Mangarevan Archaeology: Interpretations using new data and 40 year old excavations to establish a sequence from 1200 to 1900 AD

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to establish a sequence from 1200 to 1900 AD

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Front cover:
Tokani Bay, Akamaru island, Mangareva group.
(Photo: M. Weisler, 1990)

Back cover:
Sailing canoe on the Mangareva lagoon. Taken from Kamaka island with Mangareva island in the background.
(Photo: R. Green, 1959)

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Mangarevan Archaeology: Interpreting using new data and 40 year old excavations to establish a sequence from 1200 to 1900 AD.

Roger C. Green & Marshall I. Weisler

Preface

A somewhat shorter version of this publication was submitted to one of the prominent journals which publish articles on Pacific archaeology. In the end it was carefully and sensitively reviewed by editors of two such journals who did not find “its scholarly standards” or the quality of writing or referencing to other closely related work in any way remiss. Rather it was deemed of a form “not fully suitable” to appear in journals devoted to reporting on current archaeology in the Pacific field.

A principal reason given for this view was that the lengthy article (of which the current version is an expanded effort) only documented in full a dated and integrated occupation sequence for islands of the Mangarevan group from 1200 to 1900 AD. That pursuit alone was not seen as having sufficient interest or enough significance, even though not even a partial sequence was in print anywhere for this particular island group.

Although such sequences, and the site specific data on which they rest, are often said to be basic to all subsequent archaeological interpretation, they are not something easily published any more, as Green in particular has learned from direct experience over the years. They are not a highly favoured activity. A minimum consideration is a substantial subsidy. Another is access to a suitable monograph type publication series that will accept such materials. The result is that such information is in large part either confined to various kinds of the so-called ‘grey literature’, or is not available at all because it has little prospect of appearing in print. Yet we believe Pacific archaeologists at various times do need to access such data, and we are even more confident that a partial and previously undocumented archaeological sequence for Mangareva will prove to be valued by current as well as future researchers. As well it is also basic to other articles on Mangareva materials we have in preparation for conferences at the end of this year, early next year, and in the future. Thus we have underwritten this expanded publication, placed it in a long-standing serial of limited distribution, and are circulating it to such colleagues and libraries as we believe would value holding a copy.

Acknowledgments

During the field work in Mangareva Green was most ably assisted by Kaye C. Green and for part of the time by Donald and Lois McClain of Sea Island, Georgia. They are thanked both for their help and the company provided under what proved to be often difficult circumstances. A period at the American Museum of Natural History (AMNH) in late 1960-early 1961 allowed much of the initial laboratory processing to be undertaken and the basic illustrations prepared, for which Green is very grateful. Funds for additional radiocarbon age determinations and support for study at the AMNH in 1997 were provided to Weisler by the University of Otago, Research Committee. Weisler thanks especially Paul Beelitz, Belinda Kaye and Sharon Loetz for organising the Mangarevan collections at the AMNH. Les O’Neill (University of Otago) drafted figure 1, scanned all the images and did the page layout for this volume, while Joan Lawrence (University of Auckland) made additions to figures 2, 4-6, 9-11, 14, 16, 21, 23 and 24 originally prepared some 40 years previously.

Abstract

An unpublished archaeological sequence supported by information from six sites excavated in the Mangarevan group in 1959 is presented in the context of additional data and current interpretations of the prehistory of southeastern Polynesia. The sequence covers the period from ca. 1200 AD to the time of early 19th century contact with Europeans, with its dating enhanced by four new radiocarbon age determinations plus four previous ones, all on samples collected in 1959. More recent information from archaeological investigations on nearby Pitcairn and Henderson islands, showing they formed part of a long-term interaction sphere with Mangareva, indicate that while the early part of the Mangareva sequence from ca. 800 to 1200 AD remains unexplored through excavation, buried deposits for this interval probably exist within Rikitea village on the main island of the group. An 800 AD settlement for Mangareva is consistent with a similar age and origin for the first inhabitants of Easter Island, as aspects of the 13th century assemblages from both places still remain quite comparable in style and function.

Introduction

In relation to other island clusters in East Polynesia, the archaeology of the Mangarevan (or Gambier) group is not particularly well known. The archipelago consists of numerous small high islands, motu and sand cays—the five largest islands ranging in size from ca. 5 km² to 14 km²—encompassed within a lagoon some 25 km across (Fig. 1). This entire landform constitutes a now partially drowned volcanic island on its way to becoming...
an atoll. The entire archipelago is often referred to as Mangareva (the name for its largest volcanic island remnant). The atoll of Temoe, 40 km to the east, once occupied by people from Mangareva, but in this century largely deserted, is considered part of the group.

The initial archaeological investigations of the group’s surface structures were conducted by K.P. Emory of the B.P. Bishop Museum and published in 1939. Twenty years later under the sponsorship of the American Museum of Natural History and the impetus of the chair of its Department of Anthropology at that time, Harry L. Shapiro, an opportunity was provided for the first author, Green, to conduct nearly six months of archaeology in Mangareva, and especially on the island of Kamaka owned by the John Reasin family. At the end of his field work, Green (1960) circulated limited copies of a preliminary report used by many others since. In the first part of the 1960s, Green also drafted parts of a number of chapters for a final report on this work. But despite the best of intentions, and several efforts in subsequent years to complete his handwritten manuscript (including producing typescripts for many sections of chapters), this never happened.

In the period of 1990–92, the second author, Weisler (1996a:618) conducted an archaeological survey recording additional sites on most of the islands and motu that could have habitation sites, focusing particularly on coastal middens overlooked by Emory and Green, and in 1992, surveyed all archaeological features on the atoll of Temoe, some of them initially recorded by Emory. An overview of settlement data from all sources appeared in Weisler (1996b). These investigations formed a small part of a more general project in this part of southeast Polynesia that involved intensive survey and excavations on the raised atoll of Henderson, a survey and test excavations on Oneo Atoll, and, on the high island of Pitcairn, investigation of its isotropic adze rock and volcanic glass resources, as well as test excavations of a few habitation areas and colluvial sections indicating landscape change (Weisler 1994, 1995, 1998a). These three
islands, including Ducie Atoll which is devoid of any archaeological sites, were termed the Pitcairn group. Inhabitants of both the Mangarevan and the Pitcairn groups have been shown by archaeological sourcing studies to have been in continuous interaction with each other from 800 AD to well into the 16th century (Weisler 1996a, 1997, 1998b).

That work on the part of the second author has served as the stimulus for us to jointly publish the 1959 excavation results of Green some 40 years after the event. The overall objective is to provide a cultural sequence for Mangareva from ca. 1200 to 1900 AD. This first publication describes at some length and details the excavation history, stratigraphy, dates, and efforts at sequence building that provide the context for the ecofacts and portable material culture—principally fishbone and fishing and related gear—that will make up a second article. A third in the series will focus on the adzes and related artefacts, their typology and sourcing, and the implications they have for connections with the distant Marquesas to the northwest (Weisler 1998b). Another paper by Weisler will present the results of the detailed mapping and full archaeological survey on Temoe Atoll.

At the time of Green's work in 1959, one of four kinds of sequence building now current in Polynesian archaeology was in vogue (Green 1993:224; Kirch 1982:71–72, 1989:28–31). It was heavily oriented to the use of portable artefacts and stylistic changes in them over time. In East Polynesia this was especially true for adzes, fishhooks, and coral files (Emory et al. 1959; Green 1961; Suggs 1961). Another sequence building approach then in use was a developmental one of the kind pioneered by Suggs (1961) employing Settlement, Developmental, Expansion, Classic and Historic periods. The first strategy suited well Green's excavation findings in Mangareva; the second proved of limited scope.

Another difficulty faced Green, once he had radiocarbon dates for the beginning of the excavation sequence he had constructed for Mangareva from the stratigraphy and stylistic changes in fishhooks, especially of line attachments and hook shape. His results appeared to be out of line with those of Suggs by nearly a millennium. Types of adzes, fishhooks, and other items Green recovered, dating to 1200 AD and thereafter, seemingly appeared in the Marquesas from 500 to 1000 years earlier. Since then Rolett (1989, 1992, 1998) encountered precisely the same problem in his excavations at Hanamiai in the southern Marquesas. These discrepancies have finally been resolved by re-investigation of the supposedly much earlier Suggs' site of Ha'ataua showing that in large part the major prehistoric deposits there used to define the Settlement and Developmental periods in fact date to the 12th century AD and after (Rolett and Conte 1995). Consequently, the Mangarevan material excavated by Green now begins to make more sense, particularly when Weisler's efforts on Henderson containing thousand year old items sourced to Mangareva (see below) demonstrate that in fact Green failed to find deposits belonging to the first 400 years (ca. 800 to 1200 AD) of the Mangarevan sequence.

Contact period settlement patterns ca. 1840 AD

From the 19th and 20th century ethnographies of Mangareva by Laval (1938) and Buck (1938), respectively, one can sketch the settlement pattern of that island group during the time of initial contacts by Europeans. This is just as well, because at the time of Emory's survey none of the major monumental architecture from the pre-contact era remained. This is because the mid–19th century conversion efforts of Laval and other Catholic missionaries who followed, almost completely transformed the scene in physical layout and architecture to one based on a wholly European model, destroying in the process all of the substantial marae, except one on Kamaka, a marae pavement on Aukena and those on Temoe Atoll. Thus Green's map of the pre- and in part post-contact settlement at Tokani Bay on the island of Akamaru provides one of the few archaeological hints of an earlier pattern (Fig. 2).

Green (1960, 1967:115–119) compiled a basic summary of the presumed contact period settlement pattern of the 1820s to 1830s as understood from the ethnographic sources supplemented by and correlated with such archaeological data as were then available. We reproduce a summary version here that also draws on a limited amount of additional data. It serves as a necessary contextual background to the excavation results, derived as they are almost entirely from stratified cave sites. The settlement pattern reconstruction reflects a society distributed across the landscape of the main bays of the high islands, occupying a range of open site types in communities of varying sizes and social status. In contrast, the excavation data, largely from caves, reflects a very minor component of that situation not much commented on ethnographically.

