THE ARCHEOLOGY OF NUKU HIVA, MARQUESAS ISLANDS, FRENCH POLYNESIA

ROBERT CARL SUGGS

VOLUME 49 : PART 1
ANTHROPOLOGICAL PAPERS OF
THE AMERICAN MUSEUM OF NATURAL HISTORY
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PREFACE

THE FIRST STRATIGRAPHIC EXCAVATIONS in the Marquesas Islands were carried out by the Marquesan Expedition of the American Museum of Natural History in 1956, supported by Mr. Cornelius Crane and directed by Dr. Harry L. Shapiro. As a result of our very promising finds, Dr. Shapiro made it possible for me to return to the Marquesas in 1957 for a year's additional field-work, financed from the Frederick G. Voss Fund. Further, upon completion of this additional season of field-work, a grant from the Voss Fund made possible the preparation and analysis of the artifacts and data, as well as the preparation of the present monograph.

I am indebted to Dr. Shapiro for the opportunity of carrying out the work described in the following pages, as well as for his constant aid and most valuable advice throughout all phases of the field-work, the long period of laboratory study that followed, and the preparation of this monograph which contains his unpublished data from the Marquesas Expedition. My indebtedness to him is poorly repaid by this brief expression of gratitude.

Miss Bella Weitzner, of the Department of Anthropology, has patiently edited a most difficult manuscript and has offered many helpful suggestions for its organization.

Dr. Richard Woodbury of the University of Arizona, formerly my adviser at Columbia University, assisted me greatly not only in establishing the general strategy of the initial archeological survey and excavations in 1956 and the subsequent work in 1957, but in planning my supplies and equipment lists. Through his foresight, I lacked nothing in the field.

Messrs. Toby and Bailly, Governors of French Oceania during the 1956 and 1957–1958 field seasons, respectively, Messrs. Y. Gayon and G. Raboule, Secretaries General to the Governors, and Messrs. G. Bazin and Y. Perret, Administrators of the Marquesas, cooperated with us in every possible way during our work. M. G. Jacquain, Chef du Poste, Taiohae, Nuku Hiva, in his capacity as customs official was especially helpful in arranging shipping matters during 1957–1958.

M. Jacques Drollet, Chef du Cabinet du Ministre de Renseignement, was kind enough against great opposition to clear the way for the exportation of our material. His friendly assistance cannot be forgotten.

My friend, Mr. Robert McKittrick of Taiohae, Nuku Hiva, was an adviser, confidant, and intelligence officer of the highest quality. His knowledge of the Marquesans, derived from some 43 years of often bitter experience, helped me to avert much open conflict that otherwise would have arisen.

Among my many Marquesan friends, I would like to express my thanks to Tunui Puhetini, Karoro Teva'a, Charlie and He'iku'a Clarck and their family, Teiki tauhe'ua, Tini, Here Manu, Moehana, Stanislas Taupotini, Manuera Ah Schah (Chief of Taipivai), Tamihau Omitai (Chief of Hatiheu), Francois Foucaud, Tama, and Teoni Niko. Whether as laborer, informant, or friend, each has contributed much to my work.

Mrs. Helen Kenyon and Mrs. Helga Udvardy labored patiently and diligently in typing the manuscript.

My wife, Rachel, was of great assistance in the field at any and all tasks, which ranged from processing artifacts to delivering Marquesan babies. During this time she was, as she always has been, a source of great inspiration. For her patience and faith through seven years, this monograph is dedicated to her.

ROBERT CARL SUGGS

January, 1960

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INTRODUCTION

PREVIOUS APPROACHES TO THE PREHISTORY OF POLYNESIA

IN THE PAST, approaches to Polynesian prehistory have been made either through comparative studies of the abundant oral traditions of the various island groups or through studies of the distribution of traits or trait complexes. Archeology, of secondary importance, was limited mainly to descriptive studies of stone structures and other surface remains.

The traditionalist has held sway in the field of Polynesian prehistory from the earliest post-contact period. The first Europeans in Polynesia found cultures that placed heavy emphasis on traditions and genealogies reaching far back into the past with ostensibly precise dating. The rich oral traditions impressed many Europeans; consequently, many of them were recorded—usually, however, in "translated" or abstracted form.

On the basis of studies of this body of historical data, authors such as Fornander, Tregear, Smith, and Churchill developed theories of the origin of the Polynesians in Asia or India, whence they subsequently migrated through Indonesia and Melanesia into the Polynesian islands. These theories, romantic in the extreme, endowed the Polynesians with an outstanding navigational ability and an assumed foreknowledge of their destination that was unrealistic, even if it be granted that native navigation may have been more reliable than we now suppose. One of the most profound effects of the concentration on tradition on the part of early writers was their tendency to rely almost completely on genealogies for purposes of dating. This reliance on genealogies shortened the perspective of all prehistorians in Polynesia, with the result that it became generally accepted that the Polynesian arrival in Eastern Polynesia was very recent and that no island had been settled for more than one millennium. The traditionalists did not apply critical standards to their data. They gave little weight to evidence that genealogies and histories had been adjusted as a result of tribal conquests or to the coexistence of numerous variations of the same legends and, most seriously, to the human factors affecting the reliability of their informants.

The traditionalists, however, can be credited with recording a large mass of data that otherwise might have been lost. They were also almost unanimous in indicating relationships between Polynesia, Melanesia, and Indonesia. Although these relationships were postulated on the basis of very crude linguistic comparisons, they have, nevertheless, been vindicated by the most recent scientific linguistic work.[1]

Other attempts at historical reconstructions, based on trait distribution studies, often used legends implicitly or explicitly. These constitute the second major effort to solve the problems of Polynesian prehistory. Studies of this type resulted in theories such as those set forth by Linton, Handy, Burrows, and the culture-historical theorists, including Graebner, Speizer, Heine-Geldern, and Hinderling.[2]

Except for Burrows' monograph,[3] these studies in the eyes of most American students have several shortcomings in common. Of these the most outstanding is a tendency towards denial of cultural processes of independent invention, convergence, stimulus diffusion, and obsolescence. The interpretations generally advanced in diffusion studies have a rather rigid framework in which a series of "migrations," each usually consisting of a complex of culture traits *and* an associated racial and linguistic type, are assumed to emanate from a culture center, passing outward to the limits of Polynesia. Traits are believed to be spread only by migration; therefore a basic uninventiveness of mankind is presupposed.

Burrows, on the other hand, presented an analysis and comparison of Eastern and Western Polynesian culture traits. He concluded that the present inter-areal differences in culture are the result of a long separation and a dissemination of culture traits from two distinct centers. He alone pleaded for a reëvaluation of the prehistory of Polynesia in terms of culture processes rather than in terms of the fixed migration interpretation, a plea unheeded by prehistorians.

Archeology in Polynesia was, until recently,

[1] Grace, 1955.

[2] Linton, 1923; Handy, E. S. C., 1920, 1927, 1930b; Burrows, 1938; Graebner, 1909; Speiser, 1946; Heine-Geldern, 1932; Hinderling, 1949.

[3] Burrows, 1938.

limited to a study of stone structures and surface-collected artifacts.[1] Although in most areas some excavations were made, vertical or horizontal controls were not used and little analysis was made of the artifacts with a view to determine their historical significance. Consequently no archeological sequences were established except in New Zealand,[2] where the association of fossil animal remains with human artifacts made time depth obvious.

The concentration on surface remains has diverted attention from midden sites, thereby halting the development of stratigraphic archeological sequences. It has resulted, however, in the recording of much architectural data from monumental sites now destroyed and in the preservation of invaluable first-hand ethnological information concerning many of the stone structures, data that would otherwise have died with the informants. The architectural information gathered by early workers will prove of greater value when it can be fitted into its proper place in archeological sequences of the various areas arrived at by stratigraphic excavations.

Since World War II, beginning with the work of Gifford in Fiji and Emory in Hawaii, modern archeological techniques have "arrived" in Oceania, with results of great importance for prehistorians—such as the work of Gifford and Shutler in New Caledonia; Spoehr in the Marianas; Golson in Samoa, Tonga, and New Zealand; and Smith, Mulloy, and Ferdon at Easter Island. Our own Marquesan work represents strides towards a sounder conception of the settlement of Polynesia. As a result, much that had previously attained the status of dogma has already been subjected to revision.

A new approach to dating in Polynesian prehistory is presented in Elbert's paper on Polynesian glottochronology,[3] in which he attempts to date the branching of the various dialects. This study shows that an early split may have occurred between the Eastern and Western Polynesian proto-languages, followed by a long period of development *in situ* before more splintering of each main branch occurred. This study is limited by the data on which it is based, because it was impossible to obtain informants for the majority of the languages, and data were derived from dictionaries, many of which were inadequate both in total coverage and in indicating modern usages.

Another linguistic study of importance is Grace's paper on the subgroupings of Malayo-Polynesian.[4] This study assigns to the Polynesian languages the status of a subgroup in the New Hebrides-Banks Islands subgroup of eastern Malayo-Polynesian, indicating the possibility of closer cultural relationships between Melanesia and Polynesia in the more remote past.

ETHNOLOGY IN THE MARQUESAN ISLANDS

A reasonable amount has been written concerning the ethnology of the Marquesas, mostly in minor articles devoted to particular aspects of the culture. Scholars who have contributed most voluminously to our knowledge of the native culture of the Marquesas are von den Steinen, the Handys, Linton, and Tautain. Of these the most significant contributions by far were those of von den Steinen[5] and E. S. C. Handy.[6] Both of these ethnologists collected a large amount of data on the native culture which was rapidly vanishing during their respective sojourns in the Marquesas. Von den Steinen's work, although devoted supposedly to art, contains a masterful sketch of the entire cultural matrix in which the Marquesan artist and his handiwork existed. In his survey of Marquesan art he examined all the known Marquesan pieces either directly or by photographs, encompassing collections in both the New and Old Worlds. His bibliography is unsurpassed. E. S. C. Handy's work,[7] supported by that of W. C. Handy,[8] is an admirable complement to the work of von den Steinen, filling as it does gaps in the work of that author.

---

[1] See Linton, 1925; Emory, 1924, 1928, 1933, 1934a, 1934b, 1943; McAllister, 1933; McKern, 1929; Métraux, 1937; Lavachery, 1954; Routledge, 1919; Bennett, 1931.

[2] Duff, 1950, Chap. 8.

[3] Elbert, 1953.

[4] Grace, 1955.

[5] Von den Steinen, 1925, Vol. 1; 1928, Vols. 2, 3.

[6] Handy, E. S. C., 1923.

[7] Handy, E. S. C., 1923; Handy, E. S. C., and Winne, 1925.

[8] Handy, W. C., 1922, 1925, 1938.

Linton's "Material Culture of the Marquesas"[1] covers the field quite well but is overshadowed, specifically in the area of plastic arts, by von den Steinen's more extensive study.[2] The orientation of Linton's "Archeology of the Marquesas," however, is well typified by its introductory statement: "Since preliminary survey showed that little material or information was to be gained from excavation, my time was limited to a study of the ancient structures and the rather numerous images and petroglyphs."[3] As I have pointed out above, this attitude expresses adequately the orientation of nearly all Polynesian archeology of that period. Archeology was not Linton's area of major interest; therefore his monograph presents merely a brief survey of stone structures, with little analysis and synthesis.

Tautain's work,[4] published in a series of short papers, gives some excellent descriptive accounts of various aspects of Marquesan native culture as witnessed by him during the last quarter of the nineteenth century.

The ethnographic data, combined with the records left by early European visitors to the Marquesas, give a reasonable idea of the native culture, although many gaps will never be filled. The archeological data presented a sorry contrast, however, and the work described here constitutes the first step towards a clarification of Marquesan prehistory through stratigraphic excavation.

ENVIRONMENT OF THE MARQUESAS

The Marquesas Islands are grouped in two clusters along a northwest-southeast line between the parallels 7° 50′ S. and the meridians 138° 25′ and 140° 50′ W. (Fig. 1). The northern group consists of the main island of Nuku Hiva, the subsidiary islands of Ua Pou and Ua Huka, and two small, presently uninhabited, islands 50 miles to the north—Ei'ao and Fatu Uku. The southern group consists of the main island of Hiva Oa, with the two smaller islands of Tahuata and Mohotane nearby, and Fatu Hiva isolated to the south.

The components of both groups are "high" volcanic islands with peaks rising to 4000 feet, composed mainly of basalts and tufa, with some small sedimentary deposits of silicified sandstone and globigerina oozes. The geology of the islands is reported in two brief papers by Chubb,[5] and Obelianne,[6] both the results of cursory surveys. Both authors place the islands as late Tertiary or early Pleistocene in age.

The islands are heavily eroded, with deeply embayed, steep-walled valleys, each of which is watered by several permanent streams, a number of intermittent streams, and numerous seeps (Pl. 1a). The elevated central portions of both Nuku Hiva and Hiva Oa, and parts of all the other subsidiary islands, are rolling, maturely dissected plateaus with savanna-like vegetation and streams that feed some of the largest rivers in those islands (Fig. 2).

Because the prevailing trade winds bring moisture from the southeast, the eastern and southern coasts of the islands are well watered and more favorable for habitation (Pl. 1a), while the western and northwestern coasts are quite arid and unfavorable (Pl. 2a).

The coasts of all the Marquesas Islands are unprotected by fringing reefs such as are found in the Society Islands (Pl. 2b). The cool Humboldt Current from Peru has inhibited the growth of coral in all places but the shallow bay heads. The rasping action of the sharp volcanic sand particles may also have hindered coral growth. The absence of fringing reefs has had an obvious effect on the fish population, reducing the number and frequency of edible species and rendering fishing techniques in general more difficult.

The vegetation of the Marquesas is discussed by Brown, Brown and Brown, and Adamson.[7] It is largely Indo-Malayan or Pacific in origin, as is the fauna, also discussed by Adamson.[8] Several vegetation life zones can be delineated on the islands of the Marquesas, both vertically

[1] Linton, 1923.
[2] Von den Steinen, 1925, Vol. 1.
[3] Linton, 1925, 3–4.
[4] Tautain, 1895, 1896a, 1896b, 1896c, 1897a, 1897b, 1898a, 1898b.
[5] Chubb, 1930.
[6] Obelianne, 1955.
[7] Brown, F. B. H., 1931, 1935; Brown, E. D. W., and F. B. H. Brown, 1931; Adamson, 1939.
[8] Adamson, 1939.

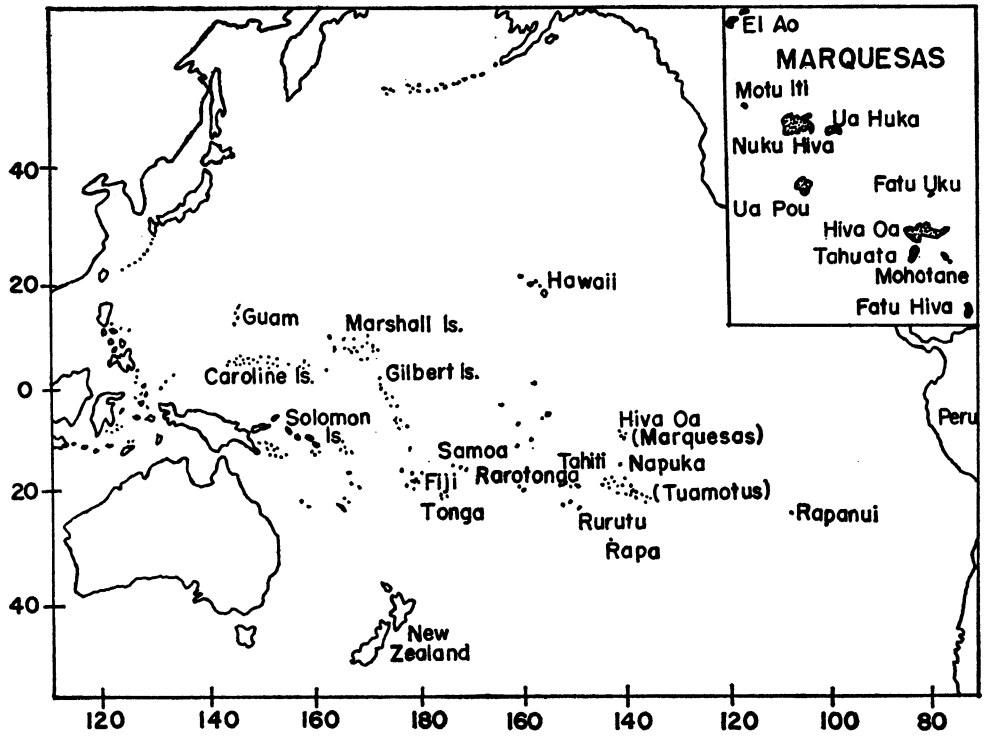

FIG. 1. Map of Oceania, showing position of the Marquesas relative to other main island groups. Inset shows Marquesas Group.

and horizontally. Horizontally we can separate the arid western and northwestern coasts from the southern and eastern coasts, as has already been suggested. Vertically, a line can be drawn at an elevation of 1000 feet above sea level, above which the useful human-introduced plants are mostly absent.[1] The area above this line preserves remnants of the original native flora of the Marquesas as it was before human occupation. The lower-zone vegetation reaches as high as the edges of the plateaus where the upper-zone vegetation begins.

The Marquesas Islands, then, are characterized by relatively small, isolated, deeply embayed valleys without coral reefs, presenting the maximum of favorable conditions for human habitation on the southern and eastern coasts of all the islands and diminishing in favorability as one mounts into the plateaus above the valley rims or passes along the northern or southern coasts towards the west.

The island of Nuku Hiva is typical, although it inevitably possesses some unique features of importance for this study. The aridity of the western half of Nuku Hiva is heightened by a north-south ridge extending across the western end of the island, limiting the rainfall on that coast more than on other islands by catching much of the moisture that would otherwise reach the west coast. Rain is diverted by this ridge into the central plateau, whence it drains into two large streams that feed the rivers of Taipi and Hakaui. Rivers of this magnitude are not found on other islands of the archipelago. The embayment of the Taipi River mouth has formed a large sheltered bay which is quite shallow and is excellent for fishing. This bay is the largest and best sheltered of French Oceania.

In conclusion, with relatively minor differences, each valley on the eastern and southern coasts of all the Marquesas Islands forms an ideal ecological situation for human habitation. All necessary resources are grouped in close proximity within these valleys, which makes their exploitation possible with a minimum of effort by a small number of people. The plateaus were never inhabited permanently except in

[1] Adamson, 1939, 37.

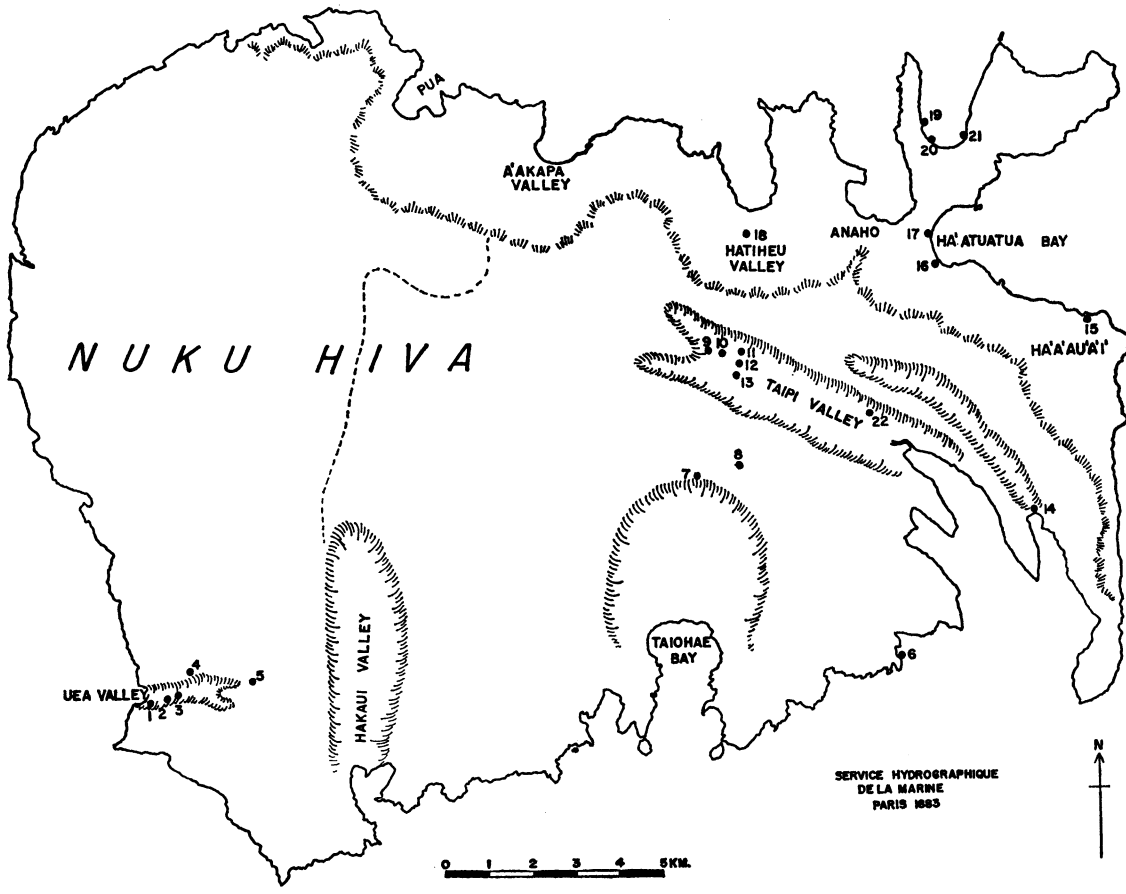

FIG. 2. Nuku Hiva. The approximate locations of major sites are numbered: 1, NBM 5; 2, NBM 1; 3, NBM 4; 4, NBM 3; 5, NBM 2; 6, NH 4; 7, NTa 10; 8, NTa 11; 9, NT 5; 10, NT 6; 11, NT 2; 12, NT 3; 13, NT 4; 14, NHo 3; 15, NHi 1; 16, NHaa 2; 17, NHaa 1; 18, NHe 3; 19, NHuu 1; 20, NHtv 1; 21, NHtv 2; 22, NT 8.

limited areas and quite late in prehistoric times.

In the matter of close clustering of vital resources, the Marquesan valleys compare quite favorably with similar socio-economic units in other Eastern and Western Polynesian high islands. Indeed, to find such high concentrations of resources in small areas is unusual for most of Polynesia.

METHODOLOGY

SURVEY

IT BECAME EVIDENT soon after our arrival in the Marquesas in 1956 that it would be impossible to complete a satisfactory preliminary survey of the entire archipelago in the time allotted. It was difficult to depend on native informants, who knew neither the characteristics of the sites for which I was searching nor had the requisite knowledge to recognize the majority of the artifacts. Subsequently, however, as the informants became familiar with reconnaissance techniques, they often gave me information which resulted in the location of sites, but only after long interrogation. The survey was hindered by the thick brush present in many areas and by the lack of speedy transportation on the islands. Inter-island transportation was completely unreliable. For these reasons, an intensive survey of all the islands in the group would have left no time for excavation.

The island of Nuku Hiva was therefore selected as a model geographical and cultural unit for intensive study. As the cultural differences between islands of the archipelago were unimportant at the time of European contact, there was no reason to assume that the archeological sequences established on Nuku Hiva, the largest island of the group, would differ markedly from those of other islands.

In 1956, the primary goal was to determine the types of sites most useful from an archeological point of view. Because time was always limited, it was necessary that as little effort as possible be wasted on projects that would not repay the highest dividends.

A few oblique references in Linton[1] indicated that some accumulations of midden material existed. Therefore, promising areas were searched for surface indications of earlier habitation in the form of artifacts, edible shellfish remains, and fish or mammal bones. Test excavations were made around arbitrarily selected stone structures to determine whether any extensive midden accumulations were present and, if so, whether they would repay excavation. Rock-shelters and burial caves were also investigated, and human skeletal specimens were collected whenever possible.

It was soon obvious that occupational debris was quite limited around and in stone structures. The relative infrequency of artifacts was due most often to the poor preservative qualities of the soil. The majority of *paepae* were built inland in humid areas, away from the sandy soil near the beaches which, though unsuitable as a foundation for the heavy stone structures, would have served far better to preserve archeological materials.

The best sites, those of open villages, were located on sandy beaches near stream mouths. The sand afforded good drainage and consequently good artifact preservation qualities. Almost every sandy beach in the Marquesas has been occupied.

Equally productive were rock-shelters which, unfortunately, are not common. These were quite often in places that are difficult of access or in remote parts of the island, and in the past were probably visited by fishing or war parties. These shelters are often sufficiently dry to have preserved wood and cordage in the deposits for several hundred years.

The beach sites and rock-shelters seemed to afford our best opportunities for establishing a cultural sequence. Artifacts were numerous, giving hope that we could establish chronologically significant artifact types, once a sufficiently large sample was accumulated. This hope was justified.

EXCAVATION

Prospective sites were tested by excavating 5-foot squares through the cultural deposits into sterile soil at arbitrarily selected points, or areas indicated by large surface concentrations of debris. When an area with sufficient artifact frequency was located, a grid system of 5-foot squares was established, and excavation was begun. The grid systems were not always oriented in the same directions, as they were often designed to test certain surface features the configuration of which did not necessarily lie neatly north-south or east-west.

[1] Linton, 1925.

Wherever possible, excavation was carried out in natural stratigraphic levels; elsewhere, in 5-inch arbitrary levels.

It was impossible to take the time to trowel through the deposit, and shovels were used with as much care as possible. All features such as pits, ovens, post holes, and burials were isolated as soon as they appeared, and the contents were removed separately. In sandy sites post holes were left in relief and removed only when all the surrounding deposits had been excavated to virgin soil. The difficulties of excavating post holes in sand and keeping their contents from being contaminated are obvious. The locations of only the important or most bulky artifacts were plotted. The majority of the material was of small size and was found in the screens.

All earth was screened through $\frac{1}{4}$-inch mesh. Such screening resulted in the recovery of much that would have been irreparably lost, including extremely small fishhooks and some of the potsherds. Through excavation of large horizontal areas, following the grid system and occasional trenches to test various features, very satisfactory results were obtained on open beach sites and in rock-shelters.

The excavation of stone architectural complexes necessitated a different approach, as these complexes were so extensive that horizontal excavation would have been impossible without more time and resources. Therefore vertical test excavations were made in an effort to establish the sequences of construction on the sites as firmly as possible. Test trenches were cut through important features, and an attempt was made to coordinate all sections of the site into the sequence. In the search for cache pits and what few artifacts might be present, limited surface stripping was carried out on the surfaces of *paepae*, or house platforms. Experience indicated which areas of the *paepae* produced the most artifacts and where the cache pits were most frequently located.

It was impossible to screen the earth from these excavations. It was clayey and damp, as the sites were generally located far up the valleys. A few small artifacts may have been missed, but the workmen were generally quite alert, as is evidenced by the recovery of many small and fragmentary objects.

Natural stratigraphy was followed exclusively in all excavations in stone structure complexes.

All radiocarbon samples were removed on a clean knife or trowel blade and placed immediately in several layers of heavy aluminum foil. It was necessary to exercise some caution in the selection of these samples, because in the Marquesas charcoal-like substance occurs naturally through the decomposition of vegetable material. Earth fill for *paepae* and other stone structures was frequently derived from older, demolished structures or excavated at random from undisturbed soil; consequently, any carbon-like material in the deposit providing the fill was naturally included in the new structure. Some natural deposits of such carbon material resemble hearths quite closely but do not contain animal or shellfish remains. Indiscreet selection of carbon samples from stone structures or from any natural deposits without absolutely indisputable artifact association or evidence of human agency in the form of bones or shells can lead to fantastic results. It would have been relatively easy, for example, to procure samples from oven-like deposits without artifact associations that would probably have dated well back into the Pleistocene.

Pollen samples were collected from one site in Uea on the west coast of Nuku Hiva. These are being examined at the present time at the University of Arizona Geochronological Laboratories by Dr. Richard Shutler, Jr.

Animal remains were collected from all excavated sites, but it has unfortunately been impossible to have them completely analyzed at present, and only the mammals can be identified (see Appendix 1).

TYPOLOGY

Any body of archeological material can be classified according to many different systems, yielding typologies differing markedly from one another in their organization of the subject material. Pioneers in the field of typological concepts in the New World have pointed out that no classification scheme can be said to have universal applicability, or be a "real" or "nat-

ural" classification.[1] The validity of any typological classification is determined by one factor only: how well it serves the purpose for which it was intended.

Different kinds of classifications may be used on the same body of material for different purposes. Thus, a group of stone tools might first be classified according to form, then presumptive function, next according to material used, and finally according to techniques of stone flaking involved. Each of these classifications may be designed for equally important ends, and all are equally logical typologies. These classifications might be called descriptive, as they deal with properties of the artifacts *per se* and have no other implications.

Another kind of typology might be called historical, as it deals not only with formal features of the artifacts but with their historical significance. Types possessing historical significance are not established by the grouping of the material according to any set of formal characteristics that seem to be most "logical" or simplest to handle. Historical types can be isolated only by constant reclassification of the same group of material, to find the formal characteristics that are suitable for measuring time or space. If the area from which the total collection has been derived is a small one, geographically speaking, then spatial differences may be insignificant.[2]

The historical typological concept, which seems to me to be the most useful for archeologists dealing with surface survey collections as well as with excavated materials, yields the most fruitful results for relative chronology. As Ford and Willey[3] have pointed out, concentration should not be limited to culture materials *per se*. Artifacts should be conceived as recorders of cultural influences and ideas and be used to measure and trace the development of culture through time and space.

Therefore a "type," as defined by Phillips, Ford, and Griffin,[4] is an abstraction, representing a combination of selected artifact characteristics of value for the measuring of time or space. This "type" definition is implicit in the organization of the artifacts described below, except where the distribution of similar material is so scattered and irregular that it is impossible to determine its historical value without much larger collections. In these cases, the only solution is to describe these artifacts as tentatively separate types pending further investigation.

This concept was found most useful in establishing seriations of sites in the same fashion as those established in the Lower Mississippi Valley[5] and the Viru Valley of Peru[6] on the basis of ceramic analysis.

The most numerous artifacts recovered in the Marquesan excavations were coral files and fishhooks. Much effort was devoted to typological studies of these artifact classes, to isolate types of historical value. Some obviously historically significant types appeared immediately upon a cursory examination of both groups of artifacts. Some groups of similar specimens had very limited distribution in time, while others appeared in both the oldest and the most recent sites. Trial types of fishhooks and coral files were established, after which the relative percentages for each site or each level of stratified sites were graphed on strips of millimeter paper. These were arranged in series across a sheet of cardboard, with the relative chronological positions of three of the sites that had already been determined by radiocarbon dating kept in mind. If no consistent picture of variation in type frequencies through time appeared, giving fairly smooth curves to the bar graphs for each type, the trial types were discarded and the material was regrouped. This process of trial and error finally resulted in the graphs that are presented below (Fig. 27a-b), on which the frequencies of the various types show fairly smooth fluctuations relative to one another through time. The arrangement of sites coincided in broad outlines with what would have been expected on the basis of other artifacts that occurred too infrequently to be used for seriation, yet seemed to have historical significance. It is interesting to note that both scales arrived at the same sequence of sites. This is, to my knowledge, the first time that seriation has been undertaken on the basis of two discrete artifact types.

[1] Brew, 1946, 44; Ford and Willey, 1949, 38, 40; Woodbury, 1954, 12.

[2] Krieger, 1944; Newell and Krieger, 1949, 71; Phillips, Ford, and Griffin, 1951, 63; Ford and Willey, 1949, 38–40.

[3] Ford and Willey, 1949, 38.

[4] Phillips, Ford, and Griffin, 1951, 66.

[5] Phillips, Ford, and Griffin, 1951.

[6] Ford and Willey, 1949.

The scale for either class of artifacts can now be expanded to admit additional graphs based on collections from other sites as yet unexcavated. By matching the type bars to see where they best fit the contours of the graph columns of the previously established type, one can establish the relative chronological position of a site.

Naturally, many factors affect the reliability of such graphs. First, the total number of sites represented is not large. They hardly approach the total number of sites included in collections from the classic New World ceramic surveys referred to above. The sites are also weighted towards the Expansion and early Classic periods, while only one site represents the Settlement and early Developmental periods and one level of another site represents the later Developmental period. A greater number of sites, more evenly distributed over the time column, probably would have indicated more plainly the frequency trends of some of the types, rendering less noticeable the irregularities in some of the type frequencies.

Secondly, the size of the samples from each site must be considered. Ford and Willey believe that in ceramic surface surveys samples of 100 sherds are adequate for chronological placement.[1] Hook or file samples of this size are rarely available in the Marquesas without excavation far beyond the means of the ordinary expedition and, as the charts show, most of the samples number fewer than 50 specimens. The deficiency of sample size is probably partially compensated by the relatively small number of types, at least in the case of the coral files. Larger collections would be necessary for an adequate sampling of classes of artifacts in which larger numbers of types were present. It will be impossible to check the reliability of such small samples until analysis of this kind can be extended, with the use of larger numbers of sites from the same areas and a comparison of the positions of sites seriated with samples of over 100 specimens with those seriated with samples of under 50.

A third point, also discussed by Ford and Willey,[2] involves the precision of the seriation. According to these writers, the best that can be expected from site seriation under optimum conditions is that the relative positions of the sites on the scale will indicate no more than the chronological means of their spans of occupation. No really exact, absolute, chronological placement is possible with this technique. Therefore, I do not hope to claim any greater degree of infallibility for the site seriations presented here, nor can I legitimately claim as much as Ford and Willey until the conditions discussed above have been fulfilled with larger numbers of sites evenly distributed over the time column, permitting a test of the validity of small sample seriations that involve small numbers of types.

TIME SCALE

The time scale developed here is based mainly on the seriations discussed above and the radiocarbon dates, aided by the chronological distributions of other artifact types that do not lend themselves to seriation.

After the 1956 season, examination of the artifacts excavated from Sites NBM 1, NBM 4, NBM 5, and NHaa 1 seemed to indicate qualitative and quantitative differences between the cultural assemblages of NHaa 1 and those of the other three sites combined.

It was impossible to be certain whether these differences were the result of chronological or spatial separation of the sites in question or the result of sample size (which was restricted by the limited time for excavations). The first possibility, that of a chronological difference, seemed the more probable, as spatial variation on an island of such size should theoretically be at a minimum. Although small, the artifact samples from the NBM 1, NBM 4, and NBM 5 sites were uniform, which indicates that some reliability could be expected. The NHaa 1 collection showed internal uniformity among samples obtained from various areas of this large site.

During the excavations of the 1957–1958 season, the conviction grew that the cultural assemblages of the NBM 1, NBM 4, and NBM 5 sites were separated from the cultural assemblage of NHaa 1 by a wide span of time. More material was uncovered from additional sites

[1] Ford and Willey, 1949, 36.

Ford and Willey, 1949, 51.

TABLE 1

MARQUESAN RADIOCARBON DATES[a]

Samples	Years Before 1956
Lamont 394 J Site NBM 5, Unit X, depth of 36 inches, on bedrock at bottom of earth oven. Classic period	270±100
Lamont 394 F Site NBM 1, Unit 55-5, depth of 20 inches. Sample of carbon. Late Expansion to Classic period	480±120
Isotopes 394 G Site NBM 1, Unit 50-3, depth 21½ inches. 34 grams of candlenuts from bedrock. Expansion to Classic period	760±150
Isotopes 394 H Site NBM 4, Unit 72-1. 41 grams of matted leaves, from just beneath Hearth 1, 5- to 10-inch level. Late Expansion to Classic period	484±150
Isotopes 394 I Site NBM 4, Unit 74-3, depth of 15 to 20 inches. 59 grams of fine wood ash from the base of Hearth 1. Expansion to Classic period	718±160
Isotopes 394 D Site NHaa 1, Unit 323, 23 inches from surface. 132 grams of ash and sand from fire pit in house floor	1090±180
Isotopes 394 A Site NHaa 1, Unit 93, depth of 4½ feet from the surface. 13 grams of charred bone from burial pit	1270±150
Isotopes 394 L Site NHaa 1, Unit 307, 11 inches from the surface. 190 grams of ash and sand from a hearth in the house floor	1910±180
Isotopes 394 B Site NHaa 1, Unit 94, 4½ feet from the surface. Sand and charcoal from a hearth in association with burials	2080±150

[a] Determined by the Lamont Geological Observatory and by Isotopes, Inc.

which appeared to stand between these two polar points. On the basis of certain artifacts in the assemblage from the NBM 1, NBM 4, and NBM 5 sites, it was tentatively assumed that these were relatively recent and that NHaa 1 was more ancient. The first Marquesan radiocarbon dates from the NBM sites partially confirmed these opinions. Additional dates from NHaa 1 strengthened them, but moved the earliest occupation of that site back far beyond previous expectations on the basis of comparison with the Hawaiian materials.[1]

When seriation of hooks and files was attempted, the historic significance of other artifact types was also determined, so that finally the radiocarbon dates, the seriations based on fishhooks and coral files, and the chronological positions of non-seriated types were synthesized to form the time scale presented below (Fig. 40).

[1] Shapiro and Suggs, 1959.

The period nomenclature used here is of the developmental type[2] similar to the nomenclature in current use in the Nuclear American areas since the late 1940's.[3] It is far more limited in scope, however, when one is dealing with a spatial and temporal micro-unit in which the amount of variation in both dimensions is restricted. The entire development of Marquesan culture would fall within the Formative period of Peru.

The Marquesan periods should therefore not be construed as equivalent to epochs in any area of the New World; consequently, terms found in Nuclear America epoch classifications have been avoided as much as possible. The period designations apply *solely to the Marquesas*. They are used because they express concisely the main points of Marquesan culture

[2] Willey and Phillips, 1958, 65.

[3] Bennett and Bird, 1949; Bennett, 1948; Strong, 1948; Willey, 1948.

history and not because they represent an attempt to construct a universal Polynesian epoch classification.

The periods of Marquesan prehistory were established on the basis of four factors: socio-political organization, settlement patterns, economic base, and technology, to the extent that these can be inferred from the archeological data. A period nomenclature based solely on technology seemed disadvantageous, as the emphasis of this study is on the culture history of the Marquesas rather than on a technological history *per se*. Designating periods by such terms as "Rotating Hook period" or "Cowrie Breadfruit Scraper period" would be very misleading. Furthermore, it would be difficult to select artifacts typifying each period, as the majority of types appear in all periods, with changes only in relative frequency. The types that are good time markers can never be said to typify a culture level, because each represents a relatively minor aspect of the total material culture. Therefore, these types cannot serve as bases for characterizations of entire cultural assemblages.

Other alternatives for designating periods are the use of numbers, relative chronological terms such as "Early" or "Late," or type-site names, all of which can ultimately cause some confusion. Numerically designated periods may be confused with site numbers and stratum numbers. Designations broadly indicating relative chronological position become unmanageable when the subdivision of major periods leads to designations such as "late Early" or "early Late." Periods designated by the name of the type site where the particular cultural manifestation first appeared can also be confusing, as it is always necessary to specify whether one is referring to the particular site or the broader cultural manifestation to which it has given its name. Furthermore, each of these alternatives implies more detailed qualitative inter-period differences than actually exist in the Marquesas.

In summary, the Marquesan culture period system relies on a developmental terminology based on socio-political, demographical, economic, and technological factors and is applicable to the Marquesas alone.

EXCAVATIONS AND SITE DESCRIPTIONS

IN THE SURVEY of Nuku Hiva, sites were designated according to a simple system similar to that used in New World archeological surveys. For all Nuku Hiva sites the prefix "N" is followed by a second group of letters designating the valley: "Ta," for Taiohae; "H," Hapa'a; "T," Taipi; "Ho," Ho'oumi; "Hi," Ha'a'au'a'i; "Haa," Ha'atuatua; "He," Hatiheu; "A," A'akapa; "P," Pua; "Hk," Haka'ehu; and "BM," Bay Marquisien (Uea). The terminal number follows no set system but is assigned to the sites in the order in which they were found.

In excavations, all stone structures regardless of type were assigned letters or numbers with a prefix "P," meaning *paepae*, because modern Marquesans call all stone structures *paepae*, disregarding their structural differences. "T" indicates terrace and refers to ceremonial sites where more than one terrace was found.

Site levels are designated by Roman numerals, as "NHo 3-I and II." Enumeration of strata begins always with the lowest stratum.

BAY MARQUISIEN

NBM 1, AKIPOU (SKY PILLAR)

A long, shallow rock-shelter was located at the base of an overhanging cliff on the southern side of Uea Valley, beneath the peak labeled as "Roche remarquable 200 m. environ" on Carte No. 3921, Service Hydrographique de la Marine, Paris, 1881.

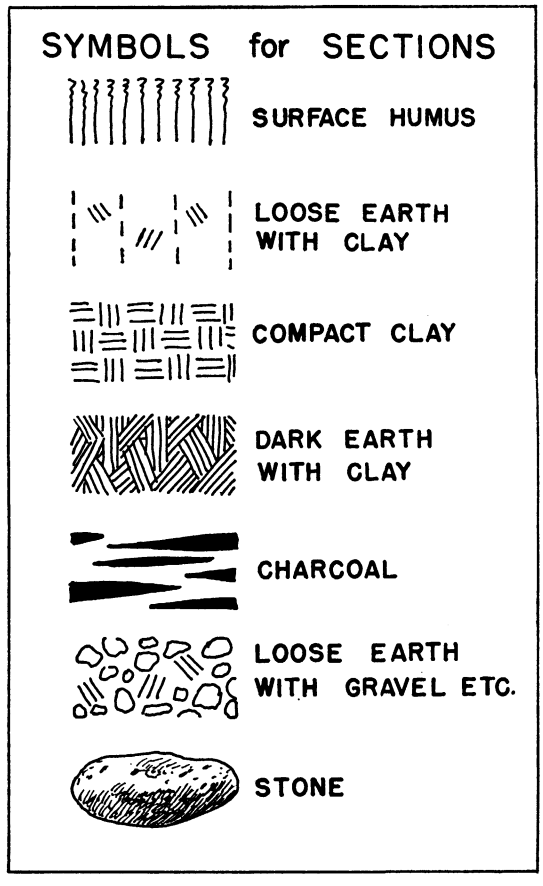

FIG. 3. Symbols used in profiles of stratigraphic excavations.

The shelter (Fig. 4) is 110 feet long, 15 feet deep at its deepest point, and 10 feet high on the edge of the talus slope. The roof descends sharply to the rear wall. The shelter opens at the top of the talus slope of the cliff, approximately 25 feet above the level of the valley in front of it.[1]

A small Transitional *Paepae* was located at the southern side of the shelter. In an effort to keep the floor of the shelter level, a retaining wall had been built along the lip of the talus slope.

During the preliminary survey, artifacts, including a number of wood chips and fragments of cordage and netting, were found on the surface. On the strength of these finds, we decided to excavate.

Two trenches were excavated in the area of greatest artifact concentration: one sectioning the deposits from front to rear; the other sectioning them longitudinally. North of these excavations a third trench was opened where the deposits seemed to be thinner. The midden material was approximately 20 inches deep throughout, but increased to depths of 25 inches in some pockets. It had been deposited on rough, uneven, scoriaceous basalt bedrock. The midden consisted of five separate strata, all roughly 5 inches thick. The lowest stratum was a discontinuous layer of leaves and shredded banyan bark that had been placed in a hollow in

[1] See Shapiro, 1958, for photographs of site.

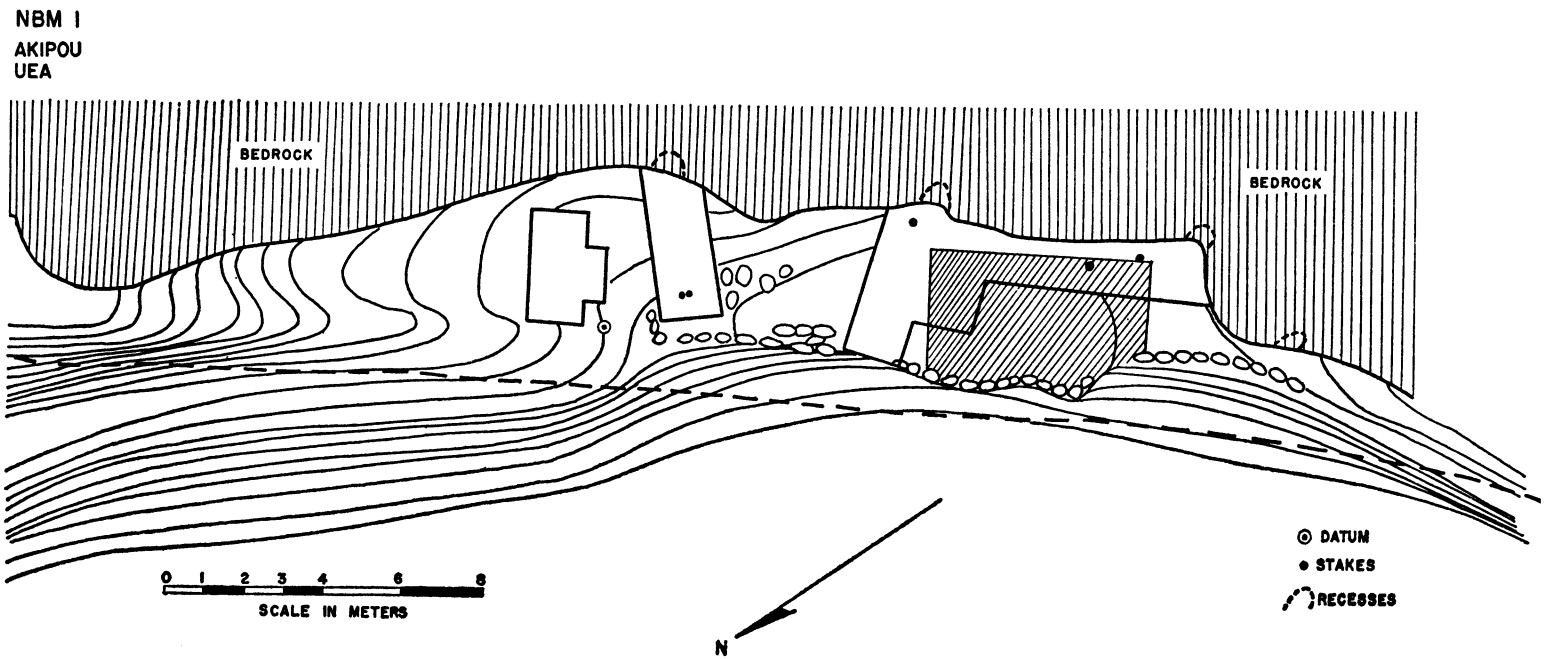

FIG. 4. Site NBM 1. Contour intervals of 1 foot are measured from arbitrary datum. The dashed line indicates the rock ledge overhang. The location of the Transitional *Paepae* is shown by shading.

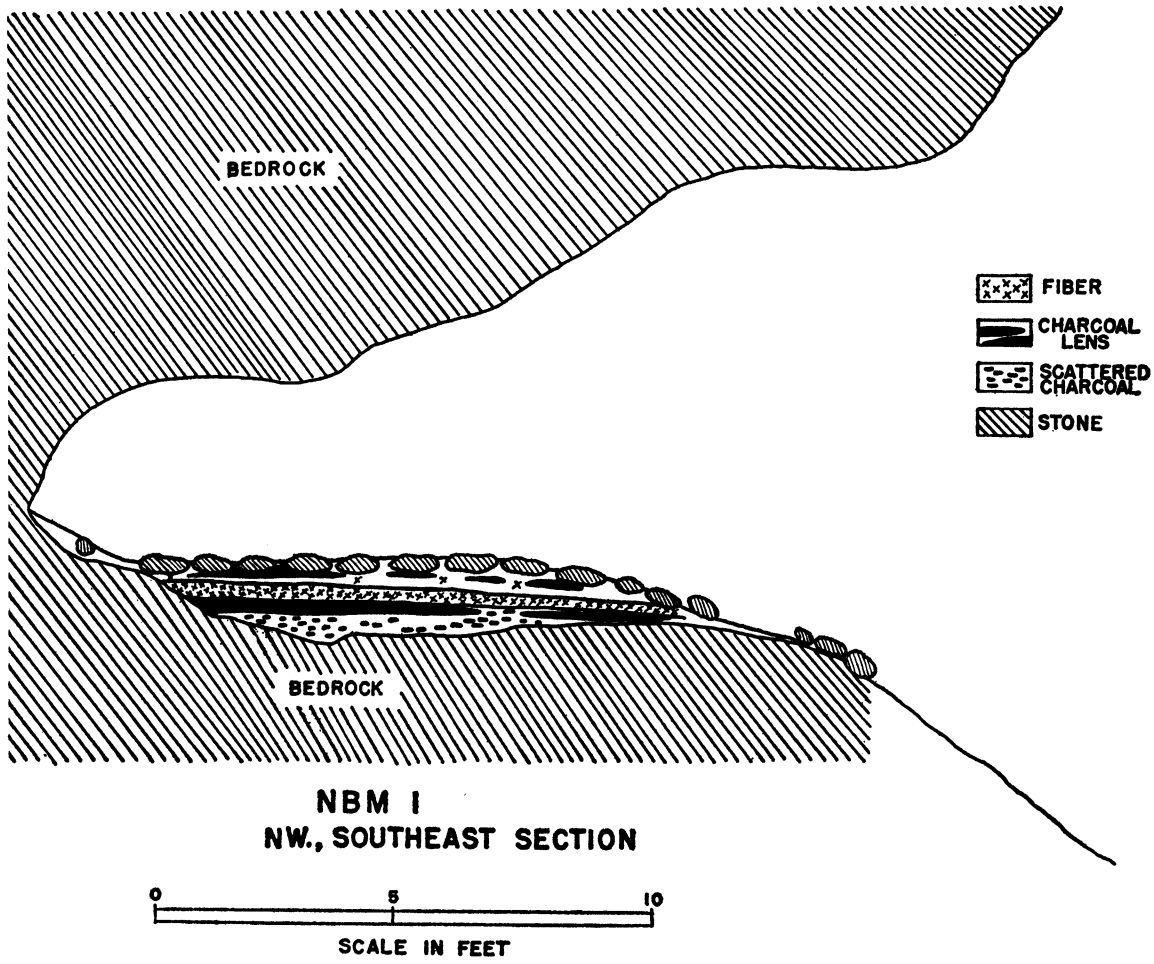

FIG. 5. Section of Site NBM 1.

the rocks, evidently for bedding. A stratum of loose, light, dusty, midden material, containing much loose charcoal and small hearths, had formed above this and continued throughout the shelter. A second continuous stratum of leaves that had been deposited over this was surmounted by a second layer of loose, dusty midden containing loose charcoal and small hearths. On the surface of this deposit the Transitional *Paepae* had been built (Fig. 5).

Dates from this site are 480±120 (Lamont 394 F)[1] and 760±150 (Isotopes 394 G), both samples from the lowest dusty midden stratum. The difference in the two dates may be accounted for by a mixing of the deposits in the peripheral area from which 394 F was taken.

[1] Olson and Broecker, 1959, 25.

The cultural assemblage consisted mainly of hooks of Jabbing and Compound Shank type, adzes of the Mouaka, Koma, and Akipou types, and coral files of the Short Triangular, Long Triangular, Blunt Rectangular, and Narrow types.

The site was occupied continuously from the Expansion period into the Classic period.

NBM 2

A house floor, outlined by small natural slabs 1 foot high, is located east of the hunters' cave in Moanau Valley in the plateau at the head of Uea Valley. A row of stones along its longitudinal axis near the center divides the floor into two sections. The unpaved southern side may have served as the house floor. The northern section, apparently a cooking house, had a

shallow fire pit in the northeast corner. A small paved area lies between this pit and the terrace division.

A test, 1 foot deep, was cut through the fire pit to virgin soil; charcoal occurred throughout the pit fill, as did numerous cooking stone fragments and clay chunks. A post hole, placed before the fire pit was dug, was found in the east end of the test pit.

NBM 3

A series of four house floors extends along the north side of Uea Valley on the edge of a precipice, directly across from NBM 1. These house floors are outlined by a single row of pebbles. Three have a longitudinal sleeping area demarcation. The fourth house floor has a lateral division but no sleeping platform. In this house an oven was built against a large boulder which the southwest limit of the house enclosed. A careful surface search revealed no artifacts.

NBM 4

A small, natural volcanic gas vent was located approximately 50 yards east of NBM 1 in the same cliff face. This vent, 20 feet long, 15 feet wide, and 5 feet high, opened above a small intermittent stream. Because artifacts had been found on the surface during the survey, I decided to excavate. Preliminary to excavation, the shelter floor was staked in 5-foot squares.

The deposits in the floor of the cave consisted of a sterile basal layer of river silts, approximately 21 inches deep at the maximum, upon which about 19 inches of midden material had been deposited. Two strata were discernible in the midden. The lower one consisted of fairly consolidated clayey soil averaging about 7 inches thick, but thickening markedly in spots. The upper stratum, however, was a loose, dusty deposit containing much guano intermixture, with a maximum thickness of 7 inches.

Three hearths were found in the shelter: one at each side of the rear of the shelter, each contemporaneous with the upper stratum of the midden; the southern rear hearth, Hearth 2, contained the cooked remains of a child, with deciduous teeth completely erupted; Hearth 3, between Hearth 2 and the mouth of the shelter, was contemporaneous with the lower stratum of the midden.

Radiocarbon dates from a leaf deposit beneath Hearth 1 in the north rear of the shelter date the upper stratum at 484 ± 150 (Isotopes 394 H). The lower stratum is dated by a carbon sample from the base of Hearth 3 at 718 ± 160 (Isotopes 394 I).

The cultural assemblage in the two strata reveals no differences that could not result from sampling. Among the artifacts recovered were hooks of the Compound Shank and Jabbing types, adzes of the Mouaka and Koma types, and coral files of the Short Triangular, Long Triangular, Narrow, Blunt, and Rectangular types.

The site was occupied continuously from the Expansion period into the early Classic period.

NBM 5

A rock-shelter was located at the extreme south corner of the beach in Uea. It was 30 feet long, 17 feet deep, and 4 feet high near the mouth. During the survey a few artifacts had been found on the surface of the site. The talus slope in front of the cave had been cut by the 1946 tidal wave, exposing material to a depth of approximately 4 feet.

Two 5-foot test squares were excavated in the interior of the shelter. The upper 10 inches of the deposit consisted of black dust containing quantities of shellfish remains. Aboriginal Jabbing hooks, Short and Long Triangular coral files, and coral abraders were mixed with European artifacts of the nineteenth or early twentieth centuries in this deposit. Beneath were the remains of an earth oven 26 inches deep, continuing down to the bedrock which sloped downward out of the mouth of the shelter. A radiocarbon sample was taken from the large quantity of chunk charcoal in this oven, yielding an age of 270 ± 100 years (Lamont 394 J)[1] which places the earliest occupation of this site in the Classic period. The aboriginal artifacts were numerically insufficient in number to allow more positive dating.

NBM 6

A small, fisherman's shrine on the south side of Uea Bay was found to contain a large quantity of pig and other animal remains, evidently left as offerings, and two coconut cups, one lined with a checker weave mat containing a portion of a tapa loin cloth (*hami*).

[1] Olson and Broecker, 1959, 25.

NBM 7

A small cave in a tiny valley near the casuarina grove north of Uea in the Henua Ataha contained an infant skull. The basal portion of the occiput had been removed, possibly to facilitate removal of the brains. Native informants state that there are some large *paepae* towards the sea in this valley.

TAIOHAE

NTA 1

A fortified observation point is located on the second prominence of the ridge south of Te'avanui Pass on the Hapa'a road leaving Taiohae. A small pit had been excavated on the peak of the crest. A coral file was found on the surface. Below the peak, a ditch, 8 feet wide and 4 feet deep, had been cut through the ridge. This pass is mentioned in legends as the site of a slaughter during a Taipi-Hapa'a war, when fleeing Hapa'a were cut off here by a group of Taipi warriors.

NTA 2

This site, on the property of Tunui Puhetini of Taiohae, is called Puki'aa. It was inhabited until recently by an aged Hapa'a chief, Tahara. Two large *paepae* structures, oriented in a north-south line, were connected by a narrow stone ramp, into which a *ma* pit had been built. Stone-walled pig pens were built on the east side of each platform. Three unsuccessful tests to locate concentrations of debris were made at this site on the south and east sides of the southern *paepae* and on the west side of the northern *paepae*. These tests revealed nothing. A fragment of a red tufa figure, formerly hidden in the southern platform, was found southwest of it.

NTA 3

Me'ae Tuka'eva, on the road above the house of Uki in Meau Valley, Taiohae, may be Linton's Site 16.[1] A broken female skull was recovered from a narrow-walled enclosure in the center of a ruined platform.

NTA 4

According to informants in Meau Valley, this site, just above the last house on the valley road, is a *me'ae*, named Maa'etea. Two human skulls and a cowrie vegetable scraper were recovered from beneath a banyan standing on the platform.

[1] Linton, 1925, 110.

NTA 5

This site, a small, low *paepae*, 15 by 16 feet and 3 feet high, is located on the rise above Vaipuko, to the east. Three tests were made for debris concentrations, on the southeast, northeast, and northwest sides. A few scattered flakes of charcoal from rotten vegetation were recovered, but no artifacts or traces of concentrated habitation. Virgin soil was struck at a depth of 1 foot.

NTA 6

Me'ae Pepeake, located on the land of Te Ma'u o Hiva in Meau Valley, is called (probably erroneously) Taputehi Avau by Linton,[2] who designates it as Site 17. A well-preserved example of a *me'ae* platform, it is of special interest because of a large saddle- or seat-shaped stone on a subsidiary platform on the west side. Neither Linton nor I succeeded in obtaining information on the significance of this stone.

In a manioc field to the east of this site, numerous evidences of heavy occupation were found in a surface search. The ground was loose, having recently been cultivated. A number of adze fragments and rejects were recovered.

NTA 7

Me'ae Kakahoautea[3] (Linton's Site 19, erroneously recorded as Takahau Autea) is a complex of six *paepae* on a ridge above Meau Valley. The second highest *paepae* on the ridge was originally the temple, according to informants. In the veranda of this *paepae* a walled pit, surrounded by a low stone wall, was found. It was tested by a 3-foot pit excavated to a depth of 2 feet to solid bedrock. Pig and dog bones were found near the surface and continued to appear down to a depth of 1 foot. A large quantity of charcoal appeared between 1 foot and 2 feet in depth where the earth was extremely hard. A fragment of metal was found at a depth of 6 inches, while a crumpled sheet of

[2] Linton, 1925, 110.
[3] Linton, 1925, 110.

thin metal with a striated piece of European roofing slate were found at a depth of 1 foot 6 inches. A European trade pipe was found in a surface search of the site.

Down the ridge from the main temple platform was a shallow, saucer-shaped pit, about 15 feet in diameter, with a channel opening from its downhill side. The channel was flanked by remnants of stone paving, which seemed to be an oven, but excavation proved otherwise. Two tests in the pit demonstrated that no fire had ever been built there. Beneath the loose, light-brown fill the virgin soil was not discolored. A Marquesan stated that this could not have been a fire pit, pointing out that the rocks scattered about were of the dense, explosive type (*ke'a kiva*) unsafe for use as oven stones.

The European materials recovered from the base of the temple veranda pit indicate that at least part of this site was built after European contact. Because cut stone was lavishly used in the temple platform, it is therefore certain that this trait continued into the Historic period.

NTa 10

Figure 6

The large fort described by Porter[1] was built on the sheer east-west cliff at the head of Taiohae Valley, west of the pass called Mouake. Three large trenches, visible from a long distance at sea, were cut through the ridge to prevent enemies from approaching it along the crest from either east or west (Pl. 7b). The steep drop behind the ridge on the plateau side made approach by attackers almost impossible from that direction, especially while under fire. A wide ridge mounts from the plateau southward to intersect the east-west ridge. At the junction of the ridges, a system of trenches and a bastion-like structure defend the approach. The faces of the trenches and cuts made in the stiff clay of the plateau still retain the marks of the narrow, bitted adzes used for digging. A petroglyph of a standard *tiki* face was cut into the west face of the eastern trench.

Some low earth terraces on the crest of the ridge were probably house floors. No large breadfruit pits were found.

NTa 11

The second Taiohae fort protecting the Taiohae-Taipi road was built on the plateau below the lofty NTa 10. The nucleus of the fort was a hill defended by trenches, scarps cut in the hillside, and bastion-like structures. A long ridge, connecting to the northern end of the fortified hill, descended towards Taipi Valley, twisting and turning along its southern edge. Numerous protective trenches were cut through this ridge to prevent attackers from using it as a bridge to gain the fort easily.

A Transitional *Paepae* structure was found on the top of the hill.

This fort, more accessible than NTa 10, was chosen for test excavations. Three tests were made in areas where, from surface indications, palisades seemed to have been located. In each test virgin soil was penetrated, but no traces of post molds were discovered. A collection of sling stones (smooth, unmodified beach pebbles) was made on the surface.

Behind the fort were a small spring and several large breadfruit pits. Of the two forts in this area, NTa 11 was evidently the most important, and all food supplies were kept here.

If one can judge from the presence of the Transitional *Paepae* on the site, the fort may have been built by the late Expansion period at the latest.

HAPA'A

NH 1

A petroglyph site is situated along the Taiohae-Hapa'a road, between the Vaihi and Vaituku valleys of inland Hapa'a. The petroglyphs are cut into rocks naturally strewn along the ridge at this point. The site was first located and reported by Danielsson,[2] who failed, however, to record several designs on peripheral boulders (Pl. 13a).

NH 3

A small *paepae* about 15 feet square and 3 feet high, with an open cist grave in the surface, is located in Naiki, Hapa'a, above the Falchetou house. Only the leg bones of a male skeleton and some mammal bones remained. The interment

[1] Porter, 1822, Vol. 2.
[2] Danielsson, 1954.

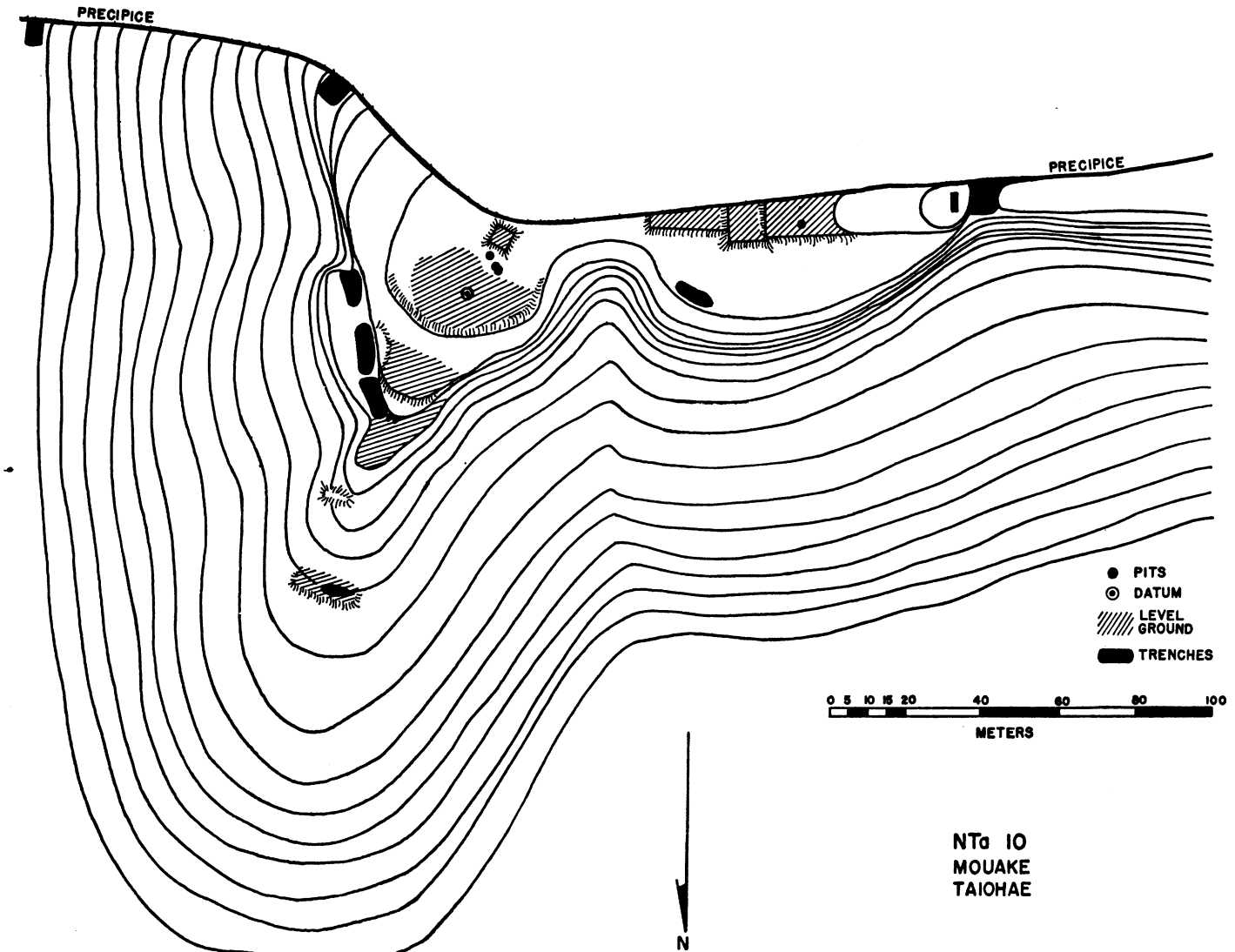

FIG. 6. Site NTa 10. Contour intervals of 5 feet.

was evidently a status burial, as fragments of a flintlock, a rectangular gunflint, and one perforated whale tooth were found.

NH 4, NAHOTOA (BAND OF WARRIORS)

A large cave is situated on a projecting point of the coast of Hapa'a, between the mouth of Taipi Bay and Haka'uhoke (Fig. 7). The cave opens eastward from the face of a high, unscalable cliff that curves in a segment of a circle, enclosing a small inlet on the east side of the point. The collapse of the outer roof, the debris of which is piled high in huge blocks between the present cave mouth and the sea, has partially cut from view the mouth of the cave from the sea.

The cave is inhabited at present by swarms of little bat-like birds (*kopekapeka*) that nest in its ceiling. The natives have infrequently used the guano deposited by these birds as fertilizer, and a few older individuals have visited the cave several times. According to some informants, this cave was used for tattooing and circumcision rites involving seclusion. The authenticity of this statement was naturally impossible

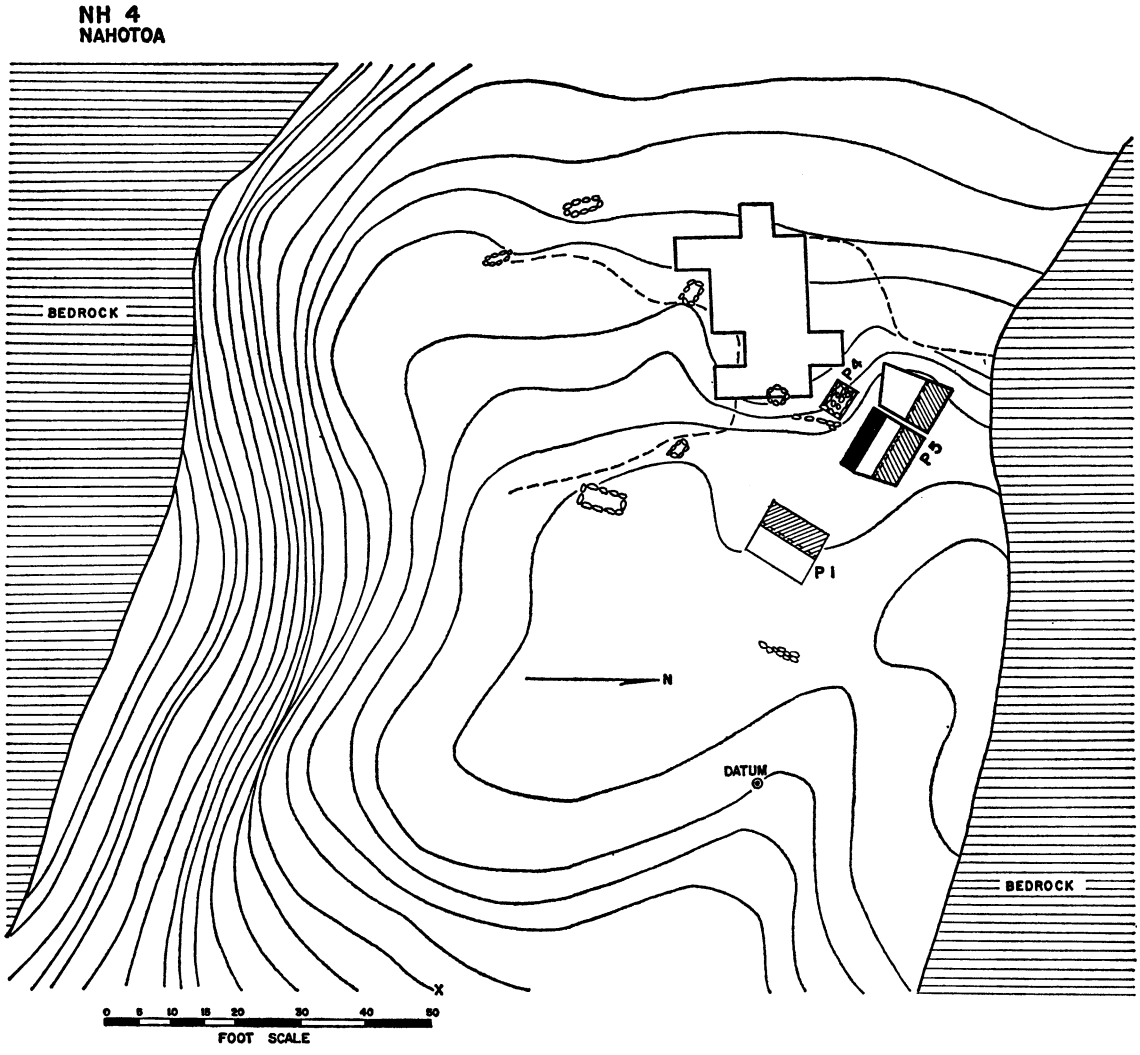

FIG. 7. Site NH 4. Contours are placed at intervals of 1 foot up to contour marked X. Above this level, contours are at intervals of 5 feet. The excavated area is outlined except in the test adjacent to P-5, which is shown in black.

to check precisely, and excavations did not lend any support to it.

The cave, a solution or gas cavity, is 150 yards long, 50 yards wide, and 30 yards high. A large salt deposit is located on the cliff face above it, and salt seeps through the roof along planes of weakness in the tufa and basalt walls. Rocks of baseball size fall constantly from the roof and litter the floor in some areas, while other areas are relatively free of them. To enter the cave, one must climb the rock pile at its mouth and then descend. The slope into the cave mouth catches rain water, conveying it into a low area inside the mouth where it soaks into the earth and gradually disappears, leaving a hard, dry, cracked crust on the surface.

Test excavations were made in the cave floor near a Miniature *Paepae* (P-1) closest to the cave mouth, and also back farther near P-4, a small Rectangular Platform type of structure, and P-5, a double Transitional *Paepae* structure. The tests indicated a sequence of strata, the uppermost of which was a 2- to 3-inch layer of guano (or puddled earth and guano in the rain catch-basin area), which had been deposited recently, i.e., since the aboriginal habitation of the cave. This stratum contained no artifacts. The cultural deposits below this sterile surface layer began in a matrix of coarse gravel. The heaviest concentration of artifacts was in the uppermost 3 or 4 inches, just below the sterile surface layer. Few artifacts were found below 10 inches in depth. The gravel matrix was composed of wave-rolled basalt pebbles, branch coral fragments, and sea shells, becoming finer as the excavations proceeded deeper. This deposit is convincing evidence that at a time prior to the collapse of the roof the sea entered the cave.

The midden material was concentrated in the center of the cave in an area free from falling rocks, which dropped frequently on the surrounding areas. Tests in these areas showed that they had never been inhabited.

In the grid system laid out in the area of artifact concentration, 17 5-foot squares were excavated.

Small stone enclosures, rectangular, oval, or circular, were scattered over the inhabited area. Although their purpose is not presently known, they may have been stands for holding small fishing canoes. Such racks are built today by Tahitians in off-shore shallows to elevate their canoes above the water level when not in use.

The eastern and western halves of P-5 were completely excavated. It was then found that the eastern half of this structure concealed a Paved *Paepae* upon which a sleeping platform had been superposed by the addition of a layer of gravel and earth. Both these structures could be classed as Miniature *Paepae* because of their small size. Excavation, however, proved that they had been inhabited. They were evidently constructed after the cave had been occupied for a short time, as some midden material was found beneath them.

The cultural assemblage of this site was characterized by Jabbing and Compound Shank Hook types and bonito shanks of the Minnow type, as well as Inset Hook points. Coral file types represented were Short Triangular, Long Triangular, and Blunt. One adze of Mouaka type was also recovered.

The site was occupied in the early Expansion period, and occupation continued through the Classic period. The occupation does not seem to have been heavy or continuous throughout these periods, and the cave may have been used by fishing or war parties, as the name implies.

TAIPIVAI

NT 2, *TOHUA* VAHANGEKU'A (WONDERFUL PALMETTO)

A Terraced *Tohua* (Fig. 8, Table 2) is located on the northeast slope of Taipivai on the land of the missionaries of the Sacré Coeur de Picpus. The valley road runs along the uphill stadium edge longitudinally through the dance floor. This site, one of the largest *tohua* in the archipelago and certainly the largest on Nuku Hiva, was probably the "capital" of the Taipivai tribe, which was attacked and burned by Porter and his native allies in 1813. The site of the first Christian church built in Taipivai by Père Pierre, "Petero mihi," it is the lengendary home of a celebrated Taipi warrior, Hokia'e (Smell-more-keenly). A magical stone upon which a man was murdered rests on the uphill side of the dance floor near P-R. It is still regarded with some awe and is used as a mortar for grinding medicines. Aside from the over-all size of this

TABLE 2

STRUCTURAL TYPES, SITE NT 2

Structure	Type	Facade	Sleeping Platform Risers	Fill	Open Veranda Pit	Uprights	Veranda Ovens
P-A	MI[a]	2	1 N[b]	S[c]	1	—	—
P-B[d]							
P-C[e]	M[f]	2–3	1 TB[g]	E[h]	2	—	—
P-D	M	2	1 T[i]	S	—	—	—
P-E	M	2	1 NT[j]	S	—	—	—
P-F	M	2	1 T	?	—	—	—
P-G	TR[k]	—	2–3 N	—	—	—	—
P-H	M	2	1 TB	?	—	—	—
P-I	M	2	1 TB	?	1	—	—
P-J[e]	TE[l]	2	1 TB	E	—	—	—
P-K	M	2	1 T	E	1	—	—
P-L	R[m]	1	—	S	—	—	—
P-M	M	2	1 T	E	—	—	1
P-N	TE	2	—	E	—[n]	—	—
P-O	M	4	1 T, 1 N	E	—	—	—
P-P	M	4	1 T, 1 N	E	—	—	—
P-Q	M	2	1 T	—	—	—	—
P-R	R	1	—	S	—	—	—
P-S	M	2	1 N	E	1	—	—
P-T	M	2	1 T	S	2	—	—
P-U-1	MI	2	1 T	E	—	—	—
P-U-2	MI	2	1 N	E	—	—	1
P-U-3	M	3	1 T	E	—	—	—
P-U-4	MI	2	1 T	E	—	—	—
P-V	TR	—	1 N	—	—	—	—
P-W	T	1 (T)	—	—	—	—	—
P-W-Sub	T	1 (T)	—	—	—	—	—

[a] Miniature temple.
[b] Natural stone.
[c] Stone.
[d] European modified structure.
[e] Composed of two separate components joined laterally.
[f] Megalithic *Papae*.
[g] *Tuu* platform; cut basalt slabs.
[h] Earth.
[i] *Tuu* platform
[j] Natural stone; *tuu* platform.
[k] Transitional *Papae*.
[l] Terraced *Papae*.
[m] Rectangular platform.
[n] Dismantled for later structures.

site, the main reason for conducting excavations was the presence of several *paepae* constructed of extremely large stones (Pl. 4) which offered the possibility of a more precise chronological placement of the Classic megalithic period. The entire complex appears to be one of the best-preserved examples of Marquesan stonework.

Unfortunately for our purpose, the site is classified as a historic monument. Although the local inhabitants were systematically despoiling the cut-stone portions of the structures for bread ovens with impunity, we were prohibited from doing more than a minimum amount of work and were encouraged to depart quickly by the proprietors. The area of excavation was limited by the necessity of our keeping a safe

distance from the valley "road," which was the property of the French Government. The heavy planting of coconut and banana trees which could not be cleared further restricted investigations.

The site consists of an artificial terrace, about 570 by 85 feet, supported on the downhill side by a retaining wall about 10 feet high at the highest points (Pl. 5a). The majority of the space on the surface of this terrace is occupied by the dance floor, which is surrounded by the lateral stadia with a platform at one end. The seaward end, which has no platform, is open to the valley road which enters at that point. As there are only slight traces of a structure at that end, it is doubtful if an end platform of the standard type ever existed.

CUT 1: In an effort to uncover any possible rebuilding periods in the fill of the plaza, a 5 by 10-foot pit was excavated through the dance floor near the downhill stadium. The sequence disclosed in this test was more complex than that on similar sites that we excavated (Fig. 9b).

The stratigraphy was as follows (from the surface downward):

1. A layer of humus, 1-foot thick, marked the third or final building period on the dance floor.
2. Separated very plainly from the first humus layer, a second humus layer, blending into yellow fill below, marked the second stage in the floor sequence.
3. A 3-inch thick humus layer, blending into yellow fill, marked the first stage of elevation of the terrace.
4. Undisturbed soil, a 3-inch humus layer on the surface containing some stump outlines.

CUT 2: A 5 by 5-foot pit was put down against the northwest corner of P-M (Pl. 4a), for the exploration of the foundations of that structure and an attempt to determine its relation to the stadium terrace upon which it stood. The excavation revealed that the shallow foundations at this point were built on a thin layer of stained fill, which was deposited on virgin soil. The stones that formed the first course were propped in position by underlying small boulders, which indicated that the stones used were selected for their shape and were so placed as to fit with other stones already selected for the upper courses of the wall.

The foundation of P-M was buried under a layer of stained, loose fill, 21 inches deep, dipping slightly towards the dance plaza. The stadium was dug from virgin soil and contained little fill.

CUT 3: A second 5 by 5-foot pit was excavated near the southwest corner of P-M, for further testing of the foundations. At this point, the wall footings of P-M were found to have been placed in a ditch some 4 feet wider than the wall and about 18 inches deep, dug into virgin soil. The foundations here were buried to a depth of 3 feet 6 inches by the loose, stained fill uncovered in Test 2. This fill was banked upward against the *paepae* wall at this point.

Tests 2 and 3 revealed the presence of a large quantity of fill built up on the west side of P-M over the foundation or first course. This elevated fill area, which extended westward along the stadium for 28 feet, was supported by an additional course of stones in the stadium wall throughout its length. From the slope above the structure, the remains of a causeway, with a low, stone, retaining wall, descended from an area where a natural deposit of a large number of basalt boulders lay. This ramp passed beneath P-O and P and onto the filled area beside P-M. Upon this ramp the massive stones from up slope were moved into position for the second course of the facade. The ditch uncovered in Test 3 was necessary, to bring the base of the structure level with the surface of the dance floor. A small single-course stone platform, about 8 feet east to west and 4 feet north to south, lay adjacent to the filled platform on the dance floor itself, just west of the southwest corner of P-M. This was probably also part of a ramp or inclined plane, which permitted the elevation of stones brought in along the plaza floor to the level of P-M.

CUT 4: A 5 by 5-foot excavation was made in the veranda of P-O, against the risers of the sleeping platform, to test for the presence of earlier structures. The edges of cut tufa slabs protruded below the present risers. As this situation was also observed on two other *paepae* of similar construction (P and U), it was decided to excavate in an attempt to uncover a structural sequence. The effort was well repaid. The almost totally obscured cut-stone slabs proved to be those of the sleeping platform of an earlier structure which had been increased in height by an increment of approximately equal size (Fig. 9a). When the fill of the earliest structure, P-O-sub, was penetrated to the un-

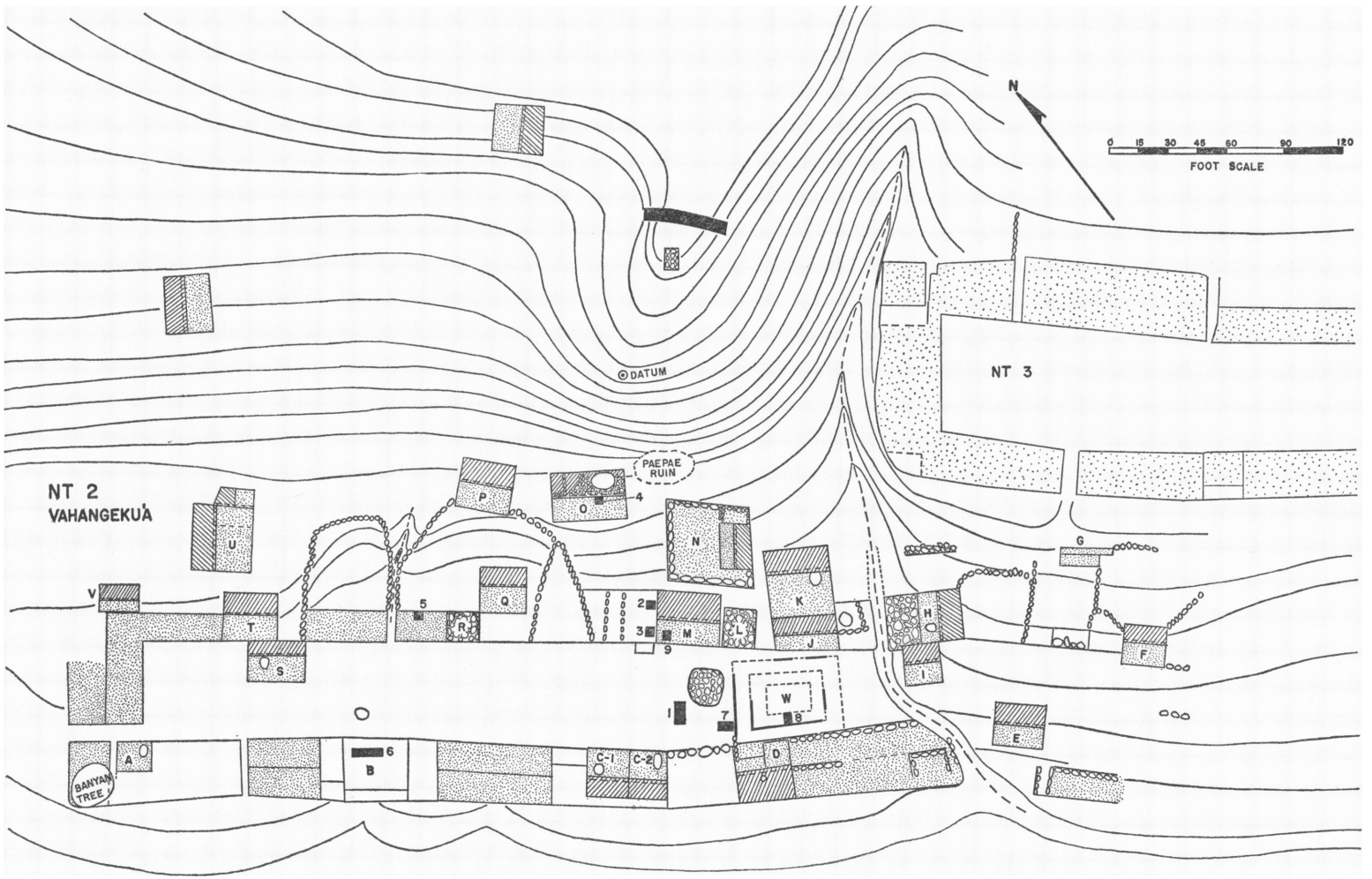

FIG. 8. Site NT 2. The contour interval is 10 feet. Excavations are shown in black. The sleeping platforms of stone structures are shaded; verandas and stadia are stippled. Site NT 3 is shown in Fig. 11.

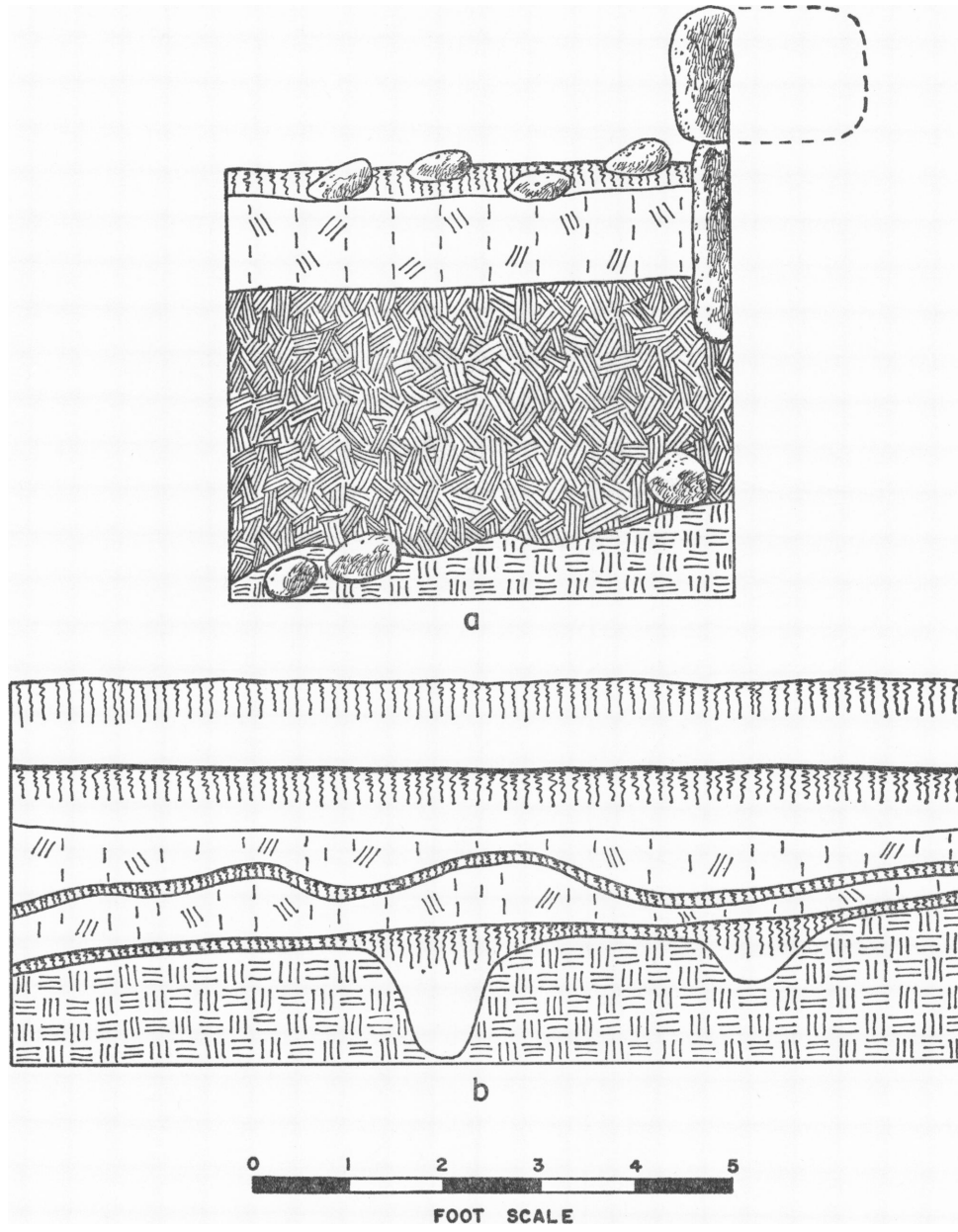

FIG. 9. a. West face of Cut 4, Site NT 2. b. West face of Cut 1, Site NT 2.

disturbed soil, fragments of bottle glass and a musket ball appeared on the contact zone of the fill and sterile soil at a depth of 5 feet, presenting conclusive proof of the late date at which megalithic structures such as this were still being built and cut stone was still being used.

CUT 5: A 5 by 5-foot pit was begun against the riser on the second step of the uphill stadium west of P-R. A mass of large boulders was encountered in the fill near the surface, and the test had to be abandoned before any information could be gathered.

CUT 6: A trench 10 by 3 feet was cut through the surface of the *paepae*, P-B, an area chosen because of its dirt fill and its strategic location on the downhill stadium. The structure should

have yielded a sequence tying into the dance floor sequence established in Test 1. It was found, however, that the *paepae* did not have a predominantly earth fill but contained mainly boulders. It was greatly disturbed and may have been a European structure. In the upper 2 feet a large quantity of burned coral plaster chunks with stick imprints was found. These were the remains of a wattle and daub superstructure, now vanished, which was identified by the workmen as having been the chapel of "Petero mihi," the first missionary to the Taipi. A band of yellow fill below the heavily stained, 2-foot surface layer contained numerous large boulders, laid directly on the top soil layer of the final dance floor stage, with no intermediary structures. The absence of intermediate structures indicates that in relation to other parts of the complex the downhill stadium was more recent, a conclusion further borne out by the fact that in some places the downhill stadium did not appear at all. The fact that the walls of this platform were composed of a triple thickness of long, flat stones, a feature not noticed elsewhere, and that traces of a sleeping platform were lacking suggests that it may have been either a European or a totally revamped native structure. There seems to be no good reason to doubt that this platform had been the chapel site, as claimed by informants.

CUT 7: A 5 by 5-foot cut was made against the west wall of P-W, the low, cut-slab ceremonial platform (*tuu*), cutting off the southern third of the dance floor, in an attempt to associate it with the dance floor fill sequence. This test uncovered the west wall of an earlier, more diminutive, slab structure, P-W-sub, intruded from the plaza stage level, parallel with and approximately 2 feet west of the west wall of P-W. Exactly the same sequence as that found on NHe 3 in P-A, and A-sub, is repeated here. The P-W-sub had been covered completely in the final fill stage of the plaza, and P-W had been constructed above and slightly off center.

