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Prehistoric and Historic Settlement in the Palau Islands, Micronesia

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ABSTRACT

Data from archaeological, ethnographic and documentary sources are summarised to provide a synthesis of prehistoric and historic settlement patterns in the Palau Islands of Micronesia. Emphasis is placed on historic contact period settlement (*circa* A.D. 1600-1900), and on an apparently short-lived but intensive prehistoric (*circa* A.D. 1300-1400) occupation of Palau's many small coralline limestone ("rock") islands. Prehistoric (*circa* A.D. 100-1200) agricultural/defensive hillslope terraces on the volcanic islands and a rich rock island cave deposit (*circa* A.D. 850-900) are also discussed.

Keywords: PALAU, SETTLEMENT SYSTEM, CHIEFDOM, TRADITIONAL VILLAGES, ROCK ISLAND VILLAGES, AGRICULTURAL/DEFENSIVE TERRACES.

INTRODUCTION

The Palau archipelago consists of more than 250 islands and islets stretched along a 150 km north-south trending arc in the western Pacific. Its centre is located near 7 degrees north latitude, some 900 km east of Mindanao in the Philippines and 650 km north of Irian Jaya (Fig. 1). The geologically diverse archipelago is dominated by Babeldaob, a primarily volcanic island whose area of 363 km² represents more than three-fourths of Palau's total land mass (Vessel and Simonson 1958). The remaining 90 km² are divided among three volcanic islands, two atolls and numerous uplifted coralline limestone islands (Fig. 2). These limestones islands, primarily situated in the centre of the archipelago between Oreor and Peliliu Islands, are referred to locally as "rock islands". The limestone islands of Peliliu and Angaur are not considered rock islands for various physiographic and culture historical reasons (Osborne 1966). Not considered in the present study are several small islands, including Sonsorol and Tobi, which lie some distance to the southwest of Angaur Island.

The volcanic islands contain heavily eroded hills reaching heights of 250 m above sea level, while the rock islands and atolls vary in elevation from sandy relict beaches a few metres above sea level to jagged limestone hills more than 200 m in height. All of the islands are covered with dense stands of mixed tropical forest; in addition, the volcanic islands contain numerous areas of savanna and a broad belt of coastal mangrove swampland. An extensive barrier reef surrounds the central islands of the archipelago, forming a rich lagoon area of more than 1200 km².

The purpose of this paper is to present a current synthesis of historic and prehistoric settlement patterns in Palau. The data for this synthesis are drawn from several sources including oral histories, historic contact period documents, and the archaeological field programmes of Jun Takayama in the rock islands (1979; Takayama and Takasugi 1978; Takayama *et al.* 1980), Laurie J. Lucking on Babeldaob's prehistoric terraces (1981), and especially Douglas Osborne's ambitious programme of survey (1966) and excavation (1979) throughout the Palau Islands. The basis for this synthesis, however, comes from an intensive programme of research initiated in 1979 by Southern Illinois University (Gumerman *et al.* 1981; Masse and Snyder 1982). The focus of our six-month-long field season in 1981 was the elucidation of Palauan settlement patterns

