jeff Clark's survey, A.D. 747±215 and A.D. 749±90. Radiocarbon dating of archaeological sites is only as reliable as the number of samples submitted for dating, and the range of variation in samples from the same context can be considerable.

A radiocarbon date should never be interpreted out of context. What is the provenience of the date from Test Pit #7? Clark's report says: "...no identifiably cultural associations can be related to this radiocarbon sample..." Can the date be used to date the construction or use of the stone walled terrace in which it is found? Clark makes no such interpretation, and rightfully so. Almost all the artifacts found at the site, and presumably associated with the construction and use of the terrace, came from the top 5 cm. of the site's deposits, while the carbon sample came from more than 40 cm. (16 in.) below the artifact layer at the site, with no obvious stratigraphic association.

However, in the report's conclusion Clark speculates that the carbon sample (A.D. 484±145) probably dates human activity in the area such as land clearance for planting. There is abundant evidence to refute this hypothesis, not all of which was available at the time of Clark's report. None of Clark's test pits in the area, or anybody else's, have uncovered an artifact layer, or shell midden, or fireplace, or house site, or agricultural field, or any kind of archaeological deposit that dates earlier than the 700s. If the former lagoon at Kawainui Marsh was one of the areas first settled by polynesian settlers, we would expect this fact to be reflected in the accumulation of archaeological evidence around the marsh. Such accumulations have not been found. In fact, the buried, undisturbed archaeological features that have been found in the area, several feet beneath the surface, date as late as the 1200-1300s, with absolutely no earlier cultural deposits beneath them. Are we to believe that the area was occupied for 900 years, from A.D. 300 to 1200, by a population proportionate to the "rich abundance of natural resources of Kawainui," without leaving a trace beneath the 13-14th century features

excavated recently in Kukanono and Kailua town?

Furthermore, the idea that the carbon sample could only result from human-induced burning is worth debating. There has been a tendency among archaeologists to assume that any black, crumbly, amorphous substance excavated from the earth is charcoal. There are two sources of carbon in any soil. One consists of charred or carbonized organic matter produced by human or natural burning. The other consists of organic compounds manufactured initially by the local vegetation. Normal plant residues (as well as many kinds of detritus referable to human occupation) undergo a long series of transformations, including the formation and accumulation of the vast complex of substances known as humus. There are many possible pathways and end products, depending upon moisture, aeration, temperature, and substrate. The mature product has a color, form, and consistency very similar to that of charcoal derived from burning. Usually there is generated an array of substances such as the humins, fulvins, and uronides. The chief characteristic of all these compounds is that they are insoluble in water and are resistant to further reduction or corrosion. (Cook, 1964) Thus, the early date from Kawainui Marsh could represent the earliest period of soil formation at the site, rather than human occupation or settlement. Clark's sample came from a sondage (a small, deep test in the floor of the excavation) that only provided questions for further study. It did not provide proof that Kawainui Marsh is the earliest site in the Hawaiian islands. It should be emphasized that neither did the sondage provide proof that the carbon sample came from a burning episode. No mention is made of ash, burned clay, or burned rock in the stratum containing the carbon.

Based on the research conducted so far there are three clusters of dates from Kawainui Marsh. Several glass and radiocarbon dates focus on the period A.D. 747-900, associated with a fireplace and some walled terraces on a slope on one side of the marsh. Another cluster of dates from the period A.D. 1270-1366 come from deeply buried fireplaces beneath urbanized level areas adjoining the marsh. A third cluster of dates from the period A.D. 1610-1790 relate to a firepit, two terraces on the slope, and the prehistoric use of the lo'i in the alluvial lowlands.

To this should be added the archival and archaeological evidence for occupation during the 19th and 20th centuries.

I would like to suggest that archaeologists here have tended to place too much emphasis on chronology, and not enough on the study of culture. The whole idea of collecting a carbon sample for dating from an unknown context is a reflection of this trend. Archaeologists have given the impression that site significance depends on dates and that finding the first poi pounder is more important than finding the last. For collectors this is true. For archaeologists it shouldn't be.

All this commotion over the earliest date, promoted flamboyantly by the anti-development faction at Kawainui Marsh, has obscured the legitimate significance and research potential of the marsh's archaeological resources. Not the least of these is the archaeological study of events and cultural processes occurring during the last 200 years: cultural decline, migration, diffusion, ethnic boundaries, to name just a few, and all supported by a substantial amound of archival information to go along with the archaeological data at Kawainui Marsh. Our 19th century sites are important and worth studying.

Archaeological interpretations and explanations area only as good ass our understanding of human culture and cultural processes. From this perspective, the study of recent human remains, for which we have written and oral information against which to measure and evaluate our archaeological findings, has an important contribution to make, both in our study of Old Hawaii and in our study of ancient peoples around the world. Our student excavations have demonstrated that this kind of historical archaeology is possible at Kawainui Marsh. It is unfortunate that the quest for superlatives by anti-development advocates (i.e, the most unique, the only, the earliest) has obscured the legitimate research potential and scientific value of Kawainui Marsh.

REFERENCES

Allen-Wheeler, Jane

1981a "Archaeological Reconnaissance Survey and Test Excavations in Kailua, Oahu: 83 Kihapai St. (TMK 4-3-57:65)." Ms. Dept. of Anthropology, Bernice P. Bishop Museum.

1981b "Archaeological Excavations in Kawainui Marsh, Island of Oahu." Ms. Dept. of Anthropology, Bernice P. Bishop Museum.

Clark, Jeffrey

1980 "Phase I Archaeological Survey of Castle Estate Lands Around the Kawainui Marsh, Kailua, Oahu." Ms. Dept. of Anthropology, Bernice P. Bishop Museum.

1981 "Early Settlement and Man-Land Relationships at Kawainui Marsh, Oahu Island, Hawaii." New Zealand Archaeological Association Newsletter, 24(1): 30-37.

Cook, S.F.

1964 "The Nature of Charcoal Excavated at Archaeological Sites." American Antiquity, 29(4): 514-17.

Cordy, Ross

1977 "A Cultural Resources Study for the City and County of Honolulu's Permit Request: Kawainui Marsh Sewerline (Oahu). Archaeological Reconnaissance and Pre-1850 Literature Search." Ms. U.S. Army Corps of Engineers, Honolulu.

