DATING RITUAL STRUCTURES IN MAEVA, HUAHINE ASSESSING THE DEVELOPMENT OF *MARAE* STRUCTURES IN THE LEEWARD SOCIETY ISLANDS, FRENCH POLYNESIA*

Paul Wallin
Kon-Tiki Museum, Oslo

Reidar Solsvik
University of Oslo, Ethnographic Museum

INTRODUCTION

THE CLASSIC *MARAE* OF THE LEEWARD ISLANDS are impressive structures, their huge *ahu* platforms built of coral and limestone slabs. Located at protruding points along the coast, and sometimes opposite the passage in the reef, they are the first things that a visitor sees when sailing into port. And, these great temples were built to be seen. Possibly the most important, but definitely the most famous of these *marae,* is that of Taputapuatea. The mention of its name stirs emotions in both Maohi and archaeologists. The ritual centre of Te Po on Raiatea has been portrayed as Hawaiki, the place of origin of both Polynesian culture (Hiroa 1938) and as the source for *marae* structures on the islands east of Tonga and Samoa (Henry 1928; Emory n.d.). Local historians claim that *marae* Taputapuatea was, in AD 1300, the ritual centre of Tia'i-hau-atea, the political alliance that influenced the rule of the Windward and the Leeward groups, and reached west to Rarotonga, south to some of the Austral Islands, and all the way to New Zealand. This last member of the alliance was named the "Light-land of the friendly alliance" (Henry 1928:122-123). The traditions that claim this exalted position for Taputapuatea and the dynasty of Opoa have, in later years, been interpreted as the history of how the influence of the 'Oro cult spread from Raiatea (and Borabora) to Tahiti and Mo'orea, and beyond (Eddowes 2001; Gérard 1974; Wallin 1993). Although the social origin of the Opoa dynasty and its ritual centre is probably found in the midst of human settlement of these islands, at the end of the first millennia AD, the rise of the war god 'Oro and his heralds from Raiatea and Borabora is probably of a more recent origin. This view has partly been based on local traditions and partly on a ^{14}C date obtained from marine shells found in cavities of the *ahu* slabs, which suggested a late 17th or early 18th century date for the construction of the last phase at Taputapuatea (Emory and Sinoto 1965).

Until recently, the ^{14}C date from Taputapuatea was the only radiocarbon age assay from any Leeward Islands *marae*. As a result of our recent investigation of *marae* complexes at several sites on Huahine, there now exists a collection of twenty-three radiocarbon dates, making it possible for us to achieve the first archaeological assessment of the origin and developments of *marae* structures in the Leeward Islands. During four field sessions, from 2002 through 2004, the authors engaged in test-excavating *marae* structures in the districts of Maeva and Fare, on Huahine. Ten *marae* structures ranging in size from very small structures to large temples with island-wide significance have been excavated and dated. In terms of socio-political importance, we have

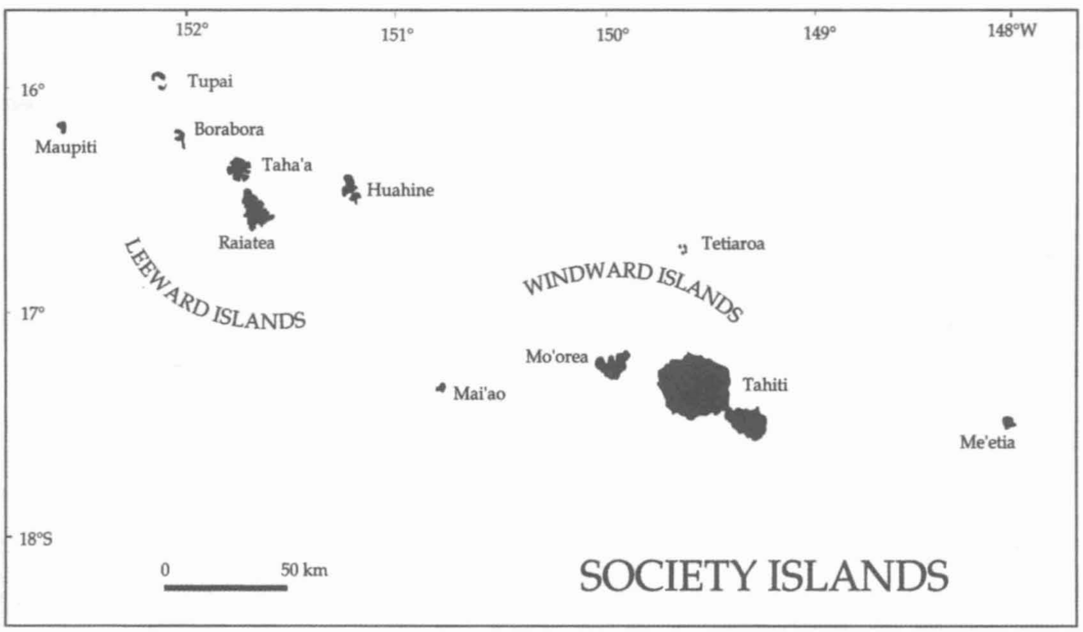

Figure 1. Map of the Society Islands, showing the location of the various islands.

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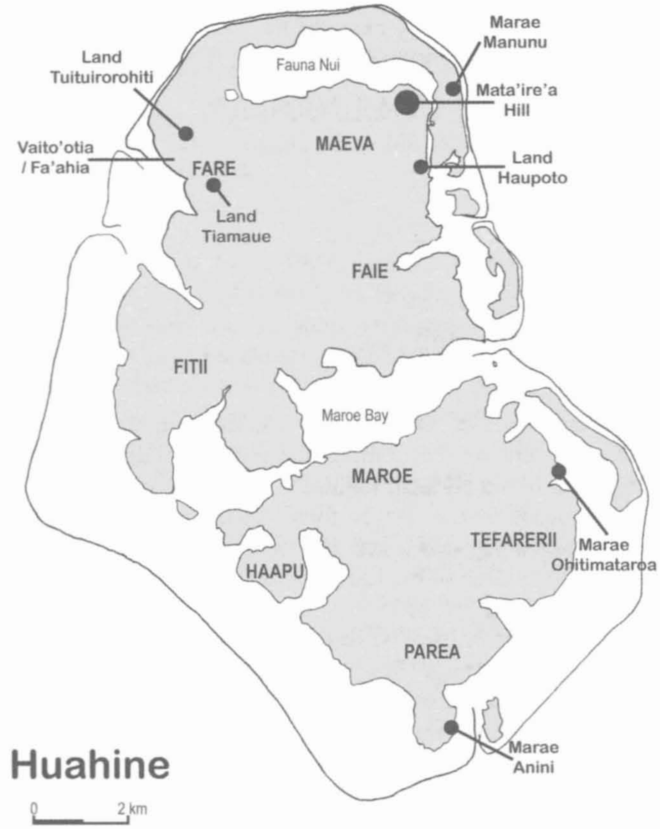

Figure 2. Map of Huahine with the location of archaeological sites discussed in the text.

investigated two key religious complexes, or *national marae* (Henry 1928:131-138); five medium sized structures that probably were lineage *marae*; and three small *marae*/shrines of which two are associated with larger structures. The project is based on surveys initiated by Yosi Sinoto, with the help of Eric Komori, Elain Rogers-Jourdane, and Toru Hayashi. From 1979 to 1983, surveys were carried out on Mata'ire'a Hill, in adjacent areas of the Maeva village, and on selected structures around the island (Sinoto and Komori 1988; Sinoto, et al. 1981; Sinoto, et al. 1983; Sinoto and Rogers-Jourdane 1980).

Site location

The island of Huahine is the second largest island in the Leeward group, aside from Raiatea, and is located approximately 160 km northwest of the island of Tahiti (Figure 1), in the Society Islands, French Polynesia. Huahine consists of two main volcanic islands separated by a bay, but connected by an encircling reef. Huahine Nui is located to the north and is slightly larger than the southern half, which is named Huahine Iti. These two large sides of a volcanic crater were formed by eruption and tectonic activities between 2.64 and 2.5 million years ago (Legendre, et.al. 2003:121-123, Figure 126). At the north end of Huahine Nui, the encircling reef has formed a natural lagoon at the village of Maeva, called Fauna Nui. In former times, Fauna Nui produced an abundance of fish and shellfish.

Huahine island is today made up of eight administrative districts: four on Huahine Nui: Fare, Maeva, Fitii, and Faie; and four on Huahine Iti: Haapu, Maroe, Tefarerii, and Parea. Fare, the main district, is found on the west side of Huahine Nui. Here, on the shores of Cook Bay, is the most important port and town of the island, as it was in former times. Not more than about 500 metres northwest from the center of the town is the oldest habitation site in the Society Islands, the Vaito'otia/Fa'ahia site, discovered in 1972 and later excavated by Sinoto (Sinoto 1988).

While Fare may have been the most important port and settlement in historic times, Maeva was the political center of the island during a large part of its history. The district of Maeva comprises the north and northeastern part of Huahine Nui (Figure 2) and surrounds Moua Tapu. A village is situated on a strip of land along the lagoon, and just behind the village, Mata'ire'a Hill rises steeply up to about sixty meters. On the slopes and top of this hill (Figure 3), numerous house foundations and terraces plus close to forty *marae* structures are found. The most important temple on the island, *marae* Mata'ire'a Rahi is located on the summit. Extending from the coast uphill and separated from the central part of Mata'ire'a Hill by a small gully on its eastern side, is

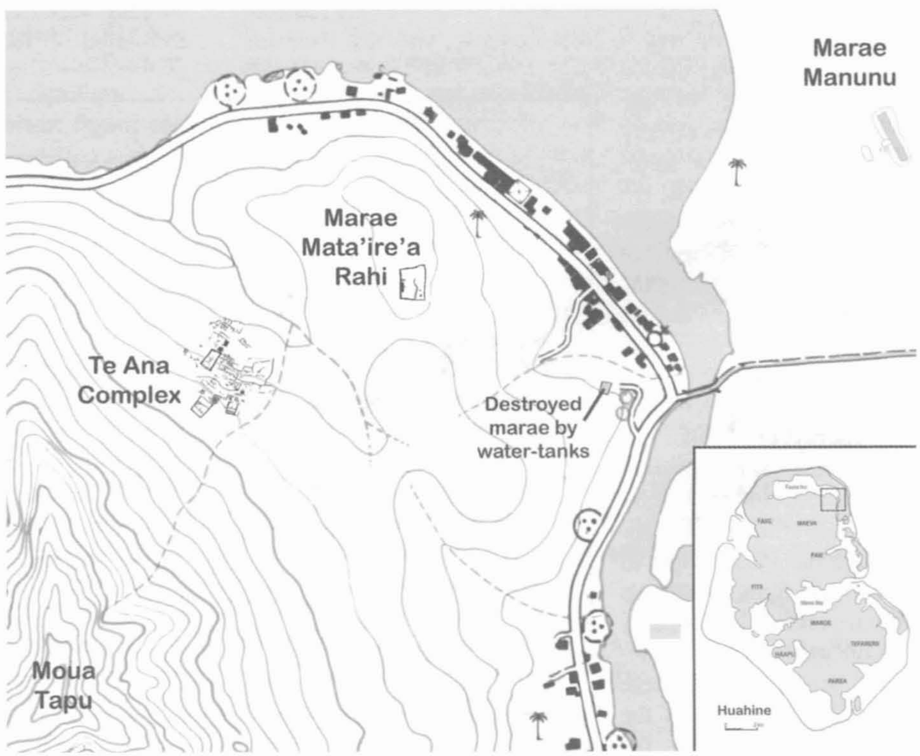

Figure 3. Map of Mata'ire'a Hill, Maeva, Huahine, showing the location of investigated *marae* sites.

the Te Ana land division where a complex of three middle-sized and two small *marae* are found. Just across the lagoon from the present village of Maeva, on Motu Ovarei (point Toerau-roa, or Manunu), is the huge *marae* called Manunu-i-te-ra'i (Benumbed-of-the-sky) (Henry 1928:148 and 363), or Manunu for short, after the site where it was constructed.

Three of the excavated *marae* were located outside the Maeva village area (Cf. Figure 2). The first of these is located about 1,5 km south of Maeva village, within the Maeva district, on the east coast of Huahine Nui. The *marae*, which is middle sized, is located on land called Haupoto on the inland side of the road. The second *marae* is located in the district of Fare at the northwest part of Huahine Nui, about 1 km outside the town of Fare. It is a medium to small sized *marae* situated on land called Tuituirorohiti, on the coastal flat about 500 m from the sea. The third *marae* is located in the mountain area above the town of Fare, at the northwest part of the island. This is a small *marae*. No secure dateable material was found here during our excavations. This *marae* is, therefore, not further discussed here.

Other *marae*, not excavated but dated by coral samples collected from their *ahu* fill, is *marae* Anini, the huge 'national' *marae* of Huahine iti. It is located on Tiva point at the southeast extremity of Huahine Iti in the district of Parea. The second is *marae* O'hiti Mataroa, another huge limestone slab *ahu* located in the neighboring district of Parea, called Tefarerii on Huahine Iti. The third of the coral-dated structures is located at the northeast corner of the Mata'ire'a Hill (Cf. Figure 2), at Maeva district. It is the remnants of a medium-sized coral slab *ahu*.