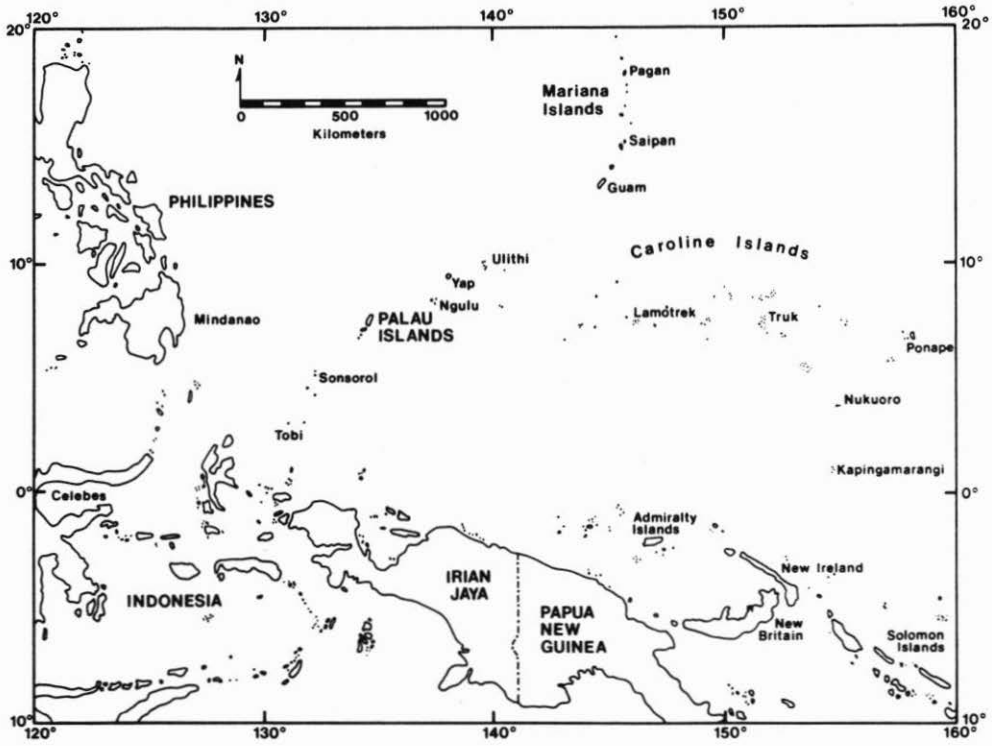

Figure 1: The location of island groups in the western Pacific Ocean.

through the intensive study of five early historic villages on Babeldaob Island and three prehistoric villages in the rock islands.

Before discussing Palauan settlement patterns, it is first necessary to distinguish among three integrated analytical units of patterning in our treatment of human settlement. The first unit is the *household*, which includes features associated with domestic activities, such as houses, cooking facilities and garbage disposal areas. This topic has been treated extensively in a separate paper (Snyder *et al.* 1983), and will only be touched upon lightly in the present work. The second unit and principal focus of this paper is the *village settlement system*. The village system consists of those features of a village representing the articulation of that village with its physical and social environment. This includes a wide range of data such as the social organisational structure of features within villages, and the location of villages in terms of possible defensive posture and access to critical resources. Our present model of the Palauan village system (see also Gumerman *et al.* 1981:16-18) has benefited from Krämer's (1919) detailed documentation of traditional villages, and from more recent analytical treatments by Osborne (1979:268-270) and Cordy (1979). The third analytical unit, and the one most difficult to retrieve from the archaeological record, is the *regional settlement system*. The regional system consists of the articulation of villages into various political, social and economic alliances.

As a final consideration, it is important to emphasise that a total of 41 radiocarbon dates has been obtained, thus far, from all archaeological programmes in the Palau Islands. Of these, nine dates reported by Osborne (1979:235-239) are excluded from