1978 "Test Excavations, Site 7, Kawainui Marsh, Kailua Ahupua'a, Oahu." Ms. U.S. Army Corps of Engineers, Honolulu.

Ewart, Ned D. and Myra T. Tuggle

1977 "Archaeological Investigation, Kawainui Swamp, Ko'olau Poko, Kailua, O'ahu Island." Ms. 14-94. Archaeological Research Center Hawaii, Inc. Lawai.

Handy, E.S. Craighill, and Elizabeth Green Handy

1972 Native Planters in Old Hawaii, Their Life, Lore, and Environment. B.P. Bishop Museum, Bulletin No. 233.

Kelly, Marion, and Jeffrey T. Clark

1980 Kawainui Marsh, O'ahu: Historical and Archaeological Studies. Anthropology Dept. Report Series 80-3. B.P. Bishop Museum.

Kelly, Marion, and Barry Nakamura

1981 "Historical Study of Kawainui Marsh Area, Island of O'ahu. Ms. Anthropology Dept. Bernice P. Bishop Museum.

McAllister, J. Gilbert

1933 Archaeology of Oahu. B.P. Bishop Museum, Bulletin No. 104.

Stearns, Harold T.

1978 Quaternary Shorelines in the Hawaiian Islands. B.P. Bishop Museum, Bulletin No. 237.

No. 6099 Miomioi Claimant.

Punipeke sworn says I know this land. It is in Kailua, in the ili Kukanono and consists of 10 taro patches and a house lot.

No. 1 is bounded by the taro land of Keonelaukea,
" by a creek,
" by land of Kamehameha,
" by upland.

No. 2 is bounded on all sides by upland.

Claimant had his land from Kaleohano in the time of Poki, about the year 1824, and has had it in peace to this time.

No. 6099 Miomio

The Land Commissioners, Greetings. I hereby state my land claim. I have one mo'o, a "jump" is at the shore, with six lo'i. Another "jump" is inland, adjoining Kukapoki, a kula planted in 'awa, and a wooded mountain area. A kula house lot is at the shore. Another kula house lot is inland, named Kukanoa. It is in Kailua. Kahele is the konohiki and I got these in the time of Kaleohano.

Miomio

'ili - land section, usually a subdivision of an ahupua'a.
mo'o - narrow strip of land, smaller than an 'ili.
jump - a detached lot of land belonging to one 'ili, but located in another 'ili.
lo'i - irrigated taro patch
kula - field, pasture, garden, dry land, open country
'awa - the kava plant, the root being the source of a narcotic drink.
konohiki - headman of a land section.

Appendix I. These are translations found in the State Archives, made from the Native Testimony and the Native Register. They were made around 1850-1854. The dig site was within L.C.A. 6099.

No. 7147 Kahele Honolulu, 4 Feb. 1848

Greetings to the Land Commissioners: I hereby state my claim for land and a house lot. It is ½ of the 'ili named Kukanono, at Kailua in Koolaupoko on Oahu. The house lot is in the Ahupua'a of Kawainui in Kailua. It is bounded on the north by the road, on the east by some hau trees, on the south by the bulrushes of Kawainui, on the west by the back of the jail house. There are many people who know the house lot, and Kalama is the witness of the division in half as it is laid out to be confirmed for me. Furthermore, I have planted three lo'i also at Kawainui in Kailua. One kihapai of trees was planted by me from fruit from Paleka. That is it, for your information, I am, with aloha,

Kahele

No. 7417 Kahele 22 April 1854

Kalaniwahine (w), sworn this claim is in Kailua, ½ ili of Kukanono, in Kailua, Koolaupoko, Oahu, a land division from the King in 1848. Kamehameha has all of these places.

I have seen the house lot in the ili of Kawainui in Kailua, Oahu.

Mauka and all sides H. Kalama's land.

Two houses are standing without an enclosure. This house lot was obtained after the death of Liliha, it was an idle land. No objections since that time to the present. Here is a copy of Kahele's land distribution.

½ Kukanono ili of Kailua, Koolaupoko, Oahu. I hereby approve of this distribution, it is good. The one half property written above is for Kahele and he may present it before the land commissioners who quiet land title.

Kamehameha.

Royal Palace 3 Feb. 1848

Appendix II. Translations of documents related to L.C.A. 7147 which is immediately adjacent to the dig site.

No. 2536 Ukikolo

To the Land Commissioners, Greetings: I hereby state my claim for an 'ili, Manu, and the kula. The second of my 'ilis is Malamalama. I have 3 lo'i at Olohana in the 'ili of Hekona, Kailua, Koolau, whose konohiki is Mahina. These were gotten by my makuas in the time of Kamehameha I, till myself at the present. The konohiki is Hoonaulu.

No. 2536 Ukikolo Wailua, 19 Oct. 1854

Makakau sworn I have seen his land claims in Kailua, Koolaupoko, Oahu.

Section 1 - 2 patches in "Olohana," an ili

mauka.....konohiki's land

Kaneohe...Kinipeki's land

makai.....konohiki's land

Waimanalo.stream

Section 2 - 4 patches in "Manu," an ili

mauka.....konohiki land

Kaneohe....."Kapaia" a land

makai.....Lalapa's land

Waimanalo.....a stream

Section 3 - enclosed at Kukanono, a house lot. Surrounded by a stone wall.

Section 1 from Hekona in 1845 or 1846. Section 2 received before Poki went to Kahiki in 1828. Section 3 from Keaweamahi before the death of Kinau. Ukikolo lived peacefully and died in 1853, from smallpox, the bequest was to his daughter Kaiwikuilani, no objections.

Kaulaila (w), sworn every word is true, no one has objected.

No. 2536 Ukikolo Protest No. 7147 Kahele

Kalaniwahine sworn I have seen that place over which there is a dispute in the ili of Kukanono in Kailua, Koolaupoko, Oahu. Mauka and all around is Kahele's land. This had been a heiau long ago and when we arrived in 1841, I saw Ukikolo's house there and it is still standing today. The konohiki has disputed because the land was closely associated with Kahele. I believe this place was probably truly associated with the konohiki.

Appendix III. Translations of documents related to Ulupo Heiau, in Kukanono, not far from the dig site.