Dating stone structures

How do we date dry-masonry stone structures or dirt-and-rubble filled platforms? This might seem like a straightforward question for an archaeologist and not much discussion is needed. Dating a site, layer, or activity is at the heart of modern archaeological practice and routinely done, but it sometimes also creates heated arguments amongst scholars. The complexity of the matter really rests with two factors: 1) *which activity* would we like to date at the site, and 2) *how accurate* do we need to date that activity. The more accuracy required, the more difficult it becomes. In Polynesia, the most intense and interesting development in settlement patterns and social organization took place during a time-period which, if we are using the radiocarbon dating technique, produces the most extended calibrated time spans because of the large wiggles in the calibration curve ion during the latter half of the second millennium AD producing multiple interception for each date (Aitken 1990). Consequently, accuracy becomes even harder to achieve.

The important question to ask when dating simple stone structures is which activity we would like to date at the site. Structures built out of stacked basalt boulders or enclosures made up of limestone slabs with coral rubble filling do not necessarily contain, nor do they easily preserve, remains of cultural material deposited at the time of construction, except perhaps bones. People might have lived at the site before it became a place for religious ceremonies or the *marae* or *ahu* might have been in use during an extended period of time and cultural deposits might belong to either end of the "life" of this structure. In such instances, architectural complexity, like the number of times the structure have been rebuilt, would make it easier to piece together a building sequence that would help us define more narrow time periods. The large *ahu* platforms on Rapa Nui, which might in some instances have been in use for up to five hundred years and the *heiau* structures in the Hawaiian Islands that may also have a similar time depth are excellent examples where architectural complexity makes it possible to narrow the time frame for each construction phase, because each phase produces a *terminus ante quem* for the preceding phase and a *terminus post quem* for the following phase. Small and simple pavements with an *ahu* enclosure on one end, like the *marae* of the Society Islands, that quite possibly functioned as ritual centres for several hundred years without being extensively nor frequently reconstructed can be much harder to date accurately.

There is a range of chronometric dating techniques available to the archaeologist, each with its own technical and practical limitations. In general, three factors determine how suitable a particular method is: 1) Time depth; 2) Sam-

Table 1. Various methods for establishing *marae* chronology.

Approach	**Method**	**Time span**	**Material**
Chrono-metric	^{14}C	50 – 70.000 years	Wood, charcoal, shells, bone, coral, and other material containing ^{14}C.
Chrono-metric	U-Th	50 – 500.000 years	Coral, stalagmitic calcite, calcite encrustation or infillings on/in bone, calcium carbonate from spring waters, deposited carbonates, concretions in arid soil, caliche and calcrete.
Chrono-metric	Thermoluminescence	50 – 500.000	Ceramics or other heated clay, oven stones, burnt flint, stalagmitic calcite, sediments, volcanic glass, and lava.
Chrono-metric	Hydration-rim	200 – 100.000	Volcanic glass and obsidian.
Typology	All use same principle	Only a relative timescale	Architectural traits of the monument.
Historical	Historical records	AD 1596 – 1900	Written records.
Historical	Genealogy	c. AD 1300 – 1900	Oral traditions.

ple material; and 3) Chronological resolution.

Most methods utilize the decay of radioactive substances and consequently they only "work" on specific sample material that contains the required radioactive substance, for example, the ^{14}C method might date all organic materials that contain the radioactive substance carbon-14 and which have been part of an organic lifecycle. That is, what is measured is *when* the organic entity stops its intake of fresh carbon-14, so that remaining amounts of the carbon-14 isotope can decay unaffected. Radioactive decay varies in terms of its half-life – that is the time it takes for a certain amount of radioactive material to reduce itself to half of its original amount – which in turn makes it technical possible to measure only a specific time-range when measuring one particular radioactive isotope. If you wish to keep within practical error-margins for the time under study, there are usually only a few methods that are at hand. The time period spanning human occupation for Polynesia as a whole is c. 3000 years, but the Society Islands have probably been settled only the last 1500 years, or more to the point, the settlement of island groups east of Tonga and Samoa and in the region of New Zealand did not take place until c. AD 800-1000 (Anderson 1991; Anderson, et al. 2003; Anderson, et al. 1994; Anderson and Sinoto 2002; Dye 2000; Martinsson-Wallin and Crockford 2001). We also know that, so far, the earliest archaeologically dated ceremonial structures in Polynesia were constructed after AD 1000 (Anderson and Green 2001; Martinsson-Wallin 1994; Martinsson-Wallin and Crockford 2001). Consequently, the majority of dates in the current study would be expected to fall within a time frame of ca. 200 to 950 years BP.

The range of material frequently encountered in archaeological excavations of Polynesian ceremonial complexes that may be feasible for chronometric dating is: 1) Charcoal or charred nuts; 2) Human or animal bones, found in context of both burials and sacrifices; 3) *Umu* stones. More infrequently, coral that was used as construction material or fill by several island groups, or both coral and shells might be encountered as sacrifices in a ceremonial context. On Hawai'i and on Rapa Nui, volcanic glass/obsidian is frequently part of the finds on archaeological sites and these flakes can be dated. Four methods might be used on these materials within a time frame of 200 to 850 years BP: the ^{14}C method on wood, charcoal, shell, and coral; UTh series testing on corals; Thermoluminescence dating on oven stones; and Hydration-rim measurements on volcanic glass or obsidian (Cf. Table 6.1). In both Hawai'i and Easter Island, hydration-rim analyses on volcanic glass/ obsidian have been applied by researchers. Dating through either UTh series testing or TL measurements has infrequently been resorted to in Polynesia.

Radiocarbon dates and accuracy

One of the few explicit discussions on the subject of how to date and interpret radiocarbon samples in connection with ceremonial stone structures has been carried out by M. J. Kolb in his PhD dissertation *Social Power, Chiefly Authority, and Ceremonial Architecture in an Island Polity, Maui, Hawaii* (1991). Here Kolb sorts his ^{14}C samples into three categories based upon "which possess the most explanatory power in terms of stratigraphy" (Kolb 1991:203). The three categories are: 1) Bounded samples, 2) Associated samples, and 3) Indirect samples.

When taking a critical view of these categories they become more uncertain. The term 'bounded' does not only say something about the stratigraphic context the sample comes from, but also implies that they contains informational values regardless of what the sample actually consist of. Kolb furthermore states, "If a sample is associated with the construction of a building element it is deemed to be of excellent stratigraphic context" (Kolb 1991:209). Bounded samples are, due to this reasoning, from excellent stratigraphic context, and are the only samples that directly date the construction of any building elements. Looking closely at to Kolb's table 6.2 (Kolb 1991:211), one can see that charcoal of "best" (excellent) quality generally comes from charcoal concentrations but, in one case, (Beta-40360) it is "a single piece of charcoal recovered from the base of the terrace in Test Unit PL 10 at 23 cm B.S." (Kolb 1991:224). A single piece of charcoal found at the base of a terrace could very well originate from a natural fire or any other activity in the area, so from our point of view, it is not an ideal sample for this purpose. Kolb's second category is defined in this way: "These are charcoal samples taken from fire pits or ovens, or samples which are appropriately *associated* with a building element by being within a matrix of paving stones or beneath distinct pieces of rubble fill. Samples of this variety accurately date the *use* of a building element, but not necessarily the time of its construction" (Kolb 1991:204). Samples from fire-pits or ovens are excellent features and a 14C sample cannot be more secure than when retrieved from such contexts. However, in this group of associated samples he also includes charcoal that might be of quite uncertain origin, even scattered charcoal found in or under stone fill. Kolb's third group, the indirect samples, are those samples that lack "reference to specifically defined features or activity areas" (Kolb 1991:204). The definition of this group is also open to a critical reading, since Kolb has the following definition: "These include samples recovered from general screening processes, from areas of refuse deposition, or from the surface of paved areas" (Kolb 1991:204). If we take the definition to mean that the samples cannot be related to stratigraphic contexts of particular phases of the structure, then nobody would have any problem with such a category; however, it is not likely that all areas of refuse deposition are outside any stratigraphic relationships to phases of a ceremonial structure. In such cases they would possibly date the use period of this particular phase.

From this study we learned that we have to deal with each collected sample in a quite independent way and make evaluations of stratigraphic contexts continuously during excavation. Different kinds of samples cannot be lumped together. Charcoal tied to a feature always has a better explanatory value than scattered charcoal. One has to make the decision in the field as to what a feature actually represents. The same is valid for scattered charcoal/bones/corals. Some can be of higher value, for example, if such dating materials are found within a defined cultural layer they could be good; but if found within fill material they may be more or less useless. It is all up to the context of the find.

Because find context is of central importance when dealing archaeologically with *marae* structures, we divided the structure and the prehistoric actions associated with the structure into four different phases: 1) Activity that took place prior to the building of the structure; 2) Activities carried out during the building of the structure; 3) Activities taking place during the use of the structure, including evidence for re-building; 4) Activities taking place on the site after the structure ceased being used for its original purpose.

Activities tied to group No. 1 are, for example, cultural layers and clearly defined features located stratigraphically under the *marae ahu*, wall, or courtyard. Scattered charcoal in the same contexts also indicates such earlier activities, but with less explanational value because such charcoal may indicate a natural fire at the spot, etc. The second category is more complicated; ideally it consists of fires or sacrifices that can be tied to the building phase, for example, fires inside *ahu* (Martinsson-Wallin, et al. 1998:6), sacrifices placed under cornerstones, and possibly coral incorporated in the fill of the *ahu*. The third category is mainly expressed by sacrificial activities and deposition of bones, for example, behind *ahu* or in pits or heaps, and activities that can be tied to re-building or expansions of the structure. Again, charcoal/bones tied to features give the most secure dates; scattered charcoal in fill, etc., have a limited value, since it may belong to earlier activities and brought in during the building of the structure. Category 4 includes dateable material found in surface contexts on *marae* courtyards that could have been brought in by later visitors, or been deposited during archaeological restorations, etc. Surface samples or samples found between courtyard stones therefore generally have a very limited value.

Age assay on pig and human bones

In order to accurately calibrate radiocarbon samples on bones we need to know the percentage of marine diet consumed by the individual human or animal in question. A marine diet would produce an "older" date than expected because of the depleted ^{14}C values (the marine reservoir effect) contained in marine foods, which can be a source of ^{14}C for individuals higher in the food chain.

There are two ways of estimating the percentage of marine diet of an individual. First, from an analysis of archaeological excavated midden the general type of diet can be inferred and the percentages of terrestrial and marine meats can be estimated. However, this approach requires a range of optimal conditions to be met. The local conditions for preserving large bones and fish bone in the soil must be excellent. It requires careful and specific archaeological excavation and recovery procedures in order to ensure that data on all parts of the diet are retrieved. In particular this is not always the case for remains of small inshore fishes, and missing a large proportion of these bones would seriously affect the estimate of percentages of marine and terrestrial foods. This approach also calls for time-consuming analysis not conducted in many cases. Most archaeological locations in the Pacific cannot meet these demands. From the settlement on Mata'ire'a Hill, a study of shell middens was undertaken (Sinoto and Komori 1988:45-63). Although this study is an extensive analysis it is not quite clear whether these middens are evidence of long-term depositions or if they are the result of a single event that took place during the construction of house platforms in the area. If the latter situation is correct, then it is probable that these middens give imprecise information on "the Mata'ire'a Hill diet." A more general argument against this approach is that studies of kitchen middens do not say much about the diet of single individuals nor do they disclose information on the diet of animals, such as pigs. The second way of inferring the amount of marine diet of a radiocarbon bone sample is to analyse the contents of ^{13}C in the sample itself. A standard $d^{13}C$ value of wood and most plants are -21.0 %, but marine organisms have much lower $d^{13}C$ values and thus animals or people that have a high percentage of marine foods in their diet would have a depleted $d^{13}C$ value. The first comprehensive study to demonstrate the relationship between low ^{13}C value in bone samples and the amount of marine foods in the diet of the individual from which this bone came was Henrik Tauber's analysis of forty-two samples of prehistoric human bones from BC 5500 to AD 1750 from Denmark and Greenland (Tauber 1983:368-369, Figure 363). Tauber, through analysis undertaken at the Copenhagen Radiocarbon Laboratory, found that samples of bone from two Eskimo living at Angmagssalik in East Greenland before contact with Europeans had a similar ^{13}C to that of marine animals, which conformed with their almost exclusively marine diet (Tauber 1983:370). However, there is another factor contributing to enriched levels of $d^{13}C$ besides a high intake of marine food. Plants that use the Hatch-Slack (or C4) photosynthesis, such as maize, sugar cane, and millet, will show similar levels of $d^{13}C$ as marine animals. Consequently, measurements of $d^{13}C$ levels cannot be used independently to estimate percentage of marine diet.

Another isotope measured on bone that might reflect the diet of the individual in question is the $d^{15}N$. A $d^{15}N$ value between +6 to +12 % would indicate a terrestrial diet, while a value between +17 to +20 % would indicate a marine diet. However, nitrogen fixation in coral reefs could possibly produce $d^{15}N$ values in marine samples as low as terrestrial values (Petchey 2004). So, neither $d^{13}C$ nor $d^{15}N$ values of a bone sample that has been radiocarbon dated can give precise information on the diet of the animal or person whose bone has been dated. The $d^{13}C$ and $d^{15}N$ values are the only isotope measurements that have been done on the samples presented below.