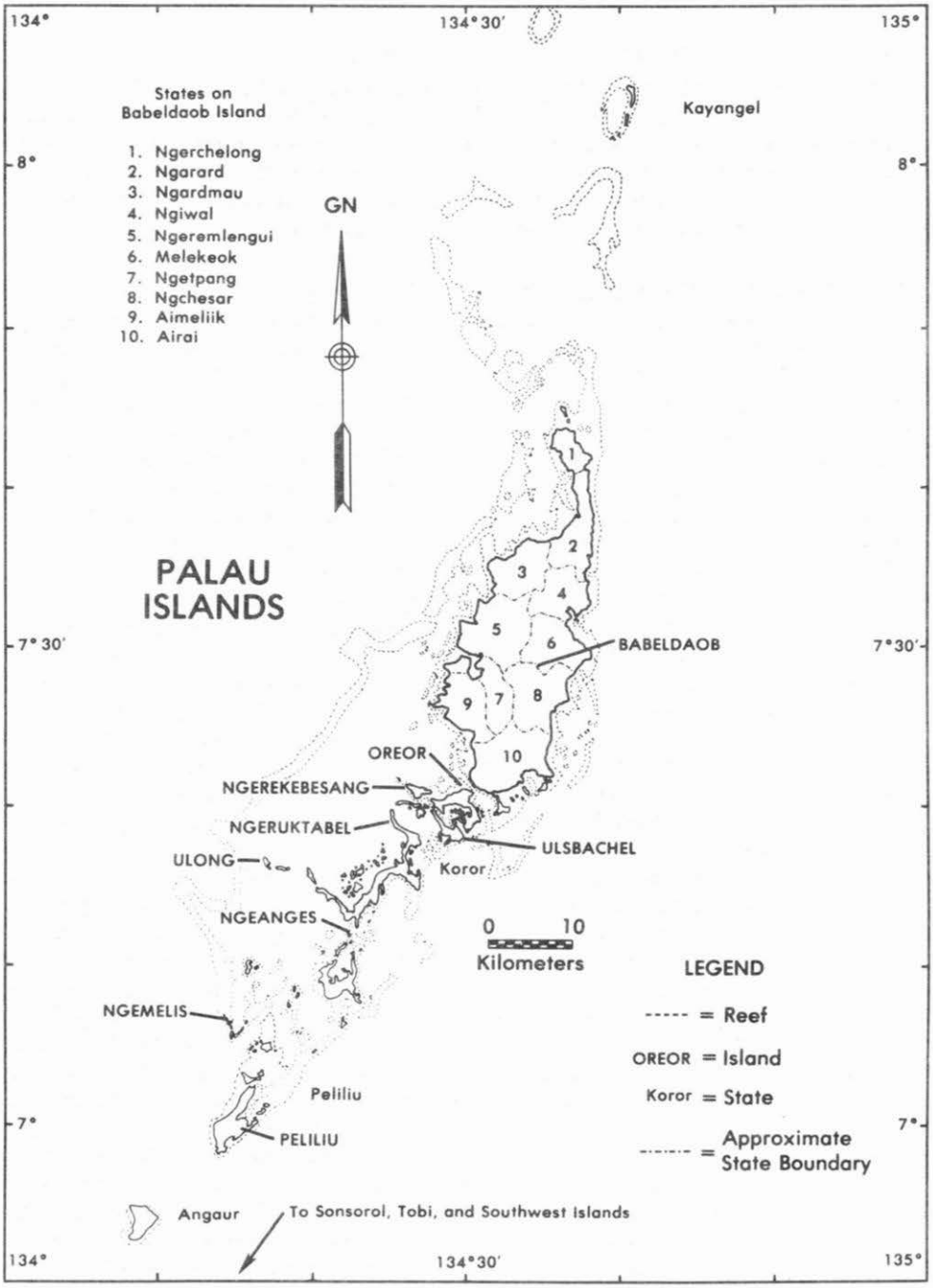

Figure 2: The Palau Islands depicting modern approximate state boundaries.

consideration here because of unresolved problems associated with the radiocarbon dating of Palauan pottery. These sherd dates range from 1420 ± 400 to 6250 ± 400 B.P., all seemingly much too early for their associated contexts. Thus, there are 32 radiocarbon dates against which to evaluate an estimated 3000 years of culture process

and events in the Palau Islands (Fig. 3 and Appendix).

Because of the limited number of radiocarbon dates, and because of our present inability to seriate Palauan ceramics, we have not divided Palauan culture history into named periods or phases as is commonly done in other regions. Rather, we will proceed with this discussion by focusing on what appear to be major definable aspects or features of Palauan settlement, beginning with the historic contact period then moving backwards in time to the earliest limits of our data base.

