



**NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION MONOGRAPH 19:  
Michael W. Graves and Roger C. Green (eds), *The Evolution and  
Organisation of Prehistoric Society in Polynesia***

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THE EVOLUTION AND ORGANISATION  
OF PREHISTORIC SOCIETY IN  
POLYNESIA

Edited by Michael W. Graves and Roger C. Green

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NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION  
MONOGRAPH

# THE COMMUNITY IN MA'UKE PREHISTORY

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Settlement pattern analysis has been part of the mainstream of Polynesian archaeology since the early 1960s. Yet despite these thirty years of research some of the most promising potential of the settlement pattern approach is still unrealised in this part of the world. In particular, archaeologists have had limited success identifying and defining the basic social and residential units of Polynesian societies. We have limited knowledge of the size or composition of the various kin groups that occupied specific forms of residential cluster and there is much ambiguity in terms such as 'household', 'hamlet' and 'village' in the Polynesian literature. Yet, it is in settlement pattern studies that these types of issue are most commonly and successfully addressed.

The problem lies partly with the Polynesian archaeological record itself. Field surveys frequently reveal a dispersed arrangement of monuments and habitation sites but few intensively occupied living surfaces. Furthermore, because of the near-total absence of pottery in East Polynesia, any such horizons which do exist are difficult to locate. In this type of archaeological landscape there has been a tendency to concentrate on settlement pattern methods aimed at macro-scale levels of resolution where the main units of analysis are geographic, ecological and economic (Clarke 1977). There has been less work done at the within-site or micro-scale levels where social and cultural elements play a greater explanatory role.

This paper deals with the micro-scale in an attempt to define the archaeological characteristics of a single unit of Ma'uke society - the community. It will be shown that the community can be identified archaeologically at several points in the Ma'uke sequence and that the spatial aspects of community life have undergone significant changes over the course of Ma'uke prehistory.

## CONCEPTS OF COMMUNITY

The definition of community used here follows from that of Murdock (1949) and is used to describe all those

members of a society who live together and interrelate on an everyday basis. Murdock describes the community as "...the maximal group of persons who normally reside together in face-to-face association." This is a definition which has been accepted as useful to archaeological analysis by a number of authors including Chang (1958:303), Renfrew (1978:102) and Trigger (1978:118). However, there are points about this definition which must be examined further.

Firstly, "face to face" is too strict a criterion in most instances. It is enough that members of a community are normally resident within a single settlement complex, and that they are bound by a network of interpersonal relationships which operates on a daily basis. Individuals can thus belong to only one community at a time, although they might have various types of affiliation to other communities or other types of social group (Renfrew 1978:102).

The use of the terms "maximal" and "normally" are also important as they exclude a number of site types with a residential component from inclusion in the category of community site. Special purpose sites such as garden shelters, hunting, processing or fishing camps may be occupied by community members for various lengths of time. However the occupants of these sites participate in networks of interpersonal relationships which extend well beyond that particular residential unit and therefore they cannot be considered community sites (Trigger 1978:116). Such sites are part of a community's settlement subsistence system and demonstrate that communities have quite different human and spatial elements at different times of the year.

It is implied by this definition of community that all members share some common identity. This will usually include language, and in Polynesian societies it has a strong basis in kinship and genealogy. It is this combination of group identity and maximum spatial cohesion which distinguishes a community from other levels of human society.

What is particularly useful about the community concept to the archaeologist is that it carries no specific socio-

political or economic connotations. Internal social and economic sub-systems differ enormously, yet the term can be used as meaningfully in reference to band level societies as it can in the context of the state. This means that archaeologists can describe a community site independently of the social and economic relationships which operate among its members. Once the physical characteristics of a community have been delineated, those other properties can often be inferred.

How then is it possible to identify a Polynesian community archaeologically? One feature that all community sites have in common is that they are essentially residential in nature. Therefore, they are best defined archaeologically in terms of the spatial relationship that exists between the primary units of residence. The primary residential unit in any community is the household and so it is the spatial relationship between households that defines the physical parameters of a community site.

## THE HOUSEHOLD

Like 'community' the 'household' is a cross-cultural concept with a near universal application (Netting, Wilk and Arnould 1984:xix, xxi; Rathje 1983:24). Defining an unambiguous and accurate cross-cultural definition is problematical however, due to variation in size, composition and function. At its most basic level the household describes the next biggest social unit after the individual (Hammel 1984:40). The household maintains a strong corporate role and Hammel has also described it as "...the smallest grouping with the maximum corporate function" (Hammel 1980:251) or, "...that social group larger than the individual that does not fail to control for its members all those resources that any (adult) member could expect to control for himself" (Hammel 1984:41).

There are at least five activities associated with the household. These are, production, distribution, transmission (of rights to valuable goods and property), reproduction and co-residence (Wilk and Netting 1984:5; see also Wilk and Rathje 1982). The specific characteristics of these activities will vary from community to community as will the relationship between them. However, the area at which these activities overlap in a given community defines the households.

Archaeologists must go further than this and Winter (1976) has distinguished between the 'household' and the 'household cluster'. The former comprises the social unit, as discussed above, while the latter consists of the material manifestations of that group. In the Valley of Oaxaca he has suggested that the typical household cluster included a house, several storage pits, a small number of graves and

various additional features all located in close proximity to the house. In Polynesia, activities and features associated with most households, and which might be identifiable in the archaeological record, include a dwelling structure of some sort and cooking and food preparation facilities. Additional elements may be food storage areas, activity areas and perhaps burials, although in Polynesia the latter are often located some distance from residential zones.

Working from the concepts of household and community it is evident that many spatial forms of site are possible. These range along a continuum from highly dispersed to nucleated agglomerations of household clusters. Therefore it is the nature of the inter-household space which defines the basic form of community spatial organisation.

In dispersed community sites the space between household clusters does not constitute part of the residential settlement area. Inter-household space is taken up by tracts of undeveloped or agricultural land, with some interspersed special function sites. Tracks and roadways serve to link the household clusters and other sites with one another. As Chang (1958:303) noted, the more dispersed community sites are very difficult to recognise archaeologically because there are often no clearly marked limits to the settlement area, and the relationship between household clusters is difficult to define. In fact, under this form of spatial organisation the community is not represented by a specific archaeological site or contiguous group of sites at all. Instead, it consists of a generalised settlement area comprising a number of household clusters, specialist sites and religious structures located within some loosely defined natural boundary.

In order to investigate these types of community the archaeologist is often required to determine the function and season of use for different groups of site, and to understand the ecological relationships between them and the landscape in which they are located. The distribution patterns then define a community in terms of a "statistical possibility" (Trigger 1978:177). The community is defined using a macro-scale approach where the units of analysis are geographic, ecological and economic rather than social or cultural (Clarke 1977). The network of inter-household relationships are not easily investigated at this level of analysis and the social aspects of community organisation are often left undefined.

At the other extreme are nucleated community sites or villages. Villages are permanently occupied residential sites with reasonably well defined spatial boundaries. Household units are clustered and inter-household space is cleared and open to everyday use by community members for the purposes of traffic, formal and informal gathering and for specialist activities organised at levels ranging from the

individual to community. Households within a village are not separated from each other by tracts of unused land nor by agricultural plantations; in fact the plantations frequently lie some distance from the village (Chang 1958:304). Renfrew (1978:102) suggests that in most parts of the world the village is the normal form of community site amongst sedentary neolithic societies.