Consequently, radiocarbon samples of bones from Huahine are calibrated with the best estimate of the percentage of marine diet we have using the two measured variables. Most times we choose to calibrate these samples with less than estimated marine diet due to the possible errors from only using $d^{13}C$ and $d^{15}N$ values.

Dating marae at the chiefly centre of Maeva, Huahine Nui

Maeva is a chiefly center (Figure 4) on the northeast corner of Huahine Nui, surrounding the sacred mountain Moua Tapu.

Figure 4. The chiefly centre of Maeva as seen from the summit of Moua Tapu, with *marae* structures and a *fare-pote* along the lagoon shore.

Local traditions claim that, in this area, representatives of every important political grouping or district on the island owned tracts of land and had their own *marae*. In Maeva, national councils were held and the all important *pa'i atua* ceremonies took place on either *marae* Mata'ire'a Rahi or on *marae* Manunu.

Structurally, it can be said that the settlement at Maeva (Cf. Figure 3 and 4) consists of three distinct components. First, there is the series of ten *marae* structures that are built along the shores of the lake Fauna Nui of which four recently have been restored. These small to medium sized *marae* represent the classic Leeward Island coastal *marae* type and made up the ritual and ceremonial centre of Huahine during the proto-historic period. The most important of these, *marae* Orohahaa, was located in the grounds of the local church and it has been utterly destroyed. According to information received by Tyerman and Bennet (1831:271), human sacrifices were hung in a giant tree that stood in the vicinity of this *marae*. All of these temples conform to the classic Leeward Island *marae* types consisting of a limestone slab *ahu* without an enclosing stone wall.

Along the inland side of the road that runs not more than twenty to thirty meters from the *marae* structures, large concave stone platforms with round-ended house curbs are found. Given the size and number of these platform houses and their location close to the temples across the road, they could be nothing else than chiefly dwelling platforms, and most likely contemporary with the nearby temples, and probably belong to the late proto-historic time in Huahine. The settlement on the slopes and top of Mata'ire'a Hill makes up the second component of the chiefly centre of Maeva. Test-excavation of house foundations in the upper parts of Te Ana land division (Sinoto 1996) shows that in this part of Mata'ire'a Hill the settlement began between AD 1300 and 1400. In several cases, our own investigations of *marae* structures on this same land division, found evidence of habitation stratigraphically below the *marae* platforms. European trade goods found in at least one burial platform during the survey in the early 1980s (Sinoto and Komori 1988:59-60, fig. 18) in Te Ana indicates that these *marae* structures were in use up to contact period times.

The third element of the settlement at Maeva are the two *marae* structures with island-wide religious significance, namely *marae* Mata'ire'a Rahi and *marae* Manunu. These two temples were of paramount importance for the ritual cycle on Huahine, and without them, the new paramount chief had not been invested into office, nor could the life-giving *pa'i atua* ceremony be conducted. The former is at the summit of the hill and the second has its *ahu* pointing towards the open sea; between them they hold all ritual ceremonies necessary for growth, order, and a new year.

A detailed settlement history for Mata'ire'a Hill has not been proposed on a macro level. Sinoto, based on the survey data, test excavations in Te Ana, and, in particular, changes in *marae* architecture, has suggested that the main settlement of the hill, inland from *marae* Tefano, *marae* Mata'ire'a Rahi, and *marae* Tamata Uporu were not in use during the proto-historic period. They had been abandoned in favor of the settlement down on the coastal flat closer to the *marae* structures along the edge of the lagoon. The main reason behind this proposed settlement chronology is that, according to Sinoto, the majority of coastal *marae* structures were rebuilt from a Leeward Inland Type 2 to the classic Coastal Type (Sinoto 1996:549-550; Sinoto 2002) by taking down the enclosing stone wall around the *marae* court. *Marae* structures seaward of *marae* Tefano, *marae* Mata'ire'a Rahi, and *marae* Temata Uporu, had been rebuilt in this fashion. Sinoto further argues that the importance of *marae* Mata'ire'a Rahi, which is known to have been in use up to 1817 (Tyerman and Bennet 1831:217) was the reason why this structure was not rebuilt like the other near-shore *marae* in Maeva. Evidence for such rebuilding can be observed at both *marae* Rauhuru and *marae* Avaroa (Sinoto 2002:255-256) and possibly a third site (Sinoto 1996:549). During our

Figure 5. Picture of the southeast corner of *marae* Mata'ire'a Rahi (ScH-2-19). Formerly, the *ahu* was built of limestone slabs on end, but these have been broken off and hidden inside the attached stone wall.

resurvey and excavation of *marae* Mata'ire'a Rahi it became evident that this particular *marae* had once looked like a classic Leeward Coastal *marae* type with an *ahu* of coral or limestone slabs (Figure 5) and lacking an enclosing stone wall (Wallin, et al, 2004). Later, this national temple was rebuilt with an enclosing stone wall and an attached *ahu* of coral and basalt slabs. Sinoto's suggested typological development is, at this site, turned on its head. This is not to say that Sinoto's observation from *marae* Rauhuru and *marae* Avaroa is incorrect, but rather that his suggested settlement sequence for the Maeva area must be checked through targeted test-excavation and dating of individual domestic structures on various parts of the Mata'ire'a Hill. A general trend of abandonment of the domestic and ritual structures on top of Mata'ire'a Hill in favour of coastal settlements late in the protohistoric era would be expected.

The two national *marae* of Maeva

Huahine had three *marae* of the highest order, or *national marae*: *marae* Mata'ire'a Rahi, on top of the small hill behind Maeva Village, on Huahine Nui; *marae* Manunu-i-te-ra'i or Toerau-roa, on Motu Ovarei, also a part of the Maeva chiefly centre; and at the southernmost extremity of Huahine Iti, on Tiva Point, where *marae* Anini is located, which was the *national marae* of Huahine Iti. *Marae* Manunu is said to be the national temple of Huahine Nui and was dedicated to the god Tane, who was of paramount significance in Huahine and evidently closely associated with this island. Tane was also the god honoured on *marae* Mata'ire'a Rahi and here the god had his earthly home in a small house built on stilts on a terrace just north of the great *marae*. That the abode of Tane was on *marae* Mata'ire'a Rahi and not on *marae* Manunu might be interpreted to the effect that the latter was subordinated to the former in the religious hierarchy of Maeva. It is possible that there existed a third *marae* in this ritual hierarchy that encompassed these two great temples. George Bennet and Daniel Tyerman, in their description of the demise of the local pantheon at Maeva in 1817, describe a third *marae* at the site where the village church is located today. This was *marae* Orohahaa (Emory 1933:130). From the information given to them, presumably by Toumata, the man who used to

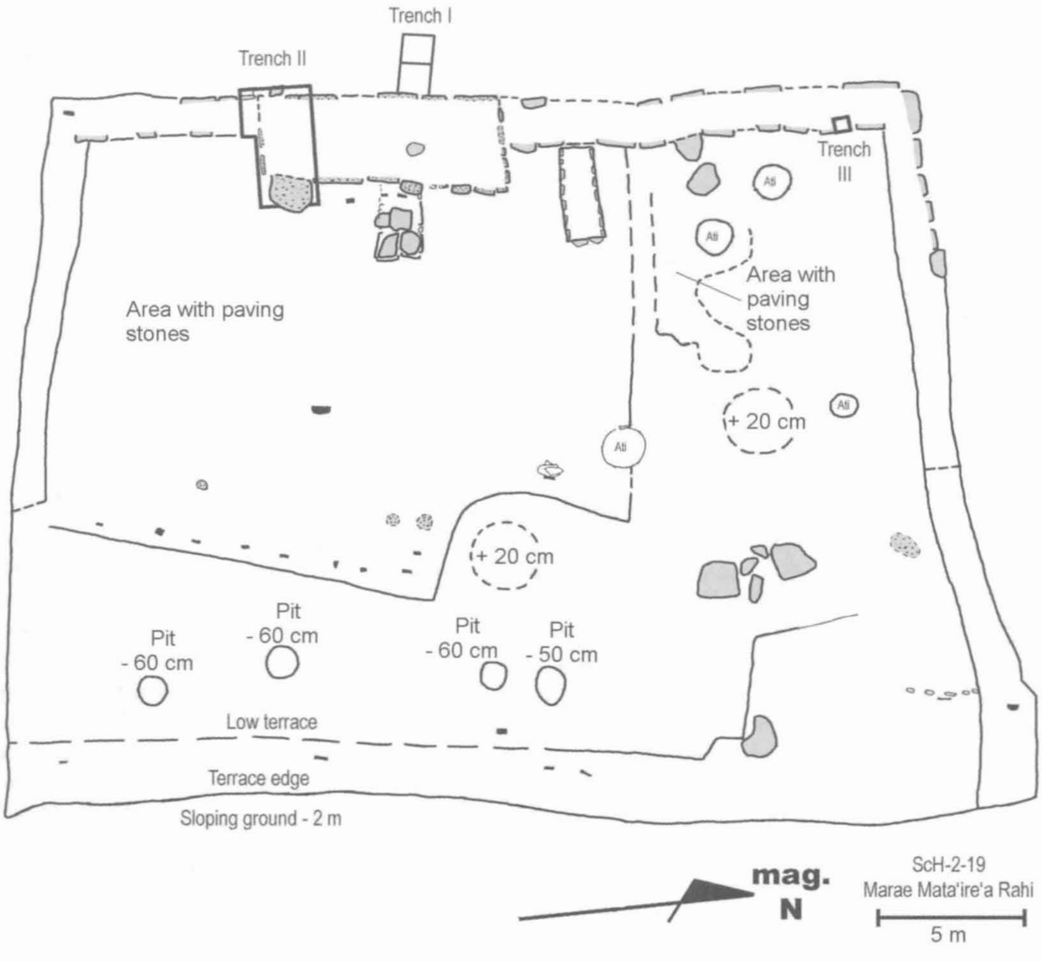

Figure 6. Plan of *marae* Mata'ire'a Rahi (ScH-2-19), the national temple of Huahine.

carry the image of the god Tane between *marae* Mata'ire'a Rahi and *marae* Manunu, the image of Tane was also taken to ceremonies at this *marae*. *Marae* Anini, on the other hand, was consecrated to the gods *'Oro* and Hiro, and some regard it as an off-shot of Taputapuatea on Raiatea (Handy 1930:98). Of these three important cult centres we have test-excavated two of them and radiocarbon dated a piece of coral taken from the fill of the third. The results of these investigations are detailed below.

Marae Mata'ire'a Rahi

Entering-of-the-Gods was what this *marae* was called. Its name today is *marae* Mata'ire'a Rahi, with its archaeological site number ScH-2-19. The *marae* is basically a large terrace situated on a slope and enclosed on the north, west and south sides with a low broad stonewall (Figure 6). The *ahu* is attached to the stone wall at the up slope end and was built mainly of stacked basalt stones. The front wall has some limestone slabs included.

Site ScH-2-19, *marae* Mata'ire'a Rahi, was the most important ceremonial ground on Huahine. This was the "national" temple on which each representative of the eight main lineages of the island had their own backrest. These chiefs descended from the legendary chiefess Hotuhiva who established the main chiefly dynasty. It was at this place that

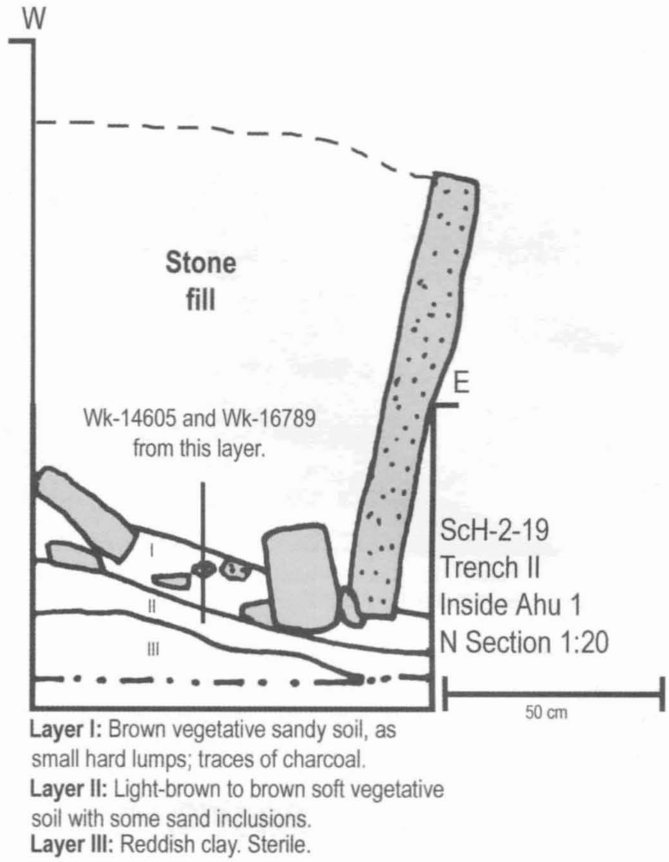

Figure 8. North section drawing of Trench II, Inside Ahu 1, *marae* Mata'ire'a Rahi.

the most important religious ceremonies where conducted.

