Excavations in Peva Valley, Rurutu, Austral Islands (East Polynesia)

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INTRODUCTION

THE AUSTRAL ISLANDS, which have close ties to the Societies and southern Cooks, are an area of key importance to East Polynesian prehistory. However, relatively little archaeological research has been done there, and so the Australs remain poorly understood in terms of the colonization of East Polynesia. In addition, there are few firsthand accounts of traditional life. The position and character of the Australs in East Polynesia is unique. They lie on the periphery of central East Polynesia and define its southern boundary. They are more temperate than the Societies to the north and the southern Cooks to the northwest. Despite being one of the most centrally located groups in East Polynesia, they are one of the most isolated. They have strong cultural and linguistic bonds with both the Societies and the southern Cooks and yet are far enough from each to possess a distinct character. The Australs are thus well situated to test current models of early East Polynesian prehistory.

Most early, or Archaic, East Polynesian sites date to within A.D. 1000–1450 (e.g., Rolett 1996, 1998; Walter 1996). During this period the Polynesians were not only colonizing islands but voyaging back and forth between them, a phenomenon that tapers off after A.D. 1450 and almost disappears by European contact. The sharing of ideas contributed to the linguistic and cultural similarity within East Polynesia, evident in the common characteristics of the material culture of this era, most notably the form of domestic and manufacturing tools, adzes, one-piece pearlshell fishhooks, and ornaments, the similarities that can be attributed to interaction (Rolett 1996; Walter 1996). Geochemical sourcing of materials such as basalt has provided empirical confirmation of inter-island and inter-archipelago exchange (e.g., Weisler 1998). Experimental voyaging (Finney 1977, 1994) and computer simulations (Irwin 1992, 1998) have demonstrated that a well-equipped canoe can traverse distances of hundreds of kilometers, whether sailing into the wind or against it. These lines of evidence have all contributed to the concept of a regional homeland, comprising multiple interacting archipelagoes.

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Central to the idea of a regional homeland is the fact that important resources are unevenly distributed among the islands in East Polynesia. Two of the most important resources are basalt for adze making and pearlshell (*Pinctada margaritifera*) for fishhook manufacture. Following the colonization of an island, multiple voyages may have been necessary to supply the new population with raw materials and other necessities. Long-distance voyaging and trade networks appear to have flourished prior to c. A.D. 1450, after which imported artifacts gradually diminish from the archaeological record. This pattern is seen throughout East Polynesia. For example, adzes from Eiao in the Marquesas were exported as far as Mo'orea in the Societies and Mangareva, all found in deposits dated to before A.D. 1450 (Green and Weisler 2002:233; Weisler 1998; Weisler and Green 2001:420). Within the Marquesas the number of Eiao adzes becomes drastically reduced after A.D. 1450 (Rolett 1998:193). On Aitutaki in the southern Cooks, adzes from Archaic period deposits were probably imported from Mangaia, Samoa, and the Societies (Allen and Johnson 1997). The presence of pearlshell is also indicative of exchange. In the southern Cooks, on Aitutaki, Mangaia, and Ma'uke, fishhooks of possibly imported pearlshell dominate in the Archaic deposits and inferior local *Turbo* shell hooks replace them in the later ones (Allen 1992a:192–193, 2002:199; Kirch et al. 1995:52; Walter 1998:100). In each case, local material begins to phase out imported material after A.D. 1450 and eventually replaces it altogether, suggesting a marked decline in interaction.

By European contact in the eighteenth century, long-distance voyaging had practically vanished in East Polynesia, with only the atolls of the Tuamotus maintaining trade out of necessity (Irwin 1992:182–183). Postulated reasons for this decline in interaction include climatic change (Bridgeman 1983), economic impracticality (Finney 1994; Kirch 1988; Walter 1996), resource, especially timber, depletion (Weisler 1994), and repercussions from sociopolitical developments in the Societies (Rolett 2002; Weisler 2002).

The concept of a regional homeland has important implications for how researchers view the colonization process, which has shifted from a linear, stepping-stone model (e.g., Emory and Sinoto 1965) to a far more complex one that we are only beginning to understand. The precise dating of colonization is an ongoing question, with well-stratified deposits lacking in key locations such as the Australs (Kirch 2000:233). However, radiocarbon dates do corroborate this model so far; all Archaic sites date to within the A.D. 1000–1450 range, be they in the Marquesas, the Southern Cooks, the Societies, or New Zealand (see Anderson and Sinoto 2002). The missing piece in this model remains the Australs, due to a paucity of archaeological excavation in the region (Rolett 2002:186; Weisler 1998:528) and a lack of geochemical analyses that may reveal ties with other island groups (Allen and Johnson 1997:129; Weisler 1998:526; Weisler and Green 2001:433; Weisler and Sinton 1997:187).

Most excavation in the Australs has been restricted to Classic period (c. eighteenth to nineteenth centuries A.D.) sites, namely Vitaria on Rurutu (Vérin 1969), the *marae* Te Rae Rae and the hilltop terrace of Hatuturi on Ra'ivavae (Skjölsvold 1965*a*, 1965*b*), and the *pare* fortifications on Rapa (Ferdon 1965*a*, 1965*b*; Kennett et al. 2006; Mulloy 1965; Smith 1965). Additional survey on Ra'ivavae (Edwards 1998, 2003) and Rimatara (Eddowes 2004) has contributed to our knowledge of Classic period sites and settlement patterns. Most of these

excavations have yielded typical Classic period artifacts, and have all been reliably dated to no earlier than the seventeenth century. Excavations on Archaic period (c. A.D. 1000–1450) sites have been limited. The term "Classic" period is well established for the Australs (e.g., Vérin 1969), and denotes the final phase of East Polynesian culture prior to European contact when monumental architecture, mainly *marae*, flourished. Garanger (1967:386) found that all radiocarbon samples from *marae* in the Societies dated to within the last centuries prior to European contact and hence the Classic period has also been referred to as the *Marae* period (Garanger 1967:387). Archaic period sites have been few. A rockshelter on Rurutu yielded some artifacts reminiscent of the Archaic, but the stratigraphy was confused and a radiocarbon sample, likely contaminated, yielded a date of 150 B.P. (Vérin 1969:146, Annexe I). More recent work on Tubua'i (Eddowes 1998) has unearthed many diagnostic Archaic artifacts. Consequently, while we have a sufficient database for the endpoint of Austral culture, we are missing data from enough early sites that would allow us to construct a developmental sequence.

In May–August 2003 I excavated a dune site in the valley of Peva on Rurutu in the Austral Islands. The site yielded a rich artifact and faunal assemblage from two distinct stratigraphic layers. The earlier deposit, which dates from the late thirteenth to early fifteenth centuries A.D., spans the Archaic period. The later layer, associated with a *marae* complex, covers the Classic period that lasted until early European contact. From one era to the next major changes occurred in material culture and subsistence. Sociopolitical changes are also reflected in the archaeological record, including evidence for feasting and wealth. The Peva dune site offers the first reference point of its kind for the Australs, and thus is significant in terms of East Polynesian prehistory. In this article the results are summarized and related to other contemporaneous sites in East Polynesia. The full details of this excavation are presented in Bollt (2005*a*, n.d.).

RURUTU: THE ENVIRONMENTAL AND CULTURAL SETTING

The Austral Islands comprise the eastern half of the Cook-Austral chain (Fig. 1). The Australs include the islands Rimatara, Rurutu, Tubua'i, Ra'ivavae, and Rapa, as well as the uninhabited Maria atoll and the Marotiri Rocks. The Australs have the smallest total landmass of any archipelago in Polynesia save for the Pitcairn group. Their surface area is therefore extremely circumscribed in comparison to other Polynesian islands. Rurutu is located at 151°21′W and 22°27′S, 472 km southeast of Tahiti. It is approximately 10 km long (north-south), and 5.5 km wide with a total landmass of 38.5 km^2 (Maury et al. 2000:11; Vérin 1969:26). The island was initially formed around 12 million years ago with a second period of volcanism over one million years ago that uplifted it and deposited a fresh layer of lava (Bonneville et al. 2002). Today, raised *makatea* constitutes approximately 28 percent of Rurutu's total landmass (Stoddart and Spencer 1987:6). Rurutu's maximum elevation is 389 m. Although not high enough to produce orographic rain, the southerly position of the Australs makes up for this and drought is not a problem. The annual rainfall is between 1800 and 2000 mm (ORSTOM 1993).

The small size of the Australs has also contributed to their current degraded vegetative state. Rurutu in particular was heavily deforested by the time of European contact. In 1769 Joseph Banks (1962:332) wrote, "The Island to all appear-

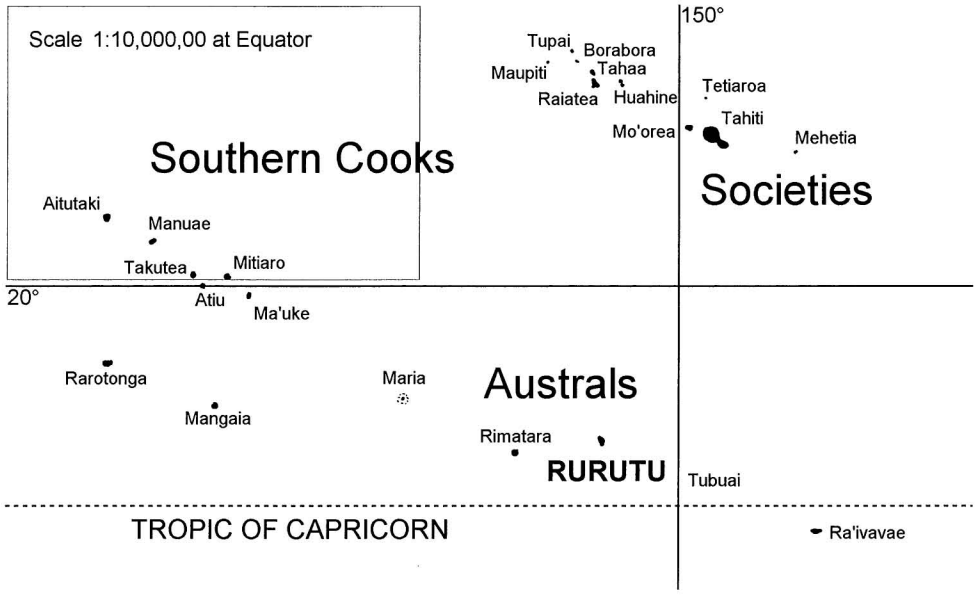


Fig. 1. The Societies, southern Cooks, Australs, and western Tuamotus. Insert: Rurutu and surrounding fringing reef.

ance that we saw was more barren than any thing we have seen in these seas." The volcanic core is covered mostly by secondary vegetation. The hill slopes are dominated by pyrophytic growth, notably *Miscanthus* grass, and in the higher altitudes *Dicronopteris* ferns. Most of these areas are virtually useless for cultivation, which is concentrated in the valleys. A narrow fringing reef encircles the island, and only two passes (located at Moera'i and Avera) are large enough to accommodate a sizeable ship. The *makatea* cliffs form, in some cases, natural barriers between the valleys. Before modern roads, overland passes were the primary means for getting from one valley to the next. The *makatea* formations have served to trap sediment in the swampy valley floors, forming terrain that is eminently suitable for taro cultivation (Stoddart and Spencer 1987). Figure 2 illustrates the different zones of Rurutu.

