The place of the land and the seat of the ancestors: Temporal and geographical emergence of the classic East Polynesian *marae* complex

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Introduction

'Marae' is a word that has many cognates in Polynesian languages and in almost all cases it designate some type of religious site or assembly place. The morpheme can be reconstructed back to Proto Polynesia PPn**malaqe* with a possible meaning as "meeting place" (POLLEX). On the Polynesian Outliers and in the island groups of Samoa and Tonga, *malae* is used to designate an open cleared space within or at the side of the settlement where people gather to held meetings or certain social and religious ceremonies. On some islands like Alofi, the *malae* has a row of upright stones or backrests at one end. On other islands, like Tokelau and Kapingamarangi, the meetings and ceremonies take place inside a house, while the general area around the house is known as *malae*. In most East Polynesian island groups, the main exceptions being Hawai'i and New Zealand, the word 'marae' refers to a particular group of ritual structures with many common architectural characteristics. It is a rectangular space with a low stone platform or enclosure at one side. On Hawai'i it is the word '*heiau*' that designate religious architecture, of various design rather dissimilar to the other island groups although ceremonies taking place on these sites strongly resembles ceremonies conducted on *marae* sites. The Maori language use the word 'marae' to characterise the courtyard in front of the meeting house, or it designates, in a modern usage the whole complex of buildings and activity ground which also include the meeting house. The Marquesas Islands is an island group straddling the differences in ritual architecture between that of the Society Islands and that of Hawai'i. Here, the *tohua*, was the communal dance ground, where social ceremonies were conducted. There are also several classes of *me'ae*, a cognate of 'marae', with different architectural designs, often built as common dwelling platforms. On Easter Island religious architecture consists of huge platforms with statues on top, termed *ahu* platforms. These are architecturally very similar to the Society Islands, Tuamotuan, Cook Islands, and Austral Islands 'marae', with a flat rectangular area in front of a platform or a stone enclosure. This stone platform or enclosure is in many island groups referred to as 'ahu'. On some island groups like Easter Island, Marquesas Islands, in the Windward Society Islands and on Raivavae statues are found on top or in front of the *ahu*. Those found on Easter Island and at a few sites in the Marquesas reached truly megalithic proportions, while on the Society Islands they are almost miniatures and most often associated with agricultural temples. In the Cook Islands stone statues associated with the *ahu* of the *marae* is absent.

This similarity in architectural design of ritual sites and the fact that they on many island groups are termed by a cognate of PPn**malaqe* have resulted in the definition of

an architectural complex in archaeological literature often referred to as the *marae-ahu* complex or the East Polynesian *marae* complex. Researchers tend to view these structures as variants of a common concept. These structures have generally been thought to have a common history in early Polynesian societies.

The first to present such a theory based on archaeological data was Kenneth P. Emory. After two decades surveying ritual architecture on various Polynesian islands he wrote a paper entitled *Polynesian Stone Remains* (1943). Here Emory argued that 'ahu' and 'marae' had existed as separate spatial structures in early Polynesian culture. 'Ahu' was uprights, like the *afu* found historically on the Ellice Islands, erected in commemoration of deceased loved ones. Later this single upright developed into a series of uprights, and, then, to a platform or enclosure. This was the first ritual structure in Polynesia. 'Marae' had all the time existed alongside this 'ahu' structure, as an open cleared area where people met and sometimes had formal "village" meetings. At some point in time this open cleared space was spatially associated with the 'ahu' and the Polynesian *malae* / *marae-ahu-heiau* complexes were born. In 1986 Roger C. Green published a paper entitled *Some Basic Components of the Ancestral Polynesian Settlement System: Building Blocks for more Complex Polynesian Societies*. Here he used data from the POLLEX project to develop an idea on early Polynesian settlement structures, following papers by Andrew Pawley who used similar methods to discuss the linguistic evidence for existence of 'chiefs' in early Polynesian societies. Green defines the PPn**malaqe* as "a public meeting place with apparently strong religious connotations" (Green 1986:53-54). Such an ancestral space or institution was clearly in existence based upon "linguistic and ethnographic" data, although the form and function may prove difficult to demonstrate through archaeological excavations. Green believed this PPn**malaqe* to be a cleared space located next to the PPn*q*afu*, defined as a raised place or mound made for a god-house or an unspecified religious structure. The religious connotations for this latter term is evident in the linguistic and ethnographic data from East Polynesia, however, Green is uncertain of the antiquity of both its presence and function in the West Polynesian area.

A few years later the model has developed and most of the uncertainty had evaporated. This more detailed model of an early Polynesian ritual site developed through a series of writings by Roger C. Green and Patrick V. Kirch from the mid-1980s (Kirch 1984; Green 1986; Kirch and Green 1987; Kirch 1989; Green 1998; Green 2000; Kirch 2000b). Their most recent and co-authored statement of this theory is to be found in the book *Hawaiki, Ancestral Polynesia. An Essay in Historical Anthropology* (Kirch and Green 2001:249-256). Here Kirch and Green describe their interpretation of ritual space in a proto-Polynesian speech community in the following manner:

> "We infer these to have been architecturally simple affairs, consisting of an open, cleared space (**malaqe*) lying seaward of a sacred house (**fale*-{*gatua*}), the latter constructed upon a base foundation (**qafu*). The sacred house may sometimes have been the actual dwelling of the priest-chief (**gariki*), and may at times have contained the burials of ancestors (**tupunga* or **tupuna*). But we are confident that one or more posts (**pou*) within the sacred house were ritually significant" (Kirch and Green 2001:255).

The main reference point for their interpretations is the *marae* Matautu on Tikopia, and it is fairly easy to isolate an implicit development of Polynesian ritual spaces in their discussion of the data. In early Polynesian societies there existed an open cleared space named PPn**malaqe* which had a god house at one side and possible one or several uprights out on the courtyard. This architectural design continued more or less unchanged on the Polynesian Outlier islands and some of the islands in West Polynesia up to the time when people converted to Christianity. This early Polynesian 'marae' was found on all the East Polynesian islands, prior to the development into the stone structures we can see on the surface today. When this transformation from open spaces to monumental stone architecture occurred is not pinpointed exactly, but the authors assumed it must have taken place sometime after the settlement of New Zealand c. AD 1200. The latter argument is based upon the observation that the classic ritual architecture of the Society Islands (or, really, the *marae-ahu* complex) is not known in New Zealand. The people who settled New Zealand must therefore have left the islands around Tahiti prior to the development of this classic architectural expression of the common PPn**malaqe* space.

In sum: From this cursory overview of the research history on the Polynesian *marae*-complex there are, both explicitly and implicitly, a few reoccurring tenets used to construct models of how this complex originated and developed.

1. The East Polynesian *marae*-complex is just a development of a religious space existing, or developing, in Proto Polynesian communities.
2. On East Polynesian islands, prior to the classic *marae* of the Society Islands or the classic *ahu* of Easter Island, we would find religious sites more similar to West Polynesian *malae*-sites.
3. The classic stone architecture of this *marae*-complex developed after the settlement of New Zealand.
4. The open, cleared spaces in Western Polynesia, called *malae*, have (more or less) remained architecturally unchanged since its first conception in Proto-Polynesian times, although the connotations of these places became more explicit religious.

All researchers, from the time of Emory onwards have adhered to one or another version of this model for how the East Polynesian *marae*-complex has developed. Our work in the Leeward Society Islands was designed to fill a gap in the data by investigating the time depth of the Leeward Society marae-complex. There were two basic questions we would like to answer: First, we wanted to get a grasp of the chronological framework of *marae* structures. In particular, our main objective was to precisely define when people in the Society Islands *first* began to build *marae*. Secondly, did open cleared spaces similar to the West Polynesian malae-complex exist in these islands prior to the construction of stone terraces and platforms named marae?

Data collected since the late 1980s from research projects on Easter Island, Hawai'i, and in the Cook Islands could not easily be fitted into the standard model. Taken together these data suggested that we needed to adjust our model for how the East Polynesian *marae*-complex developed. The main argument is that the origin of the

Polynesian *marae-malae* complex might be a result of major transformations in social organization and/or in the belief system, perhaps tied to a change in self-perception amongst early East Polynesian communities, rather than just being a continuation and development of Proto-Polynesian concepts. Currently it seems that this transformation began in the northern and south-eastern corners of the Polynesian triangle. Only later did this complex appear or became adopted in the central islands of East Polynesia and in the western islands. The new model developed by our research and the earlier investigations in the Cook Islands (Yamaguchi 2000), Hawai'i (Kolb 1991) and on Easter Island (Martinsson-Wallin 1994) have three important implications that should be the basis for future research.