No. 5835 Kaleiokane

Greetings to the Land Commissioners: Here is my claim for land. I have five lo'i in the 'ili of Kekai, a kula house lot is at Kapia in Kailua, Island of Oahu. I got these in the time of Kamehameha I.

Kaleiokane.

No. 5835 Kaleiokane (deceased)

Kuna sworn says I know this land in Kailua in the ili of Kihewakuakua, as follows: No. 1, 6 lo'is; No. 2, house lot.

No. 1 is bounded, mauka.....by the land of Kamehameha
Kaneohe.....by the waste land (nahelehele)
makai.....by my land (aina Kuna)
Kailua.....by the upland (kula)

No. 2 is bounded, on all sides by upland.

Had his land from Naku in the time of Liliha and had it in peace till his death in the year 1848. Makalani his widow is his heir.

Nalaielua sworn says the above testimony is true.

Appendix IV. Translations of documents related to L.C.A. 5835, in Kukanono, near the dig site. Note the translator's use of the term waste land for the Hawaiian word nahelehele, and upland for the Hawaiian word kula. Other translations are possible.

No. 10183 Makea Kailua, Oahu Feb. 4, 1848

To the Land Commissioners, Greetings: I, the one whose name is below, hereby state that I have land at Kailua, on the island of Oahu, an 'ili named Kumu. This land was from (the time of) Liholiho when my makuas had it, and when they died it passed to me, and my occupancy of this land was from thence.

Makea

No. 10183 Makea (deceased)

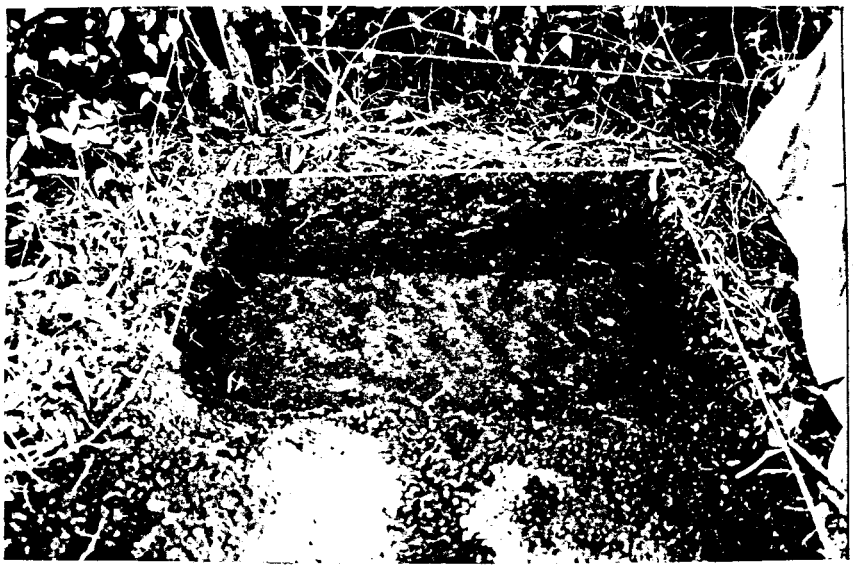
Nalaielua sworn says, I know this land. It is in Kailua in the ili of Kumu as follows, No. 1 14 lo'is. It is bounded

mauka.....by the land of Makalani
Kaneohe.....by waste land
makai.....by upland
Kailua.....by upland

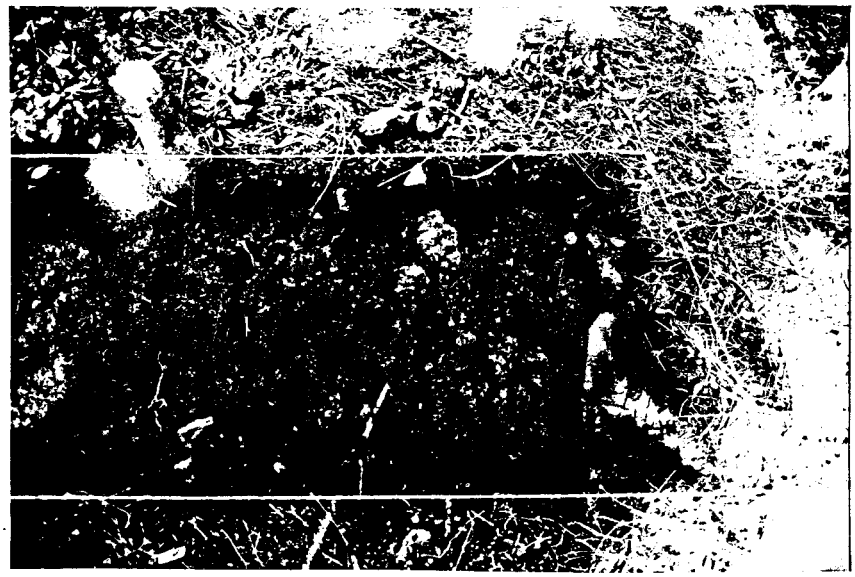
Had his land from his ancestors and had it in peace to the time of his death in May of the present year. Kuna is his heir and received from deceased this land a title before his death.

Maile sworn says the above is true.

Appendix V. Translations of documents related to L.C.A. 10183, in Kukanono, near the dig site.



TEST PIT 2. LOOKING SOUTHEAST.



TEST PIT 5. LOOKING NORTHEAST.

Plate 1. Photographs of test pits after first day of digging. Deposits contain mixed human remains, probably spanning several centuries, including prehistoric Hawaiian remains, historic Hawaiian remains, and recent Japanese-American remains.

Integrity of archaeological deposits has suffered from farming, erosion, and grading.