The total land area of the Mangareva group is less than 25 km², of which not more than 8 to 10 km² were actually used for settlement by a population that probably never numbered more than about 2200. Today, there are less than a third that number living almost exclusively on Mangareva island itself. Geography also determines to a great extent the principal zone of settlement, for the volcanic islands consist of a series of eroded remnant mountain peaks, which still project above the surface of an otherwise large atoll-like lagoon. Occasional low motu and sand cays demarcate the barrier reef perimeter on the lagoon's eastern side. On the high islands there are no major valleys, few or no streams, and no extensive level zones in their interiors. The coastal strips are narrow and discontinuous, forming small sandy and colluvial quarter-moon-shaped flats facing on a series of bays (Fig. 3). Settlement was, of physical necessity, largely confined
Figure 2. Map of the Tokani Bay archaeological complex on Akamaru island. Detailed descriptions of each of the 69 numbered structural features are given in Appendix 1.
to those flats. On them, one of three categories of settlement existed, each bearing a separate Mangarevan designation according to size and social complexity.

The smallest was the ina’o settlement, consisting of five to six extended family households, scattered over the level ground behind a small bay. The household buildings and grounds, called ‘akairinga, accommodated an extended family group of patrilocal residence. The functionally designated utilitarian buildings comprising an ‘akairinga were the sleeping house, cooking shed, and storage shed. Those buildings with special names and functions included the wall or fence-enclosed menstrual hut, and sometimes a god house with a paved court in front that served as the family marae. Unused lands were called vao.

Of next rank was the papanga settlement. It consisted of a larger number of extended family households distributed in a homestead pattern which occupied most of the flat land behind the larger bays. The focus of such settlements was a cluster of buildings including a chief’s house, a permanent marae, and perhaps a house for unmarried youths—structures which served the whole community and provided for the activities of the ramage or clan group (ati) headed by an elite leader of tongōiti status. An elite’s dwelling was simply a larger version of the sleeping house with a substantial pavement along one side associated with special features for gatherings. One of these special features was a stone bench running the length of the dwelling, set in from the eaves and tied in with the pavement. The permanent religious structures, marae, were stone platforms with pavements in front dedicated to Tu or other major gods. Family and temporary marae would also occur in places within the settlement. The settlement mapped at the eastern end of Tokani Bay might serve as an archaeological example (Fig. 2). Details of the mapped features are described in Appendix 1. Emory (1939:32) identified features numbered 41–43 on Figure 2 as a possible marae structure on the basis of some informant’s suggestions, though there appears little reason architecturally to draw such an inference.

A punui settlement, also known as the punui karamu o te ao, or centre of the rule, may in prehistory have applied to a single example. Today the term is translated as village, meaning a nucleated community, although this is not necessarily its prehistoric connotation. Rikitea on the island of Mangareva is today the only village, and that locality almost certainly in the past functioned as the site of one punui settlement, though of a quite different layout. Thus this indigenous category of settlement occurred only on the largest of coastal flats, where numerous extended family household units, scattered in homestead pattern, occupied much of the available land. These households may all have belonged to one powerful
**Selection of sites for excavation**

Emory’s *Archaeology of Mangareva and Neighboring Atolls* (1939) is largely a descriptive guide to the few surviving field monuments on islands in the Mangarevan lagoon and a selection of the more intact structures on the nearby atoll of Temoe. Excavation and the identification of stratified sites suitable for excavation were not then a main concern in Polynesian archaeology. In fact only a rockshelter on the small island of Agakauitai was deemed ‘worthy of thorough excavation’, with the consequence that Emory and others ‘sifted half the soil of the floor and combed through the other half’ (Emory 1939:30). Their efforts yielded several shell artefacts including a fishhook. Previous survey and minimal excavation therefore provided little data on possible sites suitable for extensive excavation, especially as the general destruction of field monuments recorded on the main islands did not encourage investigation of the few surviving vestiges in the survey record.

From Emory’s report Green had reason to believe that rockshelters, or field monuments suitable for excavation, would be difficult to locate on the main high islands of the group. Because of its isolation at the southern end of the lagoon, the small island of Kamaka was relatively undisturbed by activities of the historic period. After the first visit to Kamaka in 1959, it was quickly determined from an examination of the beach deposits and from the sizeable rockshelters at the rear of the beach, that it provided locations with archaeological deposits and excellent excavation potential. The suitability of Kamaka island—where stratified deposits were to be expected—was further enhanced because its two beaches provide the only safe landing places and, with the rockshelters behind the beach crests, constitute the single reasonable locality on the entire island for both temporary and more permanent habitation. For these reasons excavation was warranted despite its marginal nature in contrast to the larger high islands. It was also the case that the land owners wished to see the investigation occur.

While the results of excavations at Kamaka proved to be excellent, they suggested that initial habitation on the island had been of an impermanent nature and largely concerned with fishing. For evidence of earlier occupation in the island group, or of more permanent forms of settlement containing artefacts reflecting other forms of activity, it was obvious it would be necessary to concentrate on the four main islands, especially the well-watered island of Mangareva itself.

After the investigation on Kamaka, three weeks were expended extending the archaeological survey of the group, as a basis for locating additional sites on the four main islands that would be likely to produce a fuller range of occupation evidence and portable artefacts for comparison with those already obtained on Kamaka. At the end of the survey three sites were selected for study. As permission to excavate was delayed due to disputes over ownership of the land, this interval was spent in clearing and mapping one part of a contact settlement complex in Tokani Bay encountered during the survey of the island of Akamaru (Fig. 2).

A site on Aukena, Te Ana Pu, had been selected for the next excavation for the following reasons: (1) not only was it a large well-lit shelter in the narrow central ridge of the island (Weisler 1996b: fig. 2) but the back wall of the site had long ago been breached by erosion, providing inhabitants easy and obviously well-used access from one side of the island to the other; (2) the floor and front of
the shelter were covered by relatively thick and undisturbed deposits containing abundant signs of human occupation including prehistoric artefacts; and (3) this was judged the best relatively restricted and well-defined occupation midden among those located during the general survey.

Investigation of two other nearby sites was also undertaken at this time because they were convenient to the scene of operations and would provide useful additional data. One was the marae pavement of Tautoro; the other a small rockshelter along the cliffs to the northeast of the main cove (Fig. 1).

A brief final excavation was undertaken in a dry rockshelter at the northeast end of a bay on the main island of Mangareva near Taku village (Fig. 1).

**Excavation procedures**

A grid of 2 m² squares with intervening baulks of 1 m was established at most sites. Excavation proceeded by stratigraphic layers, where possible, or in arbitrary levels where stratigraphic units could not be traced. Plans were drawn of any structural features exposed. When no further cultural deposits were encountered, this fact was tested by a small but deep test trench into underlying deposits. Stratigraphic sections for each of the walls of an excavation pit were then drawn. After adjacent squares were completed, some intervening baulks were excavated and recorded in a similar fashion.

Squares were usually divided into 1 m² quadrants and baulks into halves, making it possible to specify the location of all artefacts to metre squares and a stratigraphic layer or arbitrary level. Stratigraphic layers (beds and lenses) were numbered from the base up according to the order of deposition. Sections were drawn from a site datum, usually some 30–40 cm above the ground surface. Sediment samples (which are no longer stored in the collections) were taken from each cultural layer and charcoal samples collected only from specific features, usually fireplaces, pits or the bases of ovens.

**Excavations on Kamaka**

Though Kamaka was inhabited at the time of European contact, in 1959 it supported only a herd of feral goats¹. Repeated exposure of human bone on the sand beach, however, has given rise to a local tradition that it served as the burial ground for the 'Kings of Mangareva', a legend which is likely of recent origin, as it does not appear in the traditional history. Of the three very small high islands in the southeastern portion of the lagoon, Kamaka is by far the most suited to prolonged habitation.

Kamaka is the southernmost island of the group. The rocky island is only 0.5 km², rising to 166 m elevation. Coastal relief is broken by two adjoining coves on the north side, behind which are shallow, cliff-lined embayments occupied by steeply-rising white sand beaches. The main areas for habitation occur at the crest of these beaches and in the shelters along the cliffs behind. A coral fringing reef occupies the entire bay and supports an excellent fishing ground. The remainder of the coast drops precipitously into the sea.

In 1959, vegetation on Kamaka was greatly influenced by a herd of feral goats, which had markedly reduced the grass, shrubs and young trees, thus inducing a heightened degree of erosion. This is reflected in the uppermost layers of the excavation sections. Because the island lacks any permanent springs and precipitation also appears to be below that on the main island of Mangareva, nowhere is vegetation lush².

In traditional history Kamaka was known as the land of Mito, but it is not often referred to. Five generations before European contact (ca. 1725 AD) when Te Oa proposed a division of land throughout Mangareva following his father’s death, he took Kamaka for himself (Buck 1938:83). Again about 1750 AD Moria-tararoa, a warrior then living on the islands with his followers, refused to support the ‘aka-ariki of Mangareva because in dividing the land all he had been given was Kamaka. As a consequence he complained that his belly was filled with nothing but the legs of crabs from its rocky promontories, a clear allusion to its meagre resources. After refusing his support, he returned with his followers to Kamaka and there prepared ti roots for a sea voyage rather than take further part in the dispute (Buck 1938:88–89). A third reference comes from a well-known tradition involving Toatutea, the daughter of Hina, who, while dying, expressed a desire to be buried on the side of Kamaka facing Pitcairn, at a spot named Te Pare-a-urua (Buck 1938:314). In summary, tradition ascribes to Kamaka a role as a less than desirable piece of real estate, and one which is mentioned only in the late portion of the traditional history.

Emory (1939) devotes only a few brief paragraphs to Kamaka in his survey, noting its local fame as a burial ground. He recorded a house pavement at the crest of each of the beaches, and a terrace at the side of the pavement on the western beach. A second terrace was recorded on a small flat on the point between the two beaches (Emory 1939:33–34). The remaining observations all concerned burials found either in the caves or weathering from the sand beaches. On the beach, all but three burials were simply interred in the sand, the exception having been laid in a slab-lined vault of vertical coral limestone blocks at one end of a raised platform, the upper portion of which had been disturbed. One burial was found on the cliffs above Sancho’s Cove (Fig. 4). Comparable vaults occur in stepped platforms on Temoe (Emory 1939:12) and Weisler recorded a slab-lined vault at the top of the north beach of Henderson Island. Similar burial crypts occur in Easter Island (Green 2000a:87–88). In 1959, parts of the beach pavements on Kamaka were visible, but all traces of burials had vanished.