1. The open cleared spaces of Western Polynesia and the Polynesian Outliers are a fairly late development occurring only after AD 12-1400, and perhaps even later.
2. The ritual space of Polynesian communities up to AD 12-1300 was not an open cleared space with an upright or a god-house, but something that need to be archaeologically identified and defined.
3. It is also possible that there existed several different types of ritual spaces, and that the conformity seen in the proto-historic period in Polynesia, attested by ethnographic, linguistic and archaeological research, came into existence at a later date and for quite different reasons than hitherto assumed.

The following section will present the result of four seasons of fieldwork on the island of Huahine in the Leeward Society group, investigating the temporal developments of temple structures, or *marae*, around the small village of Maeva situated on the north-eastern corner of the island. For the first time a comprehensive series of radiocarbon dates is forthcoming from a detailed study of ritual architecture in the Leeward Islands. The project is the first in the Society Islands that aims at investigating the temporal origin of this ritual complex. We present our findings in detail before we proceed, on this basis, to synthesize the current knowledge of Leeward Islands in particular and Society Islands marae-complex in general.

Our discussion start with an overview of the current state of research on Polynesian ritual structures while stressing the new perspectives made possible by the last three decades of research. From this we proceed to develop a new model for the origin and development of such sites on Polynesian islands, with particular reference to the islands in the east and south-eastern part of the region, French Polynesia and Easter Island.

Research history

In 1933, Kenneth P. Emory published the volume *Stone Structures in the Society Islands*, which is probably his most frequently cited work. One could claim that this work was brought about by the temper of the American business man Medford R. Kellum (Danielsson 1967). In 1924 Kellum arrived at Honolulu on board the sailing vessel Kaimiloa. He was going on a cruise of the Polynesian islands with his family. The director of the B. P. Bishop Museum, H. Gregory asked Kellum to take aboard a group of

researchers who would be accompanying him on the journey. By the time Kaimiloa had reached Tahiti, Kellum and key scientists had become mutually disinterested in each other, and Kellum let the group off in Papeete. He supplied them, however, with funds to continue their investigations on their own. The young Kenneth Pike Emory asked permission from the Bishop Museum to stay in Tahiti to do archaeological surveys. Permission was granted, and during the next fifteen months Emory spent his time surveying over two-hundred archaeological sites. Almost all of these were ritual sites, called *marae* in the Society Islands, and most of them where located on the island of Tahiti.

Emory's survey was the first comprehensive attempt to record and describe the Society Islands *marae* and their morphological variation, and as such, *Stone Remains in the Society Islands* have become the main references for all subsequent research on these monuments. The book achieved its position for three main reasons: 1) It was the first comprehensive survey of *marae* structures in the Society Islands. 2) Since the 1920s many *marae* sites have disappeared due to development of settlement and infrastructure and Emory's book had become the only surviving documentation of these structures. 3) The fact that Emory developed the only typology of Polynesian ritual structures that had both spatial and temporal validity, while still managing to contain all ritual structures of this island group in one model. This was not accomplished by any other early Polynesian researcher. Although subsequent research have shown that Emory's typology is an inadequate description of spatial and morphological variation in Society Islands *marae*, and that in particular the concepts of *inland marae* and *coastal marae* should be abandoned, archaeologists nevertheless have to begin their discussion with a critical view of Emory's typology and to some extent rely on his data (Wallin 1993).

The legacy of Emory was taken up in the 1960s, when researchers such as Roger C. Green (Green 1967), José Garanger (Garanger 1964; Garanger 1975; Garanger 1980), Bertrand Gérard (Gérard 1974a; Gérard 1974b; Gérard 1978b; Gérard 1978a), and later Y.H. Sinoto (Sinoto and McCoy 1974) initiated surveys and test-excavations of *marae* structures on the islands of Mo'orea, Tahiti, Raiatea, Me'etia, and Tetiaroa. A greater understanding of the development of, and the morphological and typological variations, of Windward Islands *marae* structures were the results of this decade in Society Islands archaeology. Green conducted his investigations on the Kellum property. The 'Opunohu work was the first application of settlement archaeology in this area, however, survey of *marae* structures and test-excavations of selected structures were an important part of these investigations. The main result of the 'Opunohu project was an understanding of the rich morphological variation of *marae* structures in a Windward valley. In particular it contributed towards making Emory's concepts of *coastal marae* redundant, since at least one classic *coastal marae* was found in the inland setting of the 'Opunohu Valley. Another important contribution made evident by the 'Opunohu survey data is the social importance of small shrines, or mini-*marae* often found built attached to larger *marae* (Descantes 1990; Descantes 1991).

Although the first radiocarbon dates from *marae* structures in the Society Islands came from the 'Opunohu investigations by Green, it was French archaeologists working on the island of Tahiti that produced the first ^{14}C dates with a time depth greater than 200 years. During the 1960s and 1970s Garanger and Gérard undertook surveys, excavations, and extensive investigations of *marae* structures, mainly from Tahiti and Mo'orea

(Garanger 1964; Gérard 1974a; Gérard 1974b; Garanger 1975; Gérard 1978a; Gérard 1978b; Garanger 1980). Garanger's excavations in the Tautira district, on Tahiti, produced the first radiocarbon dates from Society Islands *marae* indicating that *marae* structures were constructed in the Tahitian vallies from the 15th century onwards. Gérard concluded (Gérard 1978a), therefore, that the epoch of *marae* in Tahiti was a post-AD 1400 phenomena. These findings received further support when Yosihiko Sinoto and Patrick McCoy undertook a project of survey and test-excavation on the island of Tetiaroa (1974). Two season of survey and test-excavations of *marae* structures and habitation sites produced the first radiocarbon dates from *marae* structures on one of the small atoll islands in the Society group. Six ^{14}C dates from three *marae* structures supported Gérard's theory that *marae* was a late development in the Society Islands and that these structures were not built before AD 1450 to 1500.

Much work has been done on the *marae* structures in the Society Islands, and their morphological variation and type division are well known (i.e. Green and Descantes 1989; i.e. Descantes 1990; Descantes 1991; Eddowes 1991; Wallin 1993; Wallin and Solsvik 2002). The chronological framework of the Windward *marae* could have been securely established, but three weaknesses in the data have prevented this. Firstly, most of the radiocarbon dates from Windward *marae* were analysed in the 1960s and age assays from this decade, as well as those from the proceeding decade, can be unreliable. This is due to both problems with laboratory procedures, in particular relating to pre-treatment of sample material, and the generally poor understanding of sampling strategy in archaeology during these two decades. Secondly, much material from later investigations are unpublished or not even sent in for analysis. Thirdly, with a single exception no *marae* structures have been dated from the Leeward Islands, leaving a vital gap in the database which the current project was designed to fill.

Society Islands *marae* and their significance for theories of origins on ritual spaces in Polynesia

The Pacific science congress in Honolulu in 1910 decided that the Polynesian island cultures would be a priority target for coming research. The key instrument in organizing this research was going to be the B. P. Bishop Museum, and during the next three decades this institution conducted a large number of surveys, most of them focusing on ritual structures on Hawaii, Marquesas, Society, Tuamotu, Line, and the Tongan groups (Emory 1924; Linton 1925; Emory 1928; McKern 1929; Emory 1933; McAllister 1933b; McAllister 1933a; Emory 1934b; Emory 1934a; Emory 1939; Emory 1943). Consequently, the database on the morphological variation on ritual structures found on Polynesian Islands was quite comprehensive by the end of the 1930s.

This field of research opened up by Emory and his contemporaries like Ralph Linton and Te Rangi Hiroa saw Polynesian ritual space as having a common origin in the formative period of Polynesian culture. Through comparative studies, the origins and development of these structures could be discerned, providing information about the development of other segments of Polynesian culture. William Ayres' *The Cultural Context of Easter Island Religious Structures* (1973) is a modern work following in the footsteps of Emory, in which the author argues for the close stylistic and symbolic association between Easter Island *ahu* structures and the *marae* complexes of Central

East Polynesia. Ayres (1973:39), however, recognized the need for diachronic data to be introduced into the largely synchronic comparative models established by Emory and his successors, putting the emphasis on excavated archaeological data (Ayres 1973:1).

Research design and methodology

The main aim of our work in Huahine was to contribute to the understanding of the origin of the *marae* complex in the Society Islands (fig. 1) (Wallin and Solsvik 2010). In the Windward Islands several projects have provided data on architectural variability and temporal developments (Green 1961; Garanger 1964; Emory and Sinoto 1965; Green 1967; Green, Green et al. 1967; Sinoto and McCoy 1974; Garanger 1975; Garanger 1980). Data on architectural variability exists from the Leeward group (Sinoto and Verin 1965; Sinoto 1969; Gérard 1974a; Gérard 1978b; Sinoto and Rogers-Jourdane 1980; Sinoto, Komori et al. 1981; Sinoto, Komori et al. 1983; Sinoto and Komori 1988; Sinoto 1996), however, on temporal developments the material is scant. Only one radiocarbon date, from *marae* Taputapuatea on Raiatea, had been reported (Emory and Sinoto 1965:96) prior to the beginning of our investigations; collecting samples for radiocarbon dating, therefore, became important to compensate for this paucity in the data.