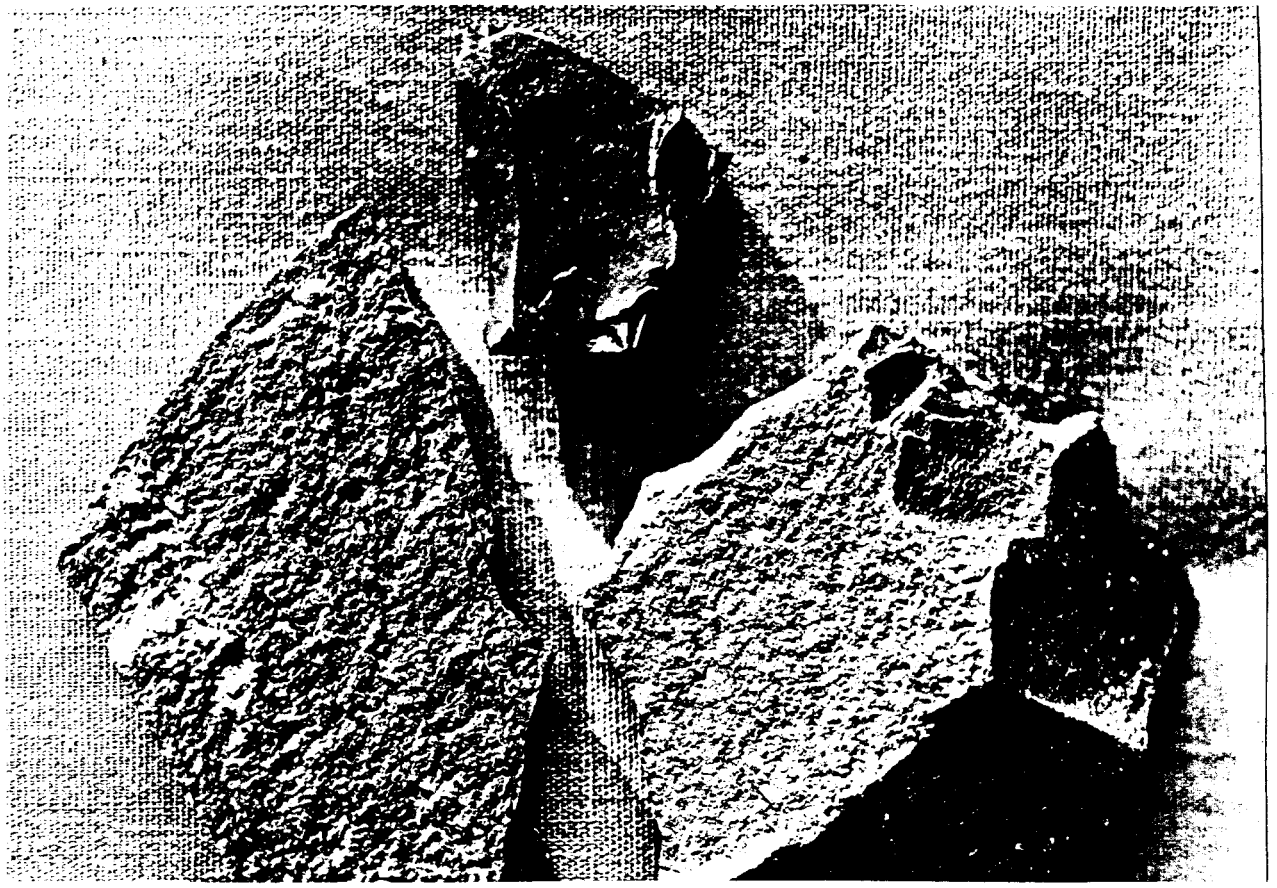


Plate 2. Many different kinds of basalt were found at the site. Local basalt was dark gray with tiny crystalline inclusions, like the large flake at left in the photograph. Some of the Hawaiian stone tools found at the site were made from this kind of basalt. Ulupo Heiau, not far away, was made from this kind of basalt. Most of the Hawaiian stone tools found at the site, however, were made from a dense, dark gray, aphanitic basalt like the flake tool at right. This kind of basalt came from somewhere outside the study area. A single flake tool was found that was made of an extremely fine grained dark gray basalt with a good conchoidal fracture. It is shown at the top of the photo.