Green & Weisler
Because prehistoric occupation remains on Kamaka were concentrated to a large degree in the area of the eastern beach, called by its younger owner Sancho’s Cove, all excavations were centred in this locality (Figs 1 and 4). Along the beach front at a level well above disturbance by the sea, oven stones, charcoal-blackened sand, midden debris and occasional artefacts were eroding from under the sterile white sand. In one place remains of a former stone structure lay partially exposed (see gk-3 below), presumably that described by Emory (see below). The rockshelters along the cliffs behind the beach, however, though obviously very suitable for habitation, exhibited no visible signs of a similar occupation. Finally, despite previous reports of scattered human bones along the beach front and in some cave shelters, none were encountered during the preliminary inspections.

During the course of excavations 11 burials were found on the beach front, as well as in one cave. Although all were carefully exposed and recorded, local resistance to their removal necessitated leaving all human remains in place, so that after study each was reburied, frequently on the exposed beach front with a stone-slab vault marking the spot. No full report on these burials has been written, but a file exists with unpublished drawings showing burial positions for several of them.

Two rockshelters and the main architectural structure on the beach crest were excavated and reported below. Figures 4 and 5 show the locations of these sites within Sancho’s Cove on the north coast of Kamaka.

GK-1. Located at the east end of Sancho’s Cove at the base of the cliffs, this rockshelter measures 14 m wide and 6 m deep inside the dripline providing nearly 80 m² of protected space. Five m² and two intervening baulks were excavated in this shelter (Fig. 6). One square, B-2, proved almost devoid of traceable stratigraphy or portable artefacts, the excavations revealing only a long series of intercutting ovens. When the wall of the baulk between B-2 and A-1 began to collapse, final cleaning up and drawing of the walls in B-2 had to be abandoned. Because of the necessity for providing drainage away from the site during storms, it was also necessary to offset square B-1 50 cm to the south by reducing the baulk between A-1 and B-1 to a width of 50 cm.

The most clearly-defined stratigraphic deposits were usually confined to the rear of the shelter (Fig. 7), while towards the open central area, successive digging of oven depressions, and other underground pits by the occupants, had disturbed any overall stratigraphic regularities. Fortunately, squares A-1, A-2 and Z-2, which lie to the rear of the shelter and contained the best defined series of deposits, also yielded the majority of the portable artefacts (Fig. 8).

Because its stratigraphy proved to be particularly well defined, Z-2 was used to construct the general depositional sequences for the site. The beds are described in Table 1 in geological fashion from the base upwards and illustrated in Figure 9. The geologic beds are combined and interpreted to form a general stratigraphically-controlled cultural sequence with correlations between squares achieved by means of the generally lighter-coloured beach sand layers.

The initial occupation of GK-1 began with layer j. This was poorly represented, primarily because of later disturbances, but also because the initial occupations were intermittent and probably not of great intensity. While the layer consisted of four beds, only 1 and 2 extended over a large area, and portable artefacts were restricted to bed 2. The main structural features from this period were post-holes, probably indicating the construction of additional protective structures within the overhang: shallow fire pits, pits and an oven (Fig. 10, lower). From a charcoal sample taken from one of the fire pits excavated into the underlying cave silt, a date of 760±80 BP was obtained, placing the original occupation...
Figure 5. The north coast of Kamaka island showing the location of the two rockshelters, GK-1 (central) and GK-2 (right or west) of the beach crest where GK-3 is located. Today, thick vegetation covers the upper beach and slopes. (Photo, R. Green, 1959.)

Figure 6. Map of GK-1 showing grid layout used in its excavation.
of the site somewhere between the mid-12th and early 15th century AD (Table 2: sample i-190). A second date, more recently obtained (Beta-109018), from another fire pit in the cave floor at the base of the deposits, more precisely defines this initial activity as occurring in the 11th to 13th century AD. These dates, and those that follow, were calibrated after Stuiver and Reimer (1993) using the decadal tree-ring data set to 6000 cal BC for terrestrial samples. Forty years were subtracted from the mean of conventional dates as well as from the 14C mean to correct for southern hemisphere samples, and calibrations reported at 2σ (see Table 2).

Layer 1 covered an extensive area and comprised beds 5–8. The sandy loam deposit of bed 5 is the most extensive among these beds and was heavily flecked with white sand—wind-blown sediments derived from the beach. In many places toward the front of the shelter this bed assumed a considerable thickness without visible internal differentiation. But towards the rear it was overlain by two more restricted beds, numbers 6 and 7. Included within layer 1 are scattered fire pits, ovens and occasional natural limestone slabs from the beach. The layer also produced a fair quantity of portable artefacts. It is dated to the 13th to 15th century AD (Table 2: Beta-109016).

Along the rear portion of the shelter, layer 1 in the stratigraphic section was capped by bed 8, or floor v (see Fig. 9, upper), the first of five such sand floors. In plan-view, a number of basalt and limestone slabs set into this floor at this time form a rather rudimentary kind of pavement (Fig. 10, upper).
Bed Description
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Bed 1 A sandy loam deposit mixed with sufficient indian red cave silt from the underlying cave floor deposit to give the whole bed a distinctly reddish cast. The bed contains occasional bands of vandyke brown loam.
Bed 2 A charcoal and white ash deposit mixed with considerable indern red cave silt, giving the whole bed a reddish cast.
Bed 3 A middle grey fine ash with occasional charcoal.
Bed 4 A white beach sand, with all but the basal band stained to give a sepia colour and overlain by a band of warm sepia-coloured sandy loam.
Bed 5 A sepia to medium-black coloured sandy loam, heavily flecked in area with streaks of unstained beach sand.
Bed 6 A clean white coral and shell beach sand.
Bed 7 A warm sepia coloured sandy loam.
Bed 8 A discoloured beach sand with a middle grey colour.
Bed 9 A white to middle-grey coloured ash layer.
Bed 10 A warm sepia to sepia coloured sandy loam.
Bed 11 A beach sand discoloured to a middle-grey or naples yellow.
Bed 12 A sepia coloured sandy loam.
Bed 13 A sepia coloured sandy loam separated from Bed 12 by a streak at its base heavily flecked with white beach sand.
Bed 14 A vandyke brown coloured sandy loam.
Bed 15 An ivory-black coloured sand fill heavily flecked with bits of charcoal.
Bed 16 An Indian red coloured silt mixed with some stained sand.
Bed 17 A white beach sand, in general discoloured to a middle-grey but possessing occasional sepia coloured patches.
Bed 18 A warm sepia coloured sandy loam with a large amount of fishbone and scales compressed into a thin band at its base.

Table 1. Stratigraphic description for site GK-1, Kamaka island, Mangareva. Note: A standard soil colour chart could not be obtained prior to leaving New Zealand for Mangareva in 1959. The colour terms used here are those of the Otswald Standard Watercolours, the only such chart obtainable at the time. Its disadvantages are obvious.

<table>
<thead>
<tr>
<th>Bed</th>
<th>Description</th>
<th>Bed</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed 20</td>
<td>An ivory black coloured sand fill heavily flecked with small pieces of charcoal. Within the bed are numerous bands of ash from raw umber to yellow ochre in colour.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 21</td>
<td>A warm sepia to sepia coloured sandy loam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 22</td>
<td>An ivory black coloured sand fill heavily flecked with bits of charcoal. In one place in square A-1 a band of middle-grey coloured beach sand appears within this bed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 23</td>
<td>An ivory black coloured sand fill heavily flecked with small pieces of charcoal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 24</td>
<td>An ivory black coloured sand fill with occasional bands of sepia coloured sand loam running through it. At the base of this bed in square A-1 is a vandyke brown coloured sandy loam and in A-2 a streak of beach sand of a middle grey colour.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 25</td>
<td>A middle-grey to medium black coloured sand fill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 26</td>
<td>A sepia coloured sand fill with basalt pebbles at the base of the deposit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 27</td>
<td>A raw umber coloured sandy loam which shows signs of more recent disturbance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 28</td>
<td>A middle-grey to naples yellow coloured beach sand deposit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 29</td>
<td>An ivory black coloured sand fill with a middle-grey coloured ash deposit at its base.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 30</td>
<td>Vandyke brown and warm sepia coloured bands of a sandy loam in which appear a number of middle-grey and yellow ochre coloured ash bands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 31</td>
<td>A sepia to ivory black coloured sand deposit blending with the sandy loam of Bed 30 toward the southern portion of the site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 32</td>
<td>A warm sepia coloured sandy loam mixed with sufficient indern red cave silt to give the deposit a generally reddish cast.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 33</td>
<td>A yellow ochre coloured beach sand.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed 34</td>
<td>A water sorted clay and coarse gravel in general of raw umber colour but flecked with particles of a yellow ochre colour.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Accumulation of a midden deposit on floor v proceeded for sufficient time to lay down beds 9 and 10, comprising layer n. The small area covered by these beds, however, suggested that only a short interval was involved in their accumulation before another sand floor, iv (bed 11), was spread out over previous deposits as a first step toward extensive revisions in the shelter’s occupation (Fig. 10, upper). At this point pit λ, an elongated trench-like feature, was constructed, then refilled, and replaced by a shallower rounded pit, θ. At approximately the same time, after the refilling of pit λ, limestone slab curbs outlining walls for two bounded habitation spaces were set in place. All this activity probably marks the first indications of more permanent habitation at the site rather than simply overnight camping by fishing parties.

Pit θ was refilled with bed 13, after which the accumulation of deposits designated as layer c began. A radiocarbon age determination (1–191) suggests a mean date of 1645 AD (a 2σ range which spans the mid-15th century to the present; Table 2). Given the events which remain before reaching beds belonging to periods of European contact, we favour a 17th century AD date. Layer G, represented by beds 14–17, is best interpreted as a period of fairly intensive and widespread midden deposition in the shelter. This eventually accumulated to sufficient depth that it entirely obscured the limestone.
Figure 9. East profiles of squares B-1 to A-1 (upper) and A-2 to Z-2 (lower) at rockshelter GK-1, Kamaka island, Mangareva.
Figure 10. Plans of excavations at GK-1, Kamaka island, showing features in the basal deposits of layer J (lower) and of sand floors IV and V (upper).
Numerous pits, accumulated in the last 1800 years, while the lower third may have taken up to 400 or more years to do so. Numerous pits, fire pits, ash lenses and ovens attest to considerable occupation activity during this shorter late period. Large pits excavated in sand floor 111 were all built after floor 111, and some showed signs of having been rebuilt within the same locality one or more times (Fig. 11, lower). Their shape, and a depth of between 40–60 cm, implies a storage function, probably for fermented breadfruit paste, but perhaps for other root crops like taro. In layer f, comprising beds 19–21, a higher frequency of fire pits and ash lenses was encountered than in previous layers, again indicating increased habitation activity. A similar picture emerges from layers e and d, represented by beds 22 and 24, respectively. At some interval between the deposition of these two layers, bed 23 was formed, probably as a result of a spread of sediment from the digging of one of the larger storage pits.