Four samples from test-excavations inside the *ahu* of *marae* Mata'ire'a Rahi have been submitted for analysis, Wk-14604 (BP 387±38) on charcoal (Figure 7); Wk-14605 (BP 225±38) on pig bone (Figure 8); Wk-14606 (BP 301±38) on human bone; and Wk-16789 (BP 190±39) on pig bone (Wallin, et al. 2004; Wallin and Solsvik 2005).

Three samples, Wk-14604, Wk-14605 and Wk-16789, (the latter two are pig teeth/bone) were found in deposits stratigraphically below the fill of the *ahu* and therefore most probably predate the construction of the *marae* (Wallin, et al. 2004:99-107; Wallin and Solsvik 2005). There is a possibility that the two samples on pig teeth/bone are intrusive from a later rebuilding of the structure, although nothing pointed towards such an interpretation during excavation. Under the fill of basalt stones, in the original ground surface soil, a circular-shaped lens of scattered charcoal (Wk-14604) was found between 5 and 10 cm thick. No red-burned soil was seen, but the charcoal must have been burned or deposited at the site before or in connection with the initial construction phase of the *marae*. Calibrated at 2 sigma it yields a result of AD 1460-1630. The same layer as the charcoal lens also produced pig bones and two pig jaws (Wk-14605 and Wk-16789); these have been dated. Wk-14605 has $\delta^{13}C$ and $\delta^{15}N$ values that indicate an almost exclusively terrestrial diet and it is calibrated with 0% marine diet. Wk-16789 has $\delta^{13}C$ and

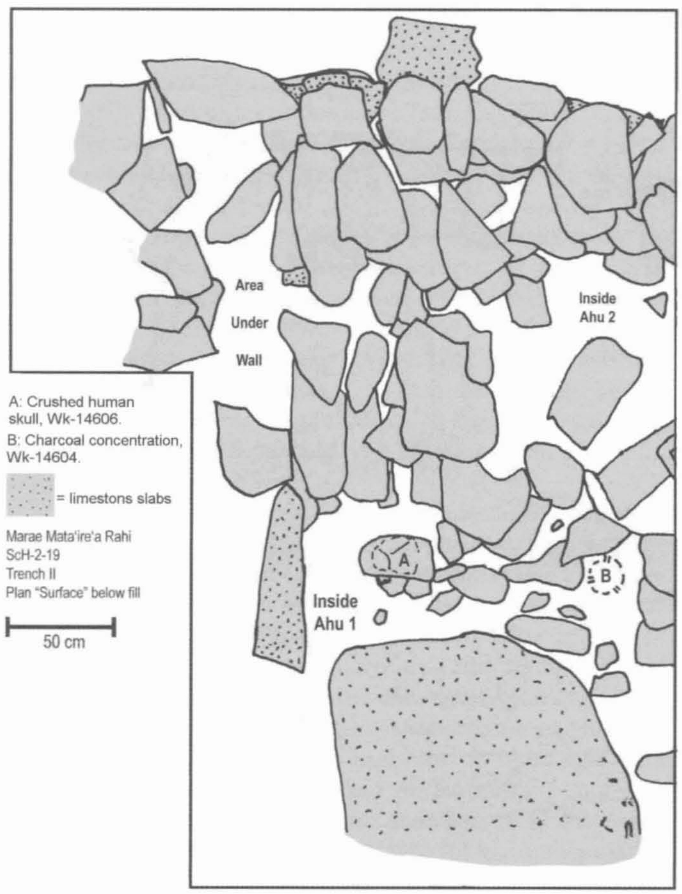

Figure 7. Plan of Trench II, *marae* Mata'ire'a Rahi, Surface under fill of *ahu* and under attached stone wall with provenance for samples Wk-14604 and Wk-14606.

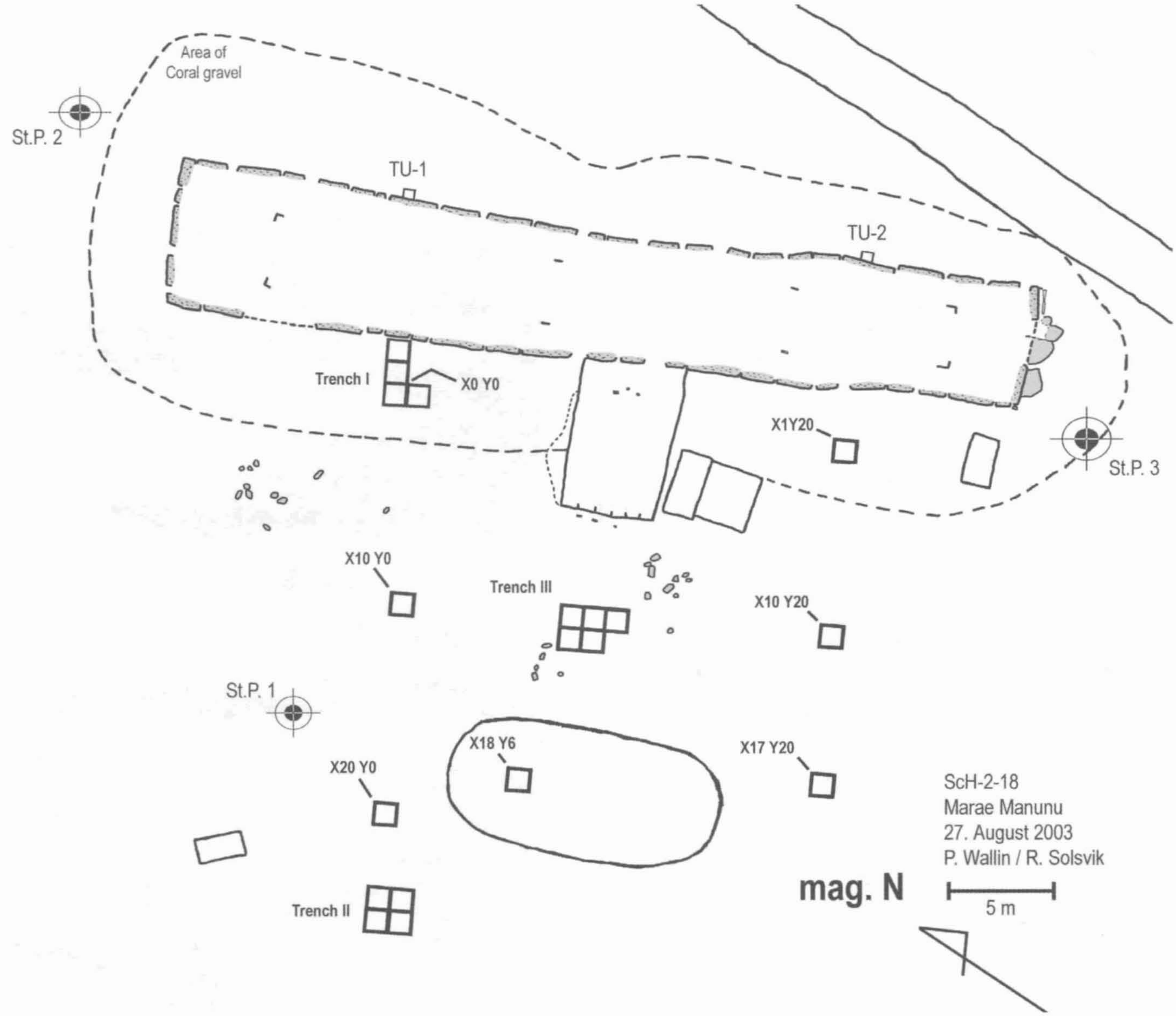

Figure 9. Plan of ScH-2-18, *Marae* Manunu, Huahine, Society Islands, showing the location of trenches I - III and all test pits and test units.

δ^{15}N values suggesting a 15% marine diet. Both samples suggest a date in the latter part of the 17th century. Even calibrated with zero marine carbon, these most likely date to the early 18th century, and do not overlap with Wk-14604. The fourth and last sample, Wk-14606, was a piece of human skull found smashed under a stone at the bottom of the *ahu* fill, just inside of the southeast corner of the *ahu* (Wallin, et al. 2004:99 and 103, Plan "Surface" below fill; Cf. Figure 107). The skull was missing both its lower jawbone and upper teeth. Based on ethno-historic information that human sacrifices were supposed to be buried under the cornerstone of national *marae* (Henry 1928:132), we make the interpretation that this skull stems from a human sacrifice offered in connection with a re-building of the *marae*. Evidence for at least one phase of rebuilding at the site was apparent in the construction of the *ahu* where limestone slabs at the rear-wall had been broken off at ground level before the *ahu* had been rebuilt, using basalt boulders (Wallin, et al. 2004:95-111; Wallin and Solsvik 2005). This incident might be linked to the changing of the chiefly dynasties at Maeva (Henry 1928:100-101), which was instigated after a ritual taking place on this *marae*. Calibrated at 2 sigma with an estimated 30% marine diet, since earlier investigations at Mata'ire'a Hill suggest a high consumption of marine shells (Sinoto and Komori 1988), this sample produced a date somewhere between AD 1670 and 1900. It is likely that the real date is at the most recent end of this time period. From these four dates we conclude that *marae* Mata'ire'a Rahi was constructed no earlier than AD 1500 to AD 1550 and a pre-historic reconstruction of the *marae* took place probably sometime during the 18th century. The charcoal in Wk-14604 was not sourced, however, but a second sample taken from the same charcoal

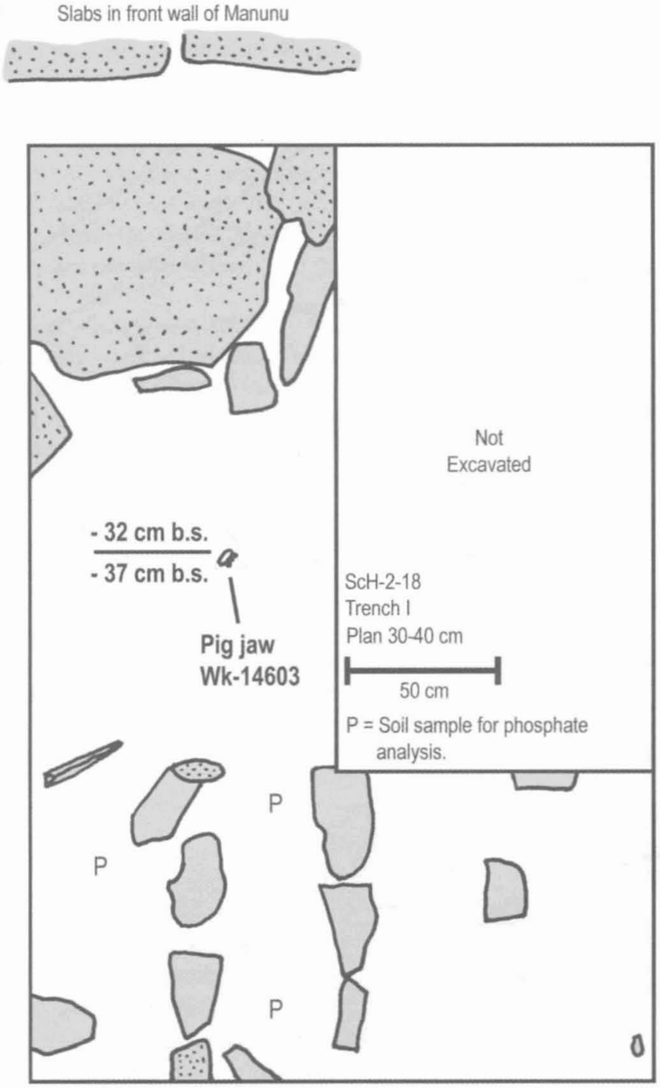

Figure 10. Plan drawing of Trench I, level 4, *marae* Manunu, with the location of sample Wk-14603.

concentration was sent to Dr. Coil at the Archaeological Research Facility at Berkeley for wood identification. The analysed fragments large enough for analysis consisted of 91% *Calophyllum inophyllum* and 9% *Casuarina equisetifolia* (Coil 2005:Table 1). Both these species are long-lived trees and suggest that Wk-14604 could have an inbuilt age and that the correct age for the construction of *marae* Mata'ire'a Rahi would be closer to the ages produced by samples Wk-14605 (BP 225±38) and Wk-16789 (BP 190±39) giving a possible date of the initial phase as late as c. AD 1600 to AD 1700.

Marae Manunu

Marae Manunu, a huge coral-slab *ahu marae* (Figure 9), located across the lagoon from Maeva Village, became the new ritual center of Maeva after *marae* Mata'ire'a Rahi, temporarily – at least – lost its importance. So far, two samples from this site have been analysed. The first age assay (Wk-14603) was done on a fragmentary pig jaw found at a depth of about ÷ 35 cm b.s (below surface) (Figure 10) on top of sterile beach sand stratigraphically below a standing slab of the *ahu* front wall (Figure 11) (Wallin, et al. 2004:76-83; Wallin and Solsvik 2005). The $\delta^{13}C$ and $\delta^{15}N$ values of this bone fragment indicate a relatively high consumption of marine foods and have been calibrated with a 25% marine diet.

Tucked under a slab of the *ahu* rear wall (Wallin, et al 2004:75; Wallin and Solsvik 2005), clearly tossed in just be-

Figure 11. Trench I, *marae* Manunu. In the foreground is seen layer V and on top of a buried limestone slab is seen layer III. The ahu slabs are set on top of this layer III.