TRADITIONAL VILLAGES, *CIRCA* A.D. 1600-1900

Our knowledge of Palauan settlement patterns at initial historic contact comes in large part from Keate's (1788) informative account of the 1783 wreck of the English trading vessel, the *Antelope*, and from the journals of Captain John McCluer's voyages to Palau between 1790 and 1794 (McCluer 1790-1792; Hockin 1803). Fieldwork by the German ethnographers Semper (1982), Kubary (1895) and especially Krämer (1917; 1919; 1926; 1929) has also provided many important details. From these descriptions it is apparent that at initial European contact Palau was politically stratified and was divided into many "districts" comprising various small islands and portions of Babeldaob Island. These districts consisted of variable numbers of villages, with one village being the most powerful and most highly ranked within each district. While there is at present some confusion surrounding the structure and boundaries of these districts (augmented in part by the seemingly uncritical usage and equating of the terms "village" and "district" by the early writers before Krämer), these districts may be equated with the concept of chiefdom (*sensu* Service 1962; Peebles and Kus 1977; Carneiro 1981), each controlled by a "paramount" chief whom the English erroneously referred to as "King". These chiefdoms exhibited a political organisation composed of at least two distinct levels of administrative hierarchy, with these positions being hereditary (Cordy 1983). The lower level in the hierarchy consisted of each individual village chief, a position filled by the highest ranking member of the most highly ranked clan of the village, and probably the ranking clan leaders of the paramount chief's village as well; however the relationship between these two groups in terms of political influence is by no means clear and the actual contact period situation may have been somewhat more complex. The higher level of the hierarchy was that of the paramount chief, a person who could organise military expeditions, who exercised the power to demand tribute from subject villages, and who required various tokens of deference from commoners and lesser chiefs. There is some evidence of supra-district political hegemony at initial contact. For example, Keate (1788:199, 307) records a military force of approximately 300 canoes and 4000 men assembled by the district of Koror against Peliliu. Allied with Koror (which had its paramount chief's village on Oreor Island) were the following "places" (Keate 1788:206; see also Semper 1982:13n): "Emungs" (Imiungs) a village in the modern state of Ngeremlengui; "Aramalorgoo" (Ngeremlengui); "Arrguay" (Ngerekeai—the old name for the capital of what is now the modern state of Aimeliik); "Emillegue" (Aimeliik); and "Caragaba" (Ngerebeched—a village on Oreor Island). All identifications follow Parmentier (1983, pers. comm.). The district of Melekeok was at one point allied with Ngardmau and Ngeremlengui (Semper 1982: 13n, 103, 169).

However, these supra-district alliances appear to have been weakly organised and unstable, and the power of the paramount chiefs of Koror and Melekeok (in the above examples) may not have been absolute at this level of political organisation (see also Cordy 1982). Oral traditions indicate that district boundaries, ranking villages and ranking clans were commonly in a state of flux before historic contact because of