Study of the sections also supports the view that the more intensive occupation was from the late 18th century on if the radiocarbon age determinations are representative. Approximately two-thirds of the cultural deposits have been dated to the last 1800 years, while the lower third may have taken up to 400 or more years to do so. Numerous pits, fire pits, ash lenses and ovens attest to considerable occupation activity during this shorter late period. Large pits excavated in sand floor 111 were all built after floor 111, and some showed signs of having been rebuilt within the same locality one or more times (Fig. 11, lower). Their shape, and a depth of between 40–60 cm, implies a storage function, probably for fermented breadfruit paste, but perhaps for other root crops like taro. In layer f, comprising beds 19–21, a higher frequency of fire pits and ash lenses was encountered than in previous layers, again indicating increased habitation activity. A similar picture emerges from layers e and d, represented by beds 22 and 24, respectively. At some interval between the deposition of these two layers, bed 23 was formed, probably as a result of a spread of sediment from the digging of one of the larger storage pits.

The final most formal, and probably permanent occupation of the shelter during the prehistoric period, was that designated as sand floor 11 (bed 28). At this time natural limestone slabs, serving as curbs, were used to outline four room-like spaces within the excavated portion of the overhang (Figs. 11, upper and 12). This occupation may correspond to that attributed to Mori-toraroa and his followers, which tradition places as ca. 1750 AD.

Midden accumulation after the construction of these structures was extensive. Layer c, which was directly associated with the structures outlined by the limestone curbs, was entirely prehistoric. Though interpretation of

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Site</th>
<th>Square/Layer</th>
<th>$^{14}$C</th>
<th>$^{13}$C/$^{12}$C</th>
<th>Conventional (g)</th>
<th>Context</th>
<th>Calibrated 2σ</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-191</td>
<td>GK-1</td>
<td>Z-2/G</td>
<td>330 ± 80 BP</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>NE quad., pit C, base of G.</td>
</tr>
<tr>
<td>Beta-109016</td>
<td>GK-1</td>
<td>A-1/I</td>
<td>640 ± 60 BP</td>
<td>-25.4</td>
<td>640 ± 60 BP</td>
<td>15.1</td>
<td>Layer I.</td>
</tr>
<tr>
<td>I-190</td>
<td>GK-1</td>
<td>A-1/J</td>
<td>760 ± 80 BP</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>Fire pit, 110 cm, SW corner of NE quad.</td>
</tr>
<tr>
<td>Beta-109018</td>
<td>GK-1</td>
<td>A-1/I</td>
<td>860 ± 60 BP</td>
<td>-25.3</td>
<td>850 ± 60 BP</td>
<td>6.6</td>
<td>Fire pit, 170 cm, SW corner, base of site.</td>
</tr>
<tr>
<td>Beta-109019</td>
<td>GK-2</td>
<td>B-1/G</td>
<td>890 ± 70 BP</td>
<td>-25.3</td>
<td>880 ± 70 BP</td>
<td>10.2</td>
<td>Layer G.</td>
</tr>
<tr>
<td>I-192</td>
<td>GK-3</td>
<td>A-1/C2</td>
<td>-100 (modern?)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>Directly under pavement, 3rd level.</td>
</tr>
<tr>
<td>I-193</td>
<td>GA-1</td>
<td>B-1/C</td>
<td>520 ± 80 BP</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>Charcoal lens, just above floor.</td>
</tr>
</tbody>
</table>
Figure 11. Plans of excavations at GK-1, Kamaka island, showing features at the base of sand floor III (lower) and sand floor II (upper).
as few signs of other domestic activity appeared above floor 1, which was one of the most extensive sand floors of any encountered.

For the last hundred or so years this site has been largely abandoned. In this interval a thick layer of compact clay, bed 34, has accumulated. Its thickness and presence is due primarily to the intensive erosion caused by feral goats.

At several points within bed 34 in square A-2 thin ash and sand bands were encountered, containing bottle glass and metal and reflecting overnight visits. These are designated as layer A and belong to the period of later European contact.

From this site, then, a not unexpected picture of habitation emerges, as one would surmise from the small size and isolated position of Kamaka in the Mangarevan group. During initial settlement of the main Mangarevan islands, Kamaka probably received little or no attention. When initial settlement stabilised and the population started to undertake fuller exploitation of the group’s resources, periodic short-term expeditions to Kamaka for fishing and capturing sea birds began. These expeditions would account for the earliest third of the cultural deposits and would seem on existing evidence to have begun as early as the 11th century AD. By the 17th, or 18th century at the latest, population pressure on the main islands, that is well-documented for the European contact period, had already begun to build up, making more permanent settlement on Kamaka likely for those whose choices through inheritance or political misfortune were either Kamaka—a landless existence living entirely off the produce of the sea (Buck 1938:165)—or voluntary exile. Thus, for some, like the warrior Mori-a-toraroa, the first choice was Kamaka, a compromise in which one acquired land, although economic existence was still more or less dependent on the sea and exchange for other than tree crops like breadfruit and coconut which still grow on the island today and were very useful to living there in 1959.

**GK-2.** Along the cliff face at the western end of Sancho’s Cove, in the promontory which divided the two beaches, a substantial overhang near the shore provided another protected shelter. A stratigraphic section exposed by high waves revealed a deep midden deposit. A grid of three 2\(\text{m}^2\) with intervening 1 m baulks was laid out in the most sheltered area (Fig. 13). The grid was oriented so the squares provided a section from the sea-eroded beach front to the rear of the shelter.

The three squares were excavated to a depth where no further cultural deposits were encountered. Because there was only a small quantity of portable artefacts recovered and the stratified deposits were poorly defined, the intervening baulks were not removed; sections were drawn and squares refilled. The deposits were difficult to differentiate by colour and composition because there
was considerable post-depositional disturbance by prehistoric site use (e.g., excavating ovens and pits), and layers may have been mixed by unusually high waves. For these reasons, excavation proceeded by arbitrary levels more often than layers.

The stratigraphic section for the west wall of each square is presented in Figure 14. Superimposed on it are the arbitrary levels by which excavation proceeded. The individuals beds are described in Table 3.

The first cultural layer, \( f \), consisting of beds 1 and 2, exhibited considerably less charcoal staining of the sand than did any of the overlying beds. This suggests a less infrequent occupation much as that encountered in the lower third of \( \text{GK-1} \). This is confirmed by the age for a basal charcoal sample (Beta-109019) dating to the 11th to 13th centuries AD. In square B-I, it is followed by a thin sterile loam bed 3, resulting probably from natural deposition during one of the breaks in human occupation.

Shortly after this break, the first deposit of white beach sand (bed 4) was spread over the loam to create floor \( \text{III} \) associated with a limestone slab—the remnant of a probable structure. As in \( \text{GK-1} \), the floor and slab probably represents the onset of more permanent habitation which may correlate with sand floors IV or V at \( \text{GK-1} \).

Local accumulation of layer \( e \) (bed 5) obscured floor \( \text{III} \), after which deposition of layer \( d \) (bed 6) occurred throughout the rockshelter. This layer was heavily stained by charcoal and contained a number of ovens and a few smaller fire pits indicative of more intensive site occupation. The change in deposition corresponds well to a similar change in the 17th century AD that began with layer G and continued thereafter at \( \text{GK-1} \).

Deposition of white beach sand (bed 8) in portions of squares Z-I and A-I marked the formation of sand floor \( \text{II} \) associated with coral limestone slabs which were subsequently sealed by an accumulation of midden designated as layer \( b \) (bed 9). As in the underlying layer \( d \), large ovens and smaller fire pits indicated a continuation of the fairly intensive occupation begun in that period.

The uppermost bed (10) in the region of square Z-I is interpreted as floor 1 which consisted of beach sand associated with several limestone slabs and two small storage pits. From its position in the sequence, it is likely contemporary with the elaborate structures of floor \( \text{II} \) in \( \text{GK-1} \) dating from the late 18th century. The midden which accumulated on the \( \text{GK-1} \) floor was designated layer \( a \) (bed 11) and contained numerous small, naturally-deposited stones from the shelter walls, suggesting that the site was abandoned probably shortly after the time of European contact.

No European contact, Mission, or later period occupations such as those identified at \( \text{GK-1} \), were found at this site. Site abandonment is marked by a relatively thin bed (12) of sterile loam.
In summary, the stratigraphic sequence at GK-2 roughly parallels that at GK-1; basal radiocarbon age determinations are almost identical (see Table 2).

Table 3. Stratigraphic description for site GK-2, Kamaka island, Mangareva. See note in Table 1.

<table>
<thead>
<tr>
<th>Bed</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed 1</td>
<td>A warm sepia coloured sand fill.</td>
</tr>
<tr>
<td>Bed 2</td>
<td>A warm sepia coloured beach sand containing rather infrequent bands flecked with pieces of charcoal.</td>
</tr>
<tr>
<td>Bed 3</td>
<td>A warm sepia coloured loam.</td>
</tr>
<tr>
<td>Bed 4</td>
<td>A white coral and shell beach sand.</td>
</tr>
<tr>
<td>Bed 5</td>
<td>A sepia coloured mud.</td>
</tr>
<tr>
<td>Bed 6</td>
<td>An ivory black coloured sand fill heavily flecked with charcoal.</td>
</tr>
<tr>
<td>Bed 7</td>
<td>A sepia coloured band of sand.</td>
</tr>
<tr>
<td>Bed 8</td>
<td>A white coral and shell beach sand.</td>
</tr>
<tr>
<td>Bed 9</td>
<td>A medium-black to sepia coloured sand fill, which in square Z-I is heavily flecked with charcoal and thus undifferentiated in part of that square from Bed 6 below.</td>
</tr>
<tr>
<td>Bed 10</td>
<td>A stained beach sand, white to warm sepia in colour.</td>
</tr>
<tr>
<td>Bed 11</td>
<td>An ivory black coloured sand fill with numerous small pebbles and vesicular basalt stones.</td>
</tr>
<tr>
<td>Bed 12</td>
<td>A sepia coloured sandy loam.</td>
</tr>
</tbody>
</table>

Figure 14. West profiles of squares Z-I, A-I and B-I, site GK-2, Kamaka island, Mangareva.