CUT 8: A second 5 by 5-foot pit was excavated in the top of P-W, along a north-south axis on the interior of the second slab line on the south side. Yellow fill, 10 inches deep beneath an 8-inch surface layer of dark stained earth and paving stones, represented the body loading of P-W. This yellow fill rested on the paved surface of P-W-sub which, in turn, was on the stained top soil and yellow fill of Plaza Stage 2. The pit was carried down to a depth of 3 inches. Part of this test overlapped an area despoiled by natives of its red tufa slabs which they used to build bread ovens. The surface was so much disturbed at this point that no trace of the original slab positions was observed.

CUT 9: A pit, on the southwest corner of the veranda of P-M, filled with small rocks, was excavated to a depth of 4 feet. It proved to be a rare type of veranda oven, found on only one other structure (P-J, NT 5). A small architectural *tiki* figure in three-quarter round was discovered on a slab of red tufa in the sleeping platform risers, turned face-in to the platform (Fig. 37). This find indicates that the slabs may have been taken from earlier structures that had been destroyed to provide for building materials.

Without excavating, the following superpositions of structures were observable:

1. P-K over P-J and J-2. K was constructed on the sleeping platform of the J-1 and J-2 combination, making the latter an extension of the stadium at that point.
2. P-I was constructed against P-H which stood on the first step of the stadium at that point.
3. P-M was constructed from materials taken from N, which stripped that structure of all paving and its sleeping platform components.
4. P-N-super was constructed on the east side of P-N.
5. P-C^1 and P-C^2 were constructed at different times, the separation between the two being still discernible. The priority of either element cannot be established.
6. P-D, or at least the western portion of D, still unfinished, was constructed after P-W. The west wall of D projects over W.
7. It was possible to work out the elaborate sequence of P-U without excavation, because the earlier components were incompletely obscured by the later additions and natural decay that exposed portions of the earlier structures. On the basis of its gross architectural features (wall construction, sleeping platform, riser type, fill, size, and shape) and its similar position, this structure can be compared with P-O and assigned to approximately the same time period. (Fig. 10.)
8. P-P is an almost exact duplicate in all respects of P-O and U and can be equated with O

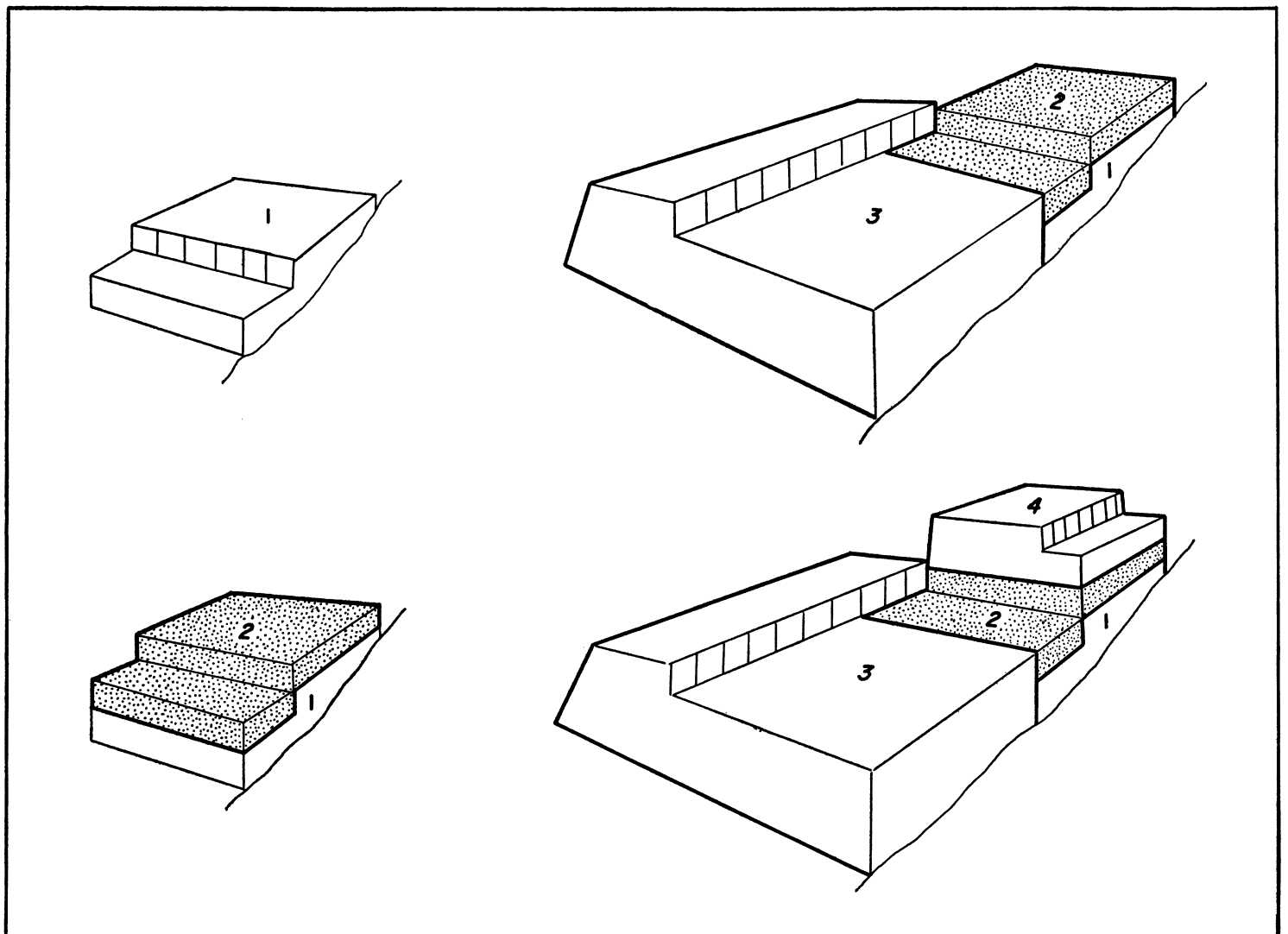

FIG. 10. Sequence of building periods in P-U, Site NT 2.

and U typologically and chronologically.

The sequence disclosed by excavation and the visible superpositions permit the establishment of the following sequences for this site.

Late Expansion Period

Period I, Plaza Stages 1 and 2: The dance platform underlying the entire complex probably began as a low terrace and was soon raised to its present height. (The interval between the first two stages allowed only a little top soil to accumulate.) At the end of the second stage, the stadium along the uphill side of the plaza was added, having been formed in the process of digging fill for the plaza terrace.

Classic Period

Period II, P_p-G, J-1 and J-2: The number of structures assignable to this period is small. Many older structures were probably removed or cannibalized to build later structures. Significantly, cut stone appears here. It is associated with a type of platform (J-1, J-2) in which cut stone was not utilized elsewhere. It is also noteworthy that a structure erected in so early a period in the area became the focus of all the truly monumental stonework in the subsequent period, which suggests a definite plan and orientation in the minds of the builders.

Period III, P_p-M, N, N-super, K, W-sub, and W, F: By analogy of type it is highly probable that P_p-A, D, I, K, Q, T, and C were built early in this period and were followed by E, M, and S. Excavation to confirm this sequence was at some places absolutely impossible, while in others there was no time for further exploration. This was the most important period at the site, showing an immense amount of new construction and renovation. Structures that could have been used only for ceremonial purposes appear (A, W-sub and W, N-super, D), which indicates an increased interest in ceremonialism. The elaboration of the *paepae*, with cut-stone, sleeping platform risers, edged and half-paved platforms, veranda pits, and the use of huge stones in facade construction, reaches its peak in P-M and N.

The attention of the viewer is focused on the facade of the structure which displays the largest stones to best advantage, with their widest surfaces on the outside. This non-functional ostentation suggests prestige rivalry.

The main buildings of this period cluster around P-N on the north stadium and on the plaza floor. This clustering may have been conditioned by the position of the rectangular slab platform, or, conversely, the rectangular slab platform may have been placed in the preëxisting cluster. Whatever the cause, the rectangular slab platform intended for human sacrifice was intimately associated with these buildings.

As Linton[1] has pointed out, the sources of uncut stone were close at hand; the stones were moved mainly from the adjacent fields down the ramp extending from P-M up past P-P and P-O.

The downhill stadium step, where present, was probably constructed in this period.

Historic Period

Period III, P_p-O, P-U, and (by analogy with chronological positions of structures of similar type on NHe 3 and NT 4) P_p-V, R, and L probably belong here also.

A marked decline in technique of construction coupled with availability of materials is evidenced by the use of small stones for retaining walls, solid-earth platform fill, and small cut-stone slabs as opposed to the great slabs used in Period III. The new structures of this period seem to be of purely ceremonial nature, although P_p-O, P, and U may have been suitable as dwelling places.

P-B, the latest structure to be built on the site, was probably a European-conceived foundation for the wattle-and-daub Christian chapel.

As in all architectural complexes, more especially those of a ceremonial nature, artifacts were very sparse and limited almost entirely to surface finds that were made while the sites were being cleared. Abundant evidence of post-European-contact occupation was furnished by the appearance of an iron adze, probably made of a fragment of a barrel hoop, a gun barrel, trade pottery, and the glass and musket balls found beneath P-O-sub. A coquina grindstone was found just below the surface against P-M in Test 2. P-M also held the crude tufa architectural figure described below (p. 151). (Figures of this type, carved on slab faces, were hitherto thought to have been restricted to the southern group of the Marquesas.) Some stone adzes and

[1] Linton, 1925, 7.

adze fragments were also recovered, as well as a stone cleaver flake.

A fragment of the base of a highly polished poi pounder of the *tiki*-headed type was found on the second step of the north stadium, at the point where the mid-plaza drain enters the complex.

Two caches were found in P-Q, one in the veranda and one in a crevice between stones in the southwest corner; both contained badly shattered human bones.

The site is late Expansion through Historic in age. The size of the structures and the sequences of elaboration established by excavation indicate that a sizable, well-organized, labor force, based on a highly productive economy, was available at this time for such community projects.

NT 3, *TOHUA* TEPAKEHO (THE STONE-LINED PIT)

This Terraced *Tohua* (Fig. 11, Table 3) is located uphill, east of NT 2 and parallel to it, overlapping the southeast end of that site by about 150 yards. This site and NT 4 constitute a kind of "super-complex" of ceremonial complexes. Similar clustering of ceremonial sites is found quite frequently in the Marquesas and is discussed below (p. 44).

NT 3 was a comparatively simple structure. The dance floor terrace was only slightly elaborated beyond the basic stadium steps and end platforms. This site was less heavily planted than other sites; consequently, better clearing could be achieved and a study of the remains could be more thorough.

CUT 1 (FIG. 12A): A 10 by 5-foot pit through the dance floor in the southwest corner of the terrace was dug, to test for sequences in the construction of the terrace itself. The sequences thus determined show two stages of fill (from top to bottom):

1. A stratum of topsoil, about 15 inches thick at most, blending into a layer of brown-orange fill, wedged out slightly uphill. This stratum represents Stage 2 of the final stage of the dance floor fill and is contemporaneous with the construction of the stadia surrounding the plaza.

2. A thick, dark stratum of fill was heavily stained with carbonized plant material in which fragments of coconut shell were easily recognizable. As would be expected, this stratum wedges out uphill and towards the southeast. It represents the attempts of the builders to smooth out the imperfections of the original ground surface and to level the floor up to that of a small knob which is visible as a slight rise in the area just west of the dance floor center, causing the course of the drain that crosses the floor at this point to veer southwestward.

The lowest stratum was undisturbed, rocky, virgin soil, dipping slightly southward and westward.

CUT 2 (FIG. 13A): A 5 by 5-foot pit was cut through the veranda of P-A, the western end platform. Seemingly perched non-conformably on an earlier structure, this outwardly simple structure contained three successive building periods, involving both vertical and horizontal expansion. The sequence was as follows (from the earliest stratum upward):

1. The earliest stratum, representing P-A sub 1, was low (about 2 feet), with a single-course retaining wall. This layer is capped by a band of humus, less than 3 inches thick, which indicates that this stage of construction remained in use for a rather short period. At this time the structure was not separated from the west end platform.

2. P-A sub 2 was represented by a thin covering of fill placed on the earliest layer, wedging out towards the sleeping platform risers. This stratum attained a thickness of about 10 inches near the end of the veranda. The addition may have been made to replace the loss of earth through erosion at the veranda edge. The stratum apparently was not exposed for any length of time, because the humus band was approximately equivalent in size to that of P-A sub 1.

3. The final addition to the structure, representing the presently visible P-A, involved a vertical increase of 15 inches, through another increment of fill, and a horizontal expansion of the veranda front some 3½ feet out onto the dance floor. A retaining wall constructed of a double course of stones was placed about 1½ feet east of the retaining wall of P-A sub 1 and 2. The intervening space was filled with a mass of broken soft stone. The whole addition was then surmounted by the 15-inch fill, topping what represents the present surface of the veranda. At the same time the southern retaining wall of P-A was constructed, raising it

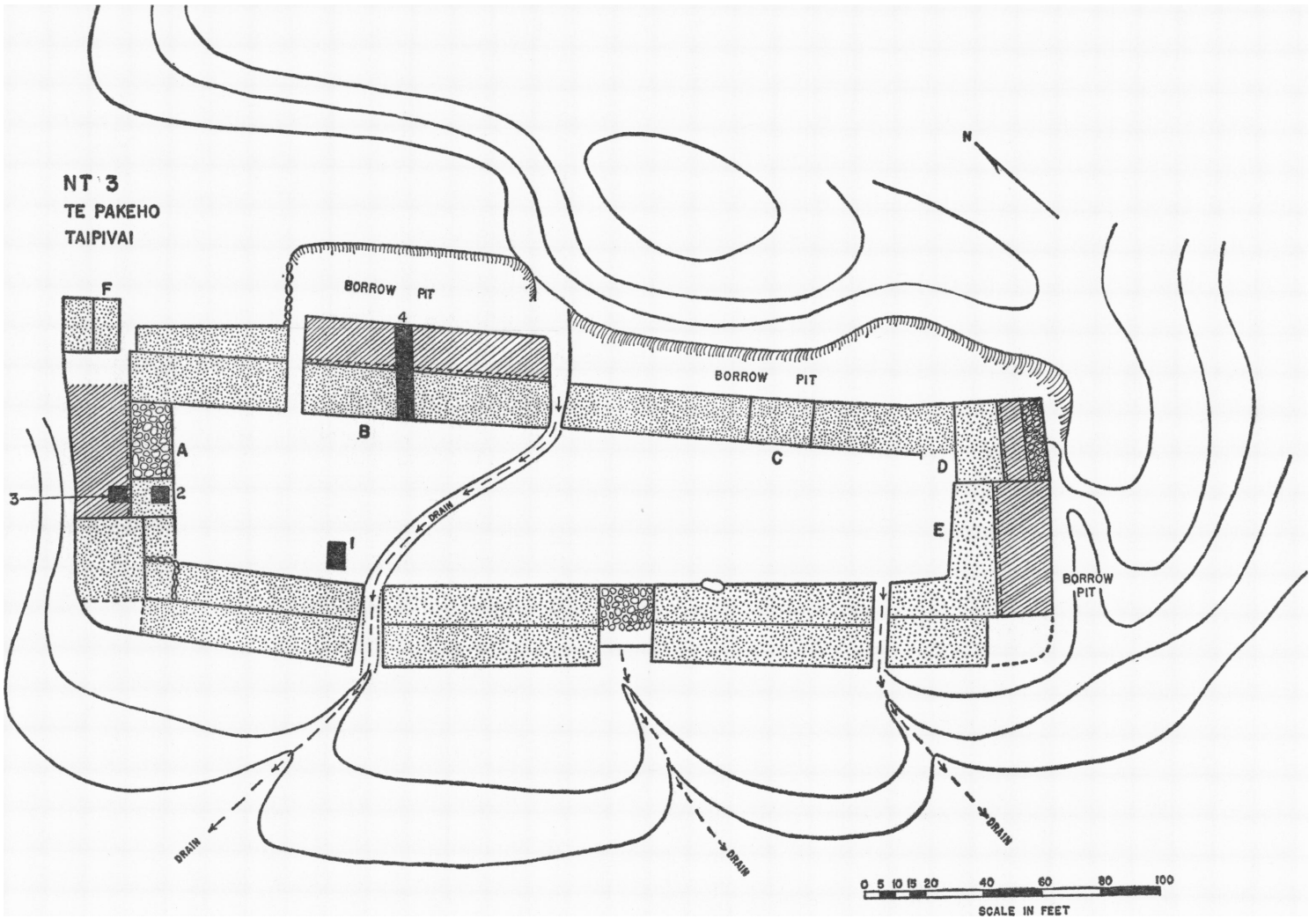

FIG. 11. Site NT 3. Contour interval is 10 feet. Excavations are shown in black. Sleeping platforms of stone structures are shaded; verandas and stadia are stippled.

TABLE 3

STRUCTURAL TYPES, SITES NT 3, NT 4

Structure	Type	Facade	Sleeping Platform Risers	Fill	Open Veranda Pit	Sleeping Platform Caches	Veranda Caches	Uprights	Veranda Ovens	Petroglyphs
Site NT 3										
P-A	M[a]	2	1 N[b]	E[c]	—	—	—	—	—	—
P-B	M	3	1 TN[d]	S[e]	—	—	—	—	—	—
P-C	R[f]	1	1 TN	S	—	—	—	—	—	—
P-D	TE[g]	1–2	1 N	E	—	—	—	—	—	—
Site NT 4										
P-A	Y[h]	3	—	S	—	—	—	—	—	—
P-A super 1	M	2	1 N	E	—	—	—	—	—	—
P-A super 2	R	1	—	S	—	—	—	—	—	—
P-A super 3	M	1	1 N	S	—	—	—	—	—	—
P-B	TR[i]	—	—	—	—	1	—	—	—	—
P-C	R	1	—	S	—	—	—	—	—	—

[a] Megalithic *Paepae.*
[b] Natural stone.
[c] Earth.
[d] *Tuu* platform; natural stone.
[e] Stone.
[f] Rectangular platform.
[g] Terraced *Paepae.*
[h] Terraced *Tohua.*
[i] Transitional *Paepae.*

above the rest of the terrace with which it had hitherto been continuous.

CUT 3 (FIG. 13B): To check the sequence revealed in the veranda of P-A, a second 5 by 5-foot pit was cut through the sleeping platform of that structure. The same sequence of strata was uncovered, matching both in color and texture, showing that P-A, even in its earliest form, was equipped with an elevated sleeping platform. A study of the surrounding stadium seemed to indicate that the fill for the latest stage had been derived from the immediately adjacent second stadium step, of which only the single course retainer remained, the fill having disappeared.

CUT 4 (FIG. 12B): A trench 5 feet wide and 30 feet long was cut through P-B, the only other remaining structure of importance on the site. This very large structure seemed to contain an earth fill holding promise of easy excavation which was, however, not borne out when work began and a predominantly stone fill, covered by a thin layer of earth, was uncovered. As in P-A and its earlier components, three construction phases were found here:

1. P-B sub 1: The earliest stratum is continuous with the north stadium extending on each side of the structure. It is a darkly stained layer, 2 feet thick, resting on virgin soil that contained a few large stones and pig bones, shell, and coral. A single-course retaining wall for the second stadium step is present. This stratum was present throughout the entire length of the trench.

2. P-B sub 2: The second construction phase consisted of a closely packed layer of small boulders, about 1 foot thick, extending the entire width of the trench. This phase, during which P-B was differentiated from the surrounding stadium, is associated with the two lowest courses in the masonry facade of the structure. The position of the sleeping platform risers is not very clear, but they appear to have been located directly above the retainers for the second stadium step in P-B sub 1. The exact position of the risers is somewhat difficult to assign definitely because of my inability to obtain a clean profile in the boulder-filled deposit. The risers were natural slabs.

3. P-B: The final phase of fill is associated

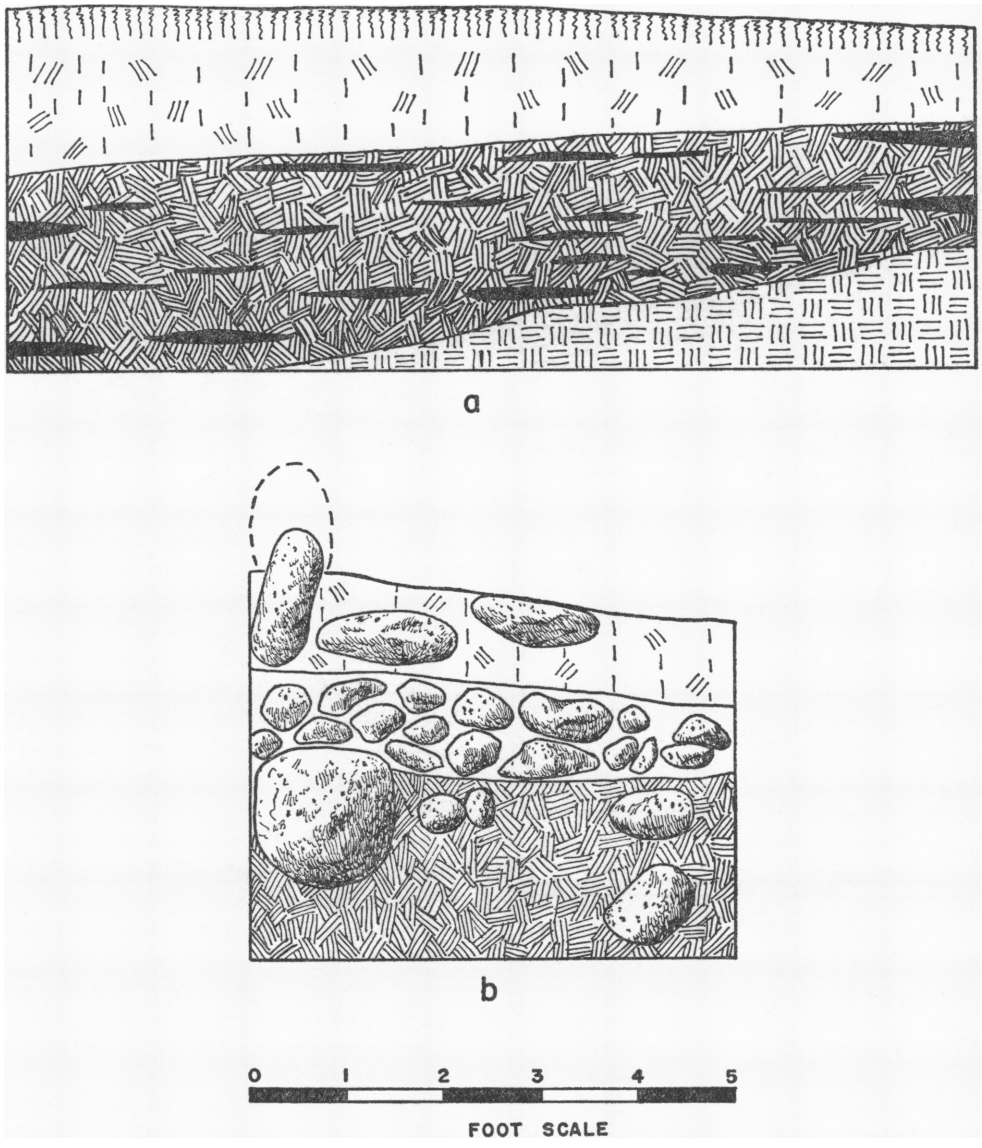

FIG. 12. a. West face of Cut 1, Site NT 3. b. Mid-section, east face of Cut 4, Site NT 3.

with the uppermost course of masonry in the facade. This earth stratum, 15 inches thick, contained sizable boulders. The sleeping platform risers were located directly over the second stadium step retainers for P-B sub 1.

The other structures on the site, P-F, P-C, and P-D, are chronologically placed by typological inference. D was inhabited rather recently by the former Marquesan proprietor who died in 1945. A modern burial of another former inhabitant is in the old borrow dirt excavation behind this *paepae*. It is difficult to place the structure typologically and chronologically, as its present features may be a result of very recent modifications. Typologically, it should be contemporaneous with P-B sub 2. Too little is left of C to be described, but it appears to have been one of the late protohistoric and historic types of ceremonial *paepae* (see Typology, p. 161). P-F, with cut-stone risers, is contemporaneous with P-B in its final phase.

The additional features of interest on this

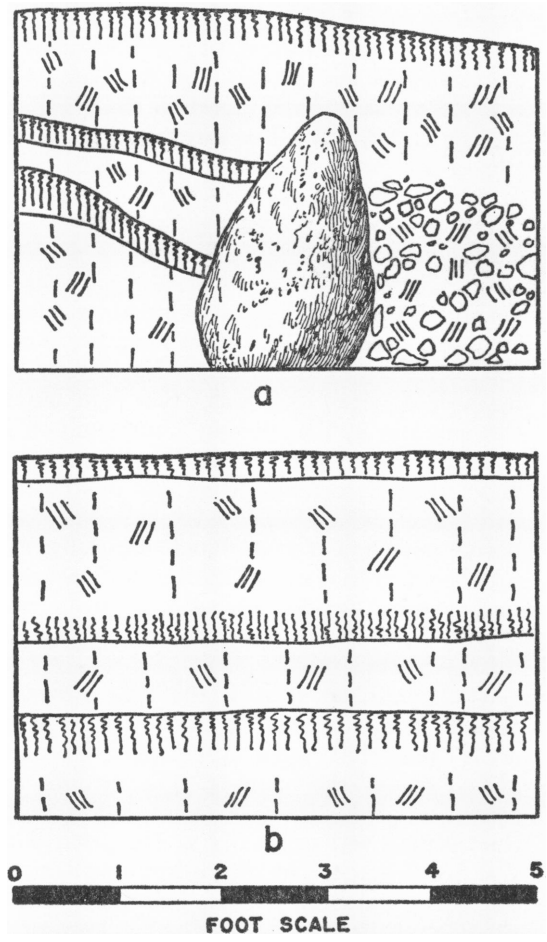

FIG. 13. a. North face of Cut 2, Site NT 3. b. North face of Cut 3, Site NT 3.

site are the two slab-lined drains, the remains of which are found in the downhill retaining wall. The breaks in the wall in which these drains are located may also have served as entrances. The situation is clearest on the western end of the plaza where a gully issues from an alley between P-B and the immediately adjoining stadium on the east, swings west across the plaza and then south through the drain. No such gully is present in the eastern side, but the natural, slab-lined drains are better preserved in the wall break, which leaves no doubt as to their function. A drain may also have existed previously in the mid-section of the retaining wall, but at an indeterminate date the wall break had been filled and a small pavement constructed atop the fill. Such drainage was necessary to draw off the water accumulating from the steep slopes of the borrow cuts in the hill behind the site. Lack of such drainage would have turned the site into a morass after heavy rains.

The sequence of Expansion period structures for this site follows.

Period I, Plaza Stage 1: Non-terraced *tohua* retaining wall with a low, or absent, stadium.

Plaza Stage 2: Terraced *Tohua* with an increase in the height of the dance floor terrace and the terrace retaining wall. The stadium appears after this period.

Period II, P-B sub 1, P-A sub 1, followed by B sub 2 and A sub 2, followed by A, P-D.

Period III, P-B, C, F: This final stage terminated long before contact times. Although the site may have been used sporadically after the Period III structures were completed, I found no construction that displayed the classical developed type of Marquesan dry masonry. No artifacts appeared on the site, of either European or native origin.

Significantly, the structures on this site were apparently begun almost simultaneously with NT 3, which indicates the presence of a very sizable labor force and, as a corollary, a well-developed system of authority founded on a sound economic basis.

The fill for the plaza was obtained from a cut still visible along the uphill stadium to the east of P-B and at the east end of the plaza, exterior to the retaining wall and somewhat downhill.

The fill for P-A was obtained from small borrow pits along the gully below the west end of the plaza; the fill used in P-B was obtained from a shallow but wide cut made directly behind it. The paving from the stadia surfaces and part of the retaining wall appear to have been removed and utilized in building on NT 2.

NT 4, *TOHUA* TEUHIATEA (THE PEARL SHELL OF ATEA)

This site (see Table 3) is situated 50 yards southeast of the east end of NT 2, south of the Taipivai road. Extremely simple in construction, the site consists of little more than a large dance plaza with a smaller adjoining plaza and a few small and decidedly unimpressive associated structures. According to informants, this site was the earliest *tohua* ever built in Taipivai. Archeological evidence, however, indicates that, although possibly not the earliest, it was built

and abandoned quite early and used again in the Historic period after a long break in occupation.

The site was distinguished by the presence of two tunnel drains, draining the main and adjoining plazas. Previously only one site had been reported with tunnel drains.[1] Because of these unusual features, it was decided to investigate. Because time was pressing and because of a heavy hibiscus growth on the portion of the site to be studied, clearing was limited to those structures that were being investigated, and no over-all site map was made.

The main terrace of this complex is about 300 feet long and 70 feet wide, with stadia along both sides, the uphill stadium lacking a second step. The plaza retaining wall varies in height, attaining a maximum of 15 feet at the southeast corner. Platforms are present at both ends; the eastern is higher and more elaborate than the western which resembles the west end platform of NT 3 in not being level longitudinally but stepped up towards the uphill side.

At the southeast corner the remains of a partially collapsed small tunnel are to be seen, filled with dirt that was washed in from the dance floor. The tunnel entrance, at the present time filled with stones, was at a point near P-C on the dance floor. The passage descended at a steep angle through the body of the terrace and out through the retaining wall just above ground level.

P-A was selected for concentration and was cleared of its dense hibiscus cover. Examination of this structure promised more than the other areas of the site, because the majority of all the superstructures were clustered here and because the substructure drain tunnel was in a better state of preservation than in the main dance floor.

CUT 1: A 5 by 7-foot cut in front of the downhill end of the substructure drain was made, to clear the mouth of the drain and determine its limits.

CUT 2: A 6 by 8-foot cut along the rear of Superstructure 3 was made at a point where the tunnel drain entrance should have been.

These cuts established that the drain had been approximately 4½ feet high at the downhill end. The construction was of a lintel type. Natural slabs were set on edge as siding for the tunnel; somewhat larger natural slabs were laid horizontally across these, to roof the drain. Excavation was carried down to the base of the side slabs and into the mouth of the drain. The side slabs were not set on any prepared foundation or pavement, evidently having been placed in small pits in the earth.

Exploration of the tunnel beyond the point excavated was continued by native workmen who crawled in farther to determine that the passage curved abruptly eastward about 6 feet in from the lower entrance, continued for about 5 feet, after which it turned north, ending in a mass of detritus and rocks that had entered through the uphill opening, completely filling it. About 3 feet deep at its deepest point, the fill in the entire tunnel consisted of fine earth and gravel, which indicated that it was waterborne and had accumulated naturally. The rapid erosion that occurs during the Marquesan rainy season could fill such a drain quite quickly, if constant attention were not devoted to keeping it cleared.

The uphill entrance of the tunnel was not found. It was evidently hidden by stones of great size that were apparently purposely placed across the opening. The interior configuration of the drain, however, indicates that the opening was originally at the point where Cut 3 was made. The intermittent stream that the drain had been designed to carry was diverted from its course by the blocking of the drain and had cut around the west end of P-A, flowing down onto the dance floor. The uphill drain opening may have been recently sealed, as informants stated that the site had been used as an enclosure for pigs. According to the former, the drains were closed because the pigs hid in them and were unable to escape.

CUT 3: A 6 by 6-foot cut was excavated in the surface of P-A, midway between Superstructure 3 and Superstructure 2. This cut was intended for the testing of the fill of the terrace, but was abandoned at a depth of 3 feet. Further excavation below this point was impossible because of the large, closely packed boulders in the fill. Horizontal extension of the pit limits to bypass the boulders uncovered only more of them. The entire P-A terrace was filled with large boulders, many of which may have been there naturally rather than placed by human agency.

A native oven was found in the southwest

[1] Linton, 1925.

corner of the pit. It had been intruded from a point 6 inches from the surface, just beneath the present topsoil. The saucer-shaped oven was shallow. A band of red, baked soil marked its lower limit, above which was a layer of tightly packed charcoal chunks. The upper portion of the oven contained the small, vesicular, basalt cooking stones commonly found in such features. This oven is probably recent if not entirely contemporary.

SUPERSTRUCTURE 2: The small stone fill of this structure was completely removed down to the surface of P-A. A hearth and bones of a suckling pig were recovered on that surface, as well as a large conoidal pounder and some coral rubbing stones. The fire and pig remains are probably from a dedicatory ceremony preceding the construction of this ceremonial structure.

P-B: The surface of this structure was stripped, but only those features mentioned were uncovered.

P-C: This structure, an exact duplicate of Superstructure 2, was located directly across from it on the southern or downhill side of the main plaza. The fill was completely removed; some datable objects rewarded the effort expended. The base of a *tiki*-headed poi pounder of magnificent workmanship and fragments of a French wine bottle were found on the surface of the plaza beneath the fill, which thus date its construction as post-1840 and allow a reasonable basis for dating Superstructure 2, its structural mate.

In the absence of more detailed excavations on this site, a sequence cannot be established with certainty. Two broad periods can be discovered, however, which fit in with what had been established in other, more completely excavated sites.

CLASSIC PERIOD

PERIOD I: In this period, P-A was first constructed as a small dance plaza, but was quickly supplanted by the main plaza south of it. P-A then became a base for superstructures oriented towards the main plaza (Superstructures 1 and 3). P-B was also constructed at this time. For reasons unknown, this site was then abandoned, and no additional construction took place for an extended period, presumably until after European contact.

HISTORIC PERIOD

PERIOD II: This site appears to have been used infrequently during this period. P_p-C and Superstructure 2 were built at this time. Such structures as these are recent in all the other contexts in which they appeared; the occurrence of trade goods in P-C here incontrovertibly demonstrates its lateness.

The proximity of three large *tohua*, NT 2, NT 3, and NT 4, in so restricted an area bears witness to the size of both the food surplus and the labor force, as well as the authority at the disposal of the Marquesan chiefs. These are made all the more apparent when one considers that at one point in time all three *tohua* were under construction and possibly in use, and that they can be considered not as the result of the concentrated effort of an entire valley unit, but as the product of the labor of a subtribe, of which there were perhaps six in Taipivai.

NT 5, *TOHUA* TEIVIOHOU (THE DESCENDANTS OF HOU)

The site (see Table 4) consists of a complex of *tohua* located on the land of C. Clarck, about 400 yards upstream from the Taiohae road ford in the northwestern branch of Taipivai Valley head. The name as given by informants may not be the aboriginal site name but probably refers to the tract of land on which the site is situated. Site names and tract names are very frequently confused by modern informants.

According to informants, Herman Melville had been held here by the Taipivai tribe and lived on P-J, the west end platform of Terrace 1. The story related was much like that in Melville's novel "Typee," and the added details supplied by the informants concerning dates on the basis of genealogies, other events in Melville's story, and so on, seemed generally quite plausible. The story is almost certainly a fabrication, however, passed on in utmost sincerity by a grandparent of one of the informants, a highly reputed story teller who was literate in French, and very familiar with Arabian Nights tales, Biblical stories, and the like, in addition to his knowledge of aboriginal legendary material.

The site consists of a complex of three dance plazas and associated platforms, situated one below the other on a gentle slope beside the river.

TABLE 4

STRUCTURAL TYPES, SITE NT 5

Structure	Type	Facade	Sleeping Platform Risers	Fill	Open Veranda Pit	Sleeping Platform Caches	Veranda Caches	Uprights	Veranda Ovens	Petroglyphs
P-A	M[a]	2	1 T[b]	S[c]	1	2 B[d]	2 B	—	—	—
P-B	M	2–3	1 NP[e]	S	1	5	—	—	—	—
P-C	M	2–3	1 NT[f]	S	1	1?	—	1	—	—
P-D	M	1–2	1 NP	S	1	1 B	2 B	—	—	—
P-E	M	2	1 NP	S	1	—	—	1	—	1
P-F	M	1	2 N[g]	E/S[h]	—	—	—	—	—	—
P-G	M	2	2 NPT[i]	E/S	1	—	—	1	—	—
P-H	M	3–4	1 N	S	1?	—	—	—	—	—
P-I	MI[j]	1	1 N	S	—	—	—	—	—	1
P-J	M	2	1 NPT	E/S	—	—	—	—	1	—
P-J super P-K[l]	R[k]	2	—	S	—	—	—	—	—	—
P-L	M	2	1 N	E	—	—	—	—	—	—
P-M	TE[m]	?	—	E	—	—	—	—	—	—
P-N	TE	2	1 N	S	—	—	—	—	—	—
P-O	R	1	—	S	—	—	—	—	—	—
P-P	M	1	1 N	S	—	—	—	—	—	—

[a] Megalithic *Paepae*.
[b] *Tuu* platform.
[c] Stone.
[d] Burials inclusive.
[e] Natural stone; pillow-lava columns.
[f] Natural stone; *tuu* platform.
[g] Natural stone.
[h] Earth and stone.
[i] Natural stone; pillow-lava columns; *tuu* platform.
[j] Miniature temple.
[k] Rectangular platform.
[l] Dismantled for later structures.
[m] Terraced *Paepae*.

T-1 (LOWEST ON THE SLOPE)

DIMENSIONS: 430 by 60 by 10 to 15 feet.

CONSTRUCTION: Multiple, irregular courses of natural stone form the retaining walls, which are slightly battered where intact and contain an earth fill. A stadium with two steps extends along the western half of the southern, downhill side of the terrace. On the eastern half of the downhill side of the terrace, the stadium is very indistinct and probably non-existent. The quantity of brush growing in the area made it difficult to trace structures, without extensive clearing. The uphill stadium is non-existent, for the south edge of T-2 served in place of this structure.

T-2

DIMENSIONS: 430 by 45 by 4 to 10 feet.

CONSTRUCTION: The retaining wall is constructed of irregular courses of natural stone. The courses increase in size and number towards the east, the highest end of the terrace. Throughout the entire terrace length there are no stadia either on the uphill or on the downhill margins. The uphill edge blends into the natural ground surface and on the uphill, or north, side is partially delimited by an alignment of small stones.

T-3 (HIGHEST ON SLOPE)

DIMENSIONS: 90 by 50 by 4 feet.

CONSTRUCTION: This was a natural terrace, with a double-course facade added on the downhill side and an end platform built out from it on the west. A roughly paved strip runs along its north, east, and south margins, but is level with the surface of the ground and is not a stadium.

The site was very heavily overgrown with hibiscus and chestnut trees, which formed an almost impenetrable thicket in some places. The large structures were cleared, but the remainder of the site was left uncleared, so that accurate mapping was impossible. The plan of attack was somewhat different from that elsewhere, because our main objective was to dismantle some of the large stone structures, to establish construction techniques, and to search for caches and status burials. Such work had been impossible on most other sites, as few landowners would grant permission for the necessary partial destruction of such stone structures. In this case, the proprietors, Mr. and Mrs. C. Clarck, were happy to give the necessary permission for the stripping of a few of the important structures, rather than for testing by trenches or pits as we had done previously.

The results of the investigation follow.

P-A: The veranda pavement of this structure, as well as the earth layer beneath it, was stripped off. Two bell-shaped caches containing human bones and grave goods were uncovered. The easternmost cache, No. 1, contained perforated whale teeth, a blue glass bowl of Chinese style, and a large pipe made of a section of sperm-whale tooth. Both caches contained remains of several individuals, all poorly preserved. Obviously long-bone bundle burials were the commonest form of interment, as few skull fragments were present in proportion to the number of long bones. Both caches had already been built when the *paepae* was constructed.

The sleeping platform was stripped. Two caches were found therein, both just behind the cut-slab platform risers. In front of these caches, the sequence of flat slabs placed end to end on their long edge was broken by small slabs set at 90 degrees to the axis of the risers. The slabs were door covers for the caches, which were probably lined with wood, but no traces of any such lining could be detected owing to considerable root disturbance. The small size of the slab "doors" made them easy to handle. The caches were at the east and west ends of the platform, the eastern cache about 8 feet and the western 4 feet from the edges of their respective sides. A broken adze and a second whale-tooth pipe were found in the eastern cache.

When the surfaces of both veranda and sleeping platform were stripped, additional European artifacts were recovered, which make it very certain that a good portion of the occupation span of this structure was after European contact. Two small green glass beads and a jew's-harp were found in the platform. A large chisel blade and a spoon were recovered in the subpavement fill. Two cowrie breadfruit graters and coral files were found. The large number of utilitarian artifacts recovered make it almost certain that the platform was a dwelling and not a ceremonial structure.

Excavation of the open veranda pit yielded nothing.

The large number of individuals represented by the bones in the four caches suggests an ancestor cult and the attachment of a certain degree of importance to the dwelling house in this cult. A similar situation is noted in the description of NT 8, the only strictly habitation site excavated (p. 48).

P-B: The western half of the veranda was excavated down to the basal fill layer of large boulders from which a trench was cut into the open veranda pit, the floor of which was excavated. The five cache pits in the sleeping platform were also excavated. No artifacts were found, in contrast to the situation at P-A, where many were recovered. The difference can be explained on the basis of the use of the structure: P-A is primarily a habitation site; B-P is a ceremonial platform. The dichotomy between ceremonial and habitation structures can be established only by excavation, as is seen below (p. 48) where the frequency of finds made on this and other *tohua* is compared to the frequency on Site NT 8, a habitation site with no special ceremonial structures.

P-C: The floor of the veranda pit was excavated, but no finds were recovered.

P-D: The surface of the veranda and of the sleeping platform were stripped, revealing two cache pits on the veranda, both of which were still sealed off with small fragments of pillow-lava prisms, thus presumably undisturbed. A cache opening onto the sleeping platform con-

nected with one of the caches on the veranda beneath the risers. A male skull was found in the sleeping-platform half of the double cache, with a mass of carbonized wood and vegetable material, evidently from wooden artifacts stored with the skull. A bamboo tube was identifiable among the plant remains in this cache.

After the outline of the double cache had been followed and the cache opened, the platform risers were moved, and a small bone *tiki* was found behind the platform risers. A poi-pounder base was found on the platform surface.

P-H: The surfaces of both veranda and sleeping platform were stripped, and the disturbance in the latter was examined. No caches were revealed, and no artifacts were recovered.

P-J: A 20 by 5-foot trench was cut through the northern section of the veranda, to test for structural superposition, but no remains of any previous structures were uncovered.

The test was carried down to a depth of 3 feet into the dance floor fill beneath the structure.

A circular area about 5 feet in diameter, edged with natural slabs and paved with small, vesicular, basalt pebbles, was noted on the southern veranda and excavated. This feature proved to be an earth oven, filled with oven stones and charcoal-stained earth. Some pig bones and iron fragments were found in the base of the oven that had been dug into the dance floor fill to a depth of 3½ feet from the veranda surface, which gives additional support to the evidence furnished by P-A that the site was occupied until well after contact.

P-K: A 10 by 5-foot cut made against the facade of P-K extended from north to south through the paved stadium area on the south edge of T-3. This excavation revealed that T-3 was constructed on a natural, terrace-like elevation. P-K was built out from the west end of this terrace, which did not serve as a core for the structure. The cut also uncovered a thin layer of fill which had been added to the terrace on its downhill side to help maintain its height. P-K was examined for caches in the hearting of the structure, but none was found.

The chronological sequence of T-3 is determinable only on a typological basis, because its separation from the rest of the complex was such that no stratigraphic connections could be established between it and other sites. The absence of superposition of structures everywhere on the site and the wide scattering of their relatively small number add to the difficulty of establishing reliable interrelationships between them.

The sequence, as far as it can be determined, follows.

Early Classic Period

Period I: Terrace 3 was constructed with a pavement surrounding this small dance floor on the other three sides. P-K was added later. (Evidence for a similar pavement was found in Period I, Plaza Stage 1, at Site NHe 3.) P-H may have been constructed at this time in an attempt to extend T-3 horizontally across an intermittent stream bed east of T-3.

Period II: P-K was probably cannibalized for P-P, the west end platform of T-2 which was constructed at this time. P-L was built when the east end platform, P-H, was constructed on the north edge of T-2. P_p-N and M may also have been built at this time, but it cannot be proved. Their orientation does not seem to indicate an association with T-2.

This period was short and probably marked an abandonment of the site. I have come to this conclusion because the dance plaza was not further elaborated, and only one associated structure was erected before the dance floor was surmounted by structures associated with T-1, and the whole focus shifted downhill to that terrace.

Classic and Historic Periods

Period III: Terrace 1 was constructed at this time. T-2, built over with structures associated with T-1, became a kind of large stadium. The two end platforms of T-1, P_p-J and F, were erected at the same time. P-A was built with material robbed from P-P.

The remaining structures, P_p-D, G, E, B, I-1 and I-2, D, C, and Terrace 2 superstructure, were also built at this time. The site continued to be occupied well into the contact period, when it was abandoned.

To summarize, we have an early, small, and unelaborated dance floor situated on a sloping hillside above a stream. This structure is succeeded by two larger, more elaborate structures built downhill, closer to the stream. The sequence developed at NHe 3 in the dance floor

cut seems to be present here, in a non-superposed context.

The greatest burst of building activity is late, quite close to the contact period, if not in it. The dating is consistent with that for the structures that display all the characteristics of the classic type of platform. The earliest occupation of the site is approximately coeval with the earliest habitation on NHe 3. This structure was probably built by a relatively small group unable to control much man power; otherwise it would have been more elaborate, as are other sites down valley. There is evidence[1] that a population shift into this end of the valley occurred in 1813 after the United States Navy under Porter defeated the Taipi and razed their *tohua* in the more accessible mid-valley region. Impregnable on three sides, this area was more easily defended. It was above this point in Taipivai that the great *ma* pit was dug, to hold 3000 cubic feet of breadfruit paste in preparation for a prolonged siege. This population shift may account for the sudden burst of activity on the site.

NT 6, *ME'AE* PEUPEU

This site, located on an artificially leveled terrace above the Hatiheu road, about 200 yards west of NT 2, had been a *me'ae* according to informants. A surface search produced a war trumpet of *Cassis* shell in excellent condition in a cache on the principal structure. The site consists of a Megalithic *Paepae*, 30 by 21 by 6½ feet, with a sleeping platform 10 by 2 feet in width. The facade is composed of five courses of medium-sized stones. A pavement surmounts the heavy earth overlay of the stone fill. The sleeping platform risers are of red and white cut tufa slabs.

A small, very indistinct pavement, or low platform, situated west of this structure, was not examined in detail.

The surface of the main platform was stripped on the veranda and sleeping platform, except for a small area in the southeast veranda where a coconut tree grew.

Three ossuary caches were found:

Burial 1, behind the northernmost slab of the sleeping platform risers, contained a large number of human bones in bad condition and a pair of earplugs carved of whale teeth and set in shell cups.

Burial 2, at the opposite end of the platform, although opened previously, had not been very much disturbed. A European carving fork was found in this cache.

Burial 3, incorporated into the structure during its construction, was almost at ground level in the northwest corner of the sleeping platform. Fragments of a French wine bottle, broken before being placed in the cache, were found with this burial.

A large whale-tooth earplug, set in a *Conus* cap, was found in the veranda, where it had evidently been carried by rats. A small *Cassis* trumpet in fair condition was also excavated.

This is definitely a Historic period site, as attested by the presence of the bottle in Burial 3, which could not have been intruded. The absence of household goods supported the informants' statements that this was a *me'ae*.

The site is of special interest because it demonstrates the continuing use of cut tufa in the post-contact period.

NT 8, HA'I'I'EI'A

This site (Fig. 14, Table 5) consists of a more or less isolated house cluster above the Vaipiko section of the Taipi River at an altitude of about 700 feet on the north slope of the valley. It is owned by the Clarck family of Taipivai and is used for growing copra. It was selected for excavation because it seemed to be strictly a habitation site, apparently representing the dwelling site of some kind of discrete social unit, probably an extended family. The owners, who had done some prospecting there and had found some rather interesting artifacts, including a small, sculptured stone, drew our attention to the site.

The amiable proprietors gave me free rein to explore these structures and to remove them completely if need be.

P-B: In an effort to locate caches in the body of the structure, the surfaces of both the veranda and the sleeping platform were stripped to a depth of 18 inches. Neither caches nor traces of any open veranda pit were uncovered. Numerous domestic artifacts, the majority being cowrie breadfruit graters, were found just below the surface of the sleeping platform. An iron ax head was also recovered. Upon reaching the stone fill and making certain that

[1] Delmas, 1927, 86.

TABLE 5

STRUCTURAL TYPES, SITE NT 8

Structure	Type	Facade	Sleeping Platform Risers	Fill	Open Veranda Pit	Sleeping Platform Caches	Veranda Caches	Sub-structures
P-A	M[a]	3	1 N[b]	S[c]	—	—	—	1 F[d]
P-B	M	3+	1 N	S/E[e]	—	—	—	—
P-C	M	3	1 N	S/E	—	—	—	—
P-D	M	1	—	S	—	—	—	1 F
P-E	M	4–5	1 T[f]	S/E	1 B[g]	—	—	3 F
P-F	M	2	1 N	S/E	1 B	—	—	1 F
P-F-1	TR[h]	—	1 N	—	—	—	—	—
P-G	Ruin							
P-H	M	3+	1 N	—	—	—	—	—
P-I	TE[i]	2–3	1 N	E[j]	—	—	—	—
P-J	MI[k]	1	—	S	—	—	—	—

[a] Megalithic *Paepae.*
[b] Natural stone.
[c] Stone.
[d] Terrace foundation.
[e] Stone and earth.
[f] *Tuu* platform.
[g] Cut basalt slabs.
[h] Transitional *Paepae.*
[i] *Tuu* platform; earth fill.
[j] Earth fill.
[k] Miniature temple.

no caches were overlooked, I discontinued excavation.

P-C: A 5 by 10-foot trench was cut into the east side of this structure for an examination of a slight depression in the veranda floor. This depression was found to have resulted from a buried veranda pit of an unusual type, square and rather diminutive (3½ by 4 feet). The pit walling was of flat stones, with pillow-lava edging; the floor was earth. The veranda pits supposedly served as caches for the fermenting breadfruit paste, *ma*, which forms the mainstay of Marquesan diet. This pit, however, had been used for cooking; its walls and bottom were reddened and discolored by heat. In the pit fill, charcoal fragments and vesicular basalt cooking stones were numerous, as were many fish and pig bones. Some fragments of coral files were also present. Because the quantity of charcoal present was very small in comparison to that normally found in an oven pit, it is assumed that the cooking stones were probably heated elsewhere and brought to the pit to be used.

P-D: Human bones were found on the surface of this structure around two opened ossuary caches on the south end of the sleeping platform. Both caches contained the bones of several individuals in bad condition. Burial 1, in the southwest corner of the sleeping platform, consisted of only skeletal remains, but Burial 2, at the south end of the sleeping platform risers, contained fragments of a bone ornament, identified by our most reliable informant as a *tu'a* headdress. An adze fragment and the blade of a pearl shell coconut grater were also found in this burial.

This structure was sectioned on a north-south axis along the sleeping platform risers and on an east-west axis through the risers. The entire sleeping platform and south side of the veranda were removed down to the surface of the underlying terrace. The fill of the structure consisted of loosely piled, angular stones underlying a layer of earth. Many small pockets of human remains, mostly teeth and phalanges, were found in the cavities of the stone fill, evidently redeposited by rats.

Charcoal, shell, and bone fragments were scattered about the surface of the earth terrace beneath P-D. These seemed too numerous to

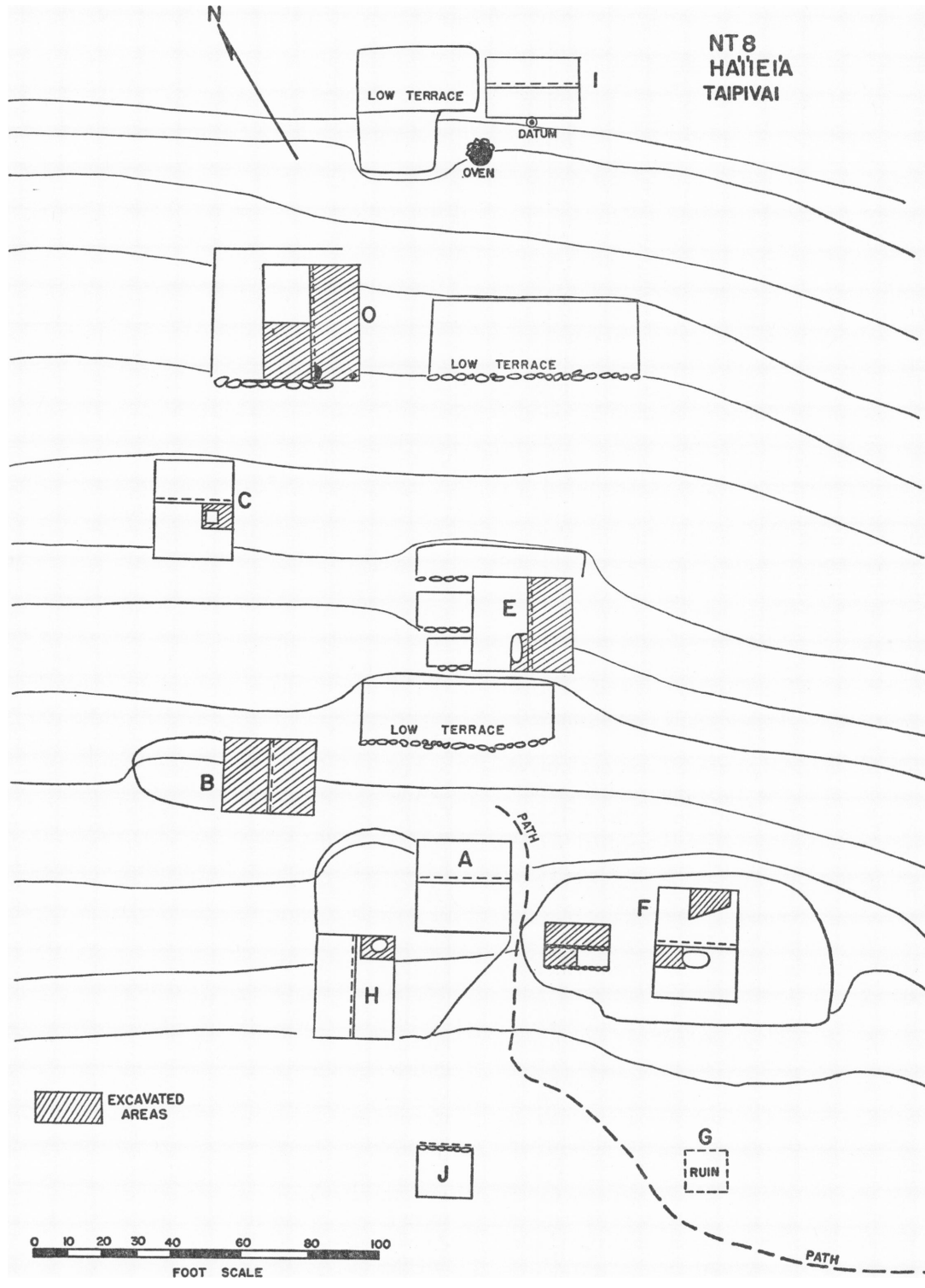

FIG. 14. Site NT 8. Contour interval is 10 feet. Excavated portions of stone structures are shaded.

have been borne down through the fill of the superposed structure either by animals or by gravity. The indications are that this was a house floor or the remains of a house floor in the immediate vicinity. No traces of a pavement or of post molds were found on this presumed floor, but the pavement may have been removed prior to the construction of P-D and set aside for use on that structure.

P-E: The presence of red tufa slabs in the sleeping platform risers of this structure and its superior over-all size distinguished it from all other habitation platforms on the site. This consideration, combined with the unusually constructed veranda pit, made excavation desirable. Because previous experience indicated that the majority of caches were to be found in the sleeping platforms, especially behind the platform risers, the sleeping platform was excavated first, down to the level of the subsoil. The excavation and removal of this portion of the structure would also permit the sectioning of the veranda pit from the east side with ease and would facilitate the removal of many large stones that had fallen into it.

Although no caches were found in the sleeping platform body, a good series of domestic artifacts (breadfruit knives and coconut graters), as well as numerous fragments of pig and human bone, was recovered. Branch coral (*he'e'o*), also present in some quantity, was used in various religious ceremonies; its presence here may indicate private or family cult practices. After the removal of the entire sleeping platform, the veranda pit was opened and the fallen stones were removed. The earth fill of the pit bottom was removed, exposing two flattened skulls, three bundles of long bones, and other scattered fragmentary human remains at a depth of 6 feet on the subsoil. A European carving knife was found with one of the skulls. The wall of the pit was constructed of six courses of elongated and natural and partially shaped stones which continued to a depth of 4½ feet from the surface. The lower 1½ feet of the pit had been dug into the clay subsoil and was not walled.

After its contents were removed and the pit was completely cleaned, the veranda surface was removed, but two trees on the veranda prevented complete clearing.

A complete human female skull was found in a cavity in the base of the west wall of the structure.

P-F: Two cuts were made in this structure, one from the rear or north side, the other through the west wall into the veranda, for the probing of the buried veranda pit. The first cut, to establish the nature of three small, circular, stone enclosures on the sleeping platform, produced a few artifacts, but nothing more. The enclosures were strictly surface phenomena, unrelated to anything in the body of the *paepae*.

The veranda pit contained an unexpected, extended, inhumation burial of an adolescent girl. This was covered by stones removed from the sleeping platform risers and earth from the fill. The skeleton was dorsally extended, with arms flexed to the right; the head, on a stone polishing slab, was turned right (north). A small, solid iron triangle was found on the neck. A severe pathological condition was present in the upper right humerus, with a large bone lesion penetrating the marrow cavity, surrounded by up-welling tissue. This condition had twisted the entire bone shaft and may have been the cause of death. Some of the bones of the hands and feet were missing; these may have been removed before burial. The burial, 5 feet below the surface of the pit, rested on an additional 18 inches of debris accumulated in the pit and antedating its use for burial.

The pit previously had been used as an oven; the walls and bottom were reddened by heat. Charcoal, cooking stones, fishbones, and another polishing slab were in the sub-burial fill. The pit wall extended down to a point 5½ feet below the surface, after which it was excavated into virgin soil for the remainder of its depth of 6½ feet.

Apparently the burial was in some way connected with the razing and abandonment of this structure. From this find one may gain some idea of the circumstances that caused the frequent abandonment and destruction of structures on many of the sites we excavated. Similar reasons may lie behind the inexplicable abandonment of NT 3 and NT 4, and Terraces 2 and 3 on NT 5.

P-F-1: This small, exceedingly simple structure was a short distance west of P-F. Unfortunately, excavation failed to establish the relative sequence of these two structures. It is conceivable that after the abandonment of P-F

this house floor was hastily constructed to shelter the family thus deprived of a home. It is likewise probable, on typological grounds, that this structure is extremely early, but it was impossible to establish any elucidating connections between this and any other structure examined.

The structure F-1 was stripped to a depth of 10 inches on the entire sleeping platform and the western half of the veranda (a coconut tree occupied the eastern half). The floor of this excavation was carefully scraped for traces of post holes, especially along the sleeping platform risers where they should have been located, if anywhere. Nothing was found to indicate that posts had ever been in place, or that the platform had ever had any prolonged use as a house floor. There was no noticeable floor level, only topsoil blending into the virgin soil beneath and a few tiny, widely scattered, charcoal specks.

A fragment of a pistol barrel was recovered in the clearing of the topsoil of the platform, but this may have been dropped here at a late date, long after the structure had been abandoned.

P-H: A 10 by 5-foot cut was made in the north end of the veranda of this structure for the testing of a buried veranda pit. The surface indications of the existence of such a pit were not very clear, as wash from the slope above the structure had come down onto the veranda at this point.

The cut, with its long axis east and west, was started at a point south of the suspected area. It was first excavated to a depth of 3 feet. Later, the north face was cut back until the suspected area was reached. In this fashion, a pit, which had been damaged extensively, was located. Although square, the pit apparently was not typical. If it ever had been walled, even traces had disappeared. The cross-section in the north face showed the pit to be 3 feet deep, with sloping sides. It had been used as an earth oven, being filled with cooking stones, odd stones from the fill of the *paepae* and the pavement, and a great deal of charcoal. Further, the earth beneath was discolored from heat.

Oven 1, 5 feet in diameter, was dug into the hill slope 7 feet southwest of the southwest corner of P-I. A retaining wall of natural slabs had been set into the uphill side of the oven lip. This prevented the pit from being too rapidly filled by erosion from the slope, which rose very steeply just north of P-I. The oven, which was excavated completely, was found to have undercut sides, with a depth of 6 feet. The fill consisted of charcoal-blackened earth; cooking stones, small, marine oyster shells (*ti'o*), and fresh-water snails (*pipivai*) were all found in large quantities. An iron tool resembling a truncated, wide, putty-knife blade with a short, rounded tang was found at the base of the oven deposits. This had probably been used for paint or deck scraping on a European ship. Whatever the cause for the abandonment of this oven, it seems to have been done in an orderly fashion, as the oven had been purposely filled in.

It is impossible to establish any sequence for this site, because superposition occurs only at P-D where that structure was built on the long, low terrace that may or may not have been previously used as a house floor. Typologically, a sequence can be hypothecated, but its value is, of course, subject to all the exceptions that can be made to any sequence that is not based on stratigraphy. As the typology utilized here was established stratigraphically, however, it may be expected to be of far greater value than one based solely on "logical" divisions. Three periods of construction in a relatively very short time are indicated:

Late Expansion Period

Period I: P-I and P-F-1 were built in this period. Some of the long earth terraces for small houses may also have been built at this time.

Classic Period

Period II: P_P-D, A, B, and C were built at this time, moving down-slope from P-I and forming a cluster, shaped as a C, opening eastward.

Period III: P_P-F, E, and I were built, closing the opening of the C which had been formed by the disposition of the earlier houses. At this time P-E was the most elaborate *paepae* on the site. Some status differentials may have elevated the inhabitants of this structure above others living on the site. These status differentials were expressed in an increase in height of the structure and the extensive use of cut tufa in the sleeping platform.

European contact and subsequent abandonment followed closely on the completion of these structures. The abandonment probably resulted from depopulation and the inability of the in-

habitants to protect themselves in their exposed position, which was marginal to the centers of population in the valley, in an area easily reached by the Ho'oumi tribe.

This site is significant principally because it is the only habitation site of the Classic period in which the structures were excavated. As such, it provides a basis for comparison with the artifact inventories from the ceremonial sites of the Classic period. After such a comparison, the great disparity between these inventories is evident and indicates plainly that the house platforms on the *tohua*, unlike the platforms of this site, were only sporadically occupied on ceremonial occasions.

In addition, we have further evidence here of the existence of a private ancestral cult in which the bones of the dead were cached in ordinary house platforms. Significantly, of the structures excavated, only two had such caches, which suggests that the maintenance of the ossuary was not entrusted to all families in the settlement. The size of the platforms containing such caches indicates that their owners may have enjoyed a relatively high prestige. (P-E seems to have been the habitation of the central figure in the village during Period III, and P-D may have been during Period II, but there is no evidence for it.)

The hasty burial in P-F provides an excellent clue to the kind of causes behind the frequent abandonment of sites noted elsewhere.

The cultural traits observed here for the first time were: (1) the use of the veranda pit, commonly believed to have been intended only for breadfruit paste storage, as an earth oven and, occasionally, as a disposal pit; (2) the use of the unpaved surface of the sleeping platform as a handy disposal area for small, broken articles or for hiding objects; the highest artifact concentrations were in the sleeping platforms; (3) a communal oven that seems to have served the entire house cluster; and (4) terraces among the houses, following the hill contours, probably for taro planting.

NT 9, ANAKOPEKA (BAT CAVE)

This is a large, low-vaulted, solution cavity at the base of Te'ava'imana, on the northeast side of Hanga Ha'a, about 1½ miles from the beach of Taipivai (Fig. 15). The main chamber of the cave turns to the northwest just inside the entrance, narrowing into a constricted passage, about 2½ to 3 feet in width, which continues back an indeterminate distance. According to local informants, this passage goes directly under Te'ava'imana, issuing some place near Vaikoukou in Ho'oumi, the adjacent valley. This information is not reliable, as no one is known definitely to have explored the cavern to its end; all reports are second- or third-hand hearsay.

The cave floor slopes gradually from the northwest corner down to the southeast, where the sea enters at high tide. The floor, consisting of a layer of damp, packed guano about 1½ feet thick, rests upon solid bedrock. Many water-worn boulders are scattered on the surface near the mouth of the cave. A rock slide descending from the northwest corner of its mouth occurred prior to human habitation, somewhat narrowing the entrance.

The ceilings and walls of the cave are covered with mineral deposits. Small stalagmites have formed in some areas, especially near the entrance to the narrow passage in the northwest. Constant seepage through its walls and ceilings and along the bedrock plane, combined with spray moisture from the sea entering its southeastern portion, gives the cave a dense, humid atmosphere not very conducive to the preservation of cultural materials.

Two structures were on the cave floor. P-A was a Terraced *Paepae;* P-B, a Miniature *Paepae*. Both had earth and stone fill.

An indistinct line of stones extended from P-A across the cave to the southeast, curving slightly eastward, following the contours of the cave floor. According to informants, this supposedly marked the site of a large, elongated platform that had been destroyed by the tidal wave of 1946, but it is doubtful that any such structure existed.

In addition to small stone cairns, small stone circles appeared on the cave floor southwest of P-A. Three oblong depressions, surrounded by stone lines, were located on a natural shelf near the cave roof, at a point above P-B. Human bone fragments scattered widely on the floor and in the narrow passageway extending under the ridge prompted excavation.

P-A was excavated first. The present surface was stripped in an attempt to find the original floor of the structure. This appeared at a depth of 6 to 8 inches immediately below the wash from the rock slide at the rear of the platform.

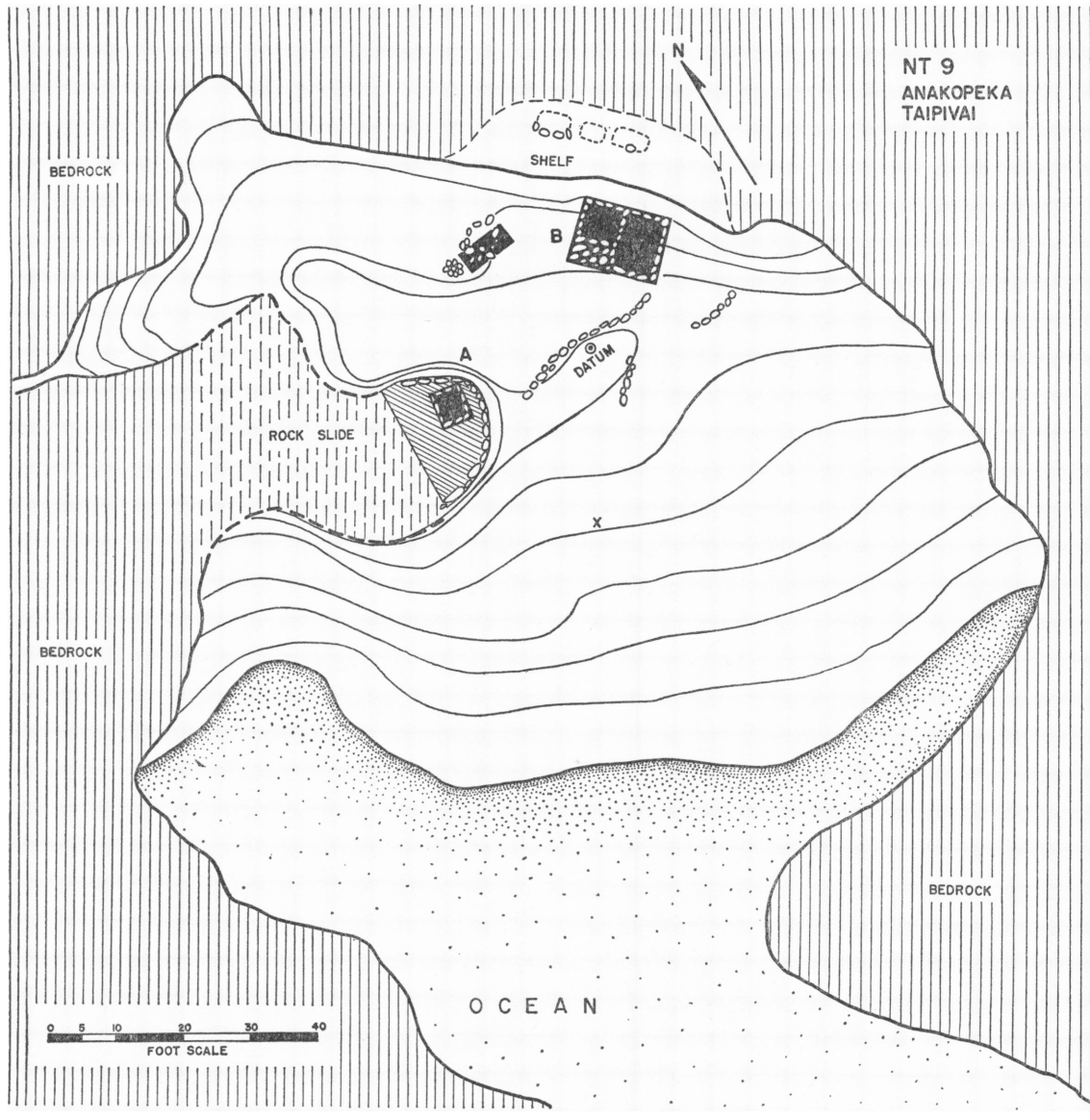

FIG. 15. Site NT 9. Contour interval is 1 foot from the datum point to contour marked X, below which it is 5 feet. Excavations are shown in black; P-A terrace is shaded.

A 3 by 5-foot enclosure of smooth, elongated sea boulders appeared on the original surface and was cleared completely. The outside edge of the enclosure ran close to the edge of the retaining wall. Another course of stones was laid between the enclosure and retaining walls in this space. The enclosure was carefully excavated, but no traces of a subsurface pit and no artifacts were found in the fill. The excavation was carried down to bedrock, which sloped from a depth of approximately 2 feet on the uphill side to 4 feet on the downhill side.

P-B was excavated next and yielded the only artifacts found at this site. The entire surface was stripped, and the fill was removed. The sleeping platform enclosure at a depth of 6 to 7 inches contained a fire bed 2½ feet in diameter. Human bone fragments were found close to the fire bed and elsewhere in the fill. A knotted lock of brown, human hair was found against the

south wall, at the level of the exterior floor surface. One coral file and fragments of worked oyster shell were the only tools recovered in the fill. These artifacts did not appear to be intrusive but were probably gathered up with the *paepae* fill and redeposited.

The large, circular, rock enclosure southwest of P-B was the next structure excavated. A section cut through this failed to reveal any intrusion or disturbance within the circle and no artifacts in the guano floor. One small, human bone fragment appeared on the surface of the ring. The adjacent rock cairn was removed and the area beneath it was tested, with similar results.

As a last resort, the stone-enclosed depressions on the natural shelf overlooking P-B were tested. The shelf proved to have a deeply hollowed surface which was filled with packed guano. The depressions resulted from excavations that had been made in the shelf to bedrock and then refilled. Excavation of one of these depressions turned up some sticks and leaf fragments. Some scorched slabs of mineral deposit from the ceiling were found in the hole; the outside pit wall was discolored as though from fire.

On the basis of architectural details expressed in P_P-A and B, admittedly slim evidence, the site can be assigned to the Classic period. The purpose of the structures is difficult to determine, but it would appear to be almost exclusively ceremonial; neither of the *paepae* had habitation accommodations adequate for even one person. The cave appears to have been used for burials quite early, after which the two *paepae* were built, incorporating in the fill of P-B human bones that by that time were mixed with the natural guano flooring of the cave. The two *paepae* were probably altars, while the pits in the wall shelf may have held torches to light the ceremonial area. The purpose of the circular enclosures and cairns on the floor is uncertain.

HO'OUMI

NHo 2

A *me'ae* is located in the head of Vaikuivi Valley, Ho'oumi, in the area called Ha'e'oupoa. It is a large Megalithic *Paepae* built on an elevated terrace against the westward slope of the valley. A dead *pua tea* tree behind the *me'ae* contained human skeletal material, representing several individuals. When the skeletal material was removed, excavation was carried to a depth of 1 foot in the slope, as erosion had washed earth over the lower portions of the bones. Seven pierced whale teeth were found among the bones beneath the surface. Long bones, pelves, and scapulae were piled respectively in three separate piles. Pig and domestic cat bones were associated with the human bones.

NHo 3

Figure 16

An open village site is located on the beach of Ho'oumi Valley on the land called Mapiko (river bend). The Ho'oumi River flows through this area into the bay. The portion of the site south of the river is very low and may recently have been the river bed. Several large *paepae* are on this bank. The northern bank of the river, however, is 6 to 7 feet higher than the southern, and a survey indicated that the most promising archeological possibilities were to be found there.

The deposits in this area were sand, therefore permitting easy excavation. One large Megalithic *Paepae* was located in the area of the excavation; ruins of several more *paepae*, despoiled for building stone walls, were in the vicinity.

The midden deposit consisted of two strata, the upper (Stratum II) of light sand approximately 10 inches thick, and the lower (Stratum I) of dark sand 15 inches thick. These two deposits represented two distinct occupations separated by a long period of time. The lower stratum represented an occupation of the late Developmental period with Paved *Paepae* structures. One of these was located in preliminary testing and was cleared in Cut 1, as much as was possible without moving superposed stone walls and palm trees. The structure was roughly rectangular, 30 feet long and over 10 feet wide, with three post holes in the floor. Tests were excavated 5 feet from this area on the other side of the obstruction and palm trees that prevented complete clearing of the structure. These tests indicated that the structure was 15 feet wide, as no part of it was struck

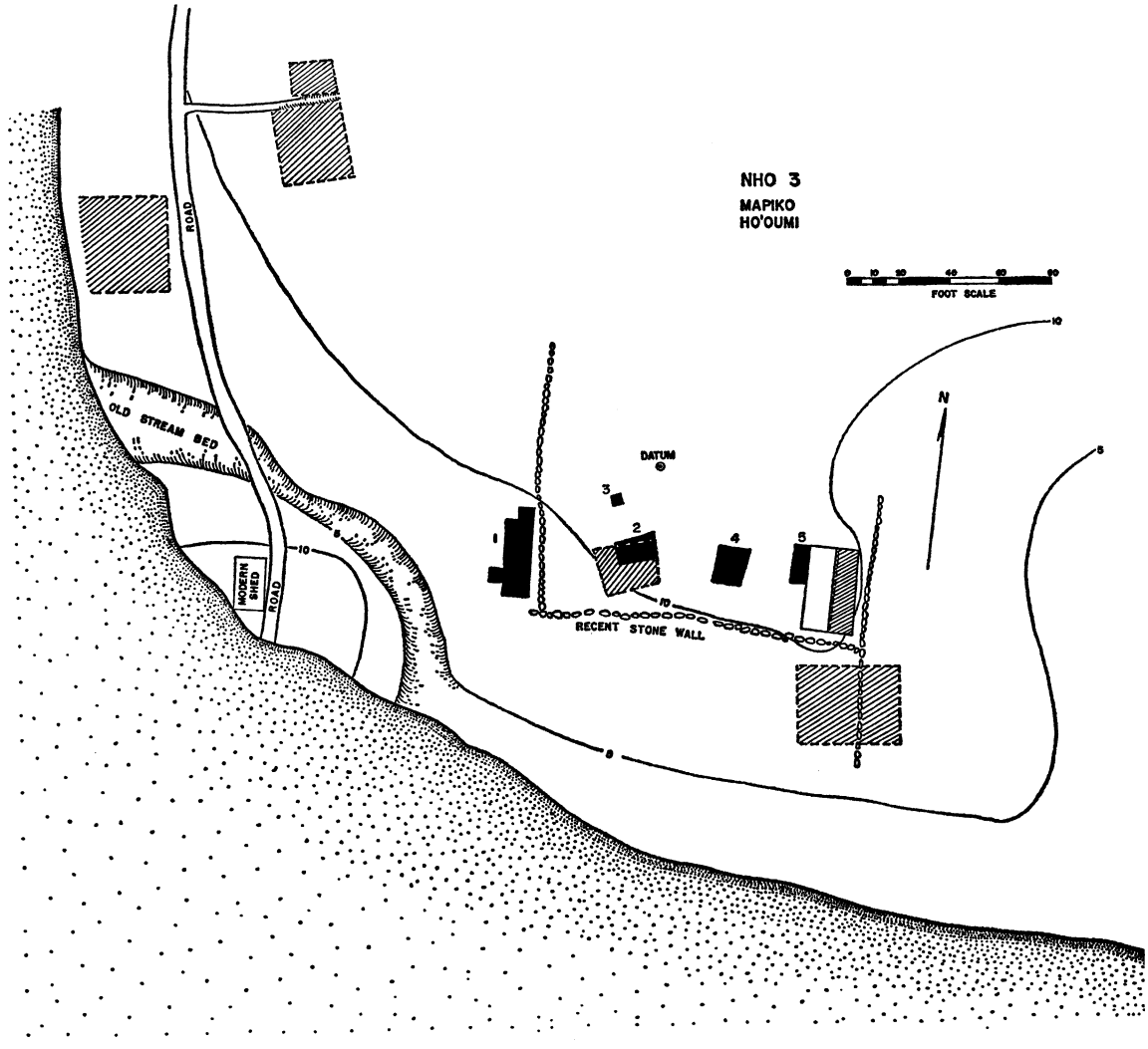

FIG. 16. Site NHo 3. Excavations are shown in black. Ruined structures are shaded and delimited by dashes; complete structure is delimited by a solid line.

in these tests. A remnant of another Paved *Paepae* was found in Cut 2, extending beneath one of the ruined Megalithic *Paepae* on the site (Fig. 17a). The cultural assemblage of this level was characterized by Heavy Shank, Jabbing, and Acute Recurved Point Hook types. Coral files of the Long Triangular, Short Triangular, and Narrow types were also present. This site represents the earliest known occurrence of the cowrie vegetable scraper. The Compound Shank Hook type is represented by one specimen which may be intrusive. One sherd of poorly fired pottery was found in the lower stratum associated with the Paved *Paepae*. This is one of two pottery-bearing sites on Nuku Hiva.

The upper stratum of lighter sand was contemporaneous with the Megalithic *Paepae*, representing an occupation of the Classic period. The cultural assemblage of this stratum was characterized by the above artifacts and the Rectangular Coral File type in addition. The Compound Shank Hook is definitely represented.

Testing in various other areas of the site was fruitless, because it seemed certain that much had been washed away in the tidal wave which

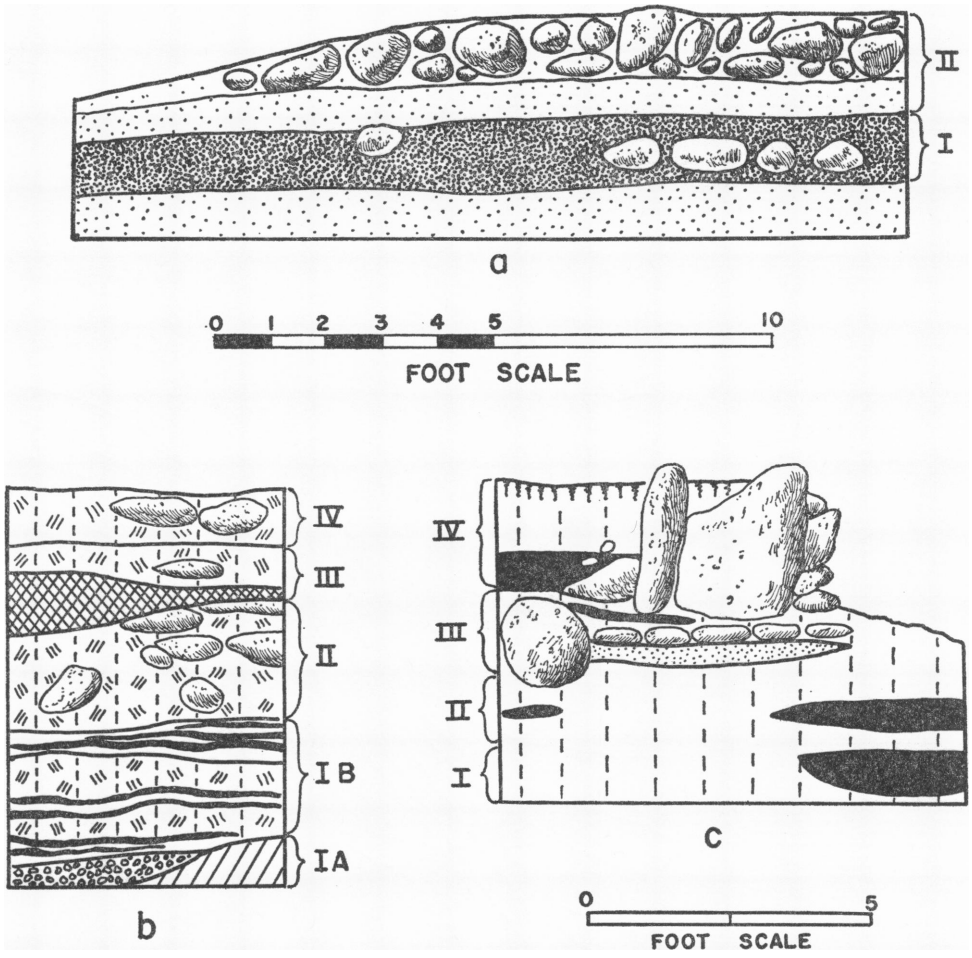

FIG. 17. a. East face of Cut 2, Site NHo 3. b. South face of cut, Site NHi 1. Cross-hatched stratum is earth and ash; all other symbols follow those in Fig. 3. c. West face of Cut 2, Site NHtv 1. The scale is the same for b and c.

had, however, not affected the area we excavated. That area was sheltered by a slight rise which had evidently diverted most of the force of the wave to each side.

According to informants, a temple had been located on the north bank of the stream where it entered the bay. A copra house now stands on the remains of this structure, which had been damaged during the tidal wave. After the tidal wave, human bones washed out of the bank in some quantity. Some fragments are still found there.

In summary, the site has two distinct occupations: Level I is of the late Developmental period; Level II is of the Classic period. It is of unusual importance because of the occurrence of pottery in the lower stratum in a good archeological context. In addition, stratification of Megalithic *Paepae* over Paved *Paepae* was found.

HA'A'AU'A'I

NHi 1 MOE'ANA (SLEEPING)

Moe'ana rock-shelter (Pl. 3b) is located beneath an overhanging ledge of vesicular basalt extending northeast-southwest on the shore of Ha'a'au'a'i, a small valley and bay opening from the south shore of Ha'atuatua Bay (Fig. 18).

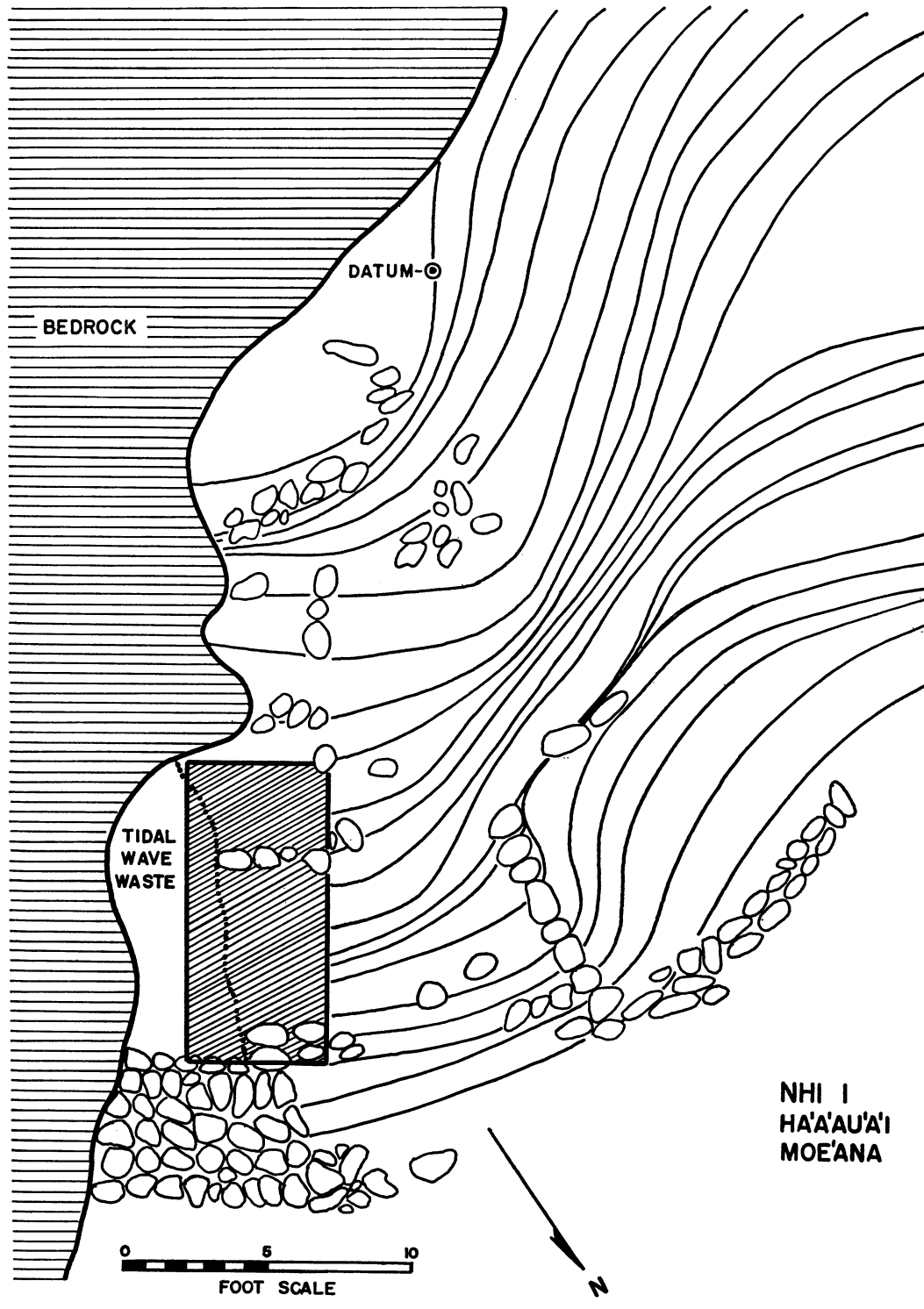

FIG. 18. Site NHi 1. Contour interval is 1 foot. Excavations are shaded.

The site is about 15 feet from the water's edge. Some of the midden along the back wall of the shelter was removed by the 1946 tidal wave.

From the southwest side of the shelter, the midden slopes very steeply to the water's edge. The rock ledge curves up southward into the hill. Much eroded earth has been carried into the shelter, causing quite rapid deposition on the floor. The steepness of the slope and the rapidity of accumulation of earth from up-slope forced the aboriginal inhabitants to build small terraces with retaining walls of single or double stone courses, to obtain a level ground surface. Many of these terraces were still visible on the surface.

Attention was drawn to the site by an inhabitant of Hatiheu, who, while working and living in Ha'a'au'a'i, claimed to have recovered several artifacts from the cave floor in the area cut by the tidal wave. (There is some reason to doubt that all the artifacts were recovered on the site, although most of them probably were.)

According to informants, the site was a stopping place on the aboriginal road between Ho'oumi and Hatiheu, a route that was abandoned as soon as the depopulation of Taipivai made it safe for the Ho'oumi people to take the shorter, overland route through Taipi.

The valley of Ha'a'au'a'i had a sizable population in the Classic period, if we can judge by the number of *paepae* in the vicinity. The center of occupation seems to have been the area in the immediate vicinity of NHi 1, extending some 500 yards up the bay and inland 100 yards. This is the only spot between Ha'atuatua proper and Ho'oumi with a suitable beach for landing in canoes.

Excavations began at the northeast end of the shelter, closest to the water's edge, following a paved floor that continued out of the edge of the midden. (This pavement had been repaired and extended by the recent inhabitants of the site.) A 15-foot cut excavated at this point, parallel to the back wall of the shelter, reached dipping bedrock and virgin beach gravel at a depth of 7 feet in the southwest face of the cut. The upper portion of the midden was dry, but, after approximately 1 foot had been removed, the soil became quite moist from ground water that seeped through the rock-shelter wall. Excavation and sifting then became increasingly difficult; the soil assumed the consistency of thick mud, clinging stubbornly to the screen, making it necessary to scrape the mesh clean after every shovelfull. Consequently, screening was abandoned, and the rest of the midden was troweled through.

Five strata were uncovered, all dipping slightly towards the sea (Fig. 17b). The lowest stratum, I-A, the surface of the otherwise virgin beach-gravel deposit, contained only three artifacts, all of which were non-diagnostic. A band of black, white, and red ash separated Stratum I-A from Stratum I-B. The latter, about 1½ feet thick, was capped by a stone *paepae* pavement which extended out of the midden. It had been repaired by the recent inhabitants. Within this stratum, on the uphill side of the pavement, were the remains of a large oven. A line of natural slabs, representing the sleeping platform of this pavement, ran parallel to the back wall of the shelter. Artifacts recovered in this stratum definitely represented a typical Expansion period habitation site. The surest time indicator was a Compound Shank Hook in Stratum I-B. An interesting find was a carved poi pounder handle with a human head, completely different from the historic Marquesan style. A Koma adze was also recovered here.

Fill from up-slope gradually washed in over the pavement of P-A. A low earth terrace surmounted by a single-course retaining wall was constructed but was covered soon by Stratum II, approximately 1 foot thick, which contained many small, discontinuous ash lenses. A large fire pit in this stratum cut down into the top of I-B. It was full of *pukava* (*Turbo*) shells and cracked fire stone.

Stratum III contained a second pavement, P-B.

Stratum IV which contained a low, single-course, retaining wall terrace, filled mostly with earth wash, was probably post-contact.

Artifacts, fortunately, were most numerous in the lower levels, I and II, but did not permit a good statistical run except on coral files. With these artifacts it was possible quite definitely to place the site chronologically. Apparently it was occupied by fishermen. It may also have been a fish preparation area, the concentration of tiny fishbones in the midden being unusually high as compared with those at other sites.

The main occupation of this site during the early Expansion period continued into the Classic period. Artifacts from Stratum I-A represent an early brief occupation but are not

assignable to any period because of their nondistinctiveness. In its earliest stages, Moe'ana may have been a permanent habitation site which probably became a periodically inhabited "road house" and a fishermen's shelter in the Classic period. Parenthetically, this site is a fine example of great depth of midden accumulation resulting from a relatively short occupation span, a phenomenon of frequent occurrence in the Marquesas where erosion seems to have been more marked in some areas in the past than it is at the present time.