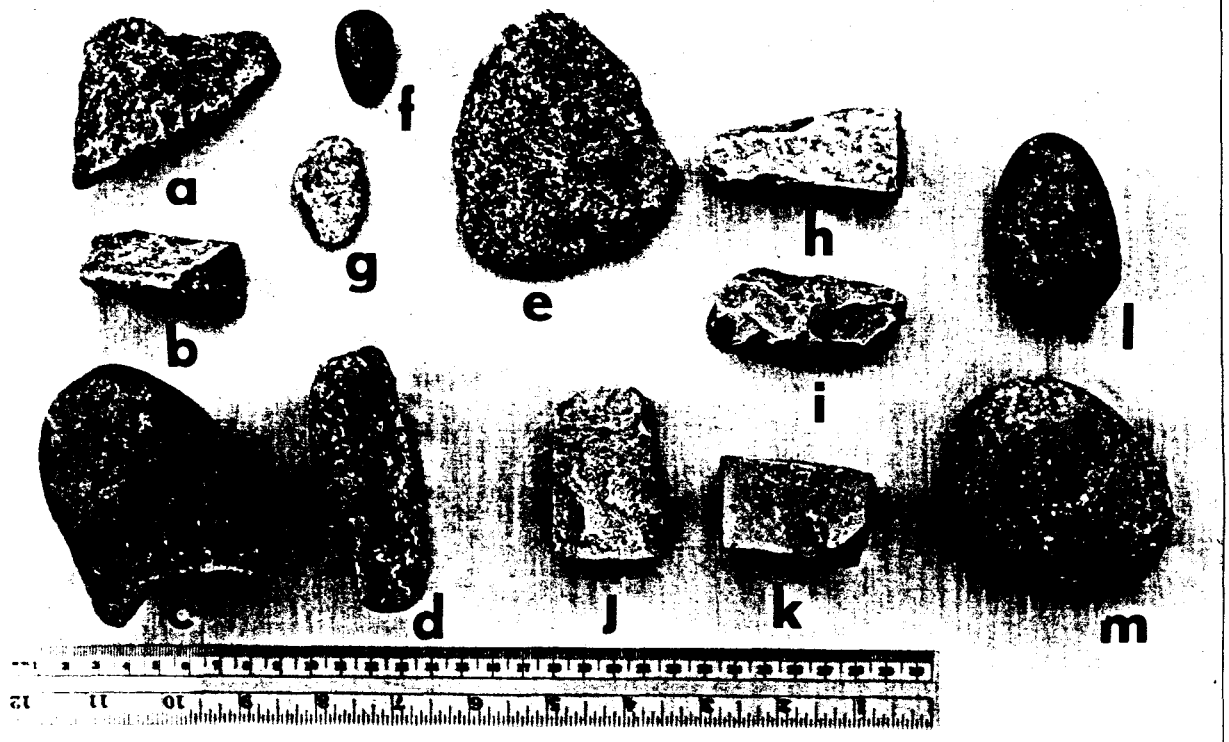


Plate 3. Basalt tools. a, b, c, d: these four rocks all have worn, abraded surfaces. a, b, and d also have blunt, knife-like edges. Such rocks would have been useful for woodworking, carving dog or pig, splitting breadfruit, and scraping 'awa roots. a, b, and c appear to be broken parts of larger implements. e has a worn, narrow edge that has been used for scraping and pounding. f and g are polishing stones probably used in woodworking. h and i are shaped stone blanks or preforms which would have been ground down into adzes. j and k are portions of finished adzes, probably broken during use. l and m are beach rocks that have been used as hammerstones, for pounding. a, b, c, d, and e are made of local basalt, which is good for certain kinds of rubbing and scraping because of the texture of its weathered surface.

Plate 4. The two rocks on the left are broken pieces of finished adzes, used to cut trees and shape wood into implements such as taro cutters, digging sticks, pounding boards for making poi, bowls, tapa beaters, and canoe parts. The rectangular cross section is characteristic of Hawaiian style adzes. The two rocks on the right are stones that have been shaped into blanks for grinding down into adzes. The finished adzes would have been much smaller than the broken adzes shown on the left, of course.

Plate 5. Three tiny basalt flakes were excavated that contained ground surfaces, such as this one. These were portions of broken adzes, perhaps shattered during use. Finding the detritus of woodworking activities at the site, such as these tiny adz slivers, is the kind of clue an archaeologist uses to figure out what happened at a site in the past.

Plate 6. A large grinding stone found by one of the Kamehameha High School students near the dig site. Kawainui Marsh is in the lowlands visible in the background. This large grinding stone is one of the largest of its kind left in the Hawaiian Islands. As it is with metal tools, the cutting edge of a stone adz became dull with use, and had to be continually sharpened. Dr. Charles Burrows can be seen examining one of the shallow basins that were produced by continually sharpening adzes on the rock.

Plate 7. A basalt flake tool. Tiny flakes have been removed from one side of the edge. Such secondary flaking may have been produced during use, or prior to use in order to make a better tool. Such serrated edges were useful for cutting and scraping, perhaps in carving dog or pig, or scraping taro corms after cooking. Basic research is still needed on how to interpret these stone flake assemblages found at Hawaiian archaeological sites.

Plate 8. A basalt flake tool. Note that tiny flakes have been removed alternately from both sides of the edge, and that the edge is slightly worn from use. The blunt end is also worn, perhaps an indication the tool was hafted, and that this flake is only a broken fragment of the original tool. Such apparently modified flake tools were rare in our sample.

Plate 9. A basalt flake tool. The ground and polished surface visible along the left edge of the flake indicates it was used as a scraper. Such a wear pattern may be a function of the abrasiveness of opal phytoliths found in certain plants and plant parts, or it may be a natural characteristic of basalt. Stone flakes might have been used to scrape taro corms after cooking, to scrape 'awa roots, to scrape the skin off breadfruit, to scrape the insides of gourds, or in cleaning dirty utensils.

Plate 10. A flake drill. A sharp corner on this flake has been ground smooth from use. Such a flake drill might have been hafted, and used to make perforations in certain kinds of fishhooks, in certain kinds of containers, and in certain kinds of ornaments.