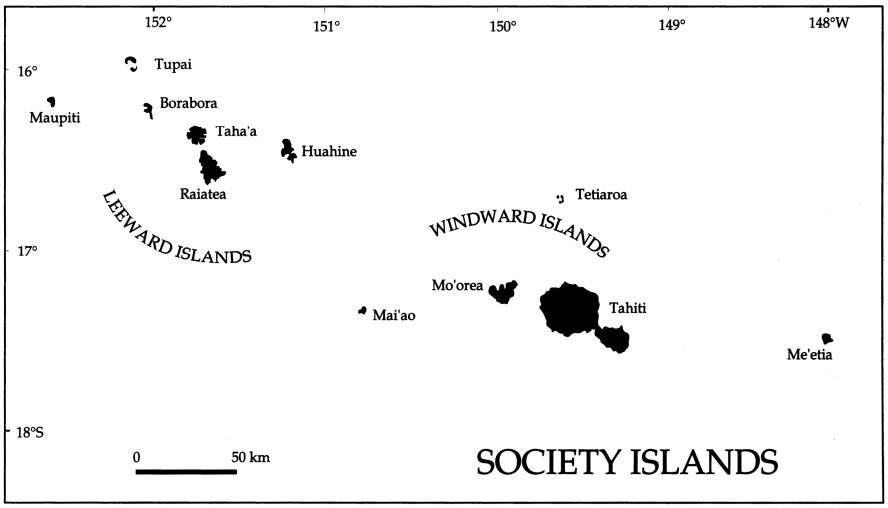

Fig. 1. Map of the Society Islands.

The Leeward Island *marae* have a quite simple and homogeneous shape and thus are not very easy to date accurately. With limited funding we decided to focus our attempts on dating initial construction at a number of sites rather than conducting more extensive excavations of only a few structures. In this way our project will contribute substantially to the discussion on when Society Islanders began constructing *marae* and less to evaluations of developmental sequences at individual sites.

Site selection and site location

Huahine (fig. 2) is part of the Leeward group of the Society Islands, and situated at 16° 5´ south latitude and 151° 2´ west longitude, about 160 km north-west of the island of Tahiti, and consists of two main volcanic islands with about 112 square km of dry land. Huahine Iti, the smallest, is located to the south-south east of the slightly larger Huahine Nui.

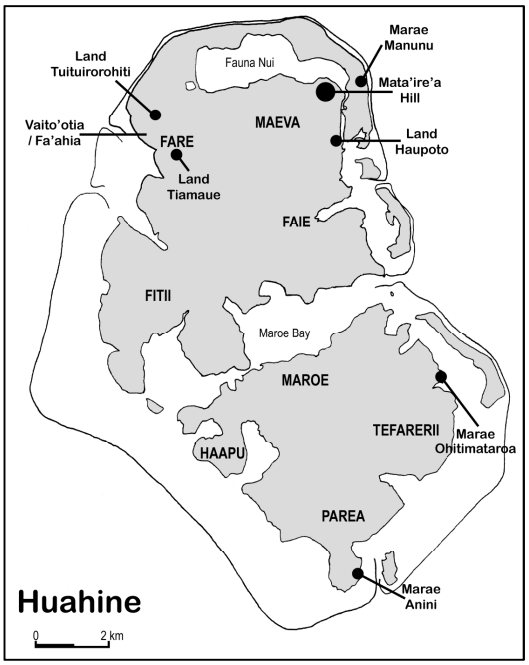

Fig. 2. Map of Huahine.

The district of Maeva comprises the north and north-eastern part of Huahine Nui that surrounds the 'sacred' mountain Moua Tapu. The area with the most important archaeological remains is really a headland stretching out towards the north-east. The western boundary is made up of a ridge of Moua Tapu coming down to the coast at this point. Maeva village is located on a strip of land, 100 to 200 m wide along the eastern end of the extensive lagoon lake Fauna Nui, with the steep northern slope of the c. 60 m high Mata'ire'a Hill to the South.

The archaeological surface remains found at Maeva village on the northeast coast of Huahine Nui are recognized as the vestiges of a traditional chiefly settlement during proto-historic and historic times (Wallin 2000). It was chosen as a study area due to its high density of *marae* structures which was the main focus of this study. For a more in-depth study it was important that the whole area had been surveyed by Y. Sinoto and his associates, and test-excavation dating house-terraces had been undertaken (Sinoto and Rogers-Jourdane 1980; Sinoto, Komori et al. 1981; Sinoto, Komori et al. 1983; Sinoto

and Komori 1988; Sinoto 1996). Our investigation could then fit into a greater set of data.

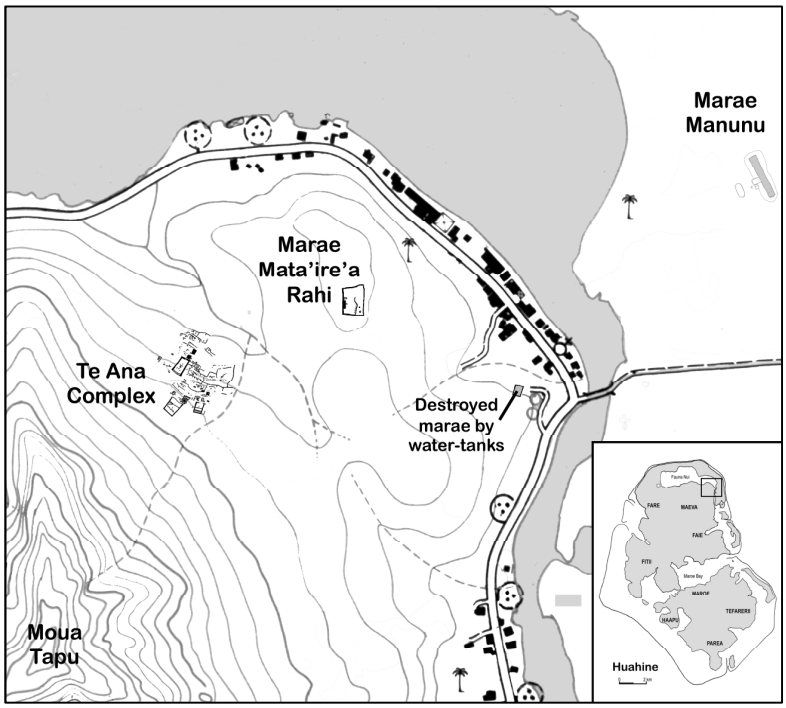

Fig. 3. Map of area around Maeva Village, Huahine.

The Te Ana Site Complex (fig. 3) has previously been described by Sinoto and Komori (Sinoto 1996; Komori 2001; Komori and Sinoto 2002; Wallin, Komori et al. 2004), and is located just west of Maeva village. It is extending from the coast and uphill along the western part of Mata'ire'a Hill, and the eastern boundary is marked by a small gully. The upper part of this area is a small slope toward the south. Sinoto and Komori have carried out test-excavation of habitation terraces in this complex (Sinoto and Komori 1988), and their ^{14}C dates fall into two phases: the first spanning A.D. 700 – 1000 and the second A.D. 1300 – 1700. Dating *marae* structures in this area, then, means that we would be able to place them within the context of the whole settlement. We therefore decided to test-excavate all five *marae* structures in this area (fig. 2) and thus obtained a dataset that would gives us a better understanding of developments of the settlement in this part of Mata'ire'a Hill.

Previous discussions on temporal aspects of the Society Islands' *marae* complex have focused on the often huge coastal *marae* of both the Windward and Leeward groups because genealogical data had been recorded as to the founding of these structures (Emory n.d.). Traditional history of the Society Islands claims that the first *marae* in these islands was consecrated either on Raiatea or Borabora (Wallin 1993: 100-103) and that the *marae*, or even Polynesian culture (Hiroa 1938), spread outward from the cult

centre of Taputapuatea at Opoa, Raiatea. In Maeva there are two *marae* structures reported to be of the "national" (or most important) class. *Marae* Mata'ire'a Rahi, located on the summit of Mata'ire'a Hill, was said to be the national *marae* of the whole of Huahine and *marae* Manunu, opposite the lagoon from Maeva Village, was reported to be the national *marae* of Huahine Nui (Wallin and Solsvik 2005). We had the opportunity to do test-excavations at both sites.

Following the first three field seasons in 2002 and 2003, bone and charcoal samples were sent for radiocarbon age assays 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 test-excavations in the Te Ana area showed that this settlement was established perhaps as early as around AD 1300 (Sinoto and Komori 1988:80; Sinoto 1996). 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 chiefly centre at Maeva would have to be examined. Three sites were eventually investigated; one along the coast in the southern part of the Maeva district and two in the district of Fare, but only two of these latter structures could be dated.