HA'ATUATUA

NHaa 1

A large, open, village site is located on the sand hill behind the beach in Ha'atuatua (Fig. 19, Pl. 3a). The area occupied is relatively level and covered with sparse grass and a few clumps of small hibiscus bushes. This was the first promising site found in the 1956 survey. Its location was uncovered after the 1946 tidal wave had sectioned the deposits along the entire length of the beach, cutting into them for a distance of 60 yards or more inland. This cut displayed the midden in profile very neatly and opened the burial area at Te'oho'au (Pl. 3a), exposing a large quantity of human skeletal remains. The southern end of the beach was not hit heavily by the tidal wave, but could not be excavated by us because of the uncooperative attitude of the owner who believed that the artifacts recovered would have great monetary value.

Originally two rivers passed through the site into the bay, but they had long been dry. In the bed of the southernmost river, petroglyphs had been pecked onto a large, flat stratum of stone exposed at that point (Pl. 11). These petroglyphs had been made at a time when the rivers were running and the tide still entered their mouths, for they had been partially obscured by a 3-inch thick layer of coquina, formed in brackish or salt water, which had to be chipped away for the figures to be traced in their entirety.

Surface survey and testing in the 1956 season determined two localities definitely of value. One of these was the burial area at Te'oho'au ("the canoe hangar") (Fig. 21); the other was in the habitation area north of the northernmost river bed, an area known as Mouaka (Figs. 22, 23). Between these two areas extensive portions of the site had been removed, ex-

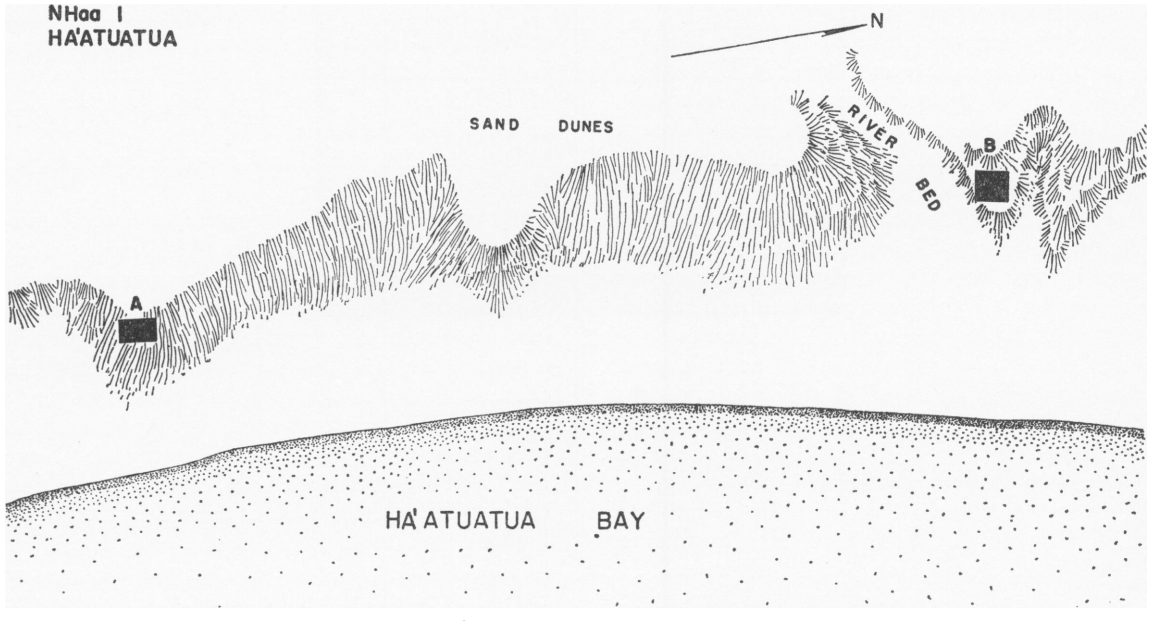

FIG. 19. Site NHaa 1. Location A is shown in Fig. 21; Location B in Figs. 22–23. Scale, 1 inch to 50 yards.

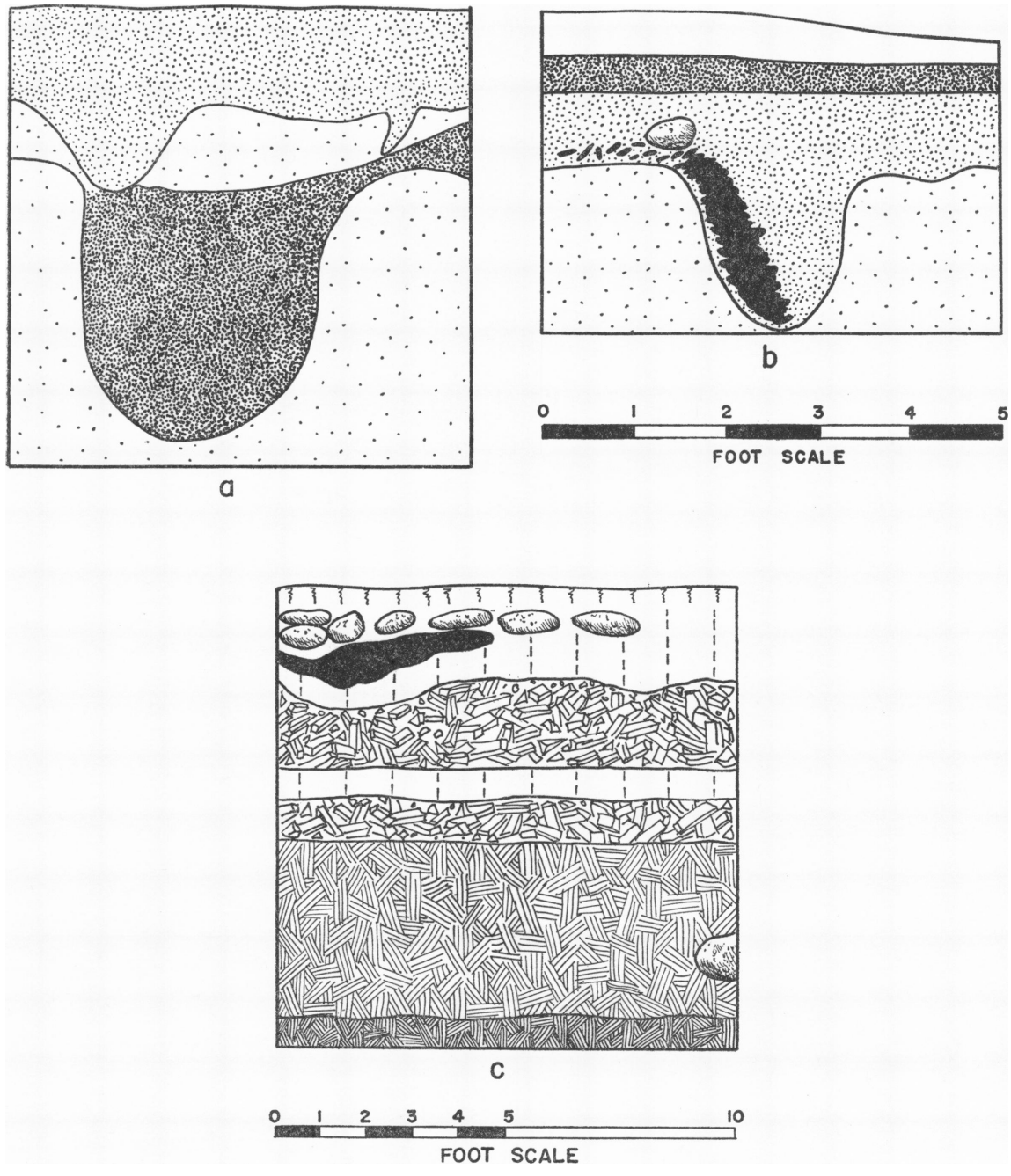

FIG. 20. a. Profile of Excavation Unit 730, Site NHaa 1, showing midden layer over early trash pit. b. Profile of Excavation Unit 715, Site NHaa 1. Overburden of clean sand is superposed above midden layer, the surface of which is darkly stained. Pit contains charcoal. c. West face of cut at NHuu 1. Upper stratum contains loose earth wash and recent hearth. Culture-bearing strata are separated by thin discontinuous stratum of sterile soil. Lower strata are sterile. Charcoal from a hearth below the lowest culture-bearing stratum yielded a radiocarbon date of less than 200 years (Lamont 504B). All excavation units are 5 feet wide.

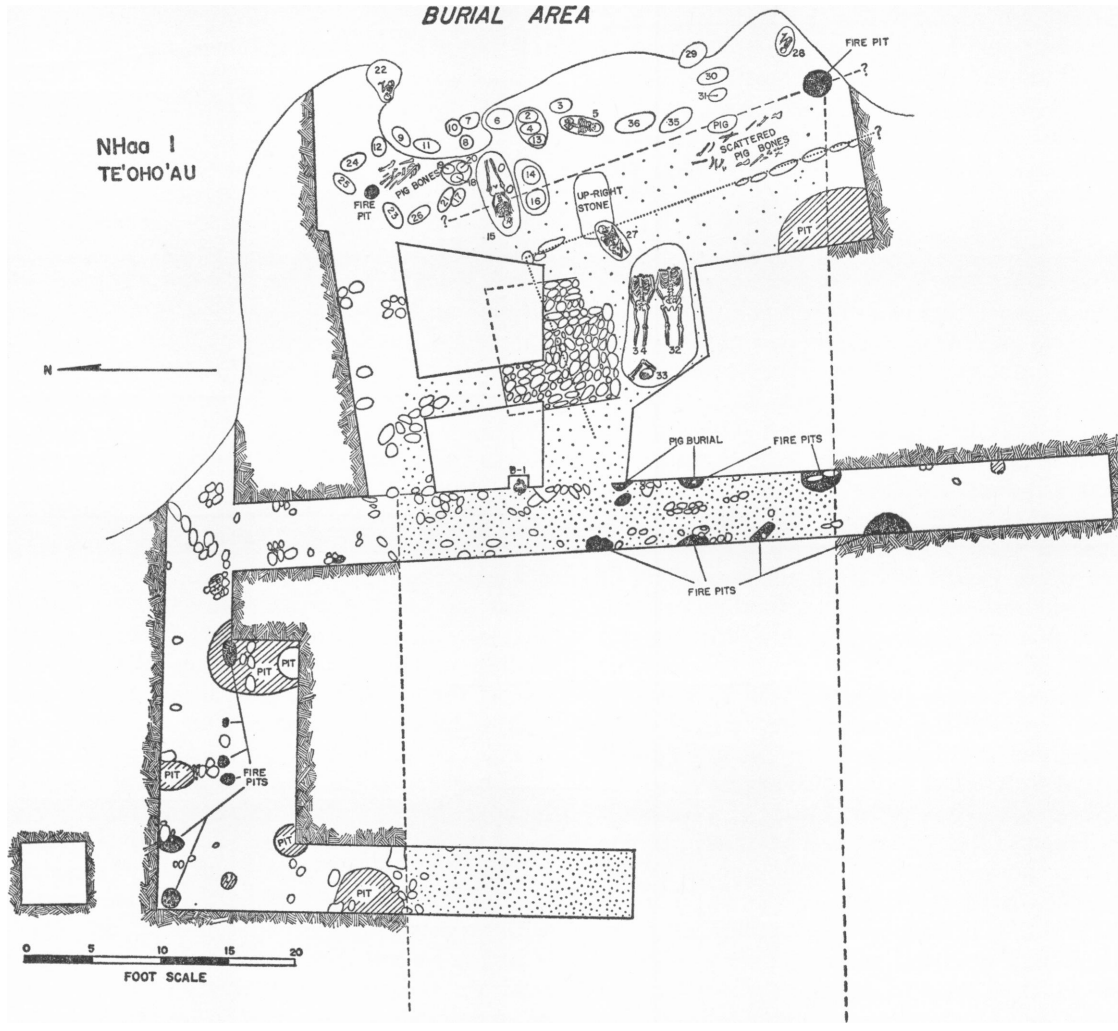

FIG. 21. Site NHaa 1, Te'oho'au (Location A, Fig. 19). Inhumations are shown in position; secondary burials are numbered. Dashes indicate limits of Paved *Paepae* structures and associated gravel which is stippled. Dotted lines indicate limits of Simple Temple structure. Post-hole braces are shown in outline. Unbroken line marks crest of bank cut by tidal wave.

posed by wind action, or covered by dunes, as the sand disturbed by the tidal wave attempted to rearrange itself and find equilibrium again. Excavations were begun in both these areas in 1956 and completed in 1957. More testing was done in the 1957 season, and a third productive area was located west of Te'oho'au.

The basic structure of the archeological deposits everywhere outside the immediate burial area was the same. An overburden of clean, wind-blown sand was superposed on the cultural stratum of black sand which had been heavily stained by decomposition of organic material. The black sand was darkest at the contact with the overburden, gradually fading out below into clean sand at a depth of 20 to 25 inches. The nature of the black sand deposit was such that it was sometimes very difficult to trace the outlines of post holes and pits up into it from the sterile sand below. Many pits could be followed, however, and the precise point from which they had been excavated was determinable. Some wind erosion had probably removed portions of the upper midden stratum prior to deposition of the overburden.

The deposit was first excavated as a single

stratum, only such features as pits, hearths, and other features being isolated. Then it was decided to use 5-inch arbitrary levels in case the occupation represented a fairly long span of time, and some cultural change had occurred. The decision was subsequently justified by the demonstration of culture change between the upper 10 inches of the deposit and the lower portion.

Excavations at Te'oho'au uncovered a very complex stratigraphic situation (Fig. 21). Two structures had been superposed, and numerous burials had been made contemporary with these structures. Other burials, including one Historic period burial, had been intruded. The disturbance that the deposit had undergone made unraveling the relationships of the components of the complex no easy task. The burials represented at least 50 individuals, and probably three times that many if all the fragments of disturbed burials were matched for duplications. Burial customs are discussed in a separate section of this report.

A Simple Temple type of structure was in the lowest level of the cultural deposits. It was fragmentary and seems to resemble a temple of Eastern Polynesian type. An upright of basalt had been erected over the burial of a dismembered man in this structure. The basalt upright was incorporated in the following phase of the sequence when small Paved *Paepae* stood at the west end of a gravel, paved, rectangular court with a hard pounded surface. This was probably a dance floor or *tohua*, representing the earliest known structure of that type in the Marquesas. Trenches sectioning the court from north to south showed that it had been constructed over the remains of earlier pole and thatch structures. In these early structures the potsherds described below (p. 95) were found.

A large flat expanse extended about 100 yards west of Te'oho'au. Tests revealed that this area had been a garbage disposal area for the early inhabitants. The field was dotted with small pits, 3 to 4 feet deep, in which ashes, fishbones, stone flakes, and a few miscellaneous artifacts had been discarded. The pits were closely placed, and a 5-foot excavation unit might touch three of them. The large numbers of needle-like fishbones contained in the pits have been especially annoying to people who walked barefooted.

The habitation section of the site at Mouaka revealed the remains of many Ovoid houses. A few burials had been made in this area. The houses were often rebuilt, resulting in a very confusing concentration of post holes (Figs. 22, 23).

Radiocarbon dates of samples collected in 1956 give the range of occupation on this site.[1] Samples from two hearths 80 feet apart give ages of 1910 ± 180 and 2080 ± 180 (Isotopes 394 L and 394 B). The disparity in age is not serious, as the archeological evidence indicates long habitation, with much rebuilding. Approximately the same time span is given by the ages of two samples from Te'oho'au—1270 ± 150 and 2080 ± 150 (Isotopes 394 A and 394 B). Sample A was from charred bone; Sample B was charcoal. As bone has been often shown to yield more recent dates,[2] the disparity between these two samples, both from a depth of $4\frac{1}{2}$ feet, is not so serious as it might seem.

On the basis of artifact seriation, as well as that of radiocarbon dates, Site NHaa 1 is the earliest found in the Marquesas. Although not one of the most favorable valleys, Ha'atuatua was probably settled soon after the initial settlement of the island.

The lower portion of the midden, from 10 inches to sterile soil, is designated as the Settlement period or NHaa 1 I. The upper 10 inches, NHaa 1 II, is designated as early Developmental. Until a site of the Settlement period with no subsequent occupation is found, which is highly improbable, it will not be possible to separate the span of occupation on this site more precisely. These periods are characterized by the presence of a complex showing definite Melanesian relationships, in addition to a normal complement of Polynesian tool types.

NHaa 1 was abandoned during the Developmental period for unknown reasons. All subsequent settlement was concentrated on the south slope of the valley, well away from the beach. The reason for the shift from the beach is not known, but it may have been forced by the drying of the two streams. As a strategically located site of this kind could hardly have escaped use at any period, it is not surprising that a few artifacts of later periods are found here. These are almost invariably in the overburden or at the contact of the overburden and

[1] Shapiro and Suggs, 1959.
[2] Olson and Broecker, 1959, 4.

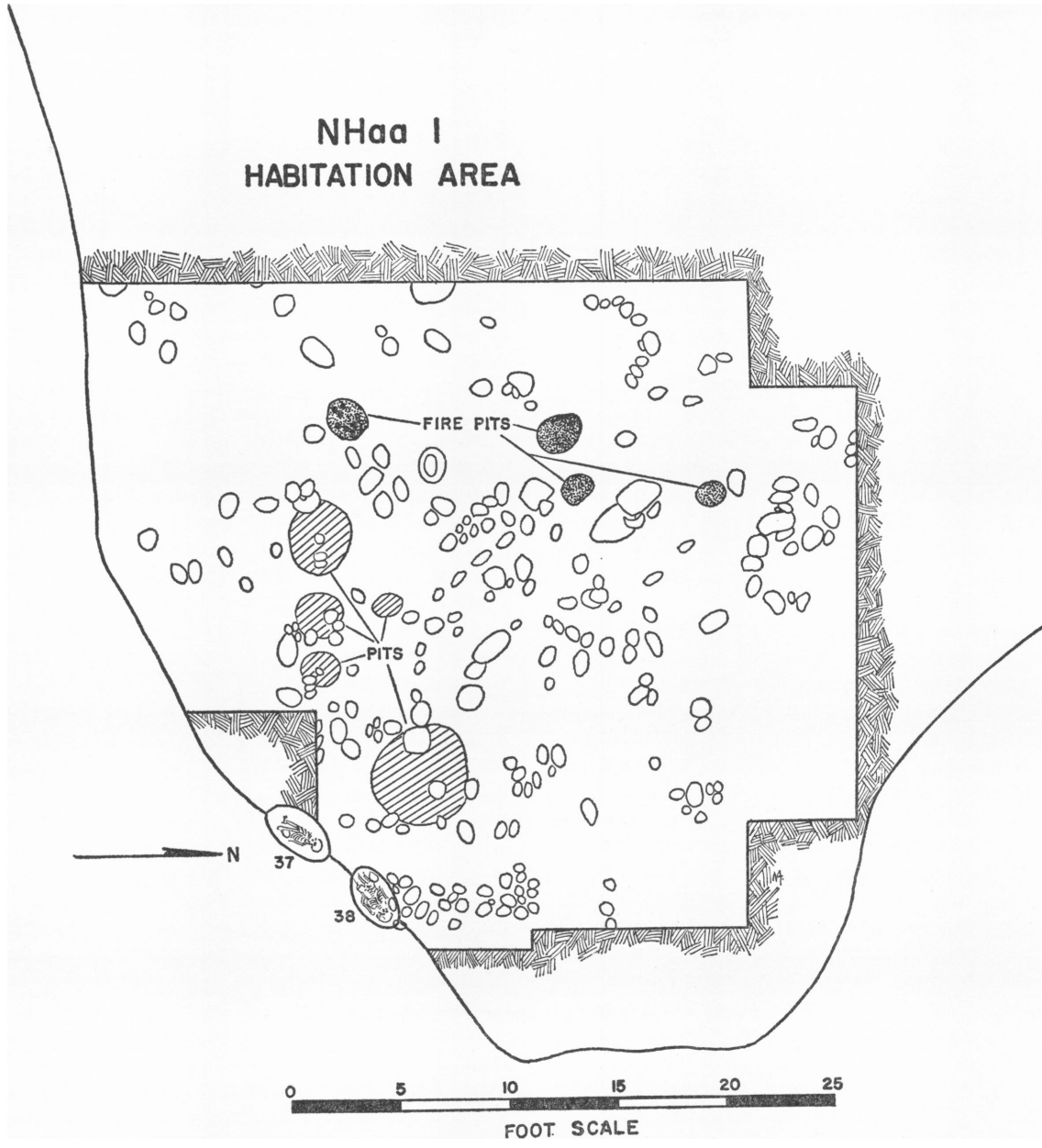

FIG. 22. Site NHaa 1, habitation area (Location B, Fig. 19). Locations of burials, post braces, hearths, and pits are indicated. Unbroken line marks limit of bank cut by tidal wave.

the midden. Sometimes they are demonstrably intrusive. A few European artifacts are also found in the same positions. One Historic period triple burial was intruded into the burial area. Probably the aboriginal artifacts of later periods, as well as the European artifacts, were let down into their present position by wind erosion of the surface of the midden layer previous to the deposition of the present overburden.

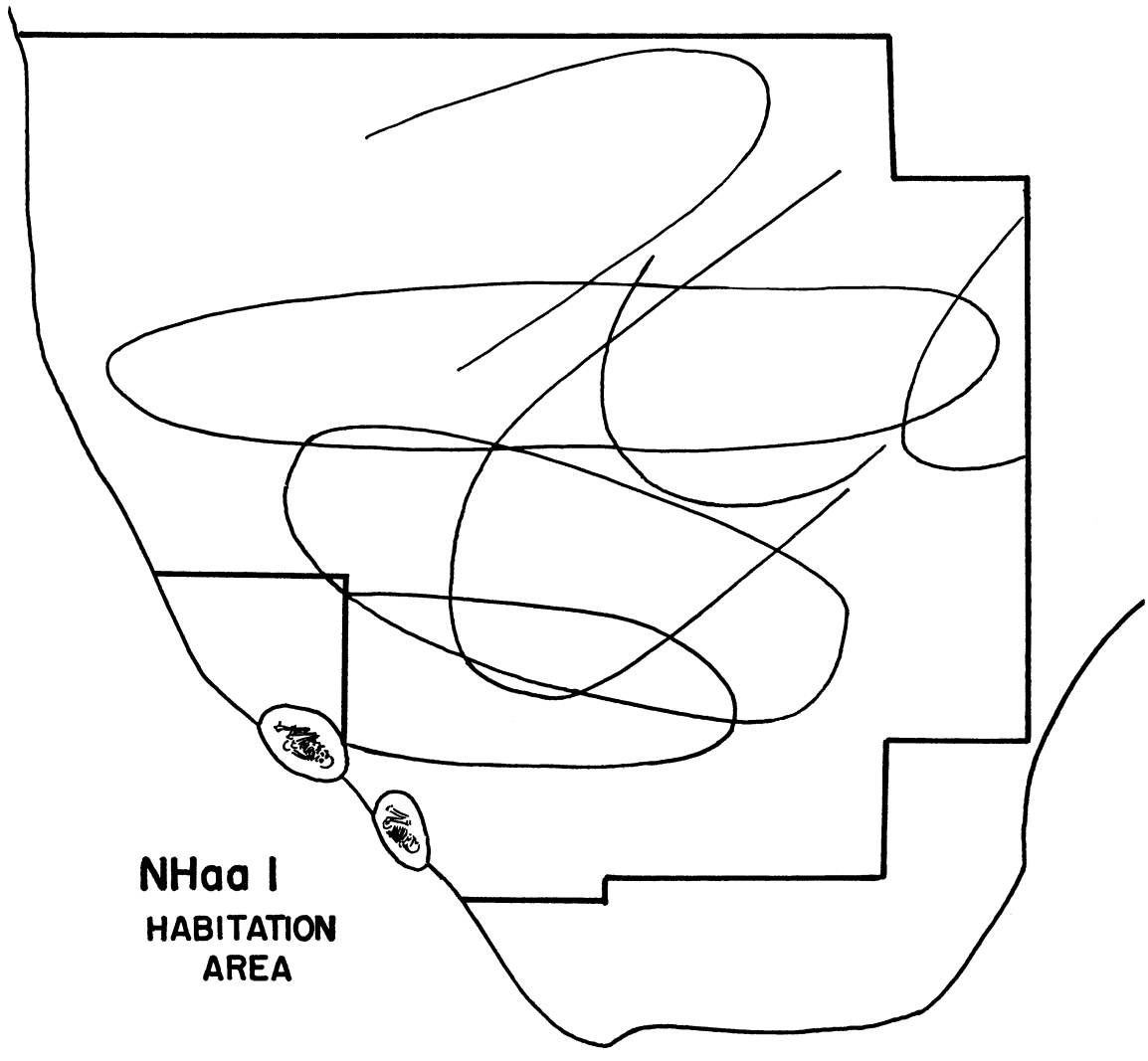

FIG. 23. Site NHaa 1, habitation area. Tentative reconstruction of superimposed house forms from post pattern shown in Fig. 22.

NHAA 2, HA'ETA'A'O'O (HOUSE OF THE SHARP SPEAR)

A Transitional *Paepae* is situated on the south side of the beach at Ha'atuatua, near the site of the old chapel wrecked during the tidal wave of 1906, at the base of a giant *tamanu* tree which has destroyed a portion of the *paepae* in its roots. Although the name Ha'eta'a'o'o was given for this site by the owners of the land, a more reliable and much older informant stated that the site was really called Te ahu pa'aoa (the Whale Altar or Temple). This site may be the one referred to by Porter[1] in the tale that he relates of the Marquesan culture hero, Hai, who brought pigs, chickens, and tumeric to the Marquesans, building his house on the beach at Ha'atuatua beneath a large tree. According to Porter the tree was still there in 1813.

Two test excavations were made in this structure, but it was impossible to dig deeply without cutting through a dense mat of large *tamanu*

[1] Porter, 1822, Vol. 2.

roots. Except for a cowrie scraper, all artifacts recovered were of European origin. The structure apparently was used quite recently as a canoe shed.

HA'ATA'IVE'A

NHTv 1, A'A VEHIE (THE GOD OF FISHERMEN)

The remains of two Megalithic *Paepae*, constructed of coralline slabs set on edge, were located at the western end of the beach of Ha'ata'ive'a. The 1946 tidal wave had removed all but the southeastern corners. This area was sacred to the god of fishermen and is to this day a fishermen's temporary camp. Artifacts were found in a surface survey in the fill of the *paepae* and in the surrounding area. In the wave-cut bank behind the beach, large earth ovens exposed in profile extend 80 feet west of this site. Other very small habitation sites occur along the beach.

Remains of both structures were excavated. The easternmost remnant, P-A, contained a hearth in the fill, the heat from which had partially disintegrated the rear wall which was braced with a line of basalt boulders in a narrow foundation trench. The landward side had been covered by erosion from the hills to the south. P-A was excavated to a hard layer of soil, where excavation was discontinued. A cut was made along the east side of the western structure, P-B, yielding fruitful results (Fig. 17). The rear wall of this structure, as is P-A, was covered by erosion material carried from the adjacent hills subsequent to its construction, forming a deposit 1 foot 3 inches deep. This structure had been intruded into an old hearth, some of which still existed beneath the foundation. Another fire bed had been intruded into this hearth before the eroded material had begun to build up.

Beneath P-B, at a depth of 3 feet, a Transitional *Paepae*, P-B-sub, was found. It had sleeping platform risers of natural slabs and a paving of flat rocks and some fragments of coralline slabs. The pavement rested on a layer of beach sand. A small fire pit was in the surface of the veranda.

Removal of P-B-sub revealed a large, oval, earth oven full of fine-grained basalt fragments (which explode when heated) and large chunks of charcoal. The oven may have been built to produce large quantities of basalt flakes rather than for culinary purposes. Next to the oven lay a basalt slab incised with the peculiar bird figure shown in Fig. 28d.

At a depth of 4 feet 10 inches, a second earth oven, smaller and round, full of charcoal and white wood ash, was found beneath the oval earth oven. Below this oven was sterile soil.

Few artifacts were found in the upper stratum: a cowrie grater, an adze of Koma type, and a hook blank. A few scraps of red tufa indicated that the site may also have been occupied by quarry workers from NHtv 2 on the other end of the beach. The incised slab, associated with the oven in the second stratum, was the only artifact recovered in the other strata.

This site, first occupied in the Expansion period, has continued in use until the present. The coral slab *paepae* are a variation of the Megalithic *Paepae* type found only in the Classic period.

NHTv 2

A quarry site on the east side of the bay extends from a point near the beach at the bay head to the northeast, a distance of some 400 yards. In the cliffs bounding the bay on this side, an extremely thick stratum of red tufa (*ke'e tu*) extends horizontally along the rear of the wave-cut rock shelf. This stratum is 25 feet thick at its thickest point. The areas nearest the beach have been worked the most; the rock of the northernmost portions is of poor quality, with little cohesiveness. The stratum continued to the wave-cut shelf where a number of sizable cut slabs, which had never been broken loose from their matrix by undercutting, are still visible, having been outlined by channels up to 2 feet wide and 1½ feet deep. At high tide this portion is awash in water approximately 1 foot deep. Niches in the vertical faces exposed in the cliffs to the rear of the shelf are roughly anthropomorphic. Monumental-sized *tiki* may have been removed from them.

A search along the base of the cliffs in front of the tufa outcrops failed to reveal any ac-

cumulation of shop debris from quarrying operations. This debris was presumably reduced and scattered by the daily tides almost as soon as it was deposited, unfortunately preventing radiocarbon age determination of the quarry site. This method would be much more desirable than dating the obviously associated structures in the valley which certainly may not have been used from the earliest occupation of the quarry site.

The tufa stratum evidently runs beneath the entire northeast tip of Nuku Hiva, appearing again in the sea cliffs near the twin pinnacles identified euphemistically on the Service Hydrographique de la Marine map as "Adam and Eve." Informants report unfinished slabs abandoned in the stratum there but say that it is almost impossible to reach, either from the sea or from the cliff edge above.

NHuu 1

An adze quarry was situated in Ha'a'upa'upa, a tiny embayment opening to the northwest of the west shore of Ha'ata'ive'a Bay. The quarry site fills the entire 150 by 50-foot semicircular valley floor which is at the base of the steep, amphitheater-like walls of the valley head.

The site was situated at the water's edge. It had been cut by the 1946 tidal wave, which sectioned the deposits, presenting at a glance a good picture of the entire history of the beach, both archeological and geological. When this bay was visited, the heavy concentration of the blue-gray basalt adze blanks and shop debris on the slope of the wave-cut bank was quite noticeable at 50 yards. Investigation proved immediately that the area was well worth excavation. The source of the basalt for adze manufacture was a series of superposed twisted strata of pillow-lava extending some distance up the slope on the north side of the valley.

The artifact-bearing stratum is 1½ feet below the surface in the center of the valley, but it is buried more deeply near the periphery by wash from the valley walls. It thickened quite noticeably near the center of the valley where either a natural gulley or man-made excavation, about 10 feet wide and 2 feet deep, had been filled with quarry debris.

NHuu 1 was located directly across Ha'ata'ive'a Bay from the large, red tufa outcroppings at NHtv 2 which provided most of Nuku Hiva with tufa for slabs and statues. The two sites were undoubtedly in use simultaneously, NHuu 1 providing the adzes used by the quarry men.

A test pit was put down at the point of heaviest accumulation of shop debris, in the depression mentioned above (Fig. 20c). The overburden of loose, crumbly soil was stripped off, revealing a number of coral blocks, cooking stones, and a fire bed 3 to 4 inches deep in the southeast angle of the pit. Informants identified this pit as probably a lime-burner's fire, as local inhabitants often visited the bay to obtain coral for lime. The total depth of the overburden was 1 foot 3 inches.

The test was continued through the cultural material in 5-inch levels until stratigraphy appeared. The quantity of shop debris in the 5 by 7-foot test pit was really surprising; therefore, some selection had to be made. Random flakes were discarded; only adze blanks were retained. A surface collection of shop flakes sufficed as a sample of that type of debris; a surface collection of blanks that was made when the site was discovered was also retained.

Two strata were uncovered. These were separated by a 5-inch-thick sterile layer which wedged out eastward towards the sea where the two strata joined. Below the shop debris strata were two fire beds: one on the contact zone with sterile soil in the mid-east face, another in the southwest angle of the test, separated by 6 inches of sterile soil. These fire beds lay on the surface of approximately 2 feet of horizontally banded, well-compacted sediment containing rounded grains of vesicular basalt or scoria and brought down by erosion from the valley walls. Some flecks of charcoal from rotting vegetation were found scattered through this deposit. Excavations were stopped at the point of contact between this stratum and the one beneath.

Aside from the large number of adze blanks of the Mouaka and Koma types and shop flakes, a hook fragment of Heavy Shank type, a few scraps of worked pearl shell, a hammerstone, and a roughly flaked stone disc were the only artifacts recovered. These artifacts indicate only that the site was no earlier than the Expansion period. It would appear from architectural evidence, however, that the use of cut stone began during the Classic period, while the radiocarbon date (Lamont 504 B) of less than 200 years establishes the age more precisely.

HATIHEU

NHe 3, *TOHUA* HIKOKU'A (WONDERFUL BANYAN)

This Terraced *Tohua* (see Table 6) is on the west side of the Taipivai-Hatiheu and the north coast road, about 600 yards from the beach in Hatiheu. It was not reported by Linton, who evidently did not see it. There is evidence that the people of Hatiheu were uncooperative during Linton's visit; his failure to visit a site of this importance stems, in all probability, from such a cause.

According to informants, NHe 3 was one of the *tohua* of the 'Ati papua subtribe or ramage of the Taipi-Hatiheu. One of the two stone figures standing on it is the goddess Tevana'uaua. Traditionally, a captured Hapa'a warrior, Tu'ehu,[1] was immolated on this *tohua* and later raised to the status of a deity by the Hapa'a group. The site is unusual in several respects, particularly in the presence of the two medium-sized statues on P-A (the *tuu* or cut-slab, walled, sacrificial platform). A third small figure, carved on the end of a slab, was inserted in the joint of two of the slabs on the dance floor side of this platform. According to Delmas[2] figures of deities

[1] Delmas, 1927, 97.
[2] Delmas, 1927.

TABLE 6

STRUCTURAL TYPES, SITE NHE 3

Structure	Type	Facade	Sleeping Platform Risers	Fill	Open Veranda Pit	Veranda Caches	Uprights	Veranda Ovens	Petro-glyphs
P-A	T[a]	1 T	—	E[b]	—	—	—	—	—
P-A-sub	T	1 T	—	E	—	—	—	—	—
P-A-1	R[c]	2	—	S[d]	—	—	—	—	—
P-A-2	R	2	—	S	—	—	—	—	—
P-A-3	R	2	—	S	—	—	—	—	—
P-B	M[e]	2	1 N[f]	S	1	—	—	—	—
P-C	R	2	—	S	—	—	—	—	—
P-D	M	2(TN)[g]	1 T	E/S[h]	1	—	—	—	—
P-E	TE[i]	2	?	E	1	—	—	—	—
P-F	M	2	?	E/S	—	—	—	—	—
P-F-1	TE	2	1 N	E	—	—	—	—	—
P-G[j]									
P-H	M	2	1 T	E/S	—	1	—	—	1
P-I	TE	3	1 T	E/S	—	—	—	1	—
P-J-1	TR[k]	—	1 N	—	—	—	—	—	—
P-J-2	TR	—	1 N	—	—	—	—	—	—
P-J-3	TR	—	1 N	—	—	—	—	—	—
P-K	MI[l]	2	1 N	S	—	—	—	—	—
P-L	M	2	1 T	S	1	1	1	—	—
P-M	M	2	2 TBN	E/S	—	—	—	—	—
P-N	MI	1	1 T	S	—	—	—	—	—

[a] *Tuu* platform.
[b] Earth.
[c] Rectangular platform.
[d] Stone.
[e] Megalithic *Papae*.
[f] Natural stone.
[g] *Tuu* platform; natural stone.
[h] Earth and stone.
[i] Terraced *Paepae*.
[j] Unfinished terrace.
[k] Transitional *Paepae*.
[l] Miniature temple.

were rare on *tohua* and when present were usually secondary deities. These figures were obviously of some importance, because they were placed on the *tuu*, the structure that is the focus of all attention on the *tohua*, wherever it appears. Their placement was definitely planned and carried out in one operation with the *tuu* construction, not as an addition to it.

If we can rely on the informant's identification of one of the images as Tevana'uaua, these images were of great importance, as this deity was the paramount goddess of two adjoining valleys and a goddess of the 'Ati papua.

It is further unusual that this *tohua* is still held in some awe by the inhabitants. The *tohua* were generally public ceremonial centers, but NHe 3 seems to have been more than that, having been invested with more than the usual amount of *tapu*. A large banyan serving as an ossuary formerly stood on the north side of P-A. Informants stated that ghostly jungle cocks appeared in this tree continually. The owner of the land, who attempted to burn down the tree, was immediately afflicted with a strange recurring illness. In his stronger moments, he stubbornly repeatedly returned to the tree, burning and cutting away more and more, until he was finally successful and no trace of the tree remained on the surface. Only then did he recover and the ghost jungle cocks fail to reappear.

Three post-contact, and almost certainly Christian, graves are placed on the southern part of the plaza in front of P-F. These are another unusual feature, as most of the contact period graves and graveyards were placed near the *me'ae* in very sacred areas, and again suggest that this site is especially sacred.

I visited the site first in June, 1956, in company with Tamihau Omitai, chief of the district, and revisited it in August. I made photographs on both occasions. During the interim, between field sessions, the mid-portion of the dance floor was planted with sweet potatoes, bananas, and manioc, but the *tuu* remained protected behind a barbed-wire fence.

The underlying terrace of this complex is 410 by 150 by 15 feet, with internal dimensions of 325 by 75 feet. The retaining wall of the terrace is constructed of irregular courses of large boulders on the west side, the north end, and a portion of the east side adjacent to the northeast corner. The remainder of the east side and the entire south side are cut from virgin soil, the fill thus obtained being used to build out to the northwest. The plaza fill is entirely earth. Stadia are located along the east, north, and west sides, with a small gap in the southwest corner.

There is no north end platform. The south end platform is built on the slightly leveled, original ground surface behind the excavated plaza edge. This end platform, atypical, is paved.

One entrance alley was situated at the northeast corner, and three were made in the north end platform. A fifth alley entered the plaza along the north side of P-L.

Of seven dancers' stones (*ke'a vehine po'otu*), one was on the plaza floor just east of P-K, two were on the east stadium lower edge on the south and north sides of P-N, and four west of P-A. Two of the last rested on the dance plaza, two on the lower stadium step. These large boulders, placed on beds of smaller stones, were used as platforms to elevate solo dancers and for young girls' puberty rites involving genital inspection. Occasionally, large, flat stones are used, propped up above the ground surface on stone uprights like diminutive European dolmens.

CUT 1 (FIG. 24A): A trench, 37 by 5 feet, was dug through the west side of the dance plaza stadium between P_p-L and M, uncovering the following sequence of strata.

1. Plaza Stage 1: This stratum, virgin soil, dipped from east to west very gradually, in line with the contours of the slope west of the site. A stone pavement or retaining wall 9 feet wide was constructed on the surface of this stratum just beneath the stadium step. Some charcoal fragments recovered on this surface were deemed highly unsuitable for radiocarbon tests. It is very probable that this retaining wall or pavement marks the boundary of an earlier dance ground like that described by Linton for Fatu Hiva and the Southern Marquesas group in general,[1] equipped with a terrace or pavement along the *uphill* side and a low wall demarking the downhill side.

2. Plaza Stage 2: A layer of yellow fill, with loading bands of chocolate-colored earth scattered throughout, brought the plaza up to its present level. At this point, it was level across

[1] Linton, 1925, 25–26, 183, Fig. 29.

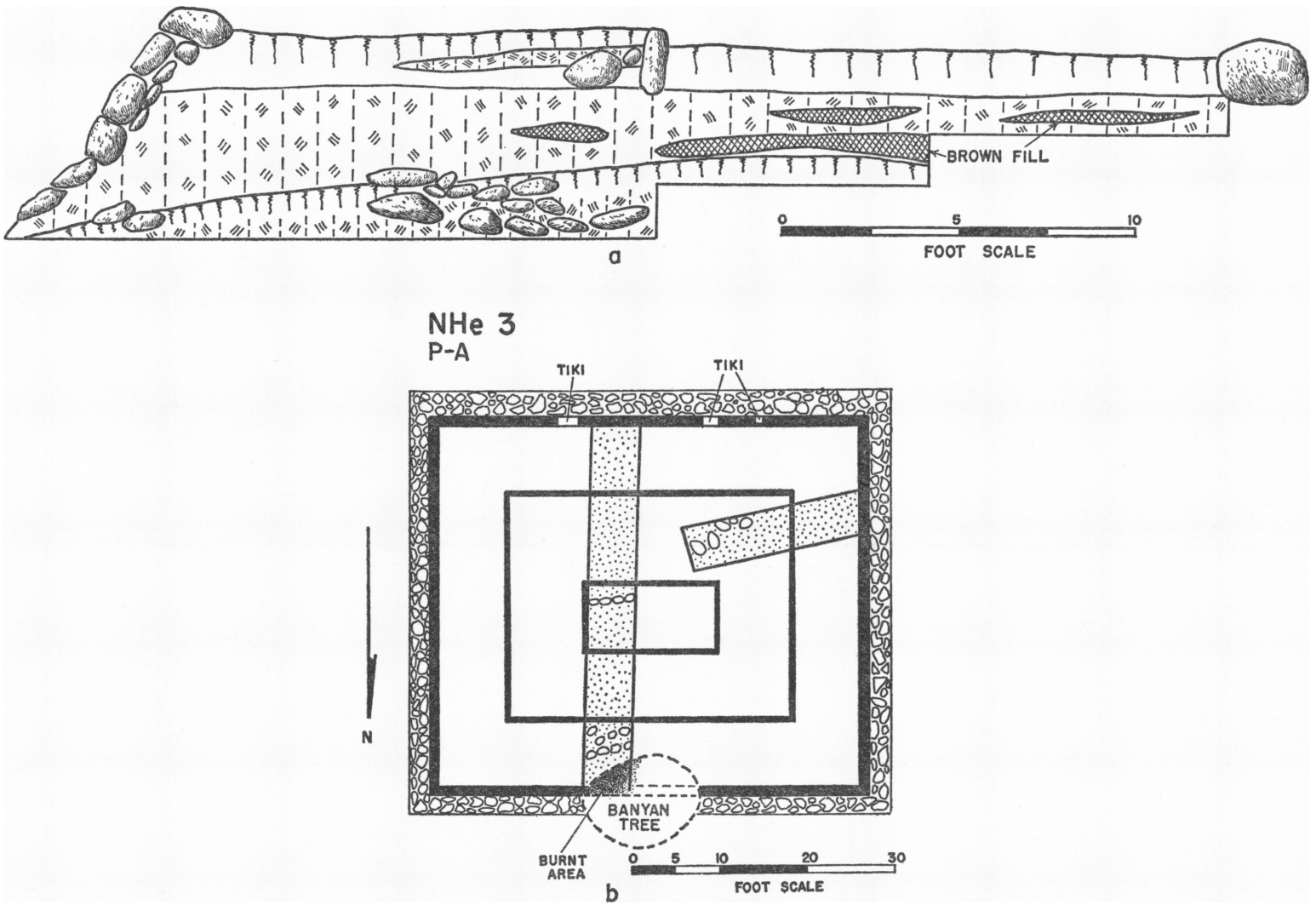

FIG. 24. a. North face of Cut 1, NHe 3. b. Plan of P-A, Site NHe 3, showing trenches and disposition of substructure remains. Rectangular platform structures on north side are not shown.

its width, without stadia on the west side. This condition, never modified along a small section of the west side south of P-L, continued long enough for a 6-inch-thick humus band to form on the surface of the fill.

3. Plaza Stage 3: A single-course retaining wall of low boulders was laid out along the west side of the plaza and set a few inches deep into the top soil. A thin layer of fill was placed behind this, to raise the earth level to the top of the boulders. A second course of natural slabs was set on this surface 20 feet back from the first retaining wall and parallel to it, which served as a retaining wall for the second step of the western stadium. The fill behind it was elevated 9 inches to 1 foot above the lower step, forming the surface of the second step which may have been paved, but no traces of pavement now exist. A short distance to the north, the second step had been robbed to provide the fill for P-M.

CUTS 2 AND 3 (FIGS. 24B, 25A): These two cuts are best described together, as they were made in the same structure, P-A, the large cut-slab *tuu* or sacrificial display platform situated at the north end of the dance floor. Cut 2 was made from the southwest corner into the structure at an angle, to avoid palm trees growing on the platform surface. Cut 3 was made directly across the platform in a north-south direction, following the only open route between the trees.

Attention was drawn to this structure during clearing, when it was discovered that the top was segmented by two concentric rectangular enclosures of cut slabs of tufa, basalt, and coral or coquina. Some of these slabs still projected above the surface, especially those of the outermost interior enclosure. The innermost enclosure, however, was partially obscured; only one side projected above the surface. The possibility that this series of concentric rectangular enclosures resulted from a series of horizontal expansions of an original small rectangular structure now buried in the center of later additions made testing almost imperative. The unique structure with cut-slab walls (slabs 5 by 3 by 1 foot in maximum size) and the stone figures set into its facade aroused added interest, because one goal of the work in the Marquesas was to attempt to date the trait of cut-stone masonry, if not absolutely, at least in relation to the sequence. Large architectural complexes with structures of this type offered the best hope available for such chronological determination.

It was found that the slab enclosures were not the exterior walls of earlier structures, but lines of small slabs set into the surface of the structure to a depth of 1 foot at most. The innermost and outermost enclosures were formed of a collection of slabs of diverse materials and sizes, shaped on the upper sides only. The builders sought only to be sure that the uppermost edges were even; the slab bases were not prepared in any way. Some attempt was made to alternate white and red slabs to produce a pleasing effect.

When the fill of P-A was penetrated almost to the level of the ground surface outside the *paepae*, the remains of an earlier structure, P-A-sub, were discovered (Fig. 25a, Pl. 6b). It was a replica in smaller dimensions of P-A. It was more precisely oriented to the plaza axis than the later structure which was canted slightly southwest. These remains were in the form of two low walls of cut slabs of tufa and coralline stone, 10 to 12 inches high, associated with a stratum of dark earth which extended in Cut 3 from a point 10 feet north of the south wall of P-A to a point 7 feet south of the north wall of P-A, a distance of 2 to 6 feet. The northernmost wall of P-A-sub was its northern exterior. The slabs that composed the southern wall, as well as those that had served to delineate the sections of the platform surface, had been removed almost completely. Only one small section remained; this was a slab wall remnant found in the third section of Cut 3, 21 feet from its southwest corner on the west face. No definite traces of this structure appeared in Cut 2, although some scattered boulders found in that excavation may originally have been in some sort of linear arrangement which was later much disturbed.

P-A-sub was destroyed and its walls "cannibalized" for its successor, which had a hearting of earth consisting mainly of a brownish stratum running throughout, with an orange stratum wedging in above towards the south side of the structure and another brown wedge above that. A large inclusion of red fired clay, 1 foot 4 inches thick, found in the brown fill just above P-A-sub, continued for 11 feet along the west wall of the cut. These differences in the fill were not culturally significant; they probably

resulted from the fact that the fill for P-A was removed from several different sources, different types of earth having been obtained from each.

The remains of a banyan, burned by the former owner, were found in the north end of Cut 3. At this point the wall had almost completely disintegrated from the pressure of the tree roots and the fire heat. The slabs along the north side, or rear, of P-A were scoriaceous basalt and more susceptible to heat changes than the extremely heat-resistant tufa.

CUT 4 (FIG. 25B): A depression was noted in the end platform on the north end of the site on the west side of P-B. The retaining walls of the first stadium step had been removed here, and an oblong depressed area had been marked off by stones taken from the stadium steps. This depression was tested by Cut 4, 20 by 5 feet, oriented north and south. A complex of earth ovens (*umu*) was excavated, providing the best opportunity yet uncovered for dating the site and, by extension, the entire Megalithic period in the Marquesas. The oven complex was divided into two portions by a stone wall extending east to west across the cut. This wall had probably been constructed as a walk-way to provide easy access to the ovens.

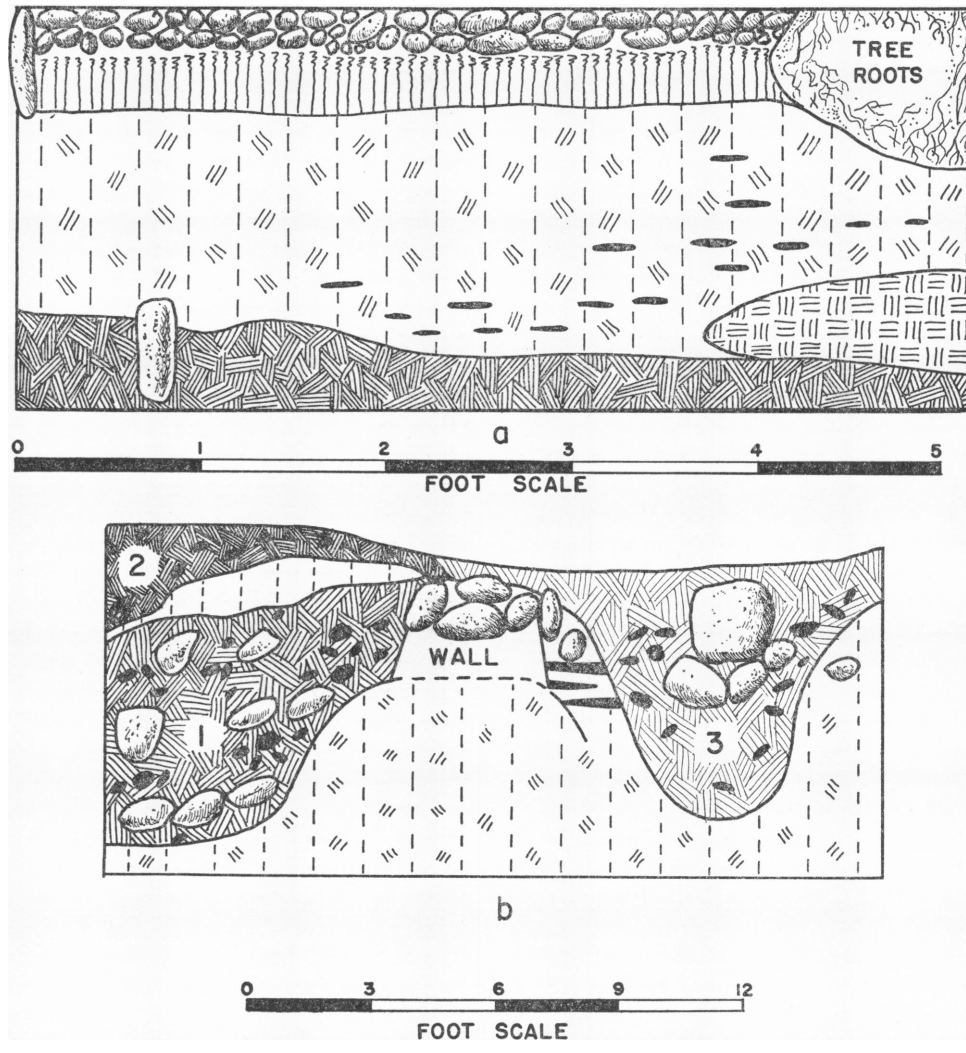

FIG. 25. a. West face of center section of Cut 2, Site NHe 3. b. Oven complex in Cut 4, Site NHe 3.

The earliest oven was almost obliterated by the subsequent excavations. A small section of it was recovered just north of the mid-wall, between that structure and the south side of Oven 3 which had been cut in from above. The earliest oven had extended to a depth of 3 feet 9 inches from the present surface. The mid-wall had been constructed in a pit dug through this oven. Oven 1 was then intruded through the remains of this early oven, south of the mid-wall to a depth of 7 feet. Oven 2 was cut into the top of Oven 1, extending outward some distance into undisturbed soil to the south. Some of the back dirt from the undisturbed area formed the stratum of orange earth separating Oven 1 from Oven 2. Oven 2 also extended to the north and west of the mid-wall and the west face.

The section south of the mid-wall seems to have been abandoned then and Oven 3 built in the north section. This oven was built in the post-contact period, as attested by a fragment of a French liquor bottle (which probably contained brandy) bearing part of a legend containing the word "Vieux." This was recovered beneath a natural slab, bearing a petroglyph, that apparently fell or was thrown into the oven as fill after use.

A carbon sample from the base of Oven 1 was taken from a pocket of large charcoal chunks, at a depth of 5 feet on the north side of the oven.

The sequence here represented seems to cover a considerable time span, stretching back from contact times into the Classic period. Therefore, a date from Oven 1 should cover, within its sigma, the period of first construction on the site. Insufficient charcoal was present for an age determination of the period of first construction on the site.

CUT 5: This cut was excavated through the center of P-D, 25 by 5 feet. The structure, which rested on a stone pavement on the east side of the dance floor, was found to represent an early stage of the lower east stadium step. The facade and north side were composed of a lower course of cut tufa slabs, identical in size to those utilized in P-A. This course was topped by a poorly placed upper course of large natural stones, which suggests the possibility of multiple construction phases. The structure appeared to have a predominantly earth fill, giving promise of easy excavation and clearly visible stratigraphic changes if any might occur.

As suspected, a substructure, called P-D-sub, was found within, coinciding with the cut-slab lower course of the facade (Pl. 7a). When the top soil layer on the veranda in front of the cut-slab, sleeping platform risers was removed, a set of smaller cut-slab risers was found buried in the veranda 1½ feet below the surface. Obviously at least two construction phases were to be dealt with.

Completion of the cut showed that P-D-sub was constructed on a dirt base, presumably the plaza fill. The veranda fill was composed of two strata of compact yellow earth. Low sleeping platform risers of cut tufa slabs formed the facade of a sleeping platform constructed entirely of small boulders, with some earth in the interstices. This structure, P-D-sub, had stood unmodified long enough for a 4-inch layer of humus to form on the surface of the veranda. The veranda was equipped with a pit 6 to 9 inches deep, 1½ feet wide, and of indeterminate length. The pit was probably not intrusive, because the humus had also formed evenly in it.

After P-D-sub had been in use for a time, it was enlarged in the latest and final construction phase. This enlargement entailed the addition of a layer of fill on the surface, 2 feet thick on the sleeping platform and 1 foot 3 inches on the veranda. The upper course of large natural stones was added, while sleeping platform risers of large cut slabs were placed 4 feet farther back on the platform than the P-D-sub risers. It was at this time also that the stone-lined pit (*pakeho*) on the veranda was added.

CUT 6: A 6 by 5-foot cut was excavated in the northeast corner of P-L. This cut produced evidence of two strata in the fill of the *paepae*, a lower stratum of rocks and earth heavily charged with charcoal, varying between 1 and 2 feet in thickness, and an upper stratum of rocks and brown earth 2 to 3 feet thick. These irregular strata evidently resulted from loading of fill. They do not indicate two building periods. This structure was particularly interesting, because the veranda contained a cut-slab grave that had been recently rifled for *objets d'art* which, presumably, had been interred with the dead. The slabs, similar to those used in P_p-A and D, surrounded and had once covered the grave. The grave floor was of pebbles with a dirt layer. When the site was first visited, some scraps of tibia were found in the grave with the lock and trigger guard of a percussion cap rifle, probably a Springfield of American Civil War vintage.

CUT 7: A 5 by 5-foot test was made in the center of the plaza. The cut was discontinued at 2 feet 5 inches, after it became apparent that it had already passed through the humus layer into virgin soil. The original contours of the earth, before the dance floor cut-and-fill operation occurred, appeared to be such that the dance floor would have been cut out of the earth throughout its entire southern and middle sections, and only the extreme western and northern sections would have been filled.

CUT 8: This was a 5 by 5-foot test cut through the surface of P-F-1, a low Terraced *Paepae* upon which P-F seemed to overlap on the southern side. The facade of P-F-1 was constructed of two courses of low, flat stones. A single course of similar stones formed the sleeping platform risers. The fill was almost entirely earth. A pavement of small stones had covered the veranda.

Beneath this *paepae*, at a depth of 3 feet from the surface, the test revealed a stone pavement (P-F-1 sub), representing an early pavement on the east side of the dance floor. This probably corresponded with the pavement or demarcating wall found in Cut 1, Plaza Stage 1. Apparently a good deal of rotting vegetation rested on P-F-1 sub when it was covered by the fill for P-F-1, as a large number of small chunks of charcoal were on the pavement and in the interstices between the boulders.

CUT 9: A 5 by 5-foot test was put through the northwest corner of P-F. The goal of this pit was to trace P-F-1 under P-F. The former structure did not, however, continue far beneath the latter. The overlap of the two structures was confined to the south edge of F-1 and the north edge of F. After 2½ to 3 feet of rock fill in F-1 had been penetrated, a clean stratum of orange fill was struck, on which the *paepae* had been erected. This fill slanted too markedly to the west to be an actual extension of the F-1 veranda, although there is a definite possibility that F-1 might have been robbed of pavement and facade stones on its southern half during the construction of F, leaving the orange fill with a rather uneven surface. The slanting orange fill of F is at the same level and of the same color as the F-1 veranda surface, increasing the possibility that it was a part of F-1.

CUT 10: An 18 by 5-foot trench was dug through P-1, a terrace of the south end platform. This proved, as was expected, that the entire end platform was cut from virgin soil and was not a filled structure as on the other sites. No trace of fill was found throughout the course of the trench; the deposit was stiff, undisturbed soil.

CUT 11: In this cut the surface of P-K, a small ceremonial type of platform in the southwest corner of the plaza, was stripped. The structure consisted of a double course of stones in the facade and veranda sides and a double course of larger stones on the sleeping platform sides. It was found that P-K consisted of an earlier structure with a rectangular plan and was not equipped with a sleeping platform filled with large slabs. This was called P-K-sub. The later addition consisted merely of a set of natural sleeping platform risers with a dirt fill behind them, forming a small sleeping platform on the surface of the structure.

In addition to the above sequences recovered in excavation, the following superpositions were determined by inspection.

1. P-F was constructed with its northern side overlapping the southern side of P-F-1.
2. P-H is divided into two sections along an east-west line. The southern segment (H-S) blends into the hill behind it and was constructed earlier than the northern segment.
3. P_p-A-1, A-2, and A-3 were added to the rear (north) of P-A in a very recent period. These are all small, rectangular stone structures, flat-topped, with no elevated sleeping platforms. They were probably added to accommodate the spread of the banyan at the rear of P-A and whatever wooden structures that may have been associated with it.
4. P_p-M, B, and D were built on the west and north stadia.
5. P_p-E, N, F-1, and F were built on the east stadium. E overlaps the stadium and does not rest completely on it, but still postdates it.

Combining the sequences determined by excavation and by inspection yields the following sequence for the site.

LATE EXPANSION PERIOD

PERIOD I: In the early part of this period the dance plaza (Plaza Stage 1) was merely an outlined rectangular area on a very gentle slope, with a paved band running along both its downhill (Cut 1, Stratum 1) and uphill (P-F-1 sub) margins. The south end pavements (P-J) were possibly also constructed at this time. They are

outside the plaza on the level of the undisturbed earth and have been only slightly leveled. P-I was certainly in existence at this time. Later in the period, during Plaza Stage 2, the artificial terrace for the present dance floor was built. P_p-J and I were completed with this stage, if not earlier.

Classic Period

Period II: With the possible exception of paving on the western margin, no further elaboration of the dance plaza itself occurred. During this period, P_p-F-1, E, and M south, all of the Terraced *Paepae* type, were constructed, blending into the undisturbed earth contours at their rear. If the darkly stained lowest stratum in P-L does not represent a loading band, it may represent an earlier structure of the Terraced *Paepae* type and would belong in this period.

Period III: This period is marked by the construction of stadia along both the long sides and the north end of the plaza. Two steps were constructed simultaneously on each side. After the construction of these stadia, there followed a phase of marked activity, during which the most impressive architectural feats were performed in the classic megalithic fashion. *Paepae* F, M, B, L, and H north were built, with two courses of very large, impressive stones in the facades, cut-stone sleeping platform risers, stone-lined veranda pits, and pillow-lava uprights on the verandas.

The first completely cut-stone structures also appeared in this period. P-A-sub was built first at the north end of the plaza, followed by P-A and P-D-sub simultaneously. P-A-sub is probably contemporaneous with or slightly earlier than the earliest Megalithic *Paepae* of this period. P-D-sub was enlarged quite rapidly to compare more favorably in size with the other natural stone-faced *paepae*. The statues were, of course, erected with P-A.

The cut tufa used in the slab structures and for sleeping platform risers was quarried in rough slabs, notched two or three times on each side for easy lashing, and carried to the site where they were more finely worked. One unfinished slab was found on the plaza beside P-A, one long side of which was cut half through.

Probably Oven 1 of the oven complex in Cut 4 (and its almost non-existent predecessor) dates from this period.

Period IV: A slack in the tempo of construction marks this period and the following period, which might be grouped together, depending on whether one chooses to accept the historical

TABLE 7

Distribution of Structural Types

Site	Ovoid House	Simple Temple	Paved *Paepae*	Transitional *Paepae*	Terraced *Paepae*	Megalithic *Paepae*	Miniature Temple	*Tuu*	Rectangular Platform
NHaa 1 I and II	x[a]	1	x[a]	—	—	—	—	—	—
NHo 3-I	—	—	2	—	—	—	—	—	—
NH 4	—	—	1	2	—	—	—	—	3
NHi 1	—	—	—	1	—	—	—	—	—
NBM 1	—	—	—	1	—	—	—	—	—
NBM 2	—	—	—	1	—	—	—	—	—
NBM 3	—	—	—	4	—	—	—	—	—
NHtv 1	—	—	—	1	—	2	—	—	—
NTa 11	—	—	—	1	—	—	—	—	—
NT 9	—	—	—	—	1	—	1	—	—
NT 2	—	—	—	2	2	14	4	1	2
NT 3	—	—	—	—	1	2	—	—	1
NHe 3	—	—	—	3	3	6	2	1	4
NT 4	—	—	—	1	—	2	—	—	2
NT 5	—	—	—	—	2	11	1	—	2
NT 8	—	—	—	1	1	6	1	—	—
NHo 3-II	—	—	—	—	—	2	—	—	—

[a] Type is present in frequency exceeding 1, but exact frequency is indeterminate.

base line as a significant line of demarcation. The structures of this period, P_p-N, C, and K-sub, are all indubitably ceremonial in nature; they could never have been used for habitation. P_p-N and K-sub may have been mortuary display platforms, as fragments of human bone were found around both.

Oven 2 was probably used at this time.

Historic Period

Period V: Among the only seemingly post-contact structures on the site are those added to the north side of P-A as appendages: A-1, A-2, and A-3. These were all ceremonial and probably served to hold the great root system of the rapidly growing banyan. P-K-sub was probably added to it at this time.

Oven 3, with its French brandy bottle, was definitely in use in the post-1840 period. By this time the French had settled in sufficient numbers so that their alcoholic beverage bottles were in common enough circulation to allow some of them to be discarded when broken, rather than be hoarded for cutting tools, as they seem to have been during the earlier Historic period.

The slab grave in P-L was also intruded at this period.

Historic occupation is well attested to by other artifacts; a musket ball, gunflint, and a pewter coco grater were all found on the surface. Of the native artifacts found, all were typical of the Classic period: the Koma type of adze predominating, an unfinished *tiki*-headed poi pounder, and a grinding pebble. A large coral file found in the P-D fill on the veranda is non-diagnostic.

The statues in the south face of P-A, the petroglyphs discovered in Oven 3 and on P-H, and the bas-relief lizard from this site (possibly P-H), which is now at Taiohae (Pl. 12b), are the most interesting of all the artifacts found. Therefore they are discussed in greater detail in the section dealing with sculpture and petroglyphs.

NHe 4

Me'ae Te Moeaoko is located high in the head of Hatiheu Valley at the conjunction of tracts belonging to Tama and Oto. It is a large Megalithic *Paepae* with associated low terraces. Cut tufa has been extensively used in its construction. A collection of human skeletal material was made from a banyan tree standing on the platform.

A'AKAPA

NA 1

Kahupaki is a petroglyph site on the property of Puke'Oho in A'akapa. The petroglyphs are inscribed on boulders in an area that may have been a ceremonial site. The boulders are situated on a long, low terrace, of which several are in the vicinity. Three stick figures, in the usual pose of arms raised and legs astraddle, were represented, as well as a standard *tiki* face. Four long-tailed mammals, probably dogs, were shown in the intaglio on the adjacent stone (Pls. 8b, 9a).

NA 2

Me'ae Pa'etua is on the slope above the house of Puke'Oho in A'akapa. It consists of a large house platform with a banyan upon it, and several smaller terraces surrounding it. Eight skulls were found in the banyan, and three more were hidden in a cache in the facade of a terrace. These were said to be ancestors of the owner and could not be removed.

NA 3

Punai'o is a second petroglyph site behind the house of Hi'o on the inland side of the main road in A'akapa. A large block of vesicular basalt is located at what appears to be a dried-up spring near a ceremonial site. A fisherman is depicted on the west side of the boulder in the act of hooking a huge shark. The north side of the boulder has a stick figure, with arms and legs in the usual position, but with a phallus, or possibly a tail, hanging between his legs. The latter possibility seems more likely, as the member is tapered to a point without any elaboration of form. It is possibly a drawing of a lizard man.

NA 4

In an open field, seaward from the football grounds in A'akapa, an irregular natural stone block has been set on a bed of small stones in what may have been a ceremonial area. Petroglyphs embellish each side of the stone in a

complex intertwining of several superposed designs which appear to have been purposely connected (Pl. 19b).

NA 5

The remains of the *tohua* Pehekua extend along the main road in A'akapa near the school. A large *paepae* of this complex has been partially demolished. A red tufa slab from the sleeping platform risers of this platform bears a small bas-relief of a full-length, conventional *tiki*.

NA 6

An upright stone placed east of the end of *tohua* Tuki'e, between that structure and the Falchetou house, has been decorated with the same long-tailed mammal seen at Kahupaki, and a small concentric-circle motif.

NA 7

A large village site lies between the Falchetou house in A'akapa and the sea. An oblong stone, decorated with petroglyphs resembling an *etua* type of motif, had been built into the wall of a large house platform on this site. The upper end of the stone, now broken off, supposedly was carved as a *tiki* head and was removed by the "Germans," according to the owner of the property.

PUA

NP 1

The *tohua* of Hiti to'u is located in the head of Pua Valley, above the Pua-A'akapa road. It is an extremely well-preserved example of the Terraced *Tohua* type, with stadia on both long sides and end platforms at both ends. The interior of the dance floor is 70 by 24 yards. An entrance on the north side cuts through the stadium at that point. The property owners have searched the site thoroughly for burial caches, of which several were apparently discovered with a quantity of grave goods.

NP 2

A small cave is located in the east wall of Pua Valley, 400 yards south of the pass where the A'akapa road enters Pua. This cave, called Tenapitai, figures prominently in several legends. Recently it has been used as a burial cave. Although the cave itself was impossible to reach without a devious climb, native informants climbed a tree opposite its opening and reported that two breadfruit wood coffins and 11 skulls were visible, in addition to some long bones. It was impossible to remove these.

HAKA'EHU

NHK 1

At a village site on the sandy beach and the level, elevated sand flats behind it, remains of stone pavements and some post-hole braces were seen on the surface. Occupational debris, found along the beach where the tidal waves have sectioned the dune, is sparse, and artifacts are few.

ARTIFACT DESCRIPTIONS

FISHING EQUIPMENT

FISHHOOKS

To AVOID CONFUSION, the terms used in the description of the fishhooks are here defined. In selecting these terms, I have tried to follow standard usage.[1]

SHANK KNOB: The knob at the proximal end of the shank to which the line lashing is attached.

SHANK LEG: The portion of the hook to which the line is attached, terminating at the point of confluence of the shank and point.

BEND: The curve of the hook where the point and shank legs meet.

POINT LEG: The distal portion of the hook point, at the confluence of point and shank.

POINT: The proximal or upper portion of the hook upon which the fish is impaled.

BARB: I define a barb as an outgrowth of the hook edge, attached to it throughout approximately its entire length. The distally directed outer surface of the barb forms an acute angle with the adjacent surface of the hook. Marquesan hooks have interior point barbs, and there is a unique example of an interior shank barb.

INCURVED POINT: The proximal portion of the point curves inward. There is no thickening of the point on the inside of the angle created by the curve, differentiating the incurved point from the interior point barb.

The types established here are the end result of a number of trial classifications of the total collection, both in the field and in the laboratory, to determine the features that are chronologically significant. The types finally established are identifiable from fragmentary as well as complete specimens, thus representing a maximum utilization of the available excavated material.

The unclassified residue may represent types of equal importance, but it will be necessary to have much larger samples before their significance becomes obvious.

The results of the seriation are presented in Fig. 27b.

ONE-PIECE HOOK TYPES

JABBING HOOK

The name of this type is derived from K. P. Emory's[2] identical Hawaiian type which is less restricted than its Marquesan relative in range of variation. All hooks of this type are of pearl shell. The hook has a straight shank leg, an evenly U-curved bend, and a straight point leg terminating in an unbarbed tip parallel to the shank. The shank knob is notched on both the interior and the exterior of the shank; the proximal end of the shank bears a transverse notch. Where the interior notch is missing, the entire knob is set back from the interior edge of the shank by a low step cut just below the knob (Fig. 26i). These hooks range between 31 and 10 mm. in length and 27 and 7 mm. in width. (For provenience, see Fig. 27b).

CHRONOLOGICAL SIGNIFICANCE: The type appears in a relatively small percentage in the Settlement period, reaches a climax in the late Developmental and Expansion periods, diminishes slightly during the Classic period, and continues in use into the Historic period. Hooks of this one-piece type, collected in 1803, are in the Peabody Museum of Salem.[3]

OPEN JABBING HOOK

As its name implies, this hook is related to the Jabbing Hook. It is similar in all respects, except for the point leg and point which are not parallel to the shank but directed outward from it. All hooks of this type are made of shell. The justification for establishing a separate type is that the chronological distribution differs quite significantly from that of the Jabbing Hook (Fig. 26p). The length ranges between 30 and 15 mm.; the width, between 16 and 7 mm. One example of this type occurred in the upper portion of the midden on Site NHaa 1 in a markedly disturbed area. This specimen is considered to be intrusive, as it occurred neither in the sites closely following NHaa 1 in the chronological sequence nor in the satisfactory samples from the habitation area of Site NHaa 1 (Fig. 27b).

CHRONOLOGICAL SIGNIFICANCE: The Open Jabbing Hook developed from the Jabbing Hook type in the late Expansion period and reached its climax in the Classic period.

[1] Duff, 1950, Fig. 50.

[2] Personal communication.

[3] Linton, 1923, 398, Pl. 71.

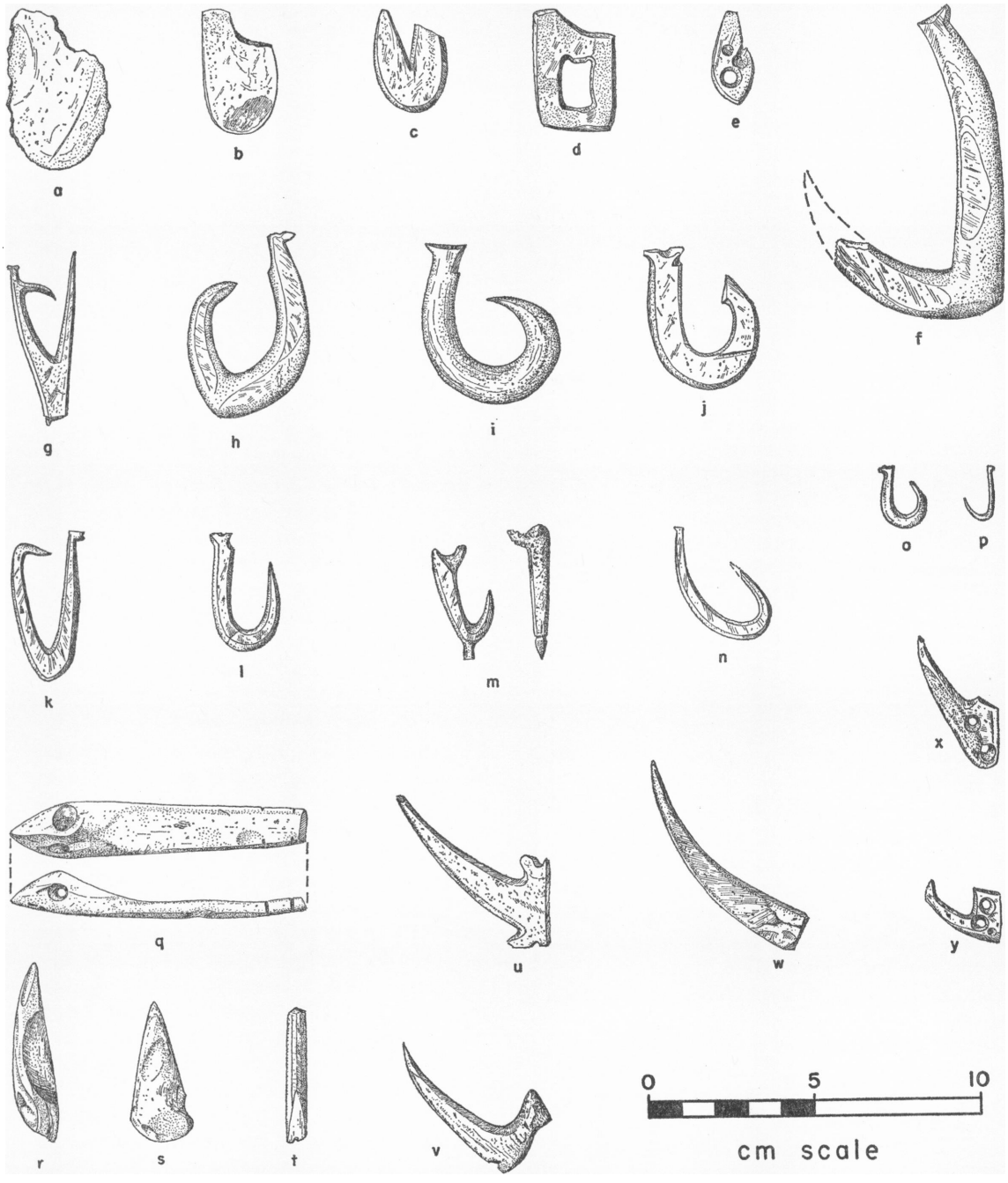

FIG. 26. Fishhooks. a–e. Steps in pearl shell hook manufacture. f. Bent Upper Shank hook. g. Aberrant type. h, o. Obtuse Recurved Point hook. i. Rotating hook. j. Heavy Shank hook. k. Acute Recurved Point hook. l. Jabbing hook. m. Compound Shank hook. n. Curved Shank hook. p. Open Jabbing hook. q, t. Minnow Shank. r–s. Triangular shanks. u. Biflanged point. v. L-shaped point. w. Inset point. x. Incipient Proximal Extension point. y. Proximal Base Extension point.

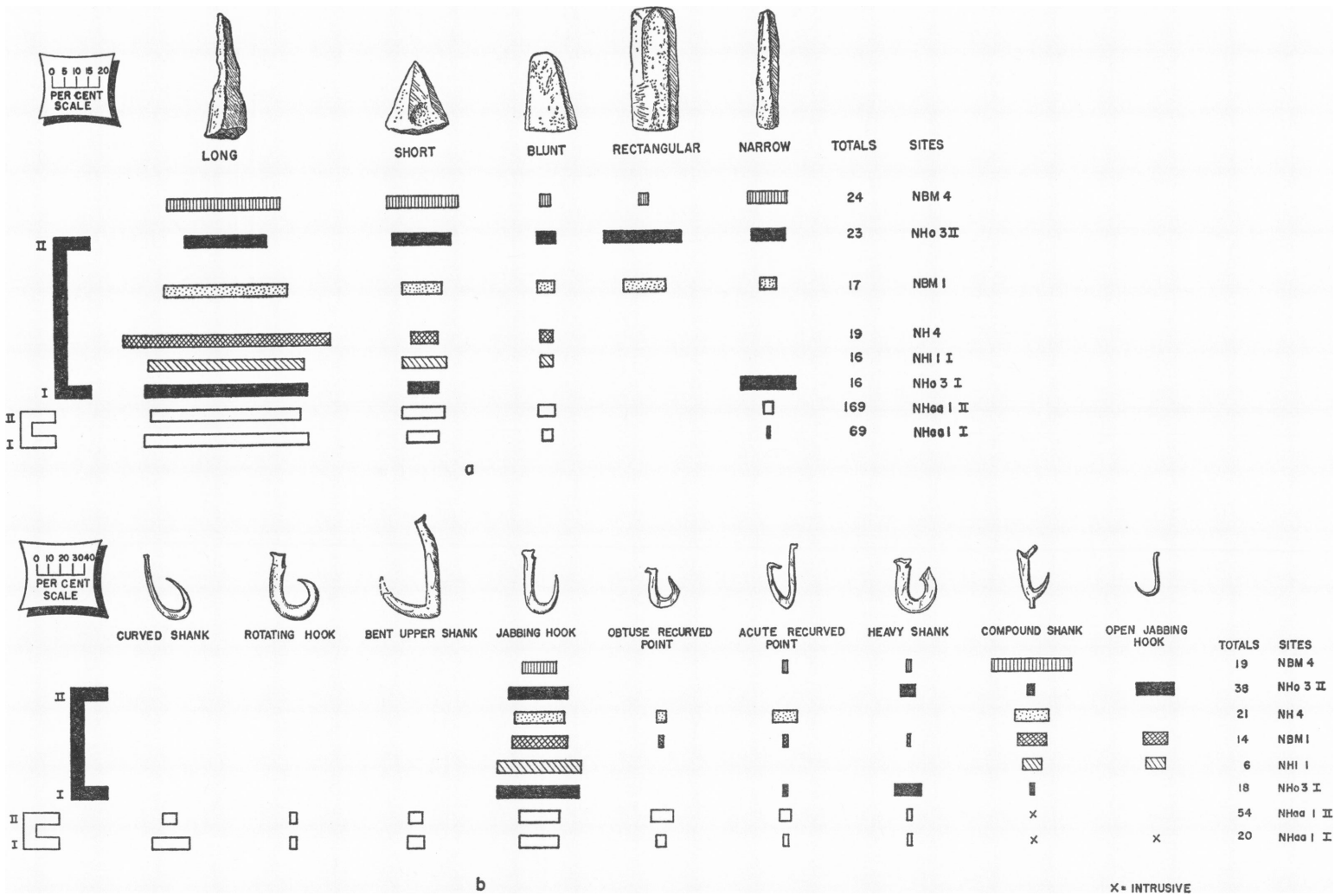

FIG. 27. a. Site seriation based on coral files. b. Site seriation based on fishhooks. Brackets at the left of both charts link separate levels of stratified sites.

HEAVY SHANK HOOK

Hooks of this type have the same general shape as that of the Jabbing Hook type but are considerably larger. The hook has a straight shank, a U-curved bend, and a straight point leg extending parallel to the shank. The slightly incurved point is barbed on the interior. The Heavy Shank Hook, made of thick pearl-shell stock (up to 8 mm.), was evidently intended to withstand heavy duty. The shank knob interior notch is much deeper than that of the Jabbing Hook. The ratio of shank length to point length is between 3:2 and 4:3 (Fig. 26j). The length ranges between 62 and 43 mm.; the width, between 40 and 38 mm.

CHRONOLOGICAL SIGNIFICANCE: Occurring in a very small percentage in the Settlement period, this type attained its climax in the early Expansion period and decreased in frequency slightly thereafter. Because the distribution is spotty, it is not chronologically reliable (Fig. 27b).

ACUTE RECURVED POINT HOOK

This type is characterized by a straight shank leg converging with the point in an acute angle. The point leg is straight, but the tip is recurved, forming an interior angle greater than 90 degrees. The point leg is as long as the shank or longer. Some examples have slightly curved shanks, with the confluence of point and relatively obtuse shank (Fig. 26k). All specimens of this type are of shell. The only complete specimen is 33 by 24 mm.

CHRONOLOGICAL SIGNIFICANCE: This hook was present in the Settlement period. Its use appears to have continued into the early Expansion period. Its distribution is very spotty, but it was definitely popular in the Settlement and Developmental periods. Its climax can be tentatively placed in the Developmental period (Fig. 27b).

ROTATING HOOK

This type designation is again borrowed from Emory's related Hawaiian type. The name derives from the fact that it is designed to rotate in the mouth of the fish so that it cannot slip off the point. The hook is circular or roughly circular, curving outward from the proximal end of the shank and then forward and downward. There is no marked confluence of the shank and point legs, the curve continuing smoothly to end in a point turned slightly towards the distal side of the hook. The point tip is close to the interior of the shank. This hook is always of pearl shell (Fig. 26i). The type ranges between 50 and 22 mm. in length and 40 and 18 mm. in width.

CHRONOLOGICAL SIGNIFICANCE: This type was found only in the Settlement period, and disappeared completely during the Developmental period (Fig. 27b). Its place may have been filled by the Acute or Obtuse Recurved Point types which may also have possessed the property of turning in the mouth of the fish, making it impossible for the point to slip out.

CURVED SHANK HOOK

The shank leg of this hook curves gradually forward as it descends from the shank knob and meets the point leg in a tight bend. The point leg is straight but directed backward from the bend towards the shank. The point tip may curve inward slightly or may be either barbless or barbed (Fig. 26n). The length of this type ranges between 50 and 22 mm.; the width, between 35 and 10 mm. These measurements are approximate, however, because they were taken on incomplete examples. All specimens of this type are made of pearl shell.

CHRONOLOGICAL SIGNIFICANCE: The type is present in a sizable percentage in the Settlement period, but decreases rapidly in frequency in the Developmental period, after which it becomes extinct (Fig. 27b).

BENT UPPER SHANK HOOK

The shank leg of this hook curves outward below the shank knob, which is of a standard type, then angles inward as it descends to the bend where it sweeps forward near this junction. The point leg joins the sweep in a sharp angle and extends upward and outward away from the shank (Fig. 26f). All specimens of this type are made of pearl shell. The size range of this type is greater than any other. Its length is between 90 and 60 mm., and its width between 15 and 5 mm. All but one specimen were broken midway along the point leg, indicating a serious weakness there which yielded to the sheer force placed upon the hook at the moment of catching the fish. This weakness, apparently a result of the hook shape rather than the material, possibly caused the abandonment of the type.

CHRONOLOGICAL SIGNIFICANCE: This type

occurs only in the Settlement and Developmental periods, after which it drops out of the cultural inventory completely.

PROBLEMATICAL

A very unusual pearl-shell hook was found on NHaa 1 in an area where it had been redeposited by erosion. The shank leg, with a standard knob, curved backward slightly, and a long, distally directed, interior barb projected from the inside of the shank. The shank and point legs met at a sharp confluence, and the point leg rose at an angle away from the shank, passing quite close to the shank barb. The point leg was straight, unbarbed, and exceeded the length of the shank. An extension from the distal portion of the hook, exterior to the shank point confluence, was broken off. It was wide and probably extended quite a distance, but its purpose is unknown. This hook was 51 mm. long and 21 mm. wide.

Two-Piece Hook Types

COMPOUND SHANK

This hook has a wide, blunt, distal shank, without the usual shank knob. A short projection on the interior aspect of the shank bears the notches usually found on most shank knobs. This projection has four processes on the tip, formed by the intersection of two grooves, one parallel with the lateral axis of the hook, the other perpendicular to it. The shank leg decreases in width as it descends towards the sharp, V-shaped confluence with the point leg. The exterior of the point shank confluence bears a short knob. The point leg extends upward and outward away from the shank, usually curving slightly towards the interior in its upper portion.

In all except one example of this hook, recovered at NBM 1, provisions were made for the attachment of an extra shank component which was an exact duplicate of the shank on the hook (Fig. 26m). This extra component was lashed against the hook shank to give added strength. One side of the hook shank was flattened to receive it. The single aberrant example at NBM 1 was small, with rounded sides, rendering the attachment of an extra shank component impossible. The thickness of the pearl shell of which it was made, relative to the over-all size of the hook, was probably sufficient to impart the necessary strength without the addition of an extra component. All hooks and shank components of this type are made of pearl shell. This hook type ranged between 48 and 34 mm. in length and 23 and 14 mm. in width.

Chronological Significance: This hook is a uniquely Marquesan form. Its sudden appearance in the archeological record makes it a good time index (Fig. 27b). Two points must be considered in the evaluation of this type. First, its appearance in the surface of the midden at NHaa 1 must be disregarded, as it is intrusive there. The ceremonial portion of the site where it occurs was sporadically used during contact times, when the main habitation had been moved off the beach dunes to the south side of the valley. One would expect, therefore, to find a few late artifacts in the surface of the cultural deposit. Second, too much weight should not be placed on its presence in NHo 3 I, as it is represented there by a single example.

On consideration of the above points, it seems to me that, until further Developmental sites have been excavated, the Compound Shank type is diagnostic of the Expansion period, reaching its climax in the Classic period and continuing into the Historic period. An example of this type at the Peabody Museum of Salem is illustrated by Linton.[1] It was collected by whalers about 1803, which proves that the hook continued in use into the Historic period.

Bonito Hook Shank Types

MINNOW SHANK

This is the commonly known shank type distributed throughout Oceania. It is elongated, tapering towards the distal end which is fitted with two or three pairs of lateral notches and a vertical notch and groove for the point lashings. The proximal end is sharply and symmetrically pointed, with a keel running from the point tip and merging into the contour of the interior surface of the hook. Two eye-like perforations for lashings, one on each side of the keeled proximal end, heighten its resemblance to a fish. The section is plano-convex to oval at the proximal end, rectanguloid at the distal end. All shanks of this type are of pearl shell (Fig. 26q). The minimum dimensions of this shank are 87 mm. in length and 16 mm. in width.

Chronological Significance: This type

[1] Linton, 1923, Pl. 71, A, 3.

TABLE 8

DISTRIBUTION OF BONITO HOOK SHANKS AND POINTS

Site	Shanks		Proximal Base Extension	Incipient Proximal Extension	Hooks		Inset
	Minnow	Tri-angular			Biflanged	L-shaped	
NHaa 1-I	4	7	—	—	2	—	—
NHaa 1-II	14	15	5	—	3	1	—
NHo 3-I	—	1	1	4	—	—	—
NHo 3-II	2	1	—	—	—	—	—
NH 4	7	2	—	—	—	—	2
NBM 1	4	—	2	—	—	—	—
NBM 4	2	1	2	—	—	—	—
NHtv 1	1	—	—	—	—	—	—

appears in the Settlement period, continuing in use into the Historic period, when it is quite frequently found. An alteration in form occurs, however; the more recent examples are less carefully finished, lacking the over-all polish and smooth contours of some of the earlier hooks. The keeling of the proximal interior end is also higher and more steep-sided in the more recent forms (Table 8).

TRIANGULAR

This shank type generally has a wide, blunt, proximal end, asymmetrical in plan when viewed from above. The distal end is narrow, and the proximal distal taper is very marked. The notching at the distal end for hook lashing is longitudinal in the midline of the shank. On smaller specimens the distal end may also be equipped with a knob. There are no perforations for line lashing in the proximal end. Some specimens are completely smoothed into a teardrop shape. All shanks of this type are of pearl shell (Fig. 26r-s). The maximum dimensions attained by this type are 65 mm. in length and 35 mm. in width.

CHRONOLOGICAL SIGNIFICANCE: This type was present in the Settlement period. In the Expansion period its occurrence diminished relative to the increase in frequency of the Minnow type. It seems to have dropped from the cultural inventory either late in the Expansion period or in the early Classic period, as there is no evidence of its survival into the Historic period. All the hooks collected by the early European visitors were of the Minnow type (Table 8).

BONITO HOOK POINT TYPES

PROXIMAL BASE EXTENSION

This point, made of bone or shell, has an extension or flange on the proximal side of the base. Two or three perforations, drilled from both sides, held the lashing necessary to secure the point to its shank. The butt of the base is flattened for firm seating against the shank. The point, which extends outward from the base of a 45-degree angle, often turns upward parallel to the shank at the extreme end, producing a sort of incipient barb (Fig. 26y). The maximum dimensions of this type are 40 mm. in length and 23 mm. in width.

CHRONOLOGICAL SIGNIFICANCE: This point was present in the Settlement period, subsequently increasing in frequency during the late Expansion period. This may have been one of the point types used with the Minnow Shank.

INCIPIENT PROXIMAL EXTENSION

This type is made of either bone or shell. The point base has a weak, proximal, basal extension. There are two perforations in the basal portion of the hook. The butt is flattened to allow it to fit firmly against the hook. The point extends outward at a 45-degree angle and turns upward slightly at the tip. The maximum dimensions of this type are 37 mm. in length and 25 mm. in width.

CHRONOLOGICAL SIGNIFICANCE: Despite the fact that this type is found at only one site (Table 17), additional documentary evidence can be brought to bear on the problem of its chronological range. The type was definitely not

present in the Settlement or early Developmental periods at NHaa 1. It appears in the late Developmental period at NHo 3. Although not found in sites of the Expansion period, it was probably used at that time, as the hooks of the Historic period in museum collections seem to be very closely related.[1] They differ only in displaying absolutely no trace of the proximal basal extension. It is important, however, to know the exact source of the hooks in museum collections, as the southern Marquesas group would not necessarily follow the style and frequency trends of the northern group. The historic examples may have come from the south rather than the north, or they may be erroneously documented and actually from other island groups. Hooks like this are still made in the Tuamotu group, being traded into the Marquesas by sailors on copra boats.

BIFLANGED

This type of point, made of shell, has a narrow base, with long basal flanges extending on both the distal and the proximal sides. The flanges are notched for lashing, and the butt of the base flanges is flattened. This type is generally imperforate. Infrequently, the base of the point has one perforation. The unbarbed point curves out at a rather wide angle (Fig. 26u). This point reaches maximum dimensions of 45 mm. in length and 43 mm. in width.

CHRONOLOGICAL SIGNIFICANCE: This type is present in the Settlement period, but becomes extinct in the late Developmental period (Table 8).