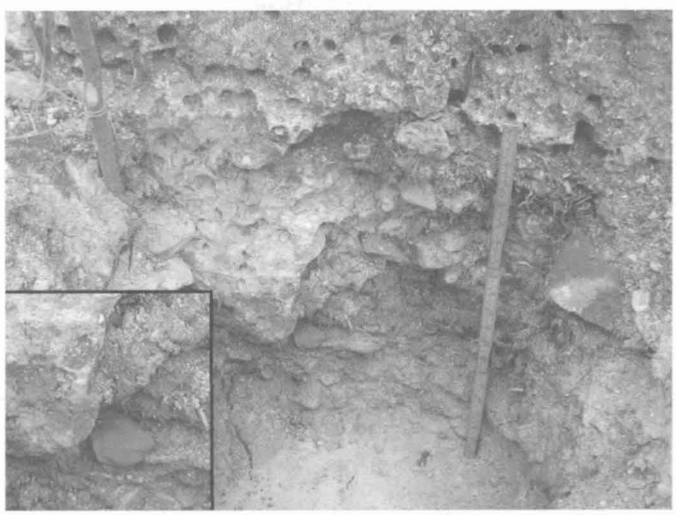

Figure 12. Location of pig bone fragment (Wk-16790) found under limestone slab in back wall of *ahu* at *marae* Manunu, TU-1.

fore the slab was erected, was a piece of pig skull (Figure 12), Wk-16790, age assayed at the Waikato Laboratory in New Zealand. This sample was calibrated with 30% marine diet. The most likely calibrated age span of Wk-14603 is AD 1650 to 1900. Sample Wk-16790 resulted in an even more recent calibrated date. What we can conclude from these two radiocarbon dates is that the construction of *marae* Manunu occurred sometime after AD 1650.

THE TE ANA COMPLEX

Te Ana is a land division stretching up from the coastal flat next to the road, just where the village of Maeva begins, coming in from the direction of Fare, and going up the west end of Mata'ire'a Hill. A small gully separates this piece of land from the main part of the hill. During the first survey in 1979, Y.H. Sinoto, Elaine Rogers-Jourdane, and Eric Komori discovered a small cluster of platforms, enclosures, terraces and house foundations with at least five *marae* structures. Te Ana was later divided up into three zones, with Zone 1 on the coastal flat next to the road and Zone 3 made up of the small cluster of structures situated on the upper part of the slope (Komori and Sinoto 2002:3, Figure 1). All references to Te Ana (Figure 13) in this paper refer to a cluster of structures defined archaeologically as Te Ana, Zone 3 (Cf. Figure 3). Five *marae* structures (ScH-2-62-1, ScH-2-62-3, ScH-2-65-1, ScH-2-65-2, and ScH-2-66-1) are located in this area, three medium sized and two small structures, and there may be parts of one ritual complex.

Marae ScH-2-62-1, with its single *ahu*, seems to be the central ritual space. This is the lowest *marae* of the three medium-sized structures and it is also the largest and most labor intensive of the three. *Marae* ScH-2-65-1 and ScH-2-66-1 seem to be twin structures. They have the same design; are constructed in similar fashion, and both have two *ahu* (Wallin, et al. 2004:52-53 and 58-59). What might be burial platforms are situated close to the down slope end of both *marae*. The only major difference is that *marae* ScH-2-65-1 has a small *marae* located at the down slope end (ScH-2-65-2), a feature lacking at ScH-2-66-1. A similar, small *marae* is located down-slope of *marae* ScH-2-62-1, but this, *marae* ScH-2-62-3, might not be directly related to the larger structure. During fieldwork in 2002 and 2003 all five *marae* structures in this area were test-excavated and in four of these cases we were able to estimate the first construction period.

Site ScH-2-62-1

Two samples (Wk-13174 and Wk-13175), both on charcoal, were analyzed from *marae* ScH-2-62-1, a medium-sized structure located on land Te Ana in the south-western part of Mata'ire'a Hill. Sample Wk-13174 consisted of scattered charcoal found under the southwest part of the *ahu*, probably originating from burning of the area sometime prior to the construction of the *marae* (Wallin, et al. 2004:34-39). The *ahu* itself was located on a terrace forming the upper southern part of the courtyard of *marae* ScH-2-62-1. Wk-13175 comes from an *umu* (Figure 14) found just downslope of the retaining wall of this terrace, that is, on the lower

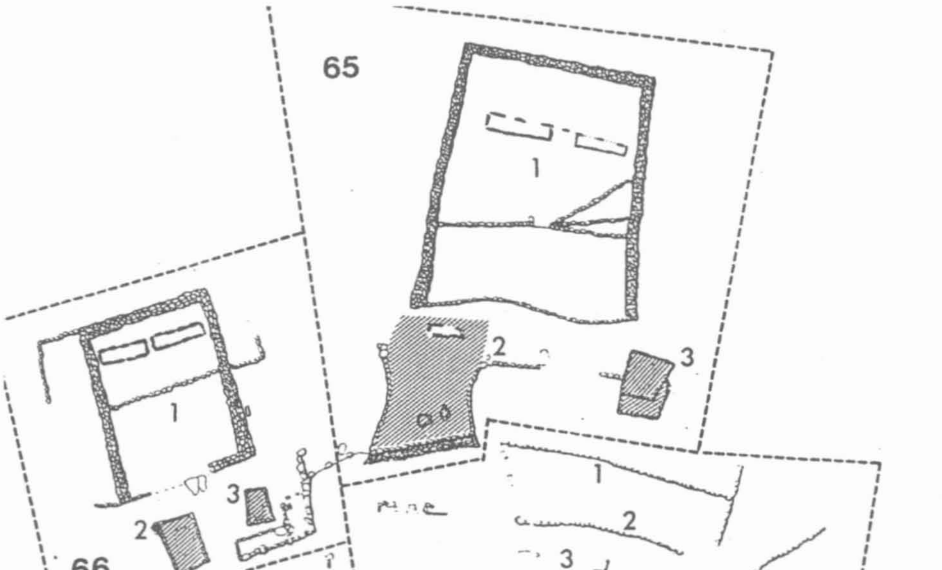

Figure 13. Segment of Zone 3 of the Te Ana site complex, showing the location of investigated *marae* structures (adopted from Sinoto 1996. Figure 2).

Table 2. List of ^{14}C dates from excavated *marae* structures on Huahine.

MARAE	LAB. NO.	AGE B.P.	$d^{13}C$	$d^{15}N$	AGE A.D. (2 sigma)	LIFE PHASE	MATERIAL
ScH-2-19	Wk-14604	387±38	-25.4±0.2		1459-1629	Pre-construction	Non sourced charcoal
ScH-2-19	Wk-14605	225±38	-20.9±0.2	6.99	1677-1953	Pre-construction	Pig tooth/bone
ScH-2-19	Wk-14606	301±38	-17.1±0.2	10.11	1669-1894, 1918-1951	Use (re-dedication)	Human bone
ScH-2-19	Wk-16789	190±39	-19.5±0.2	9.86	1678-1738, 1798-1954	Pre-construction	Pig tooth/bone
ScH-2-18	Wk-14603	306±42	-18.8±0.2	9.5	1649-1891, 1923-1951	Pre-construction	Pig tooth/bone
ScH-2-18	Wk-16790	296±34	-17.3±0.2	10.63	1672-1894, 1919-1951	Pre-construction	Pig bone
ScH-2-62-1	Wk-13174	439±60	-25.1±0.2		1426-1830	Pre-construction	Non sourced charcoal
ScH-2-62-1	Wk-13175	409±39	-25.1±0.2		1450-1626	Pre-construction	Non sourced charcoal
ScH-2-65-1	Wk-13177	372±44	-18.5±0.2		1507-1807	Use	Pig tooth/bone
ScH-2-66-1	Wk-13178	552±100	-25.0±0.2		1284-1625	Pre-construction	Non sourced charcoal
ScH-2-66-1	Wk-17066	116.7±0.5 % M	-25.8±0.2			Use	Sourced charcoal
ScH-2-65-2	Beta-177606	170±40	-27.1		1671-1952	After abandonment	Non sourced charcoal
Haupoto	Wk-17064	387±34	-25.7±0.2		1460-1627	Pre-construction	Sourced charcoal
Haupoto	Wk-17065	406±32	-24.9±0.2		1452-1626	Pre-construction	Sourced charcoal
Haupoto	Wk-16471	636±38	0.0±0.2		1589-1842	Use (from fill of ahu)	Coral
Tuituirorohiti	Wk-17062	441±31	-26.6±0.2		1436-1510, 1554-55, 1575-1621	Pre-construction	Sourced charcoal
Tuituirorohiti	Wk-17063	438±32	-25.5 ±0.2		1437-1511, 1549-1622	Pre-construction	Sourced charcoal
Tahuea	Wk-16470	2429±36	-0.7±0.2		192 BC – AD 42	Use (from fill of ahu)	Coral
ScH-2-62-3	Beta-177605	480±60	-27.1		1398-1517, 1538-1625	Pre-construction	Non sourced charcoal
ScH-2-62-3	Wk-13176	244±38	-25.2±0.2		1628-1810, 1837-1879, 1924-1951	Pre-construction	Non sourced charcoal
Anini	Wk-16786	639±35	1.3±0.2		1591-1830	Use (from fill of ahu)	Coral
Ohiti Mataroa	Wk-16787	637±34	0.0±0.2		1596-1833	Use (from fill of ahu)	Coral
Water Tanks	Wk-16788	536±35	-1.0±0.2		1711-1951	Use (from fill of ahu)	Coral

courtyard. The *umu* was sealed by a layer upon which the *ahu* terrace was constructed, and, consequently was fired prior to construction of the *marae* (Wallin, et al. 2004:39-41). Both the sample from this *umu*, Wk-13175, and Wk-13174 date to ca. AD 1425 to AD 1630 calibrated at 2 sigma. The most likely intercept for these dates is in the latter part of the 15th century and the *marae* was constructed some time after these events or ca. AD 1500 to 1550.

Neither the charcoal from Wk-13174 (BP 439±60) nor from Wk-13175 (BP 409±39) were analysed to wood species before being sent for age determinations. However, a sample of scattered charcoal from the same stratigraphic layer (but another unit) was sent to James Coil at the Archaeological Research Facility at Berkeley for analysis. This sample consisted of 13% *Artocarpus* sp., 10% *Barringtonia asiatica*, 12% *Casuarina equisetifolia*, 6% Cocos wood, 5% *Hibiscus tiliaceus*, 6% *Morinda citrifolia*, 38% Pandanus, and 2% Unknown (Coil 2005:Table 1). It clearly demonstrates that this scattered charcoal contained a range of various tree species, and thus supports the theory that the scattered charcoal stems from a burn-off of the area prior to construction at the site. Similarly, a second sample from the *umu* found in trench II was sent to Dr. Coil for wood identification. This sample consisted of 29% *Artocarpus* sp., 12% *Cordia subcordata*, 9% Pandanus wood, 44% Pandanus key, and 3% *Thespesia populnea* (Coil 2005:Table 1).

Table 3. Correlation between excavated sites, marae types, and time.

MARAE	TYPE	SIZE	AHU	TIME FRAME (c.)
ScH-2-19 I	4.1	Small	Coral-slab	AD 1600
ScH-2-19 II	3.2	Medium	Coral-slab/Stacked basalt	AD 1700
ScH-2-18	4.2	Large	Coral-slab	AD 1650
Anini	4.2	Large	Coral-slab	AD 1650
Ohiti Mataroa	4.2	Large	Coral-slab ahu	AD 1650
Water Tanks	4.1	Medium	Coral-slab	AD 1700
ScH-2-62-1	4.1	Medium	Coral-slab/Stacked basalt	AD 1500
ScH-2-65-1	4.1	Medium	Coral-slab/Stacked basalt	AD 1500
ScH-2-66-1	4.1	Medium	Coral-slab/Basalt	AD 1500
Tuituirorohiti	4.1	Medium	Basalt slab	AD 1500
Haupoto	4.1	Medium	Coral slab/Stacked basalt	AD 1500 / AD 1600
ScH-2-62-3	4.1	Small	Basalt slab	AD 1750
ScH-2-65-2	4.1	Small	Basalt slab	None

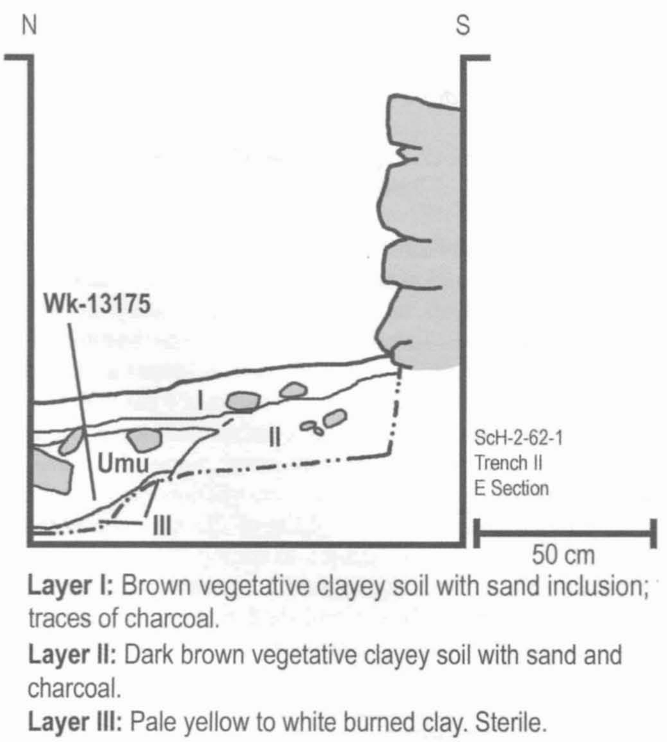

Figure 14. East section of Trench II, marae ScH-2-62-1, showing the location of Wk-13175.