The results of the investigations: Dating of *marae* at Huahine

The classic *marae* of the Leeward Islands are impressive structures, with their huge *ahu* platforms made of coral and limestone slabs. Located at protruding points along the coast, and sometimes opposite the passage in the reef, they are the first site that a visitor sees when sailing into port. Possibly the most important, but definitely the most famous of these *marae,* is that of Taputapuatea. 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.). The traditions that claim such an 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 (Gérard 1974b; Wallin 1993; Eddowes 2001) during the last centuries prior to European arrival. 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 and 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, this ^{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, now there 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.

Dating *marae* at the chiefly centre of Maeva, Huahine Nui

The two national *marae* of Maeva

Huahine had three *marae* of the highest order, or *national marae*: *marae* Mata'ire'a Rahi; *marae* Manunu-i-te-ra'i; and at the southernmost extremity of Huahine Iti, on Tiva Point, where *marae* Anini, the national temple of Huahine Iti is located. *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 this 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. 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 (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 stone wall (fig. 4). 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.

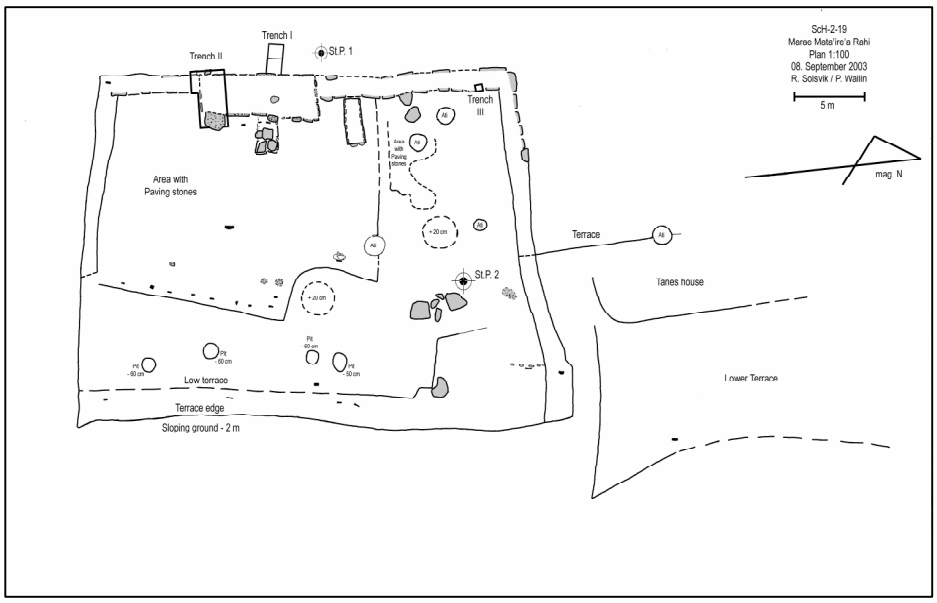

Fig. 4. Plan of *marae* Mata'ire'a Rahi, ScH-2-19.

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 (tab. 1)**;** 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, Komori et al. 2004; Wallin and Solsvik 2005; Wallin and Solsvik 2010). The 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, Komori et al. 2004:99-107; Wallin and Solsvik 2005; Wallin and Solsvik 2010:59-67). 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.

Sample	Tr.	Part	Layer	Material	ð^{13}C	ð^{15}N	Date BP	Cal. 2 sig.
Wk-14604	II	InsideAhu1	0-10 cm b. fill	Charcoal	-25.4±0.2‰		387±38	AD 1459-1629
Wk-14605	II	InsideAhu1	II	Pig bone	-20.9±0.2‰	6.99±	225±38	AD **1641-1812**, 1836-1882, 1923-1951*
Wk-14606	II	InsideAhu1	0 cm b. fill	Human bone	-17.1±0.2‰	10.11±	301±38	AD **1669-1894**, 1918-1951
Wk-16789	II	InsideAhu2	II	Pig bone	-19.5±0.2‰	9.86±	190±39	AD 1678-1738, **1798-1954**

Table 1. ^{14}C dates from ScH-2-19.

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) from this have been dated. Wk-14605 has δ^{13}C and δ^{15}N values that indicate an almost exclusively terrestrial diet and it is calibrated with 0% marine diet. Wk-16789 has δ^{13}C and 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 two samples most likely dates 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 south-east corner of the *ahu* (Wallin, Komori et al. 2004:99 and 103, Plan "Surface below fill"; Cf. fig. 107; Wallin and Solsvik 2010:64). The skull was missing both its lower jaw-bone and upper teeth. Based on ethno-historic information that human sacrifices were supposed to be buried under the corner-stone of national *marae* (Henry 1928:132), we made 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, Komori et al. 2004:95-111; Wallin and Solsvik 2005; Wallin and Solsvik 2010:60). This incident might be linked to the changing of the chiefly dynasties at Maeva, which was instigated after a ritual taking place on this *marae* (Henry 1928:100-101). 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 re-construction of the *marae* took place sometime during the 18th century. The charcoal in Wk-14604 was not sourced, however, a second sample taken from the same charcoal 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% Casuarine 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* located across the lagoon from Maeva Village, became the new ritual centre of Maeva after *marae* Mata'ire'a Rahi, temporarily – at least – lost its importance. So far two samples have been analysed from this site. 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) on top of sterile beach sand stratigraphically below (fig. 5) a standing slab of the *ahu* front wall (Wallin, Komori et al. 2004:76-83; Wallin and Solsvik 2005; Wallin and Solsvik 2010:50-58). 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.

Fig. 5. Pig jaw found on sterile beach-sand under the foundation level of *marae* Manunu, ScH-2-18.

Tucked under a slab of the *ahu* rear wall (Wallin, Komori et al. 2004:75; Wallin and Solsvik 2005; Wallin and Solsvik 2010:54-55, fig. 84), clearly tossed in just before the slab was erected, where a piece of pig skull (Figure 12), Wk-16790, that was age assayed at the Waikato Laboratory in New Zealand. This sample has been 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

Site ScH-2-62-1

Two samples (Wk-13174 and Wk-13175), both on charcoal, have been analysed 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 south-west part of the *ahu*, probably originating from a burning of the area some time prior to the construction of the *marae* (Wallin, Komori et al. 2004:34-39; Wallin and Solsvik 2010:28-36).

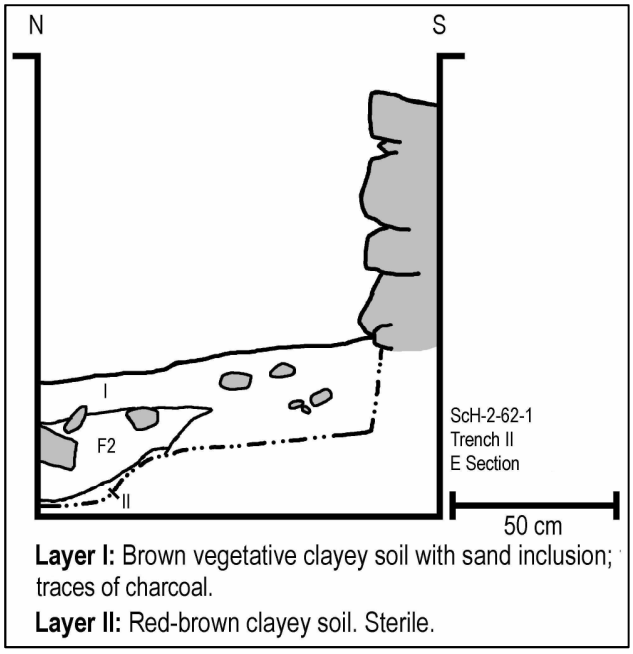

Fig. 6. Location of *umu* from which Wk-13175 was sampled.

The *ahu* itself was located on a terrace forming the upper, south, part of the courtyard of *marae* ScH-2-62-1. Wk-13175 comes from an *umu* (fig. 6) found just down-slope of the retaining wall of this terrace, that is, on the lower 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, Komori et al. 2004:39-41; Wallin and Solsvik 2010:33-34). Both the sample from this *umu*, Wk-13175, and Wk-13174 date to c. 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 c. AD 1500.

Neither sample Wk-13174 (BP 439±60) nor Wk-13175 (BP 409±39) had their wood species identified before being sent for age determinations. However, a sample of scattered charcoal from the same stratigraphical layer but another unit was sent to Dr. 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). This analysis indicates that the scattered charcoal found contained a range of various tree species, and thus supports the theory that it 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 were 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). Both samples, therefore, might have a medium risk of inbuilt age, but since the data does not seem to be univocal the calibrated age ranges are excepted until new dates can be analysed 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 when the *marae* was in use (Wallin, Komori et al. 2004:53-56; Wallin and Solsvik 2010:41-43). 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 have been sent for radiocarbon analysis to the Waikato Radiocarbon Laboratory from *marae* ScH-2-66-1. The first sample, Wk-13178, is scattered charcoal found between - 40 to - 50 cm b.s. inside the *ahu* in a layer stratigraphically below the slabs in the *ahu* (Wallin, Komori et al. 2004:59-61; Wallin and Solsvik 2010:46-49). 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 c. 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 of them with European trade

goods (Sinoto and Komori 1988:59-60, fig. 18), which indicates that these structures were in use as burial grounds 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*, and 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 (fig. 7) 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 has been analysed (Solsvik 2003;

Fig. 7. Midden under foundation stone of *marae* ScH-2-62-3.