Rurutu possessed all Polynesian-introduced cultigens, notably breadfruit (*Artocarpus altilis*), coconut (*Cocos nucifera*), sweet potato (*Ipomoea batatas*), yams (*Dioscorea* spp.), Tahitian chestnut (*Inocarpus fagiferus*), banana (*Musa*), and wet and dry varieties of taro (e.g., *Colocasia esculenta*, *Alocasia macrorrhiza*). Due to the wet climate, the Australs emphasized irrigated taro over all other cultigens as a staple crop. Of Rurutu's nine traditional districts (Moera'i, Peva, 'Auti, Papara'i, Na'a'iroa, Una'a, Naru'i, Avera, and Vitaria), only Vitaria does not possess swampland for taro cultivation. In the Australs, taro is cultivated in both raised-bed systems and pondfields (Seabrook n.d.: 1); the methods used depended on the population size. Seabrook (n.d.: 3) wrote, "Taro fields may be irrigated artificially or not: the small Rimatara population did not have to do more than weed and plant the borders of the natural swampland surrounding their island, while the crowded Rurutuans had to adapt their too-well drained island by terracing

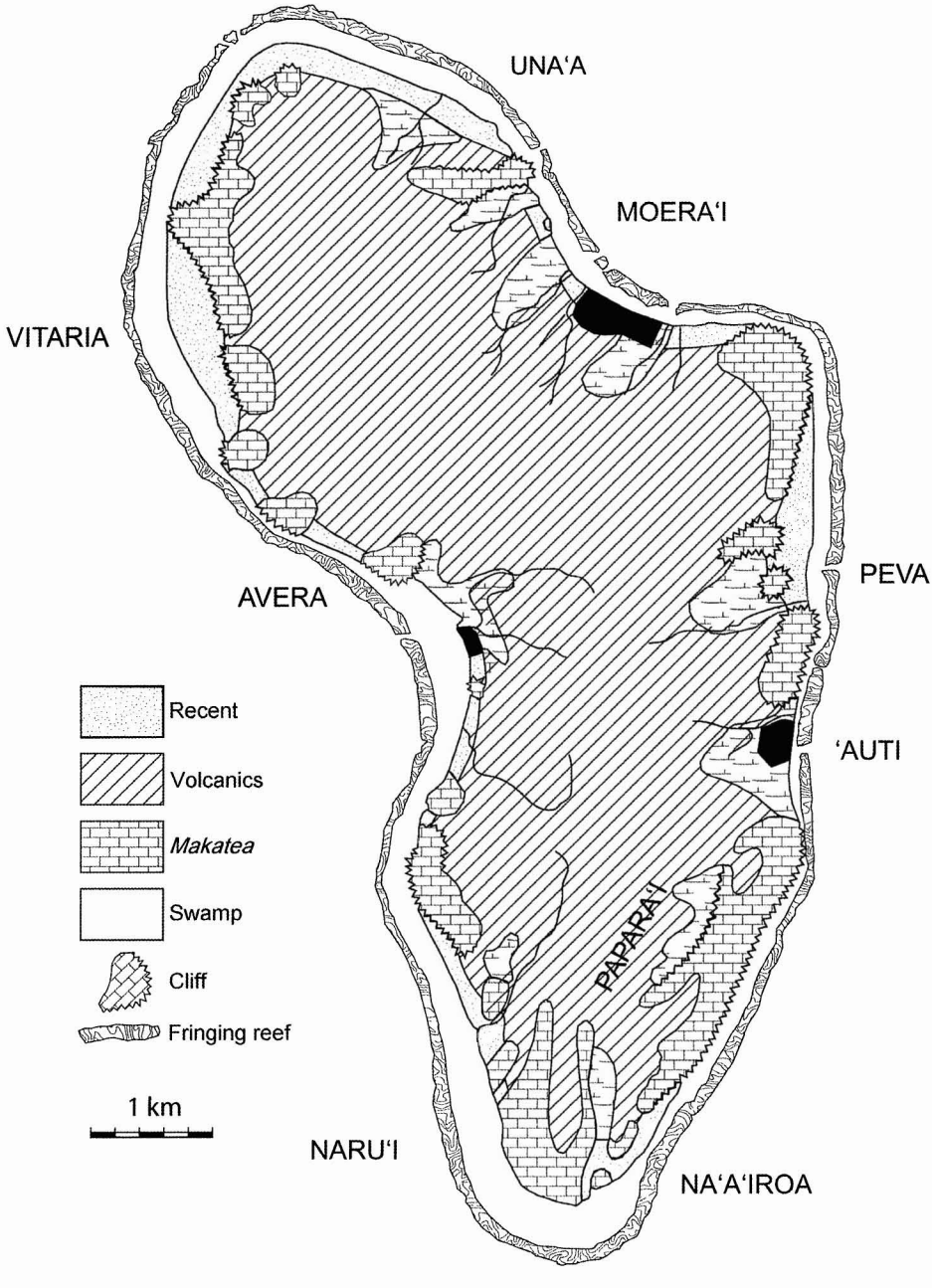


Fig. 2. Map of Rurutu showing areas of coastal plain, volcanic core, *makatea*, and swampland (after Stoddart and Spencer 1987: Figure 3).

endless slopes and re-channeling stream-beds: the Ra'ivavaean cultivation was a compromise." Today, most of Rurutu's population is concentrated in the valleys of Moera'i, Avera, and 'Auti, and the swampland in other valleys, such as in Peva, remains mostly fallow.

Rurutu's prehistoric fauna was limited to the introduced pig, dog, chicken, and rat. The flying fox, or fruit bat (*Pteropus tonganus*), present today in some islands in the southern Cooks, was not present on Rurutu (Seabrook 1938:4). However, bones from this species were excavated at Peva, suggesting that it either previously inhabited the island or else that the Polynesians imported some (Weisler et al. 2006). Rurutu's surrounding fringing reef and lack of a lagoon limit the range of fish species (Vérin 1969:29). These are mostly inshore species that feed on the coral formations. Open-water fishes and turtles also swim within the fringing reef where there are passes. The reef is home to a wide variety of mollusks, crustaceans, and echinoderms, although shellfish gathering is not now important. Today on Rurutu there are few species of sea birds and indigenous land birds, but in the nineteenth century the Australs and the southern Cooks were so famous for their parakeet feathers that the Tahitians called them the Paroquet Islands (Henry 1928:464). Tropicbirds were still numerous on Rurutu in the twentieth century, perhaps due to the protection the high *makatea* cliffs afforded (Seabrook 1938:4). It is probable that the number of bird species on Rurutu has declined considerably since initial settlement, as has been demonstrated on Mangaia (Kirch et al. 1995).

James Cook (1955:155) was the first European to reach the Australs, sighting Rurutu on August 14, 1769; he did not, however, try to reach shore. In the early 1800s, European contact introduced diseases that ravaged the population, as happened throughout Polynesia. Beginning in the early 1800s, the population fell from an estimated 3000 people to 200–300. By the 1920s the population had grown to 1240 (Seabrook 1938:10), and today it stands at 2000 people. The Australs were extremely quick to convert to Christianity, which was introduced in 1819 to Ra'ivavae and dominated the entire archipelago several years later (Ellis 1969*b*). Rurutu was evangelized practically overnight in 1821, an occurrence that led to the destruction of much of the island's religious architecture and its "pagan" idols, which is especially unfortunate considering the superb craftsmanship of extant pieces of Austral wood carving. This event also left us with few observations of traditional life there. The most thorough account comes from James Morrison (1935), who arrived on Tubua'i with Fletcher Christian and the mutineers from the *Bounty* in 1789. The missionary William Ellis (1969*a*, 1969*b*) also spent time in the Australs and Rurutu and recorded some valuable observations. F. Alan Seabrook, an ethnographer living in Tahiti, traveled to Rurutu in the 1930s and was most responsible for documenting the traditional way of life. Seabrook was fluent in Tahitian as well as the dialects of the Australs, and his unpublished observations are invaluable. Donald Marshall, whom Seabrook accompanied to Ra'ivavae in the 1950s, described Seabrook as "a brilliant man ... one of that breed who prefer living in Polynesia to anywhere else in the world. He is a thinker, a writer, and intellectual" (1961:22, 30–31). Pierre Vérin (1969) undertook the first archaeological investigation on Rurutu in the 1960s, mostly concerned with the district of Vitaria.

Based on Seabrook's research, supplemented by the accounts of Ellis and Morrison, we know that the sociopolitical structure of the Australs was an Open one

as Goldman (1970) defined the term. In an Open society there is a fluid social structure that allows non-chiefly classes to compete for power, and warfare is usually endemic. Rurutu was divided into nine districts, in which either one or several clans (*'opu*) held sway, each dominated by a chief (*ari'i*). Seabrook (1938:76) wrote, "The fundamental group was the three-generation one that naturally gathered around a pater-familias. The first-born son (*mata'iapo*) inherited everything. His brothers and sisters were apt to remain under his roof; and even raise their families in association with his wife, children, grandchildren, adopted children, and menials." The *'opu* was the basis of the social community because it owned the land, water supply, chestnut trees, and taro beds (Seabrook 1938:80). Large, oval-ended houses like those of Vitaria were once found all over the island, and could house a large family group of about 20 people. The chiefly class of the Australs appears to have been rivaled in status by that of the priests (Morrison 1935; Seabrook 1938), something that is not uncommon in Open societies such as the Marquesas (e.g., Thomas 1990).

Another Open characteristic of the Australs was the more-or-less constant warfare. The wars of Rurutu provide a good example of the "wet-dry" dichotomy discussed in Kirch (1994). According to genealogical records, Vitaria was the last district to be settled on Rurutu, probably because it is the least favorable location, lacking permanent streams and swampland. The semi-legendary first chief of Vitaria, Amaiterai, was the younger son of a chief of Tubua'i, and began his wanderings in search of the power that he could not inherit (Seabrook 1938). If we do not dismiss the oral and genealogical traditions out of hand, Amaiterai settled in Vitaria, the only uninhabited district left on Rurutu, in around the fifteenth century A.D., suggesting that population growth was quite rapid and the entire island had been claimed within four or five centuries of initial colonization. The wars between the aggressive "dry" Vitaria and the "wet" valley of Peva lasted for centuries. Although without suitable productive land, Vitaria encouraged population growth and the influx of immigrants from neighboring Una'a and developed an elite caste of warriors with which it could attack and subdue other valleys. By the eighteenth century Vitaria became powerful enough to defeat its archrival Peva and settle people in the wet, taro-rich valleys it had long coveted. The smaller valleys in the southern portion of the island were also accustomed to fight with one another (Seabrook 1938).

To summarize, Rurutu is an island with great productive capacity in taro fields. These are unevenly distributed around the island, and may well have been one of the major reasons for warfare, as was the case on Mangaia (Kirch et al. 1995). Rurutu is similar to Mangaia in other ways as well, notably in that they are both *makatea* islands with degraded landscapes, no lagoon, and Open sociopolitical systems. Despite these similarities, Rurutu developed in quite distinct ways. The results of the Peva excavation are important in terms of outlining the first such long-term sequence for the Australs.

THE PEVA DUNE SITE (ON1)

Peva is subdivided into two portions, northern Peva Iti, and southern Peva Rahi. Peva Iti is fed by one river, and is much narrower than Peva Rahi and has no swampland. Peva Rahi is a deep valley, whose swampland is fed by three rivers.

According to modern informants, Peva Rahi was once the administrative center of Peva and the chiefly residence while Peva Iti was home to the general populace. Today, Peva Rahi is uninhabited, while in Peva Iti there are several homes and a pension. I selected Peva Rahi for archaeological excavations because a sand dune extends along the entire length of the valley mouth. The sand dune is covered by a layer of topsoil and is overgrown. Peva contains one of the most attractive beaches on the island and is one of its favored fishing spots. In addition, one of the few passes through the island's surrounding fringing reef is located there, although not large enough for more than a small boat. Peva is altogether a perfect valley for human settlement, with its freshwater streams, vast potential for agriculture, and rich fishing grounds. As Peva has been largely abandoned for most of the twentieth century, prehistoric surface remains are still extant.

I focused upon the parcel of land called Te Onetietie, which contains a *marae* called 'Uramoa (Fig. 3). 'Uramoa was first documented by Seabrook (1938:180), who wrote, "*Marae* Uramoa in south Peva is now represented by less than half a dozen random slabs; it is said to have been built by the rather legendary *marae*-founder of the Australs, Tupaea; Tupaea founded Uramoa with a cornerstone brought from *marae* Tonohae in Tupuai."

Excavations

Excavation took place from May–August 2003. We began by placing 1 × 1–m test pits around the *marae* to establish the basic stratigraphy of the site and locate deeper cultural deposits. Natural barriers such as walls and vegetation restricted pit placement. It was immediately apparent that there was a culturally sterile deposit of white sand beneath the topsoil and the coral stone *marae* pavement. The clear stratigraphy dictated that excavation should proceed according to natural stratigraphic layers. All deposits were screened through 1/8″ mesh and all artifacts recovered in situ were plotted on unit maps. Cultural features such as earth ovens were photographed, as were wall profiles. Excavation proceeded in two major areas, designated Area 1 and Area 2 (Fig. 3). Both areas contained two entirely distinct cultural deposits separated by a thick layer of sterile beach sand. Area 1 was only rich in terms of the later deposit, which consisted primarily of midden, mostly pig and turtle bone, with few artifacts. The earlier layer contained mainly basalt debitage flakes with few artifacts, and the midden was mostly bivalve shell, with little bone. There was no trace of any pavement, although there was an earth oven feature from which charcoal samples were taken for radiocarbon dating. On the whole, Area 1 resembled a temporary cooking or campground more than a permanent area of habitation. A total of 15.5 m^2 of Area 1 was excavated. In contrast, Area 2 yielded rich Archaic and Classic period deposits so that a basic cultural sequence for Peva could be established. While the Classic period deposit of Area 2 resembled that of Area 1 in every respect, the Archaic period deposit yielded many more artifacts and a greater variety of faunal remains. Thirty-three m^2 of Area 2 were excavated before the Archaic deposit began to dwindle in terms of depth and richness. As the two stratigraphic layers never intersected in either Area 1 or Area 2, there can be no ambiguity concerning the fact that two entirely distinct cultural occupations are represented, separated by enough time for a deep accumulation of beach sand to develop.