In the following section I will define the spatial form of the community site at two points in the Ma'uke sequence based on site survey information and the excavation of a single settlement site. I will show that examples of both these forms of community organisation are found in the archaeological record of Ma'uke although located at opposite ends of the known prehistoric sequence.

## THE ARCHAEOLOGY OF MA'UKE

Ma'uke is a small raised coral-reef or makatea island in the Southern Cook Islands lying ca 245 km north-east of Rarotonga (Fig. 8.1). The population of ca 600 is still strongly tied to subsistence activities including gardening and fishing. However, most households also have some form of cash income mostly obtained through cash cropping or government employment (perhaps both), supplemented by remittances from Rarotonga or New Zealand.

Until recently Ma'uke was dependent on the irregular arrival of the inter-island trading vessels to supply goods and take off produce. Since the construction in 1986 of a good airstrip on the north coast however, Ma'uke has been linked by daily flights to Rarotonga. This has made some difference to the organisation of cash cropping on the island such that the planting of low volume, high priced crops such as chilli and exotic fruits is now economically viable. This in turn is having an affect on modern settlement patterns (see below).

### *Ecological zonation*

Like most makatea islands, the resource zones on Ma'uke are distributed in a strongly marked concentric pattern (Fig. 8.2). A reef platform extends out for ca 150-200 m from the coast and drops directly into deep water. A 3-4 m high coral cliff rises above the beach and encircles the entire island. From the top of this cliff a sandy beach ridge rises gently to meet the inland coral-reef (makatea) beds ca 150-200 m inland. These beds, which formed during successive periods of uplift, are ca 1 km wide on average and constitute a formidable barrier between inland resource areas and the sea. Planting lands are all located inland and while these also follow a concentric pattern of distribution the better agricultural soils are scattered and discontinuous.

Wetland soils (the Tamarua swamp soils) are used today for planting taro (*Colocasia esculenta* and *Xanthosoma sagittifolium*). These soils are located in pockets of swamp at the base of the central uplands. The dryland planting soils consist of relatively rich Taiki soils located in low-lying pockets against the edge of the makatea and Areora clay loams located inland of these. The central volcanic core of the island rises to ca 30 m above sea level and consists entirely of soils derived from weathered basaltic rock (Wilson 1982:22), too poor to support Polynesian agriculture.

### *The archaeological record*

Site surveys were carried out on Ma'uke in 1985 and in 1986. Surface field remains were sparse and architectural features very poorly defined. This was due partly to the relatively undeveloped nature of Ma'uke stone-work construction, but post-depositional factors, particularly agriculture, have also played a role. Prehistoric habitation areas were concentrated in zones of high soil productivity and these places have also been the focus for modern agricultural activities.

Seven major site types were recorded, defined as settlement areas, house sites, *marae*, paved tracks, cave burials, miscellaneous stone structures (walls and pig compounds) and traditional sites. In terms of reconstructing settlement patterns, the three most important are the *marae*, settlement sites and paved tracks.

*Marae*. All prehistoric *marae* on Ma'uke are badly damaged; nonetheless it is clear from remaining surface features that *marae* construction was not as well developed as on nearby Atiu or on the more distant islands of Mangaia, Aitutaki or Rarotonga. On the basis of remaining features, a typical Ma'uke *marae* probably consisted of a raised rectangular platform of earth ca 4 x 4 m in size, enclosed by a coral facing wall ca 600 mm high. Structures of this general form are found as components of the *marae* complexes on Atiu and are of the same approximate dimensions as several of the *marae* reconstructed in recent years on Ma'uke for investiture ceremonies.

*Settlement areas* consist of sparse scatters of cultural material including small patches of ash and broken oven rock, covering an area of up to several hectares. The most significant component of these sites is a very low density mix of white coral pebbles which is found within the soil matrix to a depth of about 100 mm. The coral pebbles are known in the Cook Islands as *kirikiri* and are used as flooring material in traditional style houses. Within each settlement area are very few discrete features, although most contained one or

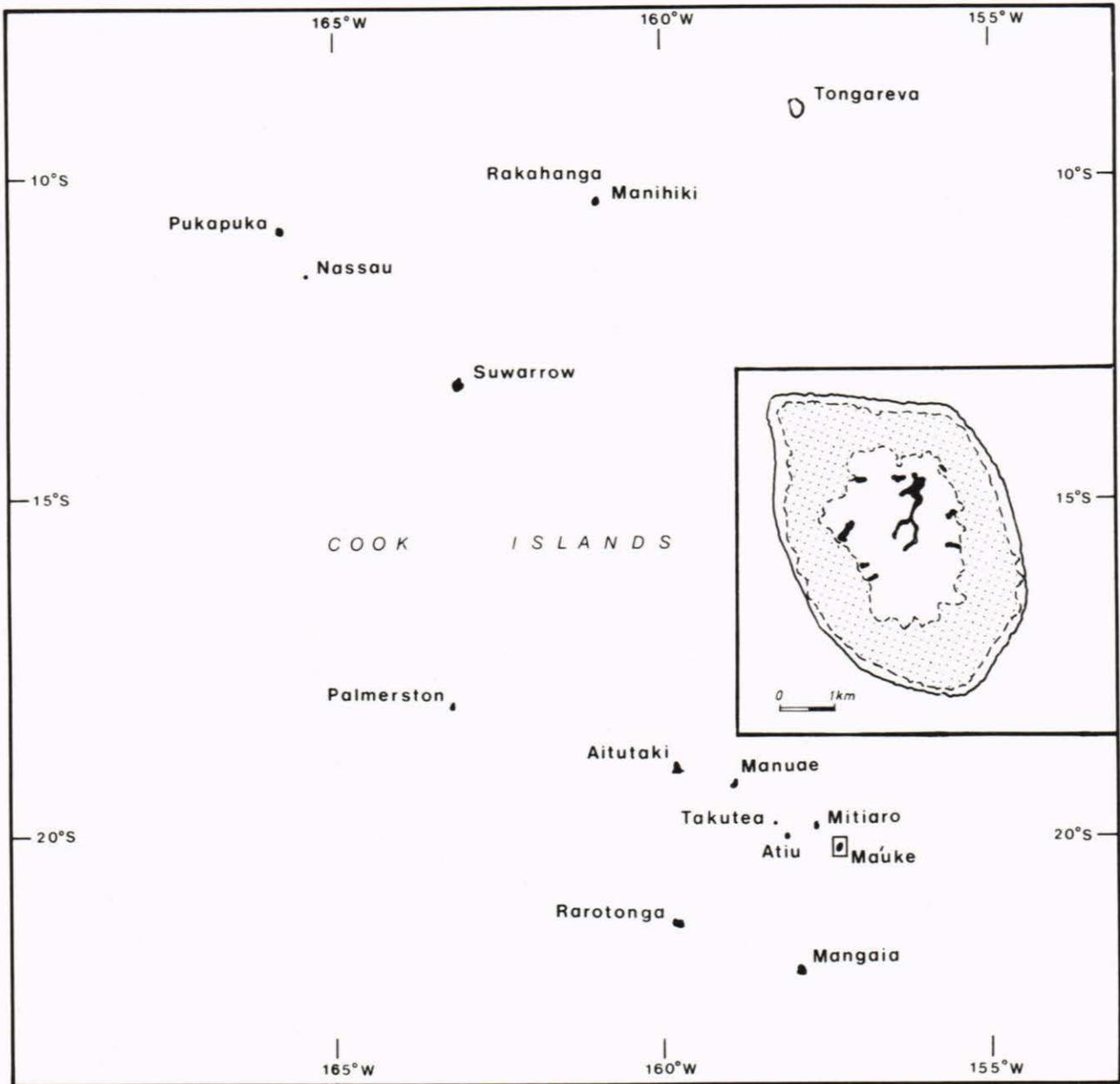


FIGURE 8.1. Location of Ma'uke in the Cook Islands group.

two denser patches of *kirikiri* and other cultural material representing house floors not yet fully disturbed by agriculture.