Wallin, Komori et al. 2004:45-51; Wallin and Solsvik 2010:37-40). 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 (244±38 BP) were collected from was sent to Dr. 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.

Site ScH-2-65-2

Only one sample, Beta-177606, have been 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

Marae on land Haupoto

This is 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 at the site was found in trenches I, III, and V (Wallin and Solsvik 2004:20-29; Wallin and Solsvik 2010:76-80). 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, were sent to James Coil at the Research Laboratory at Berkeley University for wood species identification (Coil 2005:Table 1). 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 c. 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, suggest 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 Tuituirorohiti land division in the district of Fare, a medium to small sized platform *marae* with an *ahu* was constructed of basalt slabs (fig. 8). During test-excavation a large *umu* was located in the middle and underneath the courtyard in Trench III. This earth-oven, then, must have been used prior to construction of the *marae* (Wallin and Solsvik 2004:12-19; Wallin and Solsvik 2010:71-80). 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 Coil were AMS dated. Both samples, Wk-17062 and Wk-17063, calibrate at 2 sigma to c. 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 from this *marae* was analysed. A piece of coral, Wk-16470, from the *ahu* fill 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. One piece of coral from the surface of the *ahu* fill and one from the very bottom was secured for future dating purposes, but only the bottom piece was sent for dating. It is quite likely that the coral picked from the bottom of the *ahu* fill originated as beach deposits present prior to the construction of the *marae* and that the date only pinpoints the formation of this beach flat. Four other radiocarbon dates on coral from various *marae* structures around the island have all given credible dates, and Wk-16470 must therefore be disregarded.

Fig. 8. *Marae* Tuituirorohiti, *ahu* built with basalt stones.

Development of *marae* on Huahine

So far these investigations have produced twenty-three ^{14}C dates from nine *marae* structures close to the Maeva village on Huahine (tab. 2), one in the district of Fare, and two *marae* structures on Huahine Iti. Nine structures were dated through ^{14}C analysis on material found during excavations. Four age assays were carried out on pig or human bones, and the remaining on charcoal. All dates have been calibrated using CALIB (Version 5.0.1) with the SHCal04 calibration data set (Stuvier, Reimer and Braziunas 1998). The Southern Pacific regional average (Delta R 33.0±21.0) taken from the Marine Reservoir Database (http://calib.qub.ac.uk/marine/) has been used in all 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 $\eth^{13}C$ ‰ and $\eth^{15}N$ ‰ values measured on bone collagen.

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 re-building of the structure, clearly indicates that the first construction phase – when *marae* structures were first built on Huahine – began between AD 1450 and 1500 (fig. 9) 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, or 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 2001). Smaller, more specialised-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) seems

to have been built later, between AD 1650 and 1750 (fig. 10). These latter structures must be

Lab. No.	*Marae*	Life phase	Age B.P.	Age A.D. (2 sigma)[1]	Material
Wk-14604	ScH-2-19	Pre-construction	387±38	AD 1459-1629	Un-sourced charcoal
Wk-14605	ScH-2-19	Pre-construction	225±38	AD **1641-1812**, 1836-1882, 1923-1951	Pig tooth/bone
Wk-14606	ScH-2-19	Use (re-dedication)	301±38	AD **1669-1894**, 1918-1951	Human bone
Wk-16789	ScH-2-19	Pre-construction	190±39	AD 1678-1738, **1798-1954**	Pig tooth/bone
Wk-14603	ScH-2-18	Pre-construction	306±42	AD **1649-1891**, 1923-1951	Pig tooth/bone
Wk-16790	ScH-2-18	Pre-construction	296±34	AD **1672-1894**, 1919-1951	Pig bone
Wk-13174	ScH-2-62-1	Pre-construction	439±60	AD 1426-1830	Un-sourced charcoal
Wk-13175	ScH-2-62-1	Pre-construction	409±39	AD 1450-1626	Un-sourced charcoal
Wk-13177	ScH-2-65-1	Use	372±44	AD 1507-1807	Pig tooth/bone
Wk-13178	ScH-2-66-1	Pre-construction	552±100	AD 1284-1625	Un-sourced charcoal
Wk-17066	ScH-2-66-1	Use	116.7±0.5%M	---	Sourced charcoal
Beta-177606	ScH-2-65-2	After abandonment	170±40	AD 1674-1740, **1798-1953**	Un-sourced charcoal
Wk-17064	Haupoto	Pre-construction	387±34	AD 1460-1627	Sourced charcoal
Wk-17065	Haupoto	Pre-construction	406±32	AD 1452-1626	Sourced charcoal
Wk-16471	Haupoto	Use (from fill of *ahu*)	636±38	AD 1589-1842	Coral
Wk-17062	Tuituirorohiti	Pre-construction	441±31	AD **1436-1510**, 1554-1621	Sourced charcoal
Wk-17063	Tuituirorohiti	Pre-construction	438±32	AD **1437-1511**, 1549-1622	Sourced charcoal
Wk-16470	Tuituirorohiti	Use (from fill of *ahu*)	2429±36	192 BC – AD 42	Coral
Beta-177605	ScH-2-62-3	Pre-construction	500±60	AD **1398-1517**, 1538-1625	Un-sourced charcoal
Wk-13176	ScH-2-62-3	Pre-construction	244±38	AD **1628-1810**, 1837-1879, 1924-1951	Un-sourced charcoal
Wk-16786	Anini	Use (from fill of *ahu*)	639±35	AD 1591-1830	Coral
Wk-16787	Ohiti Mataroa	Use (from fill of *ahu*)	637±34	AD 1596-1833	Coral
Wk-16788	Water Tanks	Use (from fill of *ahu*)	536±35	AD 1711-1951	Coral

Table 2. All ^{14}C dates from *marae* structures on Huahine.

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*'s. They were furthermore built at the same time as larger *marae* structures with an explicit political function in addition to being centres for worship (Henry 1928; Wallin 1993). This may indicate that crafts specialisation occurred during this time. However, the evidence for this is slight and the correlation of type 4.2 *marae* with smaller special-function *marae* might be an artefact of a small data set.

[1] When multiple intercepts are the result of calibration, intervalls of 20 years or less are disregarded.

The wider context of the investigations

Emergence of *marae* structures in the Leeward Islands

During restoration work on *marae* Taputapuatea, on Raiatea in the early 1960s, Sinoto and Emory dated some marine shells found embedded in depressions on one of the coral slab making up the *ahu* face (Emory and Sinoto 1965). The sample, GaK-299, returned a date of 700±100, which calibrated with a marine calibration curve and the Southern Pacific regional average marine reservoir correction value of ð33.0±21.0 (Reimer and Reimer 2001) at 2 sigma, produce an age span of AD 1503-1722 and AD 1793-1799. About eighty meters west of Marae Taputapuatea, an archery platform is located with its front pointing towards the famous *marae*. Charcoal was retrieved from a trench excavated between the archery platform and the house foundation next to it, GaK-403, pre-dating the archery platform produced a date of 360±90, or calibrated at 2 sigma to AD 1417-1697 (Emory and Sinoto 1965:65-66, fig. 67; Wallin 1997; Wallin and Solsvik 2006:27). It is possible, then, to suggest that *marae* Taputapuatea and the other *marae* at the area called *te po* were constructed after AD 1600, which fits the data from similar structures on Huahine.