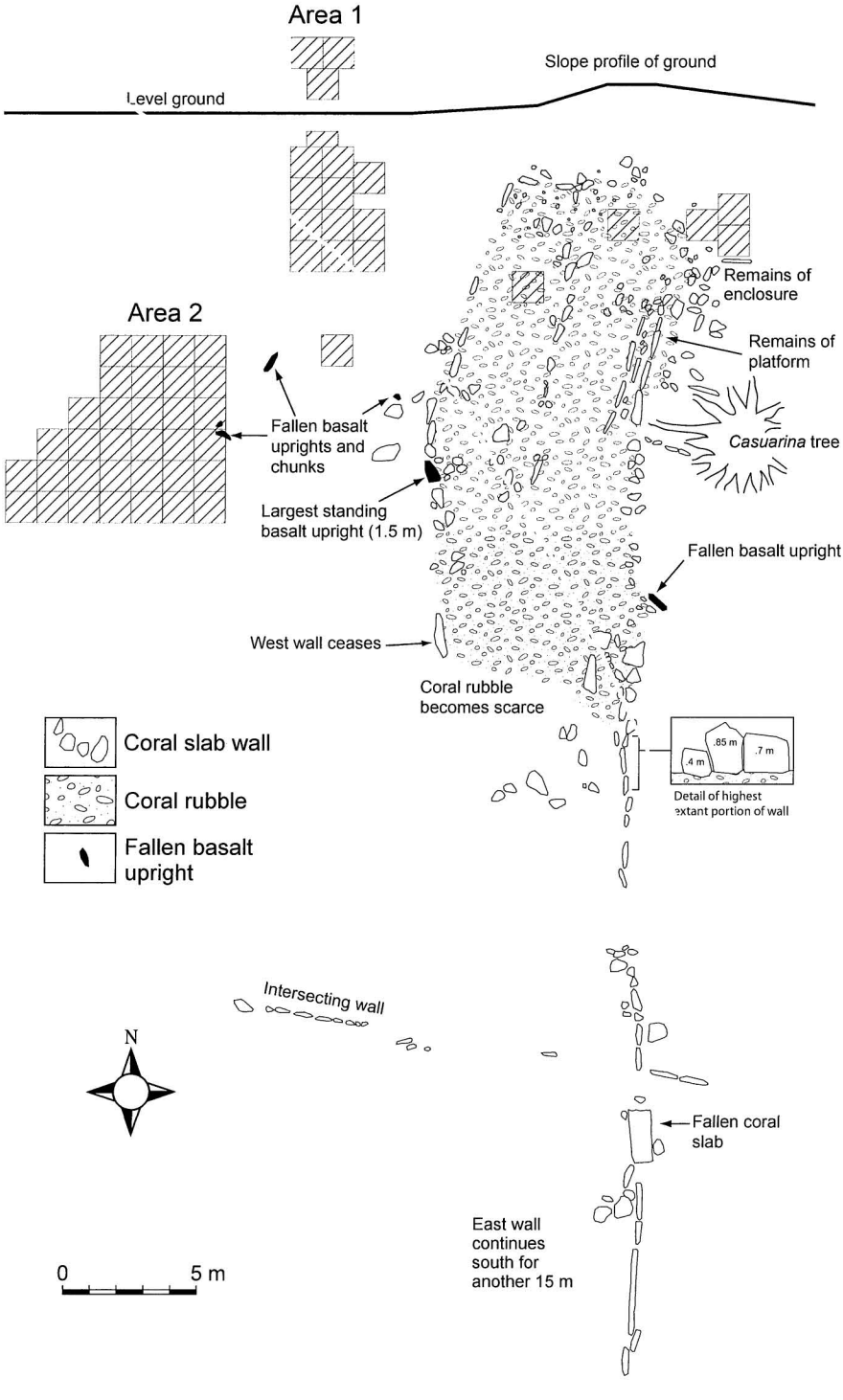


Fig. 3. *Marae* ʻUramoa with excavation areas shaded.

Stratigraphy

There are five stratigraphic layers at Peva, which were generally consistent around the entire site (Fig. 4). There are two cultural deposits separated by a layer of sterile sand. The upper Peva Phase II layer corresponds to the Classic period, and the lower Peva Phase I to the Archaic period.

Layer A — Very dark grayish brown (10YR 3/1) loamy sand. This layer consisted of topsoil, whose depth did not usually exceed 15 cm and whose abundant pig and turtle remains were clearly associated with the period of the *marae* where ritual feasting took place. The midden began at a depth of 2–3 cm, and continued throughout the layer. Pavement stones of coral and basalt represented the original surface of the *marae* grounds, which extended as far as the excavation proceeded, and probably farther. This suggests a structure of greater extent than can be mapped. Layer A was undisturbed, showing that the area of the *marae* had never been used for cultivation, and the few European artifacts unearthed are indicative of the ninteenth century, indicating the abandonment of the site during the early Historic period. Layer A was excavated as a single layer.

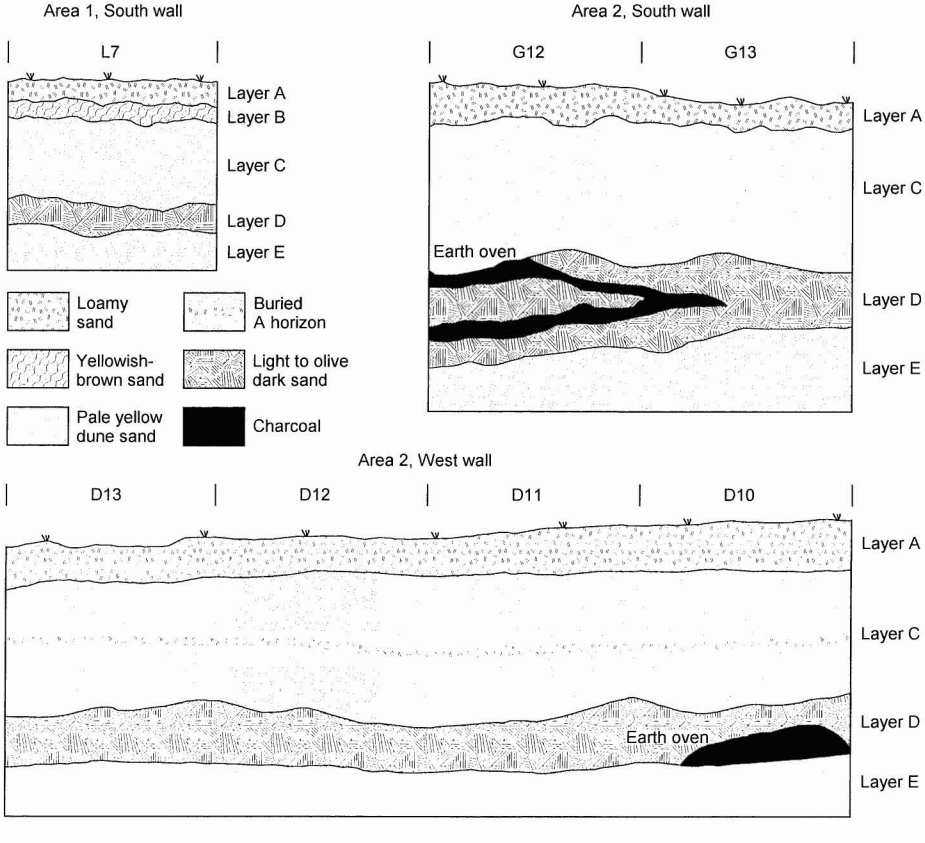


Fig. 4. Stratigraphy of Peva.

Layer B — Yellowish brown (10YR 5/4) sand. This layer is a mixture of the topsoil of Layer A and the sand of Layer C, and was indistinguishable from Layer A in terms of midden and other cultural content. The A/B interface was quite abrupt. This layer, which did not usually exceed 10 cm in depth, was also excavated as a single layer. Layer B was present in Area 1 and the test pits to the east, and absent in Area 2.

Layer C — Pale yellow (2.5YR 7/4) sand, culturally sterile. The B/C interface was abrupt and unambiguous. All cultural content ceased within Layer C, which was usually 40 cm thick in Area 1, and up to 90 cm in Area 2. In the western portion of Area 2, a thin buried A horizon was visible approximately halfway through Layer C.

Layer D — Light to dark olive brown (2.5YR 5/3–4/4) sand, compact and charcoal stained, containing abundant midden and artifacts. The C/D interface was instantaneously evident, as the sand became dark and full of midden and debitage flakes. Layer D represents the Archaic deposit and contained abundant shell midden, fish and nonfish remains, pearlshell artifacts, basalt flakes, and adzes; the artifacts are typologically distinctive of the Archaic period. Coral pavement stones and postholes suggest a house of indeterminate shape.

Layer E — Pale yellow (2.5YR 7/4) sand. This culturally sterile beach sand is identical to Layer C, and contained some coral fragments and water-rolled shell, clearly a part of the original dune matrix. The D/E interface was abrupt and cultural remains ceased almost instantaneously. Layer E represents the pristine sand dune prior to human occupation.

Radiocarbon Dating

Seven charcoal samples from Layer D were analyzed by AMS dating. In addition, two samples of flying fox (*Pteropus tonganus*) bone from Layer D, and two *Turbo setosus* shell samples from Layer D and two from Layer A (which contained no charcoal) were analyzed at NOSAMS. The charcoal and bone samples were processed using organic combustion to produce CO_2 and subjected to a series of heated acid-base-acid leaches to remove inorganic carbon and mobile humic/fluvic phases. Collagen was extracted from the bone samples using the EDTA (ethylenediaminetetra-acetic acid) method. The collagen was then combusted and converted to graphite. The shell samples were analyzed by hydrolysis, being directly hydrolyzed with strong acid (H_3PO_4) to convert the carbon to CO_2. All results were calibrated using Calib 5.0.1 (based on data in McCormac et al. 2002, 2004; Stuiver et al. 1998) and OxCal 3.10. The results are presented in Table 1.

The charcoal dates from the Archaic period (Layer D) in both Areas 1 and 2 are quite consistent with one another. They indicate a period of occupation (Peva Phase I) lasting from approximately the late thirteenth century A.D. until the early fifteenth century A.D. This is consistent with Archaic period sites from other areas of East Polynesia, such as Anai'o on Ma'uke (Walter 1998), Ureia and Moturakau on Aitutaki (Allen and Schubel 1990; Allen and Steadman 1990), and Tangatatau on Mangaia (Kirch et al. 1995). The flying fox bone, which yielded dates 200–300 years older than most of the charcoal dates from the same deposit and depth,

TABLE 1. RADIOCARBON DATES FROM PEVA

LABORATORY #	MATERIAL	UNIT #/AREA	LAYER	AGE B.P.	CAL A.D. (1σ)	CAL A.D. (2σ)
BETA 191560	Charcoal	G13/2	D	590 ± 30	1388–1424	1298–1413
NOSAMS 48511	Charcoal	K2/1	D	590 ± 30	1388–1424	1298–1413
NOSAMS 48512	Charcoal	K2/1	D	635 ± 35	1318–1402	1300–1414
NOSAMS 48157	Charcoal	D11/2	D	805 ± 30	1229–1279	1219–1288
NOSAMS 48158	Charcoal	G13/2	D	695 ± 45	1292–1387	1281–1396
NOSAMS 48047	Charcoal	G13/2	D	630 ± 30	1321–1402	1304–1415
NOSAMS 48048	Charcoal	G13/2	D	660 ± 30	1314–1393	1299–1398
NOSAMS 48011	Bone[1]	G10/2	D	995 ± 35	1034–1147	1022–1174
NOSAMS 48049	Bone[1]	G10/2	D	930 ± 30	1053–1208	1045–1220
NOSAMS 48506	Mollusk[2]	G13/2	D	1420 ± 25	982–1070	920–1135
NOSAMS 48507	Mollusk[2]	G13/2	D	1260 ± 30	1154–1258	1079–1280
NOSAMS 46629	Mollusk[2]	D12/2	A	390 ± 35		
NOSAMS 46630	Mollusk[2]	D10/2	A	380 ± 30		

1. *Pteropus tonganus*. 2. *Turbo setosus*.

is addressed in more detail in Weisler et al. (2006). The *Turbo* shell dating yielded indeterminate results, especially for Layer A. However, since Rurutu was evangelized in 1821 (Ellis 1969*b*), an event that resulted in the destruction of the island's *marae* and an end to the traditional religion, it is reasonable to postulate that *marae* 'Uramoa ceased to be used ceremonially at around that time. Shortly after evangelization, population decline left Peva largely abandoned. In addition, few nineteenth-century European artifacts were recovered from the Classic period deposit. This evidence together shows that Layers A and B can be reliably placed to within the time leading up to, and shortly following, European contact. This second period of occupation is designated Peva Phase II.

MATERIAL CULTURE

The majority of artifacts come from Peva's Archaic period (Phase I) deposit. These include pearlshell fishhooks, ornaments, and manufacturing debitage, coral and sea urchin spine abraders, *Terebra* shell chisels, basalt adzes, preforms, and debitage flakes. The Classic period (Phase II) deposit yielded far fewer artifacts and no fishing gear or shell manufacturing debitage. European artifacts from this deposit include several fragments of hand-blown glass, and a piece of copper sheathing that was used to protect the hulls of ships. The different assemblages reflect a prolonged interval during which material culture had changed considerably throughout East Polynesia. The assemblages are also highly suggestive of the different use phases of the site.