*Paved tracks* consist of flat coral slabs laid through the makatea beds to form pathways between and over the sharp coral outcrops. These paths allow easy walking access between the interior and coast. They average 1 km in length and are 500 -1500 mm in width. Many are in use today and they are periodically maintained.

*Site distribution.* The spatial distribution of these three site types is shown below in Figure 8.3 in relation to soil zonation. This areal data demonstrates several regular patterns of association between different classes of site, and with respect to soil types. Settlement areas show a marked concentration along the high, flat land above the inland swamps. Within those areas, they are found almost exclusively on the Taiki and deep-phase Areora soils. *Marae* sites are also located on these inland soils and demonstrate a very close proximal relationship with the

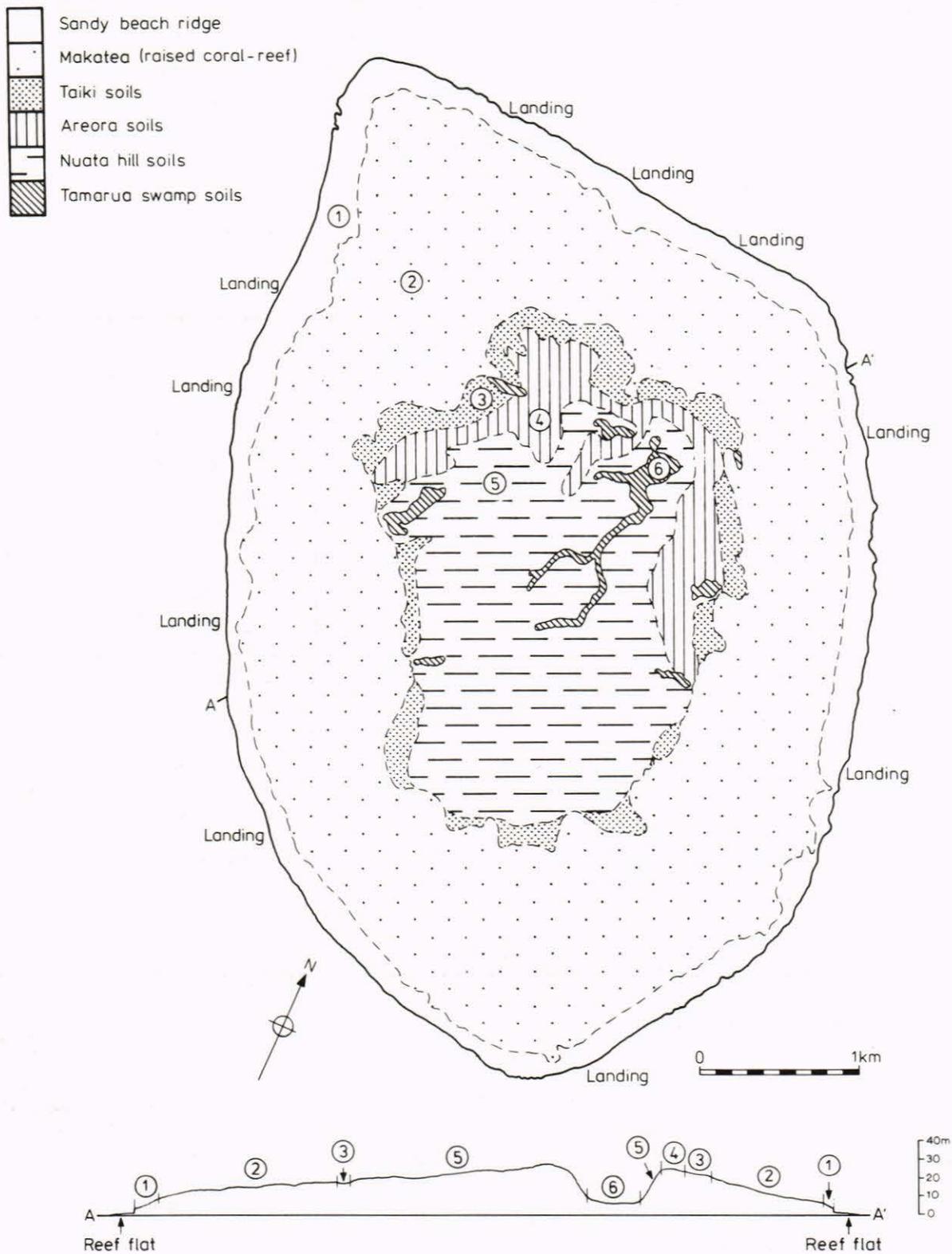


FIGURE 8.2. Distribution of Ma'uke soil zones.

settlement areas. It is possible that *marae* actually lay within the settlement areas but the field evidence was not sufficiently well defined to clarify this point. Paved tracks also shows a strong spatial correlation with *marae* and settlement areas. The tracks run from the vicinity of prehistoric settlements through the makatea to the closest reef passage.

None of the inland settlement areas were excavated as there seemed little likelihood of exposing any intact occupation surfaces. On the basis of information collected from local informants the majority of these sites appear to date within the last 300 years. Most *marae* are named, and *marae* and settlement areas are frequently associated with named ancestors, none of whom appears likely to have lived more than 350 years ago on the basis of genealogical reckoning.

This time frame is consistent with estimates based on surface collected artefacts from these sites. Identifiable adzes and fragments recovered were all triangular (Duff Type 3A) adzes which dominate the latter periods of the Cook Islands sequence. No archaic adze forms were found and no fishhooks or pearl-shell artefacts were recovered. These latter items are relatively common in the earliest known sites in the Southern Cook Islands.

#### *Interpretation*

The three site types discussed above are interpreted as the archaeological components of a small number of community land holdings. The *kirikiri* enriched soil represents the main residential component within which individual household clusters were located.

Associated *marae* and paved tracks were communal sites, the latter maintained and used by the entire community. The status of paved tracks as communal property is reinforced by oral traditions which refer to their being constructed in such a way as to provide warning to the community in the case of attack. This was done by positioning paving-stones so that they would rock when trodden on and emit a hollow ringing sound. Whether this is an accurate historical account is unclear, although it is true that all the tracks do include stones which give out a hollow ring when trodden on. The most important point, however, is that these accounts establish a relationship between the tracks and some form of independent corporate group in nearby residence.

Each community occupied an area of land which contained quality dryland planting soils and was located at a minimum distance from an area of swamp. Through the construction and maintenance of one or more tracks through the makatea, each community thus maximised access to the three major resource areas, the dryland and wetland soils, and the reef passages which give access to important fishing zones along the outer edges of the reef (Walter 1991).

Residential areas themselves are of extremely low density and even allowing for post-depositional disturbance, there is no evidence for any nucleated habitation. This suggests that the individual household clusters within each settlement area were probably located close to the dryland soils under cultivation by that particular household at any one time. As the focus of dryland planting shifted so also did the household cluster, but always remaining within the the community landholding.