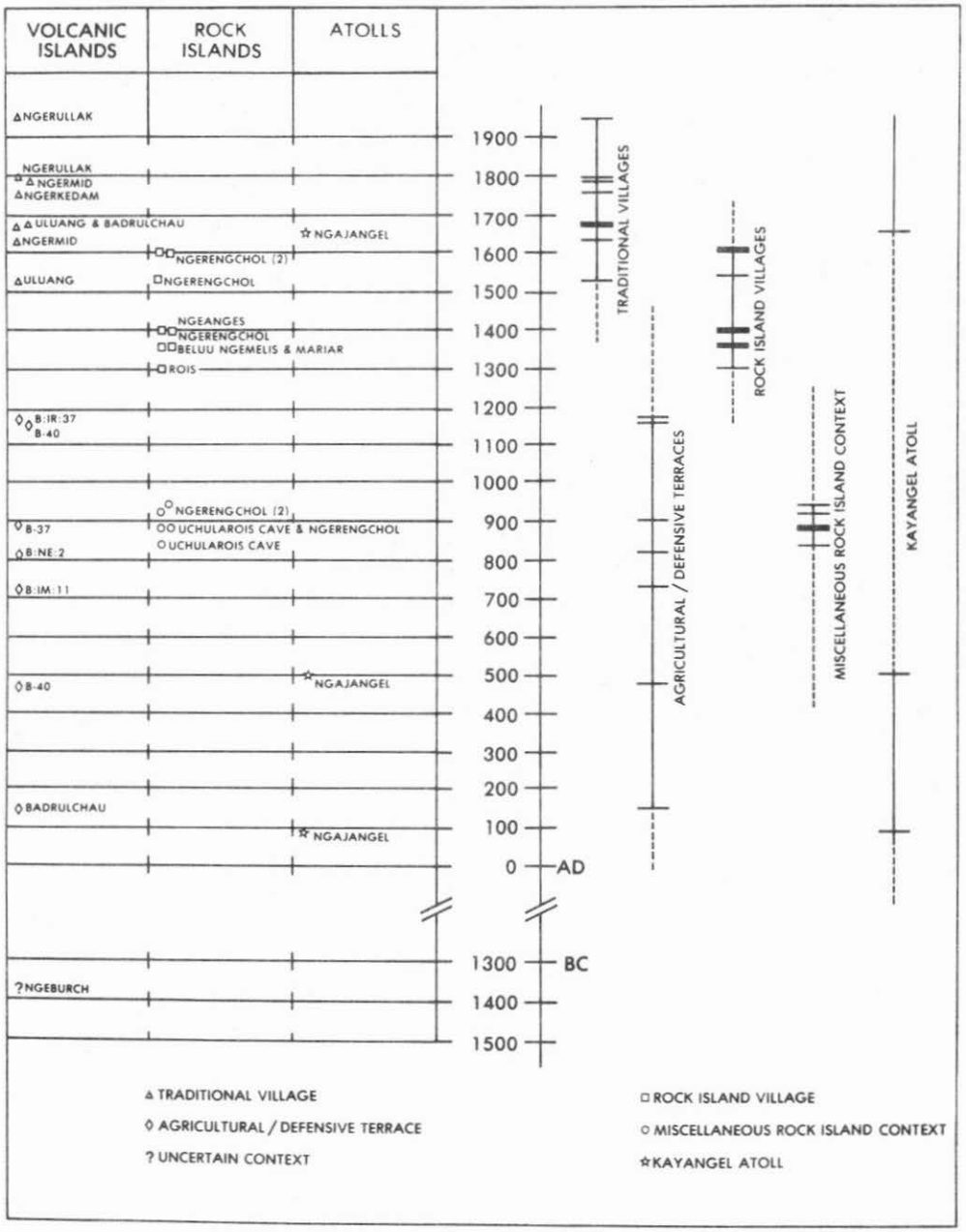

Figure 3: Synoptic chart of radiocarbon dates from archaeological sites in the Palau Islands. (Data from Osborne 1979; Takayama 1979; Takayama *et al.* 1980; Lucking 1981; Masse and Snyder 1982).

the vagaries of endemic warfare (see also Force and Force 1972:10-14). McCluer noted that even at initial contact alliances among the districts were somewhat transitory,

and it was only the superiority of the European weaponry that gave Koror the opportunity to create a sense of cohesion among its constituent districts (Hockin 1803; see also Semper 1982). Thus, the level of social organisation observed at initial historic contact, in which especially Koror and Melekeok and their respective allies were seen as stable powerful rival chiefdoms, was probably created, in part, by the circumstances of that contact itself. Nevertheless, the seeds of social complexity had clearly been sown long before historic contact; and it is likely that Koror, Melekeok, Peliliu, and possibly a few other districts were in the process of developing a supra-district political organisation by 1783. The English (and other foreigners) may simply have hastened the consolidation of power by Koror and Melekeok. It should be clear from this discussion that much remains to be learned about early historic Palauan political organisation, and this topic should be the focus of much future research.

Palauan villages dating around historic contact were more-or-less uniform in their physical structure and environmental setting. Most of the villages on the volcanic islands were situated several hundred metres away from the shoreline, usually on hillslopes or ridges ranging between 10 and 75 m above sea level. Small freshwater streams flowed in the valley bottoms next to these ridges, and supplied water for cooking, bathing and irrigated pond fields. The considerable distance of the villages from the shoreline or mangrove swamps was possibly defensive in nature in that hostile raiding parties most commonly attacked from the sea and not from overland routes.

On the basis of our admittedly limited data base from the interior of Babeldaob Island, there do not appear to have been any truly inland or land-locked villages during any time period of Palauan history, and every known village on Babeldaob had access to the sea. There are two possible exceptions to this generalisation, both in prehistoric contexts. The first is at Lake Ngardok in Melekeok State, the only freshwater lake in the Palau Islands. Although villages have not been reported from the region surrounding the lake, several prehistoric terraces are reported to be present (Osborne 1966:266; Lucking 1981:121); this area has not yet been systematically surveyed by archaeologists. Semper (1982:154) was told (by a non-Palauan individual) in 1862 about ". . . an old village near a large fresh water sea. . ." near Melekeok Village that contained ". . . a large open area surrounded by enormous stones standing on their narrow ends". But this site could easily be that of Badrulchau in Ngerchelong State, to be discussed later. The second possibility for a land-locked village is reported as a monolithic structure in southern Babeldaob, briefly mentioned by Osborne (1980:277). Villages on Peliliu Island were possibly situated nearer to the shoreline than those of the volcanic islands. However, at least some of the contact period villages on Peliliu were protected from sea attack by means of long coralline limestone defensive walls which prevented easy access into the village. One such wall was constructed across the pathway leading from the canoe landing dock to one of the principal Peliliu villages. Keate (1788:204) described this wall as being 10 to 12 feet (3.0 to 3.7 m) in height, with a ledge running along the back side of the wall on which the defenders could stand and hurl spears at their enemies (see also Semper 1982:267-268). Stone defensive walls are unknown for contact period sites on the volcanic islands, with the possible exception of a poorly understood wall at Melekeok Village, which may have been constructed as a consequence of the introduction of firearms by the English. Osborne's site B-6 in Aimeliik State contains an earthen wall seemingly defensive in nature (1966:178-180), but we suggest that this site may predate the traditional villages depicted in Figure 3.