Fishhooks

The small quantity of fishing gear recovered from Peva comes from the Archaic deposit. All the Peva fishhooks are one-piece and made of pearlshell, which does not appear to grow in Rurutu's waters; one-piece pearlshell fishhooks tend to dominate Archaic assemblages (e.g., Walter 1996:520). The Archaic East Polyne-

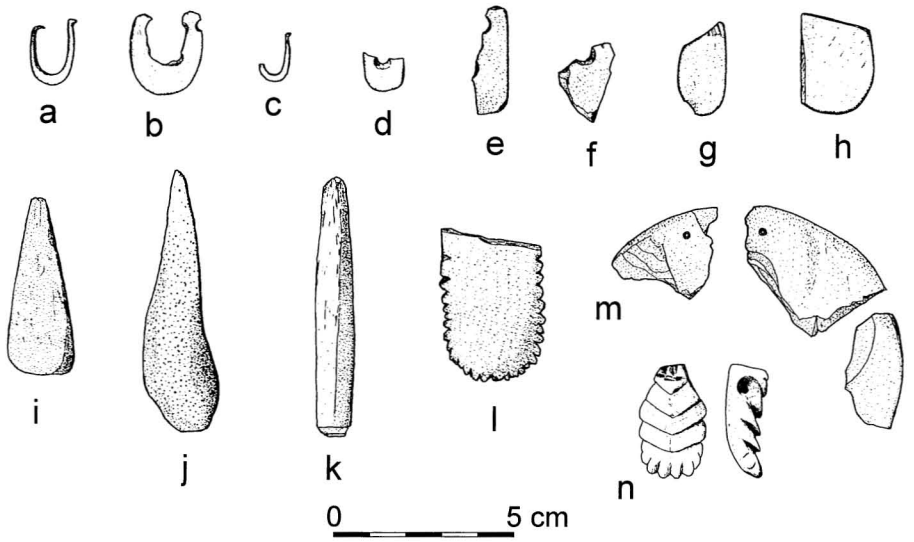


Fig. 5. Selected artifacts from Peva: a: acute recurved point fishhook (Archaic); b: preform of acute recurved point fishhook (Archaic); c: jabbing hook (Archaic); d–f: drilled fishhook tabs (Archaic); g–h: tabs (Archaic); i: *Porites* coral file (Archaic); j: branch coral (*Acropora*) file (Archaic); k: sea urchin spine abrader (Archaic); l: broken serrated pearlshell ornament (Archaic); m: fragments of pearlshell disc ornament (Classic); n: tiki pendant (Classic).

sian fishhook kit is morphologically diverse with a much wider variety of forms than found in the Classic period (see Rolett 1998). The similarity between Archaic period fishhook assemblages throughout East Polynesia suggests interaction (e.g., Walter 1996). The only positively identifiable type from Peva is the acute recurved point (Fig. 5a, b), similar to examples found in Ma'uke (Walter 1998: Fig. 4.3) and Aitutaki (Allen 1992*a*: Pl. III). This particular type is common in Archaic assemblages throughout East Polynesia, occurring in the Marquesas, Hawai'i, the Southern Cooks, and Mangareva (Walter 1996:517; Weisler and Green 2001:421). This type continued to be made in East Polynesia until the nineteenth century, but its morphology changed, especially in terms of point/shank ratio (Weisler and Green 2001). The head, or lashing point, also exhibits distinct differences through time. Simple notched heads tend to be early, while knobbed lashing points tend to be a later development (Allen 1996:109). The simple jabbing fishhook from Peva (Fig. 5c) has the later notched-type head. Comparing the Peva examples to those of Classic period Vitaria (Vérin 1969:214–218), it is evident that the earlier notched head is as characteristic of Peva as the late knobbed head is of Vitaria and the Classic period.

Although *Turbo setosus* was recovered in large quantities from both the Archaic and Classic period deposits, it is all midden and none of it is worked. All Archaic period manufacturing debitage is pearlshell (Fig. 5d–h), in contrast to the worked *Turbo* shell from Vitaria (Vérin 1969). *Turbo* is found commonly on fringing reefs and rocky shorelines. Compared to pearlshell, it is a brittle and inferior material for making fishhooks. The quantity of pearlshell, as opposed to *Turbo*, fishhooks tends to decline over time in East Polynesian sites. This is especially evident in the

southern Cooks, such as Mangaia (Kirch et al. 1995), Aitutaki (Allen 1996; Allen and Steadman 1990), and Mitiaro (Walter and Campbell 1996), and presumably reflects the dwindling ability of island populations to import pearlshell as long-distance voyaging declined after around 1450 A.D. (e.g., Walter 1998). The ratio of pearlshell to *Turbo* fishhooks can therefore reflect a site's relative age. Peva's assemblage, though small, is typically Archaic in the sense that pearlshell was the only material used for fishhooks. On the other hand, the Vitaria fishhook assemblage is characteristic of the Classic period, consisting mainly of *Turbo* hooks with few unfinished pearlshell examples (see Vérin 1969:216). However, the need for many fishhooks of any kind during the Archaic period on Rurutu is doubtful. Fishhook manufacturing tools from Peva's Archaic period deposit are few, including one *Porites* file (Fig. 5i), one branch coral (*Acropora*) file (Fig. 5j), and one sea urchin spine abrader (Fig. 5k). One stone anchor weight was also found.

Why so few fishhooks were recovered is likely directly related to the presence of a fringing reef and lack of a lagoon. If pearlshell ever grew in Rurutu, it was probably only in small quantities. The pearlshell from Peva's Archaic deposit was probably imported, possibly from neighboring Tubua'i, whose large lagoon still supports pearlshell populations. The lack of fishing gear is best explained by the prevalence of net fishing on Rurutu. This strategy is employed today, and is far more common than offshore angling and trolling. In fact, few families own a canoe on the island, and offshore pelagic fishes such as tuna have to be purchased for cash from professional fishermen. Based on the fishbone assemblage, which contains overwhelmingly inshore species that are found within the fringing reef and are easily taken with seine nets, it is most probable that this same strategy was employed in the Archaic period. The full array of Archaic East Polynesian fishhook types and bonito lures may well have been known to the early inhabitants of Rurutu, but deliberately dropped from the kit. As net fishing is a far less risky method for catching large quantities of fish (e.g., Kirch and Dye 1979; Leach and Davidson 1988), it is unlikely that angling and trolling were ever common.

Other Non-Lithic Artifacts

Some utilitarian items were recovered from Peva's Archaic period deposit, such as *Terebra* shell chisels, found in Archaic assemblages elsewhere in Polynesia, worked mammal (probably pig) bone, worked turtle carapace, and fragments of ochre. Since pearlshell was scarce or nonexistent, it is not surprising that the only non-fishhook items found in this material are ornaments and not tools such as graters. One broken serrated pearlshell ornament was recovered from Peva's Archaic deposit (Fig. 5l). Serrated pearlshell objects are mostly in the form of discs, such as those from Ha'atuatua in the Marquesas (Suggs 1961: Fig. 35); discs such as these are widely distributed in Archaic period sites (Walter 1996: Table 1).

Peva's Classic period deposit yielded fragments of a pearlshell disc (Fig. 5m), which may have been an ornament sewn onto a garment or else perhaps part of a flywhisk; Vérin (1969: Fig. 88) found a similar fragment in Vitaria. Buck (1944:438) reported such items from burial caves in Atiu and Ma'uke, so its occurrence in the *marae* deposit of Peva is not surprising. A high-status item such as this was especially rare considering the likely need to import the pearlshell (Vérin 1969:169). Vérin (1969:169, 211) speculated that adzes and feathers for head-

dresses were items that may have been traded for pearlshell. The Classic period deposit also yielded an anthropomorphic bone tiki pendant (Fig. 5n), the first such ornament found in an archaeological context from the Australs; this artifact is discussed at length in Bollt (2005*b*).

Another unique find from Peva's Classic period deposit is an unbroken and functional Triton (*Charonia tritonis*) conch shell trumpet (*pū*). It was found face down, directly beneath a paving stone, buried in the surface of Layer C in Area 2. It appears to have been deliberately cached. The Triton shell is typically found in deep waters outside the coral reef (Salvat and Rives 1983:306), and I was told that such shells are rarely found on Rurutu. The spiritual importance of this item in Classic period East Polynesia is well known. Henry (1928:391) wrote, "All univalves called *pūpū* were shadows of the gods, notably the trumpet shell, which was a herald of 'Oro." Henry (1928:156–157) also documented that chiefs and priests in Tahiti used such trumpets in processions and to make announcements. Buck (1944:269–270, Fig. 167) described this type of trumpet in the southern Cooks, and illustrated two similar examples collected by the London Missionary Society, one of which was probably a sacred trumpet and a gift from the king of Mangaia. As in the Societies, on Mangaia the Triton shell was considered to be the symbol of the deity Rongo, the principal god of the island, and was kept inside the god house of the *marae* (Buck 1944:367). The king is said to have used it to summon warriors in Rongo's name, and the trumpet's sound was thought to be the voice of Rongo himself (Buck 1944:464). The Peva example is almost certainly a sacred trumpet associated with the *marae*. This would explain why someone would bury it, possibly to hide it as the island's *marae* were being demolished in 1821.

Few European artifacts were recovered at Peva, all from the first few centimeters of the Phase II Classic deposits. There are fragments of hand-blown broken glass and one piece of copper sheathing that European vessels used to protect against dreaded Teredo worm (shipworm). Given the impossibility of a large ship mooring at Peva, it is likely to have come from Moera'i or Avera.

ADZES

Adzes represent the majority of artifacts from Peva, occurring primarily as preforms, but with some finished examples. Over 1800 debitage flakes were recovered from the Archaic (Phase I) deposit, suggesting that adze making was an important activity. Slightly fewer than 200 debitage flakes, one complete adze, and two preform fragments were found in the Classic period deposit, indicating that adze making was less significant.

Peva's Archaic period adze assemblage is interesting because, unlike the fishhook assemblage, it includes nearly the full array of Archaic East Polynesian forms (Fig. 6). I employ Duff's classification system (1956, 1959, 1970); Figueroa and Sanchez (1965) used it to describe the largest published sample of Austral island adzes, as did Vérin (1969) for his Rurutu assemblage. The majority of Peva's Archaic period adzes are of the untanged quadrangular Duff Type 2A variety (1956, 1959, 1970), of which Figure 6c is one example. Type 2 adzes are thin, untanged adzes of quadrangular cross section. Peva's Archaic assemblage contains 33 examples of adzes, mostly broken preforms, that can only be classified as Type 2s, be-

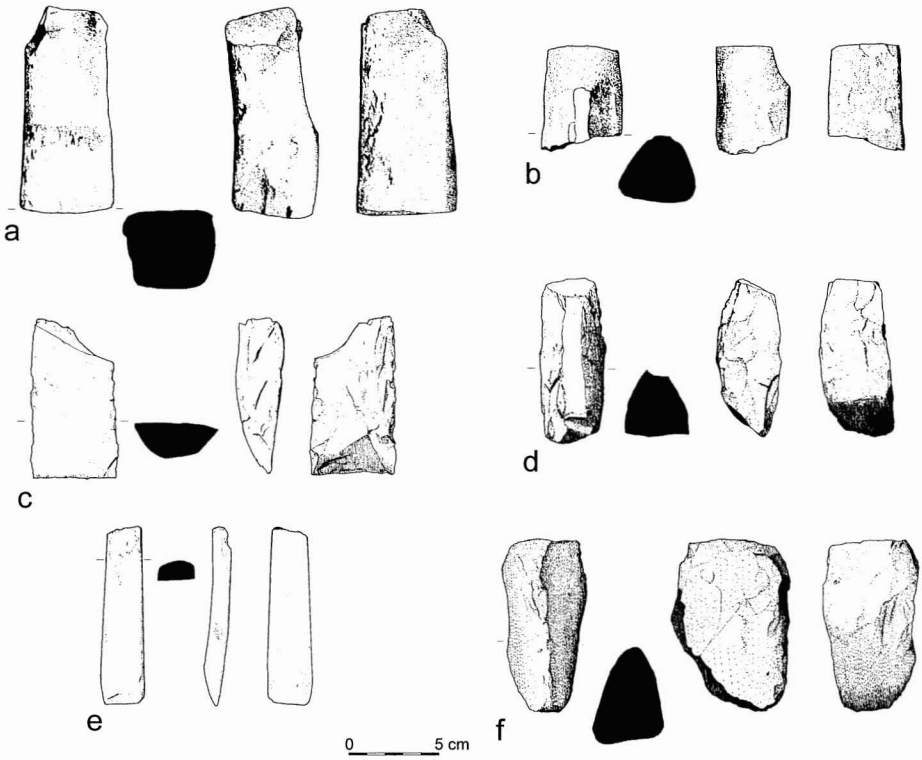


Fig. 6. Representative adzes and preforms from Peva's Archaic period deposit: a: butt of Type 1A adze; b: butt fragment of Type 4A adze; c: blade end of Type 2A adze; d: preform of Type 4E adze; e: complete Skinner Type 1B adze; f: preform of Type 4 adze.

cause they are too thin to accept a tang, and probably represent 2As based on the frequency of diagnostic specimens. Type 2 adzes are the ones that most closely resemble West Polynesian varieties. Type 2 adzes encompass a wide range of variability, including Archaic plano-convex forms (typically classified as Type 2B). The distribution of this simple adze type is universal. Type 2 adzes are the most prevalent variety in Archaic East Polynesian and West Polynesian sites. While Type 2A is prevalent in Archaic period East Polynesian assemblages, it continued to be made into the Classic period. One whole and finished example comes from Peva's Classic period deposit, and Vérin (1969:177) also found two fragments of Type 2 adzes in Vitaria.