The pattern of site distribution outlined above corresponds to the more dispersed type of community spatial organisation. It also corresponds well with the pattern which was described by the earliest European visitors to Ma'uke, and indeed to elsewhere in the Southern Cook Islands (Crocombe 1964:65; Gilson 1980:7). According to most accounts individual household clusters were scattered around the inland planting soils within a unit of land known as the *tapere*. The *tapere* is a wedge shaped land block running inland from the coast which, in its ideal form, contains a segment of each major resource zone (Crocombe 1964). There is no description of nucleated habitation sites in the Southern Cook Islands; it was one of the first concerns of missionaries to establish such centres in order to expedite the process of 'civilisation' (see Gilson 1980:26-27). The one recorded exception to the normal form of scattered habitation is a group of settlements high up on the slopes of the Maungaroa Valley on Rarotonga. This settlement has some areas of quite dense housing but it cannot be considered a normal settlement type since it was occupied specifically as a political refuge during a short period of warfare in the first decades of the 19th century (Bellwood 1978).

The dispersed pattern of spatial organisation which represents the community in the latter portions of the Ma'uke sequence stands in marked contrast to the older coastal site of Anai'o.

#### ANAI'O (MKE 1)

The Anai'o site (MKE 1) lies on the north-west coast of Ma'uke on the beach ridge immediately adjacent to the makatea (Fig. 8.3). Test excavations were carried out at Anai'o in 1985 in order to ascertain the general stratigraphy and size of the site and to recover datable material (see Walter 1990).

#### *Stratigraphy*

The site contained five layers, of which Layers 2 and 4 were cultural (Fig. 8.4). The basal Layer 5 was a gritty coral marine sand containing sub-fossil shell.

Layer 4 was the lower of the two occupation layers and



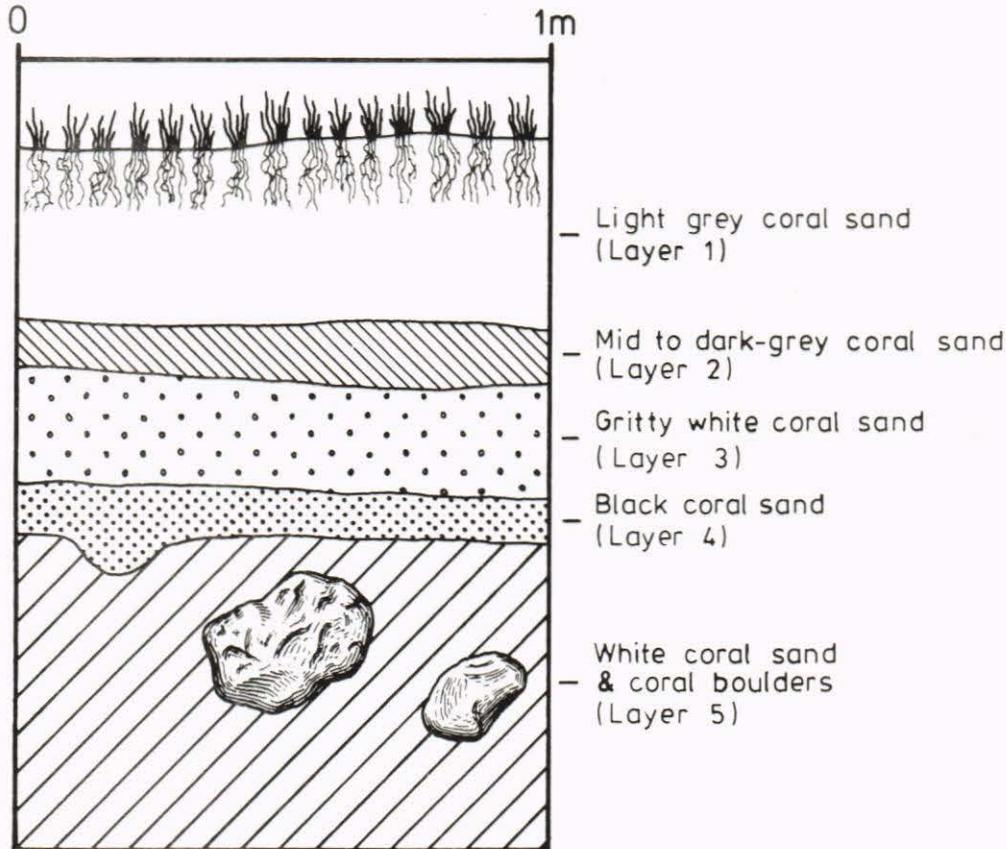


FIGURE 8.4. Stratigraphy of Anai'o site (MKE 1), north baulk Square 25N.

there prior to abandonment. Test pits dug at intervals on the beach ridge north and south of the excavation show that Layer 4 covered an area of at least 5000 m<sup>2</sup>.

Layer 3 was a thin layer of white coral sand lying between the two occupation surfaces. This layer was deeper towards the beach and there contained a greater proportion of larger sized beach debris suggesting that wave action was probably responsible for most of the deposit and that the bulk of the Layer 3 material accumulated in one short, rapid period of deposition.

Layer 2 was a largely featureless, mid to dark-grey sand horizon representing the second occupation of the site. Flecks of charcoal were responsible for the discolouration but little other culturally derived materials were noted in most of the areas excavated. The few artefacts recovered from this horizon were similar to those recovered from Layer 4.

Layer 1 was a light-grey coral sand in which a shallow humus layer had formed in the upper 60-100 mm. Judging by the relatively uniform and fine grain size over most of the

site, this layer was mainly aeolian in origin. A small number of boulders and deposits of coral rubble in several parts of the site suggests intermittent wave washing.

In 1987 a 19 m transect (Area A) and a series of small test pits were excavated to provide information on the history of site development (Fig. 8.5). Results indicate that beach ridge development began prior to the first occupation of Anai'o and that the settlement was constructed on a gently sloping ridge then ca 600-700 mm lower than the present ridge. This settlement was abandoned after being covered with wind and wave born sands (Layer 3), probably deposited in a single hurricane event. Reoccupation may have occurred very rapidly, but the main focus of this second phase of occupation was not represented within the 1985 and 1987 excavations. Layer 2, wherever it was exposed, was largely featureless and devoid of the heavy concentrations of cultural detritus which characterised Layer 4.

*Dating.* Samples of *Turbo setosus* marine shell from Layers 2 and 4 were submitted for radiocarbon analysis. These returned dates indicating an initial occupation of