Historic contact period Palauan villages are characterised by a number of different kinds of stonework features, including platforms of various functions and sizes, pathways, bathing areas, wells, occasional stone carvings referred to by Osborne

(1966:167; 1979:130-138) as "Great Faces" and frequent smaller stone carvings of varied sorts. While the Great Faces were noted at a number of villages, oral traditions suggest that they most probably originated in an earlier period of Palauan culture history. Every village also had its own canoe landing dock and associated canoe houses. For the most part these docks were situated at the heads of long sinuous channels cut through the mangrove swamps. Keate describes well-constructed lengthy coralline limestone piers at both Koror and Melekeok; McCluer (Hockin 1803:40) describes the latter as being 12 feet (3.7 m) in height, 15 feet (4.6 m) wide on top and 1 mile (1.6 km) in length.

The most conspicuous features at village sites are stone platforms. These platforms represent activity areas associated with domestic house structures (*blai*), men's clubhouses or community houses (*bai*) and religious shrines (*ulengang*). Most Palauan villages, regardless of size, contained at least one clubhouse, and the larger villages had several. Apparently not all domestic households had associated stone platforms, but the highest ranking individual in each of the 10 (ideally) clans of a village had titular ownership of, and resided at, a specific platform (Force 1960:36-40; Force and Force 1972:34, note 20). The largest number of household platforms at any of our intensively studied villages was 39 at Airai Village in southern Babeldaob, but it is unclear how many of these were occupied contemporaneously. Household platforms served as a locus for certain domestic activities (Snyder *et al.* 1983), and frequently were used as a burial ground for high-ranking individuals. Such graves are situated near the centre of the platform, and are marked by the presence of small, raised rectangular platforms of stone covering the burial trench. House platforms are readily distinguished from clubhouse platforms on the basis of size, and on the basis of associated subsurface features such as pits, hearths and midden deposits. Refuse, in particular, was found in much smaller quantities around clubhouse platforms than was the case for house platforms. In terms of size, 52 measured household platforms were found to range from 27 to 304 m^2, with a mean of 105 m^2. Seven known clubhouse platforms ranged from 352 to 600 m^2 with a mean of 460 m^2; thus there is a clear demarcation between the two general categories of platforms.

Most platforms are constructed from unshaped basalt cobbles and boulders, with some platforms exhibiting more than one tier of stone. Platforms at the early contact period village of Ngeburch in Melekeok State are notable for their excellent craftsmanship and the use of rectangular blocks of locally available sedimentary stone. It is also notable that a small number of platforms made from coralline limestone have been found at various sites in the volcanic islands, even in places where basalt was readily available. These platforms appear to have considerable antiquity, but precise dating is currently not possible.

In terms of overall village plan, traditional villages typically contained a large centrally located clubhouse platform surrounded by a scattering of household platforms. The ample space between household platforms facilitated the growth and maintenance of kitchen garden tree crops that were probably associated with each household, a common practice in traditional cultures throughout the Pacific (Helen Leach, pers. comm.), which continues to the present in modern Palau (Moses N. Sam, pers. comm.).

It is emphasised that non-tree crop agriculture was largely confined to coastal river valley floors adjacent to the villages. Various sub-species of the aroids *Cyrtosperma* and *Colocasia* were planted in elaborate irrigated pond field systems, with dryland-adapted forms being planted on the dikes separating the pond fields (Lucking 1981). There is no archaeological, documentary or oral history evidence that the large hillslope

terraces of Palau were utilised for agriculture during this period with the exception of the lowest terraces near the valley floors (see McKnight and Obak 1960:31-32).