One finished and unbroken adze that most closely matches Skinner's New Zealand Type 1B (1974; Fig. 6e) was recovered from Peva's Archaic deposit. Taken together with the Duff Type 2A and the adze types discussed below (Duff Types 1A and 4A), all very common in Archaic New Zealand sites, the Skinner Type 1B adze is thought-provoking in terms of a potential Austral Islands–New Zealand connection.

One example of Duff's Type 1A (1956, 1959, 1970) was also recovered from the Archaic period deposit (Fig. 6a). Type 1s are generally sturdy, quadrangular tanged adzes. Type 1As come in two varieties, one with a plain tang and the

other with raised poll lugs that provide an extra grip for lashing. The basic Type 1A form occurs throughout East Polynesia and was a long-lasting form. However, it has no equivalent in West Polynesia (Green 1971:34), and probably developed during the first centuries following the colonization of East Polynesia. Duff (1956) believed that the Type 1A originated in the Societies and spread to the Australs and then from there to New Zealand.

Duff's Type 4 (triangular, apex-up) adzes (1956, 1959, 1970), both tanged and untanged varieties, are relatively common in Archaic East Polynesian assemblages. Type 4 adzes are one of the three (2A, 4A, 1A) most prevalent groups in Archaic deposits in New Zealand, second only to 2A (Duff 1956:180). Several examples were found in Peva's Archaic period deposit. The triangular adze appears to be a Polynesian innovation, originating in West Polynesia (Green 1971:31–32, 1974:261). These adzes are well suited for hollowing out a canoe (Best 1977), and continued to be in use into the Classic period, albeit in a modified form. Peva's Archaic assemblage contains two varieties of Type 4 adzes, Type 4A, and Type 4E, as well as nondiagnostic Type 4 specimens. Type 4A (Fig. 6b) is a tanged reverse triangular adze. This type of adze is typically regarded as an East Polynesian invention, but reverse triangular adzes with distinctly reduced butts, i.e., tangs, are known from Samoa (e.g., Kikuchi 1963: Fig. 48), Fiji (Green 1971:37), and Tonga (Poulsen 1968:87). Type 4E (Fig. 6d) is an untanged reverse triangular adze and is distinguished from Type 4A by the absence of a tang. Duff (1968:125) assigned Type 4E to the Archaic period and representative of "one of the oldest Polynesian cultural traits" based on its distribution and its resemblance to the Samoan adzes known as Type VII (Buck 1930:351). This variety begins in Samoan contexts slightly later than Type 2C, and is contemporaneous with it from around 0 A.D. to 300 (Green 1971: Fig. 2). Duff (1959:137) believed that 4E was second in age only to Type 2, and a "Polynesian elaboration on an ancestral theme, diffused through the Society Islands." Green (1971:31) noted that while some examples come from Fiji, the adze was probably a result of interaction with Samoa. Green (1971:32) considered it likely that Type 4E was a Samoan innovation, to which the tang was later added, thus forming Type 4A. Figure 6f is a preform that may have been destined to be an untanged 4E, or else represents the blade of a 4A that broke off while the tang was being reduced.

The Archaic East Polynesian adze kit was diverse, as was the array of fishhook types. The variety of types found, which has parallels in contemporaneous sites, can be attributed to the diffusion of ideas and technology in the centuries following colonization (Rolett 1996; Walter 1996). Geochemical sourcing of basalt adzes has provided empirical confirmation that inter-island and inter-archipelago trade was occurring during the Archaic period (e.g., Weisler 1998; Weisler and Kirch 1996). As Rurutu was manufacturing most documented Archaic adze types, the Australs were probably interacting with its neighbors. The fact that few fishhook forms were found in Peva is therefore not indicative of a "founder effect," in which most of the forms did not somehow reach Rurutu.

With the post-A.D. 1450 decline in communication, variety decreased dramatically, culminating in the use of far fewer fishhook and adze types. The Classic period forms that were prevalent in the more remote areas of Polynesia such as New Zealand, the Marquesas, and Hawai'i differed from those in the epicenter of the Societies, Australs, and southern Cooks. There, as communication was still occur-

ring following the end of the Archaic period, one adze type superceded all others, the tanged triangular (apex-down) Type 3A. Duff (1956:170) called it "the type par excellence of the Society, Cook, and upper Austral Islands, and its emergence may be regarded as the last great fashion change of adzes that took place in Polynesia." The Classic deposit of Peva contained few artifacts, and only one poor example of a Type 3 adze preform. Surface finds from Peva and Rurutu in general contain mainly adzes of the Type 3 variety, as does the Vitaria assemblage (Vérin 1969). Most of the other stone tools recovered are from the Archaic deposit, including hammerstones and retouched flakes.

Geochemical Sourcing

Peva is the one valley on Rurutu in which there are no natural sources of basalt aside from river cobbles. The wide range of adzes and flake tools in Peva's Archaic assemblage was therefore of special interest, since the stone had to be collected from other parts of the island. WD-XRF analyses for major and trace elements were performed at the University of Hawai'i Department of Geology and Geophysics, following the methodology detailed in Weisler and Sinton

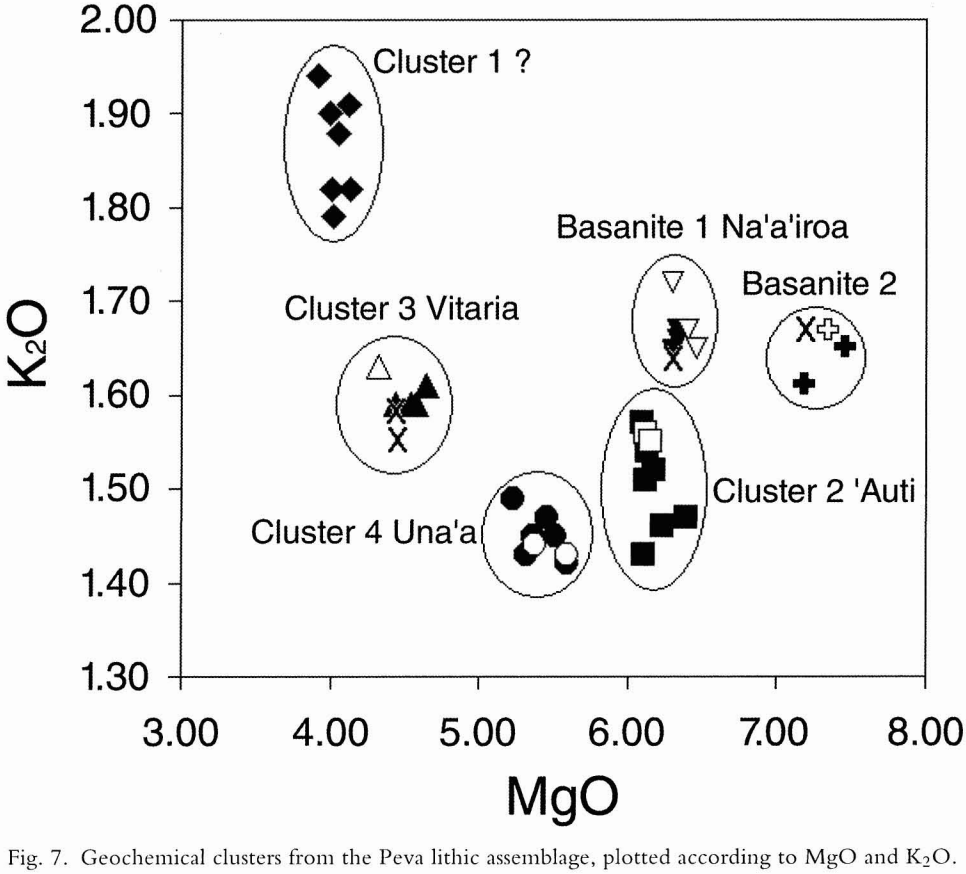


Fig. 7. Geochemical clusters from the Peva lithic assemblage, plotted according to MgO and K_2O.

(1997), on 30 excavated stone tools and debitage flakes, and an additional 20 surface collected flakes and geological samples. The chemical signatures obtained from the Peva assemblage were then compared to existing bodies of geochemical data from Rurutu in Duncan and McDougal (1976), Dupuy et al. (1988, 1989), Chauvel et al. (1997), Maury et al. (2000: Table 1), and Rolett et al. (2005).

As mentioned above, Rurutu is composed of two entirely distinct volcanic events. The younger flows around the island are composed primarily of hawaiites, with some basanites. Previous geochemical source work (Maury et al. 2000) has demonstrated that these younger flows are quite distinct from one another in terms of chemical composition. The samples from the Peva assemblage fall into four main clusters of hawaiite composition, plus two others that are essentially basanites. Figure 7 illustrates these clusters according to the percentages of MgO and K_2O. Cluster 1 is a group of hawaiites that is characterized by a lower percentage of MgO than any geological samples yet obtained from Rurutu (see Chauvel et al. 1997: Table 2; Dupuy et al. 1998: Table 1; Maury et al. 2000: Table 1). Although this source is unknown, most of the percentages of the other major elements are relatively close to those found in the other Rurutu hawaiite clusters. In addition, as Cluster 1 contains one finished adze, one preform, two non-diagnostic stone tools, and three debitage flakes, it is likely that it is a local source on Rurutu rather than an imported one, in which case we should expect to find mainly finished adzes. Cluster 2 is comprised of examples that come from a 1.1 Ma lava from the northwest of 'Auti (Maury et al. 2000: Table 1), the source of basalt that is closest to the Peva site itself. Cluster 2 contains crude, non-diagnostic Archaic period stone tools and Classic period flake debitage. It is a coarse-grained material that is instantly recognizable. The majority of the Classic

TABLE 2. VERTEBRATE REMAINS FROM PEVA (NISP)

TAXON	ARCHAIC (PHASE I)	CLASSIC (PHASE II)	TOTAL
Mammals			
Pig (*Sus scrofa*)	176	534	710
Dog (*Canis familiaris*)	3	2	5
Rat (*Rattus exulans*)	237	7	244
Small whale (Odontoceti)	12		12
Flying fox (*Pteropus tonganus*)	5		5
Human (*Homo sapiens*)	2	11	13
Unidentifiable medium mammal*	128	523	651
Birds	115	7	122
Reptiles			
Sea turtle (Cheloniidae sp.)	461	533	994
Fish	4461	560	5021
Other			
Unidentifiable medium vertebrate**	780	1741	2521
Totals			
All species	6380	3918	10298
% Fish	69.9	14.3	48.8
All species (without *, **)	5472	1654	7126

* The majority of this material is probably pig; ** The majority of this material is probably sea turtle.

period flake debitage is clearly of this material, while it is minimally represented in the Archaic period debitage.

Cluster 3 matches geological samples from Vitaria (Maury et al. 2000). In the Peva assemblage Cluster 3 is represented by one non-diagnostic tool and three debitage flakes from the Archaic deposit. Cluster 4 is identical to samples from Una'a, which is closer to Peva than Vitaria, and therefore a more convenient source. Cluster 4 is represented only by Archaic period flake debitage; it is likely that most of the Archaic period flake debitage belongs in Cluster 4. In addition to these four clusters of hawaiites, there are two distinct varieties of basanites. Basanites only occur on Rurutu in a narrow region between Mt. Manureva and Moera'i in the north, along the central spine of south-central Rurutu, and in the south near Na'a'iroa. The first type, Basanite 1, contains two specimens, including the Archaic Type 1A adze and a debitage flake from the same level. I sourced this basanite to the Na'a'iroa region (Maury et al. 2000: Table 1). The geochemistry of one Classic period adze collected in Ra'ivavae from the Peabody Essex Museum (E-33006, in Rolett et al. 2005: Table 3) is remarkably similar to this basanite. This suggests that the adze originated on Rurutu and was exported to Ra'ivavae. The second type of basanite, Basanite 2, is a low-SiO_2 basanite that matches reasonably well samples that I collected from the central spine of the island, as well as to one documented in Maury et al. 2000 (Table 1). Another Classic period adze collected in Ra'ivavae in the Peabody Essex Museum (E-33006, in Rolett et al. 2005: Table 3) is a good match with this basanite.