Both samples, therefore, might have a medium risk of some inbuilt age, but since the data does not seem to be univocal, the calibrated age ranges are excepted until new dates can be analyzed on charcoal from only short-lived trees.

Site ScH-2-65-1

From *marae* ScH-2-65-1, located a short distance uphill from ScH-2-62-1 on the Mata'ire'a Hill, only one sample (Wk-13177) has so far been sent for radiocarbon dating. A pig tooth recovered from -10 to -20 cm b.s. inside the *ahu* probably stems from ritual activity which took place sometime during the period the *marae* was in use (Wallin, et al. 2004:53-56). Calibration, with a 25% marine diet based upon $\delta^{13}C$ and $\delta^{15}N$ values, of this age assay only suggests that the *marae* was in use sometime between AD 1500 and AD 1900. This suggests to us that it was constructed in the 16th century.

Site ScH-2-66-1

Two charcoal samples were sent for radiocarbon analysis to the Waikato Radiocarbon Laboratory from *marae* ScH-2-66-1. The first sample, Wk-13178 (Figure 15), is a scatter of charcoal found between - 40 to - 50 cm b.s. inside the *ahu* in a layer stratigraphically below the slabs in the *ahu* (Wallin, et al. 2004:59-61). It dates activity prior to the construction of the *marae*. A second charcoal sample from a trench in the lower part of the courtyard was also submitted for radiocarbon dating, but it turned out to be 116.7±0.5 % modern.

Sample Wk-13178 is calibrated, at 2 sigma, to ca. AD 1280-1630 which gives a rather broad range. However, *marae* ScH-2-66-1 is similar in style and size to ScH-2-65-1 and also ScH-2-62-1 and it was probably constructed at roughly the same time. We therefore argue that this *marae* was constructed sometime after AD 1500. Burials are found in relation to both *marae* ScH-2-65-1 and ScH-2-66-1, one with European trade goods (Sinoto and Komori 1988:59-60, Figure 18), which indicates that they were in use in the late 18th century.

Site ScH-2-62-3

ScH-2-62-3 is a small platform *marae* built of stacked basalt with a basalt slab *ahu*. Three test-units were excavated next to the north, east, and west sides of this platform. Two samples, B-177605 from a shell midden and Wk-13176 (Figure 16) from a layer of shells and charcoal, associated with partly buried house platforms under the north end and west side, respectively, of the *marae* platform were analyzed (Solsvik 2003; Wallin, et al. 2004:45-51). The *marae* must have been constructed after the most recent of these dates. Sample Wk-13176 has a likely spread in the 17th century, and we suggest that this *marae* was built close to the end of the 17th century or sometime during the early 18th century. However, a second sample from the same layer in trench III as Wk-13176 (BP 244±38) was collected and sent to James Coil at the Archaeological Research Facility at Berkeley for identification. This sample consisted of 48% *Artocarpus* sp., 17% *Casuarina equisetifolia*, 11% *Ficus* sp., and 24% unknown tree species (Coil 2005:Table 1). The *Artocarpus* sp. is a long-lived trees species while the *Casuarina equisetifolia* could be a medium-lived tree, and there is a risk that this sample has a certain inbuilt age.

Figure 16. East section of Trench III, marae ScH-2-62-3, showing a layer of shells and charcoal from which sample Wk-13176 was collected.

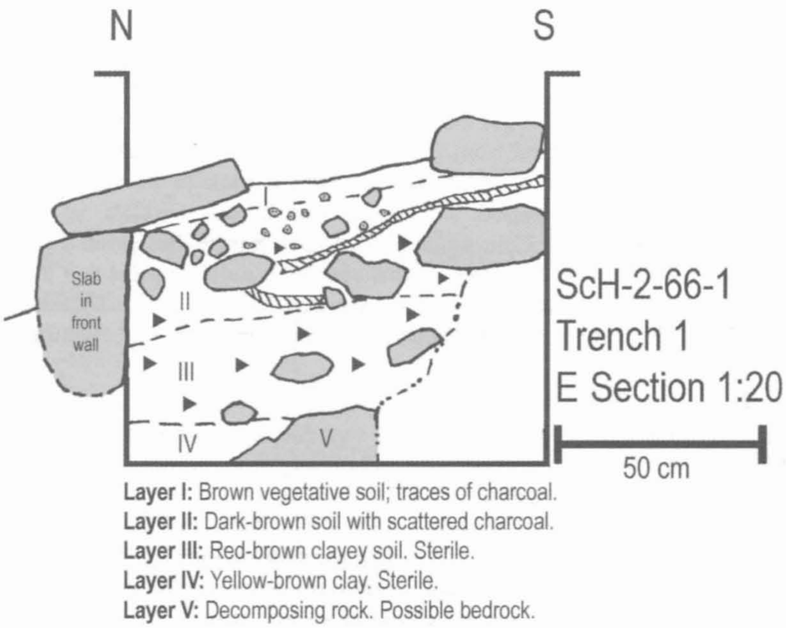

Figure 15. East section drawing of Trench I, marae ScH-2-66-1. Wk-13178 was collected from the lower part of layer III.

Site ScH-2-65-2

Only one sample, Beta-177606, was analysed from *marae* ScH-2-62-2, located just down slope of ScH-2-65-1. Some pieces of charcoal were found within a layer of fine soil on top of the fill of the *ahu* and could date the abandonment of this *marae* (Solsvik 2003). However, the span of the date is quite wide and we can only say that the abandonment of the site took place sometime before the historic era.

Dating marae outside the Maeva area

Excavations

Following the first three field seasons in 2002 and 2003, bone and charcoal samples were sent for radiocarbon analysis at the Waikato Laboratory in New Zealand. We already suspected *marae* Manunu to have been constructed fairly late in Huahine prehistory, but from both *marae* Mata'ire'a Rahi and from the complex on land Te Ana did we hold the possibility open for earlier dates, however, none of the dates seemed to indicate *marae* construction prior to AD 1500. *Marae* Mata'ire'a Rahi, as the national temple of the island, was claimed to be the oldest *marae* in the area, and testing in the Te Ana area showed that this settlement was established perhaps as early as around AD 1300 (Sinoto 1996; Sinoto and Komori 1988:80). These results forced us to rethink our strategy and initially question the age of the Maeva as a chiefly and ritual centre. The possibility that earlier *marae* structures existed outside the core Maeva area would have to be examined. Three sites were eventu-

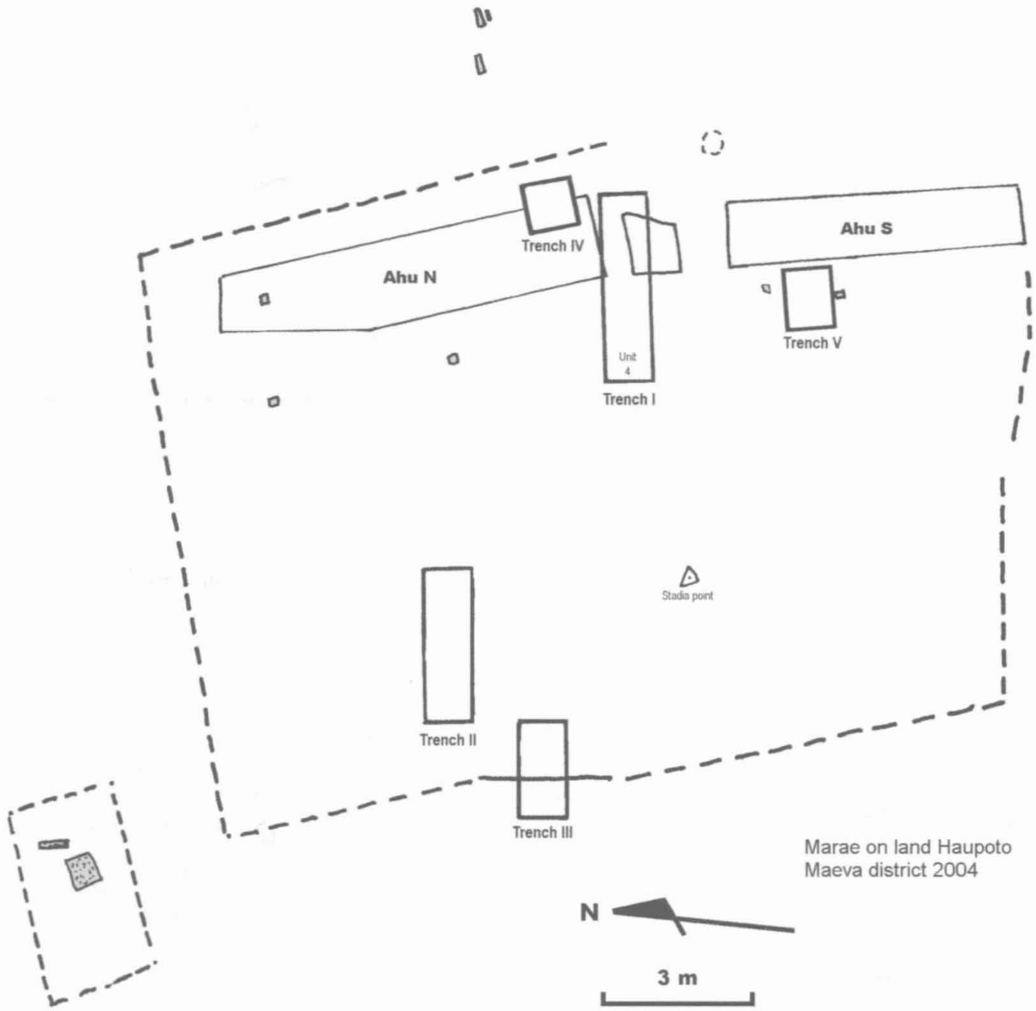

Figure 17. Plan drawing of *marae* on land Haupoto showing the location of test units.

ally investigated, one along the coast in the southern part of the Maeva district and two in the district of Fare, but only one of these latter structures could be dated.

Marae on land Haupoto

A *marae* complex with two *ahu* enclosures built exclusively of coral/limestone slabs located on land Haupoto a few kilometres south of Maeva Village on the east coast of Huahine Nui (Cf. Figure 2).

During test excavations at this site, a layer of scattered charcoal originating from a burn-off of the area some time prior to construction of this *marae* was found in trenches I, III, and V (Figure 17). The coral/limestone slabs of the *ava'a* were clearly set into this layer. Two samples of this charcoal from Trench I, units 3 and 4, - 20 and -35 cm b.s. respectively (Figure 18), were sent to James Coil at the Research Laboratory at Berkeley University for wood species identification. From the first sample, a few pieces of *Morinda citrifolia* (Wk-17064) and from the second sample (Wk-17065) fragments of coconut husks were chosen and both were ASM dated. Both samples produced dates calibrated to ca. AD 1450-1630, indicating that this *marae* was built around or sometime after AD 1500. To further nail down when this *marae* was built a piece of coral from the fill of the southern *ahu* was sent for radiocarbon analysis. This sample, Wk-16471, calibrates at 2 sigma to AD 1589-1842, suggesting that the *marae*, or parts of it, might have been constructed as late as in the last part of the 17th century.

Marae on land Tuituirorohiti

Located on the Tuituirorohiti land division in the district of Fare, a medium to small-sized platform *marae* with an *ahu* was constructed of basalt slabs (Figure 19). During test-

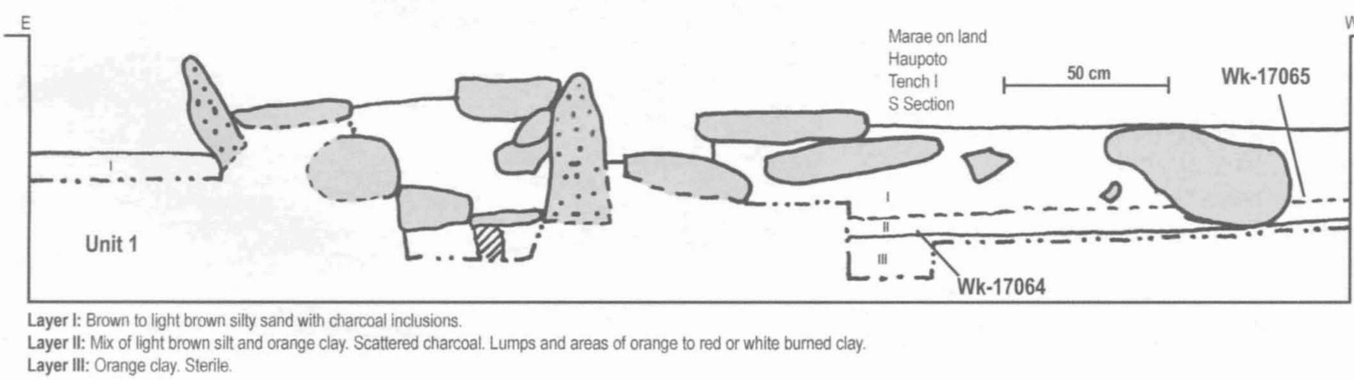

Figure 18. South section drawing of Trench I at marae on land Haupoto, showing the locations of samples Wk-17064 and Wk-17065.