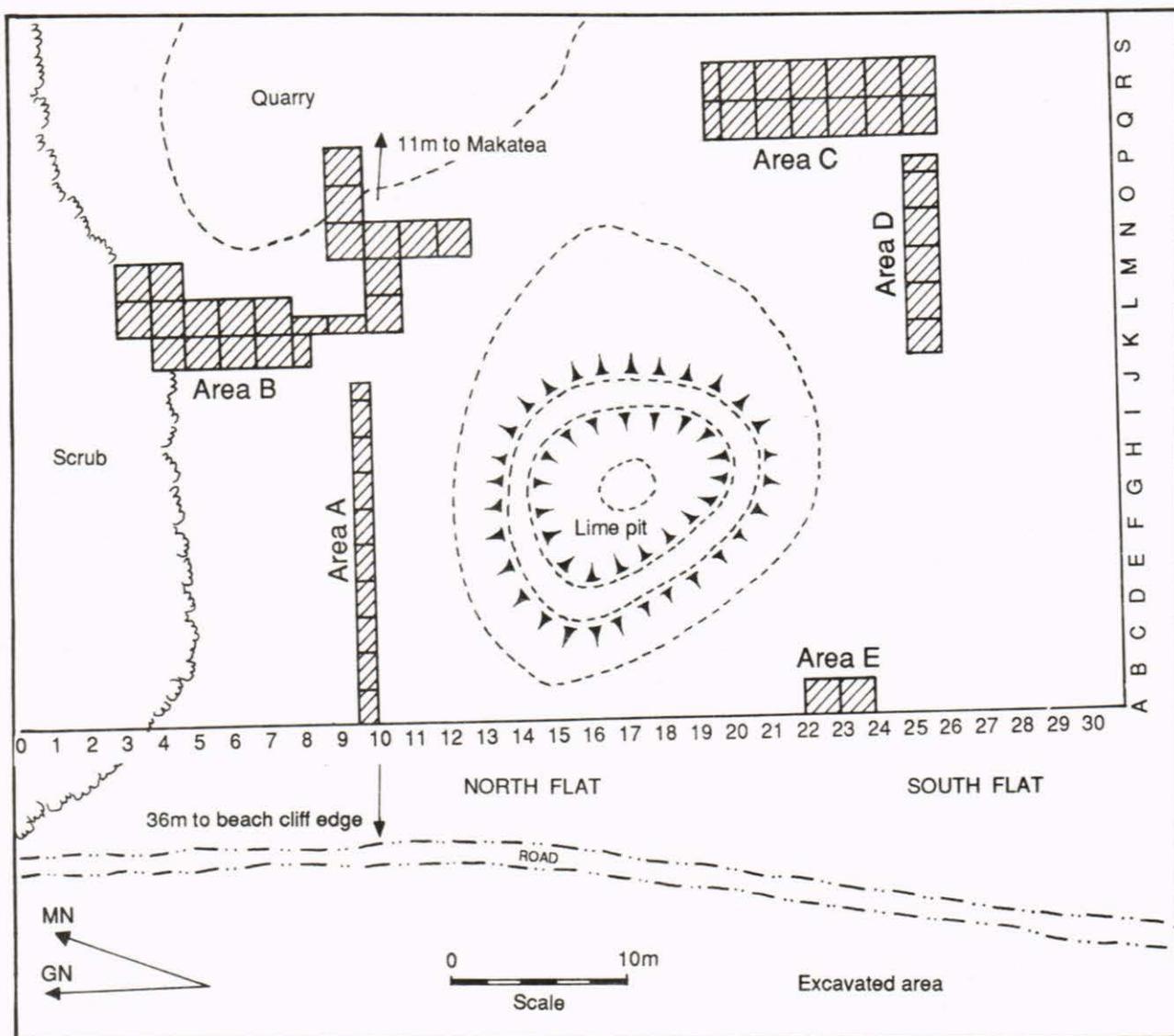


FIGURE 8.5. Plan of Anai'o site (MKE 1) showing excavated areas.

Layer 4 in the early 14th century A.D., followed by a brief hiatus of no more than a century and a second occupation in the late 14th or early 15th century (Table 8.1).

#### *Spatial organisation of Layer 4*

In addition to the transect and test pits described above, three areal exposures and one 2 x 4 m square were also opened during the 1987 excavation programme as well as a number of additional test pits adjacent to the main excavation areas (Fig. 8.5). The purpose of these was to assess the spatial organisation of the Layer 4 occupation.

Three types of activity area were recorded on the surface of Layer 4: cooking and food preparation, stone

working and shell working. Six structures were also recorded.

*Cooking areas.* Food preparation and cooking were represented by oven pits (*umu*), midden concentrations and associated artefacts. The latter include shell vegetable peelers, coconut scrapers and coconut graters. Several *umu* were enclosed by a small shelter; examples include Structure 5 and probably Structures 1 and 2 (see below).

A band of heavily stained *kirikiri* running between Structures 1 and 2 overlay a large number of inter-cutting oven features (Fig. 8.6). This area also contained a large patch of ash, burnt shell and fire cracked rock. It is probable that this portion of the site had been set aside for cooking activities throughout the Layer 4 occupation and that a sequence of small cooking shelters was erected there.

LAB No.	Material	Layer	Conv. 14C Age	Cal Age Range <sup>1</sup>
NZ 6939	Shell	Layer 4	1075 ± 48 B.P.	1301-1406 A.D.
NZ 6960	Shell	Layer 4	1015 ± 35 B.P.	1360-1434 A.D.
NZ 6984	Shell	Layer 4	1026 ± 24 B.P.	1348-1424 A.D.
NZ 6943	Shell	Layer 4	1055 ± 58 B.P.	1307-1422 A.D.
NZ 6958	Shell	Layer 2	947 ± 47 B.P.	1415-1475 A.D.

<sup>1</sup> At one sigma, calibrated to allow for marine reservoir effect with regional ocean variation using a delta-R value of 45 ± 30 (see Stuiver, Pearson and Braziunas 1986).

TABLE 8.1. Radiocarbon dates from Anai'o, Ma'u'ke.

*Stone working areas* fell into two categories. The first consisted of a single workshop area on the *paepae* of Structure 3 where the working or reworking of adzes had taken place (Fig. 8.6). The *paepae* contained a number of large flakes, several roughout adzes, grinding stones and a large quantity of small waste flakes. Smaller stone working areas where more casual tool maintenance had taken place were represented by small, tight clusters of stone flakes (Figs 8.6 and 8.7).

*Shell working areas* were marked by clusters of worked and unworked pearl-shell, echinoderm spine and coral abraders and by part finished fishhooks. There was a low density of worked pearl-shell over much of the site but the actual working areas were concentrated around the hearths and on the *paepae* of the structures (Figs 8.6 and 8.7).

### Structures

Six structures represented by alignments of postholes and deposits of *kirikiri* flooring material were excavated on the surface of Layer 4. Most contained a small hearth or, in cooking shelters, an *umu*. Activity areas were located close to the structures.

*Structure 1* was small and quadrangular enclosing an area of ca 16 m<sup>2</sup>. It contained a *kirikiri* floor, although this had been become well mixed into the matrix of Layer 4. The structure also contained some evidence for cooking activities in the form of sparse midden, ash and oven rocks scattered over the floor. A narrow *paepae* was located along the northern side and this contained a small stone-lined hearth on the eastern end and a shell working area to the west (Fig. 8.6). The latter was indicated by waste flakes of pearl-shell, abraders and fishhook blanks. Two parallel rows of postholes along the northern border of Structure 1 suggests that the *paepae* may have had a narrow overhanging roof. Given that this structure was small, contained some evidence for cooking and was located close to other oven features, it is likely that it was used primarily for domestic activities such as cooking or food preparation.

*Structure 2* contained a much denser layer of *kirikiri* than Structure 1, but posthole alignments were not clear enough to reconstruct the wall lines (Fig. 8.6). This structure, also estimated at ca 16 m<sup>2</sup>, contained a small internal hearth containing fishbone and fragments of burnt mammal bone. Basalt flakes and a polished rectangular adze were found just outside the floor to the north. Nearby were a number of fishhooks, two fishhook blanks, fragments of worked pearl-shell and a single abrader. Like Structure 1, shell and stone working activities took place along the outside of the structure and both are interpreted as cooking shelters.

*Structure 3* was partly damaged by recent road-work and rubbish dumping activities; other parts were well defined. A deep floor of light grey/brown sand and pebbles was encircled by a single row of coral boulders (Fig. 8.6). This flooring contrasted with the *kirikiri* found in Structures 1 and 2. It was also cleaner and without significant charcoal or midden inclusions or the pieces of oven rock that were found in and around Structures 1 and 2.