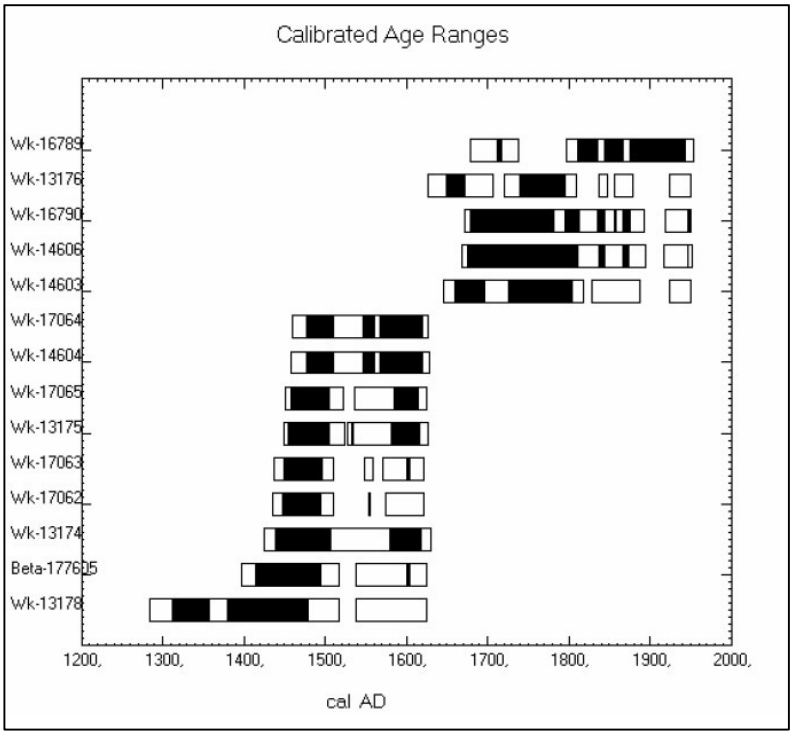

Fig. 9: Box-plot of ^{14}C dates on charcoal found in pre-construction context on Huahine.

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 AD 1500. Whether this finding translates to the other islands in the Leeward group cannot be ascertained at the present since comparable data does not exist from the other islands. Huahine is one of the few islands in French Polynesia that established an independent chiefly and ritual centre, which could have contributed to a late introduction of the *marae* concept on this island. However, since radiocarbon dates clearly show that *marae* structures were built as early outside as inside the chiefly centre of Maeva, we argue that our Huahine data is not a reflection of the establishment of Maeva as a specialised political and ritual centre. In conclusion, *marae* construction probably did not take place in the district of Maeva, Huahine, until around AD 1500. All the medium-sized *marae* on the Mata'ire'a Hill were first built between AD 1500 and AD 1650.

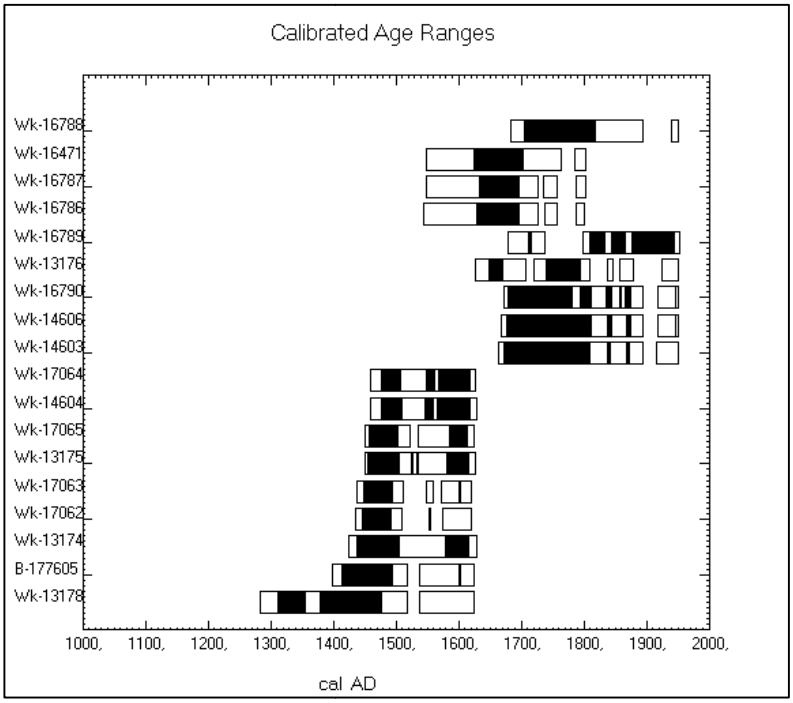

Fig. 10. Box-plot of ^{14}C dates according to type from Huahine.

Some of the *marae* in the area, like *marae* Mata'ire'a Rahi and *marae* Tefano clearly show evidence of being rebuilt during pre-historic or proto-historic times. In other cases the evidence for reconstruction is more subtle, only consisting of an enlargement of the courtyard. In most cases no radiocarbon data exists to accurately date such phases of rebuilding, but if these structures were in use during a time-span of up to 250 years reconstruction should be expected. On this basis we would like to suggest that a close examination of the architecture together with targeted test-trenching should be the

standard procedure for documenting these structures. A second trend in the data is that the large costal *marae* associated with the '*Oro* cult, like *marae* Taputapuatea on Raiatea and *marae* Anini and possibly Manunu on Huahine, seem to have been constructed fairly late in Society Islands pre-history. We now have five radiocarbon dates from four such *marae* in the Leeward group: *marae* Taputapuatea on Raiatea; *marae* Anini and *marae* O'hiti Mataroa on Huahine-iti; and *marae* Manunu on Huahine-nui. All these five radiocarbon dates supports the theory that '*Oro* type *marae* structures were being built between AD 1650 and AD 1750, or even later.

New radiocarbon dates from Windward Islands *marae*

In investigating early settlement sites, Polynesian archaeologists have become aware of problems with radiocarbon dates from the 1960s and 1970s (Anderson 1991; Anderson, Leach et al. 1994; Anderson 1995; Higham and Hogg 1997; Dye 2000; Anderson and Sinoto 2002). Two factors in particular might be mentioned. First, there may be a high inbuilt-age in old charcoal samples, due to the fact that sourcing of wood species was, and still are, not routinely applied. Second, early dates up to the 4000-series from the Gakushuin Laboratory in Tokyo have been considered as suspect by some writers (i.e. Spriggs 1989). Since most of the radiocarbon dates from temple complexes in the Windward Islands are from the sixties it would be valuable if samples from previous investigations were re-dated (table 2) (Solsvik n.d. 157-160).

The perhaps most well-known excavation of Windward Islands temple complexes is the investigation of *marae Marae* Ta'ata by Garanger, where a series of three superimposed *ahu* were exposed (Garanger 1975). Three charcoal samples in a stratigraphic series, were sent for radiocarbon analysis to the Laboratoire de radiocarbone du Commissariat à l'Energie Atomique et du Centre National de la Recherches Scientifique, Centre de Faibles Radioactivités de Gif-sur-Yvette, in France. All these dates came out as 'modern' and have never been reported in detail (Garanger 1975:53-54, footnote 24; Garanger 2005). Unfortunately, no excess charcoal exists from the original samples sent to Sacley Laboratory, so there is no way to check the previous radiocarbon dates. However, one excavation unit outside the *marae* produced a thick charcoal layer and a sample from this layer was sent by us to Waikato Laboratory for age assay. The calibrated date for this sample is AD 1653-1951 at 2 sigma (table 2). The date only proves that cultural activity took place there in the 17th or 18th century, but could also indicate an early use period at *marae* Ta'ata in light of other dates from Tahitian temple sites.

During his investigations of the district of Tautira, Tahiti, Garanger (1964; 1980) excavated a number of structures and the oldest date was B-747 of BP 410±100 from *marae* TT14, with a calibrated age range at 2 sigma of AD **1392-1682** and 1730-1802. This sample dated activity prior to *marae* construction at the site and it suggests that people began constructing *marae* in valleys of Tahiti between AD 1450 and 1680. However, other radiocarbon age assays produced dates such as BP 0±200 (Gx-1296) and BP 0±240 (GaK-449), indicating problematic aspects of either sample selection or laboratory procedures,- or both. After a request from us a number of samples from excavations in the valley of Aiurua, Tautira district, on the island of Tahiti, were received from José Garanger and one of these samples from *marae* TTA-03-1 was sent for age

assaying at the Waikato Laboratory. The sample came from an earth-oven located beneath the enclosing stone wall of the *marae* and, therefore, must have been fired not too long before this stone wall was built (Garanger 1980:88, fig. 9). Wk-17523, the charcoal sample from this earth-oven, produced a calibrated age range at 2 sigma of AD 1485-1646, indicating that this *marae* was built in the beginning or middle of the 16th century, some time earlier than the 17th- or 18th-century date Garanger assumed (Garanger 1980:84).