The question of population size and structure of traditional villages and districts in Palau at initial historic contact is critical for an understanding of social and demographic process. Unfortunately, reliable population estimates are not available before the work of the German ethnographers in the latter half of the nineteenth century. Krämer (1919:292) noted 4,000 Palauans in 1910, and de Valencia (cited in Force and Force 1972:4) estimated 3,000 in 1891, but these figures represent a population decimated by several decades of exotic diseases (Force and Force 1972:4). Semper (1982:289-290) suggests that at initial contact, Palau contained a population of 40,000 to 50,000, a figure derived from the English estimates of the military force of 4,000 men assembled by Koror against Peliliu. Semper's estimate is probably too high, given the likelihood that the 4,000 figure is inflated by impressionistic participant observation. Krämer (1919:292) arrived at a perhaps more carefully reasoned figure of 20,000 to 25,000 people at contact, based on his estimate of average village size (100 people), and on his count of 235 villages (including 151 that were extinct) throughout the archipelago, excluding the rock islands between Oreor and Peliliu. However, his estimated average village population figure and the actual contemporaneity of occupation at these various villages can both be questioned. It is beyond the scope of this paper to evaluate the various population estimates; but one fact does seem to emerge from these data. It seems likely that the contact period chiefdoms each had, at most, only a few thousand people, and it is doubtful that even Koror ever approached 10,000 subjects. Cordy (1982, 1983) has suggested a maximum polity size for any of the chiefdoms at around 1,000-3,000.

ROCK ISLANDS VILLAGES, *CIRCA* A.D. 1200-1600

It is uncertain how far back in time the historic contact period settlement pattern may have extended. On the basis of oral traditions, however, it appears that the considerable power of the paramount villages of the Koror and Melekeok districts does not extend much before A.D. 1500-1600, a supposition supported by examination of lists of title holders (Parmentier cited in Lucking 1981:12, 46).

Although still poorly known on the volcanic islands, the A.D. 1200 to 1600 time period witnessed the probable establishment and subsequent abandonment of at least 11 sizeable villages in the rock islands between Peliliu and Oreor. This apparently short-lived phenomenon represents the only good evidence for permanent settlement on these small limestone islands during any time period before A.D. 1900. It is notable that these villages are mentioned in a variety of Palauan legends (e.g. Osborne 1966:401-404, 424-425, 437-438). With the exception of those islands adjacent to Peliliu, all rock island villages were abandoned prior to contact.

In order to understand this interesting settlement pattern better, we intensively surveyed and made test excavations at three rock island village sites situated on four now uninhabited rock islands (Masse and Snyder 1982). These village systems are located, respectively, on Ngeruktabel Island, on Ngeanges Island, and on Ngemelis and Uchularois Islands (Fig. 2). Each of these villages will be briefly described.

The Ngemelis Island group is a small cluster of low-lying rock islands situated at the western edge of Palau's barrier reef system. Only one of the group's four larger islands, Ngemelis, was intensively studied, along with three of the smaller islands. The islands of the group are composed of small jagged ridges of coralline limestone averaging 10-15 m in height above sea level, which are usually surrounded by broad relict beaches of calcareous Shioya sand (Vessel and Simonson 1958) from one to two

metres in height above sea level. Ngemelis Island is 1,200 m in maximum length and 450 m in maximum width. A narrow ridge of coralline limestone extends the length of the island, but the major portion of Ngemelis consists of sand. A small mangrove swamp is present in the southern half of the island, while in the north is a somewhat swampy area that contains occasional clumps of *Cyrtosperma*.

Five large areas of concentrated archaeological midden deposit were recorded on Ngemelis Island, in association with at least 24 stone platforms or platform-like areas. There is good evidence to suggest that several additional platforms have either been destroyed during recent historic times, or lie completely buried in the sand. A possible pathway/breakwater system appears to link together the five midden areas and presumably provided protection for garden areas from saltwater intrusion. These flattop coralline limestone-based embankments average 4 m in width, and several sand-covered sections rise more than one metre above the surrounding terrain. The midden deposits range in size from about 2,500 m^2 to more than 10,000 m^2, and in maximum depth from 30 to 80 cm below the surface. Ceramics and food shell remains are extremely abundant, along with a variety of shell and stone tools. Four small (1 x 2 m) test pits yielded the remains of more than 200 individual fish, two turtles and a pig.

The coralline limestone platforms on Ngemelis Island are of variable size and shape, and in general display a village plan similar to that of the contact period villages in the volcanic islands. One particularly large and complex platform at Beluu Ngemelis, a residential complex and midden area in the centre of the island, is suggestive of a men's clubhouse. Another platform near this feature has a large volcanic boulder cornerstone, the only use of volcanic stone for structural purposes we observed in the rock islands. None of the platforms on Ngemelis or the other rock islands exhibited detectable grave features, in contrast to such platforms in the traditional historic contact villages.