The Archaic period adze assemblage from Peva demonstrates that the inhabitants of Rurutu were familiar with most, if not all, of the diagnostic types that characterized the period. Geochemical sourcing has revealed that the distinctive Types 1A and 4A, for example, were manufactured locally of Rurutu basalt. Rurutu appears to have been quite self-sufficient in that it did not need to import basalt from other islands, but still chose to maintain the variety of Archaic forms. The flake debitage from the Archaic deposit indicates that at least five different sources of tool quality basalt were being exploited. Based on the size of the flake debitage, which ranges from 2–4 cm on average, it is probable that large blanks were being brought into Peva for working. This indicates an early period of experimentation with different materials from all over the island. In contrast, the Classic period flake debitage, of which there are fewer than 200 flakes, comes primarily from the nearby 'Auti source. Adze manufacturing was probably not a major activity upon the *marae* grounds; the fact that few were found in this deposit supports this conclusion. The samples documented here and in Rolett et al. (2005) suggest that there was interaction occurring between Rurutu and Ra'ivavae, probably as late as the Classic period. Out of seven adzes from Ra'ivavae sampled in Rolett et al. (2005: Table 3), two are excellent matches with Vitaria basalt, and two with the basanites discussed here.

Faunal Remains

All bone from Peva was recovered, but I only analyzed and quantified that of Area 2. This is because the Archaic deposit of Area 1 consisted almost entirely of mussel shell, with almost no bone at all, while Area 2's Archaic deposit was far richer in terms of shell variety and contained abundant bone. Therefore I decided

that quantifying only the Area 2 material (for the time being) would make the two periods far more comparable. The methodology followed is that used in Kirch and Yen (1982) and Rolett (1998). Like most Polynesian societies, Rurutu has looked to the sea for most of its subsistence. Nonfish vertebrates were a supplemental source of nutrition. The early inhabitants of Peva relied primarily upon marine resources, fish being the most important. One of the most striking trends between the Archaic and Classic deposits is the change in the percentage of fish. Table 2 demonstrates that in the Archaic deposit, fish accounts for over 70 percent of the total assemblage (NISP). In the Classic deposit, fish comprises slightly over 14 percent percent. This difference should be interpreted in light of the ceremonial nature of the *marae*. It is probable that nonfish foods, mostly turtle and pig, were emphasized during feasting. A similar trend occurs in the site of Hanamiai in the Marquesas, which also underwent a change from being a habitation site in the Archaic period to a ceremonial *tohua* in the Classic period (Rolett 1998:103).

Turtle, Mammal, and Bird Bone

Sea turtle (*Chelonia mydas*) represents the most abundant nonfish resource during Peva's Archaic period (Table 2). In this respect, Peva differs considerably from other East Polynesian sites such as Anai'o (Walter 1998:75), Ureia (Allen and Steadman 1990:32), Tangatatau (Kirch et al. 1995:57), and Hanamiai (Rolett 1998:98), where turtle was much less common. In Fa'ahia on Huahine (Leach et al. 1984:185), turtle was also the most abundant remain. The abundance of turtle, a food of the highest status, in Peva's Classic deposit probably reflects the ceremonial and religious nature of the site. In view of the myriad of restrictions surrounding turtle consumption in Classic period Polynesia, it is likely that only high status men such as chiefs and priests were participating in the feasts on the *marae*.

Pig is well represented in Peva's Archaic deposit, and is especially abundant in the Classic. In both periods, it is a dominant nonfish vertebrate. The quantity of pig bone indicates that pig husbandry was already well established during the Archaic period. The high quantity of pig in the Classic deposit, directly associated with the *marae*, most likely reflects pork's status as a feasting food. The abundance of pig in the Classic period is in sharp contrast to the contemporary situation on Mangaia, where the pig may have been intentionally extirpated (Kirch et al. 1995). This is one of the more significant differences between the assemblages from Rurutu and Mangaia.

Identifiable dog bone is present in miniscule quantities in both deposits, suggesting that dog was not emphasized as a food source during the Archaic period. A similarly small quantity was recovered from Anai'o (Walter 1998:79). The low quantity in Peva's Classic deposit may reflect the ceremonial nature of the *marae* itself and the emphasis on feasting foods such as pig and turtle. Rat bone is present throughout the Peva sequence, although in far greater quantities in the Archaic period. No bones exhibit signs of charring. Identifiable small whale and/or porpoise bone is also minimally represented in the Archaic period deposit and absent in the Classic deposit. Bird bone, so far unidentified, is far more prevalent

in Peva's Archaic deposit than in the Classic. This suggests a stronger emphasis on wild food sources at that time.

One mandible fragment and four additional bone fragments of the flying fox (*Pteropus tonganus*) were recovered from the Archaic deposit, marking a new easternmost limit for this species (full details in Weisler et al. 2006). In the southern Cooks, the flying fox still only exists on Rarotonga and Mangaia (Hill 1979), but has been found in archaeological deposits from Ma'uke (Walter 1998:79) and Aitutaki (Steadman 1991). As on Rurutu, this may indicate that it had been extirpated in early prehistoric times. The presence of the flying fox in the southern Cooks, and now the Australs, is a further link between the two island chains. As the bones from Peva are the first to be found in the Australs, it is not yet possible to state whether the flying fox was deliberately introduced to Rurutu, or existed there prior to human arrival. Rurutu is a relatively small island (38 km^2) with a rather low maximum elevation (389 m). Apart from the *makatea* cliffs that fringe the island at intervals, the topography is accessible. Taking the impoverishment of Rurutu's vegetation into account, it is reasonable to postulate that its indigenous and endemic species faced a rapid extinction event following human colonization. If the flying fox was indigenous to Rurutu, as it was in the southern Cooks, then its presence in Peva's Archaic deposit may bear witness to its extirpation. This most likely coincided with an overall human-induced extinction event of indigenous and endemic bird species as well.

Fish

Fishbone constitutes 70 percent (NISP) of Peva's Archaic period vertebrate faunal assemblage, and over 14 percent of the Classic, for a total of almost 49 percent. Over 6000 fish bones were recovered from the excavation. As on other islands elsewhere in Polynesia, on Rurutu fishing provided the principal source of protein. The Peva fishbone assemblage reveals much about local adaptation to ecological conditions, and directly reflects the importance of Rurutu's fringing reef as a resource. Marshall Weisler and Amy Findlater analyzed the Peva fishbone assemblage and it will be discussed in detail in Weisler et al. (n.d.).

To summarize the broader findings, in Peva's Archaic deposit (by MNI) Scaridae dominate (30 percent), followed by Serranidae (20 percent), Acanthuridae (14 percent), Diodontidae (8 percent), and smaller percentages of Labridae, Cirrihitidae, Carangidae, Holocentridae, and Lethrinidae *Monotaxis* sp. As only four taxa account for a major component (more than 4 percent) of the total, this suggests a specialized approach to harvesting fish, notably net fishing (e.g., Leach et al. 1984:190). In the Classic period assemblage Scaridae also dominate (39 percent), followed by Serranidae (13 percent), Diodontidae (13 percent), and equal percentages (6 percent) of Carangidae, Elasmobranchii, Holocentridae, Lutjanidae, and Scombridae. While slightly more diverse in that five taxa each account for 6 percent, the principal taxa are also Serranidae, Diondontidae, and Carangidae, suggesting that the specialized fishing approach that began in the Archaic period continued throughout the Peva sequence. These results are quite similar to those documented by Leach et al. (1984) from Vitaria. Overall, the results indicate a strong focus on mass catching strategies, of which net fishing was probably the

foremost as it is today. Angling and trolling were never an important subsistence strategy on Rurutu, which explains the paucity of fishing gear from Peva.

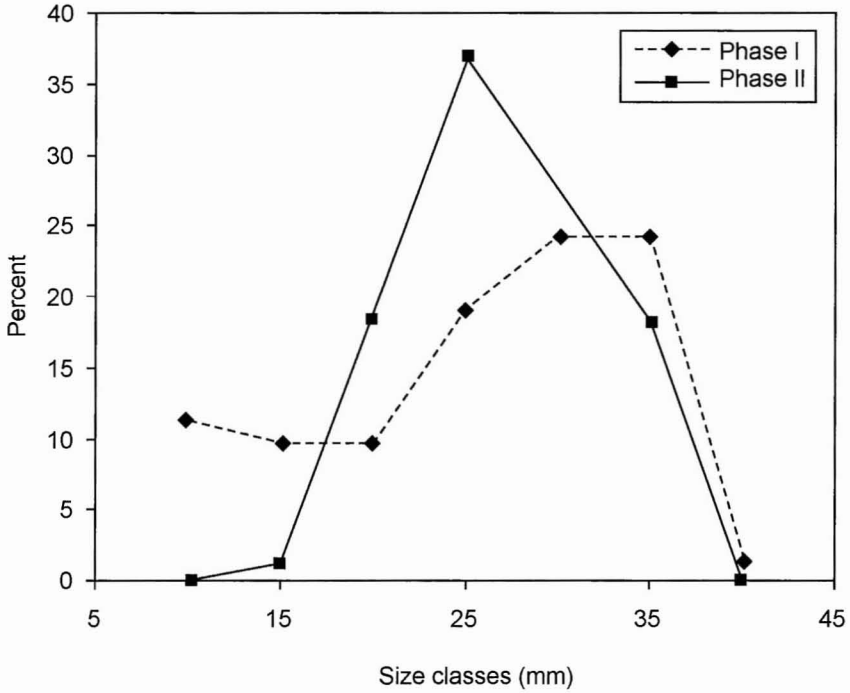
Shellfish

All shell (almost 19 kg) was recovered from the Peva excavation, but only the shell from Area 2 is discussed here. *Turbo* comprises approximately 60 percent (by weight) of the shell midden from both periods, indicating that this species remained the most harvested shellfish. Other species are less represented, the next highest percentage being the bivalve *Modiolus auriculatus* (15 percent), with even smaller percentages of *Strombus mutabilis* and *Cypraea* spp. About twice as much shell was recovered from the Archaic period deposit than from the Classic period deposit, indicating that shellfish may have been less important later on. However, the ceremonial nature of the Classic deposit must be taken into account, and shellfish may have been consumed less at feasting events. Today, shellfish accounts for a limited component of the Rurutuan diet and modern parallels cannot be drawn. Only on occasion is *Turbo* gathered for a more traditional meal, and then only as a small side dish. The relative infrequency of gathering shellfish nowadays reflects the fact that Rurutu is no longer a subsistence economy. When Seabrook (1938) was on Rurutu in the 1930s, however, *Turbo* was still an important part of the daily fare. Other varieties of shellfish do not approach *Turbo* in abundance and little can be said about the food values, if any, of the numerous smaller species of shellfish present.

Over-exploitation of *Turbo* has been suggested for Tangatatau on Mangaia (Kirch et al. 1995:59, Fig. 8). This has been demonstrated in the diameter of the opercula, which reflects the overall size of the shell (see also Walter 1998:86). In order to compare Peva with these assemblages, Figure 8 illustrates the size changes between periods. Overall, the trend is remarkably similar to that of the two phases of Anai'o (Walter 1998: Fig. 8.2). The Peva Archaic specimens display a wide range (8–40 mm) of sizes, including more small specimens. The Classic period opercula have a more restricted range of sizes (17–36 mm), with those of around 25 mm constituting almost 40 percent. Walter's interpretation of the Anai'o data may be applicable to those of Peva as well, possibly reflecting the over-exploitation of a population of *Turbo* found elsewhere than upon the algal ridge, where *Turbo* is gathered nowadays. However, one other explanation is possible. Taking into account the ceremonial nature of the Classic period deposit, it is conceivable that larger specimens were deliberately selected for feasting occasions. Walter (1998:86) called attention to the fact that the Anai'o opercula were large compared with those of Moturakau (Allen 1992*b*) and Mangaia; the opercula of the Peva assemblage are slightly larger than those of Anai'o. Rurutu's encircling fringing reef possibly made the over-exploitation of a resource such as *Turbo* unlikely.

THE PEVA SEQUENCE: IMPLICATIONS FOR EAST POLYNESIAN PREHISTORY

The Peva excavation provides an important reference point in the Australs. The habitation site on Peva Rahi's sand dune was first occupied during the late thirteenth century A.D., and was inhabited until around the early fifteenth century



Diameter range	Size class
8-12 mm	10
13-17 mm	15
18-22 mm	20
23-27 mm	25
28-32 mm	30
33-37 mm	35
38-42 mm	40

Fig. 8. Distribution of *Turbo setosus* opercula diameter from Peva's Archaic and Classic periods.

A.D. Based on the extirpated flying fox remains, I believe that it represents a very early episode in the colonization of Rurutu and the Australs in general. While perhaps not the earliest site on the island, I believe that it post-dates initial colonization by no more than around 200 years, and probably less. Peva is contemporaneous with other Archaic period sites throughout East Polynesia, especially those in the southern Cooks (e.g., Allen and Steadman 1990; Kirch et al. 1995; Walter 1998), Societies (Anderson and Sinoto 2002), and Mangareva (e.g., Green and Weisler 2002). In addition, early sites in the Marquesas appear to date from around this period (e.g., Anderson and Sinoto 2002; Rolett 1998). The similarity in material culture between all these sites taken together with their contemporaneous dates, supports a model of rapid colonization, probably in the late 1st millennium A.D. Following this, long-distance voyaging and exchange led to the development of a unique East Polynesian culture that was distinct from its West Polynesian ancestor.