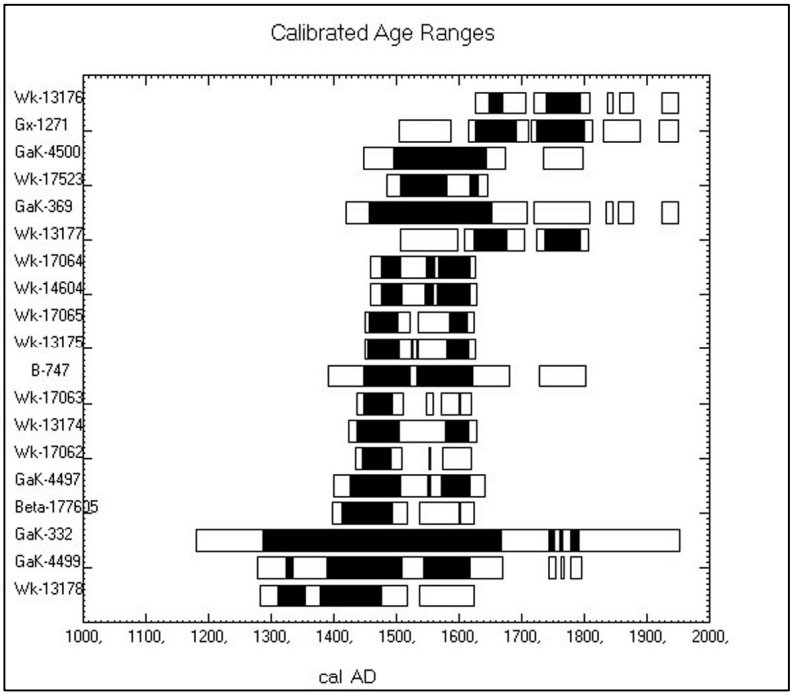

Fig. 11. Box-plot of 14C samples from pre-construction context in the Society Islands.

In the 1980s and 1990s several major archaeological projects took place in the Papeno'o Valley on the island of Tahiti and a number of sites were surveyed and excavated. Most of these investigations have not been published and readily available data on possible analysed radiocarbon dates are non-existent. *Marae* sites 206, 207, and 208 are part of a complex in the Tahinu section of the Papeno'o Valley excavated by Marimari Kellum in the fall of 1990. Three samples, two from *marae* 206 and one from *marae* 208 were submitted by us to the University of Waikato, Radiocarbon Dating Laboratory, for analysis. The two samples from structure 206, Wk-18805 and Wk-18807 returned dates of 260±52 BP and 177±76 BP respectively. The sample from *marae* 208, Wk-18806, returned a date of 115±37 BP. All these samples probably originate from use-phase context and only indicate that these *marae* were constructed sometime around AD 1600 or later.

Marae in Society Islands

At present we have forty-six ^{14}C dates (tab. 2 and 3) from *marae* structures in the islands of Tahiti, Mo'orea, Tetiaroa, Huahine, and one date from *marae* Taputapuatea on Raiatea. Having data from only four of the twelve main islands in the Society group make this discussion somewhat preliminary. On the positive side, we do have data from the two largest islands in the Windward group. From Huahine, the only island in the Leeward group where many of the major ritual structures were located in one symbolic significant area in which all the chiefs of the island had an invested interest (Wallin 2000), twenty-three radiocarbon dates have now been age assayed. From these data a general trend emerges. The same trend observed locally on Huahine is also found on the big island of Tahiti and the small low island of Tetiaroa (Sinoto and McCoy 1974). No radiocarbon date indicates any *marae* construction before AD 1400-1450 and probably not before c. AD 1500 (fig. 11).

The current temporal data on *marae* structures from the island of Tahiti is not a representative selection of Tahitian ritual structures; however, the data from this island corresponds to the data from both Huahine and Tetiaroa. On the other hand, it could be argued that Huahine was a special case. On the island, Maeva constituted a political and ritual centre (Wallin 2000) where all chiefly family on the island had invested interest. If this chiefly area was established relatively late it may be that earlier *marae* structures can be found in other places on the island. However, two *marae* structures were excavated outside the central Maeva area and these sites produced similar dates as the Maeva cases. In addition, two larger *marae* sites were dated by pieces of coral found as part of the rubble fill of the *ahu*. These samples produced similar dates as comparable structures in Maeva. To us this suggests that our data from Huahine are representative. Also, the settlement site of Vaito'otia/Fa'ahia on Huahine dates to between AD 1000 and AD 13-1400. This site has no ritual space that can be said to be the precursor of the classic Society Islands *marae*[1]. The earliest dates on midden-material found in the Te Ana section of the Mata'irea Hill indicate that settlement here began between AD 1300 and AD 1400. Before the surface structures, including the *marae* complexes were built. Based on our own investigations at Maeva and the additional dates from Tahiti and Tetiaroa *marae* construction began around AD 1400 to 1450 at the earliest in the Society Islands, and began at the same time in both the Leeward and the Windward groups.

Broader East Polynesian Perspectives

Easter Island archaeology was the origin for and context within which the above research project developed. This tiny, eastern-most island in Polynesia with its world renowned ritual architecture enticed Thor Heyerdahl already as a kid and in 1955-56 he organised the Norwegian Archaeological Expedition to Easter Island and the East Pacific with one Norwegian, four American and one Chilean archaeologist on board. This expedition unravelled much of the islands early pre-history and also produced

Lab. No.	Marae	Life phase	Age B.P.	Age A.D. (2 sigma)[1]
GaK-332	Afareaitu	Pre-construction	480±240	1182-1954*
Gak-368	Land Titiroa	Pre-construction	Mod.	
Gak-369	Land Titiroa	Pre-construction	350±100	**1421-1811**, 1837-1879, 1924-1951*
Gak-299	Taputapuatea	Pre-construction	700±100	**1457-1886**, 1949-1951*
Gif-2831	TM4	Uncertain	170±80	1648-1953*
Gx-1296	Atatunu	Pre-construction	0±200	1503-1591, **1615-1956***
B-747	Atatunu	Pre-construction	410±100	**1392-1682**, 1730-1802
Gak-449	Puhiva	After use	0±240	1486-1956*
Gx-1271	Puhiva	Pre-construction	255±55	1506-1587, **1617-1891**, 1921-1951*
Beta-16673	VAI-1-III-M	Use phase	170±50	1669-1952*
Wk-17522	*Marae* Ta'ata	Uncertain	194±41	1653-1951*
Wk-17523	Oputu, TTA-03A	Pre-construction	347±35	1485-1646
Gak-4500	ScTe-8-1-3	Pre-construction	340±70	**1450-1676**, 1736-1799
Gak-4499	ScTe-8-6	Pre-construction	500±125	**1278-1671**, 1746-1796
Gak-4498	ScTe-8-6	Uncertain	1650±270	BC 175-989
Gak-4501	ScTe-8-7	Pre-construction	50±160	1510-1574, **1621-1956***
Gak-4502	ScTe-8-7	Construction	350±470	785-785, 831-836, **867-1956***
Gak-4497	ScTe-8-9	Pre-construction	450±80	1401-1643
Wk-17522	**Marae Ta'ata**	**Unknown**	**194l±41**	**AD 1653-1951**
Wk-17523	**TT-03-A**	**Pre-construction**	**347±35**	**AD 1485-1646**
Wk-18805	**Marae 206**	**Use**	**260±52**	**AD 1504-1883, 1923-1951**
Wk-18807	**Marae 206**	**Use**	**177±76**	**AD 1648-1953**
Wk-18806	**Marae 208**	**Use**	**115±37**	**AD 1689-1728, 8105-1953**

Table 3. ^{14}C dates from excavated *marae* structures in the Society Islands (up to 2006).

connections between archaeologists, the people and the landscape that would continue to supply the island with new foreign researchers for generations to come. Arne Skjølsvold and Thor Heyerdahl returned to the island to excavate at the ceremonial site of *ahu* Naunau, on Anakena beach where the 1955-56 Expedition had their camp thirty years before. Through three field seasons *ahu* Naunau was established as the earliest ritual site on the island and with the earliest settlement site found underneath its *ahu* platform (Skjølsvold 1994)[2]. Helene Martinsson-Wallin and Paul Wallin, who had worked for Skjølsvold at Anakena in 1987-88, returned to the island in the late 1990s and began a series of targeted test-trenching of ritual architecture in the La Perouse area on the north-east coast of the island (Wallin and Martinsson-Wallin 2008). This complemented the many areal excavations undertaken by William Mulloy, Gonzalo Figueroa and William S. Ayres and others during the 1960s and 1970s. Information on the architectural development and the temporal framework for this class of structures was beginning to stack-up. Researchers found growing evidence for that the monumental *ahu* sites had

developed from quite small and classic "*marae* like" structures prior to the mid-14th century.

In the context of Polynesian archaeology in the 1980s and 1990s most researchers anticipated that the *ahu* on Easter Island and the *heiau* of Hawaii, as the *marae* of the Tahitian, Tuamotuan and Cook island groups, were developments and variations of a ritual space developed as part of the emerging Polynesian culture, not too long after the discovery and settlement of the Tongan and Samoan island groups. By inference the *marae* sites in the Tahiti, Tuamotuan and Cook island groups should pre-date the sites found on Easter Island and in the Hawaiian archipelago. These original *marae* sites of the eastern islands would eventually be found to post-date the simple open *malae* sites on the western Polynesian islands.