GK-3. This site consists of the section of beach front where the best preserved stone structure had been observed by Emory and later by Green. Only a corner of the 'house platform'—noted by Emory (1939:33) at the crest of the eastern beach—was exposed in 1959. Excavation of three 2 m² revealed a midden deposit buried under 20–75 cm of recent wind-deposited beach sand (Fig. 15). The uppermost cultural deposits formed a layer 10–25 cm thick, which masked a pavement 2 m wide and 8 m long (Fig. 16). The layer overlying the pavement, but not the raised platform part of the structure, was designated layer A.

Excavation revealed that the pavement was attached to the raised platform, of which only the lower portion remained undisturbed. The platform contained a cist-like vault with two burials (10 and 11) in it (Fig. 17). One, a supine extended burial, was judged from the attributes of the skull and pelvis to be an older male. The other was on its side and may have been female. A number of burials, either within the stonework of the raised platform or nearby within the sand in front, were probably associated with the religious activities connected to the marae (burial numbers 8 and 9, and less certainly 1–3). Those on the platform are sub-adults in contrast to those buried in the sand beach in front.

There was no stratigraphic differentiation in the deposits below the pavement, although the sand became progressively less charcoal stained toward the base. Consequently, two arbitrary levels were established: level
b began immediately below the pavement to 15 cm, level c from 15–30 cm below the pavement. The underlying deposit was sterile beach sand.

A charcoal sample from just under the pavement provided a modern date of less than 100 years ago (Table 2; 1–192). The structure is clearly prehistoric, both in type and in materials recovered from layer a above it. Consequently, it could date between 1750 and 1840 AD at the latest, and thus contemporary with floor ii of Gk-1. Layer a above the pavement may date to the same period as layer b of Gk-1, that is, from the late prehistoric to the initial European contact period just before the rise of the Mission. Levels b and c, then, represent a short interval of time and their artefacts are all late in terms of the Gk-1 sequence. The really intensive occupation, resulting in deposition of cultural material on the crest of the beach, seemingly did not begin until the 17th century. In summary, levels d and c have been assigned to the 17th and early 18th century, the structure to later 18th century and layer a above it to the final period of prehistoric and initial contact habitation on Kamaka.

Excavations on Aukena

Aukena, the smallest of the four main islands, supported only five families as permanent inhabitants in 1959; in 1992, the island was only visited intermittently by residents of Rikitea. During the Mission period isolated stone houses occupied the narrow coastal flats on either side of the central portion of the island (for an example of a historic house site, see Weisler 1996b: fig. 3). Most of the population, however, was concentrated during the Mission period in a village associated with the school, Te Ana-o-tiki, on the southwestern side of the island, or around the Church of Saint Raphael in Purirau village on the narrow northwestern coast.

In 1834 at the end of the period of initial European contact and just before the first missionary success on the island, Aukena was fairly well explored by Moerenhout. In a large cave, Te Ana-o-tiki, he found 10 mummies hidden away in recesses. A small test in the cave floor deposits in 1959 showed that its opening had formerly been inhabited. Moerenhout (1837:99) recorded relatively little about density of habitation on this section of coastal flat, but notes that the soil there was sandy and particularly fertile.

On the northwestern coast Laval (1938:6; see also Emory 1939:27) says the marae, Mara, was located near the presbytery in Purirau village, but also noted that its remains were used to make a kiln. No remains for this marae have been identified. Moerenhout (1837:103) does not mention the marae. He does describe, however, a concentration of low huts and a god house lying within a fertile valley on this side of the island. The adjacent extensive coastal flat toward the centre of the island is where the largest landholding is known as Te Ana Pu, a...
name for the nearby cave which gives access to the opposite coast. This coastal flat was covered with archaeological remains, among which, at the eastern end of the flat and close to the base of the ridge behind, was a large pavement. The Mangarevan guides, without prior questioning, not only led Green to it but designated it the remains of the Tautoro marae, one of the main traditional marae of Aukena. It was far enough along the flat toward the northeastern end of the island so that the ridge behind did face the setting sun, as described by Laval (1938:6). Emory (1939:27), without visiting the island, was ‘doubtful that anything remains of this marae’. The site, consisting today only of a pavement 9 by 18 m in size, was designated GA-3 and was cleared using trowels and mapped (Fig. 18).

Moerenhout (1837) also explored the southeastern coast of the island and beyond Te Ana-o-tiki he again reported finding a rather pretty valley, but with fewer
inhabitants than on the northwest side and containing only five or six habitations. In advancing toward the east, however, he found to his astonishment ‘several families who were living in the shallow excavations of the mountain, without other furnishings than several armfuls of dry grass and mats’. Buck (1938:228) wrongly allocates his description to Akamaru.

The 1959 excavations were directed toward exploring two of the features mentioned by Moerenhout. One was a brief but productive excavation in one of the shallow overhangs in the cliffs which he had observed occupied. This site was at the extreme eastern end of the flat, on the land called Ko’iovao, and was probably not one of those actually seen by Moerenhout, which from his description are among those overhangs lying west of the main cave. But as it was his description which led to Green searching for such a shelter to excavate, this site designated as GA-2, became known as Moerenhout’s Cave.

The main cave, with its rear opening and passageway, was known as Te Ana Putarua (Laval 1938: map p.xiv). In 1959, Mangarevans refer to it as Te Ana Pu (Figs 19 and 20). The fallen mass of rocks which Moerenhout observed had apparently been more recently organised into a broad roadway, probably during the Mission period, but this has again fallen into disrepair, a narrow trail making use of the remains. Before commencing excavation, Green and associates cleared the entire eastern floor of the cave of these surface rocks, exposing the underlying sandy midden deposit and mapped it (Fig.
Figure 19. Oceanside interior of Te Ana Pu (GA-1). (Photo, R. Green, 1959.)

Figure 20. Lagoon-side entrance of Te Ana Pu (GK-1, Aukena island) with Tepano Paeamara standing near square C-1 and Helene Paeamara sitting at the entrance. (Photo, M. Weisler, 1990.)
The site, called Te Ana Pu after the current name of the cave, was designated GA-1.

The four coastal flats, two in the central portion of the island joined by the passageway through the cave and two along the western end of the island, constitute the main land on Aukena suited to habitation. The eastern portion of the island, with its extremely rough and rocky coastline, is not suitable for long-term habitation, although two small rockshelters were recorded there (Weisler 1996b:67–68).

Aukena is first mentioned in the traditional history of Mangareva at the time of the distribution of land to heirs of Anua-motua, an event placed genealogically at about 1375 AD (Buck 1938:28). By this period in the traditions, organised settlements are indicated for several districts on Mangareva, and at least one each on Akamaru and Taravai, the three main islands. However, it was not until ca. 1550 AD, during the rise to power of Apeiti—as the first in the senior line to achieve recognition as principal chief over all the districts—that a district chief is mentioned for Aukena. This chief was Honu-a-keroiti, who lived at Veroto, a subdivision of the land of Ko’eovao (Ko’iovao) located directly in front of the cave of Te Ana Pu (Buck 1938:48).

Aukena later became one of those islands to which defeated people (‘u’igaraga) or the losing chief and his supporters fled after a battle. This is well documented for the reigns of Te Arariki Tea, Te Arariki Pagu and their sons, some seven or eight generations ago, or 1675–1700 AD. At that time Te Arariki Tea was specified as living in exile on the land of Ko’iovao (Buck 1938:78). The traditional accounts thus imply that Aukena was permanently settled later than the three other main islands and was never as important or as desirable a piece of real estate as the other three main islands in the group.

As Emory did not make a survey of Aukena, we have only the comments from Moerenhout and Laval describing prehistoric remains on the island. The additional data acquired during Green’s survey can be found in his 1960 preliminary report. Of the three excavated sites, only two GA-1 (Te Ana Pu) and GA-2 (Moerenhout’s Cave) yielded useful stratigraphic information combined with portable artefacts. Information on them is presented here.

Figure 21. Plan of rockshelter site Te Ana Pu (GA-1) on Aukena island, Mangareva showing location of excavation squares and stone ramp leading down from the north entrance through the site toward the adjacent coastal flat.
**GA-1, Te Ana Pu.** A section from the rear to the front of the cave along its eastern side was achieved by excavating three 2 m² and two intervening baulks (Fig. 21). Removal of the cultural deposits proceeded by stratigraphically-controlled layers until a sterile white beach sand was encountered (Fig. 22). On the opposite side of the cave, in an area partially free from fallen stones, another 2 m² (designated square A-4), was opened, but the deposits proved shallow with few artefacts.

Overall stratigraphy was not as clearly defined as at GK-1 on Kamaka, but better defined than at GK-2. The best developed stratification of the deposits occurred in square B-1, from which a charcoal sample for dating was taken. While all wall section drawings are on file at the American Museum of Natural History, the profile of the southwest wall of square B-1 illustrates the general sequence used in analysis (Fig. 23), the layers of which are described in Table 4.

Originally, the cave floor, then covered with white beach sand and fallen stones from the back extent of the cave, was occupied temporarily as evidenced by lenses of fish and bird bone (bed 2). The more intensive occupation following later was concentrated at the front of the cave in square C-1, but also occurred in square A-1. It was represented by the medium black deposits at the base of bed 3, particularly in square C-1. At the end of this interval clean beach sand was hauled in to provide a new living floor well represented in square B-1 (bed 3 in section, Fig. 23). The thin charcoal lens that accumulated directly on top of this floor provided a sample (1-193) dating to $520 \pm 80$ BP (see Table 2). Consequently, the floor (bed 111) and the lower accumulation of ash and bird bones—signalling first use of this portion of the cave—predates the mid-15th century, considering the mean of the age determination.

Layer B, where possible, was divided into B1 and B2 (beds 4 and 5 respectively; Fig. 23) where pits both for ovens and storage were encountered. Layer B represents major and intensive occupation in the cave, probably in the 16th or early 17th century, or within the period of permanent settlement indicated by the traditional history.