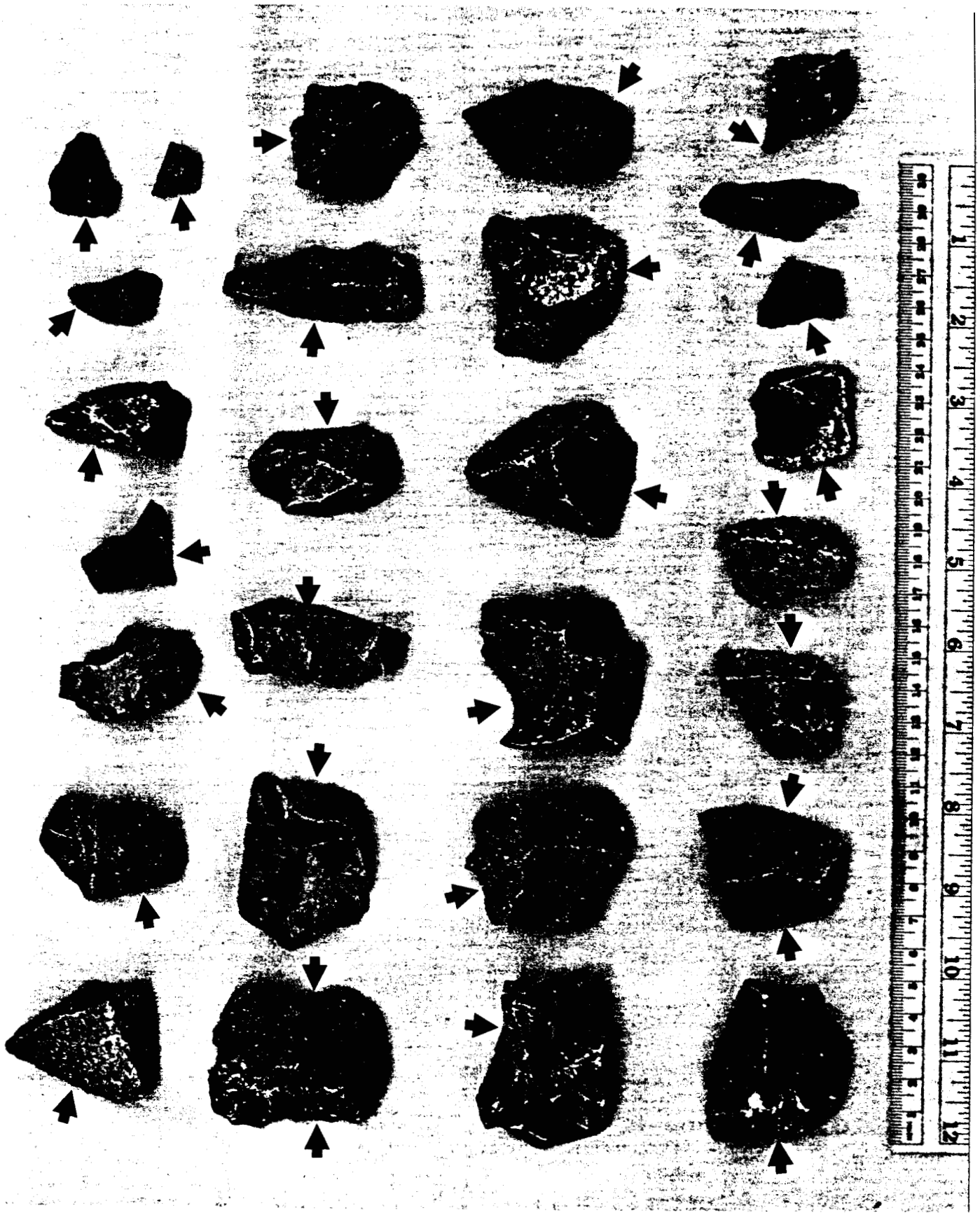


Plate 11. Basalt flake tools. Arrows point to the worn edges that indicate these flakes were used as tools. All of these flakes came from an exotic source of basalt (not found in the dig area).

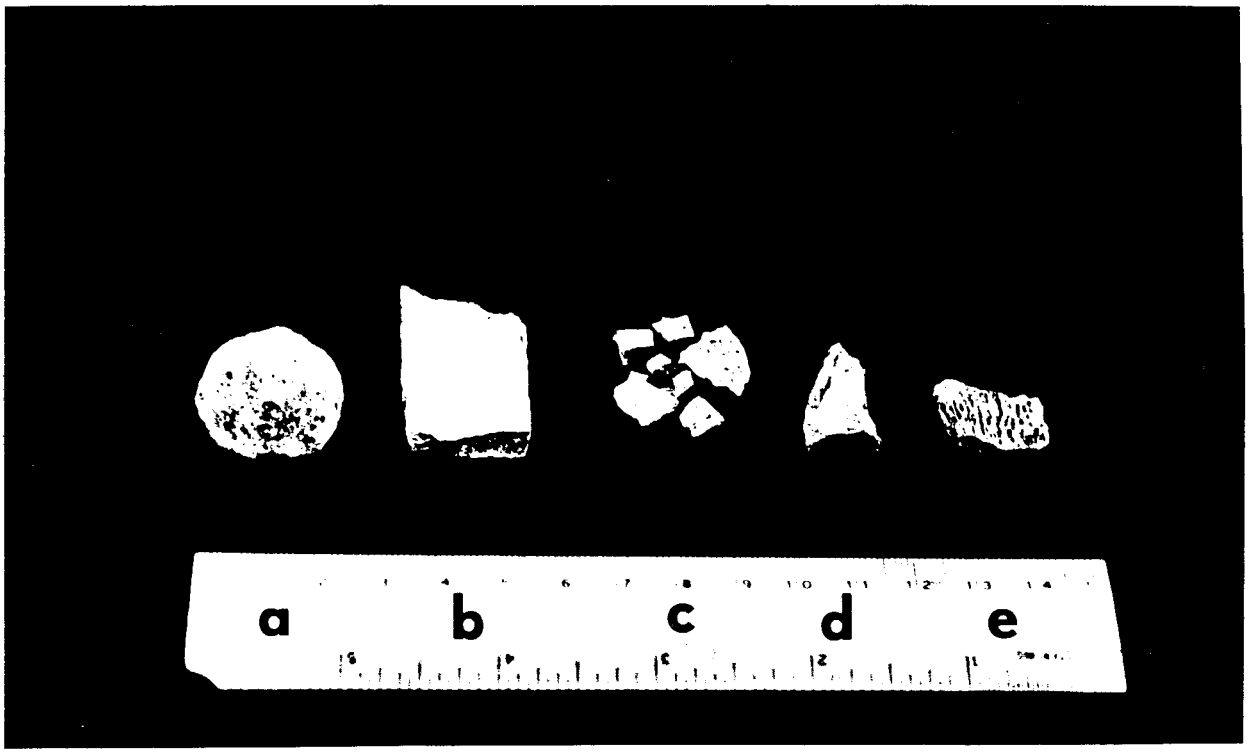


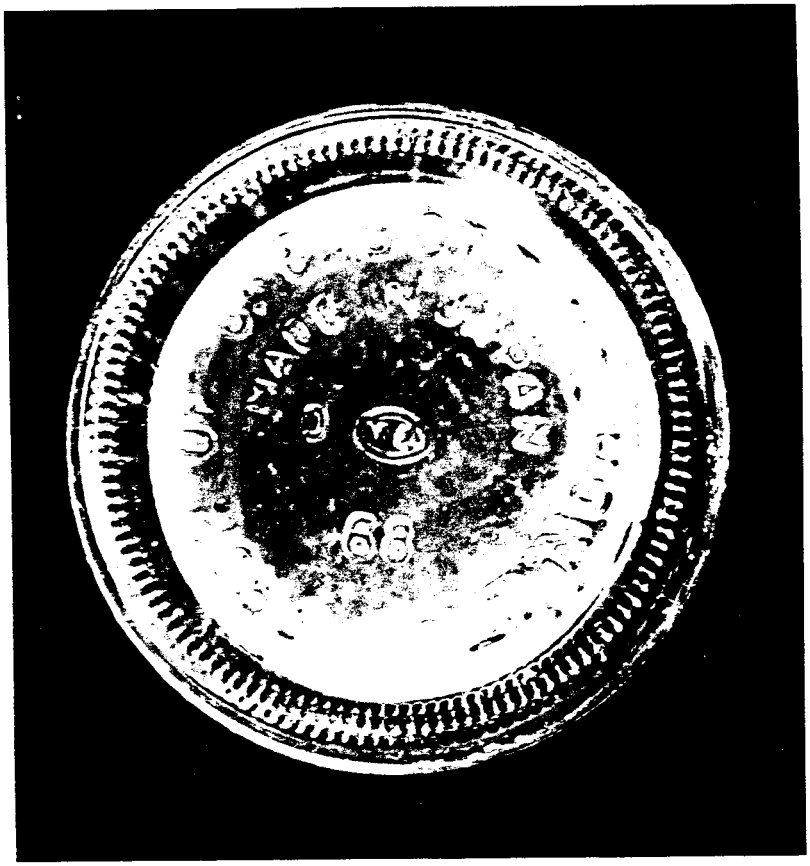
Plate 12. a: kukui nut shell. Kukui nuts were burned for light and warmth. The oil was used in stone lamps; and it was used for polishing wood.