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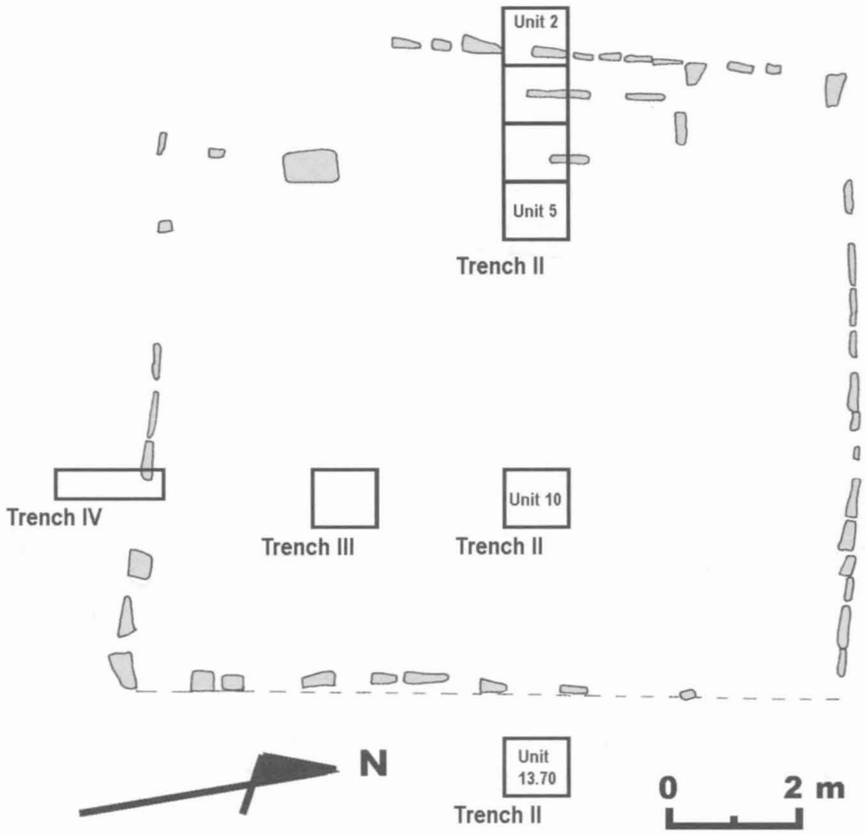

Figure 19. Plan of *marae* on land Tuituirorohiti. (drawing courtesy of Mark Eddows 2004).

excavation, a large *umu* was discovered in the middle and underneath the courtyard in Trench III. In other words, this earth oven must have been used prior to construction of the *marae*. Two samples of charcoal from this earth-oven (Figure 20) were collected at between - 35 to - 40 cm b.s.; pieces identified as *Hibiscus tiliaceus*, by James Coil at the Research Laboratory at Berkeley University, were AMS dated. Both samples, Wk-17062 and Wk-17063, calibrate at 2 sigma to ca. AD 1435-1625.

The most likely time span of these dates, however, is the last part of the 15th century and they therefore suggest a time of construction around or just after AD 1500. A third radiocarbon date exits from this *marae*. A piece of coral from the *ahu* was analyzed, Wk-16470, and produced a date of 2429±36 B.P., a date that is clearly erroneous. At the time of excavation it was observed that the natural deposits under the *ahu* was made up of sand and large coral lumps, a former beach flat. One piece of coral from the surface of the *ahu* fill and one from the very bottom was secured for future dating purposes, and a bottom piece was sent for dating. It is more than likely that the coral picked from the bottom of the *ahu* fill originated in beach deposits and that the date actually defines the formation of this beach flat. Four other radiocarbon dates from various *marae* structures around the island have all given credible dates, and Wk-16470 must therefore be disregarded.

Dating coral from the ahu fill of marae structures

The classic *marae* of the Leeward Islands with its limestone slab *ahu* and no defined courtyard is usually located on prominent places along the coast and is frequently vast in size. None of these complexes have been archaeologically excavated, although several have been restored, aside from *marae* Manunu at Maeva. The fact that the fill of these *ahu* enclosures consists of predominantly coral filling and that coral can be dated both through the radiocarbon and the UTh series measurements made us speculate whether coral samples from the fill of the *ahu* would date the construction of the *marae* or not. Recently, Kirch and Sharp (2005) dated coral deposited as offerings on Hawaiian *heiau* complexes and the results fell within expected time frame for the construction or early use of these sites. The key question here is where the builders collected the coral fill. If they collected live coral from the sea, then such coral would very likely date to the time of construction. However, if the fill consists of old coral found on beaches or cast upon the coast by storms, then it would be a much greater risk that the coral fill had an inbuilt age.

We chose to date pieces of coral from five different *marae* structures, including the *marae* on land Haupoto and the *marae* on land Tuituirorohiti, as a test of whether the fill

Figure 20. Picture of east section of Trench III at marae on land Tuituirorohiti, showing the umu discovered below the courtyard.

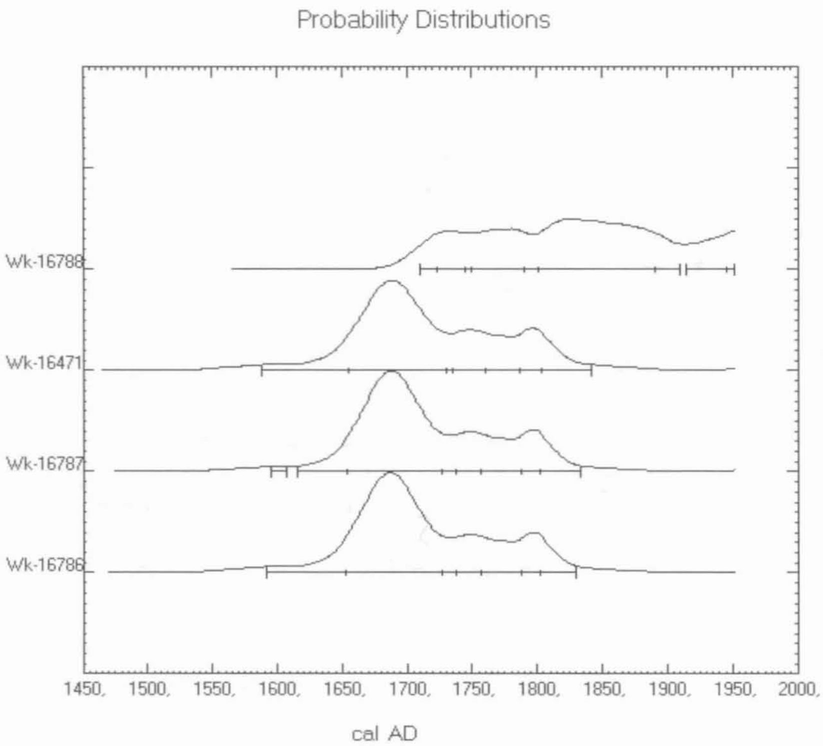

Figure 21. Calibrated age ranges of four 14C dates on pieces of coral collected from the fill of various *ahu* structures around Huahine.

of classic Leeward Islands *marae* might reflect the time of construction of the structures. Our method of choice was ^{14}C analysis because of its availability, although it might be argued that UTh series analysis can return more accurate dates on coral. Recently, UTh series analyses on coral from *heiau* structures in the islands of Hawai'i have claimed an accuracy of less than a decade for the construction of these temples (Kirch and Sharp 2005). The technical accuracy of conventional radiocarbon dates are in these instances between thirty and forty years, however, due to the need for calibrating ^{14}C dates on marine organism for local variations of the marine reservoir effect (Stuiver, et al. 1998) means that the accuracy in reality is far less. Adding to this is the fact that there exist very few individual measurements correcting for local variations of the marine reservoir effect in the Pacific. For the Society Islands only one correction, from Mo'orea, exists, and since large local variations have been demonstrated for other islands (Dye 1994), we therefore chose to calibrate all marine ^{14}C dates with the Southern Pacific Regional average (Delta R 33.0±21.0) taken from the Marine Reservoir Database (http://calib.qub.ac.uk/marine/) (Reimer and Rei-mer 2001).

With this in mind, five samples of coral of different sizes were collected from the *ahu* fill of five *marae* structures around the island of Huahine and sent to Waikato Laboratory for radiocarbon analysis. One sample each from the two test-excavated *marae* on land Haupoto and on land Turirutur were chosen in order to compare the radiocarbon dates on coral with those derived from charcoal. In addition, one sample was selected from the most important structure on Huahine Iti, *marae* Anini; one from the very large coral slab *ahu marae* Ohiti Mataroa, also located on Huahine Iti; and one sample from a small and almost totally destroyed *marae* on the north-eastern corner of the Mata'ire'a Hill, in Maeva. Except for sample Wk-16470 from the *marae* on land Tuituirorohiti, which must be deemed erroneous because it is too old, all other dates fall within expected ranges (Figure 21).

Marae Anini is located at Tiva Point, the southeastern extremity of Huahine Iti in the district of Parea, and it is said to be the national temple of this part of Huahine. The *ahu* was built with huge coral/limestone slabs in two stages. Both in size, physical manifestation, and in the way the ritual space is organized, it seems like a twin of *marae* Manunu of Huahine Nui. Were they both built at the same time as the ritual expression of the new ruling dynasty? One small piece of coral from the fill of the *ahu* was sent to be radiocarbon dated at Waikato and the date, Wk-16786, calibrated at 2 sigma to AD 1591-1830, with the most likelihood of the real date being in the latter part of the 17^{th} century or early 18^{th} century.

Marae Ohiti Mataroa is another huge limestone slab *ahu* over thirty meters long and with three meter-high slabs in the *ahu* wall. It is located in the neighboring district of Parea, Tefarerii on Huahine Iti. Although situated geographically close to *marae* Anini, Ohiti Mataroa did not share Anini's social significance. Today, this structure is in total ruin with all of the *ahu* walls having fallen down and the fill lying in a gigantic heap at the water's edge. A coral piece was radiocarbon dated to AD 1596-1833 calibrated at 2 sigma. The real date is probably sometime in the latter part of the 17^{th} century or early in the 18^{th} century.

At the far northeastern corner of Mata'ire'a Hill are the remnants of a medium-sized *marae* that must have had a coral-slab *ahu;* today it is located by the village water tanks. This structure was not surveyed. A piece of coral from the fill of the *ahu* was sent for analysis (Wk-16788) and it produced a 2 sigma calibrated date of AD 1711-1951, suggesting that this *marae* was constructed in the 18^{th} century.

Development of marae on Huahine

So far these investigations have produced twenty-three ^{14}C dates, twelve of which are presented for the first time below, from nine *marae* structures surrounding the Maeva village on Huahine, one in the district of Fare, and two *marae* structures on Huahine Iti.

Four of them were carried out on pig or human bones and the remaining on charcoal. As stated above, all dates have been calibrated using CALIB (Version 5.0.1) with the SHCal04 calibration data set (Stuiver, et al. 1998). The Southern Pacific regional average (Delta R 33.0±21.0) taken from the Marine Reservoir Database has been used in all

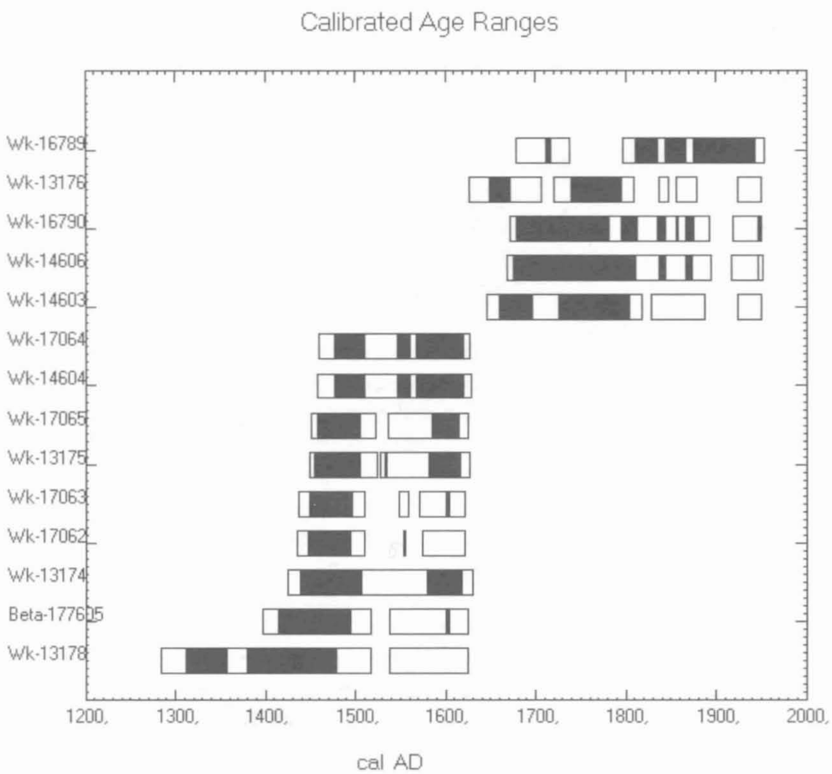

Figure 22. Calibration box plot of all pre-construction 14C dates from marae structures on Huahine, except for the three samples from *marae* Mata'ire'a Rahi which can be associated with a rebuilding of this structure.

calibration involving the Marine 2004 calibration data set. Bone dates, which are influenced by a partly marine diet, have been calibrated with a mix of Marine and Southern hemisphere calibration data set. Percentages of marine diet are a best estimate based upon $\delta^{13}C$ % and $\delta^{15}N$ % values measured on bone collagen.