Outside the southern edge of Structure 3 a 1.5 m wide *kirikiri paepae* was laid which was used as a focus for various stone working activities (see above).

Because Structure 3 was larger and the floor cleaner than Structures 1 and 2 it is interpreted as a dwelling or sleeping house with an area estimated at ca 20-25 m<sup>2</sup>.

*Structure 4* is also interpreted as a dwelling. It was represented by a tightly packed layer of clean *kirikiri* up to 200 mm deep, containing a number of post and smaller stake holes (Fig. 8.7) and was located on a flat area above a gentle slope, ca 500 mm above the rest of the site. An adjacent large, shallow fire scoop was probably used for ember cooking but the *kirikiri* flooring was clear of organic refuse and it is unlikely Structure 4 was erected and used for cooking.

*Structure 5* was located close to Structure 4 (Fig. 8.7). It consisted of flat coral boulders set around a large, deep oven pit. Post and stake holes were found among and beneath the coral flooring, but their arrangement did not form any

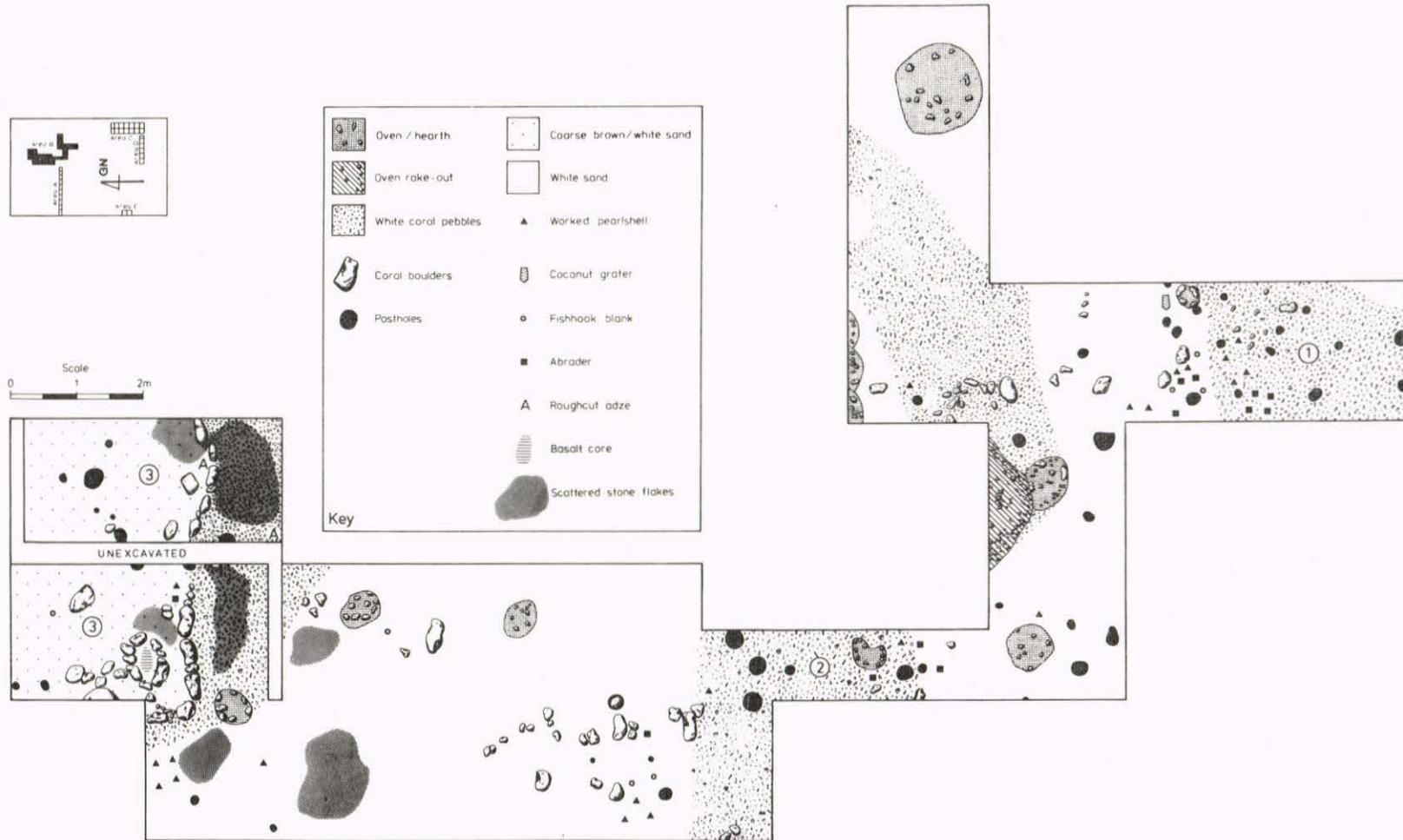


FIGURE 8.6. Plan of Area B, showing location of excavated structures and artefacts.

discernible pattern. Charcoal, ash, burnt shell and bone was present among the rocks which lined the floor. In addition to food preparation, shell working and stone tool maintenance took place around this structure which was a permanent cooking facility probably forming part of a household cluster with Structure 4.

Structure 6 was represented by deep postholes and by a shallow drain or drip line exposed in Area D (see Fig. 8.5). However, although a structure of some sort was indicated, no significant conclusions could be drawn about its form or function without further excavation.

#### *Anai'o community organisation*

The Anai'o site was a permanently occupied habitation site for a number of interacting household units. One example of such a unit is the complex of features comprising Structures 4 and 5. Structure 4, the dwelling house, was kept clear of midden, ash and other debris associated with cooking. Structure 5 was the household cooking shelter where a variety of other domestic activities were also carried out. Together with surrounding activity areas and features this was the best defined and most complete example of a household cluster recovered. Several components of other such clusters are probably represented by the other structures and associated activity areas in Layer 4.

The distribution of structures and activity areas in Layer 4 points to a regular pattern to the use of space within the site. Manufacturing activities were confined to *paepae* and outside the walls of structures, as well as the vicinity of the fireplaces and hearths. Kitchen areas in particular appear to have been foci for a range of domestic activities including food preparation and shell working and stone flaking. However, the latter activities were carried out around cooking areas only on a small scale and more intensive working of stone was recorded only on the *paepae* of the dwelling, Structure 3.

It seems reasonable to assume that activities which took place around the three cooking shelters involved men and women, implying that the cooking shelters were places where all members of the household unit would gather to perform domestic tasks in a communal atmosphere. This is a pattern of spatial use very characteristic of modern Ma'uke households. Routine activities are carried out by family members around the cooking shelters, while the dwelling house is used mainly for storage and sleeping.

Individual households at Anai'o were clustered but inter-household space was relatively clear of artefacts, features and working floors. Nevertheless, the entire matrix of Layer 4 contained a heavy concentration of midden

indicating that the whole site, including the inter-household space, comprised a single living surface. This clustering of households within a single living surface is a strong argument in favour of the interpretation of Anai'o as a village. Furthermore, because Layer 4 demonstrated evidence of continuous occupation in the form of many inter-cutting features, and because it contained a wide variety of artefact types and well built structures, I would also argue that this was a permanently occupied site, not a seasonal fishing camp. This interpretation is compatible with information obtained on the subsistence economy of the site.