b: a piece of cut bone, probably a fishhook blank. Looks like a piece cut from a human tibia.

c: fragments of burned bone.

d: bird bone fragment, the left coracoid, from a gallinaceous bird, a pheasant or a large chicken.

e: broken piece of cut bone. The distal end appears to be worn, as if the bone had been used as a scraper.



BASE
OF
BOTTLE

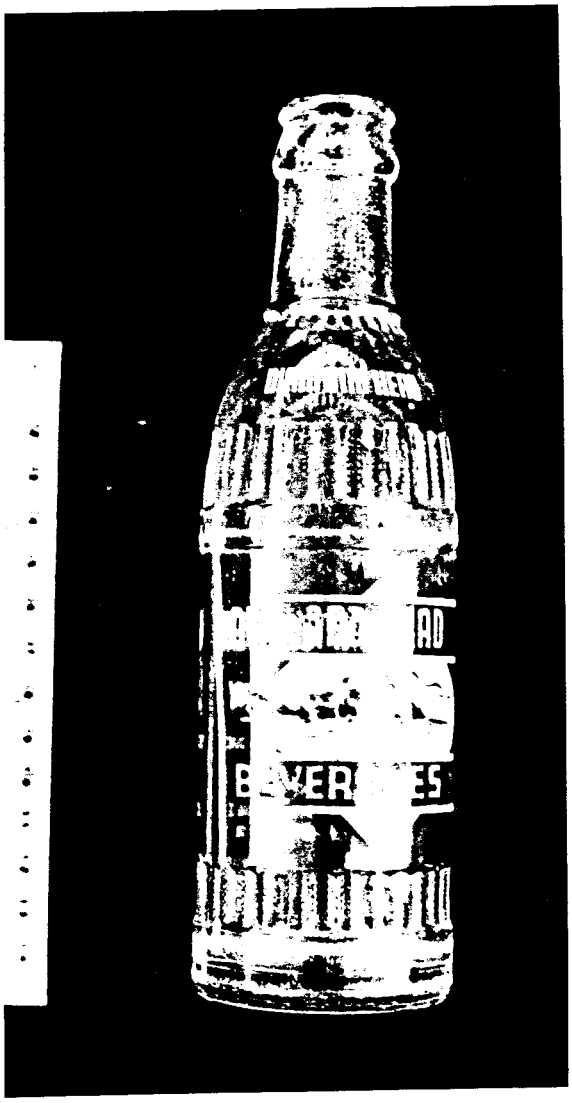


Plate 13. Soda bottle found on the surface near the dig site. Probably results from recent, post-occupational trash dumping in the area.

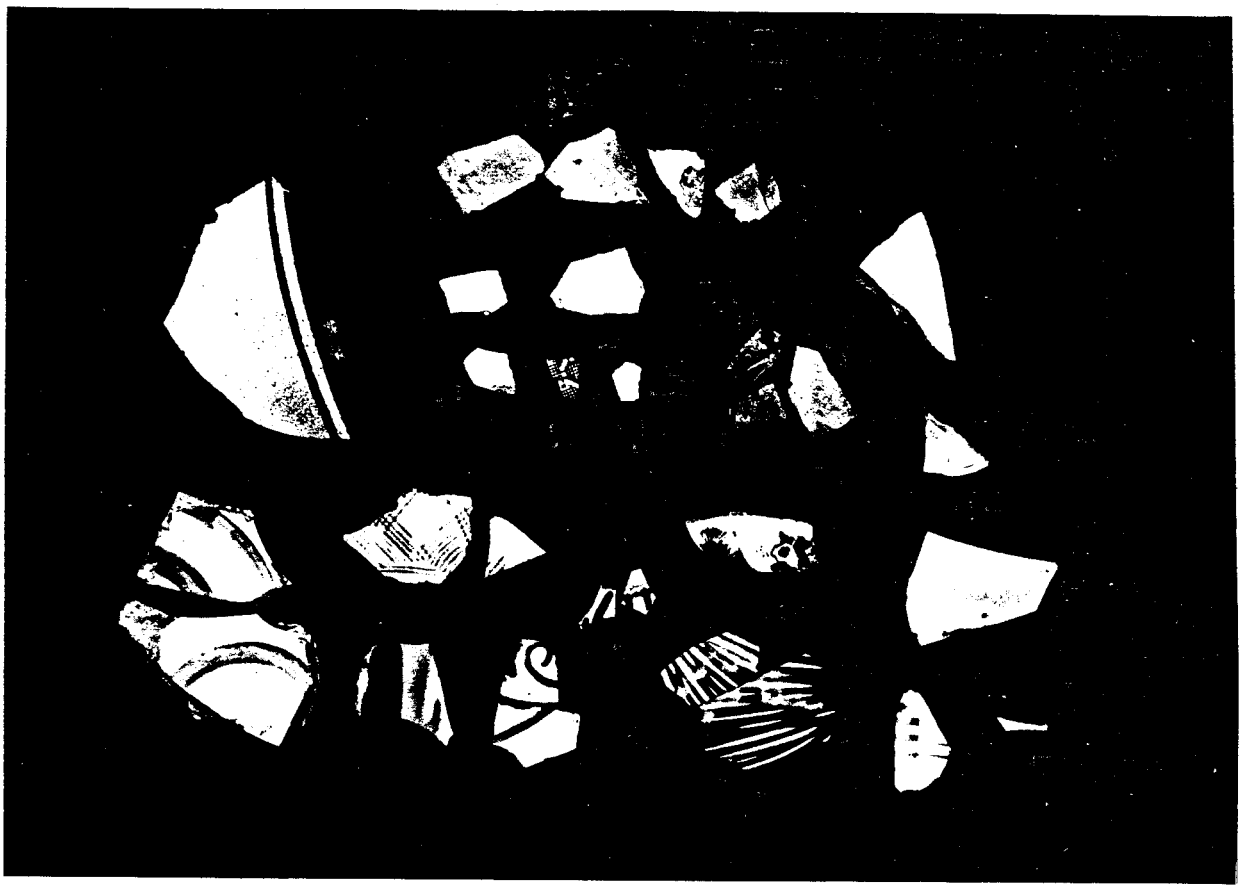


Plate 15. Ceramics. a-g are all earthenwares, probably European, and probably the refuse of the native Hawaiian farmers who lived in the dig area in the 1800s.