Marae structures in Society and nearby island groups are simple dry-masonry architecture and the text excavations from which these samples are derived cover a small percentage of the total area of the structures. Consequently, we aimed to date the earliest building phase at each site. Frequently we found earth ovens; scattered charcoal from burn-off; middens; or charcoal bones in a stratigraphic context below the *ahu* or courtyard of the investigated *marae* structures. Admittedly, this does not provide a precise date for the construction of the *marae*, but it does present a *terminus post quem* date for the construction.

Most of the cultural remains encountered in our excavations were human and animal bones that once had been deposited as sacrifices to the gods during rituals. These samples date the period of use at the site, which began when the *marae* was initiated and continued until the site was abandoned either because a new *marae* was built or because the population converted to Christianity. In Maeva, as well as for Huahine in general, this happened in the year 1817, when the images of Tane were burned and many of the old temples destroyed. Sacrificial remains were generally found only on the larger *marae* complexes, of the inferred *mata'eina* and national classes.

A box plot of the calibrated age ranges for samples from pre-construction phases, and in the case of *marae* Mata'ire'a Rahi (ScH-2-19) from a rebuilding of the structure, clearly shows that the first transformation period – when *marae* structures were first built on Huahine – began between AD 1450 and 1500 (Figure 22) or just after this period. On closer inspection all these dates are associated with medium-sized *marae* structures, which probably represent family or lineage *marae* classes. Most, if not all, of these structures are of Wallin's type 4.1 (*marae* with *ahu* as an enclosure with a stone filling lower than 1.5 m) (Wallin 1993:66; Wallin 2000b). Smaller, more specialized-function structures of Wallin's type 4.1 and larger *marae* structures of Wallin's type 4.2 (with *ahu* as an enclosure higher than 1.5 m) seem to have been built between AD 1650 and 1750. These latter structures must be associated with the development of a more complex social stratification on the island or inter-islands level. Small *marae* structures of more specified functions were probably associated with a differentiation of specialists in the society, or a rise in status for certain groups of *tahua*. They were furthermore built at the same time as larger, more explicit political *marae* structures. This may

Figure 23. Marae Taputapuatea at Opoa, Raiatea.

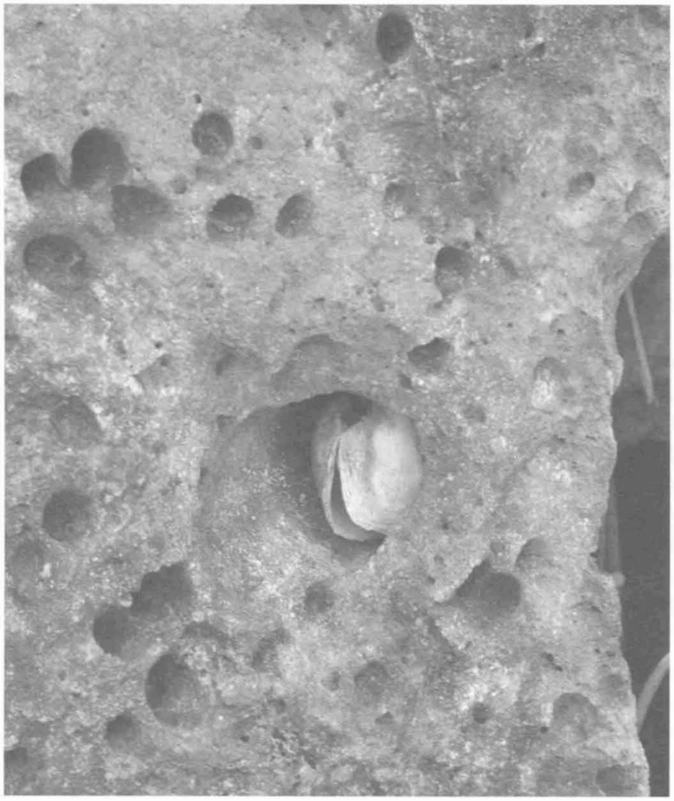

Figure 24. Marine shells found in cavities of the limestone slabs in the *ahu* wall of *marae* Tainuu, Raiatea.

indicate that crafts specialization occurred during this time. However, the evidence for this is slight and this correlation of type 4.2 *marae* and smaller special-function *marae* might be an artefact of a small data set from the latter structures.

THE WIDER LEEWARD ISLANDS PERSPECTIVE

Marae Taputapuatea, Opoa, Raiatea

Only one other *marae* structure from the Leeward Islands has been dated in addition to the ^{14}C dates produced by our own investigations. During restoration of *marae* Taputapuatea at Opoa (Figure 23), Raiatea, Emory and Sinoto collected some *Scutarcopagia scobinata* shells from within cavities on the visible face of coral/limestone slabs (Figure 24) in the *ahu* wall (Emory and Sinoto 1965) which were sent to the Gakushuin Laboratory in Tokyo for ^{14}C analyses and returned a date of 700±100 BP. In attempt to more accurately calibrate this date Emory and Sinoto also dated a sample of fresh *Scutarcopagia scobinata* shells picked from the lagoon environment surrounding the Taputapuatea complex. These shells, however, turned out to be modern, and, consequently, the Taputapuatea date was reported with both wood and shell control data (Emory and Sinoto 1965).

Currently, with extensive marine calibration curves we can calibrate the original age assay with these models, controlled by a local correction value. Calibrated with the Southern Pacific regional average marine reservoir correction value of Δ33.0±21.0, then the date is AD 1503-1722 and 1793-1799 at 1 sigma. If the Mo'orean value of Δ82.0±42.0 is used, the date is AD 1566-1820 at 1 sigma (Figure 25). Both probably give a date some years earlier than the actual construction of the *marae* and this would indicate that Taputapuatea was constructed late in the 17th or sometime during the 18th century, about the same time as *marae* Manunu.

About eighty meters west of the *ahu* of Taputapuatea is an archery platform located with its front pointing towards the famous *marae*. Sinoto excavated a test-unit between this archery platform and a house platform next to it (Emory and Sinoto 1965:65-66 and Fig. 67, p. 71; Wallin 1997). A charcoal sample from this test unit, - 70 cm b.s., and pre-dating the archery platform and possiby also the house platform gave an age assay of 360±90 (GaK-403). Calibrated at 2 sigma it gives a most likely time range of AD 1417-1697, and, consequently, this archery platform was built after AD

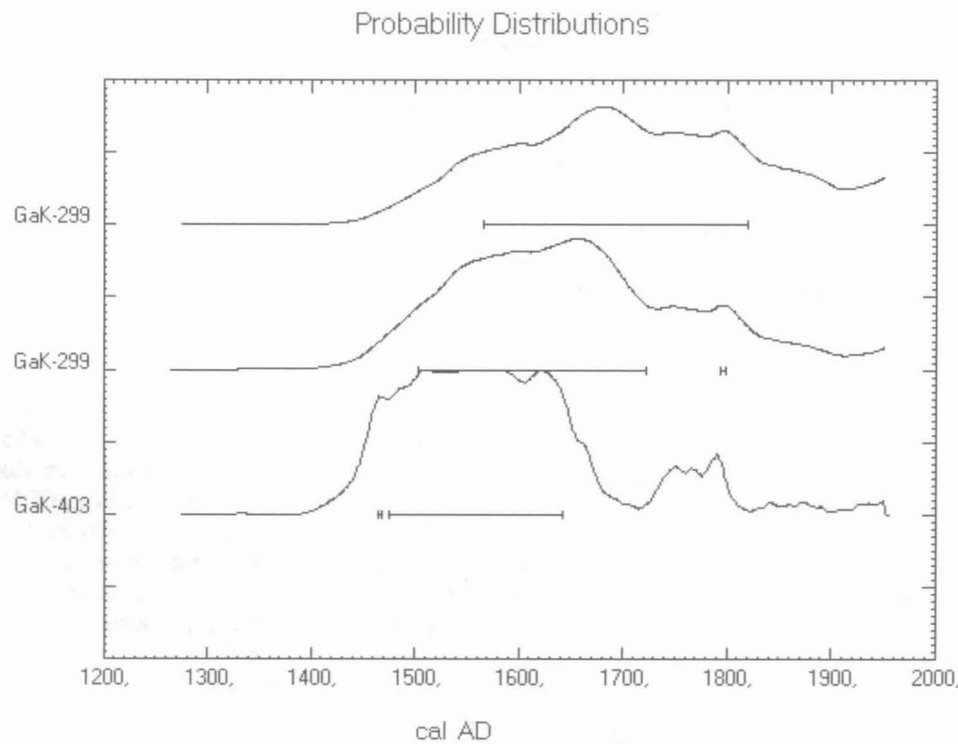

Figure 25. Multiplot of 14C dates from the Opoa complex, including marae Taputapuatea (GaK-299, with both Regional and Mo'orean marine correction values) and GaK-403.

1600. The date of marine shells from the *ahu* slabs of *marae* Taputapuatea might indicate that this huge temple was constructed at the same time, or, even later, perhaps late in the 17th or sometime during the 18th century. Therefore, a time range for development of the ritual complex at *te Po* are from about AD 1600 to early 19th century.

Development of marae in the Leeward Islands

What do the above data tell us about the origin and development of *marae* as ritual space in the Leeward Islands? In the case of Huahine, the data is comprehensive enough to suggest that, on this island, *marae* structures were not built until between AD 1450 and 1500. The ^{14}C dates come from structures located on the north-northeast, the east, and west coasts of Huahine Nui, from the two politically most important districts of the island in prehistoric times. Whether this translates to the other islands in the Leeward Islands cannot be ascertained at present. Comparable data does not exist from the other islands in this group. Huahine was, in two ways, different from nearby islands during the proto-historic period. First, Tane was the patron god of the islands and even though *'Oro* worship attempted to established itself on the island, it never took hold in the more political important part of Huahine, as in the Fare and Maeva districts (Wallin and Solsvik 2005). The *'Oro* cult was accepted on most other islands in the Society group. In fact, although the Boraboran chief Puni took control of Huahine in the late part of the 18th century (i.e. Edwards 1999:295) it took only a few years before the Huahine people united and drove out Puni's entourage. Secondly, Huahine was the only island in the whole of French Polynesia, with the possible exception of Rurutu, which established a chiefly area where land was distributed among all district chiefs and where they all lived during certain periods of the year (Wallin 2000a). These two special cultural characteristics of Huahine may have contributed to a late introduction of the *marae* concept on this island. However, as radiocarbon dates clearly show that *marae* structures were constructed as early outside the chiefly center of Maeva as in this area, we argue that the Huahine *marae* data is not linked to the formation of Maeva as a chiefly and ritual centre. This makes it less likely that our ^{14}C dates reflect a later development of the *marae* complex on Huahine than other islands in the Leeward Islands. The only other chronological data from a Leeward Island *marae*, GaK-299 from *marae* Taputapuatea, shows that this *marae* was contemporary with similar type of *marae* structures on Huahine. Consequently, we suggest that AD 1500 is an approximate date for the first *marae* in this group.

In the area of Maeva, on Huahine, people seem on the whole *not* to have begun constructing *marae* until after AD 1500. All the medium-sized *marae* on the Mata'ire'a Hill were built between AD 1500 and 1650, although it might have been later. One burial platform associated with *marae* ScH-2-66-1 had European artefacts deposited with the burial, which indicates that these *marae* had been in use up to proto-historic times. Some of the *marae* in the area, like *marae* Mata'ire'a Rahi and *marae* Tefano, show clear evidence of having being rebuilt in pre-historic times. In most instances, however, this is not apparent in the architecture itself, but in some cases enlargements of the courtyard might be the result of such developments. As a rule we do not have temporal data in the form of ^{14}C dating to support such rebuilding scenarios, but if these structures had been used during periods of up to 250 years, reconstruction is to be expected and looked for. In the case of *marae* Mata'ire'a Rahi (ScH-2-19) this temple was first constructed after AD 1500 – 1550 (and possible even half a century later), and then re-built between AD 1700 and 1800. A second trend clearly visible in the data is that large coral/limestone slab *ahu* structures built near the coast and which are often associated with the worship of the God *'Oro*, like *marae* Taputapuatea at Opoa, Raiatea, seem to have been constructed fairly late in time.

We now have five radiocarbon dates from four such structures in the Leeward Islands, *marae* Taputapuatea in Raiatea; *marae* Anini, Huahine Iti; *marae* Ohiti Mataroa, Huahine Iti; *marae* Manunu, Huahine Nui; and there are three dates from a medium sized *marae* with the same coral/limestone slab *ahu*, the *marae* at land Haupoto, Huahine Nui; and one radiocarbon date from a ruined *marae* built in similar architectural style on the Mata'ire'a Hill. All these nine radiocarbon dates points to the same conclusion that these structures were built between AD 1650 and 1750.

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