But how well did this model fit the emerging archaeological data at the end of the millennium? Let us turn to the far north of the Polynesian triangle, to the Hawaiian Islands at the beginning of the 1990s. Here, on the island of Maui the American archaeologist Michael J. Kolb were investigating *heiau* structures for his Ph.D. (1991). Through excavation at eight major sites, he documented the considerable time depth of these structures. He concluded, based upon a considerable database of ^{14}C samples that the first *heiau* on Maui was built sometimes between AD 1000 and AD 1200. Through subsequent involvement in large-scale developmental project on the island Kolb's database for the temporal development of Maui *heiau* structures has grown considerably (Kolb 1991). If Kolb's original conclusion that the Hawaiian heiau architecture developed between AD 1000 and AD 1200 is correct, this would have been the earliest dated ritual sites on any Polynesian island. There are, however, reasons to treat his original conclusion with some scepticism. Particularly, there are three critical questions we must ask of the data when assessing Kolb's conclusions. 1) Did the activity dated form part of the architectural site investigated? 2) Are we certain that the samples chosen dates the ritual structure investigated or did the samples originate from a pre-existing domestic structure? 3) Can it be determined from published data whether the structure Kolb claimed to date was a classical heiau structure or a ritual structure with a different design? Answering these questions by a close reading of all available reports, papers and Kolb's dissertation lead us to conclude somewhat differently than Kolb himself. In some cases the ^{14}C samples thought by Kolb to date the construction of a structure are more likely to date pre-construction activity. In other cases Kolb himself argues that the site had a domestic type of function, based upon analysis of midden material recovered in the excavation. In a few cases it is difficult to accept Kolb's interpretation of the find-context of the samples. Few of the samples are tied to strategraphical drawings in his Ph.D. Neither is this information to be found in excavation reports on record at the SHPD. Instead the samples are related by Kolb to particular building sequences at the sites. To complicate matters these construction sequences are defined on the basis of the site survey, which might be intensive, but not necessarily enough to completely understand the construction sequences of so complex architecture as large Hawaiian heiau. Although given these objections, we believe that Kolb has documented that Hawaiian classic heiau structures had developed by AD 1400 to AD 1500. It is indicated by these investigations that a different ritual design either associated with domestic architecture, as in classic Marquesan societies, or with simple platforms existed prior to

classic heiau design, and that these can currently be dated to between AD 1200 and AD 1400.

Our own investigations on Huahine increasingly points to a post-AD 1450 time frame for the first construction of typical "*marae*-like" structures in this island group (Wallin and Solsvik 2010). But we need to ask what the situation is in other regions of French Polynesia? In the whole of the Tuamotuan Islands only a few sites have been investigated and even fewer dated. It would be tempting to argue that the close geographical proximity between these islands and the Society group favours the interpretation that *marae* sites have the same temporal framework in both places. Such a perspective disregards the potential different processes leading to adopting *marae* structures on any given island. All we can conclude from the present archaeological data is that *marae* sites were built and in use by AD 1600. From islands to the south of Tahiti virtually no archaeological temporal data exists. In the Marquesas Islands the situation is different. Dates going back to AD 1200 from a ritual site on Hiva Oa were reported as early as 1956 (Heyerdahl 1965). In addition two data sets exist from excavation on Hiva Oa in 1963 by Arne Skjølsvold and Carlyle S. Smith (Skjølsvold n.d.; Smith n.d.; Solsvik n.d.:197-201). These dates indicate that ritual structures similar to domestic architecture developed between AD 1200 and AD 1400. Currently the classic Marquesan *tohua* and *me'ae* design are attested only from around AD 1600 or from the same time as the first historical observation of such structures by Europeans. In the Cook Islands researchers from the KEIO University have excavated a number of ritual sites of different types in the 1980s and 1990s (Yamaguchi 1998; Yamaguchi 2000). Two conclusions can be drawn from their research and other excavations in the Cook Islands.

Fig. 12. Picture of the earliest *ahu* structure at *ahu* Tongariki, Easter Island. Visually, it is very similar to later *marae* structures documented from Central East Polynesia.

First, there are various sites that can be associated with ritual activity dating back to AD 1200. None of these early sites appear to be typical *marae* sites. Secondly, based on

current data the square *marae* of the Cook Islands probably developed fairly late, quite possible as late as around AD 1600. The emerging picture of *marae* development in the centrally located islands groups, like the Societies, Tuamotuan and Cook archipelagos is that such structures developed quite late. Early 14C dates are all associated with structures of a different design and possible with a slightly different function than the *marae* rituals described in early historical sources. In the Cook Islands between AD 1200 and AD 1400 we find Mounded Turtle Ovens as the likely focus of ritual activity (Solsvik n.d.:237-240; Yamaguchi 2000). In the Society Islands only one site pre-dating AD 1400, which might be associated with ritual activity, has been excavated. This is the single upright placed into a carved coral pedestal found by Sinoto outside a small house (Sinoto 1988). If this structure had been found on an open space, it could have been argued that it conformed to the expected models of how an early Polynesian ritual site should look like. However, this upright is part of a larger complex, and sites of a similar time depth from nearby island groups have a different design as described above. On Norfolk Atholl Anderson discovered a small paved area with one, and possible more uprights located on the pavement (Anderson and Green 2001). An extensive series of radiocarbon dates places this structure between AD 1200 and AD 1300 (Anderson, Higham et al. 2001). Making it one of the earliest dated ritual sites in Polynesia. At the same time a ritual site of the "classic Polynesian *marae*" type were constructed on Easter Island (Skjølsvold 1994; Martinsson-Wallin, Wallin et al. n.d.). The situation may be that in East Polynesia a variety of temple forms existed around AD 1200-1300, which later developed into similar structures between AD 1300 and AD 1500.

We began this review of the current state of knowledge of the temporal development of the "East Polynesian temple complex" with posing the question of how well current data supported the standard model of how Polynesia temple complexes developed. As seen in the introduction to this paper current models are all based on a comparison of the various linguistic terms for such structures. This method emphasizes similarity between complexes, and architectural design elements – whether similar or different – become secondary to linguistic categories. In one respect, current archaeological data does conform to the standard model: development of the classic *marae* design in the island groups surrounding Tahiti occurred after the settlement of New Zealand. However, structures of this design did not develop in the Society group, but rather on Easter Island between AD 1200 and AD 1300 (fig. 12) more or less at the same time as New Zealand was discovered and settled. Secondly, where current models of *marae*-complex development predicts that prior to the discovery of New Zealand there would be a certain homogeneity in ritual sites design, centred on an open space in the settlement with a god-house or a row of uprights, current archaeological data reveal an unexpected heterogeneity. None of which could be described as the open place type of Western Polynesian *malae* complexes. In Hawaii there are simple platforms, possible connected to domestic architecture. In the Society Islands we have a single upright next to a house and a well. On Norfolk archaeologists have documented a paved area with one or more uprights, but not in a line. (This is important since some researchers hypothesise that it was the row-of-uprights that developed into the *ahu* platform or enclosure of the classic *marae*.) And, on the isolated Easter Island, the classic *marae* design appears fully developed just after AD 1200. We therefore need to develop a new model for how

Polynesian ritual structures emerged based upon archaeological data. Here we would like to give a first outline:

1. During the formative period of Polynesian culture one or several, as of yet, undefined ritual site(s) or structure(s) existed. It could be associated with the sleeping-house (Green 1998; Kirch 2000b) or possible be a form of oven (Carson 2002; Green and Davidson 1969; Green and Davidson 1974; Solsvik n.d.; Walter 1990; Yamaguchi 2000).
2. During the period up to AD 1400 there existed different ritual spaces on different island groups in East Polynesia.
3. The classic *marae* design developed on Easter Island or another Island in south-eastern Polynesia between AD 1200 and AD 1300.
4. *Marae* complexes in the Society, Tuamotuan and Cook island groups probably originate from south-eastern Polynesia.
5. The classic West Polynesian *malae* complexes could be a development of the marae structures of East Polynesia, since no ^{14}C date from such a structure pre-date AD 1400. However, this is a question for future research, since so little is known archaeologically of these structures.

Our research described above took as its starting point our own experiences of doing archaeology on Easter Island and of making sense of the information produced by three generations of archaeologists working there. This review of research on Polynesian ritual spaces, with focus on the eastern region, strongly suggests that the classic *marae-ahu* complex was developed on Easter Island. If this is correct archaeologists will in the future not only need to unravel the temporal aspects of these structures, but have to pay equal attention to the various cultural processes that produced the homogeneity in ritual architecture documented by early European travelers to this area.

[1] Dr. Sinoto found a single upright stone placed into a carved coral pedestal close to a round-ended house which could very well be a ritual site, however, not of the classic Society Islands *marae*. This only support the fact that the classic *marae* was not constructed until after AD 1450.

[2] Recent re-dating of 14C samples from *ahu* Naunau reveals that this temple-platform was built slightly later than previously thought. It is probably *not* the earliest *ahu* platform on the island (Martinsson-Wallin, Wallin et.al. n.d.).