L-SHAPED POINT

This point is represented by a single pearl-shell specimen found at NHaa 1. Because it is unusual, I feel it necessary to describe it here, although it cannot have the status of a type. The point has no flattened base for being fitted against a shank and is slightly curved near the tip. The short flaring base of the point leg curves from the interior side of the point, at 90 degrees. All the surfaces of this extension are bifacially beveled; hence, they could not be expected to stay in position when placed against a flat shank piece. Just above the rise of the extension the exterior of the point is notched. There is another notch on the distal side of the extension (Fig. 26v). This may have been intended as a shell point for a wooden trolling lure, designed for insertion in the shank rather than being lashed against it. The point is 51 mm. long and 25 mm. wide.

CHRONOLOGICAL SIGNIFICANCE: The only extant specimen is found in a Settlement period site. Further work, however, may certainly extend this range (Table 8).

INSET POINT

This is a long, gently curving, baseless point, unmodified by notching or any other provision for lashing or attachment. Its butt is bifacially beveled. As with the preceding, it may also have been intended for insertion in a slotted wooden shank, similar to the technique used by the Maori on their barracuda hooks (Fig. 26w). The only complete specimen of this type is 63 mm. long and 12 mm. wide.

CHRONOLOGICAL SIGNIFICANCE: There is little that is chronologically significant about this type. On the basis of the good sample obtained from the Settlement and Developmental periods at NHaa 1, it is possible to say with some assurance that this type was not present in these periods. It was probably developed in the Expansion period, but it does not seem ever to have been widely used, nor does it seem to have survived into historic times (Table 8).

PROBLEMATICAL

GORGE

This is a pearl-shell biped, opened to an obtuse angle, with a small notch at the interior of the confluence of the legs. Both point tips are missing. It is probably a fish gorge. This specimen, found in NHaa 1 I, measured 33 mm. in length and 2 mm. in width.

CHRONOLOGICAL SIGNIFICANCE: This form is unusual, rare in Polynesia, and rarer still in the Marquesas where it is not mentioned in any historical sources. If this is a gorge, its relations are to the Micronesian bent gorges rather than to the straight Western Polynesian specimens.[2] This belongs with the category of artifacts that seem to have been dropped from the Marquesan cultural inventory during the early period of habitation.

[1] Linton, 1923, 399; von den Steinen, 1928, Vol. 3, alpha P, Fig. 6; Anell, 1955, Fig. 18.

[2] Anell, 1955, 77.

HOOK BLANKS

A careful analysis of the excavated, unfinished, pearl-shell hook blanks proved that it is possible to identify certain hook types from blanks, if work on the blank had been sufficiently advanced when it was discarded. Such identifiable types were: Jabbing Hook, Open Jabbing Hook, Bent Shank-Neck, Heavy Shank, Curved Shank, Obtuse Recurved Point, and trolling hook blanks. It cannot be claimed, naturally, that identification was always positive. All that can be hoped for is a good percentage of correct identifications.

The frequency is as follows:

NHaa 1 I	9
NHaa 1 II	11
NHo 3 I	65
NHo 3 II	31
NH 4	22
NHi 1	11
NHtv 1	1
NHuu 1	1
NBM 4	6
NBM 5	2

Hook-making Techniques

In the manufacture of one-piece hooks, the raw material used was almost exclusively pearl shell, although oyster or *Cassis* shells were also used in a fraction of 1 per cent of the hooks. Only one finished hook not of pearl shell was recovered. The favored portion of the pearl shell was the central area of the valve, as the use of the marginal areas would have resulted in a thin, fragile hook. The marginal sections were used only for some of the more minuscule specimens.

The operations of manufacture were generally as follows: The *external* outline of the hook was chipped out by a directed light percussion. A wooden punch tapped with a small beach pebble was probably the directing instrument. When the outline of the hook was completed, the rough edges, serrated from the bites taken by the flaking tool, were smoothed and beveled bifacially. The skin side of the blank was cleaned and the skin was polished off, exposing the colored, subdermal area. Occasionally, a stone saw was used to cut out one or more edges of the blank, while the other surfaces were chipped (Fig. 26a–b). The outline completed, the next step was to remove the interior of the hook, accomplished in either of two ways:

1. Usually a cut with a stone saw was made from both surfaces of the step in the proximal side of the blank just below the extension from which the shank knob was destined to be fashioned (Fig. 26c). This cut was directed into the center of the hook, parallel to the long axis of the shank, and continued until a groove had been cut to a satisfactory depth. This groove provided purchase in the center of the hook from which the craftsman could work into the surrounding material, chipping and cutting out the center of the hook.

2. The second method, rarely encountered, involved the use of a rotary drill to produce one or more holes on both sides of the area to be removed (Fig. 26d–e). On small hooks, on which one perforation was made in the center of the area to be removed, a second smaller hole was placed above it in the channel between the shank and the point tip. Then these perforations were connected by the use of a stone flake-saw. On larger hooks, on which it was necessary to remove a greater amount of material, the entire central section was outlined by several drilled holes. The small areas between the holes were then easily cut away. The drilled holes were placed at corners where a tight turn with a flake-saw would have been difficult.

Once the center was cut and the interior of the hook roughly approximated its destined shape, it was ready for the final shaping and polishing with coral files and other abrading instruments which produced a good smooth finish, an elliptical cross-section, and a polish that would cause it to gleam in the water, attracting the fish.

A second manufacturing method, similar to the above, differs in the initial shaping of the blank. In this technique, represented in a small minority of examples, the entire hook outline, both interior and exterior, was initially chipped out, after which the hook received its final polish and was ready for use. This technique may have been reserved for certain of the larger hooks. It would scarcely have been applicable on the small hooks, the centers of which could be removed only by being cut or drilled with a fine drill.

In the manufacture of the trolling hook, the thick hinge of the pearl shell, its heaviest and sturdiest portion, was used for the shank component. In the removal of the hinge, some of the byssus notch area was included in the Triangu-

lar type of shank, but was confined to the hinge itself in most of the Minnow shanks. Other Minnow shanks were made on strips cut through the shell hinge at an angle, straight across the valve to the margin. This method gave the shank a certain curvature, which evidently was desired, while permitting a somewhat lighter shank. In these specimens the proximal end of the shank was made from the thick hinge section, as it was the only portion thick enough to be laterally perforated. The same tools (stone flake saws and files) were used as those in the making of the one-piece hooks. The flaking technique was not, however, used. The "blank" strips were cut out by parallel saw cuts across the shell or along the hinge and then ground and polished into shape.

A few general points in connection with the Marquesan fishhooks described above require emphasis. The almost complete reliance on pearl shell for raw materials is interesting. In two seasons' work, only three bone hooks were found, which causes one to question the references to bone hooks in the historical sources. The Hawaiians used mammal bone and teeth for hooks far more frequently than pearl shell. We can only guess at the factors that made bone so scarce during the early periods of Marquesan prehistory. Perhaps the pigs and dogs introduced at settlement were too few to provide a supply of bones from which to produce a large number of implements. The failure to use human bone for fishhooks poses another problem, as it was used for tools and ornaments later in the chronological sequence.

In connection with the utilization of raw materials, it is also interesting to note that the maritime-oriented Marquesans apparently failed to produce as many hooks as their Hawaiian relatives. The collections from even small Hawaiian sites are generally large; in the Marquesas, on the contrary, extensive digging is necessary to amass a sample. The quantity of fish remains, however, indicates much fishing. The two possible explanations are: (1) the Marquesans made a high percentage of their hooks of wood; (2) net-fishing techniques provided more of the food fish than line fishing. The second assumption seems by far the most plausible, for in two Expansion period, dry rock-shelters, NBM 1 and NH 4, many wooden artifacts were preserved, but no trace of a wooden hook or anything resembling one was ever found. Another factor influencing the popularity of hook fishing is the scarcity of good, heavy pearl shell in the Marquesas. Because of ecological factors, most of the shell is thin and small. Von den Steinen[1] states that thick pearl shells were imported aboriginally from the Tuamotu Islands, about 300 miles distant. The Marquesan pearl shell was quite suitable for smaller hooks, but it would have been difficult to obtain local shells suitable for the larger varieties. The difficulty of procuring shells may also have contributed to directing the Marquesans away from line fishing towards a concentration on net-fishing techniques. Unfortunately, we have neither ethnographic nor historic data that can contribute to the clarification of this puzzle.

Extra-areal Comparisons

As a preliminary, it should be emphasized that the accepted distribution of Polynesian hook types has been radically altered as a result of the hooks found in these excavations. Until the present series was made available by our excavations, the only hooks known from the Marquesas were those described by Linton, von den Steinen, and in the Oldman Collection.[2] These represented the Jabbing Hook and Compound Shank types of "bait hooks" and the Minnow Shank trolling lure with a biperforate point with a distal projection, which may not even be Marquesan. The incompleteness of the ethnographic collections is therefore stressed, and it is inadvisable to place too much reliance on generalizations based on them. More important for an archeological study, it shows plainly the futility of describing *ad infinitum* ethnographic occurrences of similar hooks scattered throughout the Pacific. What is needed is a sound typological study of stratigraphically excavated material from each of the main Polynesian island groups. Only when such studies are available will it be possible to draw fruitful comparisons and to chart meaningfully the movements and relationships between the major island groups. Therefore, I do not devote much space here to the ethnographic collections, but refer the reader for such data to Anell's[3] exhaustive and well-illustrated sum-

[1] Von den Steinen, 1928, Vol. 2, 52.

[2] Linton, 1923; von den Steinen, 1928, Vols. 2 and 3; Oldman, 1943.

[3] Anell, 1955.

mary of the available specimens.

I wish, however, to stress the comparison of the Marquesan fishhooks with the only two groups of archeological material presently available—the Hawaiian and New Zealand collections. Although the Hawaiian materials are not yet published, Dr. K. P. Emory and Mr. Yoshiko Sinoto of the Bernice P. Bishop Museum have very kindly sent me photographs of their extensive and precisely documented excavated material from their publication. The photographs at least allow typological comparisons, if not a detailed comparison of frequency fluctuations and the chronological appearance of common types, which will be possible when the report is published.

Unfortunately, the New Zealand material has never been exhaustively studied. Moreover, it is not so numerous as that from Hawaii or the Marquesas. With few exceptions, it was not stratigraphically excavated and, therefore, can serve only as a basis for a comparison of types.

The Hawaiian material resembles the Marquesan quite closely in the inventory of one-piece or "bait" hooks. In Hawaii the Jabbing Hook type includes in its range of variation the form of the Open Jabbing Hook. The Hawaiian type is found throughout the archeological sequence, increasing in frequency towards the present, paralleling in time, to some extent, the distribution of its Marquesan counterpart.

The Rotating Hook of the Marquesas is identical with the Hawaiian type of the same name, including within its variations forms resembling those of a type called the Circular Hook, tentatively held separate in Hawaii.

Also found in Hawaii are cognates of the Obtuse Recurve Point type, the Bent Upper Shank, the Curved Shank, and possibly the Heavy Shank types.

A few compound hook points in Hawaii are related to the Marquesan Proximal Extension type with one or two perforations, but they are rare. More numerous in Hawaii are single-perforated points without extensions, or imperforate points with distal extensions notched for being tied to the shank. In provisions for attachment these are quite similar to the Marquesan Biflanged type.

A large class of Hawaiian hooks for which no related types have been found in the Marquesas are the two-piece, point-and-shank-separate types, comprised of a shank leg and a point leg fitted together by being lashed at the bend. These hooks appear in a wide variety of forms, with several chronologically significant kinds of arrangement for lashing and fitting the component pieces firmly against each other.

Another sizable class of artifacts in the Hawaiian collections, which has no cognate in the Marquesan material, is the hook points which were meant to be fitted into a one-piece wooden shank leg and point leg component. The absence from the Marquesan collections of the latter two hook types is of some significance, as is pointed out below.

On the other hand, two items in the Marquesan material are not found in the Hawaiian collections. These are the Triangular Bonito Hook Shank which appeared in the Settlement period, gradually becoming less frequent through the Expansion period, and the Compound Shank Hook, a uniquely Marquesan type, appearing in the upper middle portion of the archeological sequence.

To sum up, the Hawaiian materials resemble the Marquesan most closely in the inventory of one-piece hooks and slightly less in the compound trolling hook types. However, two large important classes of hooks from the earliest period of Hawaiian prehistory are absent in the Marquesas. The Marquesan collections contain only two types that differ completely from anything found in Hawaii, the Triangular Trolling Shank and the Compound Shank Hook, the former brought in with the first settlers, the latter a Marquesan invention.

Duff[1] and Skinner[2] are used as summaries of previous work on fishhooks in New Zealand. The New Zealand compound hook shanks and the points associated with them are quite similar to the Marquesan materials. The shanks differ basically in the material from which they are made. The New Zealand examples are of stone or bone, while the Marquesan examples are of pearl shell which is not found in New Zealand. The New Zealand examples differ further in the lashing provisions on the distal and proximal ends. Whereas the distal ends of the Marquesan specimens are notched laterally and medially, the New Zealand examples are laterally notched and grooved with a flat or concave interior. The proximal ends of some

[1] Duff, 1950.
[2] Skinner, 1942.

New Zealand shanks are not biperforate, but have a single anterodorsal perforation.

New Zealand compound hook points differ from the Marquesan in their method of attachment. The majority of the points at the Wairau Site have single perforations in their bases with little or no basal projection,[1] although about a third of the specimens are biperforate, with the proximal basal extension similar to the Marquesan Proximal Base Extension type. Two of the Wairau points have imperforate bases with notched distal projections.

Imperforate points have been recovered on other Moa Hunter sites. At Shag River[2] there were points with either distal or proximal extensions, or both together. Similar points were recovered at Tahakopa[3] and Kings Rock.[4] These imperforate Moa Hunter points and the Marquesan Biflanged Point are generally related, although the New Zealand forms seem to be more varied.

The one-piece hooks from New Zealand, classified as Type 1 by Skinner,[5] have received little attention. Their range of variation is wide, so that analysis might be fruitful. The forms illustrated by Skinner[6] in his Murihiku hook classification show relationships to many of the Marquesan types. His Figs. 1–5 resemble the Marquesan Obtuse Recurved Hook; Fig. 6 resembles the Acute Recurved Point Hook; and Figs. 8–10 somewhat resemble the Curved Shank type. Skinner elsewhere[7] figures a fragment that may be a Rotating Hook.

The New Zealand materials display further similarities to those of the Marquesas in Skinner's Type 5,[8] or barracuda hook type, which is similar to the Marquesan Inset Point type, a type lamentably rare in the Marquesan collections.

Emphasizing the dissimilarity between the New Zealand and Marquesan materials we have again the presence of the two-piece, separate-point hooks, Skinner's Type 2,[9] and the two-piece, shank-leg-and-point-leg-separate types, Skinner's Type 3.[10] It will be recalled that both these classes of hooks were also present in Hawaii. Although Duff[11] denies the presence of the Type 2 barbed hooks in Moa Hunter deposits, Skinner[12] states that this general type of hook occurs in the Moa Hunter period. According to Skinner, Type 3 is rarely found in Moa Hunter sites, but increases in frequency in recent times.

We see here that the hooks from Hawaii and New Zealand resemble each other to a greater degree than either series resembles the Marquesan hooks, despite the basic similarity of the one-piece and compound trolling types of hook found in the three areas.

To extend the comparisons farther afield to some of the areas known only from surface collections, the information from Easter Island[13] is of interest. The stone hooks figured by Métraux[14] are related to the Marquesan Rotating and Obtuse Recurved Point types. Other bone hooks[15] differ markedly from the Marquesan material, with their sharp, V-shaped bends and notched rather than knobbed shanks. Two-piece, shank-leg-and-point-leg-separate hooks that are found in Hawaii and New Zealand are also present on Easter Island.

In the ethnographic collections, hooks similar to those recovered in the Marquesas are found scattered throughout Polynesia, Melanesia, and Micronesia. A study of these collections contributes relatively little to increasing our understanding of prehistory. A few points, however, are important in interpretation.

The similarity of the Marquesan Proximal Extension trolling hook points to Anell's Western Polynesian type[16] is interesting. This type of point was evidently in the cultural assemblage of the Polynesians when they first pushed east from Western Polynesia. Its occurrence in the earliest site in the Marquesas definitely suggests Western Polynesia as the source of the original Polynesian culture. The points occur in the Marquesas, Hawaii, and New Zealand associated with the imperforate

[1] Duff, 1950, 204.
[2] Skinner, 1924, Fig. 10N.
[3] Teviotdale, 1937, Figs. 4–6.
[4] Lockerbie, 1940, Fig. 45.
[5] Skinner, 1942, 217.
[6] Skinner, 1942.
[7] Skinner, 1924, Fig. 8D
[8] Skinner, 1942, 259.
[9] Skinner, 1942, Figs. 18–34.
[10] Skinner, 1942, 256.
[11] Duff, 1950, 214–215.
[12] Skinner, 1942, 220.
[13] Métraux, 1940.
[14] Métraux, 1940, 175, Fig. 7.
[15] Métraux, 1940, 178, Fig. 7g.
[16] Anell, 1955, 156.

points which, according to Anell,[1] are examples of an older type of hook.

It is interesting also to note that except for small crude wood and fishbone hooks,[2] the trolling hooks are the only types found in the ethnographic present in Western Polynesia. The one-piece types that must have once existed there have been dropped completely from the cultural inventory. On the basis of the distributions, Anell[3] believes that one-piece hooks were formerly present in Western Polynesia, and I would agree with him. As for the one-piece hooks, the wide spread of forms related to the Marquesan types is phenomenal.

Relatives of the Rotating Hook type are found in the Carolines, Ellice Islands, Pukapuka, Tahiti, Uvea, Eastern Melanesia, Torres Strait, Australia, and Yap.[4]

Specimens related to the Acute Recurved Point Hook are found in Tahiti, Pitcairn, Tokelau, Ontong Java, Mangareva, and the Trobriands.[5]

The Jabbing, Open Jabbing, and Heavy Shank hooks are found in Melanesia, the Chatham Islands, Tahiti, the Tuamotus, and Mangareva.[6] Anell believes that they represent the original type of Polynesian hook, relating Polynesia and North Asia.[7]

Obtuse Recurved Point hooks have an equally wide range, appearing in Tobi and the Marshalls in Micronesia,[8] and in Tokelau.[9] A good replica of the Curved Shank Hook appears in Melanesia.[10]

This enumeration of hook occurrences seems to me to serve only one purpose: to indicate, from the wide area over which these one-piece forms are spread, that we are dealing with an ancient complex of hook types that moved into Oceania from Eurasia long ago and had sufficient time to spread to marginal areas in all directions.[11]

[1] Anell, 1955, 189.
[2] Buck, 1930, 490.
[3] Anell, 1955, 96.
[4] Anell, 1955, 115, Fig. 3, No. 11; Fig. 4, No. 18; Fig. 5, No. 7.
[5] Anell, 1955, 115, Fig. 3, No. 9; Fig. 5, No. 11; Fig. 6, No. 10; Fig. 8, No. 6; Fig. 8, No. 7.
[6] Anell, 1955, 117.
[7] Anell, 1955, 120.
[8] Anell, 1955, Fig. 4, No. 9; Fig. 4, No. 15.
[9] Anell, 1955, Fig. 5, No. 4.
[10] Anell, Fig. 3, No. 1.
[11] Anell, 1955, 247.

On the basis of the comparisons with excavated archeological materials from New Zealand and Hawaii and meager surface-collected specimens from Easter Island, there seems to be a greater-than-chance disparity between the total hook collections from those islands on the one hand and the Marquesas on the other. This difference lies in the absence of the two-piece bait hooks from the Marquesan collections. Although these hook classes were absent in the Marquesas, the other hook types recovered there are basic Polynesian types which are closely related to the Micronesian and Melanesian types and through them to those of Asia.

The alternative explanations for this disparity are: (1) the Marquesan culture stems from a different source than that of Hawaii and New Zealand; or (2) the Marquesan culture derived from the same source, but at a different time. For reasons that are presented more explicitly below, I incline to the first hypothesis.

FISHING WEIGHTS (*POKA'E IKA*)

Stones that were laterally or longitudinally grooved or notched to facilitate the attachment of a fishing line were used for fishing weights. Because of their unspecialized form, the range of use is somewhat problematical. Marquesans today make similar grooved weights for fishing sinkers, cutting the groove with a machete. Similar grooved stones probably had like uses in the past, but they may also have been employed for weighting nets, or as small canoe anchors, or even possible weapons. Archeological fishing weights weigh up to 6 pounds (Fig. 28c, Table 9).

Chronological Significance: These artifacts were used throughout Marquesan prehistory, from the arrival of the settlers until contact times. They are found in relatively small numbers, because ungrooved stones often served as adequately as those that had been prepared.

In Hawaii[12] and throughout most of Polynesia, sinkers similar to the grooved and ungrooved Marquesan specimens are found. The distribution of this type of artifact is almost world wide, and its presence is not significant.

Squid Lure Sinkers

The lure sinker is plano-convex in section and ovoid to ellipsoid in plan, with a groove along

[12] Buck, 1930, 342–346.

TABLE 9

DISTRIBUTION OF FISHING EQUIPMENT

Site	Fishing Weights	Squid Lure Sinkers	Squid Lure Cowries	Squid Lure Flappers	Turtle Lures	Harpoons
NHaa 1-I	—	1	1	—	—	—
NHaa 1-II	3	17	17	3	20	1
NHo 3-I	1	—	2	1	1	—
NHo 3-II	3	—	1	1	1	1
NHi 1-I	1	1	1	3	2	—
NHi 1-II	—	—	—	—	—	1
NH 4	3	—	2	1	1	1
NBM 1	—	—	—	1	—	—
NBM 4	—	2	—	1	—	—
Surface	—	—	—	—	5	—

the longitudinal axis of the convex surface that in some examples continues around to the flat surface. All the surfaces are usually rough, as a coarse, vesicular type of basalt is most often used. A few specimens, however, have some polish (Fig. 28a). The purpose of the sinker was to weight the cowrie lure-and-hook assemblage so that it would maintain the desired position in the water when in use.

Linton,[1] describing an artifact resembling this from the Marquesas, says that the owner could offer no suggestions as to its use and that no other similar object had ever been reported from the Marquesas. However, I experienced no difficulty in eliciting a correct identification from Marquesans. They appear to have been used until quite recently, within the last 20 years at least.

There is some evidence that stone weights were not always attached to shell lures. A large *C. tigris* shell found at NHaa 1 had been filled with small pebbles which would have functioned as a weight. The mouth of the cowrie would have been effectively sealed when the hook shank was attached. The use of pebble-filled shells may account for the infrequency of weights on late sites. The squid lure weights range from 90 to 53 mm. in length and 56 to 32 mm. in width (Table 9).

CHRONOLOGICAL SIGNIFICANCE: Squid lure sinkers are found throughout the Marquesan sequence from the Settlement period to the present. Artifacts exactly like them are found on Easter Island,[2] where the illustrated specimens at least are completely grooved.

The Hawaiian material shows some important differences from the Marquesan. The stone squid lure sinkers are not found in the earliest Hawaiian culture, but appear at a later date in the sequence.[3] In contrast to the homogeneous Marquesan material, there are two very distinct types in Hawaii. One type is exactly like the standard Marquesan sinker.

The other type, called the "breadloaf" sinker, has a transverse section resembling a well-risen loaf of bread which has puffed itself out over the lateral limits of the pan. The groove is at the base of the "loaf." These are described and/or figured[4] by McAllister, Buck, and Bennett. Buck inclines to the view that the breadloaf sinkers are dip-net weights. In Samoa, highly polished weights used for squid lures are in the form of a spinning top or bullet.[5]

Spoehr's Marianas excavations on late sites of the *Latte*-building period[6] uncovered artifacts resembling squid lures, but in small numbers. These pyramidal sinkers had rounded corners and a longitudinal groove. As no ethnographic information is available to explain their use, it cannot be stated with assurance that they were used as squid lures.

Cypraea tigris, *C. reticulata*, *C. peasei*, and *C. caputserpentis* shells were used as lures to attract the squid or octopus. The Marquesans believe that the shell is highly desired by the

[1] Linton, 1923, 333.
[2] Métraux, 1940, Fig. 13b, d.
[3] Emory, personal communication, 1959.
[4] McAllister, 1933, 26, Fig. 7a; Buck, 1930, 342–346; Bennett, 1931, 74.
[5] Buck, 1930, 479.
[6] Spoehr, 1957, 145–146, Fig. 75.

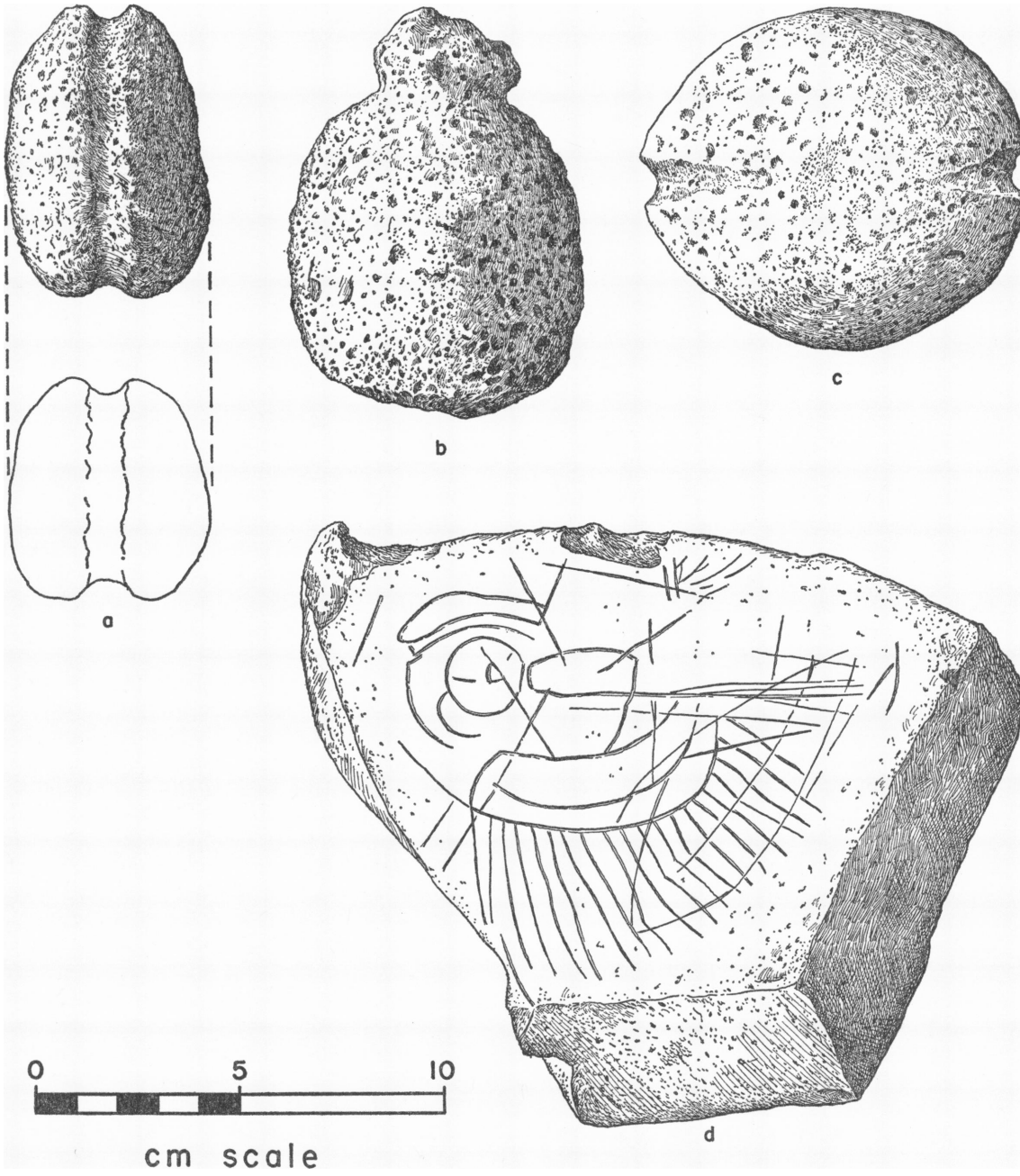

FIG. 28. a. Squid lure weight. b. Turtle lure. c. Fishing weight. d. Petroglyph slab from Stratum II, Site NHtv 1.

cephalopods, who throw caution to the winds upon sighting it and refuse to let it go. The Marquesan name for the preferred *C. tigris* shell is *i'i pu toto'i heke* (cowrie shell drawing cephalopod). The squid lure shells in Samoa are known by almost the same name: *pule to'i fe'e* (cowrie draw squid).

For attachment to the lure weight, the left lip of the shell is cut off to allow the removal of the inner column. One perforation is then punched,

usually on the column on the front exterior just above its whorl, and another through the posterior end in the longitudinal midline. Two types of cowries were found, those with a single rear perforation and those with a front and rear perforation. Cords passed through these holes bind the cowrie, weight, hook shank, and flapper, together (Fig. 29c).

A roughly shaped fragment of a cowrie cap, called the "flapper" below, was attached to the ensemble of lure, weight, and hook by a cord passed through the rear perforation of the lure and a perforation near the edge of the flapper (Fig. 29d). The flapper waved up and down in the water as the lure was moved along, supposedly adding to its attractiveness to the cephalopods.

The cowrie lures are from 93 to 61 mm. in length, and 68 to 42 mm. in width. The flappers range from 66 to 42 mm. in length and from 57 to 39 mm. in width. (See Table 9.)

CHRONOLOGICAL SIGNIFICANCE: Both types of cowrie lure, the stone weights and the flappers, were brought to the island by the first settlers and since then have been continuously in use. In the later periods the manufacture of the stone weights was possibly reduced in favor of cowrie lures filled with pebbles, as the stone weights occurred most frequently in NHaa 1 and were much rarer thereafter.

TURTLE LURES

The name of these artifacts is an adaptation of the Marquesan name *ke'a tuku honu* (turtle-catching stone). A different designation would be no more suitable, as there is little ethnographic information concerning their range of uses (Fig. 28b). The turtle lure, roughly pear-shaped, is usually vesicular basalt. A small groove over the top bifurcates a knob at the small end. A subgroup of these artifacts consists of examples of large size, with the perforation through the neck of the bifurcated knob on which two *tiki* heads were sculptured. The turtle lures, especially in their smaller size range, may almost certainly have served as net weights, as canoe anchors, deep sea fishing sinkers for grouper fishing, or canoe smashers. Linton states that artifacts deliberately shaped for this purpose are exceedingly rare.[1] On the contrary, they are so common as to be easily dismissed and are seldom mentioned by the natives because of their unesthetic qualities. Shown a lure, the native name was readily supplied by both young and old. The same name (Nuku Hiva dialect) was recorded by von den Steinen[2] for identical artifacts collected by him in Ha'atuatua and in Puamau, Hiva Oa, where the term for the same artifact is *ke'a 'upena* (net stone).[3]

We are further indebted to von den Steinen for the only available ethnographic information concerning the perforated and carved examples of this artifact type. The carved turtle lures were made by a *tuhuka*[4] or master craftsman and were kept in a fisherman's shrine to be used for catching sacrificial turtles in time of drought for rain offerings to the gods and the general dead. Te Fatu Moana (Tana'oa) was patron of the turtle expeditions, giving *mana* to the *tiki* sculptured on the turtle lure and to the fisherman. The stone supposedly floated after a catch and could be used in divination for success by being placed in the sea to see whether or not it "swam."

Von den Steinen[5] believes that the standing double *tiki*, so well known in ethnographic collections, developed from this artifact.

The turtle lures weighed between $10\frac{3}{4}$ pounds and $4\frac{1}{2}$ ounces.

CHRONOLOGICAL SIGNIFICANCE: These artifacts, a part of the original proto-Marquesan culture, were in use in all periods up to the Historic period.

Perforated net weights are reported from Easter Island,[6] but some of the specimens collected there are naturally perforated stones.

Both the knobbed and perforated types of turtle lure occur in Hawaii. Buck has designated large examples as "canoe breakers" used for "naval warfare."[7] These stones are knobbed, drilled, grooved, or perforated, and generally weigh in excess of 10 pounds. Smaller knobbed weights are designated by Buck as "plummet" type sinkers.[8]

In Samoa, large perforated sinkers used to

[1] Linton, 1923, 333.

[2] Von den Steinen, 1928, Vol. 2, 52; Vol. 3, alpha P, Fig. 12.

[3] Von den Steinen, 1928, Vol. 2.

[4] Von den Steinen, 1928, Vol. 2, 90.

[5] Von den Steinen, 1928, Vol. 2, Fig. 93.

[6] Métraux, 1940, 187–188.

[7] Buck, 1930, 281, Fig. 199a–b.

[8] Buck, 1930, 342–346.

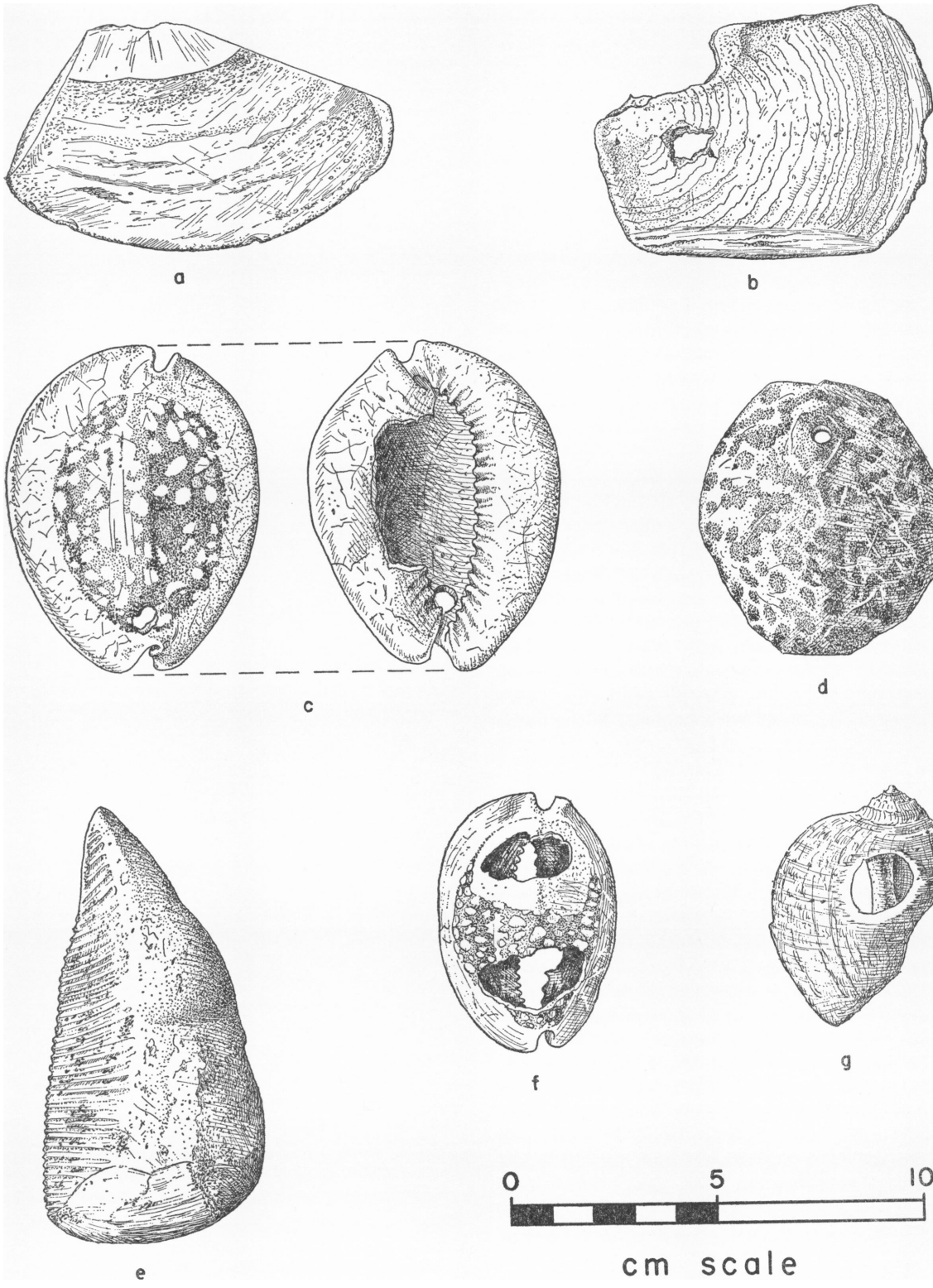

FIG. 29. a–b. Pearl shell scraper-knives. c. Squid lure cowrie. d. Cowrie flapper for squid lure. e. *Cassis* scoop. f. Cowrie vegetable scraper. g. *Tonna* vegetable scraper.

weight shark bait and nets serve also as canoe anchors.

New Zealand perforated sinkers are often elaborately carved[1] and are identical in shape to the Marquesan pierced specimens. Best[2] states that most net sinkers, however, were unmodified stones wrapped in a net sheath attached to the main net.

Turtle lures were shaped by being pecked and chipped with adzes. Apparently an attempt was made to select pear-shaped boulders requiring a minimum of work. Although pecking does not seem to have been done in any regular fashion, adzing was done in a descending spiral around the artifact. Perforations in the neck of the proximal knob were first pecked through from both sides and then punched through when the stone septum remaining between the two perforations were very thin. In the two perforated specimens that I collected the perforations tapered towards the center from each side.

Few of the specimens recovered in the excavations or in the surface collection were well finished. Most of them were obviously very utilitarian and were left with pecked, roughened surfaces. Only two showed signs of polish and a smoothing of the exterior. The *tiki* heads were sculptured by being pecked rather than incised.

NETS (*'UPEKA, 'UPENA*)

The NBM 1 site alone yielded evidence of the use of nets in the Marquesas. The few fragments found are insufficient for more than a brief description. The net fragments were made exclusively of some type of bast, probably the bark of the *hau* (*Hibiscus tiliaceus*). All the cordage was two-ply, Z-twist. The mesh ranged from 1 to 1½ inches in size. On the largest fragment found, the mesh knot[3] was used in the interior and the reef knot[4] in the outermost row of knots. The largest fragment, found protruding from the surface of Unit 64, was composed of three small pieces linked by one or two cords woven alternately back and forth through the meshes on both pieces. All fragments were probably from one net, and may be from the earlier part of the occupation span at the site. It is impossible, however, to be certain, because wild dogs and pigs had disturbed the surface at the point where most of the fragments were found.

Net Floats

A large, boat-shaped, wooden object, knobbed at each end, was found in a small gas tube in the rock wall of NBM 1. It was probably a net float, its terminal knobs intended to hold cord for lashing it to the net. The float, of *Casuarina equisetifolia* (*toa*), is 374 mm. long, 75 mm. thick, and 65 mm. wide (Fig. 34a).

As there is very little information available on nets of either the archeological or European contact period in the Pacific, a consideration of the variety of types and their distribution must be limited. A comparison with Hawaiian ethnographic net-making techniques and archeological specimens,[5] as well as Easter Island examples,[6] suggests that the Marquesan net represents a common Polynesian type. It resembles Easter and Hawaiian specimens in raw material, cordage type, knots, mesh size, and mode of assembly. Linton described a Marquesan net in the Bernice P. Bishop Museum[7] which seems to be almost an exact duplicate of what I found. Linton discusses 10 other types of net, described to him by informants, but no examples of any of these types are extant.

No parallel of the possible net float has been reported in the literature. Most of the floats described for other areas consist of billets of wood, usually longitudinally drilled, but otherwise scarcely modified.[8]

HARPOONS

Marquesan harpoon heads, with and without toggle provisions, are known. The non-toggle heads are known only from our excavations; the Historic period specimens are exclusively toggle heads. Except for the presence or absence of the toggle perforation in the central portion of the blade, the over-all plan of the heads is generally similar. The point tip is usually slightly rounded and wide. Each head customarily has one large barb and one smaller opposing barb. Just behind the large barb, a long notch ends in a sharply rising projection. As does the tang on an adze, this notch serves to take the lashings holding the point to the

[1] See illustration by von den Steinen, 1928, Vol. 2, 90.
[2] Best, 1912, 268.
[3] Ashley, 1944, 64.
[4] Ashley, 1944, 31, 66, 73, 75, 258, 542.
[5] Buck, 1930, 290–310; McAllister, 1933, 27–28.
[6] Métraux, 1940, 184, Fig. 12.
[7] Linton, 1923, 399.
[8] Buck, 1930, 297; Métraux, 1940, 187.

shaft, so that the lashings will not be exposed above the barb and hinder its efficiency. The butt of the head generally slants off on an angle to its longitudinal axis, pointing in the same general direction as the large barb and probably serving as an additional barb, once the head was firmly embedded.

Marquesan harpoons were made of wood or bone, but only bone heads were recovered. A possible tip of a wooden point was found in NH 4, but it is not enough for positive identification. I was shown a large wooden harpoon head lodged in a cranny of a cliff on the Hapa'a coast high above sea level. It had evidently been thrown from above. This harpoon head was a non-toggle example. Natives who heard that I had seen it removed it from its resting place. It may subsequently have been destroyed.

Two of the four excavated specimens are of mammal bone; the other two, though unidentifiable, are probably also bone. The two complete specimens are 100 and 86 mm. long and 21 to 17 mm. wide (Fig. 35l).

CHRONOLOGICAL SIGNIFICANCE: The harpoon is found in all prehistoric periods in the Marquesas. Its occurrence archeologically bears little relation to its true frequency, because the majority of harpoon heads were probably made of wood.

Thus far New Zealand[1] is the only other Polynesian area from which harpoon heads are known. They resemble the Marquesan specimens, but have a shorter blade in proportion to the "tang." Found in the Moa Hunter period, they are not very numerous. In some areas of New Zealand they were used apparently until the European contact period.[2] In Melanesia, where the harpoon is known only from Torres Strait, the method of construction differs in that a non-toggle head is fitted into a hollow shaft. In Anell's opinion,[3] these harpoons do not belong to the same tradition as that of the Polynesian specimens. He believes that the Polynesian harpoons are related to a northern, sub-Arctic culture like that found archeologically in the Kuriles and in Neolithic Japan, while the Melanesian harpoons resemble those found in the Philippines, India, and the Andaman Islands. The distribution of similar harpoons at two peripheral, widely separated points in Polynesia suggests that they were probably once present elsewhere in Polynesia and became obsolete, surviving only in the marginal areas.

FOOD-PREPARATION EQUIPMENT

POTTERY

The most startling find of two seasons' fieldwork, the potsherds recovered in NHaa 1 and NHo 3, radically changes the complexion of Polynesian prehistory. It can no longer be claimed that pottery was unknown to the early Polynesians or that they made no pottery after arriving on their islands. The pottery tends to support the evidence of other artifact types, which indicates that the proto-Marquesans brought to the islands a cultural inventory with a possible Melanesian overlay from a high-island home, possibly in Western Polynesia (Pl. 13).

NHAA 1, 550–3

Two body sherds were recovered, from two different pots.

Sherd 1 (85-1281)

COLOR: Reddish brown.
HARDNESS: 4 Moh.
THICKNESS: 5 mm.

The interior surface of this sherd shows light wiping striations, mostly parallel. Although the exterior surface has largely peeled away, one remaining portion has a rubbed finish. The paste is compact, with a medium-fine temper. The firing is good (Pl. 13b).

Sherd 2 (85-1281a)

COLOR: Brown.
HARDNESS: 3 Moh.
THICKNESS: 11 mm.

This sherd is crumbly, poorly fired, with coarse granules in the tempering material (Pl. 13b). The original surface remains, showing light striations.

NHAA 1, 558–560, POST HOLE "Y"

Rim sherd (85-1271)

COLOR: Reddish brown.
HARDNESS: 4 Moh.

[1] Duff, 1950, 228–233, Fig. 60; Anell, 1955, Chap. 7.
[2] Duff, 1950, 231.
[3] Anell, 1955, 68.

THICKNESS: 6 mm. below the rim; 8 mm. across the rim.

This rim sherd is from either a bowl or a constricted-neck vessel with a flaring, bowl-like rim. The interior is lightly striated parallel to the flat rim and has a shallow groove along the inside of the lip. Although a portion of the exterior surface has peeled, an undamaged section near the lip has a lightly striated surface like the interior. A black-gray firing cloud on the rim extends down onto the preserved portion of the exterior surface. The paste is compact, with medium grit tempering. This sherd is from the same vessel as Sherd 1 (85-1281), Pl. 13b.

NHAA 1, 715-1

One body sherd (85-1471)

COLOR: Brown.
HARDNESS: 4 Moh.
THICKNESS: 6 mm.

This sherd is from the same vessel as Sherd 2 (85–1281a).

NHAA 1, 731

One body sherd (85–1492)

COLOR: Reddish brown.
HARDNESS: 5.5 Moh.
THICKNESS: 4 mm.

The exterior surface has been polished with a narrow tool, according to Robert Sonin, a pottery technologist who examined all these sherds. The paste is compact with fine-tempering materials. The interior has been smoothed but shows marks of some kind of tool impressed into the clay. This sherd represents a third vessel on NHaa 1 (Pl. 13b).

NHo 3, 1061–2

One body sherd (85–1061)

COLOR: Dark red-brown.
HARDNESS: 2 Moh.
THICKNESS: 12 mm.

The sherd is from a low-fired vessel. The exterior surface has deteriorated greatly, and no signs of treatment are discernible. The interior surface, intact and uneven, with some smoothing, was coated with a limey concretion. The temper is probably entirely natural. The sherd has a slight curve, which indicates that it came from a fairly large vessel. Although larger when found, it crumbled when removed from the earth matrix and could be only partially restored.

EXTRA-AREAL COMPARISONS

The pottery finds in the Marquesas, to be fully evaluated, should be compared with material from other areas of Micronesia, Polynesia, and adjacent Melanesia. An examination of Spoehr's excellent published analysis,[1] and sample surface collections from Guam and Saipan, fail to suggest a relationship between that material and the Marquesan material.

Although the polished, thin, hard, reddish brown sherd (85–1492) from NHaa 1 superficially resembles the type known as Marianas Plain, it differs basically in lacking a red slip.[2]

The published material from New Caledonia,[3] which I was privileged to examine at first hand, shows important resemblances to that of the Marquesas only in the very unusual ceramics at Site 13, Lapita, a site inhabited by an exotic group from the Isles de Pins. The ceramics recovered here differed markedly from those from the other New Caledonian sites. At this site, flat lips of the type found on the single Marquesan rim sherd (NHaa 1, 85–1271) are very common.[4] They appear at no other site. An additional unique feature of importance on the pottery from this site is the presence of grooved lip sherds.[5] A large number of unique pottery designs executed in a technique different from that observed elsewhere also occurred at this site. This was the oldest site dated in the New Caledonian survey, giving a mean radiocarbon date of 846 B.C. from the same level as that in which the grooved sherds appear.[6] Gifford sees strong similarities between the ceramics from Site 13 and those of Tonga and some areas of Fiji.[7] The Fijian material published by Gifford[8] was also examined. It is in this area that the resemblances to the Marquesan sherds are the most marked in paste, temper, finish, rim form, and treatment.

A sample collection of sherds from Site 17 (Uluinavatu, Ra Province), taken from depths of from 86 to 99 inches, was examined at the

[1] Spoehr, 1957.
[2] Spoehr, 1957, 118.
[3] Gifford and Shutler, 1956.
[4] Gifford and Shutler, 1956, Table 42.
[5] Gifford and Shutler, 1956, Table 42.
[6] Gifford and Shutler, 1956, 91.
[7] Gifford and Shutler, 1956, 93–95.
[8] Gifford, 1951.

Fiji Museum in Suva. The flattened grooved lip was found in about one fifth of the rim sherds recovered. These were found on the relief-impressed sherds, diagnostic of the Early period in Fiji. The other rim sherds had flattened lips but no grooves.

A spot check of several excavation units from the same site in the collections of the University of California revealed that the grooved, flat-lipped type was found at all levels in the site, which may have been abandoned before contact. A collection I made on the site of the historic village of Suva (Viti Levu) did not include any grooved, flattened rim sherds. The absence of this type of rim may indicate that this rim treatment had diminished in frequency or disappeared at contact and was being replaced by the attenuated, thin, rounded lips which are common in many of the ethnographic collections from Fiji.

The ceramics from the other site excavated by Gifford, although only 80 air miles distant from Site 17, did not present so many similarities to the Marquesan rim sherds and were difficult to relate to the data of Site 17.

The flattened, grooved lip may have been associated with both the Relief and Incised Fijian types and has as yet no chronological significance. Had time been available for a complete analysis of the material in terms of this and other traits, something more useful might have emerged. As Gifford did not carry his analysis of the materials very far, his report is consequently of little help.

The Fijian and Tongan materials are closely related, but McKern thinks that the Tongan ceramics are a local product resulting from stimulus from Fiji.[1] It was impossible to obtain any Tongan sherds for examination, and comparisons are necessarily based on McKern's descriptions. The flattened, swelling rim is common in the large Tongan collection, and McKern illustrates one rim profile with a grooved lip.[2] The striations found on the sherds of flattened and grooved-lipped Marquesan vessels are also common on Tongan sherds, as is the burnished finish found on the sherd from NHaa 1 (85–1471).

The rim sherds indicate that the Tongan vessels had constricted necks and flaring rims. The profiles illustrated by McKern are similar to the Marquesan rim sherd in section and in the angle of the lip surface to the wall surface. Full descriptions of the Tongan and Samoan ceramics excavated by Golson have not yet been published, but he has informed me that no grooved rims were present in either collection.[3]

It is almost impossible to show any relationships between the small, poorly made sherds (85–1471 and 85–1281a, Sherd 2) and material from any other area, simply because virtually nothing could be determined about them aside from the fact that they were striated on the exterior, a trait in which they resemble the flattened grooved-lipped vessel. The poor technique displayed by these sherds contrasts with the other material and suggests local rather than exotic origin.

This survey of the ceramic data, based on a study of archeological collections and the available literature, indicates that at least two of the NHaa 1 vessels may be exotic. These sherds display traits linking them with a ceramic complex found in Tonga, Fiji, and some areas of New Caledonia (where it seems to be intrusive). If actually exotic, the present balance of the evidence indicates a possible Tongan origin for these sherds, because the Tongan material displays a greater number of similarities to the Marquesan. Fiji may also be considered as a possible source.

The evidence from NHo 3, that some crude, low-fired pottery continued to be made for a time after the settlement of the Marquesas, throws new light on the statements by Roggeveen and Behrens[4] that they saw pottery in use on both Easter Island and Makatea. Can this pottery have been of the crude, highly perishable type used in the Marquesas?

Chronological Significance: The Settlement period dwellers of NHaa 1 had at least three vessels. Two were well made and may be either Tongan or Fijian in origin, or local products. Another vessel, very poorly made, may have been a local product. As fragments of all these vessels were found in the ceremonial area of NHaa 1, the pottery may have had a primarily ceremonial use.

A millennium later, in NHo 3 I, there is evidence that the Marquesans were still producing

[1] McKern, 1929, 118.
[2] McKern, 1929, 116–117, Fig. 49a.
[3] Golson, personal communication, 1959.
[4] See Schurig, 1930, 2.

a small quantity of crude, low-fired, or sun-dried pottery. The climate of the Marquesas and the fragile nature of the pottery combine to render the preservation of any such sherds extremely rare. The production of low or non-fired pottery was abandoned probably some time during the late Developmental or Expansion periods, and by the time the whites arrived had dropped completely from memory. The modern Marquesan word for pottery is a compound descriptive term: *hue kea* (container rock). It undoubtedly was developed at contact time to describe the hard European earthenware, as were other terms of the same construction, such as *hue aki* (container sky, glass bottle).

CLAY

Schurig[1] has pointed out that arguments that invoke a hypothetical absence of clay on the high islands of Polynesia to explain the lack of pottery there are poorly based. Merely on geological considerations, Schurig asserted that pottery clays should occur as frequently in Polynesia as in Melanesia and Micronesia as a result of the weathering of volcanic rocks, and that the basic factors involved in the distribution of pottery were not geological but cultural.

Père Mathias Gracia[2] stated that local clays were used in Taiohae for brick production when the French garrison was being built. He further noted that sailors "on the beach" in the Marquesas before the French occupation had used the local clay for building.

It was not astonishing, then, that during the 1956 expedition Dr. Harry L. Shapiro discovered an exposed clay stratum in the bank of the river in Uea. The results of the tests made on the sample taken are given below; they constitute the first known test of the potting qualities of a Polynesian clay. The tests were carried out by Mr. Robert Sonin, whose expert aid is gratefully acknowledged here.

The clay is probably lateritic, with some feldspathic qualities, containing about 20 per cent of self-temper. Inclusions visible under microscopic examination are quartz crystals or feldspar crystals, hematite, limonite, magnetite, and pumice fragments, originating from decomposition of volcanic sources by rapid erosion. The high percentage of alumina in a lateritic clay such as this is due to a heavier than usual rainfall which removes the silica in solution, leaving the alumina.

When prepared for the making of a test tile, the clay was found to be highly cohesive, possessing generally good paste qualities. A 100-mm. bar was prepared and fired at 700° C., a normal primitive firing temperature similar to that used in the Chavín horizon pottery in Peru. Pre-firing dry shrinkage amounted to 9.5 mm. Firing caused an additional 2.1 mm. of shrinkage. Such clay shrinkage is fairly normal, actually somewhat less than would be expected. Further shrinkage was inhibited by the presence of the self-temper as well as by the high percentage of alumina. The result was a hard, strong ware giving a metallic ring when struck. The hardness on the Moh scale is somewhat higher than that of Chavín material.

The mineral inclusions removed from the clay sample in preparation for the making of the test tile are important. With hematite and limonite, a potter would be able to produce an excellent red slip, duplicating that used in aboriginal New World ceramics. The full range of colors of New World high-culture pottery was probably available to the Marquesans had they utilized their environment correctly.

WOODEN CONTAINERS

The wooden bowls and "soupiers" of the Marquesas are too well known from the works of von den Steinen, Linton, and W. C. Handy to be redescribed here.[3] Fragments of wooden containers were recovered in two dry sites, NBM 1 and NH 4. Unfortunately, not enough was found of any one vessel to permit even partial restoration. All the vessel fragments were plain, in contrast to the richly incised decoration generally found on examples in the ethnographic collections.

A fragment of an elongated, narrow, platter-like vessel, 7 mm. thick, was recovered in NBM 1.

Three bowl fragments, 8, 15, and 11 mm. thick, found in NH 4, were from the vessel body. No information on rim shape was therefore obtainable.

[1] Schurig, 1930, 3.
[2] Gracia, 1843, 217–218.
[3] Von den Steinen, 1928, Vols. 2 and 3; Linton, 1923; Handy, W. C., 1938.

COCONUT CUPS

Five fragments of coconut shell halves with smoothed edges were recovered in NH 4. One complete cup, lined with a mat fragment and used as a carrying container, was found in NBM 6, a fisherman's shrine in the rock cliffs of the south shore of Uea Bay.

GOURDS

Numerous fragments of bottle gourds (*Lagenaria* sp.) in NBM 1 and NH 4 had obviously been used as containers, as they are at present in the Marquesas.

Three worked rims were discovered in NBM 1. Two were from wide-mouthed gourds from which the narrow elongated section adjacent to the stalk had been completely removed, while the rim line had been cut around the body of the gourd rather than its neck. One of these was beveled on the exterior with a round lip; the other was beveled on the exterior and interior. The third rim was of a necked, narrow-mouthed gourd bottle. The interior of the lip was beveled, but no smoothing was noted on the exterior. The interior smoothing was probably designed to permit the plug of the bottle to rest more firmly.

Provenience	Quantity
NBM 1	
0 to 5 inches	5
5 to 10 inches	27
10 to 15 inches	8
15 to 20 inches	5
20 to 25 inches	14
NH 4	
0 to 5 inches	12
5 to 10 inches	24

Obviously, no chronological significance can be derived from the provenience of the wooden containers. As there are no known dry sites from the Settlement period, it is impossible to compare this material with anything antedating it. One point that should be emphasized is the complete absence of decoration on the wooden artifacts, contrasting sharply with the highly decorated material in the ethnographic collections. That both of the dry sites were small marginal settlements may account in some measure for the absence of elaborate woodwork, but cannot account for its total absence. The use of gourds apparently was widespread and frequent, and there is evidence of a rapid attrition of the fragile containers. Gourds were known throughout Polynesia wherever ecological conditions permitted their growth. In Hawaii, especially on Niihau, gourds were sometimes decorated by means of a "negative" type of geometric decoration.[1]

POI POUNDERS (*KE'A TUKI POPOI*)

These artifacts are rarely found in excavation. The quantity recovered was inadequate for the construction of a completely reliable sequence. The types established here follow Linton's classification,[2] except that on grounds of chronological significance I have separated the *Tiki*-headed type from Linton's Phallic type.

Phallic Type

Figure 30e; Table 10

The handle, ovoid in cross-section, is definitely phallic. A small groove on the apex of the phallus may represent the longitudinal, dorsal, foreskin incision made in Marquesan "circumcision." This groove is sometimes continued a short distance down the sides. The neck of the handle narrows in a graceful curve and expands rapidly near the base. Flattened vertically by grinding, the edge of the base may be a quarter of an inch thick rather than sharp and narrow. The base, somewhat more convex than in other types, is round in plan.

The over-all finish of the Phallic type is superior. The polish extends from the handle onto the flaring base edges. A distinctive variety of phallic pounders is found in the head of Taipi Valley near Site NT 5. They are characterized by highly realistic phalli, smaller over-all size, a very abruptly flaring, trumpet-like, basal expansion, and a very convex base.

'Opu Type

Figure 30c; Table 10

Although Linton reports the term *'opu* for these artifacts,[3] none of my informants had ever heard it used so specifically. Because it is a short, handy designation for a type, I have retained it. The type is characterized by a handle terminating in a flaring head which is ellipsoid in section, slightly convex along the longitudi-

[1] Buck, 1930, 36, 55.
[2] Linton, 1923, 338–339.
[3] Linton, 1923, 338–339.

nal axis of the ellipse, and concave transversely. The type usually has a short body, with the neck expanding gradually in diameter to the base. A small minority of artifacts with the *'opu* head have very short, narrow necks with an astonishingly wide basal flare. The base of the *'Opu* type is usually flat, although some slight concavity or convexity may appear in it.

Conical Type

Figure 30a, d; Table 10

This type is characterized by a conical body minus the slightly concave neck of the other types. There is no break between the neck and the lower portion of the body. Two forms of handles are known, both rather interesting. The less common has a transverse bar with medial and terminal ridges, resembling some of the Tahitian pounders. These may indicate some sporadic contact with Tahiti. Somewhat more common are handles with a single, crudely sculptured human head, usually turned face up. These human heads differ markedly from the conventional Marquesan type, having small button eyes and a slight trace of a brow ridge, a tapered chin, a normal-sized mouth, and normal nose. The ears are indicated by bumps resembling an aviator's radio headphones. The bases of the Conical pounders are flat. Some of the specimens have been broken and reshaped with uneven convex bases.

Tiki-headed Pounders

Figure 30b; Table 10

These are rarely found in excavations but are well represented in ethnographic collections. Although similar to the Phallic poi pounders in body shape, the head of the phallus has been laterally expanded and further altered by an exaggeration of the median line found on the phallus representing the dorsal incision. This line has been deepened in conjunction with the flattening of the phallus head, resulting in a bilobed flattened knob. The lobes of the knob have been further embellished by conventional Marquesan *tiki* faces. This type of poi pounder is usually highly polished. The material is generally of a denser, softer type of stone in contrast to a more porous, but somewhat harder stone used for the Conical, Phallic, and *'Opu* types.

Unusual Specimens

Two unusual specimens should be discussed, despite the fact that they appear to have no chronological significance. A poi pounder obtained in Ta'a'oa, Hiva Oa, had a very unusual handle head. The body, of the Phallic type, terminated in a suddenly flaring flange, ovoid in plan. Two low nipples were superimposed on the surface of this flange at each end of the ovoid. This pounder resembles certain types found in the Marianas, possibly originating in

TABLE 10

Distribution of Artifacts for Preparing Food

Site	Conical Pounders	*'Opu* Pounders	Phallic Pounders	*Tiki*-headed Pounders	Pestles	Coconut Graters	*Cassis* Scoops
NHaa 1-I	—	1[a]	—	—	—	2	—
NHaa 1-II	—	—	—	—	3	15	2
NHo 3-I	—	—	—	—	—	6	1
NHo 3-II	—	1	—	—	—	3	1
NHi 1-I	1	1	—	—	—	1	—
NHi 1-II	—	—	—	—	—	—	2
NHtv 1	—	—	—	—	—	4	—
NH 4	—	—	—	—	—	—	1
NT 2	—	—	1	1	—	—	—
NT 4	—	—	1	1	1	—	—
NT 5	—	1	1	—	1	5	—
NT 8	—	—	—	—	—	14	—
NHe 3	1	2	—	1	1	1	—
Surface	6	8	3	—	6	1	—

[a] Intrusive specimen.

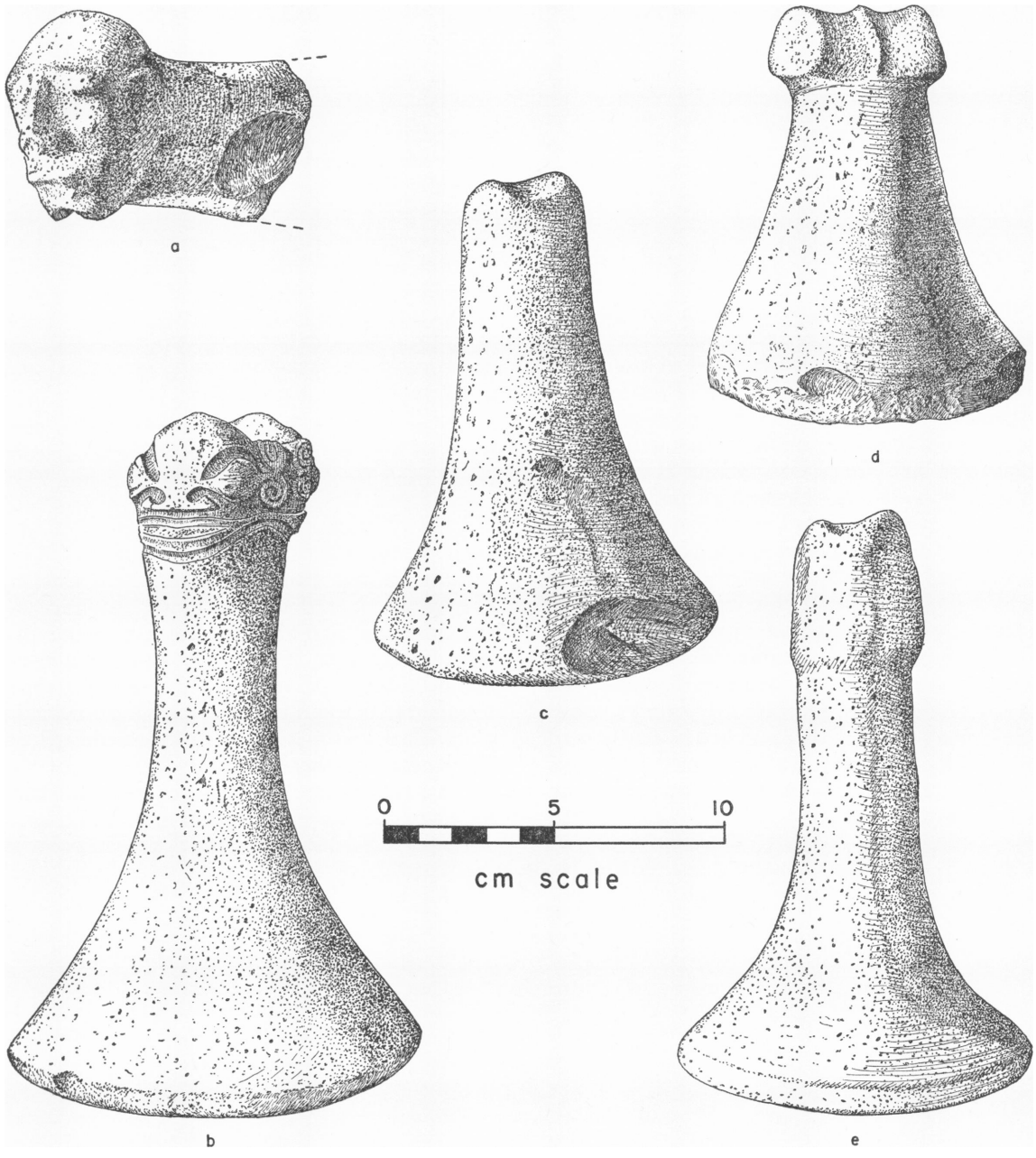

FIG. 30. Poi pounder types. a. Sculptured handle of a Conical poi pounder (Stratum Ib, NHi 1). b. *Tiki*-headed poi pounder. c. *'Opu* poi pounder. d. Conical poi pounder with Tahitian bar grip. e. Phallic poi pounder.

Truk and the Carolines,[1] except that the latter have two sets of nipples atop the flange. To my knowledge, no other specimens of this type have ever been reported from the Marquesas.

[1] Thompson, 1932, Fig. 19b, 41.

Therefore, the specimen may have been produced by the Gilbertese colony that was in Ta'a'oa in the nineteenth century, according to an unpublished manuscript of Père Simeon Delmas in the Mission archives in Taiohae.

A poi pounder head found in a surface survey

of Site NA 7 in A'akapa is in the form of a flattened phallus with a relief design generally thought to represent a vagina carved on each side. A similar artifact was collected by von den Steinen[1] in Hakaui, Nuku Hiva.

CHRONOLOGICAL SIGNIFICANCE: The Conical and *'Opu* types were the earliest types of stone pounders known in the Marquesas, appearing in the Expansion period. The carved human or anthropomorphic heads on the handles of the Conical pounders are the earliest known examples of carving in the round, differing markedly in style from the conventional *tiki* of the Historic period. Both of these types continued into the Classic period when the Phallic type appears. The *Tiki*-headed type develops from it by an elaboration of the basic phallus into a bilobed flat knob to which decoration was applied. The *Tiki*-headed type appears in greatest frequency in the Historic period, when its production may have received added impetus from the introduction of European metal tools which rendered the carver's task undeniably easier, allowing a much finer quality of work.

Two trends are noticeable in the prehistoric poi pounders of the Marquesas: a gradual increase in size, continuing to the present, and a trend towards highly polished finishes and sculptured handles.

Both groups of the Marquesas seem to have shared all the types of poi pounders known there. Linton stated that the *'Opu* type was found only on Hivaoa,[2] and von den Steinen believed that Conical pounders with anthropomorphic heads were limited to Uapou, but our work has shown that the types are distributed throughout the group.

As usual, von den Steinen has contributed some ethnographic details concerning poi pounders. He reports[3] that the *Tiki*-headed type was a prestige item and generally the property of chiefs. Non-sculptured poi pounders, made of red trachyte, were equally esteemed, evidently because of their color.

The size of the modern poi pounder has outstripped that of the archeological specimens. Furthermore, owing to a recent change in the type of poi-board (*houaka*), from a relatively deep-basined receptacle to a shallow flatter type, the modern poi pounders have flatter bases. Modern informants often state that a given archeological specimen is useless as a poi pounder because it is too small and because its base is too convex. According to these modern standards, almost all archeological poi pounders are actually medicine pounders.

Poi pounders appear through Central and Eastern Polynesia, except in Easter Island and Pitcairn, and are not found in Samoa, Tonga, or in New Zealand. Hawaiian specimens usually have knobbed handles, although the aberrant ring and stirrup forms are found on the island of Kauai. Pounders of ivory or wood, made in the form of the knobbed stone pounders, are also known from Hawaii.

The Cook Islands poi pounders bear some resemblance to the Marquesan specimens in a minority of the forms represented. Buck illustrates forms similar to the *'Opu* and Conical types, with transverse bar handles.[4] A number of wooden pounders, differing in shape from the stone pounders, were also used in the Cooks. They were circular in cross-section and elongated, without basal flaring.

In the Australs, poi pounders were made of coral and basalt. The form was much like that of the Marquesan uncarved *Tiki*-headed type with a bilobed handle. The lobes were somewhat exaggerated in length.

The best known Tahitian poi pounders are those with the winged transverse bar handles.[5] The less elaborate examples of this type[6] are like the Marquesan Conical type with the ridged transverse bar.

Buck[7] explains the absence of stone pounders in Samoa by the fact that only two of the Samoan foods are pounded, and that neither of these is pounded to the extent of the Marquesan poi. The Samoans break up and mash both breadfruit and taro with their fingers; implements are never used. The absence of stone pounders in Samoa is matched by their absence in Easter Island[8] where food was never prepared with implements of that type.

To explain the distribution of these artifacts in the Pacific, three possibilities present themselves:

1. The use of stone pounders was once uni-

[1] Von den Steinen, 1928, Vol. 2, 156.
[2] Linton, 1923, 339.
[3] Von den Steinen, 1928, Vol. 2, 45.
[4] Buck, 1927, 247, 251, Figs. 216a–b, 221d.
[5] Oldman, 1943, 57, Pl. 457a–c.
[6] Oldman, 1943, Pl. 457d.
[7] Buck, 1930, 112.
[8] Métraux, 1940.

versal in Polynesia, but disappeared in Western Polynesia, remaining in use to the present in Eastern Polynesia.

2. The use of wooden pounders was universal in Polynesia. The stone pounders of Eastern Polynesia are a development from these wooden prototypes which were discarded in Western Polynesia.

3. The distribution of stone poi pounders in Eastern Polynesia indicates that the trait developed in one of the island groups of that area and was diffused into the island groups where it now appears.

Until archeological evidence is available from Tahiti, Samoa, and Tonga, I would favor hypothesis 3. Had stone pounders previously been used in Western Polynesia, they would have appeared in surface collections from that area. It seems fairly certain that no stone pounders were used there at any time in the past. On the basis of similarities between the Marquesan Conical pounders with the short-ridged transverse bar handle and pounders from the Society Islands, the Australs, and the Cooks, I would tend to favor hypothesis 3 over hypothesis 2. The similarities exhibited by these artifacts indicate diffusion rather than an independent development from wooden prototypes in each area.

If hypothesis 3 be tentatively accepted, the stone poi pounders of the Marquesas could be the result of diffusion, or they might be the archetypes from which the poi pounders of other areas of Eastern Polynesia are derived. The history of the poi pounder in Tahiti must be precisely charted by stratigraphic excavations before this hypothesis can be accepted with more certainty or discarded completely.

Techniques of Manufacture

The sequence of operations involved in the making of stone pounders cannot be established until it is possible to excavate the quarries on Ua Huka where much of the stone for poi pounders was obtained aboriginally. Apparently pecking was used most frequently to shape the artifact roughly, as in all other large stone artifacts. It was then polished with pebbles until the rough exterior was smoothed.

There seems to be a significant shift in the technique of carving human or anthropomorphic heads on the Conical and *Tiki*-headed types, as though the artists were improving their control over the material. The sculptured heads on the Conical pounders were formed by pecking, followed by polishing. Obviously, this technique did not produce any great detail. The Phallic pounder was modified in the Classic period when the *Tiki*-headed type appeared. The features of the latter were incised, and the stone was cut away to allow certain portions to stand in relief. The incision, made with a stone flake or metal tool, was painstakingly smoothed after the features had been worked in detail.

On an unfinished *tiki*-headed handle, found at NHe 3, a transverse cut was made across the tops and down each lobe to establish the vertical center line of each face, after the incision separating the two lobes had been made. These lines were continued down to the level of the eyes. A horizontal cut was then made, to establish the line of the mouth. The rest of the face could be worked out in the rough by a series of straight cuts at various angles to these basic incisions, outlining the areas to be left in relief and the areas to be removed.

PESTLES

Pestles are ovoid or elongate beach pebbles, one end of which has been used for pounding and grinding. Rarely is the "handle" of a pestle shaped for easier grasping, but if shaped, it is usually very rudimentary. It is impossible to establish satisfactorily the use of these artifacts either from ethnographic sources or the statements of modern informants, many of whom claim that these were pounders used to prepare rats for human consumption. The rat pounders illustrated by von den Steinen,[1] however, are not like the pestles, but resemble small poi pounders. I regard von den Steinen's identification as more reliable than that of my informants. They were probably used for a variety of purposes, including the preparation of pulpy foods, medicinal preparations, nut crushing, and salt grinding.

Marks on the bases of the pestles indicate that they were used interchangeably for grinding as well as for pounding. On one site, NT 5, one of the ovoid pestles was associated with a round, basin-shaped, vesicular, basalt mortar that showed signs of use for grinding. The length of the pestles ranges between 203 and

[1] Von den Steinen, 1928, Vol. 2, 45.

80 mm.; the width, between 120 and 89 mm. (Table 10).

CHRONOLOGICAL SIGNIFICANCE: Pestles are found throughout all the periods of Marquesan prehistory. Their unimpressiveness has resulted in a general lack of interest. Although probably widely distributed, they are seldom recorded. Brigham has reported and illustrated pestles from Hawaii[1] similar to those from the Marquesas. The Hawaiian specimens are generally better made, or perhaps the collectors were more selective. Bennett has also recorded similar artifacts on Kauai.[2]

COCONUT GRATERS (*HEKA 'EHI*)

These artifacts are made of a strip of pearl shell which had been cut across the shell at a 90-degree angle to the axis of the hinge to include part of the byssus notch. The thickened segment of the hinge line on the end of the shell strip makes a strong tang for attachment of the shell grater blade to the wooden, coconut grating stool. The cutting edge of the grater is beveled on the lower side (the exterior of the pearl shell) and serrated by short shallow cuts made in this bevel. These incisions run the length of the bevel, cutting through the edge and giving it a lightly serrated appearance.

That coconut graters are found frequently on most sites is attributable to several factors. Not always made of the strongest pearl shell, they were subjected to heavy use and were often broken. Furthermore, the frequency of occurrence of unbroken graters in middens suggests that rules of taboo may have been involved. Informants state that if a person stepped over a coconut grater stool, the grater became *hihi*, or useless, and had to be thrown away, as its *mana* was removed.

Contrary to general Polynesian usage, the Marquesan did not sit astride his coconut grater stool (*tuai*), but sat side-saddle on it to prevent the grater from losing its supernatural power. In late post-contact sites, metal graters often replaced those of pearl shell, as, for example, the pewter specimens of NHe 3. The maximum size of these specimens is 116 by 39 mm. (Table 10).

CHRONOLOGICAL SIGNIFICANCE: These artifacts are found in all periods of Marquesan prehistory and from the Settlement period to the present day. Since the Historic period, there has been a rapid shift from pearl shell to metal for graters. The presence of coconut graters in the Settlement period is evidence that the Marquesans brought the coconut with them from their previous home.

Artifacts of this type are found throughout Polynesia in all island groups, except New Zealand and Easter Island where coconuts would not grow. They are generally made of pearl shell, but in Hawaii other types of shell were used, including species of *Conus*.[3] Buck reports that in Samoa old broken adzes or flakes were often trimmed and used for graters, called *tuai ma'a* by his Samoan informants.[4] In Tongareva[5] a special grater made of coral was used for hard coconuts. The grater was a conical coral fragment lashed to the neck of the grater tool. Buck[6] reports that on Tongareva and the Cook Islands, graters of pearl shell like those of the Marquesas were not fixed to a grater stool but were held in the hand. Some of the Marquesan graters may have been used in this way, but it is impossible to be certain without ethnographic information.

CASSIS SCOOPS

These artifacts are made from a longitudinal segment of the *Cassis* shell (*putupe*), cut from the interior side of the aperture (Fig. 29e). The cutting edge is wide and beveled on the exterior surface of the shell, terminating in a portion of its central column. One specimen was made of a section of the exterior whorl of the shell, cut from the edge of the wide end.

The purpose of these artifacts is unknown. There is no ethnographic information that can be brought to bear on the problem, nor are there any comparative data. The length ranges between 99 and 63 mm.; the width, between 49 and 24 mm. (Table 10).

CHRONOLOGICAL SIGNIFICANCE: *Cassis* scoops are found in the Settlement, Developmental, Expansion, and Classic periods. It is uncertain whether they were still in use in the Historic period, as no artifacts of this type are known in ethnographic collections.

[1] Brigham, 1902, 27–32, Figs. 24–26.
[2] Bennett, 1931, 65.
[3] Buck, 1930, 22–23.
[4] Buck, 1930, 367.
[5] Buck, 1932a, 104–105.
[6] Buck, 1930, 367.

BREADFRUIT HUSKING STICKS

Flat, narrow, pointed sticks were used to remove the skin of the roasted breadfruit. Such artifacts are still used. A branch of some type of easily worked wood, usually *Hibiscus tiliaceus* (*hau*), is selected. Either one end is cut flat, or the stick is split longitudinally and only one half is used, so that the flattening of the functional end becomes somewhat easier. The stick is ready for use when it is thinned and a wide-angled point is cut. The breadfruit is removed from the fire and held in the hand in a cushion of *hau* leaves. The husker, stuck tangentially through the skin between the skin and the flesh, is then twisted slightly, to loosen the skin. This action is repeated in several spots, while the cook shifts the breadfruit by tossing and spinning it slightly until the skin is loosened all around and can be easily pried off.

The only examples of these artifacts recovered in the excavations are from the Expansion period, dry rock-shelters NH 4 and NBM 1. The length ranges from 185 to 108 mm.; the width, from 26 to 18 mm.; the thickness, from 8 to 4 mm.

Provenience	Quantity
NBM 1	4
NH 4	4

Chronological Significance: The appearance of these husking sticks is significant in that they show that the breadfruit husker has not changed in type for 700 years, since the Expansion period. It is so simple a tool that it probably has great antiquity. It is found throughout Polynesia.

GRINDING SLAB

A small coquina grinding slab was recovered in NT 2 in a test beside P-M. Informants identified it as a rat pounding board, but such a use is dubious. The slab was roughly oblong and had a shallow basin in the top. Large grinding stones are found throughout the Marquesas, but they are usually too heavy to be moved, and their use is unknown. Small, portable specimens such as is described are rarely found. It was 129 by 65 by 15 mm.

Chronological Significance: It is impossible to determine the chronological significance of this artifact type. Additional examples must be found in archeological contexts before its chronological range can be established suitably.

FIRE PLOW

One fire plow was recovered from NBM 6. The base was made of a branch of *hau* (*Hibiscus tiliaceus*), 226 mm. long and 30 mm. wide. Opposite sides of this base had V-shaped grooves 10 mm. wide. Near one end of each groove was a small charred area where the tinder had taken fire. The plow was of the same wood, 203 mm. long, 20 mm. wide, and 10 mm. thick. The handle end was tapered and narrower than the flattened plow end. Linton has described the technique of making fire with this implement.[1]

TOOLS

STONE ADZES

An adze is here defined as an implement with a cutting edge, so hafted that the longitudinal axis of the handle intersects the cutting edge axis at an angle of 90 degrees. The nomenclature used here is that established by Buck *et al.* and expanded by Duff in his discussion of Moa Hunter adzes.[2] The adze is held at arm's length, as though it were hafted, with the cutting edge down and the bevel facing the observer. Held in this position, the side facing the observer is the back, the side away from the observer, the "front" or "face." The front of the adze is divided into an upper portion called the butt; its end surface is the poll. The lower portion of the face towards the cutting edge is the blade. The butt becomes a tang if it is reduced laterally or on the faces for the accommodation of lashings.

The assumptions of field-workers as to the method of hafting archeological adzes is questionable. Buck[3] cites an elderly Samoan who maintained that hafting was reversed from the method presupposed in the above terminology. If this were correct, these terms would, of course, be useless.

The development of a typology for Polynesian adzes has been slow, as Duff has re-

[1] Linton, 1923, 349.

[2] Buck *et al.*, 1930; Duff, 1950.

[3] Buck, 1930, 362.

marked.[1] This development has been realized mainly through the efforts of the New Zealand workers.[2] The latest development is Duff's modification of Skinner's typology.[3] This involved a regrouping of Skinner's 10 types into five types, each with a number of subtypes. This typology has been extended to include not only the New Zealand adzes, but also specimens from the rest of Polynesia. Its objective has been to make possible the classification of adzes from any part of Polynesia by reference to the type designations.

Duff's typology is "logical," based as it is on purely morphological criteria, such as cross-section, presence or absence of the grip or tang, and the manner of forming it. This typology is applied largely to surface collections or to those derived from archeological sites excavated without stratigraphic techniques.

Duff[4] never refers to the relative stratigraphic positions of various types, although he mentions the occurrences of adzes as grave goods. Nor is the reader informed whether any significant differences existed in type frequencies or at various levels of excavated sites. Notwithstanding, Duff arrives at very valid "age-area" conclusions from his type distribution studies. He demonstrates the existence of an early pan-Polynesian adze kit that was diffused to the marginal areas, where it survived later than in the nuclear centers of Polynesia where it was obliterated by the narrowing of preferences and concentration on one or two standard types.

Despite the usefulness of this typology as a shorthand device, I feel that it is less applicable to archeologically excavated material than a typology like that previously described, in which types are established on the basis of chronologically significant features rather than on those that may seem to be important to the classifier. In the present typology there are no gènetic implications such as those expressed by Skinner and Duff in their genus-species equivalence for type and subtype.[5]

I have therefore not used the Skinner-Duff typology (as set forth by Duff)[6] in describing the adzes recovered in the Marquesas excavations. Classification of the adzes according to the Skinner-Duff typology has blurred distinctions that I believe should be emphasized. Although I have established some types identical to Duff's, I have also fused some of his types when I believed that the distinctions imposed were insignificant chronologically. Conversely, in other cases I have divided previously established types on the basis of small features that Duff did not feel significant morphologically but that are nevertheless of chronological importance in the Marquesas.

An example will illuminate the processes involved and add to an understanding of the concept. The Marquesan Mouaka type is described here as being a composite of Duff Types 2A, 3B, and 2B. In examining the Marquesan material, I found the distinction between these types to rest on two factors that are historically insignificant, the size of the adze and its state of completeness. In creating an adze of Duff's Type 2A, the Marquesan craftsman first made a blank, triangular in cross-section, in the form of Type 3B, the result of a ridge running down the midline of the adze back. This ridge resulted from a technical factor, the need for a striking platform to direct blows towards each side of the adze, to render the adze body thinner. On the larger specimens this ridge was removed, producing a Type 2A blade, but not accomplished without some difficulty, as many broken adze blades of this type attest to a high rate of failure at this point in the process of manufacture. Removal of the back ridge involved striking a strong, laterally directed blow at a point about halfway down the back of the adze between the mid-ridge apex and the angle of the back-front edge, which often resulted in breaking the blade across its long axis or removing such a bite that the blade was less than an inch thick and would break at the slightest strain.

In the smaller specimens an effort seems to have been made to avoid removal of the ridge. Such removal would have been very dangerous, because the relative narrowness of the adze body probably would have resulted in a much higher breakage rate than that incurred with the larger adzes. On these smaller specimens, then, the back ridge was allowed to remain. The only attempts to reduce it were by polishing, which seems to have been intended mainly to remove the sharp, serrated, ridge crest. These

[1] Duff, 1950, 144.
[2] Best, 1912; Skinner, 1921, 1938, 1943.
[3] Duff, 1950.
[4] Duff, 1950.
[5] Skinner, 1938 and 1943; Duff, 1950.
[6] Duff, 1950.

smaller adzes remained in Type 3B generally. Therefore a separation of Type 2A from Type 3B seemed neither "logically" justifiable nor helpful for chronological purposes within the context of the Marquesan data.

The Marquesan adze typology, then, has been established in terms of the Marquesas alone. It is no less useful for comparative purposes than the Duff-Skinner typology; moreover, it should prove more useful in the future when the archeological data of Polynesia are considerably expanded by stratigraphic excavations, in such crucial points as Tahiti, Raiatea, Tonga, and Samoa, and by the publication of Emory's voluminous Hawaiian material. At that future date, typologies based on historically important features will enable us to trace more clearly not only the culture histories of the various island groups but those of Polynesia as a whole. The possibilities for culture-historical reconstruction based on Duff's typology or any other similarly constructed system are decidedly more limited.

The type designations utilized here follow current American usage. They consist of the names of type sites, or ethnic groups formerly inhabiting type site areas rather than completely descriptive terms. Two of the names were Marquesan adze ethno-types. The specimens designated by these terms coincide almost completely with the native concepts for them, a departure from usage followed elsewhere in this monograph, where descriptive type designations have been used. I was reluctant to use descriptive terminology which would tend to become too obscure or lengthy and would be confusing, because many of the most suitable terms applicable to adzes are already associated with concepts that differ from those to which they would be applied here. The use of numeral or alphabetical designations was impossible, as they would immediately become confused with Duff's designations. The only other alternative was that which I have employed.

Mouaka Type

Figure 31e

This type is characterized by a flat quadrangular or low triangular section. Occasional narrow polished facets where plane surfaces meet might increase the actual number of sides to five or six. The blade tapers towards the poll which is often smoothed and rounded. The lateral edges and the bevel of the cutting edge are polished.

The cutting edge is slightly convex or straight. The range of variation in size and morphological features of this type is somewhat greater than that for the other types. It is a composite of Duff's Types 2A, 2B, and 3B. It was relatively unspecialized, and probably had a wide range of uses, because it represents a sizable proportion of the collection. The largest examples recovered were used with unground cutting edges for quarrying red tufa. The length ranges between 300 and 52 mm.; thickness, between 35 and 9 mm.; width, between 90 and 22 mm. (Table 11).

TABLE 11

Distribution of Adze Types

Site	Hati-heu	Ha'e'eka	Hai	Mou-aka	A'a	Teoni	Koahi	Koma	Aki-pou	Cylin-drical	Thick Poll
NHaa 1 I and II	2	9	5	22	3	7	6	6[a]	—	7	6
NHo 3-I	—	—	—	3	—	3	—	—	—	—	—
NH 4	—	—	—	1	—	—	—	1	—	—	1
NHi 1	—	—	—	1	—	—	—	2	1	—	—
NBM 1	—	—	—	1	—	—	1	1	1	—	1
NT 5	—	—	—	1	—	2	—	2	—	—	—
NHuu 1	—	—	—	54	—	—	—	52	—	—	—
NT 8	—	—	—	—	—	—	1	3	1	—	—
NHe 3	—	—	—	—	—	—	—	4	—	—	—
NHo 3-II	—	—	—	—	—	3	2	2	—	—	—
NBM 4	—	—	—	1	—	—	—	1	1	—	1

[a] Specimens are intrusive.

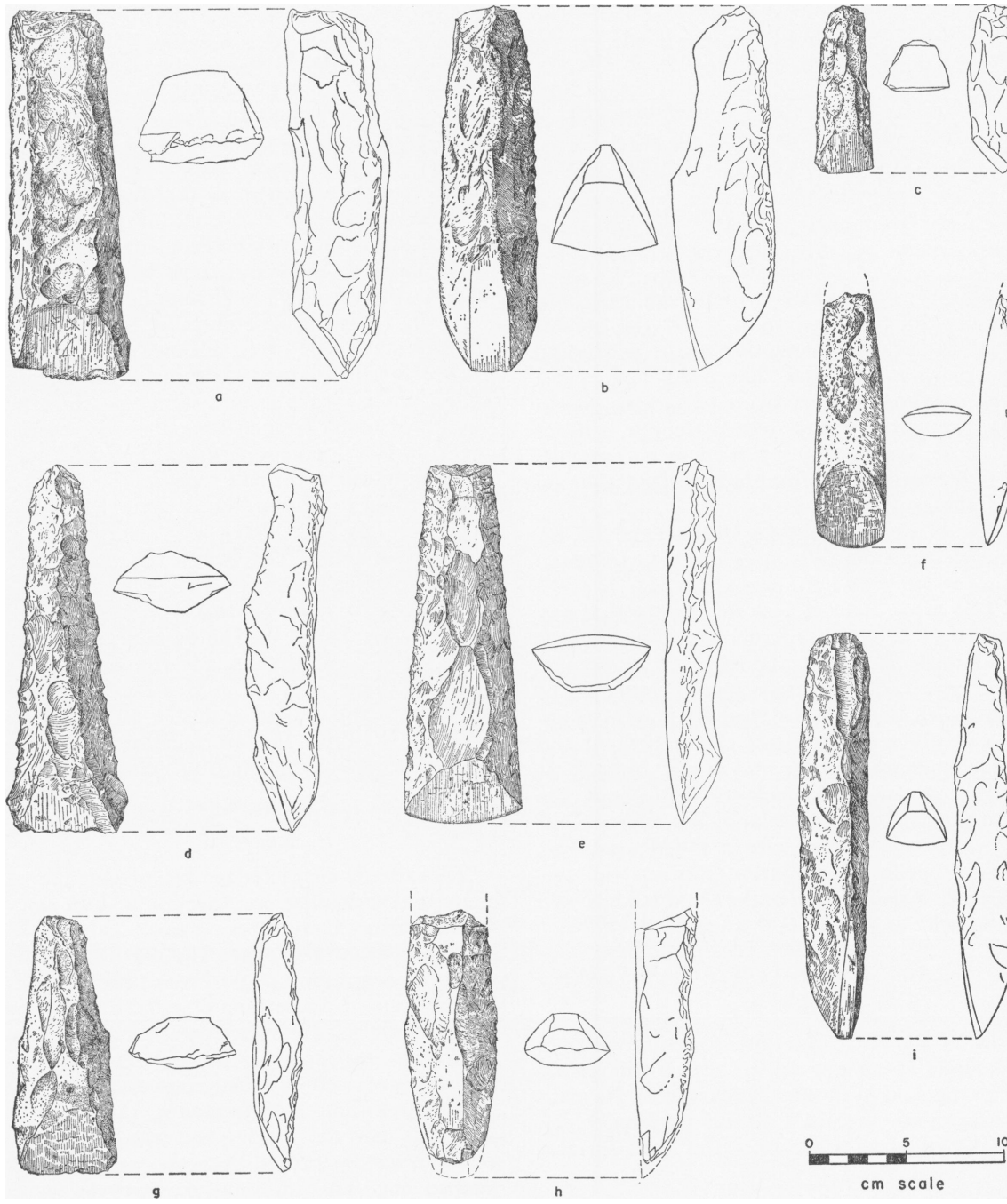

FIG. 31. Adze types. a. A'a type. b. Koma type. c. Hai type. d. Akipou type. e. Mouaka type. f. Hatiheu type. g. Teoni type. h. Ha'e'eka type. i. Koahi type.

This adze type is one of the most basic not only of the Marquesan's tool kit but of that of all Polynesia. It appears with the first settlers and continues in use up to the contact period, decreasing somewhat in frequency in the Expansion period.