a. Common pottery. Buff paste with crushed rock temper. Salt glaze (pitted surface). Large jar or crock.
b. Yellow wares. Tan paste. Crackled glaze with occasional dark inclusions. Thick sherds. Tableware.
c-g. White improved earthenware. Chalky white paste. Crackled glaze.
h. Stonewares. Buff to gray paste, vitreous. Probably from wine and mineral water bottles from the 1800s.

i-u are all porcelain sherds, and probably the refuse of the Japanese-American farmers who lived in the area in the 1900s.

i. Crackled glaze with tiny white inclusions. Bathroom facilities.
j-q. Japanese. Blue on white underglaze. Hand painted designs.
r. Japanese. Smokey white glaze. Rice bowl.
s. Japanese. Recessed horizontal green bands. Tea cup.
t. Dark brown glaze. Bottle fragment.
u. White. Design painted over glaze. Oxidized to orange color.

Plate 14. Glass marbles and 19th century glass sherds. The marble on the right is colored brown and white to look like a marble made from real marble. It is probably older than the other three marbles which are the cats-eye type.

The two glass sherds on the left came from a case gin bottle made in Schiedam, Holland in the 1800s. These bottles were square, with a human figure on the side and the words "J.J. MELCHORS WZ COSMOPOLIET SCHIEDAM." The broken glass finishes (technical term for the mouth of a bottle, which was applied by hand before bottles were made by machine) on the right have sloping collars characteristic of brandy containers. Note the pebbly appearance of some of the glass, a characteristic of hand blown bottles made in the 1800s. The glass sherds are made from dark green glass, known as black glass. These glass sherds add an unexpected dimension to our understanding of the lifestyle of the native Hawaiian farmers who lived in the area in the 1800s.

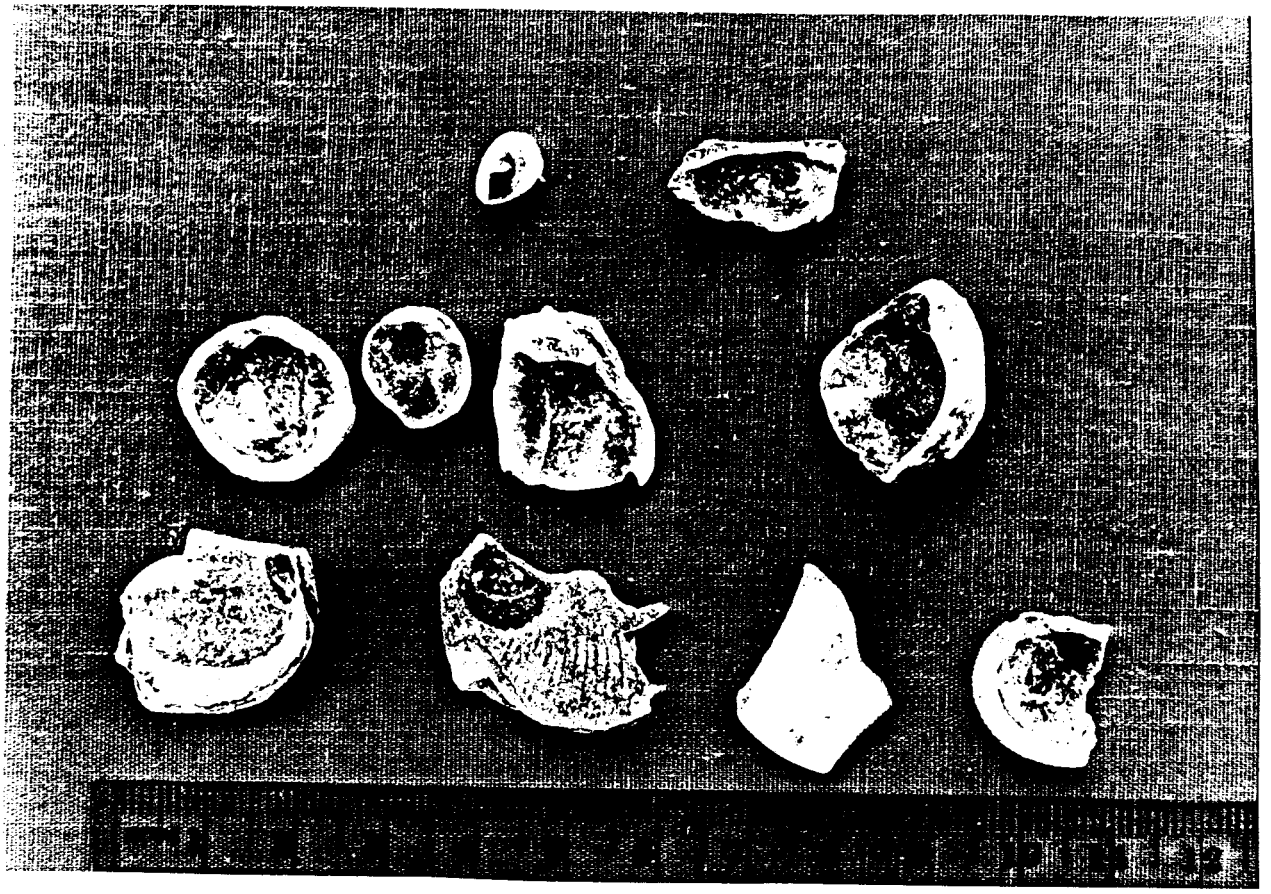


Plate 17. Marine shells. Interior side of shell fragments shown in Plate 16.