Another contribution of the Peva excavation regards the nature of Archaic period interaction and the decline of long-distance voyaging that ultimately may have brought that era to an end. Finney (1994; see also Kirch 1988; Walter 1996) addressed this issue, and postulated that some regions may have given up long-distance voyaging—large capital investments with some degree of risk—because of economic impracticality. During the early period of colonization voyages may have been necessary to ensure the transmission of a full array of cultigens and domesticates (Finney 1994:302). In many respects Rurutu appears to follow this model. For example, Rurutu was probably not importing basalt because the quality of the local stone was adequate. This self-reliance suggests that when interaction and trade were not essential or economical, an island may have opted against voyaging. Another line of evidence that indicates a lack of intensive trade is the paucity of pearlshell and fishhooks in the Archaic deposit. This is directly related to the nature of the island itself, and specifically reflects the bounty of the surrounding fringing reef. Angling was not economical in comparison to other mass-catching methods; the lack of a highly varied East Polynesian Archaic fishhook assemblage supports this. Rurutu may therefore have willingly given up the manufacture of fishing and consequentially voyaging canoes at an early stage.

The craftsmen of Peva were well versed in most, if not all, of the Archaic adze types in use throughout East Polynesia. Their adzes were all likely made from local basalt, and were manufactured on the island. This fact supports the model of a regional homeland characterized by interaction despite the fact that the Rurutuans were using local material. It also reinforces the conclusion that the relative paucity of fishhook types at Peva was an intentional abandonment, and not the result of a founder effect. It is significant that the inhabitants of Peva had already located at least five, and probably six, available sources of tool-quality basalt by that time, which would have involved intensive exploration of the island. Three types of Rurutu basalt have been identified in assemblages of Ra'ivavae adzes (in Rolett et al. 2005), demonstrating that the islands of the Australs were circulating raw materials among themselves.

Peva is an ideal valley for habitation, and the subsistence strategies in the Archaic and the Classic periods reflect this. The inhabitants of Peva subsisted primarily on fish, mostly inshore species that could most easily be caught with nets, spearing, poisoning, and other methods that did not require angling. The fringing reef offered Peva's settlers a rich array of shellfish and fish that could be captured without venturing out to sea. Turtles could also swim through a passage in the reef and lay their eggs on the white sand beach. Although the early inhabitants of Peva clearly subsisted primarily on protein from marine resources, they already had a population of domesticated animals during the Archaic period. Pig was the most prominent, whereas dogs played a minor role in subsistence. Birds were also marginal at the time, possibly indicating the tail end of a human-induced extinction event.

By the late fourteenth century the Peva dune site was no longer inhabited. As happened throughout Polynesia, at the same time voyaging was ceasing the populations were abandoning the coast in favor of the backs of the valleys, as agriculture intensified and populations grew. It is likely that competition over resources intensified, making the valley mouths more dangerous to invasion (e.g., Suggs 1961:185). This competition may be another reason for the decline in long-distance exchange; if warfare became endemic, voyaging for whatever reason

likely took less precedence than military matters (e.g., Rolett 1998:255). The Classic period is also known as the *Marae* period (Garanger 1967:387), when ceremonial architecture reached its greatest elaboration, which was itself perhaps a manifestation of inter-valley competition (e.g., Rolett 1998:255). The *marae* 'Uramoa of Peva was built, I believe, either in the late 1600s or early 1700s, when the previous habitation site had long since been covered with sand.

In terms of daily subsistence, in the Classic period fish would have continued to be the dominant protein source on Rurutu, although this is not reflected in Peva's Classic period faunal assemblage because of the site's different function. More prestigious foods such as pig and turtle were emphasized on the *marae*, whereas fish and shellfish probably played a much smaller role. This makes a direct comparison between periods difficult. The excavations of Vérin (1969) in Vitaria are only marginally helpful in this respect; the district is very different from Peva in that it had no taro because of a lack of permanent water sources, and pig bone was not prevalent in his excavation of a house site. However, similar long oval-ended houses were used also in Peva, one of which still exists a hundred meters inland, behind the former taro fields, which is precisely where we would expect to find such a structure. Nevertheless, the types of fish present in the Classic period deposit occur in virtually the same proportions as those from the Archaic, suggesting that fishing strategies had not changed significantly over the centuries, and that mass-catching techniques, especially net-fishing, still prevailed as indeed it does to this day. One major difference between the two periods is the virtual absence of birdbone in the Classic deposit and the prevalence of pig and turtle. By the Classic period, the pig population of the valley had probably grown substantially, which stands in sharp contrast to Mangaia, another *makatea* island in the southern Cooks whose landmass, though larger than Rurutu's, has less natural swampland for taro. Peva's valley floor is fertile and eminently suitable for wetland taro, which could have been planted directly in the swamp before the development of irrigated pondfields. By the Classic period these taro pondfields were productive enough to sustain an expanded population. The agricultural base, which included dryland crops, was sufficient to maintain a population of pigs. Although Rurutu's original vegetation had been almost completely replaced, the island's wealth was in the alluvial basins. The presence of the *tapu* pig and turtle upon the *marae* is also indicative of a more stratified and complex sociopolitical system than existed during the Archaic period.

The Peva investigation is intended as an effort toward understanding the efflorescence of a culture for which there is little documentation. We can now place Rurutu, and by implication the Australs in general, well within the date range of other Archaic East Polynesian sites. Based on the material culture and presence of the flying fox, I believe that it is quite possible that the Australs were colonized from the southern Cooks. Even in the late eighteenth century, the material culture between the two island chains was very similar, especially in terms of fine wood carving and adze typology. However, while the Australs shared much in common with other East Polynesian archipelagos during the Archaic Period, by the late eighteenth century they had developed a unique character that impressed early visitors such as James Cook and Joseph Banks. As there are so few firsthand accounts of traditional life, the only means we have to illuminate the past of the Australs is through archaeology. With further excavations in the Australs, the role and significance of this relatively unknown archipelago will become illuminated.

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REFERENCES CITED

ALLEN, M. S.
1992*a* Temporal variation in Polynesian fishing strategies: The Southern Cook Islands in regional perspective. *Asian Perspectives* 31:183–204.
1992*b* Dynamic landscapes and human subsistence: Archaeological investigations on Aitutaki island, Southern Cook Islands. Ph.D. diss. University of Washington.
1996 Style and function in East Polynesian fish-hooks. *Antiquity* 70:97–116.
2002 Resolving long-term change in Polynesian marine fisheries. *Asian Perspectives* 41:195–212.

ALLEN, M. S., AND S. E. SCHUBEL
1990 Recent archaeological research on Aitutaki, southern Cooks: The Moturakau shelter. *Journal of the Polynesian Society* 99:265–295.

ALLEN, M. S., AND K. T. M. JOHNSON
1997 Tracking ancient patterns of interaction: Recent geochemical studies in the southern Cook Islands. In *Prehistoric Long-Distance Interaction in Oceania, An Interdisciplinary Approach*. New Zealand Archaeological Association Monograph 21, ed. M. I. Weisler, pp. 111–33. Auckland: New Zealand Archaeological Association.

ALLEN, M. S., AND S. E. SCHUBEL
1990 Recent archaeological research on Aitutaki, southern Cooks: The Moturakau shelter. *Journal of the Polynesian Society* 99:265–295.

ALLEN, M. S., AND D. W. STEADMAN
1990 Excavations at the Ureia site, Aitutaki, Cook Islands: Preliminary results. *Archaeology in Oceania* 25:24–37.

ANDERSON, A. J., AND Y. H. SINOTO
2002 New radiocarbon ages of colonization sites in East Polynesia. *Asian Perspectives* 41:242–257.

BANKS, J.
1962 *The Endeavor journal of Joseph Banks, 1768–1771*. J. C. Beaglehole, ed. Sydney: Angus and Robertson.

BEST, S.
1977 The Maori adze: An explanation for change. *Journal of the Polynesian Society* 86:307–337.

BOLLT, R.
2005*a* Peva: The Archaeology of a valley on Rurutu, Austral Islands, East Polynesia. Ph.D. diss. University of Hawai'i.
2005*b* An excavated tiki pendant from Rurutu, Austral Islands. *Rapa Nui Journal* 19(2):85–90.
n.d. *Peva: The archaeology of an Austral Island settlement*. Bishop Museum Bulletin in Anthropology.

BONNEVILLE, A., R. SUAVE, L. AUDIN, V. CLOUARD, L. DOSSO, P. Y. GILLOT, P. JANNEY, K. JORDHAL, AND K. MAAMAATUAIAHUTAPU
2002 Arago seamount: The missing hotspot found in the Austral Islands. *Geology* 30(11):1023–1026.

BRIDGEMAN, H. A.
1983 Could climate change have had an influence of the Polynesian migrations? *Palaeogeography, Palaeoclimatology, Palaeoecology* 41:193–206.

BUCK, P. H.
1930 *Samoan material culture.* Honolulu: Bernice P. Bishop Museum Bulletin 75.
1944 *Arts and crafts of the Cook Islands.* B.P. Bishop Museum Bulletin 157.

CHAUVEL, C., W. MCDONOUGH, C. GUILLE, R. MAURY, AND R. DUNCAN
1997 Contrasting old and new volcanism in Rurutu Island, Austral chain. *Chemical Geology* 19:125–143.

COOK, J.
1955 *The voyage of the Endeavor, 1768–1771.* J. C. Beaglehole, ed. Cambridge: Hakluyt Society.

DUFF, R.
1956 *The moa-hunter period of Maori culture.* Wellington: R. E. Owen, Government Printer.
1959 Neolithic adzes of eastern Polynesia, in *Anthropology of the South Seas*: 121–147, ed. J. D. Freeman and W. R. Geddes. New Plymouth: Thomas Avery and Sons.
1968 Archaeology of the Cook Islands, in *Prehistoric culture in Oceania*: 119–131, ed. I. Yawata and Y. H. Sinoto. Honolulu: Bishop Museum Press.
1970 *Stone adzes of Southeast Asia.* Christchurch: Canterbury Museum Bulletin 5.

DUNCAN, R. A., AND I. MCDOUGALL
1976 Linear volcanism in French Polynesia. *Journal of Volcanology and Geothermal Research* 1:197–227.

DUPUY, C., H. G. BARSCUZ, J. M. LIOTARD, AND J. DOSTAL
1988 Trace element evidence for the origin of ocean island basalts: An example from the Austral Islands (French Polynesia). *Contributions to Mineralogy and Petrology* 98:293–302.

DUPUY, C., H. G. BARSCUZ, J. M. LIOTARD, J. DOSTAL, P. VIDAL, AND J. M. LIOTARD
1989 *Subducted and recycled lithosphere as the mantle source of ocean island basalts from southern Polynesia, central Pacific.* Chemical Geology 77:1–18.

EDDOWES, M.
1998 Initial results from Atiahara and Teta'itapu, two coastal settlement sites, upon the islands of Tubua'i and Tahiti: Their implications for an understanding of prehistoric regional adaptation to environment. In *Easter Island and East Polynesian Prehistory*, ed. P. V. Casanova, pp. 7–30. Santiago: Universidad de Chile.
2004 *Étude archéologique de l'île de Rimatara (Archipel des Australes).* Dossier d'Archéologie Polynésienne No. 3. Tahiti: Ministére de la Culture de Polynésie Française, Service de la Culture et du Patrimoine.

EDWARDS, E.
1998 The archaeological survey of Ra'ivavae, Austral Islands, French Polynesia. Preliminary results. In *Easter Island and East Polynesian prehistory*: 31–58, ed. P. V. Casanova. Santiago: Universidad de Chile.
2003 *Ra'ivavae: Archaeological survey of Ra'ivavae, French Polynesia.* Easter Island Foundation.

ELLIS, W.
1969*a* *Polynesian researches: Polynesia.* Rutland: Charles E. Tuttle.
1969*b* *Polynesian researches: Society Islands, Tubua'i Islands, and New Zealand.* Rutland: Charles E. Tuttle.

EMORY, K. P., AND Y. H. SINOTO
1965 Preliminary report on the archaeological investigations in Polynesia. Mimeographed report to the National Science Foundation. Honolulu: Bishop Museum.

FERDON, E. N.
1965*a* A reconnaissance survey of three fortified hilltop villages, in *Reports of the Norwegian archaeological expedition to Easter Island and the East Pacific*: 9–21, ed. T. Heyerdahl and E. N. Ferdon. Monographs of the School of American Research and the Kon Tiki Museum, No. 24, pt. 2. Chicago: Rand McNally & Company.

1965*b* A summary of Rapa Iti fortified villages, in *Reports of the Norwegian archaeological expedition to Easter Island and the East Pacific*: 69–75, ed. T. Heyerdahl and E. N. Ferdon. Monographs of the School of American Research and the Kon Tiki Museum, No. 24, pt. 2, Report 4. Chicago: Rand McNally & Company.