To summarise this data briefly: the faunal assemblage from the Layer 4 horizon pointed to an economy based on agriculture/aboriculture supplemented by fishing and some marine and terrestrial hunting. The evidence for agriculture includes shell vegetable peelers, coconut scrapers and graters. In addition, the faunal assemblage included domestic pig, dog and chicken all of which are usually associated with agriculture in Pacific societies (see Kirch 1982:352; 1984:56). The fishing assemblage, artefactual and faunal, points to the marine component of the Anai'o diet being taken predominantly from the inshore marine zone and most fish were probably caught within several hundred metres of the site (Walter 1991).

#### CHANGES IN THE ORGANISATION OF MA'UKE COMMUNITY SPACE

On the basis of site survey data and excavations carried out at Anai'o, two contrasting forms of community have been identified in the Ma'uke archaeological record. Furthermore, there is some indication that the distinction between these has a chronological basis. The suggested pattern of change is an early nucleated or village form of community spatial organisation followed, towards the later end of the sequence, by a more highly dispersed arrangement of household clusters. At this point it is not possible to offer any explanation for the change in other than speculative terms. However, it seems very likely that the essential element is that the people of Ma'uke chose, at some point in their history, to move the household clusters directly onto planting soils. This suggests that the primary issue may be one of increased competition for a valuable, but restricted resource.

As a working hypothesis, I would argue that when Anai'o was occupied population levels on Ma'uke were low enough in relation to the total area of arable land to make access to the inland planting soils relatively easy to maintain. Large settlements were constructed close to the passages to facilitate voyaging activities which were taking place with some regularity up until the 14th century A.D. (Walter 1990,

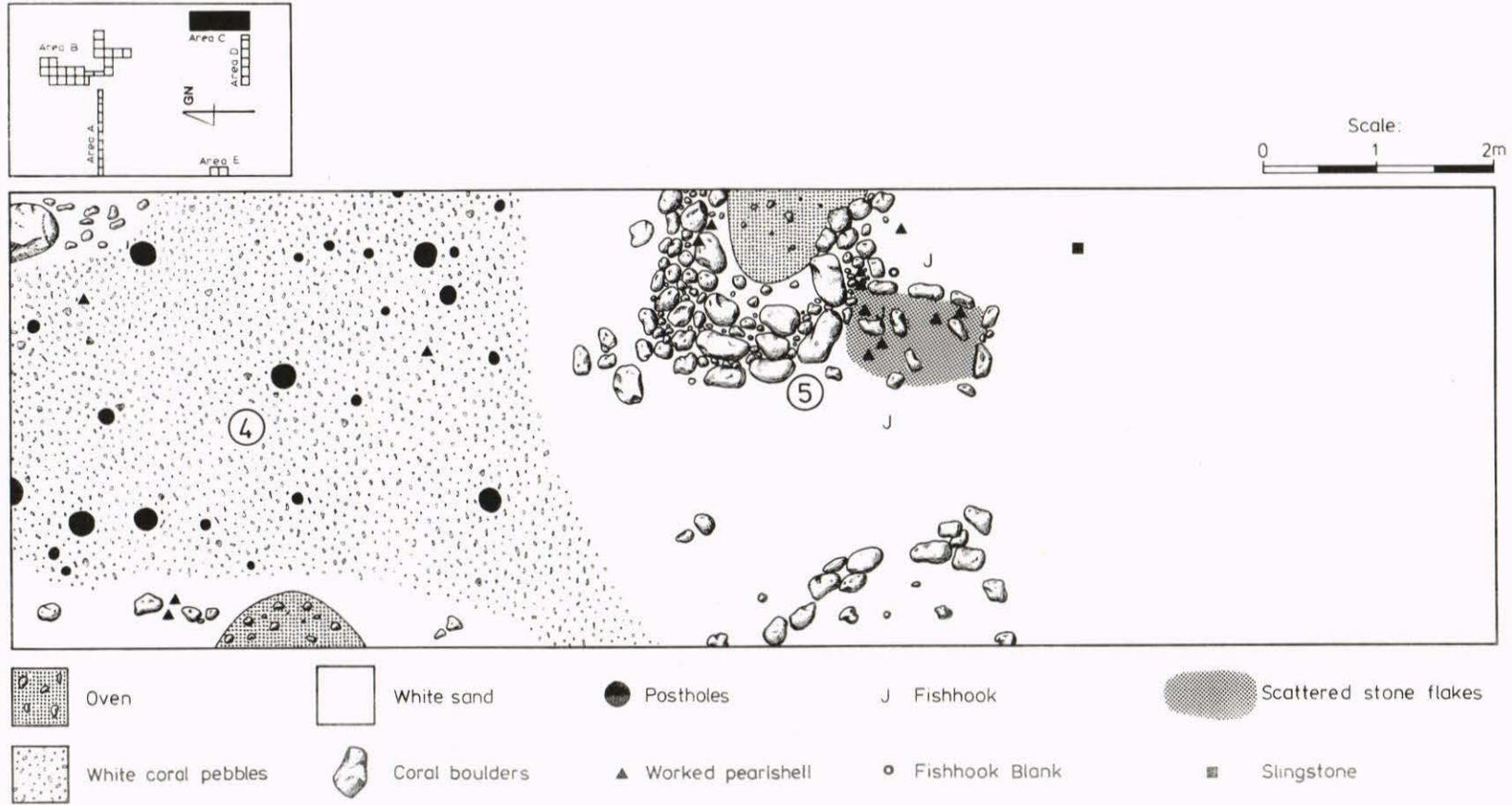


FIGURE 8.7. Plan of Area C, showing location of excavated structures and artefacts.

n.d.). In the following centuries however, the relationship between population levels and agricultural soils changed, perhaps as a result of population increase accompanied by a decrease in the availability of planting soils through sedimentation of the upper swamps and the low lying Taiki soils following increased land clearance on the Areora loams. As rights to planting land became more difficult to maintain individual households shifted directly onto the dryland soils. Long term access was thus assured through direct occupation rights. Ultimately, this resulted in the breakup of the nucleated pattern of community organisation and the development of the dispersed pattern represented in the later prehistoric and historic periods. It also coincided with the decline in offshore voyaging which is reflected in the archaeological record from several places in the Southern Cook Islands at about this time (Kirch *et al.* 1992; Walter 1990, n.d.). The loss of spatial cohesion within the community may have been compensated for by the increased construction of *marae* which became community focal points in a more dispersed environment.

Interestingly, similar changes towards a more dispersed settlement pattern have been taking place on Ma'uke over the last 5-6 years. Following the arrival of the missionaries and the establishment of church villages, the Ma'uke settlement pattern has been fairly nucleated. Until the first decades of this century there were three contiguous villages (essentially one large nucleated residential area of three named sections) in the centre of the island. Now, there is also a village on the coast. From these nucleated areas, planters move out to their agricultural land on a daily basis.

Recently, however, the possibilities for cash cropping have increased dramatically on the island. A new and safe airstrip coupled with a second commercial air service has provided a competitive and regular link with the Rarotongan market. In addition, the Ma'uke M.P., the Hon. Va'ine Tairea, is also Minister of Agriculture and has directed the establishment of a very successful infrastructure for commercial agriculture. A result is that many families are again establishing household clusters on the scattered Taiki soils, where they build small shacks and live semi-permanently tending the plantations. A dispersed settlement pattern is emerging which can be traced directly, in this case, to the changing economic value of the dryland planting soils.