In New Zealand related materials appear in the Moa Hunter period, making up a sizable portion of the Wairau sample,[1] and are present in marginal Polynesia.[2]

Hai Type

Figure 31c

This type resembles the Mouaka type, but can be differentiated from it by the greater front to back depth relative to the width and the sharply cut bevel. The cross-section is a high quadrangle or truncated triangle. Polishing, though occurring over the entire body of the adze, has not been carried to an extreme. A slight break in the front butt surface is an aid in lashing.

The Hai type resembles Duff's Type 2B, except that the depth is more marked. Its maximum width is 99 mm. (see Table 11).

This type occurred with such rarity that any firm conclusions on its chronological significance are impossible. It may be regarded as a tentative type and ultimately should, perhaps, be fused with the Mouaka type. At present it appears to be a diagnostic of the Settlement and Developmental periods and is rare in both. It occurs in surface collections throughout the Marquesas. In New Zealand, the related Duff Type 2B is also quite rare in the Wairau Site, another point of similarity between the two areas. It is also present in the Cook Islands[3] and in Samoa,[4] as well as at Pitcairn.[5]

A'a Type

Figure 31a

In cross-section this type is quadrangular in the larger specimens and truncated-trianguloid or trianguloid in the smaller examples. Its main characteristic feature is the off-set tang, which breaks off at an angle from the front surface, in some examples rather markedly. There is a definite taper from bit to poll. The bevel is not sharply cut and is, in some cases, convex. The thickness of the body is greater relative to the width than in the Mouaka type. The degree of polish varies: in some examples the almost complete polish continues to the point where the flake scars have been obliterated over large areas of the surface of the body; other adzes remain rough, with little or no smoothing over of flake scars. The size range is again quite marked, including variations in length from 310 to 80 mm.; in thickness, from 53 to 24 mm.; and in width, from 95 to 25 mm. (Table 11).

Again, frequency of occurrence is insufficient for any statement of significance to be made. Its presence in a large proportion of the surface collections makes it seem certain that the type continued much later in time than the Settlement or Developmental periods and probably was still in use at contact times.

According to Linton,[6] large examples of this type were used for heavy wood working such as plank shaving. The heavy construction of the blade tends to bear this out. Linton reports that the native name for this type was *toki a'a*.[7] Variants are found in Tahiti, Hawaii, Easter Island, the Cook Islands, and the Australs. It occurs in abundance in the Moa Hunter period of New Zealand and is the third most numerous type at Wairau,[8] in contradistinction to its limited occurrence in the Marquesas.

Koahi Type

Figure 31i

This adze is characterized by a triangular or truncated-triangular cross-section and an elongated, narrow body tapering towards both the poll and the cutting edge. The narrow front is straight except for a slight break near the poll, usually caused by pecking or a flake scar. The back of the adze curves upward to meet the front; the cutting edge is very narrow. The surfaces are well polished, especially on the front. According to informants, this type of adze was used for piercing and was hafted in a straight handle rather than the usual elbow-shaped one. This information, however, is to be regarded as questionable, as no stone adzes

[1] Duff, 1950, 139, Table.
[2] Métraux, 1940, 273, Fig. 46; Aitken, 1930, 152, Fig. 15; Buck, 1927, 236, Fig. 205.
[3] Buck, 1927, 241, Fig. 212.
[4] Buck, 1930, 345
[5] Duff, 1950, 169.
[6] Linton, 1923, 325–326.
[7] Linton, 1923, 322.
[8] Duff, 1950, 139.

have been used in the Marquesas for 100 years or more. It is related to Duff's Type 4F.

The size ranges of this type are between 318 and 210 mm. in length, 69 and 32 mm. in thickness, and 54 and 34 mm. in width.

This type appears to have been present in small quantity throughout the archeological sequence in the Marquesas from the Settlement period to the Historic period. It may have given rise to the Marquesan version of the hog-back adze or at least stimulated that development. The type is known elsewhere from Samoa, Tonga, Lau, Uvea, and Tokelau, where Duff regards it as being an "immediate diffusion from the Samoan group"[1]; Buck[2] illustrates examples. The Motukarara adze cache[3] contained adzes very close to this in over-all appearance but had a more pronounced reduction of the front surface near the poll. The fact that these adzes are more frequently found in Western Polynesia constitutes another bond between the Marquesas and the Tonga-Samoa area.

Teoni Type

Figure 31g

This adze is quadrangular in cross-section, the front being somewhat wider than the back. Its butt is tanged by a reduction in the front surface, but the tang is not curved outward as in Type A'a. The adze is long relative to its width, which decreases from the blade to the poll. When viewed in vertical plan, the point at which the tang break occurs shows a slight shoulder. The cutting edge bevel is not steep. Polishing, usually found on the back and front surfaces, or occasionally on the sides, is rarely carried far. On small specimens, usually made of flakes rather than cores, the stone blank was too thin to allow a reduction in the front; consequently, the sides of the butt were reduced to facilitate hafting. The type is a composite of Duff's Type 3A and *some* of the material included in his Type 1A. This type ranges in length between 202 and 98 mm.; in thickness, between 48 and 15 mm.; and in width, between 65 and 48 mm. (Table 11).

This type appears in the Settlement period and continues in use up to the Historic period. The size increases from the earlier to the more recent period. All the specimens recovered at NHaa 1 were small and not well worked. Polish usually is restricted to the front and back faces of the blade; the tang is extremely rough.

Material related to this type appears in the Moa Hunter period. It is also found in the Chathams, Rarotonga, Tokelau, Pitcairn, Hawaii, the Australs, and the Societies.[4] Type 3A is not found often in New Zealand, according to Duff,[5] although Type 1A comprises a good proportion of the material on the Moa Hunter sites. Judged from its distribution alone, it would seem to be an ancient adze type. The archeological evidence incontrovertably demonstrates its antiquity.

Hatiheu Type

Figure 31f

This type is characterized by a long, relatively narrow body with an oval to circular cross-section. The butt tapers slightly towards the poll. A band of pecking on the butt or a slight reduction on the front above the poll evidently provided support for firmer lashing. The bevel for the cutting edge is very definite and is somewhat concave. This type is related to Duff's Type 4D, but does not resemble it very closely, for reasons discussed below. The length of this type ranges between 255 and 129 mm.; the thickness, between 74 and 35 mm.; the width, between 49 and 20 mm. (Table 11).

This type is very unusual in the Marquesas and does not appear frequently in any previous collections from that area. Linton[6] illustrates four implements of this type. Fortunately, we were able to obtain two specimens in almost perfect condition from the local natives, thus providing us with an excellent idea of the over-all appearance of the type. It is found in a very small quantity in the Settlement and Developmental periods and then becomes extinct. Similar adzes are known from Pitcairn, Mauke, and Aitutaki, according to Duff.[7] Archeologically the type occurs in small numbers in the Moa Hunter site at Wairau and in New Zealand. It also appears in the Chathams.[8] Duff[9] assumes

[1] Duff, 1950, 188.
[2] Buck, 1930, 397, Figs. 196–197.
[3] Duff, 1940, Pl. A4, Fig. 4.
[4] Duff, 1950, 154, 173.
[5] Duff, 1950, 172.
[6] Linton, 1923, 330, Pl. 47, B1, 2, 3, 4.
[7] Duff, 1950, 186.
[8] Skinner, 1923, 97, Pl. 24, Fig. 26.
[9] Duff, 1950.

that this is additional proof of age, as the Chathams may be an atavistic marginal culture quite similar to that of the Moa Hunters, but with long chronological persistence.

Specimens in Gifford's collections, all of which unfortunately are surface finds, are exactly like those from the Marquesas in shape and in size.[1] Fragmentary material resembling this type was also found in New Caledonia.[2] The type seems to be more at home in Melanesia than in Polynesia. I believe that in the Marquesas it results from Melanesian influence, which occurred in the parent group from which settlers diverged. The adze type, along with a complex of other artifacts, was transmitted to the proto-Marquesans and was carried by them to their new home. These artifacts were, for the most part, dropped from the cultural inventory soon after arrival. This adze type, and related material, can generally be interpreted as evidence of a relationship between the Marquesas and Melanesian groups.

Ha'e'eka Type

Figure 31h

This type has a plano-convex cross-section and a narrow, elongate body tapering towards both the bit and the poll. The front and sides are slightly polished; the back is usually left rough. The cutting edge facet is small and slightly concave. This tool might actually be called a gouge. The plane of the front drops off to meet the cutting edge facet. As is the Hatiheu type, it is related to Duff's Type 4D. The difference lies in the fact that the Hatiheu type resembles more closely the ovoid or round-cornered, square-sectioned types shown by Duff in the lower line of his Fig. 45.[3] The Ha'e'eka type bears a closer resemblance to adzes shown in the upper row of the same illustration. There is, however, still a definite difference between those specimens and the Marquesan types to which I believe they are related.

No complete specimens were obtained; therefore no valid measurements were possible.

As was the Hatiheu type, the Ha'e'eka type was limited to the Settlement and Developmental periods, after which it became extinct. It represents another element of the complex that I believe suggests a relationship between Melanesia and the Marquesas.

Broadly similar material is scattered through Polynesia, as noted in the discussion of the Hatiheu type (p. 110), but, without an examination of the specimens, it is impossible to differentiate between the Hatiheu and the Ha'e'eka types. The Fijian collections display close similarities to this type. Gifford illustrates two adzes[4] that could be mistaken for the Marquesan specimens.

To summarize, this type again indicates Melanesian influence on the proto-Marquesans.

Koma Type

Figure 31b

This type is the familiar hog-back, triangular in cross-section. The body usually tapers towards the bit and the poll; occasionally the bit is as wide as the widest part of the body. The back of the adze is quite often concave. The front face converges with the back surface, from the central peak of the front, just ahead of the tang. The blade portion of the face, as are the sides of the blade, are usually polished, more by use than by intention. The bevel for the cutting edge, connecting the front and back, is very small as a result of the convergence of the front with the back.

The specimens of this type range between 222 and 67 mm. in length, between 50 and 18 mm. in thickness, and between 49 and 18 mm. in width.

This adze appears in the Expansion period and continues, with gradual increase in frequency, into the Historic period. Adzes of other types seldom occur at the later sites, especially in the Classic period architectural complexes. Although found at NHaa 1, the Koma type was invariably on the surface of the midden or in its overburden, representing part of the debris of the late ephemeral occupation of the site. The type is either a result of stimulus diffusion or independent invention in the Marquesas (derived possibly from the Koahi type). It was definitely not present in the Settlement or Developmental periods.

The Moa Hunter period in New Zealand began shortly before or approximately contemporaneously with the end of the Developmental period in the Marquesas, after which

[1] Gifford, 1951, 262, Fig. 3m, 264, Fig. 4e.
[2] Gifford and Shutler, 1956, 68–69.
[3] Duff, 1950.
[4] Gifford and Shutler, 1956, 262, Fig. 31j, 264, Fig. 4d.

the Koma type appears there. The almost simultaneous appearance of this type in the two areas leads me to favor stimulus diffusion as the process by which it was taken into the Marquesan tool kit. There is some evidence of a very slight contact with Tahiti at this time, possibly mediated through the Tuamotus. This contact may have cued the development of the Koma type in the Marquesas simultaneously with the first arrival of the Moa Hunters in New Zealand, presumably from Tahiti.

The sudden increase in frequency of the Koma type in the late Expansion and Classic sites is connected with an increase in wood working, requiring fine, narrow-bitted tools. In the Classic period, the type received an additional boost when it was applied to tufa cutting. The debris of the NHuu 1 quarry site contained adzes of only the Mouaka and Koma types. Mouaka adzes were apparently used to outline and undercut the blocks to be removed from the quarried stratum; the Koma type was used to dress and finish blocks.

Adzes broadly similar to the Koma type occur in the Cooks, Kermadecs, and Pitcairn, but those from the last-named island approach the Marquesan examples more closely than do the others. At Wairau in New Zealand, the adzes generally related to this type are present in a high proportion.[1]

In summary, the Koma type is diagnostic of the Expansion period in the Marquesas, appearing either as an independent invention, a result of stimulus diffusion, or a combination of both factors. It increases in frequency as a result of technological advancement and elaboration of certain aspects of material culture.

Akipou Type

Figure 31d

This type, an adze triangular in cross-section, is hafted base downward. The back is concave, and the front surface is reduced to form a tang. The blade expands to a width greater than the other portions of the body instead of tapering towards the bit as does the Koma type. The blade cross-section is quadrangular. This type equates with Duff's Type 4C.

The maximum dimensions of this type are 187 mm. in length, 35 mm. in thickness, 60 mm. in width (Table 11).

[1] Duff, 1950, 178–179.

The Akipou type, a relatively recent development, appears in the later Expansion period and probably developed from the Koma type which it resembles very closely. According to Duff,[2] adzes of this type are rare in New Zealand and are not found in any Moa Hunter sites. On the basis of its distribution in New Zealand and the Marquesas, he does, however, assign the Akipou type to the Moa Hunter period. As the type appears late in the Marquesas, it is probably also late in New Zealand, unless it is an independent invention there. In view of the Marquesan evidence, it seems probable that this type does not belong to the Moa Hunter period.

Surface Collection	Types
A'a	44
Mouaka	45
Koma	43
Akipou	5
Hatiheu	5
Ha'e'eka	5
Side hafted	1

Techniques of Adze Manufacture

Stone working in the Marquesas was accomplished with narrow-edged hammerstones (p. 122) made of unmodified or scantily modified beach pebbles. These tools were used in direct flaking, during which the object being produced was braced on another stone. For the removal of large flakes, the anvil technique was used.

Stone adzes were produced by two major techniques: the core and the flake. The core technique, used for the majority of adzes, particularly the medium or large specimens, involved, first, the selection of suitable raw material, generally basalt beach pebbles or pillow-lava prisms. Little is known about the techniques followed with beach pebbles, but the shop debris of the NHuu 1 Site has enabled us to reconstruct the steps followed in working pillow-lava.

The general principle in the selecting of stock was to obtain a billet of stone closely approximating the desired cross-section of the projected adze. This apparently saved time and effort and reduced the percentage of failure by eliminating the hazardous removal of the back ridges on the Mouaka type. It also reduced the difficult shaping of the hog-back of Koma type.

[2] Duff, 1950, 183.

For the Koma type, the most frequently used stock was naturally that possessing a trianguloid cross-section. If the base of the triangle were sufficiently flat, it was not altered. Only the truncated apex of the triangle was flaked to narrow the hog-backing of the section (see Fig. 33e). A series of blows directed along one of the natural angles of the stock from one side removed only flakes from the opposite side, leaving a serrated edge at the angle. The stock was then turned. The high points between the serrations were used as striking platforms, to remove another series of flakes in the opposite direction, which automatically re-serrated the edge at the angle and left it set up for more work.

If the blank was not a flat-based truncated triangle in section, but had an uneven or faceted base, this was removed by flaking directed inward along its corners. Such inward flaking produced a central ridge which was removed by outward-directed blows along each side (Fig. 33e), continued until the base was suitably flat.

The next step in the manufacture of the Koma adze was to reduce the butt back to provide a tang for lashing. That this step demanded an excellent control of both tools and material is attested by the fact that almost all incomplete adzes of this type had been broken at this point in the process of manufacture. The reduction of the front was achieved by flaking directed from both sides at an angle oblique to the long axis of the adze. A slight miscalculation of strength was enough to crack the adze blank cleanly through the body.

When this crucial point was successfully passed, the remaining operations involved the flaking of the front blade face and the bevel on the back. This was accomplished by the removal of one or more flakes from the back by a blow from the front which was directed against the cutting edge of the adze. Subsequently, very small flakes were removed along the cutting edge, principally by blows struck from the back to produce the small front level. Finally, very small flakes were removed along all the edges and surfaces, to make the edges more symmetrical.

The Mouaka type of adze was produced on flat quadrangular billets (which rarely occur in the natural state) or on multi-angular billets. With the latter, two approaches were used, both designed to obtain the maximum width from the stock. If the billet was roughly diamond-shaped or hexagonal in section, the adze was planned so that the plane of the cutting edge would run through the billet at the widest dimension (Fig. 33d). If, on the other hand, one face of the billet was wider than any of its other faces and bigger than any dimension measured through it, the wide face formed the back surface of the adze, and the smaller faceted surfaces, offering excellent striking ridges, were removed when its front was shaped.

The cross-section of the adze blank was shaped first; if necessary, the back was flattened. Then the front, if not a natural surface, was flaked down, leaving a ridge along its long axis. The butt was then tapered. Blows directed against the front removed several flakes from the blade back to form the cutting edge facet. The final and most difficult operation was the removal of the back ridge. Many adzes were broken at this point.

The second technique for adze making consisted in striking large flakes from cores by the anvil technique or with a hammerstone. Although largely unsystematic, there is some evidence for the systematic working of cores. A turtle-backed core, showing alternate flaking by blows directed against its tapering ends, was found in the adze workshop areas on Ei'ao.

Starting with a large, wide, shatter flake with a thick butt and heavy percussion bulb, the adze maker removed the lateral edges of the flake, retaining the central portion consisting of the percussion bulb and a strip extending across the flake along the axis of the blow that removed the flake. More rarely, depending on the nature of the flake itself, other sections were utilized, and the striking platform and percussion bulb might be on the lateral surface of the adze rather than at the cutting edge. When the flake had been trimmed satisfactorily, the shaping of its surfaces and edges was completed by grinding. If the cutting edge was uneven, it was ground straight and sharpened later.

An infrequent source of flakes for flake-made adzes was the back-ridge flakes struck from core-made adzes of the Mouaka type. These are not often found, as the flake removed was generally short and irregular and, therefore, could be used only rarely.

After shaping was completed, adzes were finished almost exclusively by grinding with the grooved grinders that are today found every-

where at archeological sites. An examination of the surfaces of finished adzes indicates that sand or some other coarse abrasive was used to smooth the flake scars, which were then polished with successively finer materials until a smooth, glossy, unstriated surface was achieved. Pecking was employed very rarely, neither on tangs to facilitate binding nor as a shaping technique.

Stone adzes used in the quarrying of tufa or soft basalt were not polished, as the hard inclusions in the tufa would have destroyed the fine cutting edge. The unpolished serrated edge of the blank, after its final touch-up flaking, was equally good, if not better, for stone cutting and required less effort to prepare.

The Marquesan seems to have been aware of minute differences in the materials from which he fashioned his adzes. Thus, if an adze of a high-quality stone were broken, every effort was made to reshape and render it serviceable again. A number of adzes in our collection were fashioned from fragments of broken adzes. Another factor in this conservation of material was probably the *mana* concept of the Marquesans which endowed many household tools with a supernatural charge. If a particularly powerful adze were broken, it would probably be salvaged in the hope of preserving the remnants of its supernatural strength. Very few adzes were excavated from burials. Those that were included as grave goods were always broken and may be evidence of ritual killing.

The only study of adze-manufacturing processes in Polynesia now available is that of Stokes,[1] based on the collection made on Tubuai. The shaping techniques used there differed in most respects from those in the Marquesas. The similarities, however, lie in the selection of materials. The Tubuai adze-makers, as did the Marquesans, also attempted to obtain raw material with flat surfaces, to eliminate the difficult process of leveling off a naturally uneven surface to serve as either the front or back face of the adze.[2] In Tubuai the first step was the definition of the adze in frontal plan. Then the cross-section was shaped. As were those in the Marquesas, adzes of triangular section were flaked by laterally directed blows against the edges. The cutting edges were formed by light chipping directed up and back or by a single flake removed by a backward-directed blow. There is also evidence of the use of lateral flaking to produce cutting edge bevels, which was not present in the Marquesas. Although the Marquesan tangs were defined quite early in the process, those of the Tubuai adzes were shaped later by chipping or pecking.

The main difference between the processes used in the two areas is in the finishing technique. In Tubuai the adzes were finished by pecking, followed by grinding, whereas the Marquesans used grinding only. Pecking also entered into the shaping of the adzes in Tubuai, having been used in areas of the adze where flaking would have been more difficult and more likely to cause damage to the implement, as in the reduction of the butt for the tang and the shaping of the bevel.

Stokes[3] hypothesizes that the pecking process is a late development in Polynesia, possibly originating in the Eastern Polynesian nuclear area. The process is very rare in Hawaii, Samoa, Pitcairn, Tonga, and the Marquesas, while it is found in Easter Island, the Society Group, Tubuai, Rapa, the Cook Group, and New Zealand. The Marquesan evidence indicates that Stokes's hypothesis may be quite correct. In the earliest Polynesian settlement so far discovered, the Marquesas, the process is almost entirely absent.

Extra-areal Comparisons

A marked interest in adzes characterizes the archeology of Oceania and Southeast Asia. It is due as much, or more, to an esthetic appreciation of adzes (many of which are of extremely fine workmanship) as it is to their archeological value. For good or ill, this interest has borne fruit in numerous publications from various parts of this area, dealing mainly with stonework and affording an opportunity for a comparison of adzes from Polynesia with those from as far afield as Formosa and Japan. The comparison is limited because no stratigraphic context exists for most of this material which was usually surface-collected or poorly excavated except for that deriving from Formosa and Japan.

The first important effort to organize the complicated archeological picture in Southeast

[1] Aitken, 1930.
[2] Aitken, 1930, 130.
[3] Aitken, 1930, 139.

Asia and Oceania was made by Heine-Geldern,[1] who, in his famous "Urheimat und früheste Wanderungen der Austronesier," presented a theory of successive waves of migrations which could account for the present distribution of the various adze types. He postulated three successive Neolithic periods characterized by different adze types: an early period, in which the *Walzenbeil*, or curved adze, was used; an intermediate period characterized by the *Schulterbeil*, or shouldered adze; and, lastly, the late Neolithic *Vierkantbeil* type, quadrangular in cross-section. Beyer's Philippine work[2] follows the sequence presented by Heine-Geldern, but does not mention any sites in which such a superposition of forms actually occurred. Van Heekeren's work[3] demonstrates a reverse sequence in Indoneasia, with the quadrangular adzes earliest in the Neolithic period, followed by the stepped or shouldered adze, and the round adzes latest of all. The difference between the "cultures" is apparently not only chronological but, on some time levels, spatial. The various types have different areas of distribution in Indonesia and seem to appear contemporaneously.

The data from Formosa[4] and Japan[5] based on stratigraphic excavations seem not to support the sequence established by Heine-Geldern. In Formosa, polished flat adzes appear in the middle Neolithic; these are followed by quadrangular, stepped, and shouldered adzes. In Japan, flat oval adzes, polished single bevel adzes, and the "short adze" appear in the Proto-Jomon period, followed by cylindrical double bevel adzes in the Early Jomon period, into which the earlier types continue. Quadrangular and lenticular adzes, as well as the sawing technique for the cutting of adze blanks, appear in the Middle Jomon period. The "Violin" adze and the chipped shoulder adze characterize the Later Jomon, the former continuing into the Final Jomon period. These data show quite definitely a need for revision of sequences developed on the basis of surface collections and poorly excavated material.

Of the two relatively well-known areas in which a body of well-excavated material is available, Formosa seems to afford the most tantalizing possibilities for throwing light on Polynesian origins. Most of the adze types of the Marquesan Settlement period are found in the Yuan-Shan culture of northern Formosa. The shouldered and stepped adzes of Yuan-Shan are obviously related to the Marquesan Teoni type. Coeval with Yuan-Shan, quadrangular adzes appear in Central Formosa with the Black Pottery culture.

The resemblances of the Yuan-Shan culture extend into other areas of the artifact inventory. Stone clubs similar to the Maori *patu* are found with Yuan-Shan materials, while tapa-beaters appear in the earlier Cord-Impressed Pottery culture. The Yuan-Shan people apparently were horticulturists, depending much also on hunting and gathering. Head hunting and tooth evulsion were also practiced.[6]

To sum up, regardless of which sequences one subscribes to, the prototypes of the majority of Polynesian adze types are found in Indonesia, the Philippines, and on the coasts of Asia and in Southeast Asia. The few specific Polynesian adze types that do not occur in these areas can be regarded as having developed after the Polynesians left Asia. (It is noteworthy that *all* Polynesian adze types are elaborations on the basic types evolved in Asia.)

According to recent archeological work in Formosa, adzes that are prototypes of the Polynesian examples occur in stratigraphic contexts with cultures dating back to 1700 B.C. The adze forms, then, are one of the finest indicators of the general source area of Polynesian culture. Unanimously, they point west.

SHELL ADZES

Small, narrow-bitted adzes manufactured exclusively from the heavy lip of shells of species of *Cassis* were probably used for fine wood working. Two types are distinguishable on the basis of over-all shape.

Cylindrical Shell Adze

Figure 35m

This adze type is a duplicate in shell of the Hatiheu type of stone adze. It is characterized by a narrow, elongated body with a circular cross-section. The butt tapers very slightly, and the poll is unfinished. The body polish is quite

[1] Heine-Geldern, 1932.
[2] Beyer, 1948.
[3] Van Heekeren, 1957.
[4] Chang, 1956, 37a.
[5] Groot, 1951.
[6] Chang, 1956, 37a.

extensive, but generally inadequately obliterates the crenulations of the *Cassis* lip. The bit is as wide as the widest section of the body, and the cutting edge bevel is flat and well defined. The maximum size is 75 by 17 mm. (Table 11).

The Cylindrical Shell adze is found only in the Settlement and Developmental periods in which it is associated with the Thick Poll Shell adze. The distribution coincides with that of the Hatiheu stone adze. I have decided to separate the shell specimens from the Hatiheu, however, because the basic shape of the material from which they are fashioned limits the shape of the finished product rather effectively, and also because further work will possibly expand the chronological range of one or the other types.

Thick Poll Shell Adze

Figure 35n

The characteristic feature of this type is a thick, heavy, blunt, faceted poll from which the body of the adze tapers rapidly to a narrow blade and bit. The cross-section is polygonal. The size varies between 59 by 9 mm. and 49 by 9 mm. (Table 11).

The Thick Poll Shell adze is associated with the Cylindrical Shell type in the Settlement and Developmental periods. After the Cylindrical type became obsolete, the Thick Poll type continued in use into the Historical period.

Shell adzes are not well described in the literature. The only excavated materials available to date are those reported by Spoehr and Thompson[1] from Saipan, Tinian, and Rota. Thompson records cylindrical shell adzes from the Hornbostel Collection. These do not resemble the Marquesan Cylindrical type, however, because they have convex cutting edge bevels when viewed in lateral aspect. Spoehr did not obtain any examples of this type; his collection consists entirely of quadrangular or triangular adzes. Therefore, without archeological associations, it is impossible to evaluate the chronological significance of the cylindrical adzes in the Marianas.

Ethnological specimens from Polynesia are reported by Buck from Manihiki and Rakahanga,[2] and from Tongareva.[3] These adzes are quite similar in frontal plan to the Carolinian specimens illustrated by Spoehr and Thompson, having also been made from the shell of the *Tridacna*.

Gifford[4] figures two possible shell adze fragments and one definite *Tridacna* adze (Gifford's Fig. 1f) which appears to be generally similar to the Carolinian and Cook specimens cited above. The depth at which the *Tridacna* specimen, illustrated by Gifford in his Fig.1k, was found in Site 17 indicates that it is perhaps 1000 years old. The scarcity of these artifacts in Fiji renders impossible an evaluation of their chronolgical significance.

The collections of the Fiji Museum contain three interesting specimens that expand our knowledge of shell adze distribution and variety, even though they contribute nothing of archeological significance. One of the adzes, unfortunately fragmentary, from the Gatty Collection (57.127) was found on the island of Katafanga in the Lau Group of Fiji. It is of unidentifiable material, oval in section, well polished, with a narrow bit and well-defined facet. It somewhat resembles the Marquesan Cylindrical type. The other two adzes (no catalogue numbers) from Rotuma, are made of *Cassis* lips, as were both Marquesan types. One of these is elongated and poorly polished. It may not have been hafted, as the shape fits well to the hand. The disposition of the facet seems to indicate that it was used as a gouge or chisel rather than as an adze. The third shell adze, flat and quadranguloid in section, is also made from a *Cassis* lip.

To conclude, the flat shell adzes from the Carolines, Manihiki, Rakahanga, and Tongareva, and some of the few extant Fiji specimens, are of *Tridacna* shell and resemble one another generally in frontal plan and section. These are dissimilar to the Marquesan specimens as a group. How much of this difference results from the limitations of the *Tridacna* shell material and how much stems from the variations in the island cultures is difficult to determine. It would seem, however, that the craftsmen were limited by the material which did not lend itself to the production of the elaborate forms possible to stone adze makers without a weakening of the shell blade.

Two examples from Rotuma, although they do not resemble the Marquesan shell adzes in

[1] Spoehr, 1957, 151–154; Thompson, 1932, 54.
[2] Buck, 1932b, 143, Fig. 54.
[3] Buck, 1932a, 186.
[4] Gifford, 1951, Fig. 1f, h, k.

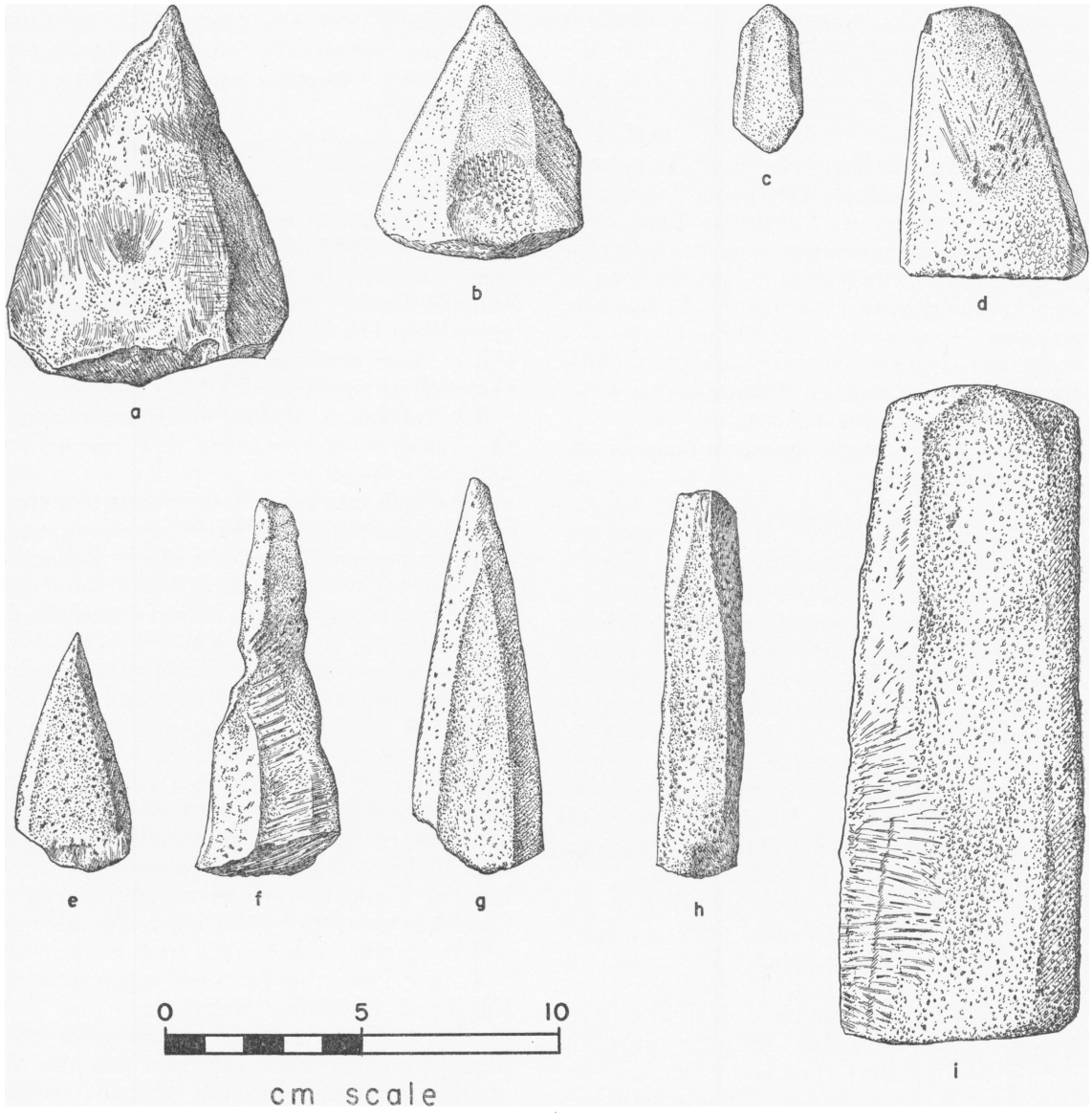

FIG. 32. Coral files. a–b. Short Triangular type. c–d. Blunt type. e–g. Long Triangular type. h. Narrow type. i. Rectangular type.

form, at least show that elsewhere in Polynesia shell adzes were produced from *Cassis* lips.

CORAL FILES

A coral file is a thin, flat, blade-like piece of coral, the surfaces of which are used for abrading shell and wooden artifacts. The sharp edges are mainly non-functional, however, and result from abrasion on the flat lateral surfaces.

The nomenclature is as follows:

TIP: The narrow, tapered end of the Triangular and Blunt types are regarded as the tip, as distinguished from the butt which is wider and flat. Several varieties described below, however, possess no distinctive tip.

BUTT: The wide, heavy, unfinished end of the Triangular and Blunt types. On the Narrow and Rectangular types, the tip is not distinguishable because the sides are parallel. Therefore, both ends are referred to as butts.

EDGE: The lateral margins between the faces.

SHOULDER: A "jog" appearing in the file edge near the tip of the Long Triangular and the Short Triangular types, in which the edge or edges have been stepped back as a result of use that has abraded the faces near the edge until it was ultimately cut.

Coral files, the artifacts most frequently found on most Marquesan sites, have been neglected elsewhere as archeologically valueless for chronological placement of sites, and probably in the main uninteresting. As the present study demonstrates, they not only have a genuine value, equal to that of fishhooks, for the chronological placement of sites in the Marquesas, but are also more reliable for seriations because they are more numerous.

In the study of these coral files, several reanalyses were required before significant traits could be segregated and types with chronological value could be established. An analysis based on cross-section types showed remarkable stability in the persistence of the relative proportions of the various types. Measurements (length and width) of complete samples were plotted on frequency polygons and scatter diagrams, and modes, means, and medians were calculated. The result was negative; no clear-cut picture of variation through time appeared.

The typology described below, based on the over-all shape of the file in lateral plane, was found in the final analysis to be the most significant feature.

LONG TRIANGULAR TYPE

Figure 32e–g

This type is characterized by a blade narrow relative to its length. The straight to slightly concave edges of the blade converge gradually towards a point, although in some examples a slight convexity of the edges below the tip occurs. The tip is occasionally shouldered. The cross-sections (always viewed at the butt) vary more than in any other type, including ellipsoid, ovoid, rectanguloid, trianguloid, and plano-convex forms. The size varies between 33 by 13 by 8 mm. and 98 by 32 by 10 mm.

This is the type most commonly found in all periods of Marquesan prehistory. Its large variation of cross-section, when compared to that of other types, indicates a wide range of uses. It is present in the Settlement period, in which it constitutes 67 per cent of the total sample. As the dominant type, it continues into the early Expansion period, after which it begins to decrease in frequency, diminishing ultimately to between 35 and 50 per cent of the total (Fig. 27a).

SHORT TRIANGULAR TYPE

Figure 32a–b

This type is wide relative to its own length, the ratio being generally between 0.75:1 and 1:1. The butt is thick and heavy; the usually straight or slightly concave edges taper rapidly to a narrow tip, below which a slight shouldering can be observed. In the majority of this type the cross-sections are ellipsoid, although a few oval and trianguloid cross-sections occur. The size ranges between 42 by 21 by 8 mm. and 93 by 70 by 17 mm.

This type, also part of the inventory of the earliest Marquesans in the Settlement period, increases gradually in frequency as the Long Triangular type diminishes, attaining a frequency of 30 per cent in the late Expansion period. The stability of the cross-section relative to that of the Long Triangular type may represent a specialization of use (Fig. 27a).

BLUNT TYPE

Figure 32c-d

The butt and edges of this file are like those of the Long Triangular type. The characteristic feature is the abruptly terminated tip, either straight or slightly rounded and thick, not tapering as in other file types. This type is ellipsoid, trianguloid, or rectanguloid in cross-section. The size varies between 36 by 19 by 8 mm. and 68 by 49 by 17 mm.

The Blunt type is present in a small percentage in the Settlement period and continues throughout the entire time column with a negligible fluctuation. It appears to increase very slightly in the middle or late Expansion period, but the scantiness of the increase is probably a result of sampling error (Fig. 27a).

NARROW TYPE

Figure 32h

Distinguished by roughly parallel but slightly sinuous edges, this type is quite narrow relative to its length. It is blunt and unfinished at both butts. In cross-section, it is ellipsoid, trianguloid, or rectangular-ovoid. The size varies between 96 by 23 by 12 mm. and 60 by 16 by 8 mm.

The graphed distribution of this type is bimodal. As yet, however, it is not so complete as may be desired, as it does not appear in either NHi I and II or NH4. It appears in the Settlement period, being present in NHaa 1 I, but in extremely small quantity. It begins to increase in the Developmental period, diminishes in the early Expansion period, and then increases gradually into the Historic period (Fig. 27a).

Rectangular Type

Figure 32i

One of the few unique Marquesan achievements in the archeological record, this type of coral file is probably an outgrowth of the Narrow type but was separated from it because of its chronological significance. These files are the largest and most distinctive in the collection but are not common. The faces are somewhat concave along the median line; the edges are thick and blunt, as are the butts, which are finished and cut perpendicular to the longitudinal axis. Facets run along each face near the edge. The cross-section is ovoid.

The circumstances under which this type was found indicate that it may have been intended for a ceremonial use. It appeared intrusively in the surface of the ceremonial area in NHaa 1 III where contact materials were found, and also in a ceremonial site in Hatiheu where three trophy heads were collected. None of the complete specimens shows signs of advanced use, although broken fragments have been found. The maximum size is 161 by 61 by 18 mm.

The Rectangular type serves as an excellent time diagnostic, appearing in the middle or latter portion of the Expansion period, when it was probably developed from the Narrow type (Fig. 27a).

Manufacture and Use of Coral Files

Coral files were made from pebble coral found in clean, bleached, wave-rolled chunks along the shores. The coral was not gathered in the living state. This raw material was split with an adze or with cleaver flake blows, to remove wedge-shaped segments from the narrower pebble edges, and cut towards the center of the pebble. These segments had the outer skin of the pebble on three surfaces, with the two cut surfaces converging towards the center of the pebble to form a trianguloid cross-section, like a slice of Edam cheese. These file "blanks" were then abraded on stones until they attained an approximation of the desired shape, at which point they were put to use. As stated in the definition of this type, the faces of the files were the main functional part. However, the edges were probably used occasionally for various fine cutting and shaping jobs. These tools were not hafted but were held by the edges or along the midline, according to the type of job. The Rectangular type seems to have been purposely hollowed slightly along the midline to permit a finger grip.

Although the main use of the coral files was to work shell, they were undoubtedly also used in wood working. It is difficult to say to what extent they were so used, because relatively

TABLE 12

Distribution of Abrading Tools and Hammerstones

Site	Urchin Spine Files	Cowrie Lip Files	Coral Abraders	Polishing Stones	Hammerstones
NHaa 1-I	1	—	—	1	—
NHaa 1-II	14	5	36	10	4
NHo 3-I	1	—	—	1	—
NHo 3-II	1	—	—	—	—
NH 4	1	—	—	—	—
NHtv 1	—	—	—	—	1
NBM 1	1	3	11	1	1
NBM 4	1	—	4	1	—
NT 8	—	—	—	2	—
NHi 1	3	—	—	—	—
NHuu 1	—	—	—	—	2

little wooden material has been recovered.

The precise number of coral file blanks recovered is somewhat difficult to establish because of the nature of the material and the manufacturing process. Numerous jagged, worked coral chunks were recovered in every site, but only the fragments showing more advanced degrees of workmanship could be identified as blanks. Therefore, the list below is not truly representative of the actual numbers of blanks present in the sites but is only an approximation:

NHaa 1	134
NHo 3	35
NHi 1	71
NH 4	7
NBM 5	5

As noted above, no attempts at file typology have as yet been published for any part of Oceania, and these artifacts are merely mentioned in the reports. William Bonk, a graduate student at the University of Hawaii, has written a report, filed at the Bernice P. Bishop Museum, dealing with eight archeological sites on the island of Maui. In this report Bonk attempted a logical typological breakdown, based on differences in cross-section, of the files recovered in those sites. Dr. K. P. Emory of that Museum kindly permitted me to examine this typology. (Unfortunately, in my own analyses I had found that cross-sectional typologies were not significant chronologically.) It is, as far as I know, the only attempt at typology of files in the Pacific antedating the present one.

According to Emory,[1] all the file types established for the Marquesas are also present in Hawaii except for the uniquely Marquesan Rectangular type. Photographs furnished to me by Emory show that vesicular basalt or pumice files, shaped exactly like coral files, were also utilized. No comparisons can be made in the matters of frequency, fluctuation, or appearance of new types because of the complete absence of data.

In New Zealand, the absence of coral led the inhabitants to turn for raw materials to the wide range of stones available to them. The forms of Moa Hunter and Maori files, or "rubbing stones" as they are sometimes called in New Zealand literature, resemble the Marquesan and Hawaiian coral files. Skinner[2] illustrates files of mudstone and schist, elongated and narrow, with tapering and blunt tips. Knapp, in a short note on Maori abrading tools, states that the materials preferred were volcanic (rhyolite, scoria, obsidian, and pumice) and sandstone.[3] His illustrations[4] show elongated, narrow blades, widest at or near the butt, and tapering to a narrow point. Facets run parallel with the edges along the faces of the files. Lockerbie[5] illustrates similar examples that show a sandstone file resembling a Marquesan Short file and a narrow, six-sided sandstone file that approaches the Marquesan Blunt type more closely.

From Fiji, Gifford[6] reports on an implement he calls a tapa marker, which he describes as a long, four-sided coral (*Astreopora*) fragment with a tapering point. This may be a coral file, but, as no others were found, it is doubtful. In the middens of New Caledonia, Gifford and Shutler[7] found quantities of coral which, according to them, may have been used for abrading tools. However, none of the coral fragments seems to have been intentionally shaped.

In Golson's recent work in Samoa and Tonga,[8] as well as the earlier work of McKern in the same area,[9] no coral file fragments were recovered, or at least none was mentioned. More recent work in Tonga[10] indicates that stone files similar to those discussed above for the Marquesas were in use there. Shaped coral files are as yet not known in adjacent Melanesia, although coral was used there as an abrasive tool. Coral files of Polynesian type are, however, found on the East Coast of Australia.[11] It is hardly safe to place great reliance on the present literature for the sketching of coral file distribution, as these artifacts may have been completely overlooked in many places where archeological research has been carried on.

Coral files are definitely worthy of typological analysis; in the Marquesas they have proved to be of great value for the seriation of sites (Fig.

[1] Emory, personal communication, 1959.

[2] Skinner, 1924, Fig. 4a–g.
[3] Knapp, 1938, 16.
[4] Knapp, 1938, 15–19, Pl. 2.
[5] Lockerbie, 1953, Figs. 10–11.
[6] Gifford, 1951, 220, Fig. 1j.
[7] Gifford and Shutler, 1956.
[8] Golson, MS.
[9] McKern, 1929.
[10] Golson, personal communication, 1959.
[11] Massola, 1956.

27a). The frequency fluctuations of the various types behave exactly as do those of the pottery types in New World ceramic studies which have been graphed in like manner. As does the fishhook seriation, the coral file seriation results in a chronological placement of sites, which is significant in view of the fact that hitherto no seriations have been attempted on the basis of more than one artifact type as a test of the value of the method.

FILES OF MISCELLANEOUS MATERIALS

The specimens described under this category are found throughout the prehistoric sequence of the Marquesas and are not considered as time fossils of any particular period. They are organized on the basis of material alone.

Urchin Spine Files

Figure 35h

The spine of the mature sea urchin (*Heterocentrotus* sp.) was abraded on one or more sides of the distal tip until a facet for polishing was achieved. The facet may also have resulted solely from use, with no previous preparation, but it is doubtful. As in the coral files described above, the flat surfaces of the sea urchin file, rather than the edges, were functional. The points of files showing advanced use are triangular in section. The facets seldom extend more than halfway down the spine.

The urchin spine seems to have offered two advantages to the user: first, its small size made it suitable for very fine work in which the clumsier coral files, with their comparatively thick bodies, would have been useless; second, the texture of the urchin spine itself is much finer than that of coral, thus making possible a finer polish than attainable with the coarser coral files.

Basic tools of the Marquesans, urchin spine files are found in all periods of Marquesan prehistory (Table 12).

Shell Files

Files of this type are made of the lips of the cowrie (*Cypraea* sp.) or helmet shell (*Cassis* sp.). For the manufacture of files, smaller helmet shells were used than those used for adzes and ornaments. The lips were cut off, and the edges were prepared either by being polished or were worn down by use. No attempt seems to have been made to shape the tool. The size ranges between 65 by 17 mm. and 38 by 9 mm. (Table 12).

These artifacts were apparently used in small numbers throughout all periods of Marquesan prehistory.

Problematical Cowrie Abrader

As a result of extensive use as a polisher, half of the base of a cowrie, with the cap removed, had anterior, lateral, and posterior facets. Only one of these artifacts was recovered at NHaa 1 I. Its dimensions were 65 by 9 mm.

These implements were probably used for final polishing on wooden objects. In Samoa, certain cowrie species (*pu 'e*) are still used for the polishing of wood. The cowrie shell is probably the most durable of any found in the area; therefore, it would withstand prolonged use.

ABRADING AND POLISHING TOOLS

Coral Abraders

The same type of coral used for files was also utilized for large abraders. A chunk of coral was picked up and immediately put to use without modification. Prolonged use of such an artifact usually resulted in one or more flat, smooth facets on the coral chunk. Occasionally, large fragments left over from coral-file manufacture were used as abraders. The method of their utilization cannot be definitely specified, but this is not too difficult to divine. Linton[1] states that such artifacts were used for wood working, which is almost obvious. The Marquesan wooden artifacts in ethnographic collections show a predilection for very high polish without complete obliteration of the tool marks, as these were arranged in rhythmic patterns on many artifacts to achieve decorative effects. The size of the abraders varied between 100 by 88 by 53 mm. and 8 by 61 by 39 mm. (Table 12).

Coral abraders were used throughout all periods of Marquesan prehistory.

Hawaiian abrading tools usually were worked into certain definite shapes before use. Abraders were arranged in a series according to the coarseness of the material used and the type of finish it would produce. Coral was used for fine finishes.[2]

In New Caledonia a large quantity of coral

[1] Linton, 1923, 331–333.
[2] Buck, 1957, 257.

was found in the middens.[1] Although Gifford says that none of it showed signs of use for abrading, he still believes that such a possibility should not be discarded.

Polishing Stones

Basalt pebbles were frequently used for polishing in the Marquesas. An ordinary, polished beach pebble, selected for its smooth, fine-grained surface, was used without any further modification. Pebbles either showed all-over use or were faceted with small saddled areas that had been used for abrading and/or polishing narrow instruments. The size varied between 165 by 60 mm. and 51 by 39 mm. (Table 12).

Basalt polishers are found in all periods of Marquesan prehistory.

Linton reported these artifacts from the Marquesas, describing them as being polished like gastroliths.[2] He believed that they were used for wood working.

Buck reports the use of close-grained basalt polishing stones from Hawaii.[3]

In New Caledonia, irregularly faceted basalt or serpentine grindstones were frequently found in the middens.

MISCELLANEOUS POLISHING STONES

Coquina

Three fragments of coquina polishing stones were found in NHaa 1 II. They all had one flat, highly polished surface. The largest fragment measured 89 by 71 by 29 mm.

Pumice

A small fragment of pumice which had been used as a polishing stone was also found in NHaa 1 II. This may be an exotic kind of stone. Pumice was used for abrading in prehistoric New Zealand where it is rather common.[4]

PERCUSSION TOOLS

Hammerstones

Figure 33c

Hard, smooth, wave-rolled, beach pebbles were used for hammerstones. The average size seems to have been rather small. A narrow rather than a thick blunt edge was preferred for a striking surface. The preference for small, narrow-edged stones is probably influenced by the need to control the blow exactly in the fine, yet very forceful, flaking required on the narrow surfaces and sharp corners of stubborn basalt adzes. One type of Marquesan basalt has a structure of alternating layers of relatively softer and relatively harder stone. When wave-washed and rolled, the softer material tends to erode more rapidly than the harder material, producing a ridged surface for the stone, with the hard layers in relief. This type of hammer was easy to hold and was preferred. Some modifications for gripping were made. One specimen has a chipped thumb-rest. Hammers were probably completely exhausted before being discarded, as few were found in recognizable condition. The size varied between 128 by 95 mm. and 77 by 82 mm.

Hammerstones are found in sites in all periods of Marquesas prehistory. No changes in form occur throughout this entire time span.

Throughout the Pacific there seems to have been a preference for narrow-edged hammerstones when they were available. McAllister illustrates a narrow-edged specimen among those recovered by him in Hawaii; the majority of Hawaiian hammerstones were, however, not of that shape.[5] One Hawaiian specimen mentioned by McAllister had been flaked into shape, a practice that did not occur in the Marquesas.

Métraux says that on Easter Island obsidian workers used narrow-edged hammerstones.[6]

In New Caledonia, cores and chopper flakes, as well as egg-shaped pebbles, are used as hammerstones. The former present a very narrow striking edge, of course; the latter are battered at the narrow ends.

MISCELLANEOUS STONE

Stone Discs

Flat, thin discs of soft, vesicular basalt were found in NHtv 1 and on Ei'ao. As the only areas where these artifacts were recovered were adze workshops, they may have been used in the adze manufacturing process. They are much too soft for hammers and bear no signs of use as polishing stones. They may have been unfin-

[1] Gifford and Shutler, 1956, 31.
[2] Linton, 1923, 323.
[3] Buck, 1957, 257.
[4] Knapp, 1938.
[5] McAllister, 1933, 34.
[6] Métraux, 1940, 281.

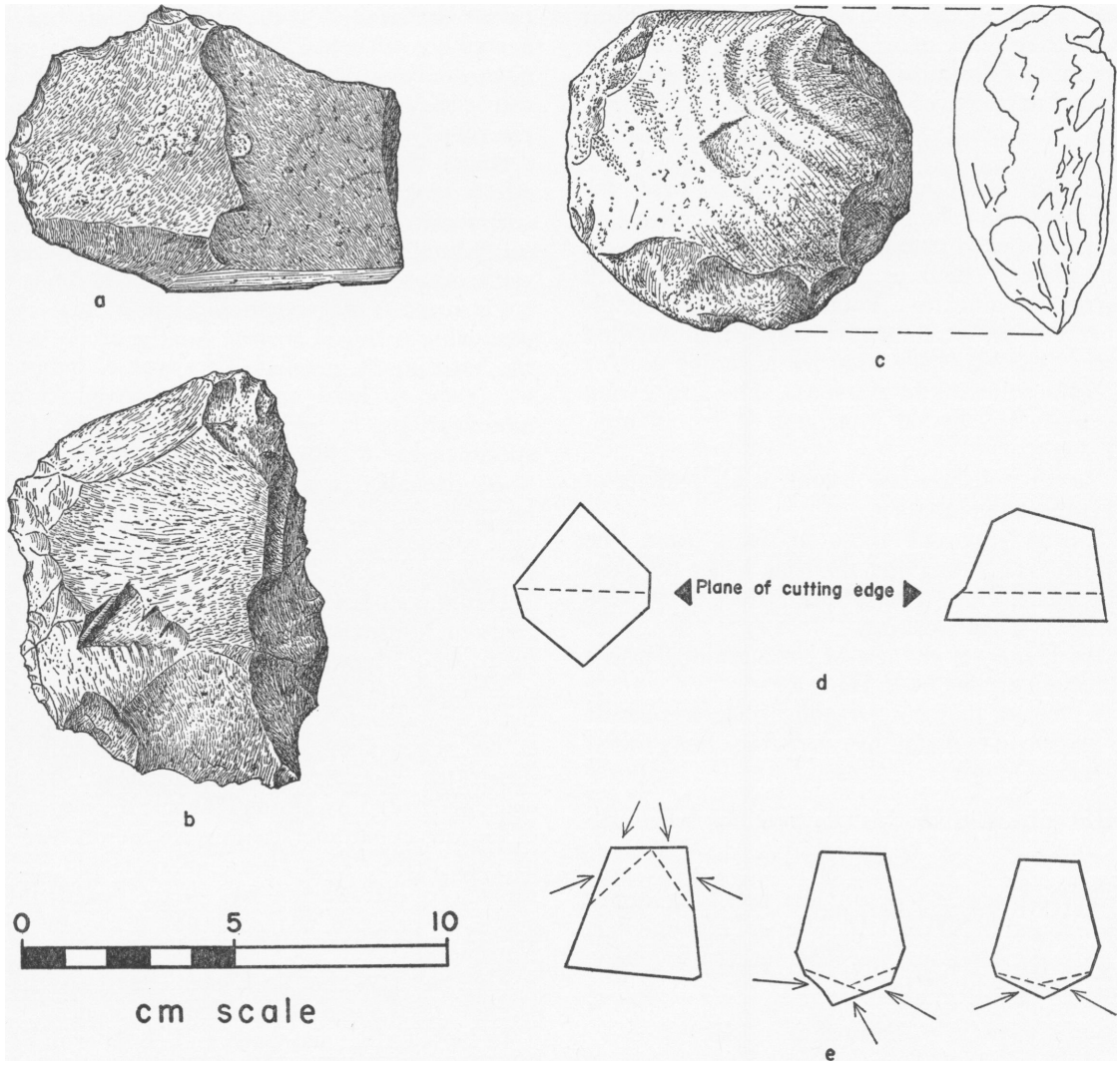

FIG. 33. a. Retouched stone flake scraper-knife. b. Cleaver flake. c. Hammerstone. d. Method of determining plane of cutting edge for adzes of Mouaka type or unused adze blanks. e. Method of flaking adzes of Koma type.

ished rotary drill weights. However, the drill weights I have examined from the southern Marquesas are made of harder stone and have well-polished surfaces, whereas these are rough.

STONE CYLINDER

A cylindroid of soft, vesicular basalt, which may have been used as a maul, was found on the surface of NHuu 1. No other artifacts of this type were recovered, and no significance can therefore be attached to it at the present time.

SCRAPING OR CUTTING TOOLS

This large class of artifacts is of a very generalized nature. The Marquesans did not lavish effort on making tools for scraping or cutting, preferring rather to use the random by-products of other operations which required little further preparation. Because of the generalized nature of the artifacts, we can say little about their use. It is possible only to delimit a variety of jobs in which each of the various artifacts may have been used. Neither ethnographic data nor

comparative archeological material is of much assistance in extending knowledge of these artifacts. (The only published study of archeological material of this type is that of Gifford and Shutler[1] on the New Caledonian material.) The artifacts are discussed here according to the materials of which they are made.

Stone Flakes

Figure 33a

This group of artifacts is composed of all the random shop flakes that resulted from adze making and other stone-working activities. They were used without modification. Apparently no attempt was made to attain any special shape with these flakes by retouching. Approximately 20 per cent of the flakes from any given site show signs of prolonged use, such as dulled, rounded edges and marked patination over the flake scars or fresh surfaces, which indicates that they were used for cutting and scraping. Undoubtedly the remaining flakes were all used for a variety of purposes, but their use was not prolonged enough to leave specific evidence. Random stone flakes were most frequently used in food preparation—cleaning fish and mammals (including humans).[2] Flakes were still used for this purpose long after the stone adze had become a useless heirloom among the Marquesans. For example, at Site NHaa 1, trash pits discovered west of the burial hill, in the uninhabited area of the site, had been used for the disposal of the remains of fish feasts. These contained large numbers of flakes, one small pit alone producing 28 specimens.

Stone flakes were also used surgically in skull trephining and in bone setting.[3] Bamboo knives which were always available for finer cutting produced much cleaner incisions.

Stone flakes also served to cut pearl shell and other mollusks in the well-developed Marquesan shell industry. To cut shell, a flake with a straight edge was selected and used with a sawing motion, producing striations parallel to the cutting edge on the flake. Incisions made in shell with stone flakes had wide, V-shaped cross-sections, especially when the shell to be cut was of some thickness. In this case a wide initial cut was made in the surface; successively narrower cuts were made as the incision was carried deeper into the shell. This process leaves small ridges or jogs along the sides of the incision where the bottoms of the earliest cuts were not completely obliterated by the later deeper cuts.

Stone flakes were probably also used for wood working, although there is no way to verify such use. To sum up, stone flakes were used mainly in the preparation of animal foods and in the extensive shell industry (Table 13).

Unmodified flake scraper-knives were used throughout all periods of Marquesan prehistory into the late Historic period.

Cleavers

Figure 33b

These artifacts show definite signs of purposeful selection and modification. A large, heavy-butted flake was struck from a core, either as a by-product of the first stages of adze manufacture or specifically to produce a cleaver. The thin edges of the large flake were then retouched by the removal of secondary flakes from its outside surface until it was roughly quadrangular in plan, with a unifacial beveled cutting edge along the side parallel to the butt surface and often on the other two sides as well. The flake butts were not retouched. These artifacts were put to a variety of uses. Their main use was apparently for heavy-duty scraping, probably in wood working. They also served as hammers occasionally, as their relatively thin edge made them suitable for fine flaking. Some examples with heavy blunted edges, upon which the retouching has been almost obliterated, had been used both as hammers and as scrapers.

Although the majority of specimens are of the fine-grained basalt used for adze making, a few are of coarse, abrasive, vesicular basalt. The sizes range between 115 by 82 mm. and 57 by 45 mm. (Table 13).

As were the other flake tools, the cleaver was brought to the Marquesas by the earliest settlers and continued in use in the Historic period.

Basalt Prism Knives

These artifacts are made of natural prismoidal fragments of basalt. The long, sharp, straight edges of these prisms in their pristine state made them ideal for knives. The prisms are naturally elongated but were broken by the

[1] Gifford and Shutler, 1956.
[2] Von den Steinen, 1928, Vol. 3, alpha W, Fig. 6.
[3] Delmas, 1927, 46.

TABLE 13

DISTRIBUTION OF SCRAPING-CUTTING TOOLS

Site	*Tonna*	*Cypraea*	Stone Flakes	Cleavers	Adze Flakes	Choppers	Chert Flakes	Pearl Shell	Oyster Shell
NHaa 1-I	2	—	103	15	9	3	4	15	3
NHaa 1-II	6	1[a]	155	16	53	—	18	2	2
NHaa 2	—	1	—	—	—	—	2	—	—
NHo 3-I	—	6	10	1	3	1	—	4	1
NHo 3-II	—	8	7	—	2	—	3	3	2
NH 4	—	4	—	—	1	—	—	32	1
NHtv 1	—	1	1	—	1	1	—	—	1
NBM 1	—	—	193	1	6	—	—	23	—
NBM 4	—	—	76	14	5	—	—	6	—
NHi 1	—	—	—	—	1	—	—	—	3
NT 2	—	—	—	1	—	—	—	—	—
NT 5	—	3	—	—	—	—	—	—	—
NT 8	—	46	—	—	—	—	—	—	—
NHe 3	—	—	—	1	—	—	2	—	—
NHuu 1	—	—	61	1	—	—	—	1	—

[a] Intrusive specimen.

users into handy-sized fragments. Otherwise, the only modification was that occurring as a result of use. Both the narrow and the wide-angled edges were used for cutting, depending completely on the need of the artisan. The sizes vary between 72 by 25 mm. and 30 by 9 mm.

The basalt prism knives occur infrequently, but are found from the Settlement period to the Classic period. The infrequency probably stems from a scarcity of raw material which, although frequently found in much larger size, is seldom found in the size desirable for such knives.

ADZE FLAKES

Flakes were struck from finished adzes, either accidentally in the course of use, or purposely from an irreparably broken adze. A thin-edged, sharp tool could be obtained by removing a flake from one of the highly polished surfaces of an adze, so that the inner flake surface intersected the surface of the adze at an acute angle. A badly broken adze could be used as a core from which many of these flakes could be struck off. No special form was obtained by retouching after the flake was removed (Table 13).

Adze flakes are found in all periods of Marquesan prehistory, from the Settlement period to the Historic period.

CHOPPERS

These tools are made from pebbles and flat tabular stones. They are extremely simple, requiring no preparation other than alternate flaking along both surfaces of one edge, which results in a rippled, serrated, cutting edge (Table 13).

Choppers are rare but occur in all periods of Marquesan prehistory.

CHERT FLAKES

Chert flakes were found at several sites and in surface collections. Some of the flakes show use as scraping tools but only in two instances bear signs of definite shaping: one of these is a flake cleaver found on the surface in Anaho; the other, a scraper in NHaa 2. A core was found in a pit in NHaa 1. The margins were flaked to produce a bifacially beveled edge, but the core itself does not appear to have been used as a tool.

A large yellow chert implement shaped like an Easter Island *mata* spearpoint is in the Mission Collection in Taiohae. It was used in human sacrificial ceremonies on the ceremonial plazas.[1]

The presence of chert in the Marquesas has

[1] Delmas, 1927, 61.

never been recorded by any geological survey of the islands, but, upon questioning the Marquesans about the occurrence of this type of stone, I was told that it is found infrequently, usually along the beaches.

Chert is known as *ke'a ahi* (fire stone). It was used recently in conjunction with steel as a strike-a-light. However, sparks can be produced by striking two fragments together without the aid of steel. Von den Steinen states that flint was used in this manner in Hawaii.[1]

A recent geological survey has recorded sedimentary deposits of types in which chert is found.[2] Pliocene or Pleistocene globigerina ooze is recorded in Tahu Ata, 80 meters above sea level, and coral deposits also appear on Ei'ao at a height of 200 meters.[3] In the past, Chubb[4] reported similar foraminiferal ooze deposits on Nuku Hiva in the plateau between Hakaui and Taiohae.

There is a great deal of free silica in the basalts of the final eruption stages of these islands.[5] The ground water from both subterranean sources and precipitation would rapidly wash this material from rocks and redeposit it. In the discussion of the Marquesan clay samples, it was noted that a removal of silica in solution had occurred, leaving a high percentage of the insoluble alumina. Obelianne records many deposits of silicified sandstone and breccia, resulting from such silica carried in solution and redeposited.[6] In conclusion, there is no reason to postulate an exotic source for this material, as quite superficial geologic surveys have shown that all the conditions necessary for its formation are present (Table 13).

Chert was used for scraping and cutting tools and for fire-making in all periods of Marquesan prehistory. Its infrequency in the collections is due to the rarity of its natural occurrence in the Marquesas.

Extra-areal Comparisons

Stone flakes were used for scraping and cutting on every Polynesian island on which there was suitable stone to make adzes. The usefulness of these by-products of adze making could not have been overlooked anywhere.

In Hawaii there are retouched flake knives,[7] some with two cutting edges and some "backed." Emory told me that used adze flakes are often found in middens there.

The Easter Island knives are made of obsidian and basalt, often taking the form of elongated, blade-like implements. The use of obsidian insured a sharp edge. These sharp edges necessitated a retouch to "back" the blade so that the user would not injure himself.[8] The famous *mata* spearpoints or scrapers of Easter Island have no formal counterpart in the Marquesan materials, with one exception, the single very large ceremonial flint object in the Mission Collection referred to above which is shaped like an Easter Island point. These Easter Island points are as haphazardly flaked as the retouched Marquesan specimens.

In Samoa, most of the archeological flake knives are not retouched. Long flakes with straight or slightly convex edges are found among the stones of house platforms, and these apparently are similar to the basalt prism knives in the Marquesas.[9]

Numbers of scraper-knives and other flake tools are found in New Zealand archeological sites, but, except in the short paper by Knapp,[10] little attention has been paid them. The large variety of easily worked stone available in New Zealand has possibly caused a proliferation of scraper-knives, perhaps occasioning the development of some standard types, as Knapp's paper indicates. Although the description of these artifacts is insufficient for comparison with the Marquesan material, the type designated by Knapp as Type C ("those flakes with a straight or comparatively straight edge for scraping"[11]) is generally similar to the Marquesan cleavers. Exact comparison must await publication of the manner in which these tools were produced. The fortuitously produced flakes found on Marquesan sites display as wide a variation of forms as those illustrated by Knapp. It is essential to know how much of the regularity of these types is a result of purposeful retouching, and how much is accidental.

[1] Von den Steinen, 1928, Vol. 3, 38.
[2] Obelianne, 1955.
[3] Obelianne, 1955, 104, 138.
[4] Chubb, 1930, 20.
[5] Chubb, 1930, 47.
[6] Obelianne, 1955, 104, 130.
[7] Bennett, 1931, 63.
[8] Métraux, 1940, 280–281, Fig. 49b.
[9] Buck, 1930, 368.
[10] Knapp, 1928.
[11] Knapp, 1928, 113.

Duplicates in flint of the Easter Island *mata* are found in the Chatham Islands.[1] These were used as knives, as were, in all probability, many of the "spearpoints" of Easter Island.

Lockerbie[2] illustrates a stone file similar to the Marquesan prismatic knives.

The archeological lithic collections of New Caledonia excavated by Gifford and Shutler[3] are the best described of any material presently available. The flake tools in these collections display a general similarity to the Marquesan and all other Polynesian material in the absence of specialization of the tool forms. More specifically, as with the Marquesan flake cleavers, we find scraper tools doubling as hammerstones.[4] Another group of artifacts, called choppers and scraper-choppers by Gifford and Shutler,[5] are similar to the Marquesan flake cleavers except that most of them are made of cores with bifacial cutting edges, whereas the Marquesan examples are unifacial and made on large flakes. Such choppers and scrapers are found at Site 13, the oldest site discovered in the New Caledonian survey, as are all of the other types of stone tools described by Gifford and Shutler, showing that the antiquity of these tool forms is well established in the western Pacific.

To conclude, simple unspecialized flake tools are characteristic of all prehistoric cultures in the eastern Pacific. The data are at present insufficient for any relationships of a finer order between the flake industries of various island groups to be demonstrated.

These artifacts are made of univalve shells, *Cypraea* or *Tonna* sp. Circular perforations, sharpened by grinding, served as a cutting edge. In the type from *Cypraea* sp., the cutting edge perforation is in the front of the shell. A second perforation, in the rear, allows the strip of vegetable skin removed by the cutting perforation to pass out of the shell and drop off. On the scraper from *Tonna* sp., the cutting edge perforation is so placed on the outer whorl that the strip of cut skin issues from the natural orifice of the shell.

The two scraper types described below are distinguished by the materials of which they are made. This factor is chronologically highly significant. The complementary distribution of the two types makes them time fossils of prime value for gross time delimitation.

Tonna Scraper

Figure 29g

This artifact is made of a small shell of a species of *Tonna* (probably *T. perdix*). The outer whorl of the shell was perforated at any point from one quarter to three quarters of the whorl circumference from the lip. The jagged perforation, which was probably punched or drilled and then broken through, was abraded on a flat stone, to smooth jagged edges and enlarge it. A larger flat facet surrounding the perforation was produced by this abrasion. When a suitable edge was obtained, the tool was ready for use. The shell scraper retains an excellent edge and even after 2000 years can function quite well. These artifacts range in size from 70 to 36 mm. in length and 50 to 23 mm. in width.

This scraper is found only in the Settlement and early Developmental periods of Marquesan prehistory and at no later date. It has not previously been reported for the Marquesas. In Samoa[6] where it was used to scrape taro it is found very rarely.

Shell scrapers made on this principle are found in Fiji[7] and in New Caledonia, where they were recovered by Gifford and Shutler in sites dating approximately at the beginning of the Christian era.[8] Sarasin also recovered similar artifacts in excavations in New Caledonia and Loyalty Islands shell mounds. He gives no proveniences or associations, merely stating that they were numerous.[9] According to Sarasin's informants, these artifacts were used to scrape edible roots and also to sharpen spears. He cites additional occurrences in the New Hebrides, Australia, and Ceylon.

From the Marianas, Spoehr mentions similar scrapers, made of the shell of a species of *Turbo*, from the Objan Site on Saipan, a relatively late site with *latte* megaliths and, therefore, dated about 800 A.D.[10]

A consideration of the data leads to the con-

[1] Skinner, 1923, 98.
[2] Lockerbie, 1953, Fig. 11.
[3] Gifford and Shutler, 1956.
[4] Gifford and Shutler, 1956, 67, Pl. 11*ad*.
[5] Gifford and Shutler, 1956, Pl. 11*w–y*.
[6] Buck, 1930, Pl. 4c.
[7] Gifford, 1951, Fig. 1A.
[8] Gifford and Shutler, 1956, 65, Pl. 8*h*; for dates, 89, Table 46.
[9] Sarasin, 1929, 104, Table 50, Fig. 11.
[10] Spoehr, 1957, 34–43, 157, 171.

clusion that this artifact is confined mainly to Melanesia and Micronesia, found very rarely in Samoa, and nowhere else in the Polynesian islands. Its presence in the early period of Marquesan prehistory adds one more artifact to the list of possibly Melanesian-derived materials in the culture of the Marquesan settlers.

Cypraea Scraper

Figure 29f

The cowrie used for this type of scraper is perforated fairly high on the front and again in the midline near the tapering back. The front or cutting edge perforation is enlarged and sharpened by abrasion on a flat stone, a facet being produced at an angle of approximately 45 degrees to the plane of the cowrie base. The size range is from 77 by 56 mm. to 62 by 45 mm.

This type appeared very late in the Developmental period, increased in frequency in the Expansion period, and continued in use to the present time as an article of prime importance in all Marquesan cook houses.

Linton has described and illustrated these artifacts,[1] as has von den Steinen.[2] Linton lists the occurrence of the type in Kusae, in the Carolines, and in the Society Islands, remarking that it is absent in Tonga. Buck[3] records its presence in Hawaii (Table 11).

As attested by the Nuku Hiva name for the *Cypraea* scraper, *i'i va'u me'i* (cowrie to scrape breadfruit), these artifacts, although also used for general vegetable peeling, were apparently mainly used to peel breadfruit. In the light of their identification with the breadfruit, it is interesting to note the sudden increase in frequency of the *Cypraea* scrapers in the late sites. NHaa 1, occupied for a long span of time, longer than any of the other sites so far excavated, had only a relatively small number of the complementary type of *Tonna* scraper. The increase in frequency of the *Cypraea* scraper can be linked to an increased reliance on breadfruit. The culture, preparation, and preservation of breadfruit were more elaborate in the Marquesas than elsewhere in Polynesia. The relative infrequency of breadfruit scrapers in the Settlement and Developmental periods indicates a somewhat less marked dependence on breadfruit than that displayed in the later sites and in Historic period documentary sources.

The change from the early *Tonna* type to the later *Cypraea* type was occasioned, I believe, by the availability of raw material rather than by any diffusion of material culture items. In the Marquesas *Tonna* shells are definitely rare in proportion to the cowries, which occur in large numbers and are easily procured. In all probability, the scarcity of *Tonna* shells caused the shift to the cowrie. It is possible that the *Cypraea* scraper was diffused throughout Eastern Polynesia, but it could just as well have been diffused *from* the Marquesas as *to* it. The occurrences of this artifact in the Societies and Hawaii may be a feedback from the Marquesas. If, indeed, it was diffused, it will be necessary to trace the appearance of this type in the Tahitian archeological record before its movements can be charted.

Pearl Shell Scrapers

Figure 29a–b

The pearl shell was utilized for scraping-cutting tools fashioned from the outer margin of the valve or from the byssus notch and hinge-line region. Both areas of the shell are seldom used for anything else and are usually discarded. Scrapers made from shell margins may or may not have been hafted in wooden handles. The cutting edges have been partially or completely polished away as a result of use. Specimens cut from the area of the byssus notch make use of a portion of the thick hinge and the entire byssus notch as a handle, the blade section of the implement being cut from the shell adjacent to the byssus notch.

Occasionally small, complete valves of pearl shell were used.

Linton[4] states that scrapers of this type were used in making tapa, in scraping the bark, and in grooving the wooden tapa beaters. He does not illustrate a specimen, but his description of the artifacts indicates that he is referring to the pearl shell scrapers described here. The sizes vary between 114 by 61 mm. and 59 by 40 mm. (Table 13).

Pearl shell scraper-knives are found throughout all periods of Marquesan prehistory. They are probably associated mainly with the tapa

[1] Linton, 1923, 351, Pl. 57c.
[2] Von den Steinen, 1928, Vol. 2, 36.
[3] Buck, 1957, 22.
[4] Linton, 1923, 411.

industry, in which they were used to prepare the strips of the inner bark of the mulberry, the *ti*, and the young banyan to be used in cloth making.

Oyster Scraper-Knives

Oyster scraper-knives were produced by chipping or grinding oyster valves into a rectangular shape, with the cutting edge at one narrow end and the hinge line at the opposite end. The cutting edge was prepared by light flaking to produce an undulating edge. No ethnographic information is available on the use of this artifact. Sizes range between 124 by 83 mm. and 49 by 31 mm. (Table 11).

The oyster scraper-knife is found in small numbers in all periods of Marquesan prehistory.

Shell scraper-knives have a respectable antiquity in the Pacific. The information presently available on these artifacts is meager, however, and no conclusions of importance can be drawn.

In Eastern Polynesia, they are recorded from Hawaii,[1] and it is certain that they will be found on virtually every island where a search is carried out. In Western Polynesia, various types are recorded from Samoa[2] where they are made of species of *Arca*, *Venus*, and *Spondylus*. The *Arca* species was used for barkcloth and breadfruit.

In New Caledonia, shell scrapers play an important role in the preparation of coconut and the cleaning of root crops.[3] Several types were used, according to this source, including species of *Pecten*, *Cardium*, *Arca*, *Patella*, and *Mytilus*. Some specimens were perforated and fitted with a cloth grip, but most were used unhafted. Knives were also made of shell of species of *Meleargina* and were perforated for attachment to the belt.[4] In excavations, Gifford and Shutler[5] found perforated and unperforated shells of species of *Pecten*, *Arca*, and *Gafrarium* used as scrapers, and other bivalves showing perforation but no worn edges. Shell knives with elongate blades were made of species of *Strombus* and *Conus*.[6]

[1] Bennett, 1931, 82.
[2] Krämer, 1903, Vol. 2, 203–204; Buck, 1930, 109, Pl. 31, B4–5.
[3] Sarasin, 1929, 90, Table 10.
[4] Sarasin, 1929, 91, Table 10 F5–7.
[5] Gifford and Shutler, 1956, 65, Pl. 8*ag*, Pl. 8*ah*.
[6] Gifford and Shutler, 1956, 65, Pl. 8*v*.

It should be noted that the majority of shell scraper-knives found in New Caledonia and Fiji do not have a straight lateral cutting edge, but have circular cutting edges ground around perforations. The Polynesian scrapers, on the other hand, are generally equipped with lateral straight edges, except for the *Tonna* scrapers of the Marquesas and Samoa and the cowrie scrapers found throughout Eastern Polynesia.

PROBLEMATICAL SHELL ARTIFACTS

Scallop Shells

Two perforated valves of a red scallop (*Pecten* sp.) were recovered in NH 4. One of the valves is complete, with a perforation near the umbo. The other is fragmentary, with two perforations near the margin of the valve. These artifacts resemble the scraper-knives made of the same material described by Sarasin[7] for New Caledonia. No signs of use were visible along the edge. The dimensions are 65 by 68 mm.

Cardia Section

A cut and polished, shield-shaped section of a *Cardia* valve was excavated in NHaa 1 II. The edges may have been polished either by use or intentionally. The ridged exterior of the shell seems to have been worn by the same agency that smoothed the edges.

PIERCING TOOLS

Urchin Spine Drills

Figure 35g

These implements are made of the spines of urchins of *Echinometra* or *Heterocentrus* species (*ha'a tuke*). They are modified only by use. These drills could have been fitted to a bowdrill or used unhafted. (Tests proved that these tools are efficient when used unhafted.)

The distal extremity of the spine was the point of the drill; the proximal end was either held in the hand or hafted. The light attrition on the ends of these drills is asymmetrical. They were probably used mainly with wood or other soft materials, as shell would have been far more abrasive against the drill point, reducing it quite quickly. The attrition of the point continues at the most about 10 mm. up the shaft.

Urchin spine drills were previously unknown

[7] Sarasin, 1929, 90, Table 10.

TABLE 14

DISTRIBUTION OF PIERCING TOOLS

Tools	Sites									
	NHaa 1-I	NHaa 1-II	NHo 3-I	NHo 3-II	NH 4	NBM 1	NBM 4	NBM 5	NT 8	NHi 1
Urchin spine drills	14	—	2	—	—	8	3	—	—	3
Terebra drills	1	4	2	—	—	—	1	—	—	—
Urchin spine punches	2	7	—	—	—	3	—	—	—	—
Bone punches	—	—	3	—	—	—	—	—	1	—
Urchin spine gouges	2	5	—	—	—	—	1	—	—	4
Rib gouges	—	—	—	4	—	—	—	—	—	—
Pearl shell needles	—	1	2	4	—	—	—	—	—	—
Bone piercers	—	1	3	3	4	—	—	—	—	—
Wooden needles	—	—	—	—	2	1	—	—	—	—
Marlin spikes	—	—	—	—	2	—	—	—	—	—
Projectile points?	1	—	—	—	—	—	—	—	—	1

in the Marquesas. Linton reported that his informants told him of drills tipped with stone, rats' teeth, or sharks' teeth, but he does not mention urchin spines[1] (Table 14).

Urchin spine drills are found in all periods of Marquesan prehistory from the Settlement up to the Historic period. Nails were begged from the early European voyagers, probably to replace such drills. It is more than likely that these artifacts were held unhafted in the hand and that they were used to work wood or other soft materials. The drills with the stone or tooth points, described by Linton, may have been used for harder materials, although it is surprising that such artifacts were never recovered. Stone drill points would have been especially noticeable, but none appeared. It is, furthermore, difficult to see how a curved point, such as a rat or shark tooth, could possibly have functioned on a bow or cord drill.

Linton is certain that the Marquesans used the bowdrill occasionally, with a perforated stone disc weight.[2] Such discs, however, are found only in the southern group of the Marquesas, from our present knowledge. Von den Steinen,[3] on the contrary, believes that the bowdrill with the stone weight was a European introduction into Fatu Hiva, being used first to repair firearms. However, such use seems highly improbable, as the *Terebra* drill points described below were used with some kind of rotary speed drill, presumably a pump or bowdrill.

Cord or bowdrills were used in aboriginal Hawaii,[4] where they were used with pierced stone disc weights.[5]

Although there is no record of the type of drill used in the Moa Hunter period, one presumes that it was of stone. The large number of drilled stone artifacts found in that period make it impossible to deny the presence of a drill, probably of the cord or bowdrill type, as the precision of the work on the stone trolling shanks and some of the ornaments would have been difficult to attain without a tool of this type. Later, in Maori times, the cord drill with a pierced disc weight was used. The bowdrill may have been present in Samoa, according to Krämer.[6] The aboriginal drill points were made of a small urchin spine called *vana* (*Centrechinus*).

Terebra DRILLS

Shells of *Terebra maculata* and *T. crenulata* were also used for drill points, probably on pump drills, as the attrition of the point is uniform all around. The outer whorl was re-

[1] Linton, 1923, 348.
[2] Linton, 1923, 348.
[3] Von den Steinen, 1928, Vol. 2, 42.
[4] Emory, personal communication, 1958.
[5] Buck, 1957, 194–196.
[6] Krämer, 1903, Vol. 2, 203.

moved almost completely, to facilitate hafting. The points of most specimens have been dulled by use almost to the point of exhaustion. The sizes vary between 71 by 17 mm. and 45 by 10 mm. (Table 14).

Terebra drill points are probably associated with the pump or bowdrill. These are found in every period of Marquesan prehistory from the Settlement to the Historic period. There seems to be no reason to doubt that the pump or bowdrill was present from earliest times in the Marquesas.

Urchin Spine Punches

The long stout spines of sea urchins, judged from the battering on the tips, were apparently used occasionally as punches. No other modifications are found on these artifacts. Most of the specimens are broken, as if from rough use, and are identifiable only from the scarred points. They may have been used to open bivalve shells by breaking through the byssus notches. The maximum dimensions are 58 by 9 mm. (Table 14).

These artifacts are found in all periods of Marquesan prehistory. That they appear so infrequently in the archeological record is probably attributable in part to the difficulty of identifying them.

Bone Punches

These artifacts are of a generalized nature. They usually consist of an articulatory knob of an animal long bone, with a portion of the shaft broken into a rough point and occasionally sharpened by light abrasion. One example, a nine-sided solid bone shaft, probably of whale bone, has been worked quite extensively. The point is broken. The sizes vary between 156 by 36 mm. and 55 by 20 mm. (Table 14).

The distribution of these artifacts is too limited to permit a definitive statement of temporal position. It can be stated definitely that the bone punch was not found in the Settlement or Developmental periods, or it was used quite rarely, as none was excavated at NHaa 1.

Artifacts of this type from New Zealand[1] are reported as plentiful because of the abundance of the *moa*, from the bones of which they were fashioned.

[1] Duff, 1950, 221.

Pearl Shell Needles

Small, flat, narrow needles were cut from the central portions of the valve of the pearl shell, often intersecting the muscle scar on the interior of the valve. The ends of these needles were tapered, but the points were blunt and slightly beveled, usually on one face. The sides were straight or almost convex. Their use is unknown. The sizes vary between 69 by 7 mm. and 60 by 10 mm. (Table 14).

This type of artifact appears rarely in the late Developmental period, increases in frequency later, and continues into the Classic period.

Bone Piercers

These objects are made of a variety of osseous material, including the sturdy fin spines of large fish and mammal ribs (probably whale). Unfortunately no ethnographic data are available on their use. They probably had a variety of uses, for few Marquesan artifacts were highly specialized. One may surmise that they were used in mat making, clothing manufacture, and even possibly in roofing (Table 14).

As are bone punches, bone piercers are infrequently found in the Settlement or early Developmental periods, but are more common in the late Developmental period and continue to the Classic period and probably into the Historic period, although no specimens are known in the ethnographic collections. The bone piercers resemble the bone "cloak pins" of the Moa Hunter and Maori periods in New Zealand.[2] Actually, some of the artifacts in question may have had a similar use, but it appears more likely, from a study of the wear, that they were used as piercers, as implied by the name. McAllister[3] records similar curved bone needles from the Hawaiian Islands.

Wooden Piercers

From the artifacts excavated at NBM 1 and NH 4, two Expansion period rock-shelters, it is possible to reconstruct a more complete picture of the total material culture of the Marquesas than from other sources because of the large quantity of vegetable fiber and wood preserved, materials that rapidly decay in ordinary sites. Among the interesting artifacts found in both these sites was a group of wooden artifacts,

[2] Duff, 1950, 130–133.
[3] McAllister, 1933, 32, Fig. 12a.

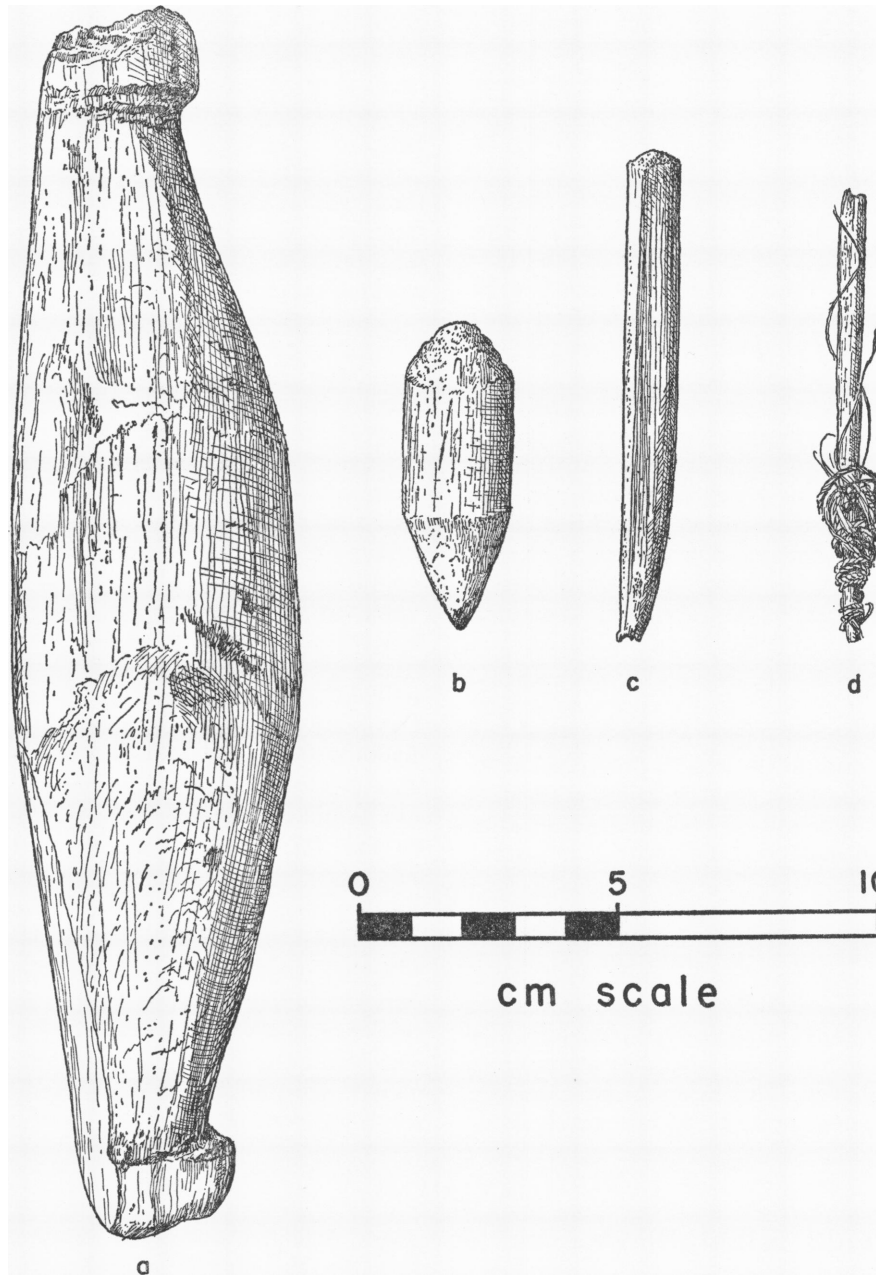

FIG. 34. Wooden artifacts. a. Net float. b. Toy top. c. Marlin spike. d. Needle.

some intended for use as needles and some possibly as marlin spikes for rope working.

The needle-like objects (Fig. 34d) were rough, scarcely shaped, random wood splinters, with one sharpened end to which a thin, two-ply, Z-twist cord was tied. These may have been used in splicing or rigging work or in net making.

The "marlin spikes" (Fig. 34c), although much smaller than their European counterparts, were comparatively well shaped, square or round in section, with blunted points. They were

made of hard woods, one of which was identifiable as *Casuarina*.

The size range of the needles varies between 101 by 6 mm. and 87 by 5 mm. The size range of the marlin spikes varies between 127 by 18 mm. and 93 by 9 mm.

No significance can be attached to the spatio-temporal appearance of these artifacts in the archeological record. If the climate of the Marquesas were like that of our American Southwest, where wooden artifacts are often preserved, we would undoubtedly be amazed at the tremendous range of size, shape, and function of artifacts of this simple nature. The very fact that the Polynesians were able to sail to the Marquesas argues that they must have possessed an extremely well-developed complex of tools devoted to maritime specialities, such as sail making, knotting, and splicing.

Projectile Points

Figure 35f

These artifacts are highly problematical. They are made of the cut distal tips of urchin spines which have been abraded regularly around their circumferences to obtain a sharp point. The sizes of the two specimens recovered were 49 by 9 mm. and 33 by 7 mm. (see Table 14). Their chronological significance is uncertain.

GOUGES

Urchin Spine Gouges

Figure 35i

Urchin spines of the same type used for drills and punches were faceted obliquely at the ends for use as gouges. The facets were carefully made in some cases, care being taken to hollow-grind them so that the gouge would have a scoop-like cutting edge. Some examples, however, were very carelessly done. The sizes vary between 106 by 10 mm. and 33 by 7 mm. (Table 14).

These gouges seem to have become extinct in the Expansion period, although they were never frequently used at any time in the past. They were probably used for the more delicate woodworking tasks.

Terebra Gouge

A large *Terebra crenulata* gouge was excavated from a trash pit in NHaa 1 I. The sharp point of the shell had bifacial facets from use as a gouge. The final whorl had been completely removed, to facilitate hafting. The dimensions are 81 by 21 mm.

Rib Gouge

The proximal end of an upper thoracic rib of a mammal (probably a pig) used as a gouge or scraper was excavated in NHo 3 II. The articulatory end of the rib served as a handle. The body of the rib was cut through a short distance from the articulatory end, and the interior rib surface was beveled. The artifact was highly polished as if from use as a gouge or scraper. Its dimensions are 61 by 13 mm.

GRAVING TOOLS

Dog-Tooth Graver

A dog canine used for engraving was excavated in NHaa 1 I. The lingual surface of the cusp had been worn by use until a small facet was formed and the tooth enamel was completely worn off. The enamel farther down the tooth was scratched deeply.

ORNAMENTS

PEARL SHELL DISCS

Figure 35a

Ornamental discs were cut from the central portion of a mother-of-pearl valve. The center of the disc had two perforations. The entire edge was notched with a flake knife held at an acute angle to the surface of the shell. These discs may have been parts of ornaments similar to the well-known forehead ornament (*uhi kana*) of the Historic period. This consisted of a pear shell valve or disc with slightly notched edges. A filigree overlay of turtle shell was attached to this disc by cords that passed through the two central perforations. On such headdresses, an alternating series of pearl and tortoise shell buttons in graduated sizes fastened the overlay to the base.

These artifacts have been described by von den Steinen, Linton, and W. C. Handy,[1] and no further description is needed here. It should

[1] Von den Steinen, 1928, Vol. 2, 17–19; Linton, 1923, Pl. 82c; Handy, W. C., 1938.

be noted that, according to von den Steinen, no *uhi kana* was ever collected in the northern group, although Cook makes some very vague references to something approximating this form.[1]

The two complete specimens recovered were 54 mm. and 10 mm. in diameter. Incomplete specimens were larger.

The pearl shell discs appear in the Settlement and Developmental periods. They may have continued in use until the Historic period, although they are not present in the archeological record.