FIGUEROA, G., AND E. SANCHEZ
1965 Adzes from certain islands of East Polynesia, in *Reports of the Norwegian archaeological expedition to Easter Island and the East Pacific*: 169–254, ed. T. Heyerdahl and E. N. Ferdon. Monographs of the School of American Research and the Kon Tiki Museum, No. 24, pt. 2, Report 12. Chicago: Rand McNally & Company.

FINNEY, B. R.
1977 Voyaging canoes and the settlement of East Polynesia. *Science* 196:1277–1285.
1994 *Voyage of rediscovery: A cultural odyssey through Polynesia*. Berkeley: University of California Press.

GARANGER, J.
1967 Archaeology and the Society Islands, in *Polynesian culture history: Essays in honor of Kenneth P. Emory*: 377–396, ed. G. A. Highland, A. Howard, M. Kelly, and Y. H. Sinoto. B.P. Bishop Museum Special Publication 56.

GOLDMAN, I.
1970 *Ancient Polynesian society*. Chicago: University of Chicago Press.

GREEN, R. C.
1971 Evidence for the development of the early Polynesian adze kit. *New Zealand Archaeological Association Newsletter* 14:12–44.
1974 A review of the portable artifacts from Western Samoa, in *Archaeology in Western Samoa*, vol. 2:245–275, ed. R. C. Green and J. M. Davidson. Auckland: Auckland Institute and Museum Bulletin 7.

GREEN, R. C., AND M. I. WEISLER
2002 The Mangarevan sequence and dating of the geographic expansion into southeast Polynesia. *Asian Perspectives* 41:213–241.

HENRY, T.
1928 *Ancient Tahiti*. B.P. Bishop Museum Bulletin 48.

HILL, J. E.
1979 The flying fox *Pteropus tonganus* in the Cook Islands and on Niue Island, Pacific Ocean. *Acta Theriologica* 24(11):115–122.

IRWIN, G.
1992 *The prehistoric exploration and colonisation of the Pacific*. Cambridge: Cambridge University Press.
1998 The colonisation of the Pacific plate: Chronological, navigational and social issues. *Journal of the Polynesian Society* 107:111–144.

KENNETT, D., A. J. ANDERSON, M. PREBBLE, E. CONTE, J. SOUTHON
2006 Prehistoric human impacts on Rapa, French Polynesia. *Antiquity* 80(308):340–354.

KIKUCHI, W. K.
1963 Archaeological surface ruins in American Samoa. M.A. thesis. Department of Anthropology, University of Hawai'i.

KIRCH, P. V.
1988 Long-distance exchange and island colonization: The Lapita case. *Norwegian Archaeological Review* 21(2):103–117.
1994 *The wet and the dry: Irrigation and agricultural intensification in Polynesia*. Chicago: University of Chicago Press.
2000 *On the road of the winds: An archaeological history of the Pacific Islands before European contact*. Berkeley: University of California Press.

KIRCH, P. V., AND T. DYE
1979 Ethno-archaeology and the development of Polynesian fishing strategies. *Journal of the Polynesian Society* 88:53–76.

KIRCH, P. V., D. W. STEADMAN, V. BUTLER, J. HATHER, AND M. I. WEISLER
1995 Prehistory and human ecology in Eastern Polynesia: Excavations at Tangatatau rockshelter, Mangaia, Cook Islands. *Archaeology in Oceania* 30:47–65.

KIRCH, P. V., AND D. E. YEN
1982 *Tikopia: The prehistory and ecology of a Polynesian outlier.* B.P. Bishop Museum Bulletin 238.

LEACH, B. F., AND J. M. DAVIDSON
1988 The quest for the Rainbow Runner: Prehistoric fishing on Kapingamarangi and Nukuoro atolls, Micronesia. *Micronesica* 21:1–22.

LEACH, B. F., M. INTOH, AND I.W.G. SMITH
1984 Fishing, turtle hunting, and mammal exploitation at Fa'ahia, Huahine, French Polynesia. *Journal de la Société des Océanistes* 79:183–197.

MARSHALL, D. S.
1961 *Ra'ivavae: An expedition to the most fascinating and mysterious island in Polynesia.* Garden City: Doubleday & Company, Inc.

MAURY, R. C., C. GUILLE, H. GUILLOU, S. BLAIS, C. CHAUVEL, AND R. BROUSSE
2000 *Carte géologique "Rurutu et Tubua'i" Polynésie, notice explicative de la Feuille Rurutu et Tubua'i à 1/25 000 (Polynésie Française, Archipel des Australes).* Orléans: Éditions du BRGM.

MCCORMAC, F. G., A. J. HOGG, P. G. BLACKWELL, C. E. BUCK, T.F.G. HIGHAM, AND P. J. REIMER
2002 High-precision calibration of the radiocarbon time scale for the Southern Hemisphere AD 1850–1950. *Radiocarbon* 44:641–651.

MCCORMAC, F. G., A. J. HOGG, P. J. REIMER, T.F.G. HIGHAM, M.G.L. BAILLIE, J. PALMER, AND M. STUIVER
2004 SHCal04 Southern Hemisphere Calibration 0–1000 cal BP. *Radiocarbon* 46:1087–1092.

MORRISON, J.
1935 *The Journal of James Morrison, boatswain's mate of the Bounty, describing the mutiny & subsequent misfortunes of the mutineers, together with an account of the island of Tahiti. With an introduction by Owen Rutter and five engravings by Robert Gibbings.* O. Rutter, ed. London: The Golden Cockerel Press.

MULLOY, W.
1965 The fortified village of Morongto Uta., in *Reports of the Norwegian archaeological expedition to Easter Island and the East Pacific*: 23–68, ed. T. Heyerdahl and E. N. Ferdon. Monographs of the School of American Research and the Kon Tiki Museum, pt. 2, Report 3. Chicago: Rand McNally & Company.

ORSTOM
1993 *Atlas de la Polynésie française*, ORSTOM Editions: 112.

POULSEN, J.
1968 Archaeological excavations on Tongatapu, in *Prehistoric culture in Oceania*: 85–92, ed. I. Yawata and Y. H. Sinoto. Honolulu: Bishop Museum Press.

ROLETT, B. V.
1996 Colonisation and cultural change in the Marquesas, in *Oceanic culture history: Essays in honour of Roger Green*: 531–540, ed. J. M. Davidson, G. Irwin, B. F. Pawley, and D. Brown. Dunedin: New Zealand Journal of Archaeology Special Publication.
1998 *Hanamiai: Prehistoric colonization and cultural change in the Marquesas Islands (East Polynesia).* New Haven: Yale University Press.
2002 Voyaging and interaction in ancient East Polynesia. *Asian Perspectives* 41:182–194.

ROLETT, B. V., J. M. SINTON, E. WEST, AND R. COTUTU
2005 The adzes of Rurutu (Austral Islands): Geochemistry, context, and pre-European links to other islands. Report submitted to the Cooke Foundation, February.

SALVAT, B., AND C. RIVES
1983 *Coquillages de Polynésie.* Papeete: Les Éditions du Pacifique.

SEABROOK, F. A.
1938 Rurutuan culture. Manuscript. Honolulu: Bishop Museum.
n. d. Study of taro and taro planting in Raivavae. Manuscript. Honolulu: Bishop Museum.

SKINNER, H. D.
1974 Comparatively speaking: Studies in Pacific material culture 1921–1972. Dunedin: University of Otago Press.

SKJÖLSVOLD, A.
1965*a* Ra'ivavae Island, the ceremonial enclosure of Te Rae Rae with brief notes on additional marae, in *Reports of the Norwegian archaeological expedition to Easter Island and the East Pacific*: 97–107, ed. T. Heyerdahl and E. N. Ferdon. Monographs of the School of American Research and the Kon Tiki Museum, pt. 2, Report 7. Chicago: Rand McNally & Company.
1965*b* Hill terraces of Hatuturi, in *Reports of the Norwegian archaeological expedition to Easter Island and the East Pacific*: 109–116, ed. T. Heyerdahl and E. N. Ferdon. Monographs of the School of American Research and the Kon Tiki Museum, pt. 2, Report 8. Chicago: Rand McNally & Company.

SMITH, C. S.
1965 Test excavations and surveys of miscellaneous sites on the island of Rapa Iti, in *Reports of the Norwegian archaeological expedition to Easter Island and the East Pacific*: 77–87, ed. T. Heyerdahl and E. N. Ferdon. Monographs of the School of American Research and the Kon Tiki Museum, pt. 2, Report 5. Chicago: Rand McNally & Company.

STEADMAN, D. W.
1991 Extinct and extirpated birds from Aitutaki and Atiu, southern Cook Islands. *Pacific Science* 45:325–347.

STODDART, D. R., AND T. SPENCER
1987 Rurutu reconsidered: The development of *makatea* topography in the Austral Islands. *Atoll Research Bulletin* 190:31–57.

STUIVER, M., P. J. REIMER, E. BARD, J. W. BECK, G. S. BURR, K. A. HUGHEN, B. KROMER, F. G. MCCORMAC, J. PLICHT, AND M. SPURK
1998 INTCAL98 Radiocarbon age calibration 24,000–0 cal BP. *Radiocarbon* 40:1041–1083.

STUIVER, M., P. J. REIMER, AND T. F. BRAZIUNAS
1998 High-precision radiocarbon age calibration for terrestrial and marine samples. *Radiocarbon* 40:1127–1151.

SUGGS, R. C.
1961 *The Archaeology of Nuku Hiva, Marquesas Islands, French Polynesia*. New York: Anthropological Papers of the American Museum of Natural History, vol. 49, pt. 1.

THOMAS, N.
1990 *Marquesan societies: Inequality and political transformation in Eastern Polynesia*. Oxford: Clarendon Press.

VÉRIN, P.
1969 *L'ancienne civilisation de Rurutu*. Paris: Mémoires ORSTOM 33.

WALTER, R.
1996 What is the East Polynesian 'Archaic'? A view from the Cook Islands, in *Oceanic culture history: Essays in honour of Roger Green*: 513–529, ed. J. M. Davidson, B. F. Pawley, and D. Brown. Dunedin: New Zealand Journal of Archaeology Special Publication.
1998 *Anai'o: The archaeology of a fourteenth century Polynesian community in the Cook Islands*. Auckland: New Zealand Archaeological Association Monograph 22.

WALTER, R., AND M. CAMPBELL
1996 The Paraoa site: Fishing and fishhooks in 16th century Mitiaro, southern Cook Islands. *Man and Culture in Oceania* 12:47–60.

WEISLER, M. I.
1994 The settlement of marginal Polynesia: New evidence from Henderson Island. *Journal of Field Archaeology* 21:83–102.
1998 Hard evidence for prehistoric interaction in Polynesia. *Current Anthropology* 39:521–532.
2002 Centrality and the collapse of long-distance voyaging in East Polynesia, in *Geochemical evidence for trade and exchange*: 257–273, ed. M. D. Glascock. Westport: Bergin and Garvey.

WEISLER, M. I., R. BOLLT, AND A. FINDLATER
2006 A new eastern limit of the Pacific Flying Fox (*Pteropodidae Pteropus tonganus*) in prehistoric Polynesia: A case of possible human transport and extirpation. *Pacific Science* 60(3):403–411.
n.d. Prehistoric fishing strategies on the *makatea* island of Rurutu.

WEISLER, M. I., AND R. C. GREEN
2001 Holistic approaches to interaction studies: A Polynesian example, in *Australasian connections and new directions: Proceedings of the 7th Australasian Conference*: 413–453, ed. M. Jones and P. J. Sheppard. Research in Anthropology and Linguistics Series 5. Auckland: University of Auckland.

WEISLER, M. I., AND P. V. KIRCH
1996 *Interisland and Interarchipelago Transfer of Stone Tools in Prehistoric Polynesia.* Proceedings of the National Academy of Sciences, U.S.A. 93:1381–5.

WEISLER, M. I., AND J. M. SINTON
1997 Towards identifying prehistoric interaction in Polynesia, in *Prehistoric long-distance interaction in Oceania, an interdisciplinary approach*: 173–193, ed. M. I. Weisler. Auckland: New Zealand Archaeological Association Monograph 21.

ABSTRACT

The Peva dune site on Rurutu, Austral Islands, excavated in 2003, has yielded a rich archaeological assemblage containing artifacts and both vertebrate and invertebrate fauna from two distinct stratigraphic layers. The lower layer dates from the East Polynesian Archaic period (c. A.D. 1000–1450), and the upper layer from the Classic period (c. eighteenth and nineteenth centuries A.D.), during which time the site was a ceremonial *marae*. The two layers are entirely distinct, separated by a thick deposit of sterile beach sand. This article analyzes the major temporal trends in Rurutu's artifact and faunal assemblages, and discusses them in terms of both the general efflorescence of East Polynesian culture, and the more specific emergence of a uniquely Austral culture, which impressed early European visitors as being quite unique.
KEYWORDS: East Polynesia, Austral Islands, Cook Islands, Rurutu, colonization.