Layer A contained traditional Polynesian artefacts which exhibit none of the features characteristic of the final period of settlement, suggesting that occupation ceased before the period of European contact. The few European artefacts in the layer were undoubtedly deposited during either the Mission or more recent periods after the cave had been abandoned. Layer A probably dates to before the mid-18th century corresponding to similar materials from Kamaka, except for its upper surface which contained European artefacts. After its
abandonment for habitation, additional falls of rock accumulated on this surface and were seen by Moerenhout in 1834. The trail he followed then seems to have been improved into a formal stone rampway and paved path, probably during the Mission period, when many similar works were carried out over all these islands. It has now fallen into disrepair.

GA-2, Moerenhout’s Cave. Situated at the narrow coastal flat at this end of the island about 15 m from the sea, GA-2 is an overhang shelter with a protected area 2.5 m deep and 3 m wide. The surface deposits had been disturbed by the recent rooting of pigs. Nevertheless, the top 20–30 cm of deposit was a rich black layer of midden containing large pieces of pearl shell. In one corner, at the base of this layer, a white beach sand appeared, suggesting either a storm deposit, or more likely indicating that the beach sand had been imported to make the shelter more suitable for habitation. Sifting of these deposits produced a small collection of fishhooks which, stylistically, date to before the mid-17th century. Consequently, the site, in relation to its fishhooks, probably dates between 1650 and 1750 AD, though ethnohistory might extend its range to 1837 (see below and footnote 5).

Excavations on Mangareva

As the largest island, Mangareva is the obvious choice in any search for sites dating to the period of initial settlement (see also Weisler 1996:70) yet, in 1959, there...
Table 4. Stratigraphic description for site GA-1, Aukena island, Mangareva. See note in Table 1.

<table>
<thead>
<tr>
<th>Bed</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed 1</td>
<td>The non-cultural deposit which formed the natural floor over the greater portion of the cave was white coral beach sand. In a local area of square B-1, however, this deposit was mixed with silt at the top of the bed.</td>
</tr>
<tr>
<td>Bed 2</td>
<td>A localised bed of compact brown clay with a band of fish and bird bone within it.</td>
</tr>
<tr>
<td>Bed 3</td>
<td>A band of white beach sand with this lenses of charcoal at the top and base marks off the upper portion of the bed; elsewhere than this section the band is underlain by a medium-black sand and charcoal fill.</td>
</tr>
<tr>
<td>Bed 4</td>
<td>A warm-sepia coloured beach sand mixed with midden debris.</td>
</tr>
<tr>
<td>Bed 5</td>
<td>A more localized warm-sepia coloured beach sand with one major and other small bands of charcoal running through it.</td>
</tr>
<tr>
<td>Bed 6</td>
<td>An ivory-black fill of sand and charcoal.</td>
</tr>
</tbody>
</table>

was some difficulty in finding artefact-rich rockshelters suitable for excavation. Midden deposits occurred along most of the coastal flats, but in general they lacked depth and were frequently mixed with European artefacts. Throughout the last 1000 years or so steady progradation of the coastal flats has occurred and the earlier sites may lie buried some distance inland from the present shoreline, unmarked by surface debris.

The traditional history provided by Buck (1938b) mostly concerns the island of Mangareva where many of the events recorded are said to have occurred. However, only a single reference was made to the land of Kape’ure, in the district of Angakuku, on which excavations were conducted. This tradition referred to Moiume, a chief of Apeakava and owner of Kape’ure, who, about 1775 AD, was provoked into war as a result of an incident while tilling this land (Buck 1938:86-87).

GM-1. On this land one rockshelter (designated GM-1) was discovered along the base of high cliffs, several hundred metres from the sea near Taku village. The overhang shelter measured over 46 m long and of variable width. The inland portion of this shelter, 26 m in length, was sufficiently free from rock-fall to be habitable, while the other portion had served as a burial area. A concrete slab foundation for an emergency radio transmitter constructed during World War II occupied the central portion of the habitable part of the shelter. Its construction had not disturbed the underlying deposits. A low retaining wall of one or two courses of unworked stone slabs ran along the front of this same portion of the overhang for 3.6 m. It seemed unrelated to the concrete slab and probably antedated it. The distance between the stone wall and the contact of the deposits with the face of the cliff provided an area 3–3.5 m wide and nearly 15 m long suitable for habitation and protected from the elements. Natural deposition building up along the base of this cliff over the past millennium had reached a height of 4–5 m above the coastal plain before accumulation of any cultural deposition began.

No record of prior archaeological investigations is known for this locality. Despite some archaeological survey in 1959, no other sites were found in the immediate area. Three 2 m² squares were staked out in the habitable portion of the rockshelter, the main base line being placed about 40 cm out from the cliff face. Only two of the squares were excavated to a depth where no further cultural deposits were encountered, because of the lack of much cultural debris. In hopes of finding additional materials, the baulk of 40 cm left between the squares and the cliff face, was also removed. Observable stratification of the deposits did not occur below the top layer, so that the remaining cultural deposits were removed in two arbitrary levels.

The results may be summarised briefly: level C rests on non-cultural deposits, which were encountered 90–105 cm below the surface in square A-1, and 105–120 cm in square A-III. Lacking observable stratification, a level between 35–40 cm below the surface in A-i, and 35–50 cm in A-III was used to separate level A from level C. Both were composed of a fine black silt containing a considerable quantity of oven stones, pebbles, charcoal and some shell.

Layer A, a light-brown dry loam fill, 3–5 cm thick, contained several European artefacts. Two charcoal samples were taken from the base of each square, but have not been submitted for analysis.

In summary, a homogenous refuse deposit 90–100 cm thick accumulated in this shelter during the prehistoric period largely as the result of cooking activity. While it contained few artefacts, the midden reflected the local marine ecology.

Correlation of excavation sequences

From excavations on three islands, we present a single set of intervals that are broadly applicable for the entire group. The archipelago is small and changes in the artefact sequence for each island should be broadly contemporaneous throughout the group. Intra-archipelago differences that occur during any one period from one island or site to the next may be explained, in part, by variations in the local ecology. Such variation in response to the local ecological setting is well illustrated by the midden, but it serves also to explain the high frequency with which fishhooks, for instance, were recovered from Kamaka.

The final correlation of the sequences from the six excavated sites discussed above is summarised in Figure 24. It is based on three factors: (1) selection of Gk-1, and use of layer contents and sand floors to form a sequence...
to which other sites have then been correlated; (2) a general interpretation of the geological and cultural events represented by each sequence, based on historical and traditional information, and dating of some deposits by European artefacts or the analysis of radiocarbon age determinations, permitting a rough correlation between the various layers and levels of sites; and (3) a sharpening of these rough correlations wherever possible by identifying the periodic stylistic changes in fishhooks at Gk-1, and equating similar assemblages from the other sites to those of that period. The correlation between some layers in sites is stronger than in others. Although various alternatives present themselves, some choice was necessary; usually it has been resolved by dependence on the fishhook evidence.

Only a small amount of material from the first period, represented by layer 1 at site Gk-1, was recovered (Fig. 24). Thus whether it differed significantly from the assemblage in the layers immediately above is something of an open question. However, the artefact assemblage from layer 1 of Gk-1, particularly in fishhooks, forms a more complete assemblage. A few items similar to this

Figure 24. Correlation of sequences from the six excavated sites in the Mangareva group.
appear at the base of gk-2, but not elsewhere, suggesting that none of the other sites contain any layers with assemblages of this age. The first assemblage of gk-1, therefore, which is well recorded in other sites is that of layer H. It is also found in the lowest layer of gk-2, and in the lowest layer of ga-1. At ga-1, this assemblage also appears in layer B contexts, and where stratigraphically separable is designated as B2. Sufficient change occurred in the fishhook forms between layer H and those of F and G at gk-1, that the correlation of these latter layers with those indicated in Figure 24 for gk-2, gk-3, ga-1 and ga-2, seems reasonable. In the case of the latter two sites on Aukena, the fact that the type of fishhooks recovered from the final period of gk-1, and also well known from ethnographical collections, does not appear in these two sites, strongly suggests as indicated above that they were already abandoned at this date. An inference that level C of GM-1 on Mangareva belongs to a period equal to F of gk-1, lacks a sound basis other than the logical one which makes it earlier than level B. The whole deposit of levels B and C could be included in the final period or extended over an even greater interval of time.

A final prehistoric period is based principally on sites on Kamaka, though it is likely that level B, at least, of GM-1 belongs here. At this time an ethnographically-known type of Mangarevan fishhook is present. This prehistoric assemblage continues on into an even more brief early contact period, represented by layer B at gk-1, in which a piece of scrap iron occurs—probably for an adze. Layer A at gk-2 and gk-3, respectively, may either belong to this period, as shown in Figure 24, or may be slightly earlier in date, correlating instead with layer C of gk-1. Finally, either occupation or construction evidence belonging to the Mission and later periods of European contact and/or deposits representing complete abandonment of the sites, occurs at all but ga-2, and here recent rooting by pigs has probably obliterated this surface deposit.

The sequence

In keeping with the archaeological pursuits of the time which were focussed on building culture-historical sequences from artefact-rich deposits at stratified sites, the 1959 excavations in Mangareva specifically targeted rockshelter sites thought to contain the necessary components for formulating a chronological framework for the island group. The major excavations were conducted at Kamaka and Aukena islands, both small and with limited terrestrial resources. Indeed, there is no dependable water sources on these islands and arable land is at a premium. Consequently, it is unlikely that the earliest habitation deposits would be encountered at any sites on these islands. Like settlement patterns on low coral atolls, the smallest islets of each atoll can be viewed as resource locales for capturing birds and for staging fishing sorties on the adjacent oceanside reefs (see Weisler 1999b)—a situation analogous to Kamaka. Aukena, at 1.5 km², with rugged topography and limited coastal flats, is not an ideal locale for colonisation sites either. However, the obvious location for finding the earliest sites is almost certainly Rikitea village on Mangareva (see above and footnote 6). As pointed out by Weisler (1996:70), the springs issuing at the base of the slopes, on the inland margin of the deep alluvial soils, provided an ideal locale for early settlement. This is suggested further by the gley soil (Tercinier 1974) located there, which at initial colonisation, was probably a swampy area suitable for planting aroids. This area provides easy access to the lagoon shore and is situated in the lee, protected from the southeast trades. We believe the ‘missing centuries’ of the Mangarevan sequence will be found there.