I believe that this artifact can be identified as the *uhi kana* and related through that to the Melanesian *kapkap*.[2] The specimens found at NHaa 1 resemble those from Melanesia in having dual central perforations and edge notching. The notching on the modern Melanesian disc is frequently omitted, but small triangular-design elements pendent from the edge into the center of the disc simulate edge notching.

The possibility that this object was independently invented must be admitted. However, in view of the number of elements involved and their similar interrelationships within the whole, I think it is unlikely that independent invention can be invoked here to explain the unique occurrence of the *kapkap* outside the Melanesian area. The New Hebrides is the closest island group that shares the *kapkap*.

If the pearl shell discs of NHaa 1 are truly from *uhi kana* or *kapkap* ornaments, then we have another possible Melanesian element in the Settlement period to add to the pottery, the adzes of Hatiheu and Ha'e'eka types, and the *Tonna* scraper. The disappearance of this artifact on Nuku Hiva in the archeological and ethnological record is, however, not easily accounted for. If we postulate that the northern islands were settled first, then its appearance in the southern group may be explained on an age-area basis, in which the more archaic forms persist in areas farther from the heart of the culture. We have no information about sequences or dates in the southern group; therefore we cannot say when this artifact appears there or in what frequency. To conclude, it is very possible that the pearl shell discs of NHaa 1 are from a *kapkap* form of headdress, further attesting Melanesian influence in the Settlement period of the Marquesas.

[1] Von den Steinen, 1928, Vol. 2, 17–19.

[2] Reichard, 1933, Vol. 1, Chap. 3.

SHELL PLAQUES

Figure 35c

These artifacts are small, generally trapezoidal pieces of cut pearl shell. The dermis of the shell has been carefully abraded off, exposing the colorful subdermal layer. They may be intended for inlay in wooden objects or for attachment to clothing for decorative purposes. Unusual care was expended in polishing off the dermal layer. It is doubtful if anything but ornaments or fishhooks would have received that attention.

No partially completed fishhook was ever found, however, that could have been derived from these shapes. Some of the non-trapezoidal pieces are semicrescentic and extremely thin, coming from the edge of the shell which is unsuitable for hook making.

Ethnographic sources do not mention any mother-of-pearl inlay in the Marquesas, which does not present too much difficulty for our interpretation, as the artifacts did not continue in use into the Historic period. The size varies between 43 by 30 mm. and 33 by 31 mm. (Table 15).

Pearl shell plaques appear in the Settlement and early Developmental periods, but begin to decrease in frequency towards the end of the Developmental period and do not continue into the Expansion period.

RECTANGULAR PERFORATED SHELL TABS

Figure 35b

These artifacts are rectangular, usually somewhat oblong, with a perforation near one end of the rectangle. They were probably used as ornaments, although none was found in the direct association with burials. All the specimens, however, were recovered in the ceremonial area of NHaa 1. The size ranges between 31 by 21 mm. and 18 by 8 mm. (Table 15).

These artifacts are found infrequently in the Settlement and Developmental periods, after which they disappear from the archeological record.

FIG. 35. a. Pearl shell disc. b. Perforated pearl shell tab. c. Pearl shell plaque. d. Pearl shell pendant. e. Solid earplug made of spine of *Murex ramosus*. f. Urchin spine projectile point? g. Urchin spine drill. h. Urchin spine file. i. Urchin spine gouge. j. Whale tooth tobacco pipe. k. Bone *tiki*. l. Bone harpoon point. m. Cylindrical type of shell adze. n. Thick poll type of shell adze. o. Bone reel.

PEARL SHELL PENDANT

Figure 35d

A fragment of what was apparently an oval pearl shell pendant was recovered at Site NBM 4. It was perforated near one end and was highly polished on the skin side. The fragment was 59 mm. wide and 55 mm. long. As no other shell pendant was recovered at any site, no statements can be made as to its chronological significance.

WHALE TEETH

Figure 36a–e

The whale tooth ornament (*ei*), so common in all of Polynesia, is frequent in the Marquesas. Rarely, however, is a full-sized tooth of a sperm whale or a large unmodified tooth of any type found. All large teeth were broken up for the production of smaller tooth replicas, thus increasing the number of teeth available in response to a pressing demand. Despite Linton's claim that no whale teeth were shaped,[1] the present work indicates that the Marquesans were expert at carving this material. The most readily available tooth, if one can judge from the specimens recovered in excavation and surface collecting, was the small blackfish tooth (Fig. 36d). These whales were evidently either within the range of possibilities afforded by

[1] Linton, 1923, 247.

TABLE 15

DISTRIBUTION OF ORNAMENTS

Site	Pearl Shell Discs	Shell Plaques	Rectangular Tabs	Whale Teeth	Imitation Whale Teeth	Pig Teeth	Shell Jewelry	Solid Earplugs	Compound Earplugs	Shell Trumpets
NHaa 1-I	1	11	—	—	—	—	—	—	1[a]	4
NHaa 1-II	7	37	5	61	—	—	6	—	—	—
NHo 3-I	—	1	—	1	—	1	8	—	1	—
NHo 3-II	—	—	—	4	7	—	—	—	—	—
NH 4	—	—	—	7	—	—	—	—	—	—
NHi 1	—	—	—	—	2	—	—	—	—	—
NBM 1	—	—	—	—	—	—	—	1	—	—
NBM 4	—	—	—	—	—	—	—	1	—	—
NBM 5	—	—	—	—	—	—	1	—	—	—
NT 5	—	—	—	102	—	4	—	—	—	—
NT 6	—	—	—	—	—	—	—	—	2	2
NT 8	—	—	—	—	—	2	—	—	—	—
NHe 3	—	—	—	—	1	—	—	1	—	—
NH 3	—	—	—	—	—	1	—	—	—	—
Surface	—	—	—	10	8	2	—	1	—	2

[a] Intrusive artifact.

Marquesan whaling techniques or came ashore more frequently than others, as 86 per cent of the teeth recovered were of this type, and only 14 per cent were of the cut type. For sperm whales of more impressive dimensions, it was probably necessary to rely on sick or dead, drifting individuals to augment the supply of teeth for ornaments, as it is doubtful if large whales could be taken with the aboriginal techniques.

Although the whale tooth was obviously a sign of rank in the early periods of Marquesan prehistory, it may have become somewhat cheapened during the Historic period, when whale teeth were in abundant supply as the result of the presence of European whalers in the Marquesas. So great was the demand for whale teeth during the late Expansion and Classic periods that imitation teeth, made of the lips of *Cassis* shell, were fabricated, according to von den Steinen,[1] as a kind of "poor man's *ei*." Marchand and Forster both mention the shell "whales teeth."[2]

The *ei* cut from large, sperm whale teeth (Fig. 36c) can be distinguished by the remains of the enamel of the "parent" tooth on one side only, in slightly curving laminae, which indicates that the small tooth is manufactured from a segment of the wall of the larger tooth. The cut teeth have a tendency to crack, or separate completely, along the internal planes of the laminae concentric to the exterior surface of the parent tooth.

Both types of teeth are pierced, usually near the proximal end. In several specimens the tooth has been perforated three times to replace broken perforations. As these teeth were undoubtedly heirlooms, many were probably used over a long period of time and thus subjected to all the attendant hazards. The size varies between 61 and 41 mm. in length and 17 and 8 mm. in width (Table 15).

IMITATION WHALE TEETH

Figure 36a–b, e

Imitation *ei* are made of the cut and polished lips of *Cassis* shell, *pu tupe* (Fig. 36e). The lip was detached by a cut along its outer, rear margin, which separated it from the outer whorl of the shell. The lip was then polished, to remove the crenulations and the fold, respectively, on the interior and exterior of the lip. If these could not be obliterated, they were smoothed out and rendered less noticeable. Almost invari-

[1] Von den Steinen, 1928, Vol. 2, 22.
[2] Von den Steinen, 1928, Vol. 2, 22.

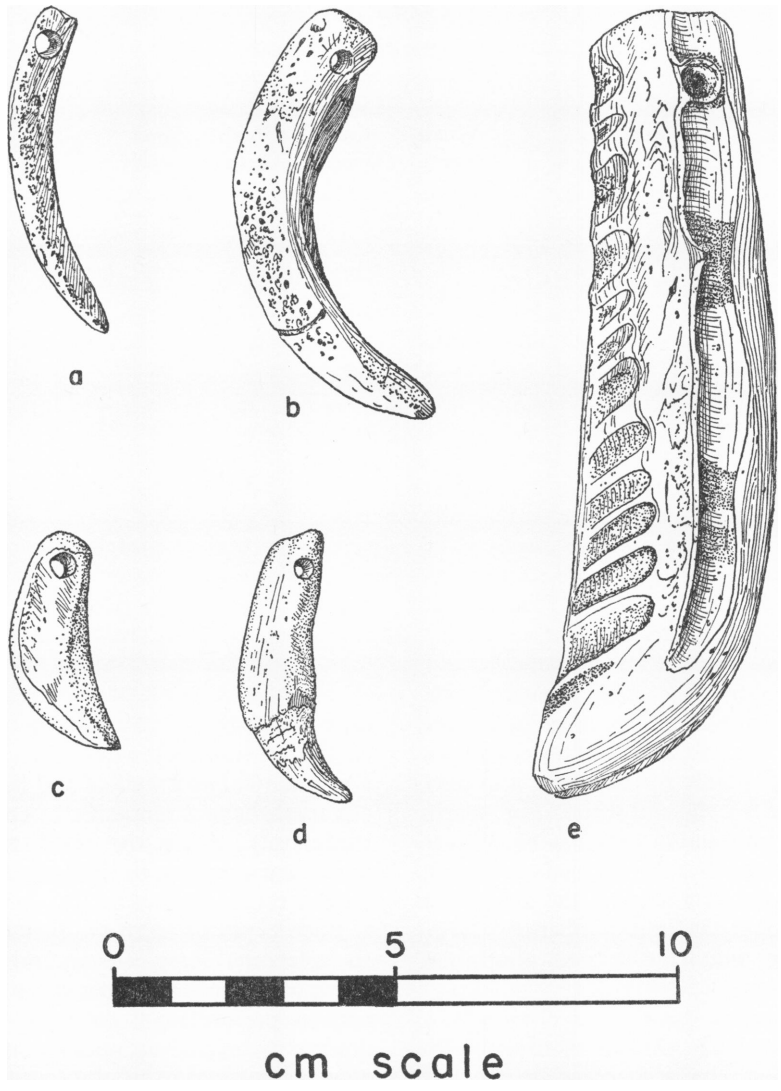

FIG. 36. Whale teeth. a–b. Imitation whale teeth cut from *Murex* shells. c. Whale tooth carved from section of large tooth of sperm whale. d. Unmodified whale tooth. e. Imitation whale tooth made from lip of *Cassis* shell.

ably a close examination of these artifacts discloses either incompletely obliterated crenulations or traces of them in the grain of the lip if they have actually been removed. These specimens are a chalky white if poorly preserved, mottled with red and brown dots if well preserved. Perforations are counterdrilled from each side of the top which was cut and flattened off to resemble the root end of the whale tooth. The drill marks on these teeth bear evidence of the use of a rotary drill with a tapering bit.

Rarer than the *Cassis* lip specimens are *ei* made of the lip of the large shells of *Murex* sp. found so frequently in the Marquesas, *pu ta'a ta'a* (Fig. 36a–b). The curved lip of the orifice is detached from the shell and polished, but such specimens are inferior in quality to the *Cassis* imitations, as they are often riddled with parasite borings and are also short and flat. The size varies between 128 and 100 mm. in length and 38 and 25 mm. in width (Table 15).

Whale tooth ornaments are found in the cul-

ture of the earliest Marquesans and continued in use through the Historic period. The majority were uncut teeth of small whales, with a few examples cut from larger teeth. Some large-sized whales were obtained at that time, as attested by petroglyphs and a heavy whale-bone slab in a burial at NHaa 1 recovered in 1956. Such large whales were rare, however, providing material for relatively few teeth. Even at this early period in Marquesan prehistory, large teeth were not preserved intact, but were cut up to satisfy the demand for tooth ornaments that was to manifest itself increasingly as time went on. In the late Expansion period, imitations were made from lips of *Cassis* shell, which indicates that for the first time the demand had far exceeded the supply. At the first European contact, the Marquesans were using both genuine and imitation whale teeth. The demand for genuine teeth was so great that an entire boatload of sandalwood would be traded for a few sperm whale teeth.

Whale teeth were used as ornaments and symbols of rank throughout Polynesia and parts of Melanesia. In Hawaii these artifacts were not numerous before the time of Kamehameha I, who amassed a number of them as spoils of war.[1] Their scarcity was evidently due to the difficulty of procuring sizable whales in sufficient numbers, a situation that also affected the Marquesas. In Hawaii, the lack of genuine teeth spurred the production of stone and ivory imitations. These were gradually elaborated, until a form quite far removed from an actual whale tooth was ultimately attained.[2]

In New Zealand, stone imitations of whale teeth are found in the Moa Hunter period.[3] These became obsolete later, disappearing completely from the cultural inventory by the Historic period, except in the Chathams where many cultural atavisms remained.

Other occurrences of this ornament are in Mangareva,[4] in Samoa,[5] and Tonga, as well as in Fiji where whale teeth are still symbols of honor and prestige and their export is forbidden.

I agree with Duff's[6] statement that necklace ornaments such as whale teeth and reels (p. 140) were once found in the cultural assemblage of the ancestors of the tropical Polynesians. They were subsequently diffused to all parts of Polynesia, becoming obsolete later except in "marginal" areas such as Hawaii, the Marquesas, and Mangareva, and also in the western Polynesian-Melanesian area.

[1] Malo, 1951, 77.
[2] Buck, 1957, 534.
[3] Duff, 1950, 110–122.
[4] Buck, 1957, 533.
[5] Buck, 1930, 629.
[6] Duff, 1950, 80.

PIG TEETH

The tusks of the male pig, and occasionally some of the incisors, were used as personal ornaments, as decoration for trophy heads, and possibly other art work. Usually the tusks were cut at the roots where they were perforated for attachment. Occasionally, they were cut and abraded at both ends. The size varies between 125 and 57 mm. in length and 21 and 15 mm. in width (Table 15).

The pig tusk ornament does not appear until the late Developmental period, but was undoubtedly present before that time. Its scarcity is related to the scarcity of all artifacts made of mammal bone and teeth in the early periods of Marquesan prehistory. Pig teeth were used more frequently in the Classic period.

SHELL JEWELRY

Various types of small marine shells were used to make bracelets, necklaces, and anklets, which are now rarely found in the Marquesas, although they continue in use throughout the rest of Polynesia. The shells were modified only to the extent that they were perforated to allow stringing. Small cowries were perforated at the narrow end with a small punch. *Terebra* and other snails were perforated through the outer whorl near the lip, and the *Nerita* shell had been cut so that only the mouth with the columella remained. The sizes vary from 30 to 16 mm. in length and 22 to 13 mm. in width (Table 15).

The use of small shells as ornaments is evident in the culture of the settlers in the Marquesas and persisted up to the time of the collapse of Marquesan culture, about 60 years ago. Their present unpopularity can be traced directly to missionary prohibitions which made taboo all native apparel, especially that involved with formal festive occasions. Von den Steinen illustrates complete bracelets or anklets of this type from the Colmar Collection.[7]

Judged from the modern distribution of these

[7] Von den Steinen, 1928, Vol. 3, alpha H, Fig. 8.

ornaments throughout Polynesia and Melanesia, the trait should have a respectable antiquity, antedating the eastern-western split of the Polynesians. The appearance of the trait in the earliest period in the Marquesas indicates that such an expectation is well founded.

EARPLUGS

Two types of earplugs were recognized aboriginally in the Marquesas. According to von den Steinen,[1] these were the *taiana*, a small whale-tooth plug fitted into a cone cap, and the *ha'akai*, a large whale-tooth plug fitted into a bone or ivory disc (the *Diskuspflocken* of von den Steinen). The disc or shell cap of such a plug was not fitted into the perforation in the ear, but the small whale tooth was secured by sticks or quills serving as cotterpins which passed through perforations in the tooth on each side of the ear lobe. The tooth projected to the rear of the wearer and slightly outward; the disc or cap projected forward.

SOLID PLUGS

Figure 35e

These ornaments are made of various types of shell. They are carved in the general shape of a whale tooth with a slightly expanded proximal end, which is usually faceted around its circumference. The plug, unperforated and uncarved, is made in one piece and, unlike the *taiana* type, is not used in conjunction with a cap fitting over the proximal end. Materials used were *Murex* sp. spines, lips of the *Cassis* sp., and the heavy hinges of an unidentified clam or oyster. The size varied between 50 and 33 mm. in length and 26 and 11 mm. in width (Table 15).

COMPOUND PLUGS

This type is represented by specimens described by von den Steinen as the *taiana* and *ha'akai* types. Hybrid varieties with features of both types are also included, such as the specimen recovered at NT 6 which consisted of half of a *ha'akai* disc with the undamaged tooth-like projection still intact, fitted into a cap made of the shell of a *Conus* sp., thus becoming a *taiana* plug. On these types, small carved *tiki* figures on the tooth projection are placed distally and medially. The size varies between 62 and 36 mm. in length and 40 and 30 mm. in width (Table 15).

The shell and bone earplugs of the Marquesas were developed in the Expansion period, possibly from wooden prototypes. The first to appear is the unelaborated Solid Plug type. In the late Developmental period this basic form was further elaborated by ornamental carving on the plug portion, the addition of a cap on the proximal end, and perforations for pins to lock the plug in place once it had transfixed the ear lobe.

MISCELLANEOUS ARTIFACTS

TOBACCO SMOKING PIPES

Figure 35j

The Marquesans were introduced to tobacco quite early by European voyagers. They developed quite a liking for this stimulant, with a consequent proliferation of native smoking techniques and utensils. Von den Steinen[2] has illustrated three wooden pipes, one highly carved, demonstrating that wooden pipes were known. The specimens recovered in excavations, however, were naturally of bone or whale teeth. These probably represent, therefore, only a small percentage of the pipes actually in existence, and it is probable that most of those were made of wood.

Two of the three known native examples were made of whale teeth and were recovered from graves in P-A, NT 5. As they are distinctive, I describe each separately.

The most interesting specimen (NT 5, 85-1101; Fig. 35j) is 75 mm. tall and 44 mm. wide, barrel shaped, but with a slight curve resulting from the natural curve of the sperm whale tooth. Around its circumference at the top and bottom are horizontal ridges, four at the top and three at the bottom. A large stem perforation through the side of the pipe, quite low, admitted the wooden stem. The ridges on these ornaments are quite similar to those found on the "reel" ornaments of the Moa Hunter culture of New Zealand.[3] They undoubtedly stem from the same source, a common element in the substratum underlying both the Eastern and

[1] Von den Steinen, 1928, Vol. 2, 23–25.
[2] Von den Steinen, 1928, Vol. 3, alpha S, Figs. 8–10.
[3] Duff, 1950, 79–95.

Western Polynesian cultures. "Reels" are found at present in Hawaii, Fiji, Tonga, Rotuma, and Atiu.[1] More recently they were occasionally worn by the Maori, although often such specimens seem to have been archeological surface finds rather than contemporary productions.

The second pipe (52 by 24 mm.; 85-1102) was shaped like a whale tooth, with a sharp lower taper. Two horizontal grooves of the same type as those found on Fig. 35j encircled its mouth.

A third pipe (73 by 33 mm.) was found by a Marquesan on the surface in Anaho. It was very poorly made of porous whale bone, shaped like a whale tooth.

BONE REEL

Figure 35o

This artifact, found in Stratum II of NHo 3, is made of a section of long bone, probably nonhuman. It is decorated by two horizontal grooves separated by a mid-ridge, with a raised lip at each end. The interior of the tube shows two polished, longitudinal tracks. Informants stated that these artifacts were used as slides on coconut fiber loops to hang large, highly decorated wooden bowls (*ko'oka'a*), on house walls, and also as loop handles for dance plumes. The reel is 24 mm. in diameter and 14 mm. in height.

The unique occurrence of a reel of this type in a late site cannot form the basis for a satisfactory statement of chronological importance. All other occurrences of the grooved and ridged reel type of decorative pattern are also in the late period (the two pipes of NT 5, the earplug disc at NHaa 1 III). These occurrences might be interpreted as indicating that the reel motif is a late phenomenon, despite its early appearance in durable material in Moa Hunter New Zealand. I must emphasize that I do not imply that the reel motif *per se* is late in the Marquesas, but merely that its appearance in durable material is late. It undoubtedly developed in the Marquesas from a wooden prototype.

TU'A

A fragmentary bone plaque found in P-E, Site NT 8, was identified as a parietal ornament, or *tu'a*, by my informants. There is no reference to this artifact in the literature, nor could the informant recall very much about similar objects he had seen. It seems to have been a wing-shaped bone plaque attached to a headband (probably of coconut fiber) by cords passed through the two perforations in its narrow end. The plaque had been placed in an ossuary. It was 84 mm. long and 74 mm. wide in its fragmentary state.

MUSICAL INSTRUMENTS

Most Marquesan musical instruments were of bamboo; fewer, of other types of wood. None would, therefore, survive very long in the usual archeological deposits. Trumpets made of marine shells do, however, endure under the most adverse conditions found in the Marquesas, thus giving us some clue to this aspect of native culture which has now almost completely vanished because of the missionary ban on all native musical instruments and music.

The trumpets described here are called *pu* generically by the Marquesans, but can also be differentiated more precisely by reference to the species of shell of which they are made: *pu tupe* for the trumpets of shells of *Cassis* sp. and *pu tokatoka* for the large trumpets of *Charonia* sp. Von den Steinen reports that the trumpets of *Charonia* sp. were used for war and to announce births and deaths.[2] He does not describe a trumpet of a *Cassis* sp., however, the use of which may have been different. The trumpets of both species vary in size between 308 mm. and 141 mm. in length and 208 mm. and 62 mm. in width (Table 15).

Both *Charonia* and *Cassis* trumpets were brought to the Marquesas by the earliest settlers and remained in use until the Historic period.

BARKCLOTH

Naturally, archeological barkcloth in a good state of preservation is quite rare in the Marquesas. Some tiny scraps excavated from NBM 1, the dry Expansion period shelter, had been reduced to formless lumps of gray, fibrous material. A burial cave in Hapatoni, Tahu Ata, yielded samples of two types of tapa and European woolen stuff, while a fisherman's shrine, NBM 6, contained a virtually complete loin cloth (*hami*) in comparatively fair condition.

[1] Duff, 1950, 84.

[2] Von den Steinen, 1928, Vol. 2, 58–59.

The tapa was water-marked and non-water-marked. The water-marked specimens found in NBM 6 and the Hapatoni burial cave had been impressed by beaters with parallel striations. The borders had been decorated by crossing the beater marks, producing bands of diamonds.

Unmarked white tapa had been used to wrap the bundle burials in the Tahu Ata cave. This coarse, heavy material was probably produced solely for that purpose and was not intended to be worn.

The only colored material found was the water-marked specimen from Hapatoni. This had been dyed a reddish brown, probably by application of *eka* (*Curcuma sativa*) or a solution of the bark of the Marquesan trees that contain tannin in large amounts, such as *Casuarina equisetifolia* (*toa*) or *Inocarpis edulis* (*ihi*). Crude barkcloth, still made in Fatu Hiva, is dyed with *eka*, sometimes attaining a color similar to that on the specimen described.

MATS

A fragment of a mat was found in a coconut cup in NBM 6, a fisherman's shrine in the Uea Bay. The mat was woven in a simple checkerboard pattern, with two- to three-ply strands of pandanus leaf.

TOYS

A small fusiform wooden object, excavated in NH 4, was immediately identified by Marquesan workmen as being a spinning top (*niu*) for children (Fig. 34b). The top was 57 mm. long and 21 mm. at its widest point.

NET MESH GAUGES

In Site NBM 1, three strips of bamboo with smoothed, even edges and ends were recovered. They were probably used as mesh gauges for making nets, and are similar to the Hawaiian gauges described by Buck,[1] except that most of these are made of turtle shell. They varied between 168 and 125 mm. in length and 23 and 15 mm. in width.

PROBLEMATICAL ARTIFACTS

A number of problematical artifacts of shell, wood, and bone were recovered. Although they all show signs of human use, it is impossible in the present state of knowledge of Polynesian archeology to identify them.

[1] Buck, 1957, 290.

Pierced Shells

Miscellaneous types of shell had holes drilled or punched in them.

Provenience	Quantity
NHo 3 I	2 *Conus* sp. and unidentified snail shell
NHo 3 II	3 *Murex*, oyster, and an unidentified shell

Murex Spines

Spines from the larger *Murex* specimens, cut and polished, were recovered:

Provenience	Quantity
NHaa 1	1
NBM 5	1

Cut Whale Bone

Fragments of cut and occasionally abraded whale bone are frequently found. In some instances they appear to have been used as files or polishing tools.

Provenience	Quantity
NHaa 1 I	4
NHaa 1 II	5
NHo 3 II	1

Split Long Bone Sections

These are transverse sections cut from long bone shafts which have been split longitudinally. They may be fishhook blanks.

Provenience	Quantity
NHaa 1 II	1
NHo 3 II	1

Drilled Bone Tab

A small tab of bone, 28 mm. long and 7 mm. wide, was found in NHaa 1 II. It had been drilled with a fine rotary drill.

Wood

A number of wooden objects, nearly all fragmentary, were recovered in the two Expansion period, dry shelter sites, NBM 1 and NH 4. As there is nothing available for comparison, it is impossible to assign any use to them.

Short dowels, hammered on each end, were recovered in NH 4 and NBM 1. They may have been used as plugs in lacing holes of canoe planks.

A large, curved, cover-like object with gouged or punched perforations was found in NH 4. It may be a portion of a bow or stern cover for a

TABLE 16

CORDAGE

Site	Twisted Cord 2-ply Z	Twisted Cord 3-ply Z	2-ply S	Braided Cord 3-ply
NBM 1	39	—	2	52
NH 4	8	2	—	434
NBM 4	—	—	—	2
NBM 6	—	1	—	—

canoe. A long plank fragment recovered at NBM 1 may be a gunwale fragment.

CORDAGE

Cordage was recovered at four dry sites, NBM 1, NBM 4, NBM 6, and NH 4. The materials and techniques of manufacture of the excavated specimens were not so complex as suggested by Linton.[1] Most numerous were fragments of three-ply, braided, coconut husk cord (*pu'u*). Fragments of two- and three-ply, S- and Z-twisted cord were also recovered (Table 16). Aside from the knots on net fragments mentioned above, others recovered were the overhand, cow-hitch, reef, slip, and square knots (Table 17). Coconut fiber was used almost exclusively for the three-ply braided cord, although a small percentage was made of bark and leaves. Twisted cord was almost invariably of bark, mostly that of *Hibiscus tiliaceus*.

The cordage found in these sites is not unusual. It can be duplicated in any sizable collections from Polynesia.

WEAPONS

Nine slingstones were collected on the surface of Sites NT 10 and NT 11; two were found in excavations on Site NHaa 1. These were all unworked stones, probably beach or river pebbles. The sizes ranged between 67 by 60 by 47 mm. and 97 by 46 by 42 mm.

TABLE 17

KNOTS

Site	Overhand	Cow-hitch	Reef	Slip	Square
NBM 1	4	4	1	—	2
NH 4	35	7	2	2	1

PETROGLYPHS AND SCULPTURE

PETROGLYPHS

Only Linton has devoted any real attention to the Marquesan petroglyphs.[2] Handy[3] has written a short article on the relationships between certain petroglyphs in Hiva Oa, those on Easter Island, and the Madjapahit script. Danielsson[4] published a note on the petroglyphs on Nuku Hiva and Hiva Oa. Von den Steinen[5] refers to petroglyphs occasionally, but always in general terms. He failed to record any examples he may have observed during his stay in the Marquesas.

Most frequently petroglyphs were produced by a combination of pecking and incising, varying in depth from a shallow band a few millimeters deep to a steep-sided, round-bottomed channel 2½ cm. deep. Relief and intaglio carving occur more rarely. Relief carving is more often found on cut tufa slabs; one example was found on a basalt boulder. Intaglio is very rare, but, when it does appear, it is used on large figures that must have required much effort.

In the following discussion of the petroglyphs, I try first to segregate the dominant motifs and

[1] Linton, 1923, 377–379.
[2] Linton, 1925, 96–100.
[3] Handy, E. S. C., 1943.
[4] Danielsson, 1954.
[5] Von den Steinen, 1925, Vol. 1; 1928, Vol. 2.

then indicate how, in some measure, they have been combined, when combination appears to have been at least partly systematic.

Among the most common motifs is the *mata komoe*, a large-eyed, round or oval *tiki* face, with a large-lipped, ovoid mouth and protruding tongue. An oval or circle usually encloses the mouth and eyes, setting them off as a discrete unit (Pl. 13a). The numerous variations in this motif may be a result of chronological difference between examples. It is impossible to determine chronological positions too precisely at present, because such petroglyphs are rarely found in archeological contexts that permit dating. This motif is also discussed by von den Steinen,[1] who gives the Marquesan name for it as *mata komoe*. He believes that it is an early motif in Marquesan art. Von den Steinen identifies it as an insignia of the *kaioi*, whom he believes to have been sacrifice hunters rather than a group of pleasure-bent, unsupervised youths, as is the present prevailing conception of that group.

A possible variation is shown by Linton.[2] The concentric-circle eyes seem to have been pushed into one disc, the mouth removed, and the nose, infrequently shown in the archetypical *mata komoe*, protrudes from the center of the disc over the concentric rings. In a *mata komoe* illustrated by Danielsson[3] from Eiaone, Hiva Oa, the mouth has been suppressed completely, while the oval which encloses the eye rings has been extended towards the outer ring, in a channel representing the nose. W. C. Handy[4] illustrates a motif called, according to her, *vai to'e*. This consists of an oval with an arm protruding from the center, and another with a hollow oval containing a narrow pendent body.[5] She states that this motif is found on the joints of the body. Therefore, it would appear to be an abstraction from the *mata komoe*.

The purported Marquesan designation of this motif *vai to'e*, meaning "vaginal secretions" and not "seminal conduit" as she has translated it, may be nothing more than an example of typical Marquesan humor in replying to an inquiring ethnographer.

It was also found in Tahu Ata and Hiva Oa by Linton and Handy[6]; a variation was reported in Eiaone, Hiva Oa, by Danielsson.[7]

According to our present knowledge, the *mata komoe* on Nuku Hiva are concentrated in the Hatiheu, Taipi, and Ha'apa valleys. They were also found on Site NT 5 in a complex combination of petroglyphs that is discussed in more detail below.

In the valley of Hatiheu, they are found on a boulder which had been built into a wall at the livestock enclosure of Mt. Tama, while a large cluster is found in the west entrance passage to *Tohua* Manamana Hawaiki, in the locale called Maiku'u. Another large group of these motifs is found in a house cluster on the fortified ridge of Putoka which leads to the plateau that separates Taipi and Hatiheu. In Ha'apa the motif was found at NH 1.[8] It is also found in NA 1, NA 4, NA 5, and NA 7 in the valley of A'akapa.

Perhaps related to the above are series of concentric circles or a single circle with a center dot. These were reported by Linton[9] as the commonest of all motifs, occurring on all but two sites visited by him. Danielsson also illustrates these motifs in the Eiaone petroglyph which he reported.[10] It is often a question whether these are to be taken as individual discrete elements, where they appear, or whether they are actually parts of unenclosed *mata komoe* in which the relationships of the parts have been obscured by later superimposed petroglyphs.

A variation frequently found consists of the squaring of one or more of the concentric circles. The so-called *vai to'e* motif mentioned above, as well as the *ipu* motif, may also be variants. Circles of this type were found in large numbers in NH 1 and also in Site NT 4 on P-A, Superstructure 2, and Site NT 5 on P-I and P-F. The petroglyph found in Oven 3 on NHe 3 also displayed an element of this type. Other occurrences are on Sites NA 4, NA 6, and NA 7.

Abstract human figures with laterally extended arms upraised or hanging and legs astraddle represent a third motif of high frequency (Pls. 8b, 10b, 11a). It runs a gamut of variations from a simple stick figure, with a

[1] Von den Steinen, 1925, Vol. 1, 172.
[2] Linton, 1925, Pl. 13, Figs. A, F.
[3] Danielsson, 1954, Fig. 1.
[4] Handy, W. C., 1938, Fig. 6, Fb.
[5] Handy, W. C., 1938, 6, Fe.
[6] Linton, 1925; Handy, E. S. C., 1943.
[7] Danielsson, 1954.
[8] Danielsson, 1954.
[9] Linton, 1925, 96, Pl. 13a, c, f.
[10] Danielsson, 1954, Fig. 1.

circle or round depression for a head, to bodies outlined or in intaglio, culminating in the elaborate forms described by Linton[1] in which the lines outlining the two sides of the arm on each side continue downward to delimit the body and become the legs. This emphasizes the bilateral symmetry of the figure as it is normally shown. The two lateral units are united by a pendent, V-shaped element at the groin; the head is usually circular, with dots for the mouth and eyes. Occasionally, in place of a V-groin, there is a pit.

Often, center lines traversing the trunk end in a splayed trident-like projection form the groin. Linton believes that the smooth contours of the limbs are "decidedly at variance with the art canons of the historic natives,"[2] but I fail to see anything in Marquesan art of the Historic period that would justify characterization of the style as "angular." It is frequently difficult to decide whether a human or a lizard is represented. A flat reptilian head with a projecting, straight tongue is represented on a small petroglyph found on a boulder in Ha'atuatua above the Foucaud house. Another example, at NA 3, had a long member pendent from the groin, possibly a phallus or a tail (Pl. 10b).

Another variation is the unique swastika-like form found in the Oven 3 petroglyph in NHe 3.

These were distinguished as an ethno-type by the Marquesans, although there seems to be a difference of opinion on the designation of the type. Von den Steinen records it as *'etua* (god), and W. C. Handy claims that it is called *'enata* (man).[3] Von den Steinen's information on this type is probably more reliable than that of Handy. He believes that this is basic to many of the late Marquesan motifs, such as the *mata hoata*, *hope vehine*, and the *kake* which were derived from it by elaboration or simplification.[4] Derivations such as this may be read in either direction, but the hypothesis advanced by von den Steinen seems quite plausible to me.

The *'etua* or *'enata* motif was found in Sites NHaa 1, NHe 3, NA 1, NA 2, and NA 4. Duplicates of the variant reported from Tahauku[5] are found in the *Me'ae* Teipoka at the west end of *Tohua* Kamuihei in Hatiheu. They are also found in the west entrance to *Tohua* Manamana Hawaiki in the same valley and on a boulder on the Hatiheu-Anaho road east of the place called Teivi'oputiti.

Animal representations are infrequent in Marquesan petroglyphs, but, when they are represented, quadrupeds, fish, and turtles are the most abundant.

Quadrupeds are interesting, as they apparently represent dogs rather than pigs, although pigs were prestige animals in the Historic period (Pls. 9a, 11a). Two quadrupeds are represented by stick figures similar to the stick-figure variations of the *'etua*. The head is indicated by a line; ears are represented with ticks or a triangle. Another quadruped is outlined by incising, while a group of quadrupeds is executed in intaglio. They all have the same characteristics: an elongated body, short legs with paws indicated, elongated necks with small heads and ears, and a long tail curving up and over the back, pointing towards the head.

Motifs of this type have not been published previously in any work dealing with Marquesan petroglyphs, but they occur on the large sculptured head collected by von den Steinen from *Me'ae* Te'i'ipona in Puama'u, Hiva Oa.[6] The quadrupeds were placed at the rear of the corners of the mouth. Von den Steinen's informants told him that they represented pigs, dogs, or rats. He believed that their identification as rats was most plausible, as dogs were not mentioned in legends and, when von den Steinen was writing, were believed to be a European introduction into the Marquesas. As the excavated animal remains have confirmed the existence of dogs in the Settlement period culture, it appears more likely to me that the long-tailed quadrupeds actually represent dogs. These motifs appeared on Sites NHaa 1, NA 1, and NA 6.

Sharks and whales are the marine animals (Pls. 10a, 11b) most frequently depicted. They are stylized, and fins and certain color lines on the body are prominently indicated. Some appear to have extra fins. They are usually presented in profile, but important features such

[1] Linton, 1925, Pl. 15a, d.
[2] Linton, 1925, 98.
[3] Von den Steinen, 1925, Vol. 1, 150; Handy, W. C., 1938, Fig. 3a.
[4] Von den Steinen, 1925, Vol. 1, 170, 163, 162, respectively.
[5] Linton, 1925, Pl. 15d.
[6] Von den Steinen, 1928, Vol. 2, 77–86.

as the tail are rotated so that they are visible. Representations are either outlined by pecking and incising or are in relief. A whale, killer whales or sharks, and a possible tuna are represented on the petroglyph rock at NHaa 1.

At NA 3 a large shark is shown being caught by a human standing in a canoe (Pl. 10a). Two other sites at which fish are represented are in Hatiheu, both near the *Tohua* Kamuihei. In an especially good series located near *Me'ae* Teipoka, west of Kamuihei, the forms resemble the other NHaa 1 forms very closely.

Turtles, outlined or in relief, are more stylized than the fish motifs. The typical turtle motif is in vertical plan, with an oval shell and head, flippers, and tail in the form of small projections. Usually the flippers are swept back as they are in life. Attempts to indicate the sections of the shell are rare. In variations, the flippers are exaggerated in length, and their thickness is much reduced. These representations are found in NHaa 1 and in several sites in Hatiheu, among them *Me'ae* Teipoka and *Tohua* Manamana Hawaiki.

Fish motifs were evidently common in tattoo patterns of the earliest contact period. Quiros mentions that fish were tattooed on the faces of Marquesans he saw in 1576. The fish is also found in the face painting on the tapa-wrapped Colmar trophy skull.[1] A shark on an engraved bamboo in the Louvre[2] demonstrates the method of rotating the body segments to display the features significant to the Marquesans. The head has been turned 90 degrees, and the mouth is depicted as a hole fringed with triangular points to represent the teeth.

Lizards are rarely found in Marquesan petroglyphs despite their frequency in variant form in the wood carving of the Historic period.

The possibility that some of the *'etua* motifs represent lizard-men is discussed above. The only definite lizard representation that I have seen in the Marquesas is a relief on a tufa slab, now in the churchyard at Taiohae (Pl. 12b). According to native informants, this slab was originally in the sleeping platform risers of P-H, Site NHe 3. The body is long, with tapering tail and limbs crooked. A curious collar-like device covers the neck and rear of the head.[3] Lizards seem to have been associated with evil; many modern Marquesans have an unreasoning fear of them which cannot be enunciated clearly but is nonetheless quite strong. Despite this fear, von den Steinen[4] believes that lizard motifs may have represented clan symbols or have served as protective devices. Similar lizard motifs are illustrated by W. C. Handy.[5]

Bird petroglyphs are extremely rare in the Marquesas. Only one example was recovered, and this, fortunately, was excavated in a stratified archeological site, NHtv 1 (Fig. 28d). A stylized parakeet, inscribed with a basalt flake on a slab of pillow-lava, had the head in profile and one wing in vertical plan extended below the head. Despite the absence of bird representations in the archeological record and in the elaborate wood carvings of the Historic period, there is evidence that they were frequent, especially on houses of the highest *tau'a* priests and genealogists (*tuhuka o'oko*). Bird symbols were also used in ceremonies associated with these dignitaries. The bird figures, evidently of wood or other highly perishable materials, were representations of the god, Tehiti kaupeka, a member of the Marquesan trinity, charged with guiding the souls of the priests to the sky upon their death.[6]

The motifs utilized in Marquesan tattoo of the Historic period, as we know them from the works of von den Steinen and Handy,[7] are seldom found on the petroglyphs despite the fact that this highly elaborated style completely permeated wood carving and cloth painting. Perhaps this is because these motifs have developed quite recently. Marquesan tattooing, in its final manifestation, developed in the early nineteenth century from a somewhat different set of antecedents, including checker and triangular motifs used in textiles and weaving[8] and the *mata komoe* and *'etua*.

Von den Steinen believes that Marquesan tattooing had its climax after Cook's visit and is best exemplified[9] by Krusenstern's figure of the *kaioi* done in 1803. This would indicate that the art forms considered "characteristic"

[1] Von den Steinen, 1925, Vol. 1, Fig. 147.
[2] Von den Steinen, 1925, Vol. 1, Fig. 149.
[3] The present-day lizards in the Marquesas are not collared, nor are they elsewhere in Eastern Polynesia.
[4] Von den Steinen, 1925, Vol. 1, 190.
[5] Handy, W. C., 1938, Fig. 4a–b.
[6] Delmas, 1927, 19.
[7] Von den Steinen, 1925, Vol. 1; Handy, W. C., 1922.
[8] Von den Steinen, 1925, Vol. 1, 127, 188.
[9] Von den Steinen, 1925, Vol. 1, 143.

of the Marquesas developed in a 60-year period, from 1780 to 1840 A.D., and probably in the later two-thirds of that period, between 1800 and 1840 A.D. By 1825 A.D., the tattoo had become differentiated from that shown by Krusenstern in 1803 and resembled the examples that we know from von den Steinen and Handy's photographs.

If one accepts von den Steinen's theories of the development of Marquesan art, the Historic tattoo motifs would have arisen late and would not have had sufficient time to become frequently reproduced in petroglyphs before the collapse of the culture. Four occurrences of tattoo designs of Historic type in petroglyphs are known: three on Nuku Hiva and one on Hiva Oa.

In Site NA 7, a large complex design element was cut into the face of an elongated, natural basalt pillar that had been built into the side of a house platform. *Mata komoe* and concentric-circle motifs on the inside of the slab carry evidence that it had once been exposed in some other fashion and that these tattoo designs in this instance are later than the *mata komoe* and concentric circles. The total design is quite difficult to identify, although various elements of it are recognizable. It appears to be a large, highly stylized mask, bilaterally asymmetrical, a design technique characteristic of the art of the Marquesan Historic period.

The second example, on a red tufa slab which was removed from an unknown site in Hakaui, is found in the churchyard of Taiohae (Pl. 12a). This is an excellent reproduction of Historic period tattoo motifs organized into a coherent whole. The total complex represents a highly stylized mask, consisting of two equal-sized and similar units on each side of a central line. The outer units are *ipu* motifs above a *mata hoata* motif.[1] The interior subunit consists of half of a *mata hoata* surmounted by two *ipu* arranged vertically, with a triangle next to them, the base of the triangle against the central line of the whole complex.[2]

A very curious group of tattoo motifs was seen in the Mission yard in Hiva Oa. These were carved on six short, eight-sided tufa posts which had been taken from a site on Mission land in Atuona Valley. The more elaborate portions of the design are restricted to two wide pairs of opposed sides. The intervening narrow sides are often filled with short, lateral, parallel lines. The upper ends of the posts are encircled by parallel grooves; the lower ends, uncarved, are probably intended to be placed in the ground. The most common design appears to be the *mata hoata* and variations of it. An arrangement resembling the *po'i'i* and *papua* motifs, the former a derivative from the *mata komoe* discussed above, occurs on one more elaborate specimen. The *po'i'i* and *papua* were used on the knees in female tattooing,[3] the *po'i'i* as an oval motif on the knee cap; the *papua*, as its name indicates, surrounds it. The *po'i'i* is unfinished, and no facial features are discernible. It may also be an *ipu* motif.

Ipu motifs were also observed at Site NH 1, where a variant with a center bar was associated with a group of concentric-circle motifs. An *ipu* or *mata hoata* motif was found on an isolated petroglyph above the Foucaud house in Ha'atuatua.

Sexual motifs are noticeably absent on Marquesan petroglyphs. Only three highly problematical petroglyphs were seen that might be interpreted as genitalia. A small petroglyph on Superstructure 2, P-A, Site NT 4, may represent the female genitalia. A figure on the petroglyph rock on NHaa 1 may represent a penis; a similar motif occurs on the petroglyphs at *Me'ae* Teipoka in Hatiheu.

Interesting and rare petroglyphs are relief or incised figures or faces on fortuitous stones which naturally resemble human figures. The best example is the large *tiki*, called Hu'upeke, mounted on a temple platform in the extensive ceremonial complex in Ta'a'oa, Hiva Oa (Pl. 8a).[4] The stone is a flat-topped cylindroid of basalt, on which the features of a typical Marquesan *tiki* have been carved in relief. A part of the mouth has been obliterated by exfoliation, but the rest of the figure is in excellent condition. A small dip in the side of the cylindroid was deepened to produce the effect of a shoulder on the figure, although such was impossible on the opposite side of the stone as there were no corresponding natural dips. The style of the *tiki* is exactly like that of the small

[1] Von den Steinen, 1925, Vol. 1, 168–173.
[2] Von den Steinen, 1925, Vol. 1, 106, 126, 143, 185.
[3] Von den Steinen, 1925, Vol. 1, 106.
[4] Linton, 1925, 138.

tufa *tiki* illustrated by Linton[1] seems to have been characteristic of the southern group, especially Hiva Oa. The same style is again repeated on the numerous *poivi tiki* of human bone, which are so favored by art collectors.[2] The only other relief figure on natural stone was a *mata komoe* face, carved on the end of a saddle-shaped, adze-sharpening stone. This was hidden in a house platform in Hatiheu.

There is some evidence of attempts at depicting important events in petroglyphs as well as the purposeful combining of certain motifs to produce rhythmic patterns of some complexity. Only two examples of petroglyphs might be identified as representing events of everyday experience. Most certain is the western petroglyph on NA 3, where a large shark (whale shark) is depicted with a line leading upward from its mouth to a small *'etua* figure turned at 90 degrees to the vertical axis of the shark, perched on a sausage-shaped figure that might be interpreted as representing a canoe. A similar scene on the petroglyph rock on NHaa 1 is shown: an *'etua* figure connected with a turtle figure by a long line, terminating in the back of the turtle.

In many cases, the efforts to combine petroglyphs in rhythmic patterns seem to have been carried far, producing a baffling superposition of interweaving elements that is very hard to unravel. Such groups are found on Sites NHe 3 (P-H), NT 5 (P-I and P-F), NT 10, and NA 4 (Pl. 9b). They can be divided into two general types. In one type extensive use is made of lines surrounding narrow, elongated, and often curving fields in which concentric-circle motifs and *mata komoe* are interspersed, with or without symmetry. These give an impression of striving to attain a linear type of decoration similar to that which later developed in the Historic period. The effect is very tiresome and uninteresting, lacking the balance and smoothness of contour that the *mata komoe* display. It gives the impression of experimentation with a new design concept.

The second type of synthesis of motifs was found in NA 4 (Pl. 9b) and in the petroglyph rock reported by Linton in Tahauku.[3] The *'etua* figure predominates in these groups. The *mata komoe* is also used, but infrequently. There is a minimal use of long lines to connect or surround blank fields. The spread arms and legs of the *'etua* give good opportunities for serial linking of these motifs horizontally and vertically, with head either up or inverted. Thus, on the south side of the boulder a line of *'etua* extends across its lip and descends down its west side, all in inverted position. The components of the horizontal line are linked by their hands, while those of the vertical line are linked hands to feet. A *mata komoe* has been incorporated in the angle of the vertical and horizontal lines, probably as an afterthought. On the other side of the stone, a *mata komoe* is flanked at the mouth by two *'etua*, which delimit the face. Another *'etua* encloses the right eye of the *mata komoe* in the space between its upper arm and thigh. The ends of its arms are elaborated into circles which are connected by a bar. The empty field between the circles and the upper arms of the *'etua* could easily be modified to form a mouth.

The mode of attachment of *'etua* figures found in NA 4 is also present in the upper portion of the Tahauku rock. In most cases the figures are joined by their arms and feet, but a diagonal arrangement is also produced by the joining of the right foot to the left hand of one figure, which, in turn, is joined to the left hand of another.

In a small group of petroglyphs in Taipivai the same method of uniting a series of *'etua* was utilized, but the rock on which this group was carved has exfoliated badly; only a few *'etua* legs and one complete figure remain.

Extra-areal Comparisons

There is, as is commonly the case in Polynesian archeology, relatively little comparative material available on Pacific petroglyphs. The outstanding exception is Lavachery's exhaustive compilation and discussion of the petroglyphs of Easter Island.[4] Other material is scanty and scattered throughout the literature. Publication of a large number of Hawaiian petroglyphs may be expected soon, as a result of Emory's recent work on petroglyph sites in the Hawaiian group, which will undoubtedly greatly expand the range and variation of forms from that area.

The *mata komoe* motif is obviously analogous

[1] Linton, 1925, Pls. 7o, 9d.
[2] Von den Steinen, 1928, Vol. 3, beta K, beta L.
[3] Linton, 1925, Pl. 15d.
[4] Lavachery, 1939.

to the *makemake* mask of Easter Island, as Handy has pointed out.[1] Both motifs represent skulls.[2] The mask on Easter Island served as a symbol of *makemake*,[3] the high god of that society, who often appeared in myths in the form of a skull. The mask motif on Easter Island differs from its Marquesan counterpart, however, in the frequency with which the nose and chin are shown and also in usually representing the eyes as connected in a bilobed unit.

Only one example of a mask-like petroglyph is known from Tahiti[4]; it is obviously related to the Marquesan *mata komoe*. The eyes are large and round; the highly stylized nose has the shape of an elongated hourglass. The mouth is not indicated. Other masks from Tahiti, more highly stylized, show only the eyes and ray-like appendages from the head,[5] believed to be a feather headdress.

Some masks, or facial motifs, from Hawaii are much less stylized than the Marquesan and Easter Island examples. Headdresses like those of the Tahitian specimens are often shown.

Masks from the dendroglyphs of the Chatham Islands[6] are comparable to those already cited from Eastern Polynesia. The eyes are large and round, with dots or small circles in the center. The mouth is either a straight line or beaked. The nose is represented merely by a small vertical line.

Masks are numerous on New Caledonian petroglyphs.[7] These resemble the Easter Island forms recorded by Lavachery[8] in the preservation of the nose. Typically, the mask consists of a pair of dots, circles, or spirals for eyes, above which usually converge curving lines for eyebrows, forming an elongated nose separating the two eyes. In variants the eyes are represented by a straight center line in a series of concentric ovals, an extension of which represents the nose. Mouths are shown as concentric series of ovals or single ovals. Luquet[9] illustrates one mask exactly like the *makemake* mask of Easter Island.

Masks are found in Fiji petrographs.[10] The eyes of these figures are like inverted airfoil sections placed beneath arched eyebrows diverging from a central, short, stubby nose. The mouth is a small open oval, with the chin shown as a crescentic line, thickening markedly towards the center. Short, ray-like members radiate from the head. The distribution of these figures is imperfectly known in Fiji; therefore further exploration may add much to our present knowledge. Similar masks are also illustrated from New Hanover.[11]

Concentric-circle motifs are somewhat rarer in Polynesia than the mask motifs discussed above. They are not found on Easter Island. In the Society group they occur infrequently.[12] None is known from the Chatham Islands, Pitcairn, or Hawaii at present. In Melanesia, they are found quite frequently, both in Fiji[13] and in New Caledonia.[14] They often appear with rays radiating from the edges in both these locales, and in New Caledonia are often surrounded by appendages that resemble gear teeth.

The stylized human figure, with arms raised and legs astraddle, has an extremely wide distribution in Polynesia and Melanesia. It is found in Hawaii[15] in a wide range of variations, in many of which the forearms are pendent rather than upraised. It is also found in Tahiti, but less frequently.[16]

Absent from the petroglyphic art of Easter Island, this motif is nevertheless found in the script of the *kohau rongorongo* tablets,[17] on which it appears with some frequency. It is also present in the Chatham Island dendroglyphs, but the head and facial features are often those of the stylized masks such as the *mata komoe* motif, differing in this respect from the rudimentary head of the Marquesan *'etua*, which was indicated merely by a knob or bump, and often absent. Among the Pitcairn petroglyphs,[18]

[1] Handy, E. S. C., 1943.
[2] Lavachery, 1939, 101; von den Steinen, 1925, Vol. 1, 172.
[3] *Tiki;* see Barthel, 1957.
[4] Emory, 1933, Fig. 128b.
[5] Emory, 1933, Fig. 128.
[6] Skinner and Baucke, 1928, Fig. 2.
[7] Luquet, 1926, Figs. 82, 87–88, 139, 191.
[8] Lavachery, 1939.
[9] Luquet, 1926, Fig. 191.
[10] Official Fijian Government Information Photograph G1531.
[11] Bühler, 1946–1949, 262.
[12] Emory, 1933, Fig. 128h–i.
[13] Official Fijian Government Information Photographs 6454, 6456, 6457.
[14] Archambault, 1901, 263, Fig. 4; 1902, 696, Figs. 7–8; Luquet, 1926, Figs. 83, 85, 91–92.
[15] Emory, 1924, Fig. 16.
[16] Emory, 1933, Figs. 129a–b, 130c.
[17] Lavachery, 1939, 392, Pl. 30.
[18] Lavachery, 1936, Figs. 3–4.

motifs similar to the Marquesan *'etua* are also common.

In Fiji, motifs cognate to the *'etua* are as yet unreported, but they are definitely present in New Caledonia,[1] where they are treated in the characteristic Caledonian fashion, with the body and limbs traversed by lines parallel to the outline. Such figures are also found in New Hanover.[2]

On the basis of our present knowledge, animal representations occur mainly in Eastern Polynesia. Scattered representations occur outside that area.

Fish and whale representations are found only in Easter Island, but turtles have a wider distribution, appearing in Hawaii and Tahiti[3] where they are among the most frequently found motifs. The representations in both places resemble the style used in the Marquesas.

Quadrupeds of the type found in the Marquesas occur in Hawaii in a wide range of variations,[4] with short or long legs, elongated bodies, and long curving tails. Simple variants, with stick legs and sausage-like bodies, are reported from Pitcairn.[5]

Lizards are widely distributed in Oceania. Representations are usually in vertical plan, with four stubby legs and an elongated, tapering tail, leaving no doubt as to identification. They are found in Hawaii, are common in New Caledonia, and appear elsewhere in Melanesia in wood carving as a dominant motif.[6]

Birds and motifs with bird components, such as the bird-man representations, are common on Easter Island. They are also found in Hawaii in different form. The birds are often represented as seen head on, and only the angle of the wings is shown. No attempts at representation of a bird like that displayed on the NHtv 1 slab are known from elsewhere in the Pacific.

Stylized female genitalia (*komari*) make up a large part of the Easter Island petroglyphs, in contrast to the rare and often questionable Marquesan petroglyphs that may represent them. To my knowledge there are no such petroglyphs elsewhere in Polynesia or Melanesia. It is worth noting here that modern Marquesan pornography represents the male genitalia in a fashion exactly like that of the long-nosed *makemake* images of Easter Island or the Marquesan *ipu* concentric-circle motif with an extended central stem. Because reliable ethnographic data are lacking in all areas of Polynesia, it is obviously impossible to be dogmatic about the significance of enigmatic motifs such as these.

There are naturally no Marquesan tattoo designs of the Historic period found on petroglyphs outside the Marquesas. Many of the petroglyphs from other island groups related to the *'etua*, *mata komoe*, concentric-circle, and animal motifs were probably used there in tattoo.

A large number of motifs that occur elsewhere are, oddly enough, absent in the Marquesas. Among these are canoe or boat representations which are found in Easter Island,[7] Tahiti,[8] Pitcairn,[9] New Zealand,[10] and Hawaii.[11] The only representation of a canoe in the Marquesan petroglyphs is very problematical (p. 147).

The concentric crosses of New Caledonia[12] do not appear in the petroglyphic art, although they are found in wood carving, especially on bowl bases. Spirals, common in New Caledonia[13] and found also in New Zealand,[14] are not present in the Marquesas.

Also absent from the petroglyph inventory are the geometrics found in Tongan *langi*, reported by McKern.[15] The Marquesan use of lines to connect groups of petroglyphs bears no resemblance to the short, disconnected, and often rectilinear lines of the Tongan and Fijian petroglyphs. Superficially, the latter resemble Shang and Chou Chinese characters. The linear petroglyph groups of New Caledonia are closer to the Marquesan "frame" groups.

It would be futile to attempt any definitive statements on the uses and meanings of petroglyphs in the Marquesas. The scant ethno-

[1] Luquet, 1926, Figs. 88, 93.
[2] Bühler, 1946–1949.
[3] Emory, 1924, Fig. 19; 1933, Figs. 192c, 130a–b, 131–132.
[4] Emory, 1924, Figs. 17k–l, 19.
[5] Lavachery, 1936, Fig. 13.
[6] Emory, 1924, Fig. 16u; Luquet, 1926, Fig. 128; Reichard, 1933, Vol. 1, 36 ff., Vol. 2, Pl. 8, Nos. 21–28, Pl. 9, No. 29, Pl. 54, No. 153.
[7] Lavachery, 1939, Pl. 13, Nos. 128–132.
[8] Emory, 1933, Fig. 130a.
[9] Lavachery, 1936, Figs. 19, 29–30.
[10] Hamilton, 1925.
[11] Emory, 1924, Fig. 19.
[12] Luquet, 1926.
[13] Luquet, 1926.
[14] Hamilton, 1925.
[15] McKern, 1929, Fig. 41.

graphic detail from elsewhere in Polynesia[1] is contradictory, showing nothing more than a wide variety of uses, varying with individual whims. Certainly a part of the information already collected consists of rationalizations of phenomena that are inexplicable to modern natives.

Neither Linton nor I was able to obtain information on the significance of the petroglyphs. My most reliable informants insisted that they were "doodled" (*patu'ia pu*). This is probably a rationalization from present-day usage, for Marquesans still produce petroglyphs of a kind, scratching names, dates, *tiki* faces, and pornography into rocks and clay banks along almost every route in the island. These are seldom cut deep, however, and therefore would not endure over a long period of time.

It should be noted that two large groups of petroglyphs, mostly *mata komoe* and concentric circles, were found along aboriginal trails. These may have been executed by parties of sacrifice-hunting *kaioi* youths, symbolized by this motif. The NH 1 Site is quite near the site of a legendary massacre of the Ha'apa tribe by the Taipi, an incident related to me by an informant. Another large cluster of these motifs was on a fortified ridge that was probably the usual route of attack by the Taipi warriors when they moved into Hatiheu and out along the north coast.

Many of the other petroglyphs recorded by Linton and by me are of the *'etua* type, associated with *tohua*, or are on stones that had some sort of ceremonial function, in tattooing rites, for example. The reason for the prevalence of the *'etua* motif in such contexts may lie in the fact that it symbolized sacrificial victims, but such is, of course, only a guess.

That turtles were used as rain-making offerings, according to von den Steinen's informants,[2] was supported by statements of my own informants. Turtle figures may record various turtle offerings or, perhaps, symbolic offerings instead of turtles that were not caught.

It is almost certain that the whales depicted at NHaa 1 commemorated the arrival of a large "drift" sperm whale, the bones of which were found throughout the midden on that site. The shark of NA 3 may also have been drawn for similar reasons in remembrance of a record catch. However, a legendary event may also be depicted in this petroglyph. An informant related a legend in which Taka'oa, in the form of a shark, was hooked by a fisherman; in his struggles he overturned the island of Fatu Uku.

Emory has suggested that many of the motifs found in Tahiti and Hawaii[3] are derived from tattoo symbols. He cites historical sources to show that numerous designs found in the Tahitian and Hawaiian petroglyphs were also present in the tattoo motifs of those islands of the historic base line. If the complex forms of Marquesan tattooing of the Historic period were derived, as von den Steinen believes, from the *'etua* and *mata komoe* motifs, among others, the majority of Marquesan petroglyphs of those types probably duplicate tattoo designs of a period antedating European contact by a considerable span of time.

The possibility that these forms are clan or subtribe symbols might also be considered. Many Marquesan subtribal names referred to their residence localities, but others seem to refer to animals or plants, such as *Atike'a* (descendants of the crab), *Manu* (bird), *Ha'e'eka* (house of the turmeric), *Puhi'oho* (savage eel), and *Puhiku'a* (red eel).

To sum up, the available comparative material indicates that most Marquesan petroglyphs are variants of motifs that occur throughout Melanesia and Polynesia. The stylized masks, *'etua*-like figures, concentric circles, and lizards all apparently belong to a substratum of decorative elements that must be of great age among the Melanesian-Polynesian groups. A number of elements, such as fish and dog figures, are found only in Polynesia and hence were probably developed there at a later date. Likewise, a number of Melanesian motifs do not appear in Polynesia.

Obviously the absence of a particular design from the petroglyphic art of a given island group is no guarantee of its absence from that culture. The motif may never have been applied to stone, but may have been on wood, bark-cloth, or some other perishable material. Long before the proto-Marquesans departed for the Marquesas, they were in possession of the total inventory of these motifs. They were not all reproduced immediately as petroglyphs. Ac-

[1] Hawaii, Emory, 1924; Tahiti, Emory, 1933.
[2] Von den Steinen, 1928, Vol. 2, 89–93.
[3] Emory, 1933.

tually, some motifs may have undergone modification in other media before they were reproduced in petroglyphs. A similar process seems to have taken place in all island groups, offering a partial explanation for the slight intergroup variations.

It is possible to establish a tentative chronology for the appearance of petroglyph motifs in the Marquesas on the basis of their occurrence in dated sites, if it is constantly borne in mind that all the basic motifs were always present in other media. The Historic tattoo motifs alone were unique to the Marquesas. The petroglyph motifs of the Settlement and Developmental periods were the *'etua*, turtle, dog, fish, and whale, such as are displayed on the petroglyph rock at NHaa 1. There is no trace of the *mata komoe* or concentric-circle motifs in this group—a very unusual phenomenon. Later, probably in the middle or late Expansion period, the concentric-circle and the *mata komoe* motifs appeared, becoming extremely numerous. The linear "frame-work" motifs also appeared. In the Classic period and later, there were infrequent attempts at applying to stone the highly stylized tattoo motifs that had been developed in tattoo and wood carving. The typical Marquesan *tiki* form may also appear in relief in this period.

STONE SCULPTURE

Anthropomorphic Poi Pounder Heads

In the discussion of poi pounders, it was noted that pounders of the relatively early Conical type were in some cases decorated with anthropomorphic heads carved on the handles. One specimen was excavated in NHil I(B), which allows us to assign at least a minimal date to the type and to demonstrate a definite evolution in style and technique from this Expansion period example of stone carving to the Historic period examples.

The NHil I(B) specimen is a single upturned head, 64 mm. long and 44 mm. wide (Fig. 30a). The eyes are indicated by almond-shaped protuberances. There is no indication of an eyebrow except at the glabella. The nose is straight, with flaring nostrils on which there was possibly an attempt to delineate the nasalia. That the mouth seems to be open may be the result of late damage to the face. The lips are indicated by a ridge. Only one ear is indicated, merely by a ridge across the temporal region. The face is oval in frontal aspect; the head is rounded. The chin tapers but is damaged at the menton. The entire head has been executed by pecking which is finished by heavy abrading and polishing.[1]

The late Classic or Historic period, *Tiki*-headed type of poi pounders with *tiki* heads back to back, well known from the ethnographic collections, present a contrast to this sculpture. The difference in style is striking. The eyes have been enlarged to flat, goggle-like, laterally placed ovoids, delineated by a grooved rim, with an upward slanting median ridge across the eyeball. The nose is still well defined, but the bridge is split into two branches that diverge to the inner corners of the eyes to meet the eye rims. The ovoid mouth is open, with the tongue protruding. The ears are indicated either as doughnut-like appendages below the back corner of the eye, or by a double scroll arising from a horizontal rearward extension of the eye rim. The wide chin, although rounded, is often the widest part of the face.

An important difference between these sculptures and those of the earlier conical types is the manner of execution. The more recent specimens are incised rather than pecked, and the incision is followed by a meticulous polish in all the grooves outlining the features, which are always left in relief.

Statues

Plate 6a; Text Figure 24b

The eastern statue in P-A, NHe 3, dating from the Classic period, is in an excellent state of preservation. As it has never been described before, it merits some space here.

The statue was carved on a slab of red tufa. Only the head was carved in full round; the remaining features are in relief on the front of the slab. The head, a typical Marquesan *tiki* head, has a large oval mouth and protruding tongue, bulging goggle eyes, and a wide nose. The ears are represented as large bumps on each side of the head, resembling an aviator's headphones. The shoulders are wide. The space between the ribs and the flexed inner arm is represented by a wide channel cut into the face of the slab. The channel extends up into the

[1] For additional references to similar pounders, see Linton, 1923, 342, Pl. 52d; von den Steinen, 1928, Vol. 2, 153–154.

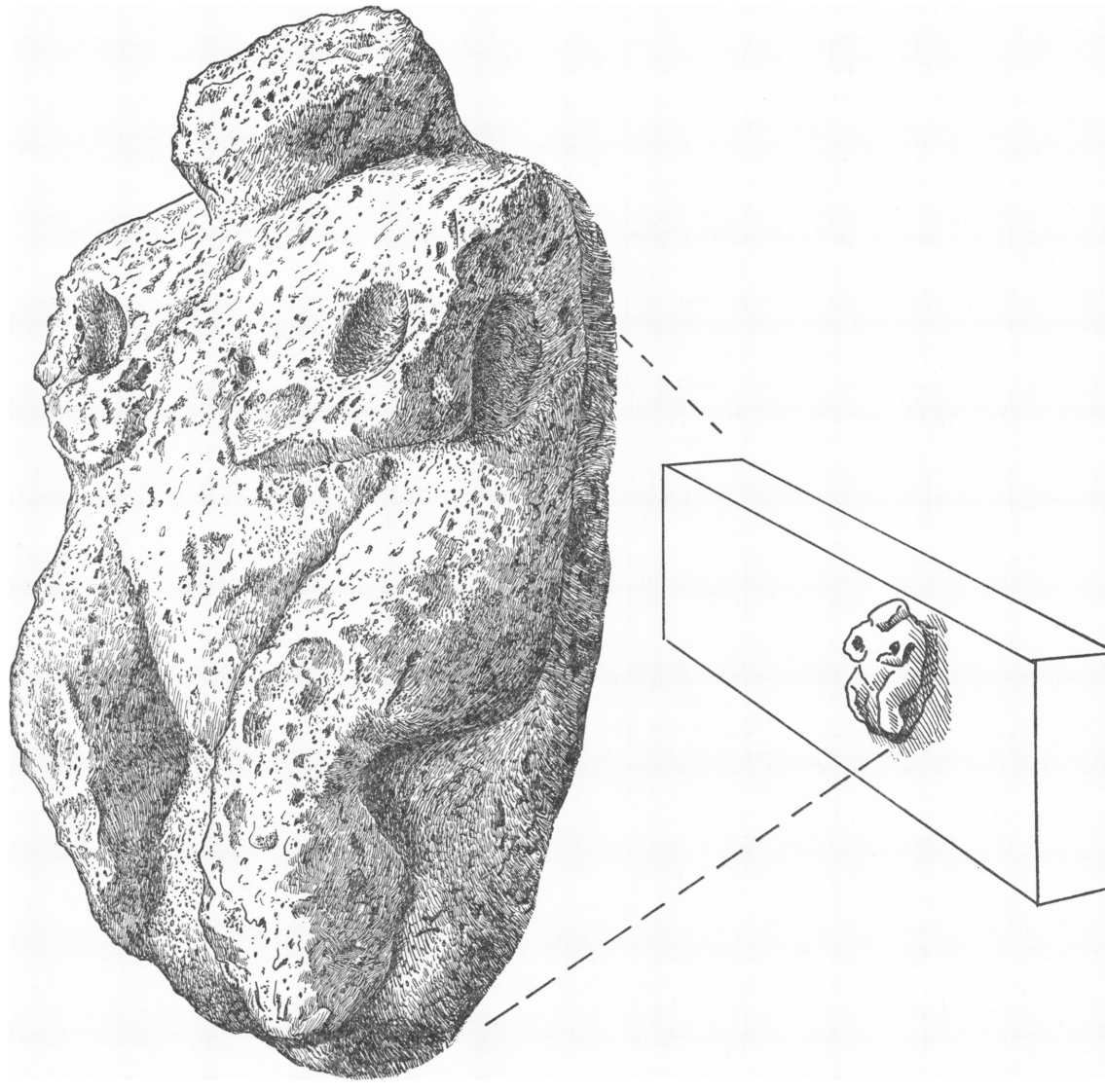

FIG. 37. Red tufa architectural figure from sleeping platform riser slab, P-M, Site NT 2. Position of figure on slab is shown at right.

axilla so that the statue appears to have been split down the back and spread open so that its frontal and lateral aspects would be simultaneously observable to the frontal observer. This flattened-out portrayal of the *tiki* figure was evidently believed to present its best possible aspect, for in this position the lateral surfaces of the slab are obscured. (Such considerations did not bother the Marquesans who installed the sculptures at Paeke, now called Vaitaviri, in Taipivai,[1] obscuring both sides and rear by building them into the faces of the *paepae* on that site.) The forearms were placed across the abdomen and the hands on each side of a protuberance which one may assume was a herniated umbilicus. The hands, highly stylized, were indicated by an arch enclosing two short lines parallel to the legs of the arch. The flat chest is

[1] Linton, 1925, 115–116.

marked by a stylized necklace. Similar necklaces, more detailed, are found on several of the statues at Paeke in Taipivai. The slab is unmodified below the forearms and is left blank to the base, which is set in the soil sbout 1½ feet. The slab, 30 inches across from shoulder to shoulder, is 36 inches high above ground.

The western statue in P-A, NHe 3, was carved in the round on a small pedestal. The entire body was represented, but little remains owing to the rapid erosion along natural planes of weakness in the soft vesicular basalt of which it was carved. The features seem to have been typically Marquesan, if one can judge from the almost totally obliterated east side of the face which is, nevertheless, in a better state of preservation than the west side. The figure was depicted in a squatting position, with the arms across the stomach. Its total width is approximately 2 feet; height, 3½ feet.

Architectural Figure

An architectural figure, discovered on the sleeping platform riser slab in P-M, NT 2, was carved in three-quarters round, being attached to the slab by a wide stem in the center of the back. To allow for the undercutting of the rear of this figure, the lateral surfaces had to be narrowed. As is the eastern figure of P-A, NHe 3, it is presented as though it had been split down the back and the lateral surfaces had been moved out to the edges of the frontal plane. The arms are separated from the body at the elbows, and the hands are placed on the stomach. the navel is indicated by a depression. The legs are flexed. The featureless head is short and flat topped, probably unfinished, although it may have been broken off. The figure is 295 cm. high and 205 cm. wide. According to Linton,[1] this type of figure is found only on Hiva Oa. Although more frequent in that group, it is obviously also present in the northern group (Fig. 37).

BONE SCULPTURE

A small bone figure of late Classic or Historic period, found in P-D, NT 5, was carved in the style that seems to represent the culmination of elaboration of the Marquesan *tiki* (Fig. 35k). It is 41 mm. high and 27 mm. wide. The head is over half of its total length. The upper edges of the eyes are bordered by wide bands (brows) curving above each eye and terminating at the point where the eyes are intersected by a horizontal line, from which the scrolls of the ears rise. The forehead between the eyes is flattened transversely, curving very slightly in the sagittal axis. The chin is narrower than the dimension across the eyes. The top of the head is flat, the upper edge being encircled by a grooved ridge, as is the edge of the base. The arms are tiny. The hands, holding a peculiarly shaped device between them, rest on the stomach. A ridge starting at the base of the neck diverges and curves off across the shoulder blades to the shoulders. A bilaterally symmetrical design on the rump resembles a *mata hoata* motif, although it is impossible to identify it with absolute accuracy.

This *tiki* and the others of its type[2] resemble the recent stone *tiki* of Hiva Oa, described by Linton,[3] and the figure of Hu'upeke in Ta'a'oa described above. The wide, hollowed eyebrow band above the eye, the abbreviated body, and the greatly enlarged head of the small bone figures are exactly like those of these monumental stone figures, which indicates that the bone forms may be quite as recent as their Hiva Oa stone counterparts.

In the discussion of petroglyphs, we have seen that the art of the Marquesas derives from an ancient stock of motifs distributed throughout the Polynesian-Melanesian area. Among these elements are the face mask, the human figure with upraised arms, and the concentric circle.

Although infrequently preserved in imperishable materials, obviously all these motifs were present in the culture of the Polynesian discoverers of the Marquesas. The earliest known stone sculpture, dating from the Expansion period, has the large-eyed anthropomorphic head like that represented on petroglyphs by the *mata komoe* motif. Von den Steinen, in his masterly study of Marquesan art, declared that two forms are basic to all Marquesan art: the *tiki*, with its wide-eyed countenance, and the *'etua*. By abstraction and geometrization, the organic parts of these motifs have been elaborated until they bear little resemblance to the motifs, resulting in the complex art of the Historic period, known to us from wood carving

[1] Linton, 1925, 84.

[2] Von den Steinen, 1928, Vol. 3, beta K, beta L.

[3] Linton, 1925, 165–168, Pls. 9d, 10b–c.

and tattoo.[1] Von den Steinen's theory of the derivation of Marquesan art appears quite plausible and accurate in the light of the archeological evidence presented herein. There is ample evidence for the actual precedence of the motifs that evolved into the Historic period forms in accordance with von den Steinen's belief.

There is, however, absolutely no evidence to support a claim for the antiquity of the Historic period *tiki* style. Specimens of this type, excavated or recorded during our work in the Marquesas, all come from unambiguously recent contexts, from sites well within the Classic period and generally in association with platforms of the Megalithic *Paepae* house or temple type.

Independent dating for the two well-known temple sites, with monumental statuary on other than architectural bases, is also available, supporting my own conclusions as to the recent age of these figures that represent the style of the Marquesan Classic period.

Von den Steinen[2] dates the *Me'ae* Te'i'ipona in Puama'u on the basis of five genealogies of families related to the builders of the site that he collected and compared. He found that the site dated to 1750 or 1700 A.D. at the earliest. The statues were erected after the site was built, but how long after it is impossible to say. The statues may be more recent, therefore, than the maximal date assigned to the site. Ordinarily, genealogies are not reliable, but as these cover so short a span of time, with five texts for comparison, their reliability is greatly increased. Crane[3] reports radiocarbon dates of 470 ± 150 and 460 ± 200 on Samples M704 and M705 excavated from Te'i'ipona. Both have rather large sigmas, constituting almost one half of the mean date, thereby greatly decreasing their reliability. The relationship of the samples to the statues in question is not clear but will presumably be demonstrated in the forthcoming report of the work of Skjöldsvold and Figueroa. The upper range of the span of time covered by these dates is close to that proposed by von den Steinen for the same site; thus the dates do not invalidate his conclusions as to age.

These figures do not demonstrate the same degree of artistic capability as the later figures of Puama'u discussed by Linton.[4] These were carved within the memory of informants living during Linton's visit in 1919. Except for the reclining figure of Maki'i-tau'a-pepe[5] which displays superior workmanship, the Te'i'ipona figures seem to represent a stage preceding the full development of the Classic Marquesan style. The figures of Taipivai[6] have been dated at 1516 A.D.,[7] which is fully plausible on the basis of architectural traits displayed by the Classic period Megalithic platform into which these figures were incorporated. However, as the Taipi figures are carved in full round, but are not displayed in this fashion, one must always suppose that they may originally have been displayed as free-standing figures and later incorporated into the temple platform. Stylistically, they differ from the Te'i'ipona figures in the execution of the head and facial features. The head juts forward from the shoulders and has almost no forehead. The eyes are round but have no raised rim. There are no ears on the sides of the head. The indeterminate mouth is almost obscured.

The differences between the Taipivai and Hiva Oa figures may be explained as resulting from chronological precedence. (We have already observed that the statues may antedate the structure in which they now repose.) This would, however, give the cruder Taipivai figures a status of early, immature examples of Marquesan art. An additional factor that may have markedly influenced their execution is the very coarse quality of the tufa from which they are made, so that the fine rendering of features that characterizes the Hiva Oa figures was impossible. A third factor, that of regional art style variation, may account for some of the differences between the figures of the two islands.

The results of the present work have contributed further to a precise dating of the appearance of cut stone for architectural and artistic purposes. A preliminary assay of a radiocarbon sample from a hearth beneath the lowest culture-bearing stratum at Site NHuu 1, the adze quarry site at which tools were made for use in the largest tufa quarries on Nuku Hiva,

[1] Von den Steinen, 1925, Vol. 1, 137, 170, 188–189.
[2] Von den Steinen, 1928, Vol. 2, 84–86.
[3] Crane and Griffin, no date.
[4] Linton, 1925, 165–168.
[5] Von den Steinen, 1928, Vol. 2, 81.
[6] Von den Steinen, 1928, Vol. 2, 75–77.
[7] Smith, C. S., personal communication, 1959.

gives a date of less than 200 years. This places the earliest utilization of cut tufa for any purpose at a very recent period, more in accordance with von den Steinen's dating of Te'i'ipona.

There is, then, evidence to show that the appearance of monumental statuary may be even later than indicated by the dates from Te'i'ipona and Taipivai image sites.

The development of the Classic-Historic period style was apparently carried out almost exclusively in the media of tattooing and wood carving, whereas monumental stone sculpture appears to be almost exclusively a late Eastern Polynesian trait, with a few crude and scattered small figures from Western Polynesia and Fiji. The number of Historic period wooden figures collected in the Marquesas attests to the amount of wood carving for monumental purposes. If such were possible, a selection of wooden figures from all periods of Marquesan prehistory would probably fill in all the details of the evolution of the Marquesan art style, from the basic elements brought by the first settlers to the Historic period. The figure style developed in wood carving was rarely applied to stone carving; at first it was used only in the heads carved as poi pounder handles and finally, much later, in full figures of monumental size.

In summary, the art forms brought to the Marquesas by the earliest settlers were derived from a widespread and ancient complex of motifs in Oceania. These people undoubtedly made wooden figures, but the earliest *preserved* expressions of their art are in the form of petroglyphs. The separation of the Marquesans from their parent group marked the beginning of independent elaborations of this basic artistic heritage in which most of the motifs were derived from the human figure. After a long development in the media of wood carving and tattoo, the art forms were applied to stone, appearing first in the anthropomorphic heads found on the Conical type of pounders of the Expansion period. These pop-eyed heads, differing markedly from the later *tiki*, demonstrate the correctness of von den Steinen's emphasis on the wide-eyed face, or death's head, as one of the most important forms in Marquesan art. Petroglyphs in the *mata komoe* style appear at this time.

The middle or late Classic period marks the first utilization of soft tufa or basalt for monumental figures, executed for the first time in the style we know from the Historic period collections, a style commonly believed to be "typically Marquesan." Figures of this type, despite minor regional style differences, materials, or relative chronological position, are all basically quite similar. They are, in *every* case, associated with the Megalithic *Paepae* house type of structure and, therefore, are of either the Classic or the Historic period. In these periods we also find "typical" Marquesan *tiki* heads in back-to-back position on the pounders of the *Tiki*-headed type.

Intricate super-stylized forms of the basic motifs of the proto-Marquesan cultural heritage are found in petroglyphs of typical tattoo designs, with similar Classic period associations.

All the evidence points to an *in situ* development of the Marquesan art style, free from external influences, after a 2000-year evolution from simple stylized motifs. The end product of this evolution, although it certainly resembles the Chinese Bronze Age Shang and Chou motifs, is not genetically related to the Chinese manifestations of that period but is merely a chance convergence.

The monumental stone sculpture of the Marquesas resulted from the application to stone of techniques evolved in other media, principally wood. The Marquesan stone sculptor did not achieve complete control of these media until after the beginning of the Historic period and the availability of European steel and iron; it was then that the smaller, fine statues of Hiva Oa were executed.

I can add nothing to Linton's discussion of sculpture in Polynesia.[1] He concludes that the carving of stone images developed from wooden images in those areas of Eastern Polynesia where large deposits of tufa were available. The present data bear out this hypothesis.

[1] Linton, 1925, 88–95.

EUROPEAN ARTIFACTS

ADZES: Iron adzes shaped like aboriginal quadrangular stone adzes were frequently made from barrel hoops or other bits of iron. Porter[1] records trading barrel hoops for pigs to provision his ships. The adzes varied in length between 115 and 112 mm.; in width, between 73 and 58 mm. Three of these tools were recovered at NT 8, one came from NT 5, and three were found at NT 2.

CHISELS: One broad chisel tang, 195 mm. long and 51 mm. wide, was found at NT 5.

SPOON: A large soup spoon of iron or tin was also found at NT 5. It was 205 mm. long, but the tip of the handle had been broken off. Its width was 44 mm.

JEW'S-HARP: A small jew's-harp, 40 mm. by 57 mm., was found at NT 5.

SCRAPER: A small tanged fragment of iron, flaring sharply from the tang to a straight cutting edge, was found at NT 8. It was probably a paint scraper. Its length was 77 mm.; its width, 72 mm.

FORK: A two-tined carving fork with a small riveted bone handle was recovered at Site NT 6. It was 165 mm. long and 19 mm. wide.

GLASS: Glass fragments, usually from broken wine bottles, were found at Sites NHaa 1 (on the surface), NHe 3, NT 4, NT 5, and NBM 5. The glass, mostly from hand-blown bottles, was generally greenish. It may have been used to provide flake knives.

TRADE POTTERY: Two small fragments of brown, glazed, trade pottery of very hard texture, 5 mm. thick, with wheel marks on the interior, were found in NBM 5.

MUSKET BALLS: One ball was recovered at Site NT 2 and another at NHe 3. Both were approximately 17 mm. in diameter.

BULLETS: A lead cylindrical projectile was found in the grass roots of the habitation area of NHaa 1. It was 17 mm. in diameter and had spent itself in the sand.

Three brass cartridge cases were found in the upper levels of NBM 5. Two were 11-mm. cartridges, one necked for a rifle, the other a neck-less revolver cartridge. The third was a 9-mm. necked cartridge.

GUNFLINT: An exhausted, rectangular, gray gunflint, 27 by 23 mm., was round at NHe 3. A round-backed white flint was found at NH 1.

[1] Porter, 1822, Vol. 2.

RIFLE PARTS: A portion of the proximal end of a musket barrel was found on the surface at NT 2. It was round in section at its extremity, but the barrel wall was too badly corroded to show whether it was from a flintlock or cap and ball rifle.

A trigger guard, probably from a Springfield 0.50-caliber Army rifle used during the American Civil War, was associated with the rifled slab grave on NHe 3.

PEWTER COCONUT GRATER: A pewter coconut grater, 112 by 45 mm., was found on NHe 3. The blade, perforated in two places by a rotary drill, tapered to a narrow proximal tang which had also been perforated but had broken at the point of perforation.

HARPOON: A full-sized whale harpoon was recovered with Burial 32 at NHaa 1. It was fitted with a double-barbed head and a square foreshaft, blending into a round shaft flared at the base to admit a copper-lined basal socket into which the wooden handle was fitted. According to information kindly furnished by Mr. E. Stackpole, Director of the Mystic Museum, this harpoon was of a type used from about 1790, when the first whalers moved into the Pacific, until 1840.

KNIVES: Two wooden-handled knives were found with the harpoon in Burial 32 on Site NHaa 1. The blades had been badly corroded, however, and were not preservable. Because copper studs secured them, the wooden handles were in relatively fair condition.

BOWL: A blue glass bowl of Pennsylvania Stiegel ware was found with a status burial in Site NT 5. This type of bowl was made between 1790 and 1820 and thus provides a fair dating index.

PIPES: One pipe bowl was recovered on NTa 5. It was kindly identified by Mr. H. Geiger Omwake, of the Delaware Archeological Society, as representing a type made during the second half of the nineteenth century in England, Germany, Holland, France, and the United States by fiercely competing manufacturers who were imitating one another's models.

A pipestem in the 5- to 10-inch level of NBM 5 (in a disturbed area) was marked "Davidson-Glasgow" and was identified by Mr. Omwake as of Scottish manufacture, dating between 1864 and 1908.

MARQUESAN MATERIAL CULTURE: A SUMMARY

Several points from the preceding description of the Marquesan material culture and its comparison to other Oceanian cultures should be emphasized. These indicate the relation of the Marquesas to Oceania generally, Asia, and the New World, and permit us to make some statements about culture change and conservatism in the Marquesas.

The Settlement period material culture in the Marquesas is basically Polynesian, with broad similarities to other Polynesian culture assemblages which we know archeologically. These similarities are most apparent in adzes, simple and compound fishhooks, coral files, scraping-cutting tools, sinkers, turtle lures, squid-fishing gear, and petroglyphs. An exotic element in this culture, possibly of Melanesian origin, consists of the adzes of Ha'e'eka and Hatiheu type, pottery, *Tonna* vegetable scrapers, and pearl-shell discs. This element may represent a genetic relationship between the Polynesians and the Melanesians, or it may be a result of Melanesian contacts and extensive trade in Western Polynesia.

The Settlement period culture of the Marquesans is definitely Oceanian, well adjusted to a high volcanic island environment. The basic industries of pearl shell, coral, urchin spines, and stone were imported full-blown and demonstrate no period of indecisive groping such as would be evidenced as the result of experimentation in a completely unfamiliar environment. There are, in addition, no signs of any improvement in the utilization of raw materials. All its extra-Polynesian relationships are to the west—in Melanesia, Micronesia, Indonesia, the Philippines, and Asia. No continental North or South American culture resembles it, even remotely. Fortuitous, isolated artifact resemblances are found in the New World, as well as in Europe, the Near East, and Africa. The cultural assemblage defined here must be compared with other total assemblages, if genetic relationships are to be postulated.

This study reveals a fairly clear picture of Marquesan cultural dynamics. Much of the change in Marquesan culture occurs in the Settlement and Developmental periods. Such change may have been a result of minor adjustments necessary to fit a slightly altered biota or a form of compensation for the absence of certain tools available in the original home of the Marquesan settlers but impossible to produce in the Marquesas because of lack of raw materials. The absence of a fringing reef around the Marquesas, the relative coolness of the ocean due to the influence of the Humboldt Current, and the steeply declining rocky bottom all affect the fish biota, making it different from other high-reefed islands such as Tahiti, Samoa, and Tonga. The absence or infrequency in the Marquesas of certain fish types known to the Marquesan settlers from their home islands may have occasioned the obsolescence of the Rotating, Curved Shank, and Bent Shank-Neck hook types and the Triangular Shank and Biflanged points of the bonito trolling hooks. These types were probably found to be less suitable than others. A reliance on net fishing, which seems to have been quite important in the Historic period, may also have begun to form at this time.

Further, the obsolescence of the *Tonna* vegetable scraper may have been caused by environmental factors, because the *Tonna* shell is rarer in the Marquesas than elsewhere in the Pacific, whereas other equally suitable shells (cowries) are found in large numbers in the Marquesas.

The elements of the so-called Melanesian complex apparently were not perpetuated beyond the Developmental period, with the exception of the pearl-shell disc which is represented in the *uhikana* head ornament of the Historic period. The Hatiheu type of adze was quite rare, subsequently disappearing rather quickly, while the more frequent Ha'e'eka type continued for some time in the Developmental period. The *Tonna* vegetable scraper was replaced by the cowrie scraper before the end of the Developmental period, while crude pottery may have continued into the Expansion period.

Additional changes occurred in the Expansion period, mainly in the forms of replacement and invention. Several new artifacts were developed; one, the Compound Shank Hook, is a rather complicated innovation. New adze types appear, the Koma and the Akipou, possibly developing from preëxisting types or as a result of stimulus diffusion from Tahiti. Both were related to technological innovations. The Rectangular Coral File developed to fill a highly

specialized need. In addition to the Compound Shank Hook, the Open Jabbing Hook, a modification of the Jabbing Hook, appeared at this time. Stone poi pounders, bearing the earliest known example of Marquesan stone sculpture, developed probably from wooden antecedents or partly as a result of diffusion. Earplugs developed in the Expansion period but may have had earlier wooden antecedents.

The art forms preserved from the prehistoric periods are not many, but they demonstrate quite definitely a slow development from a set of stylized motifs representing the human figure and its various components to the hyperstylized forms of the Classic and Historic periods in which the original motifs are quite difficult to recognize.

The same sort of gradual change through time is demonstrated for the relative frequencies of the various types of fishhooks and coral files.

Despite the changes involved in a readjustment to a slightly different type of environment in the Settlement and Developmental periods and the largely innovating changes of the late Expansion period, the main mass of Marquesan material culture items remains unchanged throughout the prehistoric sequence. Most of the adze and fishhook types are found in all periods. Coral file types demonstrate a marked conservatism. The scraping and cutting tools are identical in all periods, as are the drills, punches, and files of sea-urchin spine. Fishing gear (sinkers, turtle lures, and squidding equipment) is unchanged.

Techniques of tool making are likewise very stable. No chronologically significant differences were found in the making of fishhooks, adzes, coral files, net weights, squid-fishing apparatus, and scraping-cutting tools. Therefore, techniques and motor habits of the technology seem to have been very firmly established in the remote past and were not altered in the Marquesas.

This analysis of Marquesan culture indicates that it was by no means conservative. In material culture, the environment seems to have been the most influential factor affecting evolution in the Settlement and Developmental periods. Minor modifications of the cultural inventory occurred because of the slight differences in environment that may have distinguished the Marquesans from the original home of the settlers. Many of the artifact types lost in this manner were replaced by other types; others never were. Another dynamic was socio-economic. Some of the developments of the late Expansion period apparently result from an increase in activity in certain areas of technology, sparked by the increased productivity of a sizable population which permitted craftsmen to be more divorced from subsistence activity than previously. The Compound Shank Hook must have been developed, and the art style of the Classic and Historic periods must have reached its culmination in this way.

As suggested by the few pieces that have survived archeologically, the greatest changes seem to have occurred in art work of perishable nature. If the perishable material were available for study, we would probably find it possible to demonstrate more refined divisions than can be done on the basis of the imperishable material.

ARCHITECTURAL TYPES

OVOID HOUSE

Figures 22–23

HOUSES OF THIS TYPE were constructed of light poles set into the earth, braced in position by stones. They were ellipsoid to oval in plan, with unpaved floors. Small, irregular, outdoor pavements may have been associated. The poles were arranged roughly in a single row along the wall line of the house. Small fires were made for warmth, and small pits may have been used to cache valuables. The roofs and walls of these structures were probably completely covered with thatch. No entrance passage is noticeable. The house probably gave the appearance of an overturned boat. Although few complete houses were uncovered, the size seems to have varied between 20 and 35 feet in length and 5 to 8 feet in width at the widest point. This type of house is found in the Settlement and early Developmental periods. It was gradually supplanted in the later Developmental period by houses with a rectangular floor plan (See Table 7).