## CONCLUSIONS

I began this paper by suggesting that settlement pattern archaeology in Polynesia has concentrated on macro-scale analysis at the expense of the micro-scale. This is not to say that the micro-scale has been totally ignored; a number of

important analyses of internal spatial patterns have been carried out in the Pacific in recent years (Kirch 1988; Pigeot 1986; Sheppard and Green 1992; Sutton 1990). However, intra-site spatial studies need to be developed a lot further if we want to understand the form and function of that smallest and most important of Polynesian social units, the household.

In this study, it was not the household, but the community which was chosen as the unit of analysis. This was because the community was the finest level of resolution possible in Ma'uke at this point. Settlement data pertaining to the later phase of Ma'uke prehistory was badly disturbed and lacked a well defined structure. Furthermore, it was not possible to address the spatial and social elements of the household at Anai'o in detail. Nevertheless, the Ma'uke archaeological record does suggest that the spatial aspects of community organisation changed considerably over the last 500-600 years of prehistory.

When changes occur in the spatial relationship between individual household units which make up a community, changes occur also in the operation of those everyday inter-relationships which bind household units into a corporate whole. The implication is that variation in the spatial organisation of the Ma'uke community is indicative not only of major change in the land tenure system, but also in the social and political organisation of community life. By applying more micro-scale methods to the study of Polynesian settlement patterns, it should be possible to interpret changes in spatial organisation in social and political terms in addition to providing economic, ecological and geographic perspectives (Clarke 1977).

The pattern of change in the spatial organisation of the Ma'uke community argued for here, is based largely on the partial excavation of a single settlement site. However, I have suggested elsewhere that this pattern may be quite common in the Cook Islands (Walter n.d.). Several excavated sites of comparable age to Anai'o in the Southern Cooks appear also to be of the nucleated village form (Walter n.d.), despite there being no record of these types of community site in the ethnographic literature.

Furthermore, village sites from this period are known from elsewhere in East Polynesia, the best known example being the Fa'ahia/Vaito'otia complex on Huahine (Pigeot 1986, 1987; Sinoto and McCoy 1975). On this basis, it seems probable that the proposed pattern of change in the Ma'uke sequence may reflect a more general pattern within the Cook Islands or even within East Polynesia as a whole.

## REFERENCES

- Bellwood, P.S. 1978. Archaeological Research in the Cook Islands. *Pacific Anthropological Records* 27. Honolulu, Bernice P. Bishop Museum.
- Chang, K.C. 1958. Study of the Neolithic social grouping: examples from the New World. *American Anthropologist* 60:298-334.
- Clarke, D.L. 1977. Spatial information in archaeology. In D.L. Clarke (ed.) *Spatial Archaeology*, pp. 1-31. New York, Academic Press.
- Crocombe, R. 1964. *Land Tenure in the Cook Islands*. Melbourne, Oxford University Press.
- Gilson, Richard. 1980. *The Cook Islands 1820-1950*. Wellington, Victoria University Press.
- Hammel, E.A. 1980. Household structure in 14th century Macedonia. *Journal of Family History* 5:242-73.
- Hammel, E.A. 1984. On the \*\*\* of studying household form and function. In R. McC. Netting, Richard R. Wilk and Eric J. Arnould (eds), *Households: Comparative and Historical Studies of the Domestic Group*, pp. 29-43. Berkeley, University of California Press.
- Kirch, P.V. 1982. Advances in Polynesian prehistory: three decades in review. In F. Wendorf and A.E. Close (eds), *Advances in World Archaeology*, pp. 51-97. New York, Academic Press.
- Kirch, P.V. 1984. *The Evolution of the Polynesian Chieftdoms*. Cambridge, Cambridge University Press.
- Kirch, P.V. 1988. The Talepakemalai Lapita site and Oceanic prehistory. *National Geographic Research* 4:328-342.
- Kirch, P.V., J.R. Flenley, D.W. Steadman, F. Lamont and S. Dawson. 1992. Ancient environmental degradation. Prehistoric human impacts on an island ecosystem. Mangaia, central Polynesia. *National Geographic Research and Exploration* 8:166-179.
- Murdock, G.P. 1949. *Social Structure*. New York, Macmillan.
- Netting, Robert McC., Richard R. Wilk and Eric J. Arnould. 1984. Introduction. In R. McC. Netting, Richard R. Wilk and Eric J. Arnould (eds), *Households: Comparative and Historical Studies of the Domestic Group*, pp. xiii-xxxviii. Berkeley, University of California Press.
- Pigeot, Nicole. 1986. *Nouvelles Recherches sur le Site de Fa'ahia*. Puna'auia, Tahiti, Département Archéologie Centre Polynésien des Sciences Humaines.
- Pigeot, Nicole. 1987. *La Structure D'habitation C50. Une Occupation Saisonnière Fa'ahia*. Puna'auia, Tahiti, Département Archéologie Centre Polynésien des Sciences Humaines.
- Rathje, William J. 1983. To the salt of the earth: Some comments on household archaeology among the Maya. In Evon Z. Vogt and Richard M. Leventhal (eds), *Prehistoric Settlement Patterns: Essays in Honor of Gordon R. Willey*, pp. 23-34. New Mexico, University of New Mexico Press.
- Renfrew, Colin. 1978. Space, time and polity. In J. Friedman and M.J. Rowlands (eds), *The Evolution of Social Systems*, pp. 89-112. Pittsburgh, University of Pittsburgh Press.
- Sheppard, P. and R.C. Green. 1992. Spatial analysis of the Nenumbo (SE-RF-2) Lapita site. Solomon Islands. *Archaeology in Oceania*, 26:89-101.
- Sinoto, Y.H. and P. McCoy. 1975. Report on the preliminary excavation of an early habitation site on Huahine, Society Islands. *Journal de la Société des Océanistes*, 31:143-186.
- Stuiver, M., G.W. Pearson and T. Braziunas. 1986. Radiocarbon age calibration of marine samples back to 9000 cal B.P. *Radiocarbon* 28(2B):980-1021.
- Sutton, D.G. (ed.). 1990. *The Archaeology of the Kainga*. Auckland, Auckland University Press.
- Trigger, Bruce. 1978. *Time and Traditions: essays in archaeological interpretation*. Edinburgh, Edinburgh University Press.
- Walter, R.K. 1990. The Cook Islands in Eastern Polynesian Prehistory. Ph.D. thesis. Department of Anthropology, University of Auckland.
- Walter, R.K. 1991. Fishing on Ma'uke: an archaeological and ethnographic study of fishing strategies on a makatea island. *New Zealand Journal of Archaeology* 13:41-58.
- Walter, R.K. n.d. The Cook Islands - New Zealand connection. In D.G. Sutton (ed.), *The Origins of the First New Zealanders*. Auckland, Auckland University Press.
- Wilk, Richard R. and Robert McC. Netting. 1984. Households: changing forms and functions. In R. McC. Netting, Richard R. Wilk and Eric J. Arnould (eds) *Households: Comparative and Historical Studies of the Domestic Group*, pp. 1-28. Berkeley, University of California Press.
- Wilk, Richard R. and William J. Rathje. 1982. Towards an archaeology of the household. *American Behavioural Scientist* 7:617-41.
- Wilson, A.D. 1982. Soils of Mauke, Cook Islands. *New Zealand Soil Survey Report* 52. Wellington, New Zealand Soil Bureau.
- Winter, Marcus C. 1976. The archeological household cluster in the Valley of Oaxaca. In Kent V. Flannery (ed.), *The Early Mesoamerican Village*, pp. 25-31. Orlando, Academic Press.