Based on the chronological sequence for Henderson Island, where numerous sites contain pearl shell (Pinctada margaritifera), vesicular basalt stone and medium-grained industrial stone—most imported from Mangareva beginning as early as the 9th century AD (Weisler 1995:38)—it is clear that sites predating the 11th century on Mangareva must surely exist. This is suggested further by the faunal sequence at gk-1 and gk-2 which contain the earliest known habitation evidence, yet only three bones of extinct or extirpated land birds (Steadman and Justice 1998:33). Although relatively more bird bones were identified from the lower layers in these sites, the faunal sequence does not have the ‘signature’ of early habitation sites identified elsewhere on Oceanic islands (e.g., Steadman and Rolett 1996; Steadman et al. 1994). That is, relatively large quantities of extinct and extirpated land and sea birds in the earliest deposits with upper, younger layers containing progressively fewer bird bones (see Emory and Sinoto 1961:18 for a classic example). Based on the evidence discussed here, we believe that two to four centuries of Mangarevan prehistory awaits definition with earliest human evidence possibly predating 800 AD.

The evidence for interaction between Mangareva and the Pitcairn group is diverse during about 1000 to 1450 AD (Weisler 1995) with an array of commodities documented. Stone and shell resources have been mentioned above, while cultigens, such as giant swamp taro (Cyrtosperma chamissonis) and banana (Musa sp.) and several other species of economic value (e.g., Cordyline, Aleurites and Hibiscus) were introduced to Henderson during the period of interisland voyaging (Hather and Weisler 2000; Waldren et al. 1999; Weisler 1997:65). Although we do not know whether the plants were introduced directly from Mangareva to Henderson—they could have come via Pitcairn—the original source was undoubtedly Mangareva.

The exporting of industrial stone, pearl shell and plant materials from Mangareva to the Pitcairn group was well developed during nearly five centuries begin-
ning about 1000 AD. One polished basalt flake, a surface find from the Aukena rockshelter (GA-I), originated from the Tautama source on Pitcairn (Woodhead and Weisler 1997) and provides the first evidence in Polynesia of two-way transfer of commodities in prehistory. We also know that by the 13th century, Mangareva was also linked to the Eiao basalt source in the Marquesas and, additionally, may have had indirect contact with the Society Islands (Weisler 1998a). This middle period (1000–1500 AD), characterised by long-distance interaction, is relatively well-known for the Mangareva sequence, while the first few centuries of discovery and colonisation await documentation.

The Easter Island connections with and initial origins within the Mangarevan-Pitcairn interaction sphere have recently been developed by Green (1998, 2000b) using multiple lines of evidence from not only archaeology but oral tradition, historical linguistics, biological anthropology, and the faunal evidence. The dated portable artefact comparisons on which Green has relied, however, were drawn in both instances from Mangarevan and Easter Island assemblages largely assigned to the 12th to 13th centuries AD though they probably accurately reflect aspects of an earlier stage. Thus the Settlement period for Easter Island is presently set at 800 to 1100 AD (Martinsson-Wallin and Wallin 1998:183), much as in Mangareva. Although little is known in relation to diagnostic artefacts of either at this time, for the 12th century AD and after, numerous parallels are in evidence in a number of artefact categories common to Mangareva and Easter Island (Green 1998:103-107). Later connections also have to do with the Mangareva marae and the Easter Island ahu structures (Green 2000a).

Summary and conclusions

We have summarised the archaeological excavations conducted on the islands of Mangareva, Kamaka and Aukena in 1959 with a view to providing the first culture-historical sequence for the Mangareva archipelago. In addition to radiocarbon age determinations analysed in the early 1960s from three sites on two islands, four additional samples were analysed from key stratigraphic contexts which confirmed the early date from GK-1, as well as provided chronological control for the faunal and artefact sequence that will be discussed in future papers. It is clear not only from these dates, but from the frequency and distribution of bones of extinct or extirpated birds that several hundred years of Mangarevan prehistory await documentation. This fact is further confirmed by the presence of pearl shell, industrial stone and plant material exported to Henderson Island, Pitcairn group between ca. 1000-1450 AD.

Generalised settlement patterns for atolls—roughly analogous to Mangareva where small islands surround a lagoon—suggest that excavations conducted thus far on the smaller, resource-poor islands of Aukena and Kamaka and at a marginal locale on Mangareva island, were not positioned to discover early, colonisation-period cultural deposits. We believe that future work aimed at locating early sites could benefit from an environmentally-informed archaeology. One area of Mangareva island itself, where gleyed soils may represent former swamp margins is, in our view, the key area for locating buried, early colonisation deposits. While locating portable artefacts and combustion features—the necessary and sufficient conditions to document extensive evidence of human habitation acceptable to all—will be difficult solely through test excavations (see discussion in Weisler 1998b), we believe that dispersed charcoal particles indicative of early human discovery of Mangareva will be easily found near the south end of Rikitea village, identified by Tercinier as the area of gleyed soils. On Mangareva island, buried terrigenous deposits with dispersed charcoal particles have been previously identified in stream-cut banks and at shorelines where sections have been exposed by wave action (Weisler 1996b:67).

And it is precisely wave action from high surf that is eroding the large coastal midden along the south shore of Taravai as well as the village site along the north coast of Aukena. These two occupation middens, but especially site 5 at Taravai (Weisler 1996b:67, 74), thus deserve immediate attention before much more of the cultural deposits are lost through erosion.

In addition to the points raised above, future work should include a more precise understanding of the Mangareva-Pitcairn group interaction sphere. Thus far, dozens of items have been identified as exported to the Pitcairn group, most of these recovered from secure dated deposits on Henderson Island. As only one Pitcairn artefact has been identified in Mangareva, we believe additional excavations throughout the island group should further document the magnitude, directionality and symmetry (Plog 1977) of this long-distance interaction network, one that had strong links to the Marquesas Islands as well.

Discovering the earliest cultural deposits will also have implications for determining the rate of extirpations and extinctions of land and sea birds. On Henderson Island, for example, at least five out of nine land birds went extinct after human colonisation and six sea birds have fossil records but are no longer breeding on the island (Wragg 1995:410; Wragg and Weisler 1994). Since Henderson is a makatea island with relatively depauperate terrestrial environments, it is reasonable to assume that the volcanic islands of Mangareva once had a more diverse range of avian fauna awaiting documentation.

Finally, if early deposits with significant artefactual material can be found on Mangareva we will be in a position to further document the Easter Island connection and add additional support to the current view that its inhabitants had their origin in the Mangarevan-Pitcairn southeast Polynesian interaction sphere.
1. During 1990-92, Kamaka was inhabited by the Tihoni Reasin family. The Gk-1 rockshelter, with its water drip, is the major source of potable water on the island. A cistern and concrete foundation were constructed there which protects the cultural deposits, yet discourages any future work by archaeologists.

2. Some 30 years later, in 1990-92, the vegetation on Kamaka was somewhat rejuvenated and portions of the island supported thick stands of economically-useful trees. The inland reaches of the sandy beaches fronting Gk-1 and -2 were cloaked in typical coastal vegetation.

3. Two sets of radiocarbon ages are reported. Those designated by \( \text{T} \) (Teledyne Isotopes) were processed in association with the American Museum of Natural History (New York) and no analytical details on their composition or treatment are now available. However, these samples were selected by Green as the best ones for dating layers and/or events at Gk-1, Gk-3 and Ga-1. Sample weights were probably similar to additional samples collected by Green at the same time and submitted by Weisler in 1997. Samples preceded by Beta were analysed by Beta Analytic Inc. These are standard radiometric age determinations where samples were given acid-alkali-acid pre-treatments. All analytical aspects proceeded normally. All age determinations reported are on unidentifiable wood charcoal. However, small pieces probably representing twigs and small branches, were submitted for the Beta samples. This should reduce or eliminate problems associated with ‘old’ wood.

4. In 1992 Weisler recorded an oven exposed in a modern garden above the rockshelters, which contained carbonised Cordyline roots (identified by Jon Hather, 1992).

5. Ga-2 thus may or may not be the actual cave where Moernhout saw people living.

6. This statement, decades ahead of its time in 1959, has proven correct for numerous island groups including, for example, the Society Islands (Lepofsky et al. 1996), Vanuatu (Spriggs 1997) and Hawai‘i (Beggerly 1990). After the 1959 Mangareva project, Green further stated, ‘Looking back on this, my first experience with searching for excavation sites on relatively unexplored tropical Polynesian islands, from the point of view of an archaeologist I would now have done less surface searching and more digging of test pits in those locations most favourable for deep deposits within Rikitea village and similar coastal flats’ (Green December, 1959: note incorporated into preliminary report of 1960).


APPENDIX 1: Descriptive catalogue of features mapped in Figure 2 as part of the Tokani Bay settlement complex on the island of Akamaru in the Mangarevan group.

Reference to the traditional history of Mangareva supports the identification of the settlement in Tokani Bay as one belonging to a single sub-clan, the Ati-Anua. They trace their descent from a son of Anua-motua, the first principal chief to have wide control within the Mangarevan group. In his division of the lands of the group, the island of Akamaru was given to his son, Anuaiti from whom the Ati-Anua trace their descent.

In the traditional accounts that refer to Akamaru during later periods, the Ati-Kura, Ati-Tama-matua and Ati-Taratara and their leaders constitute major social groups on the island who dwell on its north and northeast sides. In this period Ahine and Te Ma-ahine are mentioned as togo’iti leaders of the Ati-Anua. Still later the first three Ati and their leaders are mentioned as having fled with their defeated leaders from the island. Thus it would seem that those Ati-anua of Akamaru who remain and retain a historic association with Tokani Bay were a remnant of the former Ati-Anua who trace their descent from a once more dominant and widespread kin group.

The historic fame of the Ati-Anua lies in the fact that the seeress, Toapere, was apparently from this kin group and was buried in Tokani Bay, in front of which the European mission ship, whose coming she had predicted, first cast anchor (Buck 1938:25–98, 140–143).

Structures of the pre-European and early mission periods in the bay are numbered on Figure 2 from 1 to 69. Numbers 1 through 60 are in the southern section of the bay on the land called O’e’a (Oheha) from which the brush was completely cleared for Green by a Mangarevan crew. Numbers 61–69 record other prominent structures in the northern two thirds of the bay which could be easily identified through reconnaissance, but there are doubtless many more features which only a complete clearing of the brush would have revealed. Details of cleared portion of O’e’a are presented first.