PAVED *PAEPAE*

Figure 38a

These *paepae* were flat, single-layered, stone pavements, rectangular or ovoid in plan. Posts in the interior of the house were innovations. They were braced by the stones of the surrounding pavement. Probably small poles that left little trace were also used in narrower interstices in the pavement. There was no elevated or demarcated sleeping area on these pavements. The sizes range from 30 to 6 feet in length and 15 to 6 feet in width. These pavements first appeared in the early or middle Developmental period at NHaa 1 where they were found superposed over the Simple Temple type of structure described below. At NHaa 1 they are associated with a large, rectangular, gravel-paved court extending inland from the focal point of the ceremonial complex. This court is probably an early type of *tohua* (see site map of NHaa 1, Fig. 21). It is very likely that the pavements are floors of religious structures, as the only perfectly preserved example, which is too small for human habitation, is situated beside the stone upright which protrudes through an overburden from the underlying earlier Simple Temple structure. Because Marquesan temple *paepae* of the Historic period were built on the same plan as dwelling *paepae*, there is reason to suppose that the earlier temples were also built on the same plan as the dwelling units.

The Paved *Paepae* type appeared in the middle or late Developmental period. It may have been used first in temple structures but was later applied to dwellings, continuing in use into the Expansion Period (Table 7).

TRANSITIONAL *PAEPAE*

Figure 38b

Paepae of this type were always rectangular in plan, being merely Paved *Paepae* with sleeping platforms added. With this type, one notes the first appearance of a sleeping platform on a Marquesan *paepae*. The sleeping platform, usually unpaved, was delineated by a line of small natural slabs or stones parallel to its longitudinal axis. It was only slightly elevated above the level of the veranda. Occasionally, a rectangular cooking area, outlined by stones, was located at one end of the *paepae*. These *paepae* were generally smaller than later types.

Transitional *Paepae* were built in the Middle Expansion period and may have remained in use into the Classic period, especially in marginal areas (Table 7).

TERRACED *PAEPAE*

Figure 38c

This type of *paepae* marks the first major step in the evolution that culminated in the massive Megalithic *Paepae* of the Classic and Historic periods. It is a definite break with the structures used in earlier periods. The Terraced *Paepae*, always built on slopes, was raised above the surface of the surrounding earth on three sides by retaining walls of stone. The front wall was usually constructed of two chinked courses of elongated flat stones. The rear of the *paepae*, along the sleeping platform, blended into the earth surface, often with no boundary to mark the point at which the roof met the ground. The fill of the terrace was almost completely of earth. The veranda surface was paved. The risers of the sleeping platform are of the same elongated flat stones of which the facade is constructed. On one structure in NT 2, however,

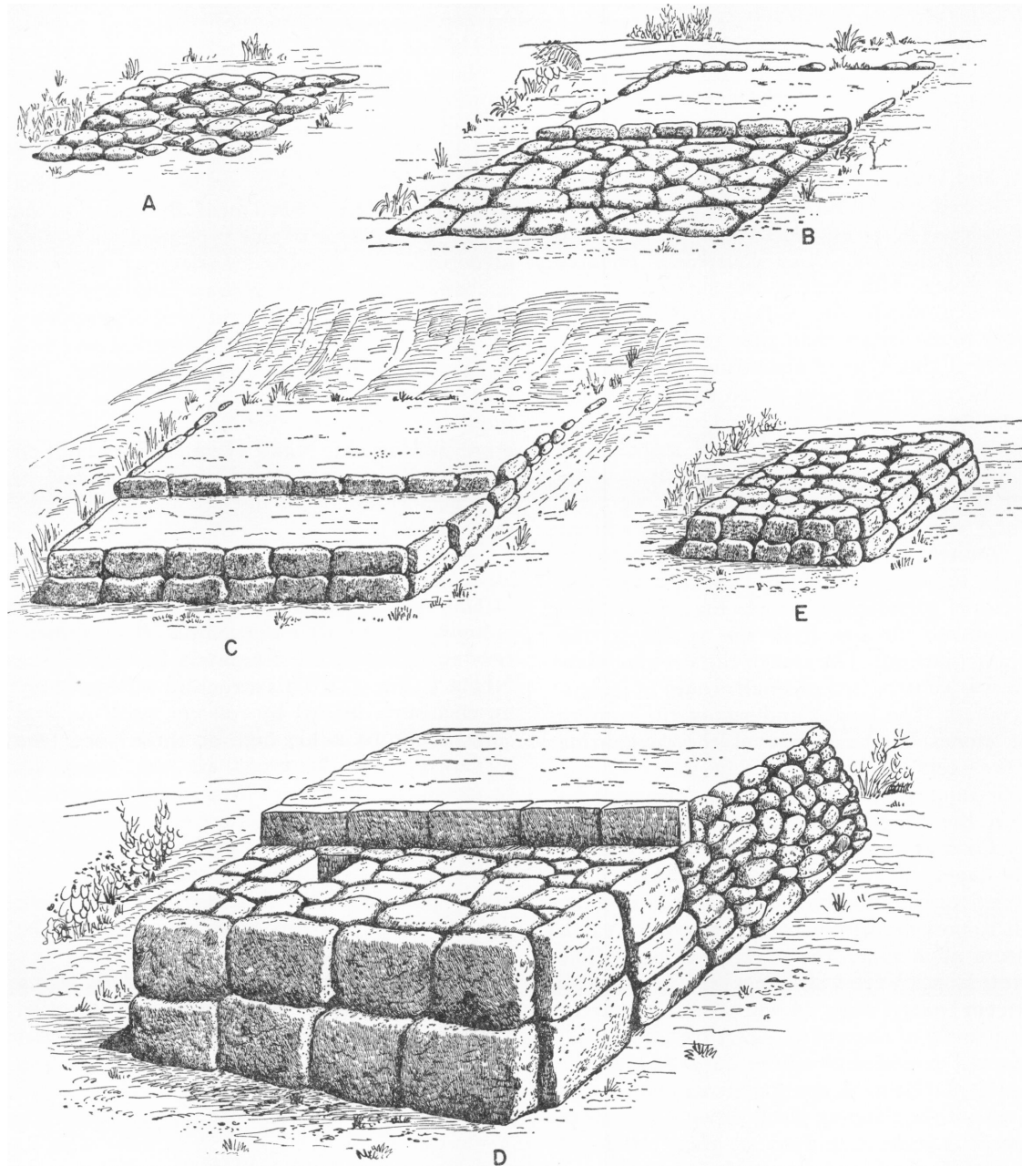

FIG. 38. Structural types. a. Paved *Paepae*. b. Transitional *Paepae*. c. Terraced *Paepae*. d. Megalithic *Paepae*. e. Rectangular platform.

such risers were made of cut tufa slabs, which is quite unusual.

These structures were definitely used as temples, but there was apparently little elaboration of the basic plan for religious needs. Of those examined, only one structure of this type had a veranda pit, such as is routinely found on temple *paepae*. The Terraced *Paepae* are found in the very late Expansion and early Classic periods (Table 7).

MEGALITHIC *PAEPAE*

Plates 4, 5b; Text Figure 38d

These *paepae* represent the culmination of the architectural ability of the Marquesans. They demonstrate great feats of planning, organization, and brute strength. The Megalithic *Paepae* were elevated from the ground surface on all four sides. The facade was constructed of two or, less frequently, three courses of massive uncut stones, with their widest surfaces turned outward towards the viewer, making them appear much larger than they really are. In a variant of this type of structure, the facade is constructed of tufa slabs set on edge in a single course. Second courses, if added above the cut slabs, consisted of uncut natural stones. Cut stone was used in multiple courses only in block form and very rarely. Natural stones were extremely well chosen so that the contours fitted one another, but chinking was added between courses to insure stability. The sides of these structures consisted of stones that diminished progressively in size from the facade to the sleeping platform. The rear of the sleeping platform was constructed of small stones in irregular courses. The height and size of the component stones of the facade of the Megalithic *Paepae* seem to have been an index of the prestige and rank of its owner. The stratified fill within the Megalithic *Paepae* consisted of a basal layer of medium-sized stones surmounted by a layer of smaller stones. Pebbles were jammed into all interior crevices in the retaining walls to prevent erosion of the uppermost earth stratum upon which the pavement rested. The paving stones were well selected. The sleeping platform risers were of cut tufa or basalt, infrequently of natural stone. A paved band, 3 feet wide, extended along the outer edge of the sleeping platform. Sleeping mats were placed at the rear of the sleeping platform on a dirt strip.

These *paepae* displayed a great range of elaboration not found in earlier types. Square, oblong, or ovoid veranda pits were edged with fragments of pillow-lava prisms. These pits, walled with small flat stones, generally extended below the surface of the surrounding ground surface. The pits were used for burials, cooking, disposal of *tapu* objects, general garbage, and breadfruit paste storage. On Megalithic *Paepae* used as temples, such pits were often surrounded by a wall of cut tufa slabs. Bell-shaped caches were built into the surfaces of the veranda and sleeping platforms for the deposition of bone bundle burials and other valuables. Bone caches were also made behind small, easily moved slabs in the sleeping platform risers, which permitted easy access.

Short stone uprights made of pillow-lava prisms are often placed near the sides of the veranda on *paepae* of this type used for temple structures. A number of sleeping platform caches are present. Temples are often associated with banyan trees. This structural type appears in the middle and late Classic period and was built occasionally in the Historic period. The most impressive example of this type that I have seen is located behind the Ets. Donald store in Hatiheu, Nuku Hiva. It was built in 1870 by Ko'oamua, the chief of the valley, in commemoration of the birth of his granddaughter (Table 7).

SIMPLE TEMPLE

This type is presented tentatively because it is known from only one example, the fragmentary structure on the ceremonial section of Site NHaa 1 (Fig. 21). This structure was probably an enclosure defined by rows of small natural slabs about 10 inches high on three sides. One megalithic upright stood on the northeast corner of the structure with a burial beneath it. Unfortunately, the structure had been extensively disturbed by later prehistoric construction and burials. Thus only one side, a corner, and a portion of the adjacent side remained. The structure probably faced the land with the upright along the rear of the platform.

The type, if we are justified in so designating it, probably became obsolete in the Developmental period, as subsequent structures of that period, overlying it, are of the contrasting Paved *Paepae* type (Table 7).

MINIATURE TEMPLES

Figure 10 (4)

Numerous Miniature Temples in the Classic and Historic periods are too small for human habitation. These are built in the style of the larger dwelling and temple structures. It is, of course, arbitrary to say definitely that a platform could not be inhabited, because small Transitional *Paepae* in NH 4 had obviously been occupied. The diagnostics for a Miniature Temple platform are, therefore, a paucity or

absence of artifacts, when excavated, and location on or near other definitely identifiable ceremonial structures (Table 7).

TUU PLATFORM

Figure 24b

These are highly specialized rectangular platforms, all sides of which are constructed of cut slabs of red or white tufa, coralline rock, or cut basalt standing on edge. They are *always* found on *tohua* near one end of the dance floor. The flat surfaces of such structures are divided into three concentric rectangles by rectangular enclosures of slabs set on edge in the platform surface. The upper edges of these slabs protrude slightly above the surface so that they are easily visible. The surface of the platform is paved with small boulders about the size of a soft ball.

Human sacrifices and enemy dead were displayed on these platforms.[1] They were also used in the rite of suspending human sacrifices. *Tuu* were never used for habitation. They are a uniquely Marquesan structure, completely absent elsewhere in Polynesia. They developed in the Classic period, probably quite late, contemporaneously with the Megalithic *Paepae* type of house (Table 7).

RECTANGULAR PLATFORMS

Figure 38e

These are small, relatively low, rectangular structures of solid stone fill, with flat, roughly paved, or slightly sunken tops. The absence of good pavements and sunken tops may indicate that the platforms supported scaffolds or stilt structures. Stones used for the retaining walls vary from football size to large boulders, 2 to 3 feet on the side. Four large boulders are often sufficient to form all four sides of a small structure of this type. These structures are found on *tohua* in the late Classic and Historic periods (Table 7).

NON-TERRACED *TOHUA*

This type of *tohua* is described by Linton as typical for the southern Marquesan group.[2] It is a rectangular area on a virtually unmodified earth surface, delimited by pavements or small stone alignments along the long sides. Associated structures, if present, are usually along the up-slope side if the area is on sloping ground. The Non-terraced *Tohua* type was developed in the Expansion period. Its antecedents can be traced back even farther to the Developmental period, to the gravel court and associated Pavement Temple structures at NHaa 1, which may have been a *tohua*, as I point out above.

In the northern group of the Marquesas this type did not survive into the Classic period, but was superseded at the late Expansion-early Classic transition by the Terraced *Tohua* described below. The Non-terraced *Tohua* continued in use in the southern group until the Historic period, while the Terraced *Tohua* are rarely found in that part of the archipelago. *Tohua* construction and elaboration above and beyond a "village green" area evidently arose in the northern Marquesas, reached its highest degree of elaboration there, and diffused slowly to the southern group, with a consequent retardation of the type as one progresses farther south, so that in Fatu Hiva the *tohua* are the least developed of all.

TERRACED *TOHUA*

Plate 5a

This type is constructed on a large rectangular terrace, up to 600 feet long and 90 feet wide, built by cutting into a hillside and piling the back dirt behind a retaining wall. The retaining wall usually has a foundation course of large stones and subsequent irregular courses of small stones piled with a marked batter to a height of about 10 feet. The surface of the terrace has two elevated steps, here called the stadia, along each long side, and a *paepae*-like platform across each end. These marginal structures surround a dance floor that occupies the greatest portion of the terrace surface. Associated structures, both domestic and religious, are ranged along both sides of the dance floor on the stadia and also located on the dance floor, as in the case of the structures of *Tuu* type.

The Terraced *Tohua* appear in the early Classic period, at first without lateral stadia. These were subsequently added, and the elaboration of the *tohua* proceeded with great rapidity.

According to Delmas and Handy,[3] *tohua* were

[1] Delmas, 1927, 129; Handy, E. S. C., 1923, 242; Dordillon, 1904, 281.

[2] Linton, 1925, 30–31.

[3] Delmas, 1927, 85, 120–122; Handy, E. S. C., 1923, 203–205.

used as daily meeting places and for ceremonial occasions. They were constructed by a chief in honor of his first-born son, an ancestor, or an inspirational priest about to be elevated to the status of deity. Because of the immense amount of labor involved, many of the *tohua* could not be completed. Krusenstern cites the postponement of a war between the Taipivai and Taiohae tribes for 14 months to permit the completion of a *tohua* to fulfill some high-priority ceremonial demand.[1]

FORTIFICATIONS

Marquesan fortifications are of two types, both previously reported by Linton and Handy.[2] The most common type is merely a strategically important ridge or hill that has been fortified by the cutting of ditches around all the possible approaches, such as NTa 10 and NTa 11, and Ta'atapu in Taipivai (Pl. 7b, Fig. 6). Stone walls were uncommon on this type of fortification, appearing only on Ta'atapu, where a small low wall, probably a foundation for a wooden superstructure, was noted. The narrowness of the Marquesan ridges makes this type of defensive measure practical. As the only sensible approach to most of the strong points is along a ridge crest, cutting through it in a trench too wide to be vaulted necessitates a detour around the trench on the very steep ridge sides, which is impossible without the use of both hands and feet, a mode of locomotion leaving an attacker defenseless beneath the darts and slingstones of the defending warriors.

Von den Steinen[3] has pointed out that Mendana saw a palisaded fort of this type in Vaitshu, Tahuata, in 1596. Cook saw a similar fort in the same valley in 1774, as did Marchand in 1791. Porter describes the fortification of Sites NTa 10 and NTa 11 during his sojourn in Taiohae in 1813. These sites were protected by 40-foot palisades, with a firing step. They were probably situated at the most accessible areas of the fort.[4]

The house structures within the forts seem to have been of a temporary nature and were renewed frequently. Large breadfruit storage pits demonstrated that a long siege could, however, be withstood.

Forts of this type are probably a part of the Marquesan heritage brought from the homeland of the original settlers (p. 179). Certainly they were in frequent use in the Classic and Historic periods when they were expanded.

A second type of fort is stone-walled with a varying plan. Many have been built in a rectangular form, as was the only standing example that I saw, Teaka'ua, in Hatiheu, Nuku Hiva. These forts seem to have been designed more for emergency protection than for prolonged sieges, as breadfruit storage pits do not seem to have been included, and the forts are generally small. The walls of the Teaka'ua were 7 feet high and about 4 feet thick at the base, but not of a very stable construction.

Porter[5] attacked a well-built fort of this type. It had stones 6 feet thick in the walls which were curved in a segment of a circle for a length of 50 yards. The attack was unsuccessful, and Porter vowed that only cannon could breach the walls. Stewart[6] reports a stone breastwork across the entire valley of Ho'oumi, built for protection against attack by sea.

It is highly probable that many of the stone-walled forts were built in the Historic period as a response to firearms, as many of those reported by Linton were loop-holed for musketry.[7] The stone-walled fort was probably also aboriginal, but not in completely enclosed form.

Extra-areal Comparisons

Although information on house forms in Polynesia is abundant, it refers mainly to current house types or those of the European contact periods. Little is known about the early house forms in any area of Polynesia, nor are archeological sequences available.

Except for their cut-stone curbing, the oval houses of Easter Island[8] resemble the Marquesan Ovoid houses in shape and construction. This was a relatively recent feature, used during the time of Forster and La Parouse.[9] Another contrasting feature of the Marquesan Ovoid House is the absence of a pavement outside its entrance. Métraux states that these pavements were often 2 to 3 meters wide. Possibly such a feature would be found on houses of the Settle-

[1] Krusenstern, 1813.
[2] Linton, 1925, 20–23; Handy, E. S. C., 1923, 142.
[3] Von den Steinen, 1928, Vol. 2, 33.
[4] Porter, 1822, Vol. 2, 20.
[5] Porter, 1822, Vol. 2, 103.
[6] Stewart, 1832, 318.
[7] Linton, 1925, 21.
[8] Métraux, 1940, 194–195.
[9] Métraux, 1940, 198.

ment and Developmental periods if more were excavated.

Round-ended or ovoid houses are known from Tahiti, inland Moorea, the Tuamotu islands, and Rapa Iti.[1] Barthel, noting their presence in Melanesia, has expressed the opinion that they may be a Melanesian trait, transmitted to the Polynesians at an early date.[2]

Rectangular houses were also built in Tahiti. Many were erected on slightly raised terraces when sloping, uneven ground necessitated such a foundation structure.

In Hawaii, both Bennett and Buck[3] point out that a variety of houses were known from the Historic period, as proved by a drawing of Webber of the village of Waimea in the late eighteenth century, showing wall-less, piled, round-ended, and curved and straight-gabled houses. Archeologically, the round-ended or circular houses are not as yet attested from Hawaii, but it seems almost certain that they will be. Various types of rectangular house floors are known from surface surveys in Kanai, Lanai, and other islands. Bennett established seven types as a result of his work on Kanai: (1) cleared flat spaces with occasionally a four-stone fire pit (possibly circular or ovoid house floors?); (2) stone-outlined house floors with inside fires, 15 by 25 feet on the average; (3) raised platforms, 6 inches to 3 feet high, 18 by 30 feet in average size; (4) terraces with dirt or stone faces, 1 to 10 feet high, with a paved veranda, some as large as 60 by 25 feet; (5) walled platforms, with walls built around three or all sides of the house floor; (6) two-terraced sites with a difference of 6 inches to 4 feet between the upper and the lower terrace; and (7) a final catch-all type consisting of all unusual types not fitting other categories. This classification demonstrates quite plainly that on a marginal island, such as Lanai, structures rivaling Marquesan Megalithic *Paepae* in gross size were being built, which is supported by McAllister's data from Kahoolawe in which numerous house platforms of similar size were built. Paved areas were found in front of most hut floors.[4] Emory illustrates and discusses house platforms from Lanai closely resembling some of the Transitional *Paepae* types of the Marquesas.[5] A separate sleeping division across the back of the house floor is in some cases raised above the forward or veranda area.

In Mangareva[6] the houses observed at the European contact period resemble the Marquesan *paepae* very closely. Some had a veranda built on the ground surface, paved or marked off with flags, and elevated sleeping platforms with coral facing. Others were built on terraces, usually on sloping ground, some of which attain heights of 8 feet. The large terraces have been dated to approximately 1425 to 1520 A.D. on a genealogical basis, but this dating is of course not completely reliable.

In the Cook Islands[7] the houses were originally built at the rear of double platforms or pavements, separated by a narrow path which entered the house door. These exterior pavements were called *paepae*. The term was not applied to the foundation on which the house was built. The houses in aboriginal times had rounded ends and pointed roofs.

In Samoa[8] the *paepae* was an ovoid house platform, always built after the house frame had been erected. The height and extent of the *paepae* depended on the status of the owner. The surface was not divided into sleeping and non-sleeping areas.

The Tongan house mounds,[9] round or rectangular, were equipped with ramps or steps for reaching the house floor level. The platforms were often single but could also be stepped. House mounds were faced with small natural slabs, broken to fit more snugly. Some of the more elaborate house mounds had doorsills. house posts, and rafters of stone, as well as "stelae,"[10] evidently similar to what are here designated as uprights. Tongan houses were oval.

The old abandoned village sites in the Lau group of Fiji[11] have predominantly rectangular house platforms. The more recent villages, however, have oval mounds with earth fill and natural slab facing, formed of natural slabs either laid horizontally or standing on edge. A ramp faced with slabs leads to the house level.

[1] Emory, 1933, 44.
[2] Barthel, 1959.
[3] Bennett, 1931, 10–13; Buck, 1957, 75.
[4] McAllister, 1933, 11.
[5] Emory, 1924, 39, Fig. 2; 41.
[6] Emory, 1939, 12, 14–15, Figs. 13b-3, 17, 22.
[7] Buck, 1927, 2, 38, Fig. 1.
[8] Buck, 1930, 66–68.
[9] McKern, 1929, 8.
[10] McKern, 1929, 9.
[11] Thompson, 1940, 160–165.

It would be very unsafe to draw any conclusions from the information presented above, as it is devoid of stratigraphic context. However, there is good evidence for an Ovoid House type with adjacent pavement as an original type in Polynesia. This type was elaborated by expansion of the attached paved area, until it gradually assumed the generally rectangular forms found throughout eastern Polynesia today. In Easter Island, Rapa, and the Tuamotus, all marginal areas, the archaic oval form remained unchanged. The sleeping platform division found in Hawaii, Mangareva, and the Marquesas is merely a survival of the outside-veranda division of the older house, but does not constitute evidence of a common source or sharing of a common influence. Foundation platforms for houses seem to have been a local development almost everywhere they occurred. They are probably an outgrowth of the Polynesian concern with relative height as an expression of rank or prestige.

Turning to the temple structures, we are on somewhat firmer ground, as more study has been devoted to them than to any other feature of Polynesian archeology.

Emory believes that all temple structures of Eastern Polynesia, including those in the Marquesas, are generally related and opposed to a type of Western Polynesian temple.[1]

The temple structures of Hawaii,[2] Tahiti,[3] Easter Island,[4] Mangareva,[5] Tubuai,[6] Pitcairn,[7] Tongareva,[8] and New Zealand[9] all have a general similarity in plan. They all consist of a rectangular altar with uprights of wood or stone, representing the figures of deities. These altars may be either low platforms, the Tahitian Inland type of *marae*,[10] or quite elaborate, as the massive *marae Maha'iatea*.[11] This altar faces an open space or court which was often permanently enclosed by a stone wall or slab alignment. In Tubuai and Raivavae there are no altar structures, merely slab-enclosed courts. Where no permanent enclosure was made, it is probable that temporary wooden enclosures were erected when the *marae* was in use.

Temples of the *ahu* style, or elaborations such as the very complex late Hawaiian *heiau*,[12] seem to be an extremely old element of Eastern Polynesian culture, as Emory has suggested.[13] They are not, in my opinion, related to the common Marquesan temple platform which is, conversely, of the god-house type that Emory designates as Western Polynesian.[14] This Western Polynesian temple is a replica, either full-sized or miniature, of a human dwelling, but is intended for the gods. It is found in Samoa, Tonga, Fiji, Tokelau, and also in Micronesia.[15] The Marquesan Simple Temple type, tentatively set up on the basis of the structure excavated at NHaa 1, is apparently related to Emory's Eastern Polynesian type, thus supporing Emory's contention that such temples are of respectable antiquity in Polynesia. Religious structures of this kind did not continue in use for very long in the Marquesas, but were superseded by the Western Polynesian "god-house" temple, which was undoubtedly also brought from the original home of the Marquesans. The Western Polynesian temple was by far the most popular. It continued in use to the Historic period, appearing at that time as full-sized Megalithic *Paepae* (outwardly indistinguishable from the ordinary dwelling *paepae* of the same type), or as miniature replicas of dwelling *paepae*. The similarities between the Marquesan temple *paepae* and Emory's Eastern Polynesian temple type are few. Images were displayed on both temples but in different fashion. Both temples were occasionally used for the disposal of human remains. Marquesan temples possess neither a forecourt nor anything corresponding to an altar or *ahu*. The word *ahu* has been erroneously reported as the local term for "temple" in the northern Marquesas. It is, however, used in this fashion only on the island of Ua Pou. Elsewhere in the northern group, as in the southern group, the word used to denote temple is *me'ae*, a cognate of the Tahitian term *marae*.

The Marquesan *me'ae*, so often found on the *tohua* or ceremonial plazas, constitute another

[1] Emory, 1943, 13–15.
[2] Emory, 1933; Bennett, 1931; Buck, 1957.
[3] Emory, 1933.
[4] Métraux, 1937.
[5] Emory, 1939.
[6] Aitken, 1930.
[7] Lavachery, 1936.
[8] Buck, 1932a.
[9] Emory, 1933.
[10] Emory, 1933.
[11] Emory, 1933, 23–38.
[12] Bennett, 1931, 30–35.
[13] Emory, 1933, 50.
[14] Emory, 1943, 15.
[15] Emory, 1943.

point of similarity with Western Polynesia, where the god-house is generally associated with the village assembly ground. This brings us to a discussion of *tohua* and their relation to other structures in Polynesia. The village assembly place is universal in Polynesia. As is mentioned above, in Western Polynesia the god-house is associated with it, whereas in Eastern Polynesia, except in the Marquesas, it has been separated from the temple structure. Even the earliest Marquesan *tohua*, the one represented by the gravel-paved court, the Paved House structures, and the basalt upright at NHaa 1, seems to have been associated with a structure of great religious importance.

Although the Non-terraced *Tohua* may be said to resemble the village-green ceremonial ground found in Western Polynesia, the fully elaborated Terraced *Tohua* has no real cognate in all Polynesia. The only structures that remotely approach them are the Leeward Islands council platforms, which were not intended for the same use as the Marquesan *tohua*. Among the varied forms of the Hawaiian *heiau*[1] are some that resemble on first glance the Marquesan *tohua*. These were apparently not used for everyday meetings and profane gatherings, however, as were the *tohua*, but were for ceremonial purposes only.

Therefore, the Classic or Historic period Marquesan Terraced *Tohua* is a uniquely Marquesan form. It is, however, an outgrowth of the typical Polynesian village-green meeting place, through a long evolution.

Cognates of the Marquesan fortifications are found throughout Polynesia. On Lanai, Emory[2] records a fort at the head of Maunalei gulch, on the Ho'okie ridge. The fort, exactly like forts found on Marquesan ridges, consisted of a series of trenches, 20 feet wide and 8 feet deep, cut through the ridges where approaches were easy. Boulders were placed in these trenches to be rolled on the attackers.

In the Society Islands, stone-walled forts with massive walls, 10 feet high and thick, are reported from Huahine.[3] Possible fortifications consisting of stone-faced terraces are found near Papeete, Tahiti, in an unspecified locality. Handy[4] reports forts on Raiatea with terraced defenses in the plateau.

Stone-walled forts are known from Mangareva,[5] but they were in ruins when the first missionaries arrived. They appear not to have been so large as those on the island of Rapa which were first studied by Stokes and by members of the Norwegian Expedition in 1956.

Tongan earthwork forts were elaborate and often built on flat land.[6] The Tongan fortifications were surrounded by moats and earthworks surmounted by fences of thatch and posts secured by vines or bark cord. Lookout platforms were constructed on the walls. Deadfall traps were dug in the interior, where secondary walls were erected. These fortifications were probably derived from Fijian types, such as those described by Gifford.[7] They also resemble those built by the Samoans.[8] McKern[9] believes that the Samoan elaboration may result from the copying of the Fiji-derived Tongan models.

The Maori of New Zealand were very industrious fort builders who managed to keep abreast of the European contact situation well enough to erect forts that defied the efforts of British field artillery. Many of the *pa*, as they are called, resemble the Marquesan ridge forts. They are nothing more than strong points with complexes of low terraces and storage pits protected by trenches cut through the approaching ridges.[10] Other forts are terraced hill tops, with trenches enclosing parts of the periphery.[11] The advent of firearms, however, brought about a change in Maori defensive works. In *pa* built after contact, the double trenches have reëntrant sides, bastion-like structures, and "bombproof" shelters.[12]

In summary, fortifications resembling the Marquesan ridge forts and stone-walled forts are found throughout Polynesia; therefore, they probably constitute a part of the Polynesian cultural heritage. The fortification complex was not nearly so elaborate in the Marquesas as it was elsewhere, for example, in Tonga, Samoa, and Fiji where warfare had taken on more of a national character.

Only one architectural trait is of enough interest to merit discussion here—the use of cut stone in building. We have seen that this is a late trait in the Marquesas, where it was never extensively exploited for either architecture or

[1] Bennett, 1931.
[2] Emory, 1924, 75, Fig. 8.
[3] Emory, 1933, 45.
[4] Emory, 1933.
[5] Emory, 1939.
[6] McKern, 1929, 80–82.
[7] Gifford, 1951, 249.
[8] Krämer, 1903, Vol. 2, 337.
[9] McKern, 1929, 82.
[10] Firth, 1925; Kelly, 1933a, 1933b, 1938a, 1938b, 1945.
[11] Fairfield, 1938, 1941.
[12] Kelly, 1939.

sculpture, but was limited mainly to small figures and sleeping platform risers on Megalithic *Paepae* structures.

Cut stone occurs sporadically elsewhere in Polynesia, most strikingly in the stone structures and sculptures of Easter Island,[1] where house foundations were cut from tufa, and cut-tufa blocks were used in the facades of some of the larger *ahu*[2] or on the stages of these structures. In a few instances great perfection in cutting and fitting stone was reached, as in *Ahu Vinapu*.[3]

Cut stone occurs in Hawaii in irrigation ditches on Kanai and at Kailua.[4] These examples resemble the fitted dry masonry of *Ahu Vinapu* of Easter Island. Fitted masonry of this type appears again on the tiny volcanic island of Meetia,[5] but the stones involved are somewhat smaller.

In the Society Islands a great deal of cut or shaped stone was used. Curb facings for temple *ahu*, often shaped from tufa or basalt, provided foundations for subsequent courses of cut blocks or pecked, round-ended stones. Sporadic occurrences of cut stone have also been reported in New Zealand, Fanning, Raivavae, and the Cook Islands.[6]

Cut stone was used in Tonga, where it reaches its climax in the massive cut-stone trilithon, Ha'amonga'amaui.[7] Cut-stone slabs were also used for Tongan house mounds and tombs. The stone utilized was from reef coral deposits and solidified sand strata. Slabs up to 10 by 6 feet were removed with blunt adzes from exposed strata of this material and carried to the construction area, where they were fitted to one another more accurately and dressed.

Métraux believes that the scattered distribution of stone cutting in Polynesia can be explained as local developments, each under different ecological conditions.[8]

Emory, however, believes that the art of cut-stone building is old in Polynesia. Furthermore, he believes that the Eastern Polynesian occurrences of this trait are mostly the result of Tahitian influences and therefore are more recent than Tahitian cut-stone structures. A third possibility, which was raised by Emory,[9] has now been presented in new form by Heyerdahl who attempts to explain all occurrences of cut stone or megalithic construction in Polynesia as the results of Peruvian settlement or contact.

Until detailed stratigraphic excavation has been made in both Tahitian and Hawaiian stone structures, it is impossible to say whether Emory is correct in claiming a Tahitian source for all stone cutting, or Métraux, in claiming independent origins. It certainly seems that in the island groups adjacent to the Societies, diffusion from Tahiti is probably the correct answer, but in the Marquesas, independent development may have taken place.

The Heyerdahl theory of Peruvian origin is not worth much consideration. Had the Peruvians occupied the Polynesian islands prior to the Polynesian arrivals, it is difficult to understand why they would have suddenly stopped building in Peruvian style and begun constructions of Polynesian type without ever having known of the existence of the Polynesians. It is also difficult to understand how Incaic fitted stone masonry, such as Heyerdahl claims to have found, could appear on Easter Island at 300 A.D., in the Peruvian Tiahuanaco period, long before it appeared in Peru.

Finally, we may say that the Marquesan house demonstrates an evolution from an early ovoid house, with paved areas adjacent, with a pan-Polynesian distribution, to a rectangular house on an elevated rectangular platform. The process of elevation of the house foundation and the gradual change from an ovoid to a rectangular house seems to have occurred in several places in Polynesia independently.

The predominant temple structure of the Marquesas is the Western Polynesian "god-house" type. The Eastern Polynesian altar and forecourt temple may have been present in the Settlement period but were not used subsequently.

The ceremonial plaza developed from an unelaborated Polynesian village-green meeting place to a semi-enclosed planned plaza, finally emerging as the fully elaborated Terraced *Tohua*, which was a unique Marquesan trait.

The *Tuu*, the Miniature *Paepae*, and the Rectangular platforms were late developments, possibly reflecting an increase in ceremonialism beginning in the middle Classic period.

[1] Métraux, 1937, 1940; Lavachery, 1951, 1954.
[2] Lavachery, 1954, 146–148, Fig. 9, *Ahu anakena* 5–6.
[3] Métraux, 1937, 127.
[4] Bennett, 1931, 22–23, 105–107; Emory, 1943, 10.
[5] Emory, 1933, 114.
[6] Emory, 1943.
[7] McKern, 1929, 5–7, 63–66.
[8] Métraux, 1937, 125.
[9] Emory, 1933, 48.

BURIAL PRACTICES

LINTON HAS DISCUSSED the burial practices of the Marquesas, based on historical documents, informants' statements, and observations made on surface ossuaries.[1] As he did not excavate, he could make no certain statements about the prevalence of earth burial customs. Despite this deficiency, he hypothesized a series of migrations to account for the distribution of burial practices in Polynesia and Melanesia. According to this theory, the earliest settlers in Polynesia used extended earth burial in disposing of the common dead, practicing bone preservation and mummification for the upper classes. The "last wave of immigrants"[2] buried their upper class in vaults. Although they had previously disposed of commoners in extended earth burials, they adopted mummification, cave burial, or bone preservation from the people already inhabiting the islands upon which they settled. I attempt to show here that the evidence permits no such interpretations and that the complex and varied Polynesian burial customs seem to have been a part of the heritage carried to the Marquesas by the Polynesian discoverers.

Our excavations reveal that primary and secondary earth burials were practiced in the Marquesas in all periods. The primary burial was either flexed, dorsally or laterally, or extended. Secondary burials were either bundle burials or isolated skull burials. No common method of orientation was evident.

Vault or cache burials, practiced later in the Classic period when large *paepae* were constructed, were either primary extended or secondary bundle burials.

Cave and tree burials were practiced throughout the prehistoric periods. Artificial caves were also dug in stiff clay hillsides for storing burials.

As earth burials were excavated only at NHaa 1, all discussion of this practice is based on the data recovered from that site.

Primary earth burial is found as frequently as secondary burial, despite Gracia's statement[3] that only young girls, dead without issue, were given earth burial. Extended male and female dorsal burials were excavated. The hands were crossed on the pelvis or extended beside the body. Male skulls were removed from extended burials, but female skulls were rarely disturbed. Burial offerings, usually consisting of occipital portions of pig skulls or other pig bones, were placed with the body. The occipital section of the pig skull was frequently placed on the chest. Other grave offerings, such as prestige goods, were seldom found until the upper Expansion or Classic periods. Therefore, extended primary burial is one of the original forms of Marquesan burial. It was applied to persons of status, as well as commoners.

Burial 15 at NHaa 1 was a young woman, obviously of some importance, who had been interred with a male trophy head. Burial 5 seems to have been a female victim of a violent death, possibly in war, and was not honored by anything more than pig offerings. At the same site, the intrusive Burials 32, 33, and 34 are all of individuals possessing status. They can be dated to the Historic period by the presence of a harpoon and knives of a type used up to 1840.[4] Their heads had all been removed.

The use of extended primary burial for people of status and commoners can thus be established for all periods of Marquesan prehistory, from the Settlement period to the Historic period. The fact that skulls were frequently removed indicates that there was a greater importance attached to the head as the repository of individual *mana* than to the body which was nevertheless treated with deference.

Flexed primary burials are not so common as extended burials. Such burials were placed either on their sides or on their backs. There were several unusual burials of this type; in one instance, the torso of an adult male had been buried in a semi-reclining position (Burial 1, Site NHaa 1-II). Another unusual burial was found beneath the upright in the Simple Temple structure; the legs had been removed, reversed, and flexed (Burial 28). Only two burials of this type had associated pig offerings; both of these were found in the habitation area (Burials 37 and 38; Fig. 21).

On the basis of our present knowledge, which is limited by the absence of earth burials of the

[1] Linton, 1925, 54–69.
[2] Linton, 1925, 68.
[3] Gracia, 1843, 117.
[4] Stackpole, F., personal communication, 1958.

more recent periods, we can say only that flexed burials are found in the Settlement and Developmental periods. They may or may not be found in the subsequent periods.

By far the most common form of burial, the secondary bone bundle burial, is equally as frequent as both types of primary burials at NHaa 1. The usual method of preparation was to macerate the bones, whether by exposing the corpse, as Handy states,[1] or by temporary burial. Even after mummification, gradual decomposition would take place, resulting ultimately in macerated bones. The long bones, vertebrae, scapulae, pelves, ribs, and some of the hand and foot bones were interred in the bundles. For example, some bundles contained long bones only; others contained long bones and pelves with vertebrae, and so on. The bones were in some instances tied together securely, as in the case of vertebrae that appear to have been strung, after which they were wrapped in tapa and buried. Quite often, bones of more than one individual were placed in the same bundle. Skulls were separated from the bundles, undoubtedly to be placed in family or tribal temples. These burials were seldom accompanied by offerings of any kind.

Bundle burials are found in the Settlement and Developmental periods at NHaa 1. They are also known from Historic period burial caves, tree and vault burials, as discussed below, and are therefore found throughout Marquesan prehistory. This form of treatment of the dead was apparently always the most commonly used.

Another form of secondary burial was the burial of isolated skulls, usually with associated mandibles. The two upper mesial incisors were removed to allow passage of the cordage commonly used to attach the mandibles of trophy or ancestral heads (Fig. 39). This form of burial was found at the base of the longest sequence of superposed burials that could be established at NHaa 1; thus it is present in both the Settlement and Developmental periods. It is well known from the Historic period also,[2] so that we can conclude that it was brought to the Marquesas by the earliest settlers, continuing in use through the Historic period.

In the stone structures of the Classic period, open veranda pits and small, narrow-mouthed caches were built into the platform fill to contain human bones. These were usually found in the house platforms of the most important individuals in any given settlement or house cluster. Small caches were placed in the face of the sleeping platform, behind small, movable, platform-riser slabs which allowed easy access to the ossuaries. Although most of the remains in these caches were fragmentary, they apparently were stored as bundle burials, with occasional trophy heads.

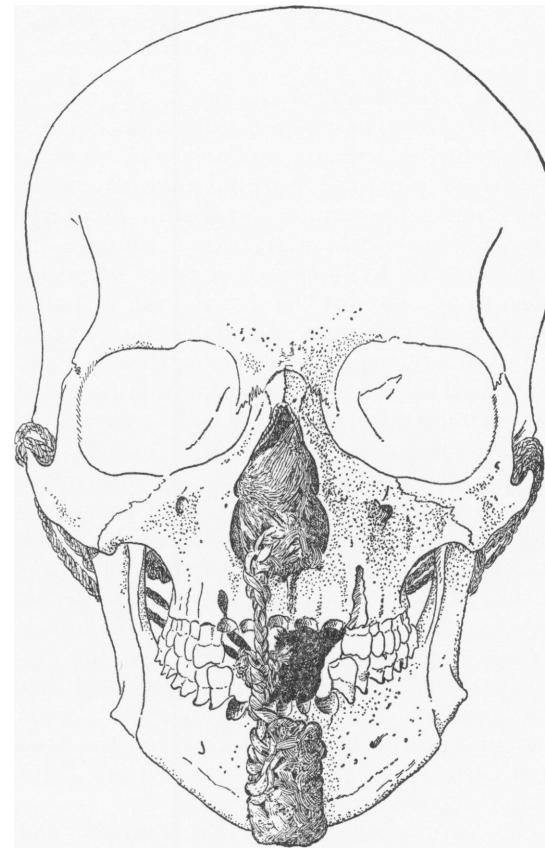

FIG. 39. Ancestral or trophy skull, showing removal of incisors to facilitate attachment of the mandible.

The only real cist burial was that at Site NHe 3 on P-L, in which the remains of a rifled tufa-slab cist were noted. The cist cover had been removed and broken. The burial contained in the cist had been dorsally extended and had status grave goods, including a musket.

Human remains were deposited in sacred banyans on *me'ae* platforms, such as those of

[1] Handy, E. S. C., 1923, 113.

[2] Von den Steinen, 1925, Vol. 1, Figs. 30, 59; 1928, Vol. 2, 68, 96–98, 218; 1928, Vol. 3, alpha X.

NHe 4, NHo 1, NHaa 3, and NHaa 4. They were also placed in small niches or shelters in nearly unscalable cliffs (Site NP 2). These remains were often deposited in the form of bundle burials, or in small, narrow coffins containing only macerated bones.

Linton[1] reports that Handy saw a cave on Ua Pou that was either artificial or artificially enlarged. This may have been a common form of disposal in many valleys. I did not find any sites of this type until it was too late to check extensively. In Taipivai a site of this type is located at the place called Te Metie, just above the valley road; another is only 50 to 60 yards distant from the road, next to the house of Puhe, near Te Metie. On both sides, shafts about 3 by 4 feet had been sunk at a 30-degree angle into stiff clay hillsides to a depth of at least 5 feet, at which point they level off. As all the shafts have partially caved in, they could not be entered for observation of their interior features except for some scraps of human bone. The shafts were probably intentionally filled to prevent them from being looted. Only one informant provided any information, but this was, unfortunately, second hand, related to her by her grandfather who was reliable in many other details that could be checked. The grandfather supposedly entered one of the shafts at Te Metie, reporting that an oblong room opened from the bottom of the shaft. The walls of this room were cut with niches in which long coffins were placed, "like a bunk-room on a white man's ship."

The late Historic period burials were influenced by missionaries; therefore none of these was excavated. Such burials are usually in stone-walled enclosures (*papua tupapa'u*) located on or near the sites of aboriginal temples. Church cemeteries are often marked by *ti paniee* (frangipani) trees, which are traditionally the flower of the dead in the Marquesas. Two cemeteries of this type were visited in Ha'atuatua. The larger was on the south end of NHaa 1 on the site of the aboriginal *me'ae*, *Te mata hue tea*. The enclosing cemetery wall had been constructed of stones removed from the aboriginal temple structure, a few traces of which were still to be seen west of the cemetery. The latest burials in this cemetery, made during the plagues of the late nineteenth century, were not real interments; the corpses had merely been thrown inside the enclosure to prevent them from being eaten by pigs. The survivors were too few to bury the dead. These remains are now covered only by a few inches of wind-blown sand. A smaller cemetery, *Ke'eke'etupa*, is located on a high spur on the south shore of Ha'atuatua, between Site NHaa 2 at Ha'eta'a'o'o and the small inlet of Ha'ate'ate'a. This cemetery supposedly also holds bodies of plague victims.

Grave goods mentioned incidentally in the discussion of burial types deserve separate treatment. Offerings with the burials of the Settlement and Developmental periods at NHaa 1 show that very few status-marked differences existed at that time. The most frequently found offerings were remains of pigs. According to Handy and Radiguet, pigs were used as grave offerings on Nuku Hiva.[2] Handy[3] says that the gifts were to secure safe passage to Havaiki. The occipital portions of the skull predominated, but quarters of piglets were also found. The positions of fishbones found in several graves indicated that they had been placed with the body rather than having been previously deposited in the midden. Artifacts were definitely associated with only two burials of the Settlement and Developmental periods; Burial 36 had a necklace of 53 whale teeth, while the "Whale Bone Lady" excavated in the 1956 season had a porpoise tooth ear ornament and had been interred flexed upon a slab of whale bone. Other artifact associations with burials were probably fortuitous. It is always possible, of course, that perishable artifacts placed with the dead expressed greater status differences than the non-perishable artifacts that survived. There seems to have been a consistent stripping of ornaments from the bodies before interment, however, as the ornaments found in the midden are rarely found with the burials.

The Historic period triple burial (Burials 32, 33, 34) at NHaa 1 demonstrates status quite clearly, as do most of the Classic and Historic period burials in stone structures. In these periods the dead were interred with implements and ornaments which were often of some value to the members of the surviving families. Pig

[1] Linton, 1925, 61.

[2] Handy, E. S. C., 1923, 110; Radiguet, 1929, 212.

[3] Handy, E. S. C., 1923.

remains were still placed with burials in the Classic and Historic periods, but in larger quantities.

Evidences of cannibalism were numerous at NHaa 1 in the debris of the burial hill. Fire beds on the south end of the burial area excavated in 1956 contained numerous fragments of cracked, charred human bone. The skull of Burial 7 had been cooked and completely discolored. Fragments of skull and finger bones were also found in the habitation area of NHaa 1-I and NHaa 1-II.

Some human bone fragments and teeth were excavated in NHo 3-I and NHo 3-II.

The remains of a child with fully erupted milk teeth were found in the west oven in the rear of NBM 4. A few fragments of the skull and fingers were found in the front of the shelter, but the majority of the torso and some portions of the limbs had been left in the oven, although in quite fragmentary condition. They had evidently been overcooked.

This evidence indicates that cannibalism was already present in the Settlement and Developmental periods and was not confined to the Classic or Historic periods, when the population pressure became much more marked and warfare more frequent and savage.

An analysis of the burials, grave goods, and evidence of cannibalism permits inferences concerning the ceremonial and religious aspects, as well as social structure, of Marquesan culture. The bundle and isolated skull burials of NHaa 1 of the Settlement and Developmental periods show very clearly that ancestral cult practices, involving the preservation of the skulls of the dead, were part of the earliest culture of Marquesas. They also demonstrate that at that time the concept of the head as the repository of individual *mana* had already developed in Polynesia. From the evidence of these burials we must infer the mortuary practices of exposure, burial, and exhumation for maceration of bones, or mummification. We can also infer the presence of cult places, *separate* from the house areas, in which the skulls were deposited. No trophy or ancestral skulls were found around the habitation areas, although burials were scattered throughout those areas as well as in the ceremonial area. The cult places were early *me'ae* (of which the structures in the burial area of NHaa 1 are examples), or perhaps caves and banyan trees.

Food offerings with burials indicate a concept of a hereafter similar to earthly life. The offering placed with the dead was most often a mere token of bone fragment of the entire pig offering which had been put to more realistic uses by the mourners or the priestly staff.

A burial was made beneath the basalt upright of the Simple Temple for some ritual purpose. The legless torso (Burial 1), and Burial 5, which had a depressed fracture of the frontal bone, offered other evidence of ritual mutilation and violence. Cannibalism occurred, but probably very infrequently, but it was not a primary food source, as Linton[1] has stated.

The next collection of human skeletal material is from the Classic and Historic periods. At that time the cult places (temples, caves, banyans) were still the repositories of human remains, but the house had gained importance in family ancestral cult practices, for many ordinary dwelling units contained quantities of human remains cached in small, bell-shaped pits. Cannibalism was still present, probably increasing in frequency, at the beginning of the nineteenth century, when contact with American whalers brought firearms and enabled wars of a more sanguinary nature.

The grave goods in these periods are more numerous. They are generally things of value, both for pure status and also as useful implements.

Earth burial was practiced not only for those of higher rank but also for the lower classes, as it probably was throughout Marquesan prehistory.

Comparative information on burial practices is very scarce in Polynesia and Melanesia because of the opposition of the native inhabitants to what is correctly regarded as desecration. The only available information based on excavations is that of the Moa Hunter culture in New Zealand.[2] These data unfortunately suffer from a lack of excavation technique, as demonstrated by the burial profiles which show the strata in detail but do not show grave limits or the level from which the burial was intruded. Consequently, it is impossible to establish a sequence of burials on the site or to be certain if some burials have not been intruded from a later occupation. Nevertheless, they afford our

[1] Linton, 1939, 142.
[2] Duff, 1950, Chap. 3.

only opportunity for comparison with the Marquesan data. It is immediately apparent that a great difference exists between the burial customs of the Marquesan Settlement period and those of the New Zealand Moa Hunter period. The Moa Hunter male burials are oriented in an east-west line, with the heads west. Males are dorsally and ventrally extended, and there is evidence of post-burial removal of skulls. The grave goods placed with the male Moa Hunter burials contrast sharply with those of the Marquesan burials, which seem naked by comparison. In Moa Hunter graves, adzes and reel or tooth ornaments are quite frequently found. Female and adolescent burials are often flexed without orientation or grave goods. Bundle burials are rare.

The Moa Hunter material culture differs from that of the Marquesan in adze and fishhook types, which indicates a possible difference in source for the two cultures. This conclusion is supported by the evidence of the burials and suggests a somewhat different ceremonial and religious complex.

The ethnographic data are of small help for further comparison, because they are so fragmentary and scanty. The Maori burial customs differ from those of the Moa Hunter in their use of the flexed upright position, facing east.[1] Duff[2] also states that the Pukapukans bury their dead in the manner of the Moa Hunters, while the Moriori of the Chatham Islands orient their dead towards the sea, burying them flexed in an upright position, with the head exposed. Métraux[3] describes for Easter Island the same orientation, towards the encircling sea, for the biers on which bodies were decomposed in vaults before burial. Buck[4] has described the varied customs of the Hawaiian Islands, demonstrating that they resemble the Marquesan customs more than those of the Moa Hunters of New Zealand. This description is not in any way related to chronology, presenting only a two-dimensional picture of the practices followed by the Hawaiians. Flexed and extended primary burials were practiced, usually with the bodies wrapped in tapa or in mats. There was no stigma attached to earth burial in Hawaii, for Bennett[5] reported earth burials with status ornaments on Lanai. Buck[6] reports other status earth burials at Mokapu, Oahu. Secondary burial was also common, and bones of persons of high rank were preserved. Burials took place in or near dwelling houses. Cists and platforms containing burials are found in Hawaii. Caves were used for depositories.

On Tongareva, Buck reported slab-enclosed graves[7] in which the slabs were flanged and knobbed to fit, but no information was obtained on the type of burial contained in the enclosure.

In Tahiti I have seen complete earth burials of males recovered during construction in a village site in Puna'auia. It was uncertain from the statements of informants whether the bodies had been extended or flexed. No grave goods were associated with these burials.

Linton[8] cites literature demonstrating that the usage in Samoa was earth burial, with graves of chiefs marked by stone platforms. The Tongans used earth burial for commoners, but placed chiefs in stone vaults in mounds. Although skulls were preserved in Samoa, such practice was not known in Tonga.

Some burials of the late period were excavated by Gifford in Fiji.[9] The skeletons were dorsally extended with folded legs and heads towards the east. A group of five burials was found in one house mound. Only one artifact, a shell bracelet, was associated with these burials. Other burials were found scattered through the midden.

Human bone scraps occurred frequently throughout the Fijian middens.[10] Therefore, one may infer that canibalism was quite prevalent at all known periods of Fijian prehistory.

For New Caledonia, various mortuary practices have been described by Sarasin.[11] Bodies were exposed in caves or crevices, on the ground surface, on platforms, in hollow trees, in canoes, or hung in trees. After maceration, the bones were placed in caves. Flexed burial was practiced, with the head left above the ground surface to facilitate the removal of the skull. Complete inhumation in the earth, or in stock-

[1] Duff, 1950, 64.
[2] Duff, 1950.
[3] Métraux, 1940, 115.
[4] Buck, 1957, 566–572.
[5] Bennett, 1931.
[6] Buck, 1957, 570.
[7] Buck, 1930.
[8] Linton, 1925, 65.
[9] Gifford, 1951, 219.
[10] Gifford, 1951, 208.
[11] Sarasin, 1929, 260–271.

aded tumuli about 4 feet high, was also known. Bodies were also preserved by crude mummification practices or were abandoned in a sealed hut.

All the above practices, except exposure on a scaffold or in a tree, were also known from the Loyalty Islands. In both the Loyalty Islands and New Caledonia, grave goods were placed with the dead for use in the hereafter.

When more archeological data are available on burial customs in Polynesia and Melanesia, additional similarities will probably be noted between the island groups than are now evident. For the present, it is interesting to note the dissimilarities between the Moa Hunter and the Marquesan burial customs of a millennium earlier. It is also interesting to note the presence of all the Polynesian practices in New Caledonia, which is better known ethnographically than are other island groups in Melanesia. These data again demonstrate the possibility of the appearance of much closer Melanesian-Polynesian relations on the archeological level as a result of further excavations in both areas.

INTERPRETATIONS

THE ABUNDANT MARQUESAN archeological remains are described above. The task presently at hand is to synthesize these data into a meaningful construction, emphasizing those salient features that are of considerable importance not only to the prehistory of Polynesia but to that of the Marquesas. First, the data permit some rather precise statements concerning the date of Marquesan settlement, the origin of the settlers, and the nature of the voyages involved in populating the islands. These matters, discussed below, are followed by a survey of the Marquesan archeological sequence. Finally, it is possible to arrive at an assessment of the role that the Marquesas Islanders played in the over-all picture of the Polynesian migrations. Special attention is drawn to the role of Marquesan society within Eastern Polynesia.

The date of the settlement of the Marquesas Islands has been fixed by the radiocarbon dates obtained on NHaa 1 (2080 ± 150 to 1910 ± 180 years before 1956).[1] An intensive search on the island of Nuku Hiva failed to uncover any other sites of similar age. An examination of the artifacts recovered at NHaa 1 gives the impression that some are of lithic materials (an obsidian flake, basalt) which may actually have been imported from outside the archipelago. Therefore, I believe that the site is one of the first to be occupied on Nuku Hiva; indeed, it may have been settled by some of the discoverers of the archipelago. For this reason, the dates from the earliest stratum of NHaa 1 are accepted as adequately expressing the date of Marquesan settlement. Although somewhat earlier dates may ultimately be obtained from the Marquesas Islands as a result of further excavations, it is doubtful if these dates will significantly exceed the values of 2080 ± 150 and 1910 ± 180. These dates do not coincide in any way with those previously established for Marquesan settlement by Handy.[2] According to the most trustworthy genealogies, the settlement of the archipelago by Nuku, the traditional first settler, occurred around 950 A.D. Elsewhere I have shown conclusively that such genealogical dating is unreliable, constituting the least acceptable portion of the traditional orientation to Polynesian prehistory.[3] It is no surprise, then, that the Marquesan carbon-14 dates demonstrate that the islands were settled about 1000 years before the date arrived at on the basis of genealogies.

To examine and test their congruity, let us consider these dates as opposed to those obtained elsewhere in Polynesia. In Hawaii, where the most extensive archeological collections yet to be obtained in Polynesia have been assembled by Emory and his colleagues at the Bernice P. Bishop Museum, a new date of 120 A.D. was recently obtained from the lowest level of the South Point Dune Site.[4] Emory has continually suggested that the lowest stratum of this site contained a cultural assemblage of a more archaic type than that found elsewhere in Hawaii. His belief was vindicated by the recent Groningen date for a sample from that stratum, which pushes back the prehistoric sequence in Hawaii some 500 years further than even he had suggested.

The excavations of the Norwegian Expedition to Easter Island have yielded a large number of radiocarbon dates, mostly from samples associated with the architectural remains. The earliest date of this series, 386 ± 100 A.D., was obtained from Sample K502,[5] collected beneath a mound at the edge of Poike ditch. Unfortunately, however, information is not yet available concerning the nature of the specimen or its artifactual associations. Therefore, an evaluation of the significance of these data must await full publication of the results of the Norwegian Expedition.

In New Zealand, the intensive study of the Moa Hunter cultural manifestation undertaken in recent years has provided us with an excellent series of well-documented radiocarbon samples from excavated Moa Hunter sites. The earliest so far obtained are from the Wairau Site, 1015 ± 110 A.D. (Sample Y204) and 1100 ± 50 A.D. (Sample N250).[6] Although these dates do not coincide precisely with the date of New Zealand settlement, they are apparently acceptable as

[1] Shapiro and Suggs, 1959.
[2] Handy, E. S. C., 1923, 10–19.
[3] Suggs, 1960.
[4] Rouse, personal communication, 1959.
[5] Smith, C. S., personal communication, 1959.
[6] Emory and Sinoto, 1959, 7.

approximations and fit fairly well with the dates for settlement determined on the basis of legends.[1] Within Eastern Polynesia, therefore, the Marquesan dates are distinguished by their antecedence to dates presently obtained for other islands. Priority of Marquesan settlement, relative to these other islands, is, however, not extreme. It must also be recalled that the Marquesas Islands are far less peripheral to the center of the Polynesian triangle than are the truly marginal islands of Hawaii, New Zealand, and Easter. It should not be surprising, then, that the Marquesas were settled earlier than the latter islands, which in their isolated loci should logically have been the last to be discovered had colonization proceeded in a reasonably orderly fashion from west to east.

The data from Western Polynesia are not voluminous, but are nonetheless definitely significant in this comparison of the chronology of Polynesian settlement. Golson's excavations under the auspices of the Tri-institutional Pacific Program in Samoa and Tonga[2] have thrown new light on the prehistory of these island groups. Especially interesting are the radiocarbon dates obtained from some excavations in the Vailele Site near Apia, where the remains of a fifteenth century traditional village were sealed in an earlier stratum of dark earth containing a large quantity of potsherds which had previously never been found in Samoa. Charcoal samples, collected from pits in this layer, gave dates of 9 ± 120 A.D., 79 ± 60 A.D., and 109 ± 50 A.D. (Samples WS499, WS497, and WS498).[3] As Golson located no other early sites, the position of the culture represented in this stratum of Vailele in the over-all picture of Samoan prehistory cannot yet be determined. It is fortunate, however, that the pottery and architectural remains found at Vailele will permit comparisons with similar remains at NHaa 1. Full publication of Golson's work is awaited to make possible further comparisons between Marquesan and Samoan material culture.

In Tonga, Golson's excavations were quite fruitful, expanding and refining the earlier work by McKern.[4] As yet, no radiocarbon dates have been obtained from samples recovered in the deep refuse deposits tested during the Tongan survey. *A priori*, there seems little reason to expect that the occupation of Tonga will ultimately prove to be significantly later than that of Samoa. In fact, there are excellent grounds to believe that further work will push the prehistory of the Western Polynesian islands back well past the point now represented by Vailele.

In addition to radiocarbon dates, another source for a chronological ordering of island settlements within Polynesia is provided by glottochronology. Elbert's application of Swadesh's techniques of lexico-statistical dating for Polynesian dialect divergence has produced quite interesting results, agreeing generally with the sequence apparent in the enumeration of the Polynesian radiocarbon dates. Unfortunately, the actual dates for Polynesian dialect divergences arrived at in this manner are considerably less precise than those afforded by radiocarbon dating. This relative lack of precision may be as inherent in the available data and historical background of the Polynesian languages themselves as in the dating technique. First, informants from the islands included in Elbert's work were often unavailable; therefore, dictionaries were used to supply terms for the comparative word lists. The dictionaries seldom, if ever, contained data on current usage of vocabulary, thereby presenting a serious problem of selection of proper terms to complete the lists. In addition, there is a problem of controls for comparison. Even by extreme calculations, the earliest divergences of the Polynesian dialects cannot have occurred over 3000 years ago; some occurred within the last few centuries. The lexico-statistical techniques are most productive when applied to differentiation of a much greater order of antiquity. Clearly, even the most painstaking methodology can be no more precise than the most precise control data available. More information on relatively recent dialect divergence is needed for refinement of glottochronological techniques when applied to relatively short-term problems such as this.

Another factor seriously affecting the precision of lexico-statistics in Polynesia is the prevalence of word taboo. Elbert has noted this practice, especially in relation to the glottochronological position of Tahiti in the Eastern Polynesian languages. The chances are excel-

[1] Duff, 1950, Fig. 1.
[2] Golson, personal communication, 1957.
[3] Emory and Sinoto, 1959, 6.
[4] McKern, 1929.

lent, however, that it also affected the positions of other languages in the over-all picture, for word taboo was a common practice in the Marquesas, apparently affecting color terminology in particular.

It is, therefore, clear that the glottochronological data should be used with some caution. Nevertheless, the results offer some support for the archeological data. It is suggested that the Marquesan and Easter Island dialects were the first to branch off from an eastern Polynesian linguistic nucleus, at a date prior to 530 A.D. Later, the dialect of Hawaii became differentiated, followed by that of New Zealand, the Tuamotus, and Rarotanga. If we disregard the actual dating assigned to these later divergences, we see that the general order agrees with that arrived at on archeological grounds.

Other glottochronological dates for main family divisions within Eastern Malayo-Polynesia[1] penetrate into a time level on which glottochronology was intended to be used. Grace dates the Melanesian-Polynesian division as having occurred between 1850 and 1450 B.C., and the east-west division of Polynesian languages as having occurred between 295 B.C. and 155 A.D. The latter time interval coincides well with the date of Marquesan settlement, but it would certainly be unwise now to label the Marquesas as the home of the Eastern Polynesian dialect, because other Eastern Polynesian islands may have been settled at roughly the same time as the Marquesas.

Moving from Polynesia farther westward, we consider here the radiocarbon dates derived from archeological excavations in Melanesia and elsewhere in the Pacific. In the Fiji group, nearest of all Melanesian islands to the Polynesian triangle, Gifford's limited survey uncovered evidence in Site 17, Naulinivatu, of a distinct cultural complex, which he designated as the Early Culture and dated at 46 ± 500 B.C.[2] This date may not even approximate the date of Fijian settlement, however, for in New Caledonia[3] excavations at Site 13, Lapita, uncovered potsherds quite similar to those from Fiji and Tonga in an archeological context, subsequently dated at 846 ± 350 B.C. When both the New Caledonian and Fijian excavations are considered, it must be borne in mind that these were part of a preliminary survey program and thus could not hope to achieve the extent or depth that would be possible for a more prolonged and ambitious effort. Despite these strictures, it may be permissible to assign a tentative date of 1000 B.C. for the settlement of the New Caledonian and probably the Fijian groups, pending more work in each area.

Farther north and west of Melanesia lie the Marianas, where Spoehr excavated in the mid-1950's. He set the date for settlement of the Marianas at 2000 B.C.[4] This estimate was based on the fact that the earliest radiocarbon date of 1527 ± 200 B.C. was obtained from a sample lying above some 4 feet of refuse deposit. Spoehr believed that 500 years might be added to the date obtained to account for the 4-foot-deep deposition below the sample in the midden. The Marianas evidence clearly testifies to the relatively early date at which seafaring capabilities had become well developed on the coast of Asia and adjacent islands. The probable Philippine Islands derivation of the Marianas culture[5] is also of interest, as it suggests that the advanced Asian seafaring technology included the ability to sail *against* prevailing winds.

From this discussion of radiocarbon dates for the early settlement of various islands in Polynesia, Melanesia, and the Marianas, with further illumination provided by glottochronological dating within Polynesia, a broad picture emerges. By at least 2000 B.C. the islands east of the Philippines had already been penetrated and settled by exploring groups moving eastward. The Melanesian islands on the western fringes of the Polynesian triangle were settled by 1000 B.C. or earlier. Sometime, possibly in the middle of the first millennium B.C., the Western Polynesian islands were settled. By the second century B.C. one settlement had definitely been established in Eastern Polynesia, in the Marquesas Islands. It is highly probable that the Society Group was also settled at approximately the same time, although no stratigraphic data or radiocarbon dates are as yet available from that group. We may, however, expect radiocarbon dates for this archipelago in the near future. Roger Green, early in 1960, discovered and directed the excavation of

[1] Grace, 1959.
[2] Gifford and Shutler, 1956, 89.
[3] Gifford and Shutler, 1956.
[4] Spoehr, 1957, 168.
[5] Spoehr, 1957.

an interesting site on Moorea that has yielded adequate charcoal samples suitable for dating purposes. A little later in the same year Kenneth P. Emory and Y. Sinoto began a survey of Tahiti and some of the other islands of the group.

Following the settlement of the Marquesas and the Society Islands towards the end of the first millennium B.C., some of the peripheral islands of the Polynesian Group were settled rather rapidly; Hawaii was colonized in the second century A.D. and Easter Island in the fourth. It is also certain that coincidentally the more central but less hospitable islands were also explored.

In conclusion, dates obtained from archeological radiocarbon, as well as lexico-statistical studies, in Polynesia, Melanesia, and adjacent islands demonstrate an orderly sequence of eastward movement from Melanesia to Western Polynesia, thence to Eastern Polynesia and, finally, into the peripheral islands. In the light of these data, the Marquesan dates are quite reasonable.

The most interesting of all problems raised by the Marquesan archeological excavations is the origin of the Marquesan settlers. What islands were the source of this colorful variation of Polynesian culture? The evidence for Marquesan origins is derived not only from archeological data in the form of concrete artifacts, but also from linguistic and traditional sources. The contributions of each of these sources are considered in turn, in order to identify the homeland of the Marquesans as precisely as possible.

First, let us consider the archeological evidence. One of the most outstanding features of the material culture of the Settlement period is the presence of the so-called Melanesoid complex, represented by a group of artifacts identical with material heretofore generally believed to be Melanesian in origin. This complex consists of the Hatiheu and Ha'e'eka adze types, *Tonna* vegetable peelers, pearl-shell disc ornaments, and pottery, all of which are discussed above in this monograph. After a relatively short period, a few of the artifacts (the adzes and the *Tonna* peelers) became obsolete. Others, for example, pottery, remained in use for an extended period, while the pearl-shell discs continued in use up to historic times.

Some artifacts in the Settlement period culture have a decidedly Western Polynesian flavor. These are the Mouake, Koahi, and Hai types of adzes and the pearl-shell trolling lures with multiple perforated points. On the other hand, tanged or shouldered adzes, commonly believed to be a diagnostic trait of Eastern Polynesia, are found in only very small quantity relative to the frequently occurring Mouaka type.

It is relatively more difficult to characterize other aspects of the material culture assemblage of the Settlement period. As indicated in the comparative sections of this report, large lacunae exist in our knowledge of archeological material culture from many areas of Polynesia and Melanesia. For example, good series of fishhooks are available only from Hawaii, New Zealand, and the Marquesas, with a large thin scattering from many other islands. None is known from Melanesia. It is therefore impossible in the present state of our knowledge to characterize most types of hooks as being either Melanesian or Polynesian except for a few regional or local creations. One-piece bait hooks, for example, might be incautiously labeled "East Polynesian," but no comparative data at all are available from Western Polynesia where such hooks have yet to be reported from archeological excavations. For this reason, it is unwise to overemphasize the similarities of the Marquesan hook assemblage with the extensive Hawaiian collections. Such an overemphasis may lead to the erroneous assumption that the early culture of the Marquesas is Eastern Polynesian in character.

The abrasive tools or files made of coral, urchin spines, coquina, and stone are so generalized that they are of little assistance in our attempts to fix the origin of the Marquesan settlers. Such glamorless and unobtrusive tools may often have been overlooked in archeological excavations or reports, so that it is impossible to chart their distribution with certainty. Tools of this broad type, however, are presently found throughout Western Polynesia, Melanesia, and eastern Australia, so the evidence, unsatisfactory as it is, does not negate the possibility of a Western Polynesian origin for the Marquesas.

The architectural remains of the earliest culture of the Marquesas Islands offer additional evidence pertinent to the determination of the source of the Marquesan settlement. The

round-ended, pole-and-thatch houses of NHaa 1, a type of great antiquity in Polynesia, are also found in Melanesia,[1] which suggests additional connections between the two areas on a more remote time plane.

In contrast to these house structures is the temple structure on NHaa 1 which resembles the edifices of simple early "Inland Temple" type described by Emory for Tahiti.[2] Such temples are generally more elaborate than the example recovered at NHaa 1. Religious structures of this variety are generally characterized as "Eastern Polynesian." The accuracy of this term has, however, yet to be demonstrated conclusively by excavations in archaic Western Polynesian religious structures. Structures of this type may have descended from some ancestral type in Western Polynesia and Melanesia. Indeed, some of the temple structures found in the so-called Megalithic complex of Melanesia possess, in various combinations, the elements of the Eastern Polynesian temple type: stone uprights, platform altars, courts, and so on.

The probable appearance of the Eastern Polynesian type of temple with the Marquesan settlers is quite interesting and is rendered more intriguing by the fact that it evidently was accompanied by the Western Polynesian god-house type of temple which is merely a replica of a human dwelling and not, as is the Eastern Polynesian variety, a specialized, stepped altar. It will be recalled that remains of miniature houses, probably small temple structures, were found superposed directly upon the ruins of the Eastern type of temple. No remains of structures of Eastern type were found anywhere on Nuku Hiva after the Settlement period. Apparently the type became obsolete quite rapidly after this period. The typical Western Polynesian god-house temple remained extant until the nineteenth century collapse of Marquesan culture.

Up to this point, the evidence discussed has been strictly of an archeological artifactual nature. There are, however, additional important non-archeological sources (linguistics and traditional history) that bear on the origin of the Marquesan settlement. Two recent works on Malayo-Polynesian linguistics have aroused the interest of the prehistorian. The first, Elbert's application of lexico-statistical dating techniques to Polynesian dialect divergence, is mentioned above in connection with the dating of Marquesan settlement. The second study, of more far-reaching significance, is Grace's subgrouping of Eastern Malayo-Polynesian languages.[3] Before Grace's work is discussed, it may be profitable to review some additional aspects of Elbert's research. According to him, the data indicated that the Marquesan and Easter Island dialects were the first to separate from the Eastern Polynesian language nucleus. A keystone in his concept of dialect relationships is the existence of two independent centers of linguistic development in which discrete Eastern and Western Polynesian languages developed from a proto-language which, ultimately, diffused to result in the proliferation of dialects known in the ethnographic present. This concept of dialect divergence is quite similar to the "traditional" views in which Tahiti was conceived of as the center of population for Eastern Polynesia. The Marquesan data, however, indicate that the Marquesas were inhabited quite early and, as is shown below, the Marquesas may have played a considerable role in populating Eastern Polynesia. In the absence of any stratigraphic data from Tahiti, we may therefore say that the Marquesas have a strong claim as a second important center of population distribution and that Elbert's view of a single Eastern center may be too simplified. It may also be possible that the Eastern proto-language developed in Western Polynesia geographically and was thence carried into the Eastern islands. When Elbert's conclusions are judged, it is well to recall the difficulties, enumerated above, under which the study was carried out. Further refinement of techniques or new data may alter Elbert's originally proposed ramifications of the Polynesian languages. His conclusions certainly contain nothing drastically contrary to the weight of archeological evidence for Marquesan origins.

The subgrouping of Eastern Malayo-Polynesian languages undertaken by Grace is quite interesting. He assigns all the Polynesian dialects to this subgroup consisting of the languages of the northern New Hebrides, Rotuma, and Fiji, which itself is part of the

[1] Barthel, 1959.
[2] Emory, 1943, 24.
[3] Grace, 1955, 59.

larger New Hebrides-Banks Island language group.[1] Although he does not particularize on the specific position of the Marquesas Islands, he nonetheless indicates very clearly the strong linguistic relationships between Polynesia and Melanesia.

Finally, the oral traditions of the Marquesas relate the statements of early European visitors concerning the origin of the settlers. The two most reliable observers of the Historic period, Captain David Porter and Père Mathias Gracia, agree that according to their informants the Marquesans came from Western Polynesia, specifically mentioning Vavau of the Tonga Group. Other islands mentioned by Marquesans in their historical traditions were Tonga-tabu, Upolu, and Vitinui.[2]

Let us now summarize the evidence for the source of the Marquesan settlement voyage, or voyages. The archeological evidence seems to indicate that the Marquesas were settled by a Western Polynesian group who carried with them a number of remarkably Melanesian culture traits. Such traits may have diffused into Western Polynesia through contact with Melanesian groups, or, more likely, they may have been part of a common Melanesian-Polynesian heritage extending farther into the past than any period spanned by current archeological data. The archeological evidence for the Western Polynesian origin of the Marquesans is supported by their oral traditions of the Historic period which cite one of the Tongan islands as the source of the migration. Linguistic groupings support the archeological and traditional evidence in that they show a close linguistic relationship between Polynesia and adjacent Melanesian islands. Although language and culture are not necessarily coterminous, the circumstances are such that we may anticipate evidence of closer cultural relationships between Melanesia and Polynesia. These relationships are borne out in the Marquesan data. The glottochronological data are not so clear cut. They fail to support other linguistic evidence in indicating a Western Polynesian source for the Marquesan settlers. These data are subject to a number of limitations, however, and there is some hope that further work may clarify the picture.

On the basis of the available evidence, it is possible to maintain that the Marquesans originated in Western Polynesia. Let us now inquire into the nature of the event of settlement, reviewing the available evidence that either an accidental or a purposeful voyage resulted in the settlement of the Marquesan archipelago. The migration route of the original settling party to the Marquesas can, at this late date, never be very clearly known. However, the archeological record contains certain information that illuminates the nature of the settling party, from which some interesting facts can be deduced. Most striking is the information that the Marquesan settlers were quite well equipped for settling an uninhabited island. Pigs and dogs (see Appendix 1), coconuts (pp. 104, 181), and either root crops or breadfruit, or both (pp. 128–129) are evident from the archeological remains at NHaa 1. Chickens were possibly also introduced at this time. Indeed, probably all the domesticated plants then known to the Polynesians were introduced by the Marquesan settlers, even though only the principal crops are evident in the archeological sites.

It appears that the Marquesan settlers definitely intended to establish a colony somewhere. The question is: Did they have any idea of their destination, or were the Marquesas Islands merely a chance discovery? The question is now and probably always will be unanswerable. Certainly some of the eastern Polynesian islands may have been reconnoitered by Western Polynesians previous to the arrival of a main body of settlers. At best, evidence for this type of reconnaissance would be hard to find, especially as the Marquesas are at the extreme edge of Polynesia. However, if legendary sources are at all reliable, the Marquesans, once established in their islands, seem to have been able to find their way around Eastern Polynesia, for contacts took place between the Marquesas and the Tuamotus and Mangareva, as well as possibly Easter Island.[3]

In connection with the problem of Polynesian voyaging, it may be profitable to digress slightly to discuss the thesis recently advanced by Andrew Sharp.[4] Sharp asserts that the

[1] Grace, 1955; 1959.
[2] Porter, 1822, Vol. 2; Gracia, 1843, 5.
[3] Danielsson, 1956, 6; Laval, 1938, 53, 348–349; Métraux, 1940, 181–182.
[4] Sharp, 1957.

Polynesian islands were settled mainly by "accidental" voyages, rather than intentional navigation from island to island. I have discussed this thesis elsewhere at some length, pointing out its main inadequacies in data and methodology, which indicate that it fails to explain the distribution of Polynesian population.

One incidental point of Sharp's thesis should, however, be mentioned. Sharp has denied the possibility that well-equipped expeditions founded settlements on Polynesian islands, insisting that domesticated plants and animals arrived piecemeal as a result of later accidental voyages. Sharp, however, had no access to the information from Hawaiian and Marquesan archeological excavations at the time he wrote. He did not know that the archeological remains in these areas demonstrate clearly that both archipelagos were settled by well-equipped expeditions.[1]

The archeological remains at NHaa 1 provide information concerning the size of the settling group. The number of house remains in the earliest inhabited area of the site, combined with the early temple structure and burials south of the habitation area, indicate that the site was probably settled by at least 50 people. The valley of Ha'atuatua is located on the periphery of the most favorable region of Nuku Hiva, the southeast corner, comprising the valleys of Taipivai, Ha'apa, and Taiohae. One would presume, with reason, that these valleys would have been settled first, or at least simultaneously with the settlement in Ha'atuatua. In fact, there is some evidence of the existence of an early village site, possibly contemporaneous with NHaa 1, near the mouth of the Taipai River in an area that has been eroded by the meandering of the river, until only a remnant of the site remains. Excavations to verify the nature of the site were impossible.

If the logical settlement pattern were followed and nuclear settlements were established in the most suitable valleys of the island, then the group that established itself on Nuku Hiva may have numbered 150 or more. If other islands were colonized simultaneously, the total expedition was probably quite large. These data accord well with traditional information on Polynesian voyaging techniques, in which a large number of canoes fanned out to cover a wide area of ocean, thus increasing the possibilities of landfalls. Judging from the available evidence on Marquesan canoe sizes, if the nuclear settlements numbered in the vicinity of 50, each may have consisted of a separate canoe load. Some common types of Marquesan canoes were said to have carried 45 or 50 people.[2]

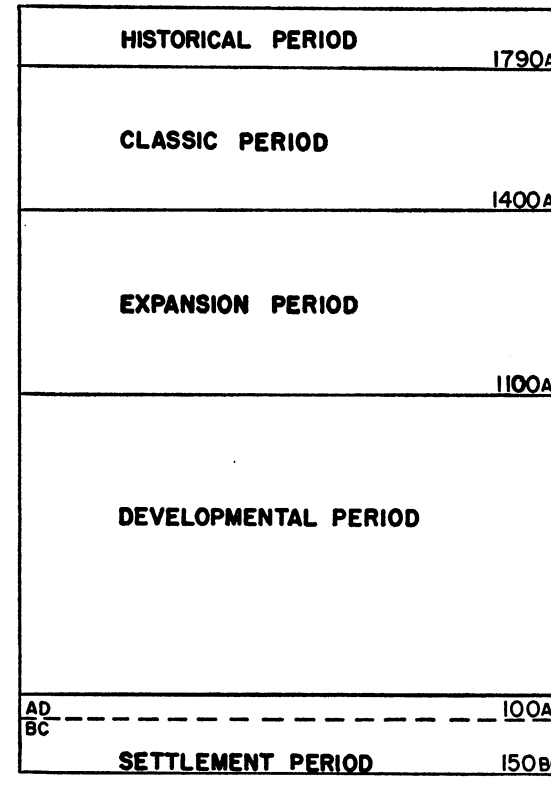

FIG. 40. Time scale.

To summarize this discussion, the following points may be made:

1. The Marquesas were settled at least by the second century B.C. The archeological evidence and radiocarbon dates accord well with data obtained from Polynesia and Melanesia, as well as from glottochronological dates of east-west Polynesian dialect division.

2. The Marquesan settlers originated in Western Polynesia. They carried with them to the Marquesas a material culture characterized by a preponderance of Western Polynesian and Melanesian traits. It must be noted, however,

[1] Emory, 1959.

[2] Handy, E. S. C., 1923, 160.

that the traits referred to as Melanesian may actually be remnants from a common early Melanesian-Polynesian heritage.

3. The expedition that discovered the Marquesas was rather large and well equipped, with domestic animals and plants suitable for the establishment of a new colony. Therefore, although the ultimate destination of the migration may not have been foreseen, the expedition was apparently quite well conceived and planned.

4. As a result of the early settlement and the favorable environment, the population of the Marquesas Islands may have played a significant role in the settlement of some of the adjacent areas of marginal Polynesia.

With this prelude, we may now turn to a discussion of the culture history of the Marquesas as reconstructed from the archeological remains.

SETTLEMENT PERIOD, 150 B.C. TO 100 A.D.

The earliest settlements in the Marquesas were probably on the eastern coasts of the main islands. The order in which the islands were inhabited is, and probably always will be, questionable, as both northern and southern groups are within sight of each other. Reconnaissance of the general area would probably have quickly followed, once an island was settled. Therefore, we can assume that the entire group would have been explored within a decade or so after discovery.

Settlements consisting of small house clusters were made on the beaches near the stream mouths, where both drinking water and the sea were within easy reach. Houses were of the Ovoid House type, possibly with an outdoor pavement, and were frequently rebuilt. Temple structures were separated from the dwelling area. They were probably of both the Eastern Polynesian *ahu* and forecourt types, as well as the Western Polynesian god-house type. House clusters were probably inhabited by extended family groups. Primary, flexed and extended, and secondary burials were made in dwelling areas as well as in the sacred precincts. Exposure of the dead and bone repositories can be inferred from the secondary burial customs.

Breadfruit played a less important role in the economic base of the Settlement period than later in the sequence. Root crops were probably the staple at this period. Coconuts may be inferred from the presence of coconut graters. Pigs were common; dogs and rats were also present. Reliance on the sea for fish and shellfish was quite marked, as it was throughout all of Marquesan prehistory.

Private ceremonialism was well developed in this period. A skull cult, involving trophy or ancestral skulls, functioned. Ancestor worship may further be inferred from the numerous incomplete burials. Food offerings were made to the dead. Few, if any, material goods were placed with burials. Some cannibalism was in evidence.

Burials of the Settlement period infrequently suggested marked status differences, although status may have been indicated by perishable burial accompaniments. Information on the physical type of the early Marquesans is not yet available, but an analysis of our large skeletal collection will undoubtedly contribute much to our knowledge of this facet of Marquesan prehistory.

DEVELOPMENTAL PERIOD, 100 TO 1100 A.D.

The earlier settlement pattern in this period was unchanged. Probably only the south and east coasts were occupied, with house clusters located on the beaches near stream mouths. Temple precincts were still separate from the dwelling areas. Simple community ceremonial structures may have appeared at this time in association with temples, such as the gravel paved area at NHaa 1 which may be an early *tohua*. Ovoid houses gave way to houses constructed on Paved *Paepae* structures.

Small Paved *Paepae* are found in the ceremonial areas above the early Eastern Polynesian simple temple structure, which indicates that the Western Polynesian god-house temple had gained popularity. By the end of the period some structures attained a length of 40 feet.

The economic basis of the society was unaltered, except that an increase in frequency of breadfruit scrapers infers an increase in popularity of breadfruit. A change in the material of which these artifacts were made occurred at

this time: the *Tonna* scraper was replaced by the cowrie scraper. The increased need for breadfruit scrapers probably caused a shift to a raw material more readily available than the relatively scarce *Tonna* shells. Large breadfruit groves, such as those described in historic sources, were probably in this period first planted in the valley bottoms. Use of coconut continued; pigs and dogs were still present.

Status differences, in general, were apparently not marked. However, the increased sizes of some of the house structures later in this period suggest that a gradual increase in prestige or rank may have prevailed at this time.

Private ceremonialism, which included the head cult, ancestor cult, and cannibalism, remained unchanged. In fact, except for cannibalism, these practices continued unchanged throughout Marquesan prehistory.

Material culture did change. Some of the artifact types found in the Settlement and early Developmental periods were discarded by the end of the Developmental period. Some were replaced, and others, such as the adzes of Hatiheu and of Ha'e'eka type, apparently were not important enough to merit replacement. Interestingly, almost the entire Melanesoid complex found in the early period disappeared by the late Developmental period. Low-fired or sun-baked pottery was still made, however, and the Pearl Shell Disc Ornament continued in use. Several hook types dropped from the inventory, possibly indicating a shift to net-fishing techniques, which were most productive later in the Historic period.

During the Developmental period, the population of NHaa 1 increased. Houses were evidently quite numerous along most of the northern half of the beach, so that a uniformly thick midden deposit accumulated throughout that area. Although there is no direct evidence from this period from other valleys, apparently the population was increasing rapidly in all the centers on the southern and eastern coasts of the island, as evidence from archeological remains of the following period demonstrates.

The artifacts of the Settlement and Developmental periods present frequent and striking similarities to artifacts recovered on Easter Island. The Obtuse Recurved and Rotating hooks, adzes of Mouaka and Hatiheu type, and the Ovoid House structures are almost identically duplicated in the Easter Island remains. The early temple structure at NHaa 1 may represent a basic form from which the *ahu* of Easter can have developed. Métraux[1] believed that the source of the Easter Island settlement and the present data appear to bear out this judgment. Another authority on Easter Island prehistory, Dr. Thomas Barthel of the University of Tübingen, states that in his opinion the settlers of Easter Island may have arrived from the Marquesas. A more definite statement may be possible when the work of the Norwegian Expedition has been published in full. In the light of our present knowledge, however, suffice it to say that the dates of the Developmental period culture and many of its characteristic artifacts make it appear to be a definite possibility that the Marquesas settlements were the source of the Easter Island occupation.

EXPANSION PERIOD, 1100 TO 1400 A.D.

The population of Nuku Hiva, which had been increasing in the large verdant valleys on the south and east coasts, suddenly broke out; little habitation sites appeared all over the island in marginal areas, such as Uea on the west coast and Ha'a'au'a'i. Rock-shelters were popular habitation sites in this period. Four of the five rock-shelters excavated in two seasons of work were first inhabited in this period; the single exception is of a slightly later date. Small house clusters were still the main settlement pattern. They were, however, no longer located only on beaches near stream mouths, but were found in the interior of the valleys. They also occurred in the marginal areas, but very rarely.

At this time a change in house platform type is evident; the Transitional *Paepae* appear later in the period with the first definite demarcation between sleeping platform and veranda. Probably the Marquesan house, as it is known in the Historic period,[2] had assumed its basic, rectangular, steep-roofed form by this time. A second type of house platform, the Terraced *Paepae*, appears at the end of this period.

[1] Métraux, 1940, 181–182.

[2] Linton, 1923.

Ceremonial centers are no longer barely modified village greens, as was the paved court at NHaa 1, but become more elaborated. The non-terraced *tohua* first appears in the late Expansion period, being subsequently diffused from Nuku Hiva to the southern group where it was the dominant type[1]; the Terraced *Tohua* is extremely rare. The non-terraced *tohua* were undoubtedly constructed by groups on the subtribal level. They are found in excavations beneath most of the Terraced *Tohua*, which were themselves constructed by groups of that magnitude. There is evidence of planning and long-range continuity of purpose in the construction of the non-terraced *tohua*, because later structures are often superposed on them, as though the non-terraced *tohua* had set the location.

The construction of such ceremonial centers by subtribes marks the beginning of the intergroup rivalry that was so marked in the Historic period. The size, elaboration, and general condition of the *tohua* of an individual's subtribe was evidently a matter of considerable pride. A great victory was scored in war if the *tohua* of the adversary was razed, a fact that Porter seems to have recognized when he burned the "capital" of the Taipi tribes.[2]

Although no burials permitting status inferences are known from this period, the architectural evidence indicates very definite differences in personal prestige and a tightening of the social organization. The construction of the non-terraced *tohua* as ceremonial centers required a fair-sized population, a sizable food surplus, and some source of authority to direct the work and to organize economic support for the workers who were thus removed from their ordinary subsistence activities. This authority was probably still vested in the hands of chiefs, although the formalized ceremonial centers may indicate the beginning of a rise in prestige of the priesthood which is definitely later, in the Classic period.

The causes of the sudden appearance and proliferation of settlements in the marginal areas are complex and should be examined more closely. Evidence from NHaa 1 shows that the population of that valley had become very large before the beginning of the Expansion period and occupied a sizable expanse of beach. An informant stated that, according to tradition, the settlements in the valley of Uea (see NBM 1) had been made by the 'O to kahe'e tribe of the valley of Hakaui who were being crowded by their neighbors and decided to remove themselves from a position in which they ultimately might be destroyed. Evidence of increased intertribal conflict at this time is provided by the fort on Site NTa 11, which probably dates from the Expansion period. According to tradition, the arid northwest coast of Hiva Oa was settled about 1450 A.D.,[3] which indicates that the same general pattern of events that occurred on Nuku Hiva may have been duplicated on that southern island.

The settlement of the less suitable areas of the Marquesan islands was not the only result of the population "explosion" of the Expansion period. Other island groups in Eastern Polynesia may have been settled by groups fleeing from the Marquesas. Danielsson uncovered legendary evidence on Ravoia that that island had been settled by a defeated war chief from an island called "Hiva Nui," which he believes to be either Nuku Hiva or Hiva Oa. This migration, on genealogical counts, was dated at about 1250 A.D. As genealogies are, however, definitely an unreliable dating source, the actual date may be somewhat more recent.

The settlement of Mangareva, attributed by Laval to Marquesans, supposedly occurred about 1275 A.D., again on genealogical counts.[4] Some of the archeological remains from Mangareva, particularly house platforms, many of which are like the Marquesan Transitional *Paepae*, seem to resemble those that characterize the Marquesan Expansion period.[5] Therefore, it appears that we have both archeological and documentary evidence to indicate that there was a population increase in the Developmental period which resulted in overpopulation of the most desirable areas for human habitation on the southern and eastern coasts of Nuku Hiva, and probably Hiva Oa also. Weaker groups in these areas were forced out into the marginal subsistence areas of the islands; some groups apparently struck out to sea in search of new islands. The situation in the Marquesas

[1] Linton, 1925, 24–31.
[2] Porter, 1822, Vol. 2, 101–102.
[3] Handy, E. S. C., 1923, 16.
[4] Laval, 1938, 1–2.
[5] Emory, 1939, 49.

which resulted from a large population with limited land areas of prime quality appears to be analogous to the situation described for New Zealand by Vayda,[1] wherein cleared agricultural lands were at a premium. Expulsion of a tribe from lands of this type resulted in a chain reaction of expulsions as each refugee tribe successively conquered a weaker neighbor until, ultimately, a weak group was forced into virgin forest to begin the onerous task of clearing and preparing the land.

Occasional contact with Tahiti during the Expansion period resulted in the reaching of the Marquesas by stone poi pounders and adzes of Tahitian type, which may have stimulated the development of the local stone pounder industry. The contact was very sporadic and not of great importance for the culture history of the Marquesas. It may also have been indirect, mediated through the Tuamotu Islanders who were trading their pearl shell for stone from Tahiti.[2] Von den Steinen's informants maintained that the Tuamotu Islands were the source of much of the pearl shell of the heavier variety used in the Marquesas. This trade may have also resulted in introducing a few Tahitian artifacts from the Tuamotu group as well. Trade of this type cannot be interpreted as a "second migration" by any stretch of the imagination.

The artifactual evidence of the contact with Tahiti in the Marquesas is of the trait-unit type defined by Wauchope as Type B3, "Fusion with Dominance of the Intruded Trait Unit in the Aspect of the Culture Involved."[3] This hardly can satisfy the strict requirements for migrational evidence quite justly established by Rouse,[4] who insists on actually finding a site-unit intrusion in the culture studied. He believes an actual foreign settlement must be located with house types, artifacts, and, if possible, human remains of an exotic identifiable culture group. This intrusive settlement must also be contemporaneous with similar manifestations in its home area as well as with the components of the cultures it supposedly affected. Environmental and cultural conditions must be shown to be favorable for migration. Lastly, and perhaps most difficult of all, Rouse states, "it is incumbent upon the person who wishes to demonstrate migration to consider and eliminate the possibility that some other hypothesis may better fit the facts at his disposal."[5]

Historic sources[6] indicate that the Tahitians had a vague knowledge of islands existing in the general area of the Marquesas. Information gathered by Cook and his associates from Tahitian informants gives a garbled picture of a large number of islands in the Marquesan area, some of which bear actual Marquesan names. The relative location of the named islands, however, is completely confused. It is important to note that all this evidence is based on hearsay, strained through European ears; there is no record of a Tahitian informant who claimed to have visited the Marquesas. Sharp has pointed out that we might expect the Tahitians to have gained some knowledge of the Marquesas from accidental voyages[7] and, one might also add, from contact with the Tuamotu Islands, which apparently were visited by the Marquesans. With the meager evidence at hand, obviously we can do no more than tentatively assume a sporadic contact with Tahiti.

Several new types of artifacts appear in the Expansion Period. Whether traceable to Tahitian sources or not, poi pounders of the Conical type are found, some bearing the first example of Marquesan sculpture in the round: little pop-eyed anthropomorphic heads. The Koma type of adze which appears in this period may also have been a result of stimulus diffusion from Tahiti. The Compound Shank and Open Jabbing Hook types are also characteristic. In the later sites of the period, the Rectangular type of coral file first appears.

CLASSIC PERIOD, 1400 TO 1790 A.D.

The general community pattern of the Classic period presented no change from that prevalent throughout Marquesan prehistory. Small clusters of dwellings were usually scattered along water courses. Certain differences were notable, however: the beaches were generally shunned,

[1] Vayda, 1956, 205–209.
[2] Danielsson, 1956, 53.
[3] Wauchope, 1956, 21.
[4] Rouse, 1958, 64–67.
[5] Rouse, 1958, 64–67.
[6] Cook, 1955, 241–294, Chart 11; Forster, 1778, 519–521.
[7] Sharp, 1957, 25.

and the entire population seemed to gravitate inland, moving up high into the valley heads for protection from increased raiding from the sea. Houses were built on Terraced *Paepae* and Megalithic *Paepae*. Large, fully elaborated, Terraced *Tohua* appeared in this period, centrally located among the numerous satellite dwelling-house clusters. Some *tohua* were still constructed on the beaches, but the majority were well inland. A few settlements are found in the plateau areas adjacent to Ha'apa and Ho'oumi where conditions permitted habitation.

Nuku Hiva was the center of a Classic period florescence of Megalithic architecture. The effects of this development penetrated the southern Marquesas to some extent, being most evident on the island of Hiva Oa. During the latter portion of the Classic period cut-tufa slabs for architecture became widespread. The cut slabs served as an index of personal prestige when used in domiciles. The raw material itself came to be highly valued and attained a quasi-sacred status, receiving some magical attributes.

Monumental stone sculpture also appeared at this time, probably as a result of the transfer into stone of the sculptural efforts that had hitherto been confined to wood.

Breadfruit was the mainstay of the economy of this period. Large quantities were probably produced in groves of trees planted throughout the valleys. This staple was of particular value, as the trees required a minimum of care, comparatively speaking, and the surplus fruit could be preserved in paste form for future need. Elaborate provisions for preservation and storage were made, principally in the form of large, stone-lined pits and possibly above-ground silos.

During the Classic period, pigs were numerous, large, and common in the diet. The remains of especially large adult pigs are found around ceremonial sites where they had evidently been placed as offerings. Dog remains are very rare in excavated sites of this period, which may indicate that the dog was approaching extinction at this time.

Although there is little evidence for it, cultivation of other food crops, especially starchy root crops, such as taro, yams, and sweet potatoes, must have been nearly as highly developed as that of the breadfruit. It is in sites of the Classic period that many stone-walled taro terraces are scattered through the house clusters and along streams in uninhabited areas. These terraces, however, may date back into the Expansion period or earlier; there is no way to establish a maximum date for them. They usually follow the contour lines of the slope and are often arranged in stepped series, such as those illustrated by Handy.[1] There is no basis for Linton's statement that taro terraces are scarce in Marquesan valleys.[2]

Warfare may periodically have caused the reduction or loss of the surplus, or even loss of the means of production, as one of the typical tactics of war parties was to girdle breadfruit trees and otherwise cripple the economy of their enemies. This hazard, carrying with it the possibility of famine, may have been a check on cultural elaboration to the level attained by the Tahitians or Hawaiians. In historic times, famine through natural or man-made causes seems to have been particularly dreaded. A special god of famine existed in the Marquesan pantheon.[3] His importance may be judged from the fact that the chant intoned as a preliminary to every feast, in gratitude to his god, is still remembered by many in its entirety and was last formally sung about 1945 in Taiohae.

Status and prestige differences are very marked at this period. Ornaments and other status goods are found with burials. The prestige differences also are expressed in the architecture of the Megalithic *Paepae*. The size of the stones in the facades of these structures seems to reflect the prestige of the owner or his family. The ostentatious facades and the poorly built rear portions of these imposing structures can have no other meaning. The architectural use of cut-stone slabs was another index of prestige. In domiciliary structures rivalry was partially expressed on the individual level, but on the tribal level it was demonstrated by the elaborate *tohua* constructions which now appeared in clusters in each subtribal district.

The cause of the intense prestige rivalry may be seen in the relation of the population to the habitable land. As the population increased beyond the point at which all possible ecological niches became filled, intergroup conflicts over

[1] Handy, E. S. C., 1923, 185, Fig. 20.
[2] Linton, 1925, 101.
[3] Delmas, 1927, 42–45.

land would have increased. That such conflicts actually occurred is well known from the Historic period documents[1] and traditional sources.[2] The alternative to conflict and bloodshed, a flight in search of new lands, may sometimes have served as a safety valve, but it would not always have functioned successfully. The need to acquire and hold the land necessary for existence and to increase the areas held to accommodate population increases intensified to an extreme the rivalry apparently present in most Polynesian societies.

During this period there is evidence of an increase in ceremonial activities. The proliferation of new types of structures on the Terraced *Tohua* that could be used only for ceremonial purposes is striking. The structures of the *Tuu* and the Rectangular Platform type make their first appearance, as do a large number of Miniature *Paepae*, singly and as superstructures on other buildings.

There is also a rapid increase of isolated *me'ae* structures of the Megalithic *Paepae* type, usually found in conjunction with low terrace complexes. These structures often rival or surpass ordinary dwelling structures in size, and generally make lavish use of cut-tufa slabs, so important for prestige. *Me'ae* could be tribal, dedicated to minor or major deities, or familial for use in ancestor cults. The increase in ceremonial architecture is probably linked closely with a rise in prestige of the priesthood. In the discussion of the Historic period, it is shown below how important the *tau'a* were at that time; on the archeological evidence we may consider their rise to have been a relatively recent phenomenon occurring mainly in the Classic period.

The cause of the sudden increase in ceremonial construction is difficult to determine. It may be related to several factors, the most important of which may be the prestige rivalry that became so obvious in the archeological record of this period. The intense drive for status may have begun to affect the priests and encourage them to acquire increased secular and economic power through achievement in their own fields, especially in feats of prophecy, magic, and possession—aspects of the Historic period Marquesan religion which were highly developed. During the Classic period the high priests may have been members of the chief's family, often younger brothers, as they apparently were later in the Historic period.[3] If such were the case, there was ample reason for attempts at achieving status, for the tribal chief, under the rule of primogeniture, inherited the title to all the prerogatives and possessions of his father, while younger siblings were inferior. The attempts of the *tau'a* to gain prestige through supernatureal means may have been linked in a mutually reënforcing relationship with the efforts of others—warriors, or even chiefs. These individuals, to attain their own goals, would have had recourse to the supernatural services of the *tau'a*. Success for them would have immediate effect on his prestige as well as their own. The *tau'a's* success in gaining prestige may be judged from the fact that they were quite frequently deified as tribal gods.[4]

How far this situation, so obvious in the Historic period, may be projected into the archeological past is, of course, impossible to determine. The Classic period archeological remains, however, demonstrate an increase in prestige rivalry; one might say that the importance of achievement in status might be traced back at least to that time.

The condition of acute prestige rivalry that manifests itself in the archeological record of this period may actually have caused a change in the basis for attainment of chieftainship. Goldman[5] has suggested that a traditional status system was the basis for Polynesian social organization, and that this may have changed to a system in which status could be achieved. Achievement appears to have been quite possible during the Historic period, if one examines the record of extremely intricate palace politics involving the Taiohae tribe, its chiefs, and those of Ha'apa in their attempt to establish one rule for both valleys.[6] French techniques for obtaining native cooperation, as described by Delmas,[7] were based on a recognition of the possibility of achievement as a means to power.

[1] Krusenstern, 1813; Porter, 1822, Vol. 2.
[2] Handy, E. S. C., 1923.
[3] Handy, E. S. C., 1923, 223.
[4] Delmas, 1927, 51; Radiguet, 1929, 141; Gracia, 1843, 44–45.
[5] Goldman, 1957.
[6] Gracia, 1843; Radiguet, 1929; Christian, 1895; Porter, 1822, Vol. 2; Krusenstern, 1813.
[7] Delmas, 1905–1911.

It is impossible to say whether the chief represented the main source of authority at this time or whether he and the tribal priest shared in the power, as they apparently did in the Historic period. In the Classic period, the chiefs probably controlled economic activities involving community participation, bringing to bear considerable economic pressure or brute force within their own immediate families. Whether proceeding from the chiefs alone, or from the chiefs and priests together, a central authority of great strength is attested to in such structures as Site NT 2, where the fill contains approximately 240,000 cubic feet of hand-moved earth. Such structures could never have been built without a central authority and a well-developed, redistributive organization, utilizing sizable economic surpluses.

Although warfare undoubtedly increased, it was not vicious until the introduction of firearms in the Historic period. The large hilltop forts at NTa 10 and NTa 11 were definitely manned by this time.

Art, as expressed in wood carving and tattooing, was developing rapidly towards the distinctive Marquesan designs of the Historic period. Many of these designs had already been developed by 1790. Certainly during this period the distinctive Marquesan *tiki* face had crystallized, appearing in the monumental tufa figures of Puamau and Taipivai and the beautiful miniature bone *tiki* and *tiki*-headed poi pounders. The well-known intricate tattoo designs seen by the early nineteenth century voyagers do not appear to have evolved by the end of the Classic period, however, as petroglyphic representations of these designs in Classic period contexts are non-existent.

Population was probably at its peak in this period, as European diseases followed in the wake of the whalers after 1790. Handy believes that the population of the archipelago was between 50,000 and 100,000,[1] but I believe that it may have been close to the latter figure, for reasons presented below.

The characteristic artifacts of this period are largely the same as those in the preceding period. The Koma type of adze, which increases markedly in frequency, is the most common in sites of this date. Its frequency increase is linked to an increase in wood carving and stone cutting, for both of which purposes it was used.

The highly polished, esthetically pleasing, *tiki*-headed poi pounders are one of the artistic *tours de force* of the period, as are the bone *tiki* figures and the sculptured earplugs. Other artifacts are poi pounders of *'Opu* and Phallic type.

HISTORIC PERIOD, 1790 A.D.

The rationale for designating 1790 as the beginning of the Historic period, rather than the 1596 date of Mendana's discovery or Cook's visit in 1774, is based on the fact that these contacts had little effect on native culture. After 1790, however, whalers frequently called in at the Marquesas, and it is at this time that the contact attained importance for culture history. During the Historic period, the settlement was the same as in the past, but the orientation towards the interior was more pronounced, and the beaches of the valleys most frequented by European shipping were completely evacuated.

The economic basis of Marquesan society of this period is naturally better known than that of the prehistoric periods, thanks to European documentary sources. Breadfruit and coconuts were apparently quite numerous, as their abundance impressed the early visitors. Other plants mentioned in documentary sources are taro, yams, sweet potatoes, chestnuts, bananas, sugar cane, turmeric, water cress, purslane, gourds, candlenuts, and palmetto.[2] Additional plants not mentioned in these sources are pandanus, *ti*, wild taro or *kape*, arrow-root, and a kind of aroid, called *piapia*, which is not identified in the literature. Nearly all the early visitors attest to the large number of pigs that were available. European voyagers made good use of these animals to provision their ships, thus putting abnormal strains on the economic structures of the most frequented valleys. Porter's 15-month sojourn in Taiohae must have taxed the resources of that valley tremendously. Gillis, in 1825, wrote that hogs were more abundant in Ha'apa than in Taiohae which had

[1] Handy, E. S. C., 1923, 9.

[2] Marchand, 1797, 82–83; Krusenstern, 1813, 142; Porter, 1822, Vol. 2, 130–131; Stewart, 1832, 234–235; Gracia, 1843, 139.

acquired a reputation, even then, for being depleted. He purchased approximately 50 hogs at the rate of five hogs for a musket, remarking that he could have obtained several hundred hogs had he wanted them.[1]

Marchand states that fowl were not common and were used not for food, but as a source of feathers. No voyagers mention dogs until the early nineteenth century, when they may have been reintroduced by Europeans. Either Cook or Marchand seems to have introduced domestic cats.

From this enumeration of the food resources, it is clear that the productivity of the Marquesas was highly developed, and that breadfruit was not the only staple of importance, as Linton states.[2] His claim that taro terraces were not common is not supported by the testimony of Handy, Tautain, and Gracia, all of whom must be considered highly reliable.[3] It also contradicts the fact that ancient taro terraces are to be found everywhere in the valleys at the present time. The large quantity of starchy staples thus produced served as an adjunct to breadfruit, yielding high dividends per unit of effort expended on their cultivation.

The tribe was neither the largest nor the most significant social unit, above the household, as Linton has implied.[4] It constituted only one level in a hierarchy of interlocking social groups. It is impossible to overlook the importance of subtribal groups, or *mata'eina'a*. These groups are mentioned first by Porter, who lists several subtribes for each of the main valleys.[5] The names of many of these are prefixed by the morpheme *'ati*, meaning "descendants of." Other subtribal names refer to animals (clan symbols?) or to place names, such as the *Puhi'oho* (savage eel) group of Hatiheu, or the *'Oto meau* (of Meau Valley) group of Taiohae. Lists in a relatively usable orthography are published by Christian, von den Steinen, and Delmas.[6] On the islands of both Nuku Hiva and Hiva Oa, the subtribal groups organized into tribes were, in turn, grouped into dual divisions. The Nuku Hiva divisions were the *Te'i'i nui 'a haku* and the *Taipi nui 'a vaku*. According to legend, the Te'i'i were descended from the elder of two brothers who were the first settlers of the island. This unit consisted of the populations of Taiohae, Hakaui, Ha'apa, A'akapa, Pua, and Haka'ehu. The *Taipi nui 'a vaku*, which traced descent from the younger brother of the pair, consisted of Taipivai, or Vai'i, Ho'oumi, Ha'atuatua, Hatiheu, and Anaho.[7]

Except during periods of war against the combined Taipi tribes, all the Te'i'i were united; in times of peace there was internal strife within both groups. Relations between the subtribes in a valley were seldom harmonious; many of these groups fought one another periodically, uniting only against outsiders. The importance of the subtribal groups is sufficiently established by the fact that they were named and had an in-group feeling, as indicated by their communal projects, such as *tohua* construction and warfare.

This structure of increasingly large interlocking social groups of subtribal, tribal, and supratribal orders, all tracing ultimate descent from common ancestors through various lines, seems to indicate a ramage structure, according to Sahlins,[8] who also has pointed out that this type of organization develops where resources are too scattered to be easily exploited by a single household.[9] Such is not necessarily the case in the Marquesas. As I indicate (p. 14), the main food resources are clustered quite closely within the valley confines. There is no zoning, as in Hawaii, where different crops were produced in differing ecological areas. Marquesas agriculture was confined to the valleys. A Marquesan household can maintain itself quite well on the produce from a relatively small garden plot, a few breadfruit trees, and a taro terrace, all of which can be crowded into a very small area. For fishing, however, large groups were far more efficient, and in this situation a ramage organization would have been ideal. The efforts of single individuals or small family groups would have had small success with some of the net-fishing techniques which evidently supplied larger quantities of fish than line fishing.

Therefore, despite the fact that a ramage

[1] Dodge, 1940, 386.
[2] Linton, 1925, 101.
[3] Handy, E. S. C., 1923, 184–186; Tautain, 1897a, 542; Gracia, 1843, 139.
[4] Linton, 1939, 149.
[5] Porter, 1822, Vol. 2, 29, 31, 52, 79–80.
[6] Christian, 1895, 199–200; von den Steinen, 1925, Vol. 1, 15–17; Delmas, 1927, Chap. 3.
[7] Christian, 1895; Delmas, 1927.
[8] Sahlins, 1958, 72–77.
[9] Sahlins, 1958, 251.

organization existed in the Marquesas, there is no marked pressure in the ecological situation that would inevitably produce such an organization. Sahlins has observed that in Easter Island, Tikopia, and Uvea such pressure was not marked, admitting that this diminishes the probability of his hypothetical relationship between ramage organization and scattered resources.[1] I submit that the Marquesas may also be added to the exceptions to his hypothetical relationship, which I believe, nevertheless, to be of great interpretive value.

In the Historic period, authority seems to have been centered in the chief and the *tau'a*, or tribal high priest. These individuals were usually of the same family[2] and acted in concert. The chief in the Historic period apparently was not easily identified by any outward indication of rank or respect. Nevertheless, he possessed economic power as the initiator of all communal economic activity, such as breadfruit harvesting and fishing expeditions. The European visitors were almost unanimous in their surprise at the absence of visible symbols of authority. Marchand[3] writes that no one appeared to have any great authority and that force constituted right. Krusenstern says the "king" was indistinguishable from a commoner and was laughed at.[4] Lisiansky perceived, however, that the chiefs, despite their lack of dignity, had definite privileges.[5] Porter's longer stay on Nuku Hiva entitles him to status as a better authority than the previously cited earlier voyagers who stayed only a few weeks. He declared that no chiefs seemed to be charged with any real authority,[6] and that their rule was generally mild and patriarchal. It may be noted, however, that Porter always dealt with the chiefs when arranging any activity involving tribal participation. As a result of his five-year sojourn, Gracia was even better acquainted than Porter with Marquesan political organization. He states that chiefly authority was generally paternalistic, but could be extended to the death decree when that authority was defied.[7]

Handy[8] interpreted the political organization as a kind of feudalism, in Sahlins' more precise terms an "overlapping stewardship," in which the chief assigned land plots in return for goods and services which he redistributed as best suited tribal interests, according to his judgment. In addition, the chief drew additional wealth from land belonging to the members of the main line of the chiefly family.

Property was always in terms of land. Plots of land, once assigned, were passed on according to the rules of inheritance. Ordinarily the possession of such inherited land would not be revoked by the chiefs for any reason. The earliest land maps I examined were made by the French in the late nineteenth century. They suggest a concept of named plots with definite boundaries acquired through inheritance. There does not appear to be any basis in the literature for Linton's statement that property was vested in trees or gardens, and not in land.[9]

In the Historic period chieftainship could be not only inherited but achieved by acquisition of rights to resources or prowess through war. A family could raise its status by skilful adoptions, marriages, and alliances, utilizing sexual hospitality and mutual economic benefits to attain a concentration of economic power. The prevalence of the institutions of polyandry and the *pekio* secondary mate is probably related directly to their importance in social advancement in a society in which prestige rivalry was strong. They were also a means of recruiting promising young warriors for the exercise of force, as well as bringing decided economic dividends. Statements by Radiguet and Lisiansky seem to indicate that polyandry was not the rule but was generally restricted to families of higher status.[10] Stewart[11] noted polyandry, which also indicates that marriages served to further political and other ambitions. A good example of the value of such customs is given by Radiguet,[12] who describes an incident in which war between Taiohae and Taipivai was prevented when the 16-year-old wife of the Taiohae chief adopted a much older Taipivai chief as her son.

By this time the *tau'a* had risen very high in social prestige. Handy[13] has remarked that in

[1] Sahlins, 1958, 216.
[2] Handy, E. S. C., 1923, 55; Delmas, 1927, 70.
[3] Marchand, 1797, 133–134.
[4] Krusenstern, 1813, 165.
[5] Lisiansky, 1814, 80.
[6] Porter, 1822, Vol. 2, 63–64.
[7] Gracia, 1843, 102.
[8] Handy, E. S. C., 1923, 57–59.
[9] Linton, 1939, 140.
[10] Radiguet, 1929, 125; Lisiansky, 1814, 83.
[11] Stewart, 1832, 340.
[12] Radiguet, 1929, 76.
[13] Handy, E. S. C., 1923, 56.

1919 the exploits of the *tau'a* were remembered with much more interest than those of the chiefs. A survey of the names of temples and gods listed by Delmas[1] reveals few names of the deities found elsewhere in Polynesia, for at least 40 per cent can positively be identified as deified *tau'a* (only one deified chief and one warrior are represented). The *tau'a* participated in the government in collaboration with the chief to the extent that Gracia has called the Marquesas a theocracy.[2] *Tau'a* were hedged with a large number of taboos, all crisis rites in their lives being marked by human sacrifices.[3] They were more sacred than any other members of the tribe, including the chief, and were distinguished by dress and economic prerogatives, such as rights to certain types of food.[4] They did not participate in ordinary economic activities. Below the tribal priests was a long series of less significant priests, many of whom were engaged in their religious activities only part of the time.

Classes of specialists in various occupations, known collectively as the *tuhuka*, had become highly organized. These men performed special tasks requiring more skilled knowledge and training than the average individual would have normally acquired in his lifetime.[5] The prestige of warriors was also high, for accession to the chieftainship was probably possible through attainment of war honors.

In this period status differences are very marked in the grave goods which consist of valued native ornaments and European prestige trade items.

Large-scale megalithic construction was still carried on, although in the collapse of the native political structure that followed French contact there was some local decadence in *paepae* building. Thus the huge Megalithic *Paepae* in Hatiheu (p. 161) dates from 1870, but structures on NT 2, also dated well after contact by included European artifacts, show a use of small, poorly selected stones and more easily obtained solid dirt fill.

The introduction of European tools did not, at first, have an entirely adverse effect on the native material culture. Iron, usually obtained in the form of barrel hoops, was highly desired for adzes.[6] Dodge also mentions the trade in muskets, powder, fishhooks, axes, and knives. Glass bottles were quite widely circulated, attaining a certain importance as prestige items, for fragments are often found among grave goods. Glass may have been used for wood carving; some fragments of thick bottle bases were apparently percussion-flaked to provide blades.

The introduction of iron cutting tools rapidly caused the stone adze to become extinct. Iron adzes, however, are to this day hafted in the fashion of the stone adze. The introduction of metal fishhooks caused a quick decline of the use of native pearl shell hooks except for the bonito trolling hooks. As a corollary the artifacts involved in hook making, such as coral files and drills, became obsolete.

Plastic art flourished at this period, especially stone carving in the southern group. The elaborately carved wooden objects in most ethnographic collections are probably largely from the Historic period, for, as I have noted, not one fragment of ornamentally carved wood was recovered from the middens in the earlier dry rock-shelters. Tattooing reached its climax and began to decline.[7]

Warfare was quite frequent in the Historic period, even before firearms became common. Porter[8] described continual raiding and the use of large hilltop and stone-walled forts for observation and defense during his visit. Following the introduction of firearms, however, with an increase in actual wars of conquest rather than raids, the conflicts became more sanguinary.[9] The Ha'apa tribe managed to cow their former allies, Taiohae, placing a kind of "regent" with the young heir to the Taiohae chieftainship, Te Moana. Other chiefs from Ha'apa were placed in key positions in Taiohae before the French occupation had begun.[10]

According to Delmas,[11] the population of the Marquesas reached its peak about 1790 and began to decline thereafter as a result of a large number of complexly interrelated factors, which I discuss below. A reconstruction of the popula-

[1] Delmas, 1927, Chap. 3.
[2] Gracia, 1843, 59.
[3] Delmas, 1927, 70, 153; Handy, E. S. C., 1923, 226.
[4] Delmas, 1927.
[5] Handy, E. S. C., 1923, 143–147.
[6] Porter, 1822, Vol. 2; Lisiansky, 1814, 64–67; Dodge, 940, 386.
[7] Von den Steinen, 1925, Vol. 1.
[8] Porter, 1822, Vol. 2.
[9] Radiguet, 1929; Gracia, 1843; Delmas, 1927.
[10] Gracia, 1843, 17; Radiguet, 1929, 56.
[11] Delmas, no date, MS. in Taiohae Mission.

tion of the Marquesas Islands at its peak, in the beginning of the Historic period, is no easy task, however, because the data available are of most uneven quality. The size of the Marquesan population is based on estimates by early European voyagers and traditional information. The explorers' estimates quite frequently apply to only limited portions of the total archipelago and, with few exceptions, rest on a few days' or weeks' experience with a limited number of natives. In addition, population numbers were often quoted in terms of "warriors," and we have no criteria for judging the proportion of the population that should be counted in this category. Delmas[1] assumes that the term "warrior" applied to able males and some women and that one-third of the population of any given area would fall into that category. The figure seems somewhat ambitious, but Delmas' 50 years' of experience in the Marquesas must be respected.

Delmas further used the relative proportions of the various modern island populations to expand the limited estimates made by early visitors to cover the entire archipelago, but the projection of modern relative population sizes backward into the past is at best a dubious method.

The data for Nuka Hiva begin with Krusenstern's estimate of 1803, made following a 10-day visit. He includes only five valleys in the count, based on statements elicited from two white deserters residing in Taiohae who may not have been very reliable. According to this estimate, the population was 5900 warriors, or possibly a total of 18,000 to 24,000 for the island, depending on the proportion of warriors to non-warriors one selects.

[1] Delmas, no date, MS. in Taiohae Mission.

Porter's 1813 estimate is based on a stay of some 15 months on Nuka Hiva and experience with a large segment of the population. Included in his calculations is information from eight major valleys, giving a total of 19,200 warriors, or between 60,000 and 80,000 for the entire island. This estimate appears rather high in view of the fact that a famine occurred between the visits of Krusenstern and Porter which apparently wiped out two-thirds of the population.[2] Furthermore, Porter was an enemy of the Marquesans, and the figures may have been expanded somewhat to make them appear more impressive.

Following the French occupation, the population estimates may be presumed to be more reliable, as Europeans became acquainted with the entire archipelago, thus gaining a better basis for their inferences.

Table 18 gives a summary of these estimates.[3] The estimates of Du Petit Thouars and Jouan are possibly in error, as there are some unusual differences between their figures for the Nuku Hiva and Ua Pou populations. The estimates of Des Vergnes and Clavel are the results of conscious "nose-counting" efforts and may be reasonably correct. These figures show very plainly the sickening plunge of the population curve after French occupation, but they contribute little to our reconstruction of the population of Nuku Hiva and the archipelago, because the first half of the nineteenth century saw a tremendous toll of native lives taken by disease, warfare, and famine.

To return to the matter of maximum population for Nuku Hiva, I believe that it lies some-

[2] Gracia, 1843, 12–13.
[3] Von den Steinen, 1925, Vol. 1, 12.

TABLE 18
POPULATION ESTIMATES

Source	Nuku Hiva	Ua Pou	Ua Huka	Hiva Oa	Tahuata	Fatu Hiva	Total
Du Petit Thouars 1842	8000	200	200	6000	700	1500	20,200
Jouan 1856	2700	1100	300	6000	600	1200	12,550
Des Vergnes 1872	1560	900	19	3015	301	250	6,045
Clavel 1882	980	376	189	2161	520	639	4,865

where between the estimate of Krusenstern and that of Porter. The Marquesans of Gracia's time believed that Krusenstern's figures were quite possible. I find Porter's figures somewhat high. If one accepts Thouars' 8000 estimate for 1842 as roughly representative of post-famine Nuku Hiva, then the population before the famine would have been about 24,000. This agrees roughly with traditional information that I collected for certain valleys on Nuku Hiva, indicating a population of about 30,000. The values do not seem in any way exorbitant in the light of my archeological survey, which indicated that the island of Nuku Hiva had been occupied to the maximum density that was possible with the given native technology. Even the most marginal areas show signs of habitation in the form of house floors and platforms.

Therefore, I believe that the peak population of Nuku Hiva was approximately 30,000. This peak occurred in the last decade of the eighteenth century. On the basis of this estimate, the total population of the archipelago might have been 100,000, if one assumes that Nuku Hiva had been occupied by as much as one third of the total population, rather than one fourth as it has in recent times. This proportion (one third) is more in accord with the early estimates of the colonial period.

After 1790, the natives were decimated by childhood communicable diseases and tuberculosis. Famines may originally have had natural causes, but their effects were prolonged and heightened by the constant drain on native resources made by European ships provisioning in the islands. The situation worsened materially with the introduction of firearms, for they contributed to an increase in warfare that fragmented completely the whole socio-political structure. Thus both the economic and political structures of Marquesan society incurred serious damage during this period.

The occupation of the island after 1840 brought quick death to the native culture. As von den Steinen remarked,[1] the Missions were mainly responsible for the extinction of the native way of life. In their capacity of official representatives of the government, they enjoyed full temporal powers and utilized them to ban native dress, singing, dancing, musical instruments, the use of kava, and the use of turmeric, nudity, and tattooing.[2] Further, they acquired much of the best land by skilful trading in hardware. This land was worked by native labor. The material gain from this arrangement can be seen clearly from an examination of the situation in 1888 when the population of Nuku Hiva was about 500,[3] and 39 churches were maintained on the island, and 127 in the entire archipelago[4] for a total population of 4865.

The Missions, in collaboration with French military forces, caused the complete collapse of native government by utilizing the characteristic high prestige rivalry, playing one chief against another, and exterminating or replacing the hard core of Marquesan chiefs with pliable substitutes chosen from the ranks of the malcontent warriors.

[1] Von den Steinen, 1928, Vol. 2, 216–217.
[2] Delmas, 1905–1911.
[3] The official government census of 1882 gives a figure of 980.
[4] Delmas, no date, MS. in Taiohae Mission.

SUMMARY AND CONCLUSIONS

THE EXCAVATIONS IN THE Marquesas have brought to light a number of interesting facts which have considerable significance for Polynesian prehistory in that they require a revision of certain previously accepted theories and methods which had, in the past, characterized our knowledge of the prehistory of Polynesia.

1. The age of the Marquesan settlement is demonstrated to be considerably in excess of any previously held theories for the settlement of Eastern Polynesia. The evidence that the Marquesas, on the fringe of Eastern Polynesia, were settled in the second century B.C. casts a considerably different light on the entire pattern of settlement of the Polynesian islands. Previously, Tahiti was believed to have been the obvious center of diffusion from which all of Eastern Polynesia was populated. Now, regardless of the age finally established for the Tahitian occupation, the relatively early settlement of the Marquesas demonstrates that the Marquesans occupied their islands for a time more than ample to have contributed to the population of Eastern Polynesia. In support of the Marquesas as a center of cultural diffusion, there is evidence of both an archeological and historical traditional nature indicating that Marquesans may have been responsible for the settlement of Easter Island, Raroia (and other northeastern Tuamotu atolls in the vicinity of Raroia), and Mangareva.

The final decision on the relationships of these island societies with the society of the Marquesas must await publication of the archeological evidence obtained at Easter by the Norwegian Expedition and at Mangareva by Roger C. Green of Harvard. No excavations, unfortunately, have been undertaken on Raroia. Only when detailed comparisons of archeological data are possible will the genetic interrelationships of the above-mentioned atolls be placed on a firmer footing.

It is necessary to emphasize that in this view the role of Tahiti in the population of the central area of Eastern Polynesia, New Zealand, and Hawaii is fully recognized and accepted. It is maintained, however, that the Marquesas may have been a second center of diffusion, acting in conjunction with Tahiti to populate the marginal islands.

2. The archeological evidence from the Marquesas indicates that the origin of the settlers was a western Polynesian island. A number of artifacts in the cultural assemblage of this group show a decidedly Melanesian character. These data permit several conclusions:

A. The west to east direction of settlement in Polynesia is completely vindicated, and a New World origin for Polynesian culture is ruled out effectively.

B. The Melanesian artifacts in the Settlement period culture point to a Melanesian-Polynesian relationship on an earlier time level than has already been demonstrated by historical linguistic studies. The further one penetrates into the past in Polynesia, the more apparent is a convergence between Polynesian and Melanesian cultural assemblages, to the point where identity might be reached in the second millennium B.C. Such a convergence has been partially demonstrated by the most recent excavations in Tonga and Samoa.

C. By demonstrating the relationship between early Polynesian cultures and those of Melanesia, the Marquesan data also strengthen the links between the Polynesian cultures as a whole and the cultures of the Southeast Asian peninsula and, by extension, Coastal China.

3. In view of the current popular scepticism concerning the Polynesians' ability to perform long voyages and effect discoveries of land by planned explorations, it is well to note that the Marquesan data show that the expedition that settled those islands was of large size and was completely equipped with plants and animals to found a new colony. Thus the traditional views of Polynesian migrations receive support from the archeological data, and a new assessment of Polynesian navigatory capabilities may be in order.

4. The Marquesan data further show that Marquesan society developed, in relative isolation from any marked exotic influences, over a course of 2100 years or more. Such does not preclude contacts with exotic groups, however, for these apparently occurred, with the Marquesans playing both active and passive roles. The archeological evidence does eliminate, however, that favorite device of traditionally

oriented students: the "wave" migration mechanism. There is no trace of any outside influence in the Marquesan archeological record that could in any way be interpreted as the result of the impact of a large number of people arriving from a relatively "foreign" Polynesian cultural tradition. It should be noted that once the islands became relatively well populated, perhaps attaining a census of 10,000, any migrant group would be swallowed up unless it numbered in the thousands or was able to reside in an isolated area to recruit its strength over a number of generations.

The evidence of exotic contact in the Marquesas indicates that it was relatively superficial and infrequent, exercising little effect on the main stream of Marquesan cultural evolution. Therefore, the development of Marquesan culture must be viewed as the result of the interaction of a group with its environment rather than a heterogeneous assemblage of influences from a wide variety of differing cultures.

It is further suggested that in the absence of well-founded archeological sequences, the "wave" migration mechanism be used with increased caution in other areas of Polynesia.

5. It was assumed in the past that Polynesian culture was diffused from two centers, the Eastern Polynesian center having been the nuclear area in which the characteristic aspects of Eastern Polynesian culture developed before being diffused to the outer islands.[1] This view has also been carried over into linguistic constructions.[2]

The Marquesan data imply, however, that this concept may have been far too idealized, so that the possibility that a basic Eastern Polynesian culture ever existed in one area is decidedly remote. The Eastern Polynesian cultural peculiarities have evidently developed piecemeal as a result of an interplay between several centers of diffusion, some of which began, as the Marquesas did, with a Western Polynesian culture, which developed in interaction with the distinctive features of the local environment. To refer to "Eastern Polynesian culture" as an entity, then, may be haphazardly grouping together a number of societies of different origins, from different environmental milieus, rather than a set of shoots from the Eastern Polynesian cultural trunk as was previously believed. Such a grouping is not necessarily legitimate, despite the obvious utility of the term "Eastern Polynesia" as a short-hand device.

Finally, the results of the recent stratigraphic archeological excavations in New Zealand, Hawaii, the Marquesas, Easter Island, Samoa, Tonga, and Mangareva are seen to be changing radically many of the well-established theories previously taken for granted in Polynesian anthropology. The interplay between these archeological data and the data of other prehistoric studies (traditional, linguistic, trait distributional, or physical) has produced a situation in which much of the old data may be open to restudy and re-interpretation in the light of the new findings, while other data and conclusions long held in disrepute may ultimately be resurrected as having been remarkably advanced.

Already a picture of Polynesian migration patterns and schedules is beginning to emerge in general terms, while new data are constantly accumulating to fill the gaps in our knowledge.

These new advances in Polynesian prehistoric studies will result in many interesting feedbacks to theoretical anthropology, especially in the field of cultural evolution and dynamic processes. The simpler environmental situation of Polynesian cultures makes the area an ideal laboratory for the study of cultural ecology, as has already been demonstrated.

Much remains to be done, but the initial groundwork has long been laid, and the next decade should see many problems of Polynesian prehistory dissolve before the combined attack of all the subdisciplines of anthropology.

[1] Burrows, 1938.
[2] Elbert, 1953.

APPENDIX 1. ANIMAL REMAINS

REMAINS OF BOTH vertebrates and invertebrates were found. Of these, only the vertebrate specimens have been partially identified. A preliminary examination of the invertebrate remains, however, demonstrated that all were of species still present in the islands.

The remains of domesticated animals were naturally of most importance in the prehistory of the archipelago; therefore, most attention was devoted to separating these remains and identifying them. The distribution of mammal remains throughout the sites is shown in Table 19.

The most significant fact is that pig, dog, and rat remains were recovered from NHaa 1, the earliest site excavated, which demonstrates that the Marquesans brought these animals with them in their migration from the west, the pigs and dogs being brought purposely, while the rats were undoubtedly stowaways aboard the vessels. Remains of pigs were the most frequently encountered in all excavated sites; in the later habitation sites, dog remains were present only in small quantity. Although there is some evidence that dogs were used as a food source, it is inconclusive. The decrease in frequency of dog remains may account for the statements of early visitors to the Marquesas who often claimed that dogs were not known to the natives or were very scarce.

Remains of domestic cats were found only in association with contact material, which indicates that these animals were introduced in the Historic period by Europeans.

TABLE 19

ANIMAL REMAINS

Sites	Pig (*Sus* sp.)	Dog (*Canis* sp.)	Rat (*Rattus concolor*?)	Cat (*Felis* sp.)
NBM 1	x	x	x	—
NBM 4	x	—	x	—
NBM 5	x	—	—	—
NBM 6	x	—	—	—
NTa 2	x	—	—	—
NTa 7	x	x	—	—
NH 3	x	x	—	—
NH 4	x	—	—	—
NT 2	x	—	—	—
NT 3	x	—	—	—
NT 4	x	—	—	—
NT 5	x	—	—	—
NT 6	x	—	—	—
NT 8	x	—	—	—
NHo 2	x	—	—	x
NHi 1	x	—	—	—
NHaa 1	x	x	x	—
NHaa 2	x	—	—	—
NHtu 1	x	—	—	—
NHe 3	x	—	—	—

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CATALOGUE DATA FOR CERTAIN TEXT FIGURES

26. Fishhooks
    a. Unit 1052, 0–5″ level, Site NHo 3 (85-1052)
    b. Site NHaa 1 (85-1305)
    c. Site NHaa 1 (85-1270)
    d. Site NHaa 1 (85-1437)
    e. Surface, Site NHaa 1 (85-1218)
    f. Site NHaa 1 (85-1270)
    g. Surface, NHaa 1 (85-1222)
    h. Site NHaa 1 (85-1235)
    i. Site NHaa 1 (no number)
    j. Unit 1052, 10–15″ level, Site NHo 3 (85-1052)
    k. Unit 58, 10–15″ level, Site NBM 1 (85-888)
    l. Unit 1051-1, Site NBM 1 (85-1051)
    m. Unit 50, 0–5″ level, Site NBM 1 (85-862)
    n. Surface, Site NHaa 1 (85–1218)
    o. Site NHaa 1 (85-1262)
    p. Unit 1080, 0–5″ level, Site NHo 3 (85-1080-1)
    q. Site NHaa 1 (85-1312)
    r. Site NHaa 1 (85-252)
    s. Surface collection, Site NHaa 1 (85-1210)
    t. Surface, Site NHaa 1 (85-1218)
    u. Site NHaa 1 (85-1260)
    v. Site NHaa 1 (85-1243)
    w. Test 2, 0–5″ level, Site NH 4 (85-931)
    x. Unit 1071, 10–15″ level, Site NHo 3 (85-1071-2)
    y. Surface, Site NHaa 1 (85-1218)
27. Coral files
    a. Unit 72, 0–5″ level, Site NBM 4 (85-849)
    b. Site NHaa 1 (85-1249)
    c. Site NHaa 1 (85-1242)
    d. In residue of excavations, Site NBM 4 (85-860)
    e. Site NHaa 1 (85-1241)
    f. Surface, Site NHaa 1 (85-1218)
    g. Site NHaa 1 (85-1382)
    h. Unit 1081, 10–15″ level, Site NHo 3 (85-1081-3)
    i. Site NHaa 1 (85-1317)
29. Poi pounder types
    a. Unit 751, Stratum Ib, Site NHi 1 (85-751-4)
    b. Marquesas Islands (80.1-709)
    c. Surface, A'akapa (85-820)
    d. Surface, Taiohae (85-821b)
    e. Surface, Taipivai (85-806a)
30. Adze types
    a. Surface, Ha'atuatua (85-759m)
    b. Surface, Hatiheu (85-1264)
    c. Surface, Hatiheu (85-7570)
    d. Surface, A'akapa (85-796e)
    e. Site NHaa 1 (85-1259)
    f. Surface, north coast, Nuku Hiva (85-794b)
    g. Surface, Hatiheu (85-757h)
    h. Site NHaa 1 (85-1310)
    i. Surface, north coast, Nuku Hiva (85-794)
31. Stone artifacts
    a. Retouched stone flake scraper-knife, Site NHaa 1 (84-1483)
    b. Cleaver flake, Site NHaa 1 (85-1491)
    c. Hammerstone, Test 1, 10–15″ level, NHuu 1 (85-761-2)
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    a. Pearl shell scraper-knife, Site NHaa 1 (85-1525)
    b. Pearl shell scraper-knife, Unit 54, Site NBM 1 (85-871)
    c. Squid lure cowrie, Site NHaa 1 (85-1340)
    d. Cowrie flapper for squid lure, Site NHaa 1 (85-1311a)
    e. *Cassis* scoop, surface, Site NHi 1 (85-753)
    f. Cowrie vegetable scraper, Test 1, Site NHaa 2 (85-745)
    g. *Tonna* vegetable scraper, Site NHaa 1 (85-1218)
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    a. Pearl shell disc, Site NHaa 1 (85-1264)
    b. Perforated pearl shell tab, Site NHaa 1 (85-1315)
    c. Pearl shell plaque, Site NHaa 1 (85-1269)
    d. Pearl shell pendant, Unit 74, 0–5″ level, Site NBM 4 (85-853)
    e. Solid earplug made of spine of *Murex ramosus*, Unit 53, Site NBM 1 (85–870)
    f. Urchin spine projectile point?, surface, Site NHaa 1 (85-1218)
    g. Urchin spine drill, Site NHaa 1 (85-1255)
    h. Urchin spine file, Site NHaa 1 (85-1358)
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    m. Cylindrical type shell adze, Site NHaa 1 (85-1312)
    n. Thick poll type of shell adze, Unit 936, 0–5″ level, Site NH 4 (85-936)
    o. Bone reel, Unit 1054, 5–10″ level, Site NHo 3 (85-1054-1)
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    a–b. Surface, Ho'oumi (85-1202ab)
    c. Site NHaa 1 (85-1330)
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    b. Toy top, Unit 937, 0–5″ level, Site NH 4 (85–937)

c. Marlin spike, Unit 942, 0–5″ level, Site NH 4 (85-942)
d. Needle, Unit 1000, 0–5″ level, Site NH 4 (85-1000)

36. Weights, lure, and petroglyph
a. Squid lure weight, Site NHaa 1 (85-1264)
b. Turtle lure, Site NHaa 1 (85-1218)
c. Fishing weight, Site NHaa 1 (85-1218)
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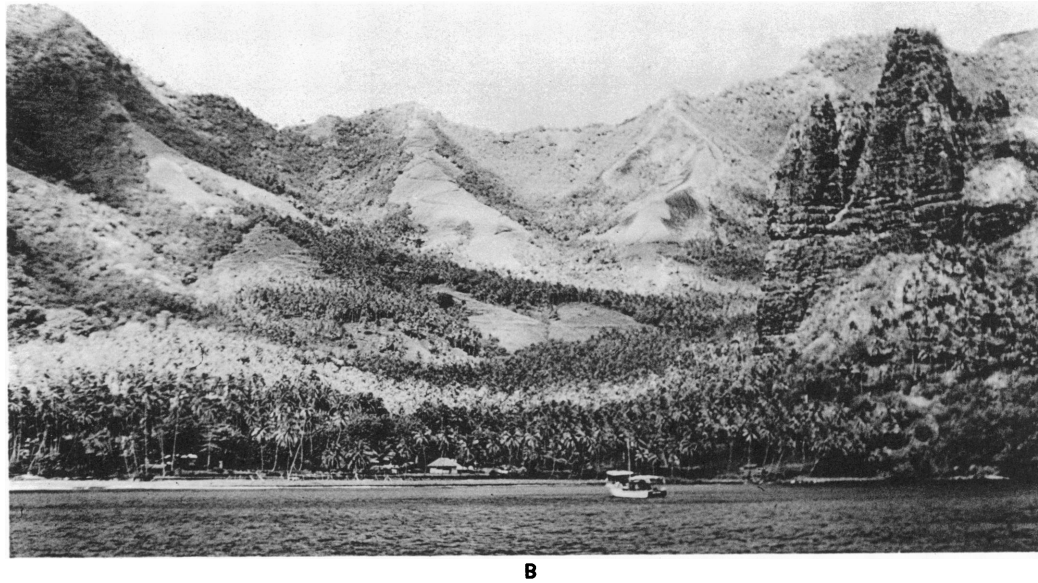
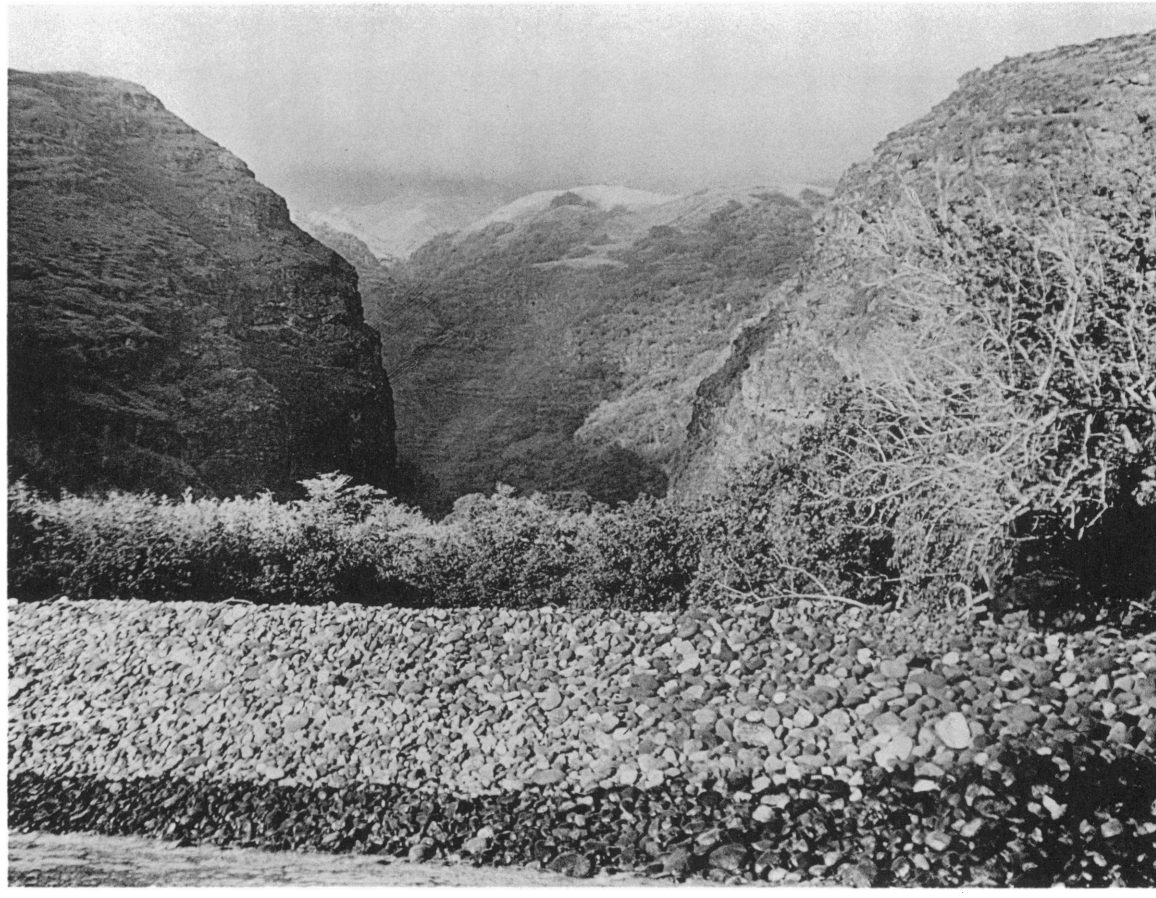
PLATES 1–13

A

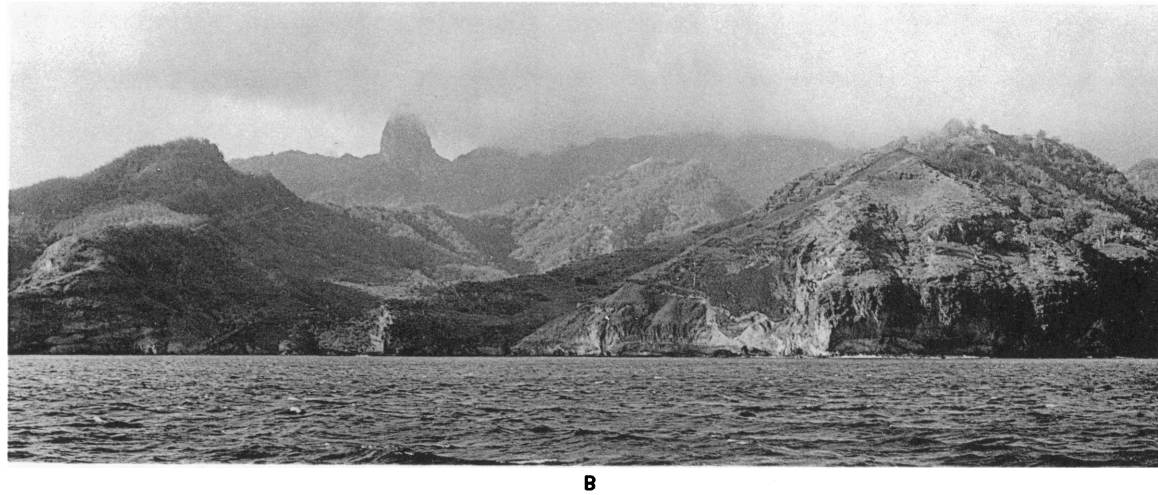


B

a. A typical Marquesan landscape, Tukemata Peak, Anaho Valley, Nuku Hiva
b. Hatiheu Valley, Nuku Hiva, typical of the well-watered valleys on the eastern end of Nuku Hiva

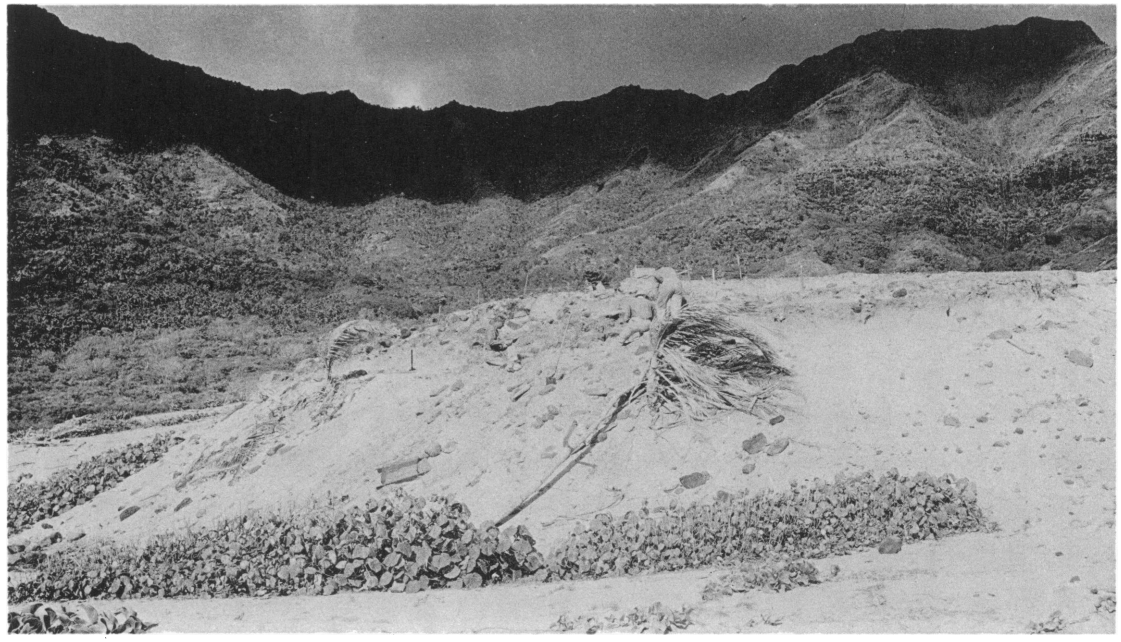


A



B

a. Uea Valley from the sea, showing the arid, rocky landscape of the west coast of Nuku Hiva
b. Marquesan coast line showing steep seaside cliffs. Off Hakama'i'i, Ua Pou

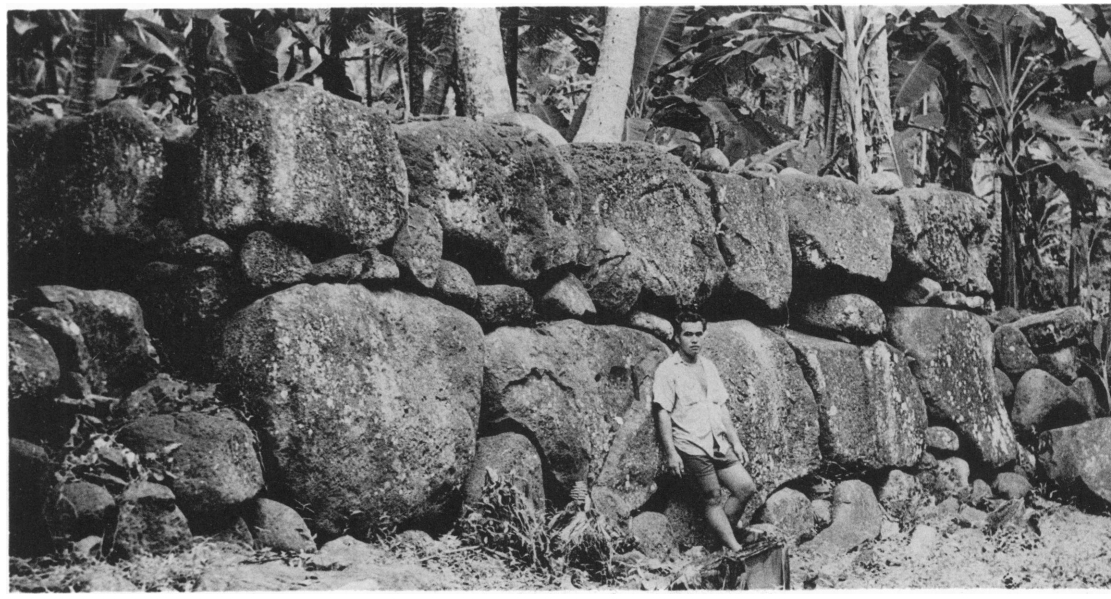


A

B

a. View of Site NHaa 1, Ha'atuatua Valley. Sand hill in foreground is Te'oho'au, site of ceremonial and burial areas. View towards southwest

b. Site NHi 1, Moe'ana Shelter, Ha'a'au'a'i Valley, looking east. Cultural deposits were in deep hollow beneath rock overhang



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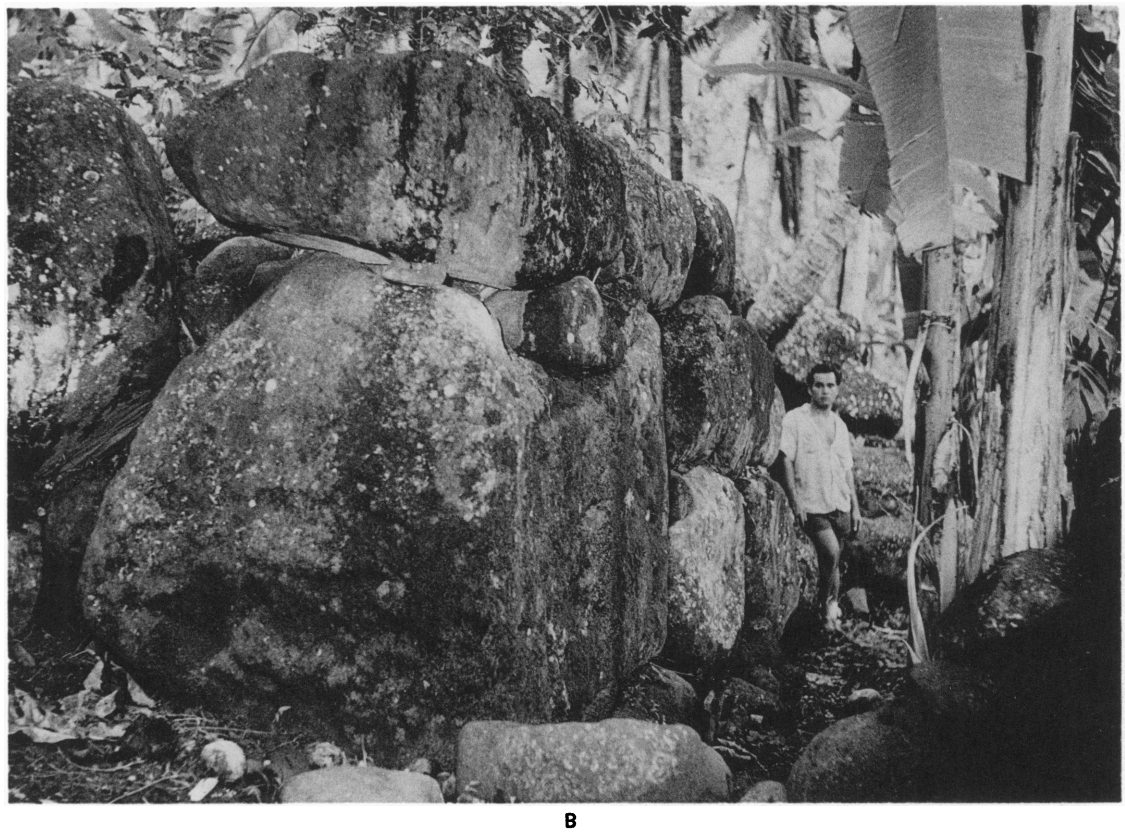
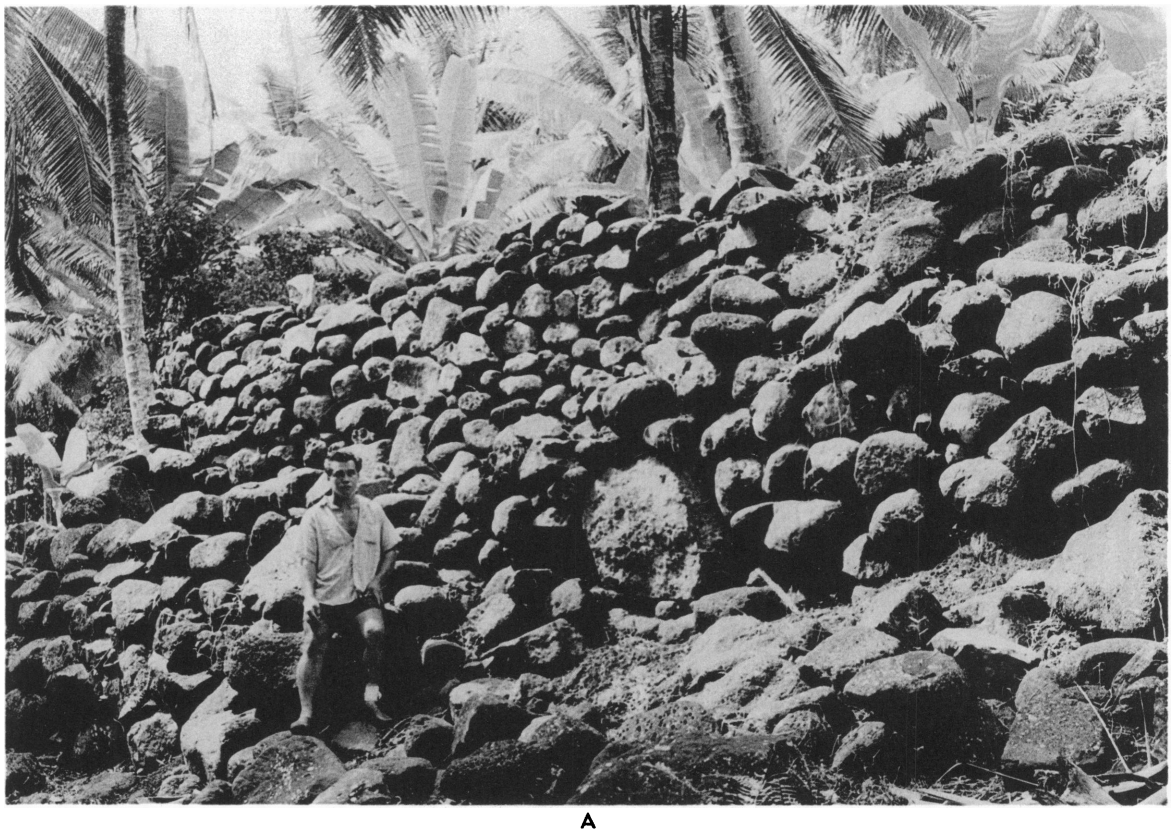


B

a. South face of Classical *paepae*, P-M, Site NT 2, Taipivai Valley
b. South face of Classical *paepae*, P-N, Site NT 2, Taipivai Valley



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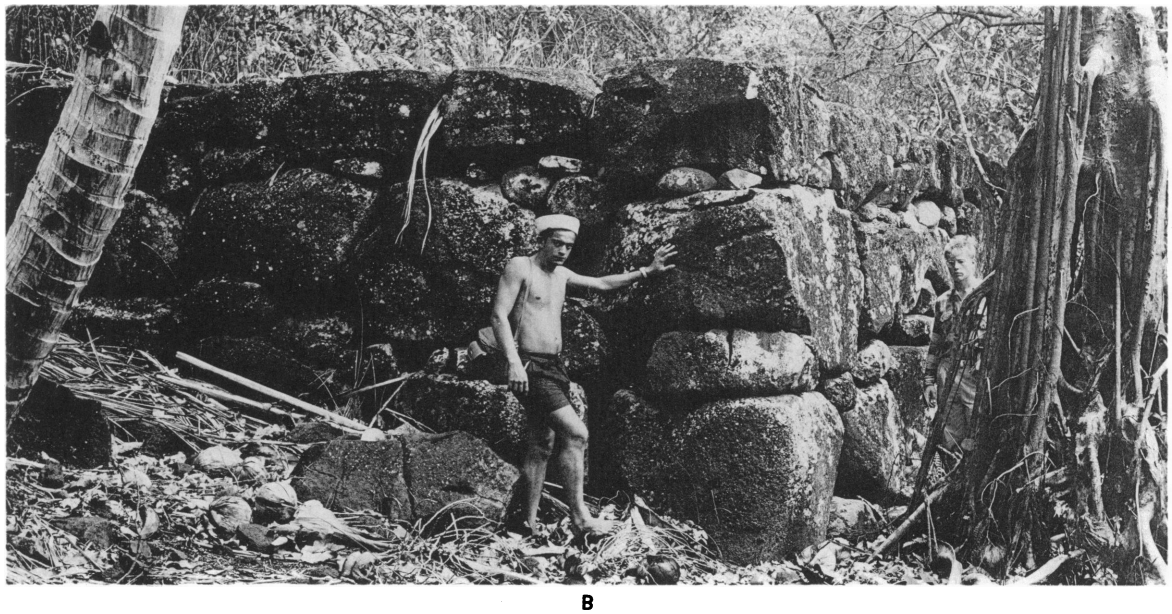


B

a. South wall of dance floor behind P-C 1 and 2, Site NT 2, Taipivai Valley
b. East face of Classical type of *paepae* at Punai'o, Ha'atuatua

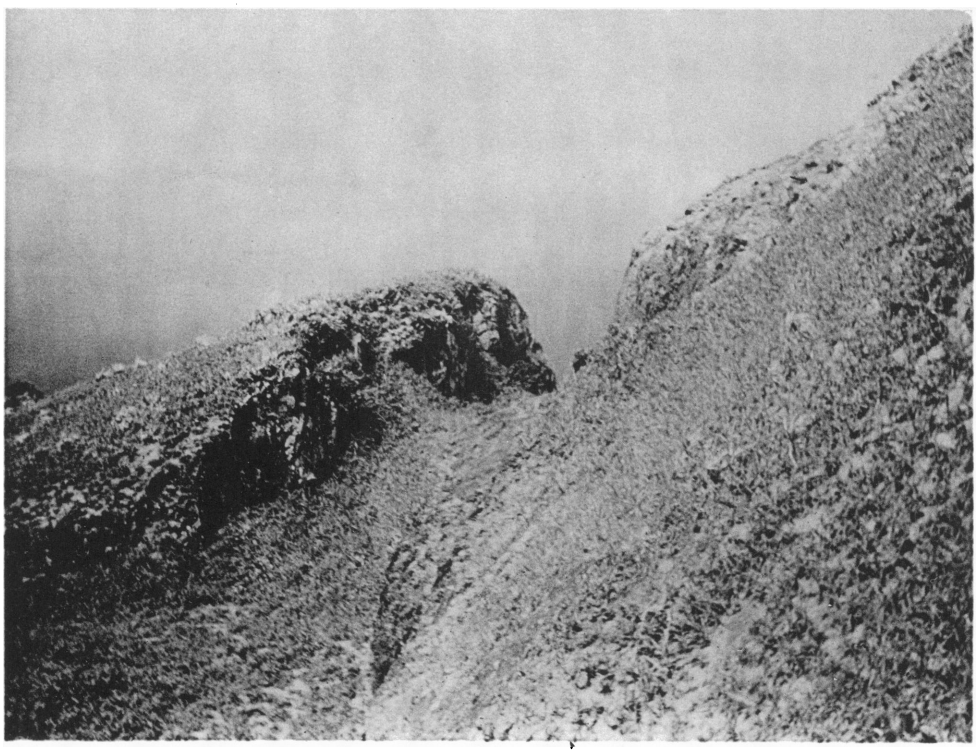
A

B

a. Red tufa figure on eastern side of south face, P-A, Site NHe 3, Hatiheu Valley. Incised markings on chest have been darkened. Figure may represent god Tevana'uaua

b. Remains of wall of P-A-sub, exposed in Cut 3, looking south

A



B

a. South face of Cut 5, P-D, Site NHe 3, showing stratification in fill representing successive construction periods

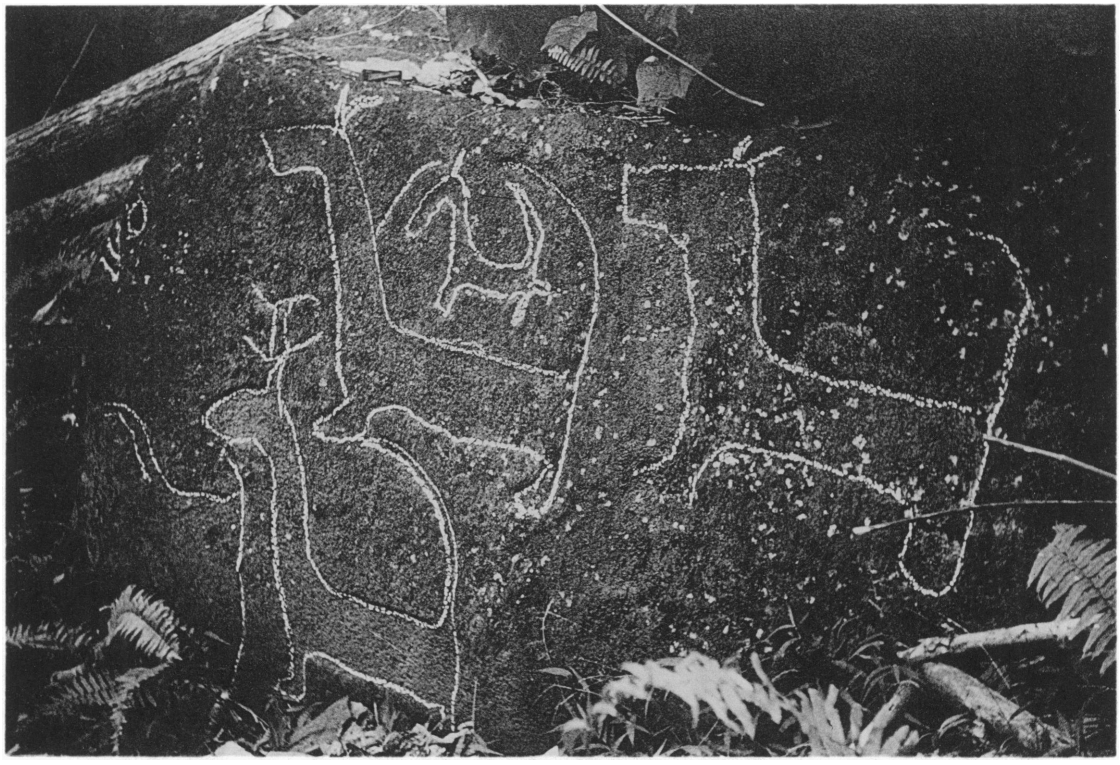
b. Eastern fortification trench on Site NTa 10 on Mouake Peak above Taiohae Valley

A

B

a. Relief carved basalt column representing god Hu'upeke, standing on temple platform of Ta'a'oa community ceremonial center

b. *'Etua* type of figures on Site NA 1, A'akapa Valley



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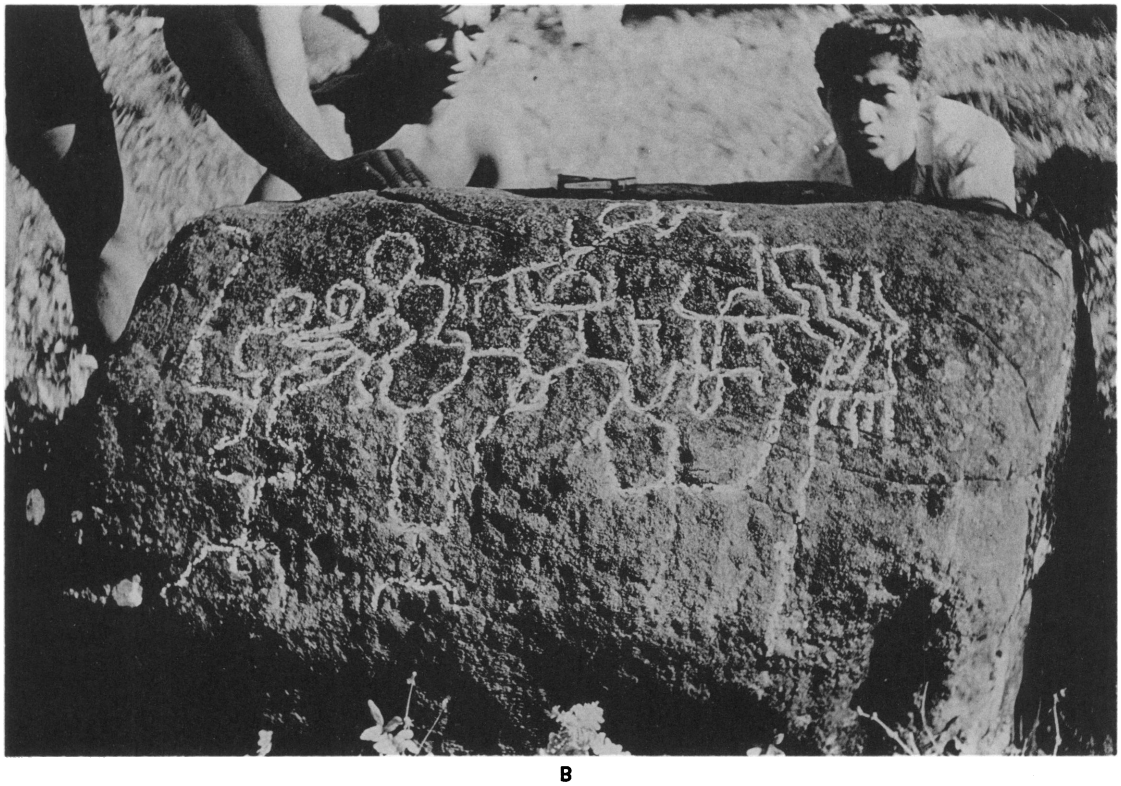
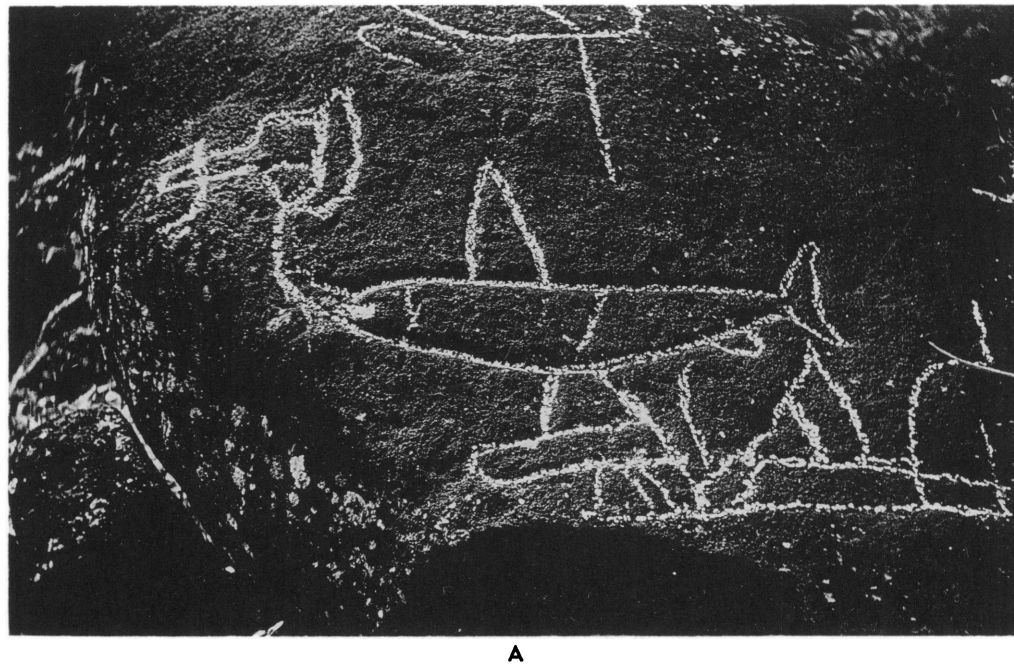


B

a. Intaglio canine figures on Site NA 1, A'akapa Valley
b. Petroglyphs on Site NA 4, A'akapa Valley



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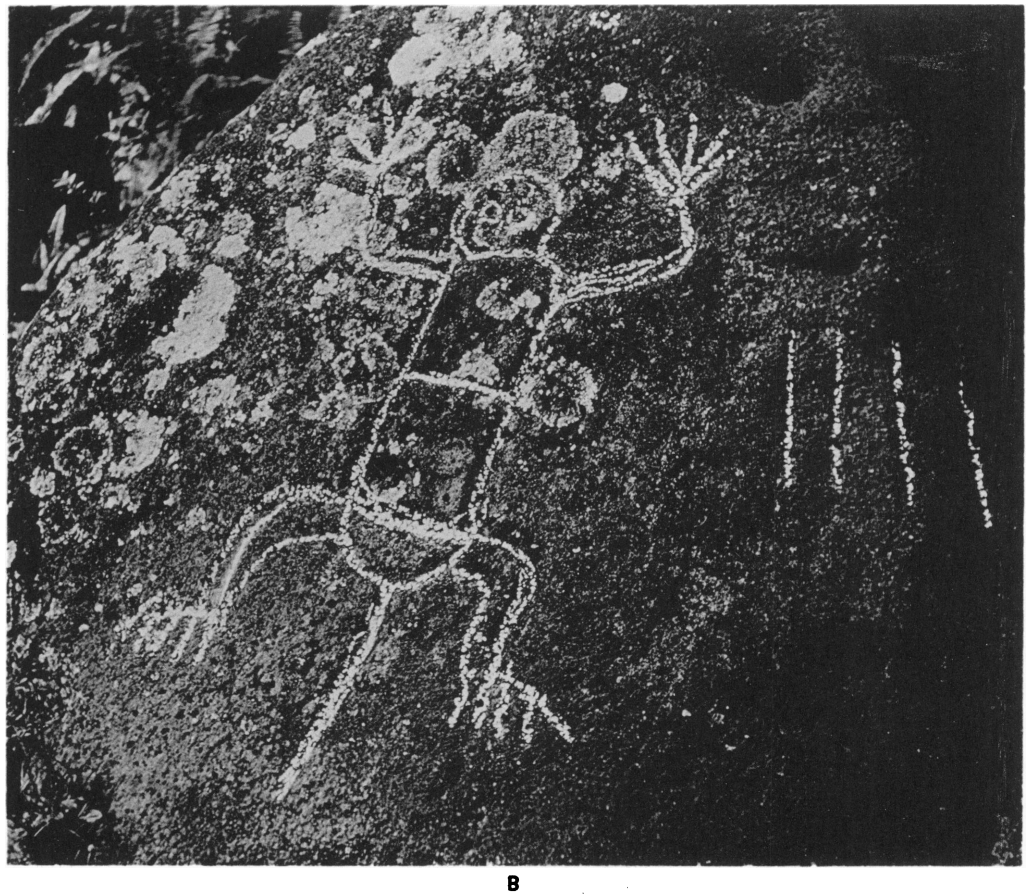
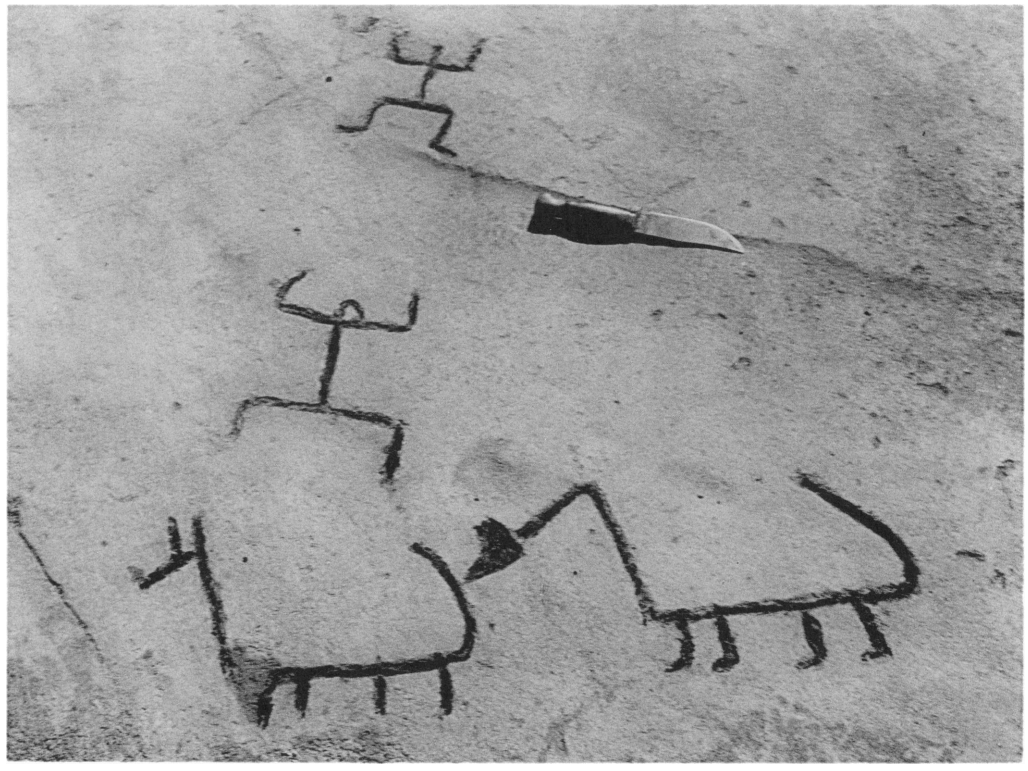


B

a. Shark and fisherman scene, west face of the petroglyph boulder, Site NA 3, A'akapa Valley
b. Lizard-man figure on east face of petroglyph boulder, Site NA 3, A'akapa Valley



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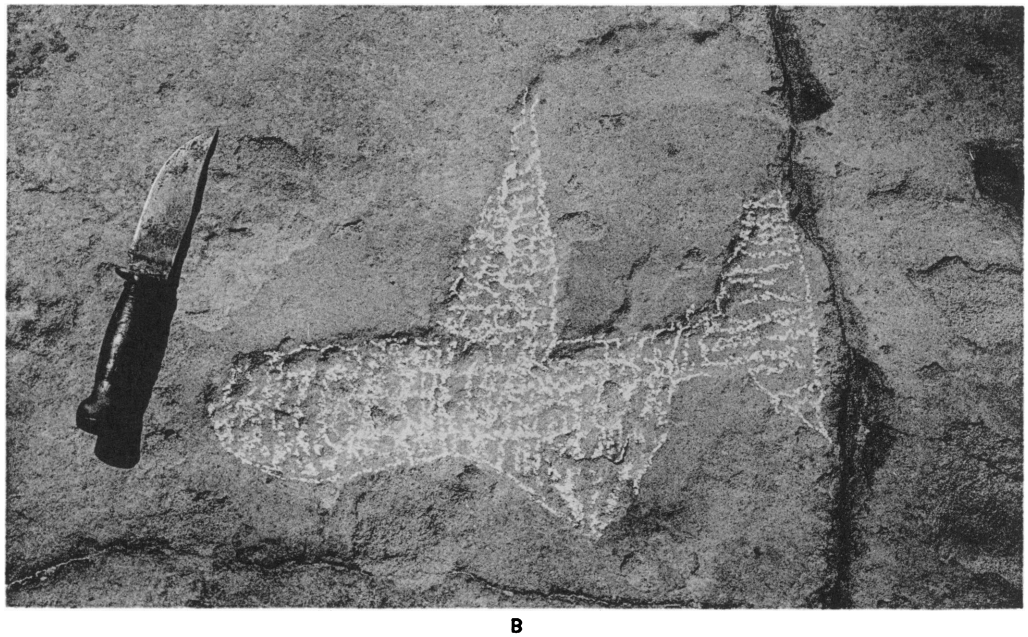
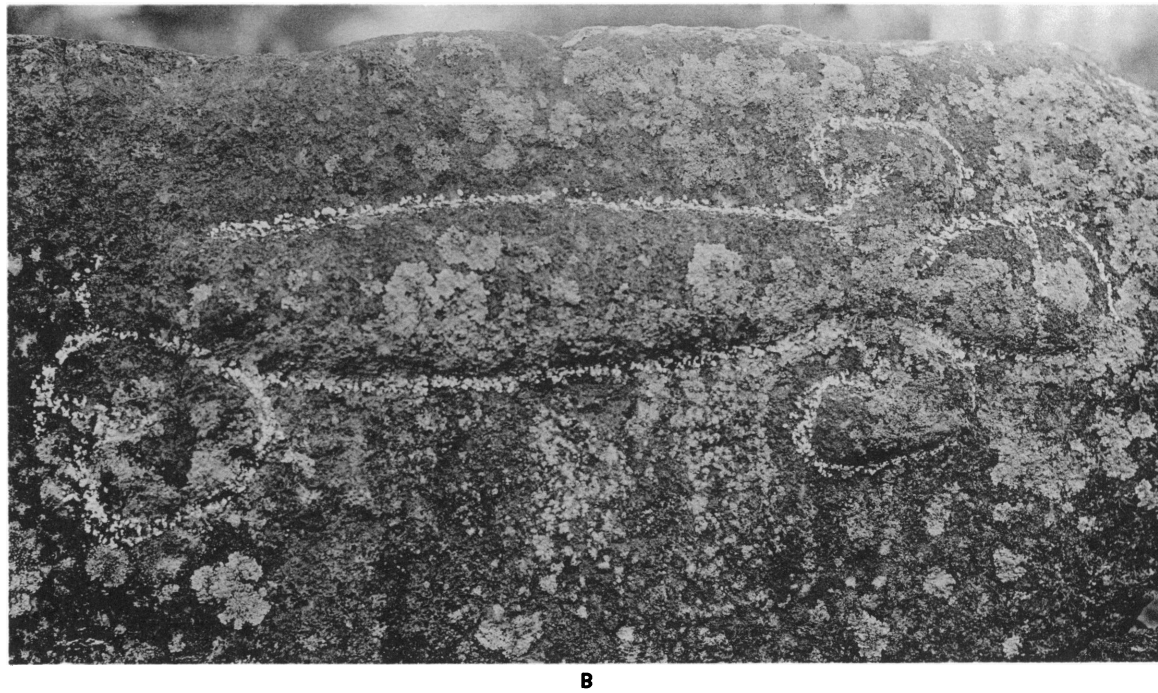


B

a. *'Etua* and canine figures on petroglyph rock in south river bed, Site NHaa 1, Ha'atuatua Valley

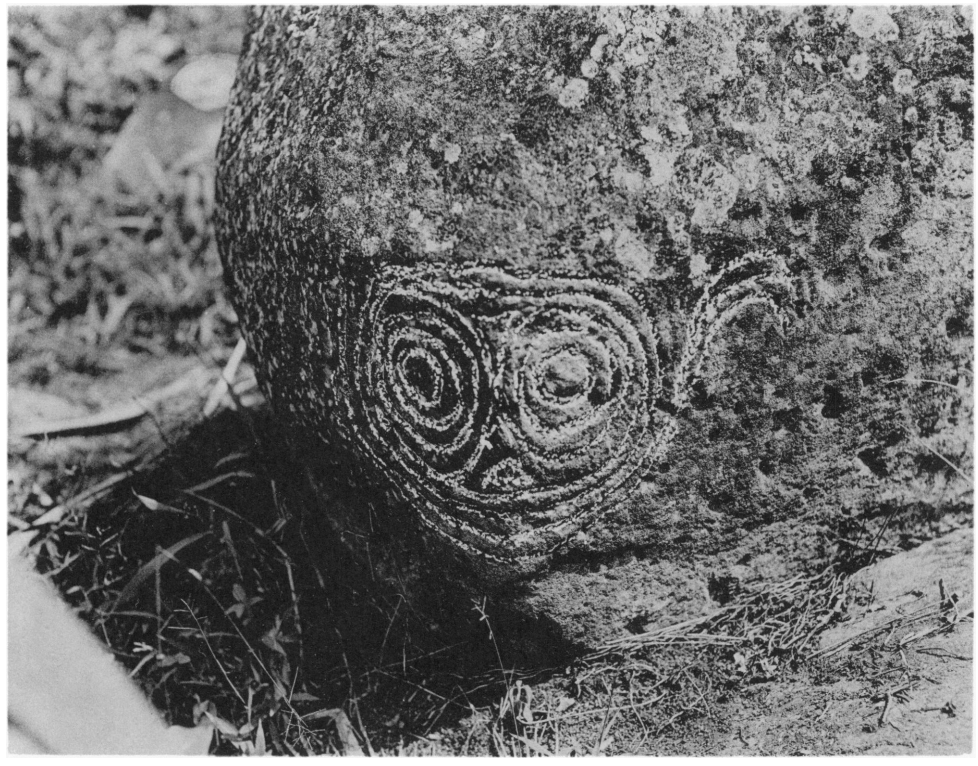
b. Killer whale or shark in intaglio, petroglyph rock in south river bed, Site NHaa 1, Ha'atuatua Valley

A



B

a. Developed tattoo motifs on riser slab of red tufa platform, displayed at Taiohae Mission
b. Relief lizard figure on riser slab of red tufa platform, also at Taiohae Mission



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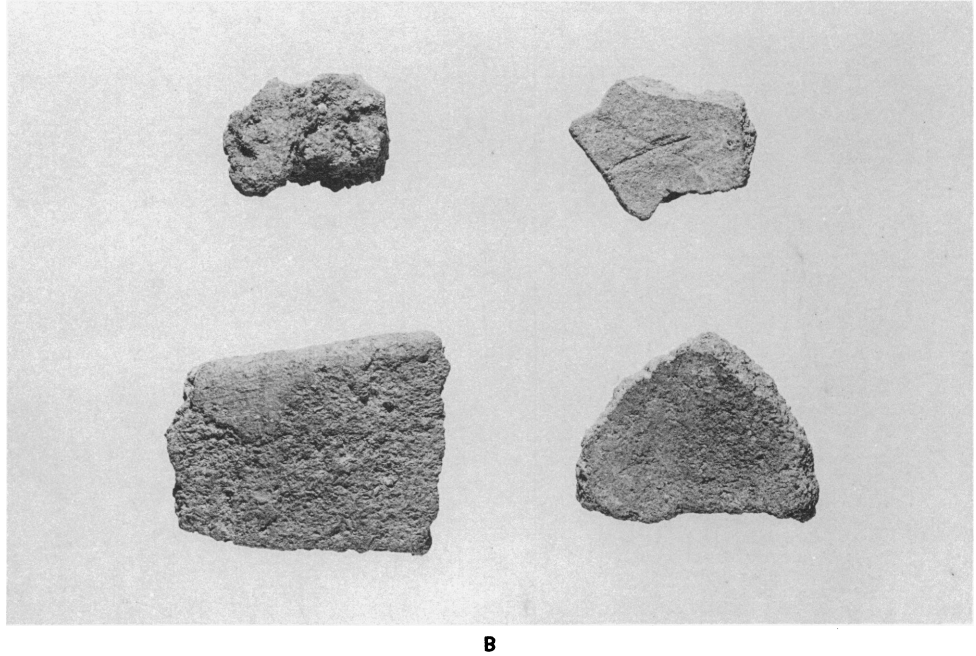

B

a. *Mata komoe* motif on Site NH 1, Hapa'a Valley
b. Potsherds recovered from Site NHaa 1

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Volume 49

PART 1. The Archeology of Nuku Hiva, Marquesas Islands, French Polynesia. By Robert Carl Suggs. Pp. 1–206, 13 plates, 40 text figures, and 19 tables. 1961. Price, $4.00.