At the seaward extremity of an overhanging cliff forming a rockshelter along the southern side of Tokani Bay and beyond a dyke extending out from cliff face, there was one human femur, probably part of a burial next to the cliff face, just beyond it. Towards the beach a series of arranged basalt and coral limestone blocks form a series of ‘steps’ which lead down to the seashore from which is a more sheltered zone.

1. A well-defined pavement, 5.5 by 2.7 m in size, outlined by basalt rocks, with the most formal front wall portion parallel to cliff face.

2. A whole raised but ill-defined area along and under the overhanging cliff face consisting of basaltic stone rubble forming a platform-like zone lying 50 to 90 cm above the sandy flat that forms the surface of this part of the bay.

3. A basalt stone-outlined pit, 2.5 by 1.8 m in size, right on the edge of the sea-washed beach.

4. Alignments of large basalt stones lying on the sandy coastal flat suggesting the position of former structures constructed in more perishable materials.

5. Square and rectangular shaped pavements outlined in basalt stones set on the surface of the sandy coastal flat, with their interiors filled primarily with small basaltic stone rubble and an occasional piece of coral.

6. A portion of a well-built stacked wall 55 cm high.

7. A basaltic stone pavement laid directly on the sandy coastal flat with one well-defined circular feature within its southern portion outlined in larger stones.

8. Another circular stone feature, which the Mangarevan workers thought might define a breadfruit pit. It had numerous small stones in its interior fill, bringing it nearly level to the surrounding pavement surface.

9. A disturbed area with a shallow depression, probably resulting from a fallen tree.

10. A portion of basaltic stone pavement, now exhibiting a rather irregular surface.

11. The main well-formed stacked stone wall, probably originally 1.2 to 1.5 m high. It has a recently washed out gap in the middle part. The wall lies to the rear of and protects portions of habitation platforms 7 and 15.

12. Set of stone retaining walls forming a series of sloping earthen terraces, probably for dryland horticulture.

13. This is the longest and most distinct of the terrace walls among those encountered along the back of the bay. They are 50 to 60 cm high and may not be for horticulture, but to provide slope-wash protection.

14. An aligned set of boundary stones lying behind and protecting the habitation features 8 and 9 from slope wash.

15. A one course high well-formed basalt stone alignment defining one end of a large habitation platform to the north.

16. A habitation platform, the interior of which has a rubble fill of small stones in contrast to the sandy coastal flat surrounding it, with its seaward central portion well defined by large boulders.

17. A large boulder, 75 cm high, which perhaps served as a resting place or storage surface.

18. A small area of basaltic stone paving.

19. A one course high alignment of stones defining a probable living surface lying behind it.

20. A set of large aligned stones demarcating the break in slope at the back of a large habitation platform surface.

21. Well-defined alignments of a single course of basalt rock joining at right angles and demarcating the outer edge of a very large habitation platform surface on which there are scattered stones of smaller size.
22. A well-defined low platform suitable for a house demarcated on three sides by a border of aligned basalt rocks. There are pieces of glass and other European objects on the surface. Local knowledge suggested the site may have been occupied as late as 1940, making this the last used part of the complex. In contrast most of the other features recorded were not associated with materials of European origin.

23. An irregular line of stone retaining rubble fill, perhaps for a habitation surface behind it.

24. A large natural rock outcrop completely surrounded by a rubble fill of small stone retained by irregular alignments of single course high basalt rocks on all sides. The stone alignments may have been higher and of several courses on the north side.

25. Low basalt stone alignments resting on the sandy coastal flat outlining the area of a possible structure of perishable material.

26. An elongated rubble-filled pavement surface retained by large basalt boulders which is situated just in front of, and probably associated with, feature 27.

27. A remnant of what was once a large well-made basalt stone pavement laid directly on the sandy coastal flat.


29. Oval rubble-filled surface outlined by stone boulders.

30. Smaller rubble-filled surface outlined by stone boulders.

31. Recent heaps of small stone from manioc cultivation.

32. A well-defined low rectangular platform outlined by a rock border with rubble-fill interior and a patch of basalt stone pavement inland of it.

33. A basalt boulder with a bowl-like depression on its upper surface for sharpening stone adzes.

34. Alignments of basalt rocks demarcating a path along the front of the settlement complex.

35. A long but low raised rectangular area of rubble fill held in place by an alignment of large rocks, tucking off to small ones on the north end.

36. A pile of stone rubble demarcated only on the inland side with rocks serving as a retaining wall.

37. A well-defined pit dug into the sandy flat outlined by stacked stone retaining walls. It was interpreted by the Mangarevan workmen to be for growing taro in the brackish fresh water that accumulates just above the high tide level.

38. A second, but less well-defined pit with nicely built retaining walls on the south and east side, and a small part of the west side. It has subsequently been altered and some coral limestone slabs rest on the surface of the infilled portion.

39. A series of irregular stone and boulder alignments.

40. A low stone rubble-filled mound.

41. A fairly level rectangular raised surface with a small stone rubble fill. It is demarcated on three sides by stacked stone alignments (see Emory 1939: fig. 11a).

42. A major pavement within the complex composed of fairly large stones selected for one flat face, some of them of coral. A cluster of branch coral pieces is scattered toward the western edge of the pavement. The edges of stacked stone two to three courses high and these delineate well-made borders around the platform. Five circular areas, two lacking stone or rubble in their interiors, occur at the southern end of this pavement. Emory (1939: fig 11a) was told by some local informants, when making his record of this feature, that it might be the remains of a marae. This is a possible but by no means certain interpretation.

43. A large flat slab resting on the pavement surface could be the remains from one of those table-like features that occur on some Mangarevan religious and/or habitation structures on the island of Temoe.

44. An ill-defined mound of rectangular shape with a stone rubble and earth fill, covered by surface rocks.

45. A mound of small stones related to manioc cultivation according to the Mangarevan crew.

46. A probable European-period grave.

47. An area with an artificial rubble fill lying to the south of an alignment of stacked basalt stones.

48. A possible outline for a recent fermented breadfruit storage pit excavated into a path structure of older age.

49. A series of very large aligned boulders.

50. A large mound consisting of rocks and rubble rising to a height of 60 cm on its inland end.

51. A slightly sloping terraced area covered with small stones.

52. An alignment of large boulders along the southern border of features 50, 51 and 53.

53. An elongated raised mound, 1.5 m high on its south end and 90 cm on the north side, consisting of small stones and a rubble-like fill.

54. A partially disturbed and sometimes eroded portion of a pathway paved with stone rubble pieces.

55. A well-demarcated portion of a raised (40–45 cm) rubble-paved pathway with aligned rock borders on each side.

56. A rubble covered platform attached to the northern side of the pathway.
57. An indistinct feature of rocks joining features 56 and 58.

58. A high (65–75 cm) mound built of stone rubble with boulders outlining three sides.

59. A single course boulder-built retaining wall.

60. A 70 to 90 cm high wall of stacked basalt rocks, probably the best built wall seen in the bay, filled in behind with small stone rubble to provide a more level surface.

61. This surviving portion of the Mission period road, 1.8 to 2.4 m in width, leads around the island to the main hamlet. It is only paved in patches, but its sides are marked by lines of large basalt rocks. That part of the road which extends into the bay runs along a clay bank at the back of the beach, some 90 cm to 1.8 m in height, and ends at a large stone-walled house and a grave that are situated at this end of the bay. All these features probably belong to the early European mission period.

62. On the sand beach itself, and parallel to the road for about 18 m, there is an aligned series of rather large boulders which may either belong to the early Mission period, or are of pre-European origin as the local people believe. What they represent is difficult to say.

63. The house at the end of the road of the type built during the early Mission period with its stone walls laid up in mortar.

64. Another house with stone walls laid up in mortar of the type built during the early Mission period.

65. This feature consists of a rectangular pavement outlined by a curb border of selected basalt and coral blocks one course high rising 20 to 36 cm above the surrounding ground. The nearly square structure measures 6 x 6.4 m and its interior is paved with block coral and basalt slabs with coral rubble in between. From its size, material used, and type of construction, it is probably the foundation for a family marae or image house. It lies about 18.3 m inland of feature 66.

66. An elongated pavement which lies between feature 65 and the beach about 49 m further on to the east. Its size is 3.8 by 13.7 m and the surface is composed entirely of well-laid basalt rocks. A pavement of this size could have fronted a special kind of house, perhaps a chief’s residence, though it lacks the stone bench described in the ethnohistoric accounts of that dwelling.

67. A turtle pen built of undressed basalt boulders about 1.8 m out from the shore situated in very shallow water. It is of elliptical shape and has a diameter of 7.6 m according to Emory (1939). The walls, which are 60 cm or more in height, rise above the surface of the water at high tide.

68. This unusual structure was claimed by local informants and crew to represent the remains of the first missionary building in Mangareva, a point on which Green was not at all convinced. Perhaps it can be verified by reference to the earliest written records of the mission now held in Rome. It is certainly like no other structure seen in Mangareva, and was at first thought to be some type of fortification. It lies just north of the property of O’e’a and some 12 m northeast of a large ‘otu (Barringtonia) tree that stands in this part of the coastal flat. Between this strange feature and the tree there are several limestone slabs said to mark a child’s grave.

The structure consists of three walls, some 1.8 to 2.4 m wide, forming low mound-like alignments consisting in the main of heaped up stone. The northeast wall to the rear of the bay along the back and to one side is the longest, stretching over some 36.5 m. It extends back at an acute angle from a dirt bank which runs parallel to the shore along this part of the bay. The dirt bank may in fact reflect an old beach line which has been added to by several pits (for taro?) dug at its base toward the seaward slope. At intervals along the rubble alignment wall are even higher piles of stone rubble. The wall then turns an abrupt angle and runs southwest for a distance of 18.3 m along what is the structure’s southeast side, where it turns a right angle and extends back to the northwest another 9 m, thus partially enclosing a courtyard-like area. In the alignment of this last wall, after a gap of 7.3 m, there is a rubble mound and another nearby. Inside the enclosed area, there are two more low-rubble mounds and one much larger one.

69. In one of the several overhung recesses in the second level of cliffs that extend along the rocky peninsula continuing southwest from Tokani Bay, the burial of a very young child was encountered. The cave is the first one after passing a tiny sandy beach. The burial was covered with coral sand, apparently from this beach. Tests in the lower line of cave-like overhangs along this coast show that few were ever occupied (except very recently) as fishing shelters.