It is our belief that the five midden deposit areas were once part of a single extensive village system. This hypothesis is suggested by the apparent similarity in artefact types among these areas (analysis of this material has not yet been completed), and by the apparent linkage of these areas by the causeway system. A single radiocarbon date of 600 ± 45 B.P. was obtained from food shell remains at Beluu Ngemelis. Several additional food shell samples from Ngemelis Island and the other two tested rock island villages have also been submitted for dating.

Adjacent to Ngemelis Island is Uchularois Island, a steep ridge of coralline limestone approximately 200 m in length, 75 m in width, and rising to a height of 40 m above sea level. This tiny island, which is connected to Ngemelis Island at low tide by a sandy tombolo, contains a large number of archaeological features. At least 12 stone platform-like areas are precariously perched on the slopes of Uchularois Island, and a possible canoe landing dock is at its base. These remains have been tentatively identified as the legendary village of Rois. Also present near the top of the island is a cave of which more will be said later. The lack of easy access onto the island and the location of most of the platforms suggest that the need for defence may have been an important aspect of this settlement. A radiocarbon date of 650 ± 50 B.P. was obtained from food shell associated with one of the platforms. This date coincides with the previously mentioned date from Ngemelis Island, and suggests that the Uchularois platforms were contemporaneous with, and part of, the Ngemelis Island village system.

The second rock island village system studied was on Ngeanges Island. Ngeanges is approximately 750 m long and 150 m wide, and consists of two coralline limestone ridges separated by a broad expanse of sand. Two large areas of rich midden deposits are situated on the sand formation at either end of the island. A few possible platforms

are associated with these middens, but the great majority of platforms, 20 in total, are situated on the southern ridge. Only a small number of artefacts were observed near these platforms, suggesting that the southern midden area at the base of the village may have served as the focal point of subsistence activities for the ridgetop village. The northern midden area may also have been contemporaneous with the village, perhaps being utilised from June through November, a time when the adjacent ridge could have offered some protection from the southwest trade winds.

A single radiocarbon date of 550 ± 35 B.P. was obtained from food shell remains at one of the ridgetop platforms. This date, while not overlapping at one standard deviation with the date from Uchularois Island, is still close enough to suggest possible contemporaneity between the two villages.

Mariar was the third rock island village investigated. Mariar is one of at least five legendary villages located on Ngeruktabel Island, of which three have now been verified archaeologically. Ngeruktabel is the largest of the rock islands, being approximately 19 km² in size. The island is dominated by steep, forested limestone ridges, some of which approach 200 m in height above sea level.

The village of Mariar consists of at least 36 stone platforms or platform-like areas situated partly in two adjacent sandy beach coves, but primarily on the hillslopes and ridgetops surrounding these coves (Fig. 4). Several specialised architectural features of the village appear to have served defensive functions. Each cove was presumably protected from sea attack by means of substantial coralline limestone walls which span the breadth of the coves. These walls were probably originally about 2 m in width and more than 2 m in height, and appear similar to the contact period wall previously described for Peliliu. In addition, at least two hillslope pathways were flanked by specially constructed or placed platforms; and one hillslope valley was seemingly protected by a stone wall built across a narrow pass.

Large complex platforms are situated on top of two small hills adjacent to the southern cove. Two test pits at the southern platform yielded numerous artefacts including ceramic net-sinkers, a variety of shell adzes and a front tooth from a short-finned mako shark. These specimens, when coupled with the size, location and construction of the platform, suggest that the platform may have been the location of a men's clubhouse. A single radiocarbon date of 600 ± 40 B.P. was obtained from food shell at this platform, suggesting that Mariar was roughly contemporaneous with the village systems at Ngemelis and Ngeanges. The second hilltop platform is of even more complex construction than the first, and its size of 600 m² falls well within the range of traditional contact period clubhouse platforms.

Village systems similar to those described above have been partially mapped and described from several other rock island locations (Osborne 1966, 1979; Takayama and Takasugi 1978; Takayama 1979; Masse and Snyder 1982; Snyder 1983). Village sites at both Ulong and Ngerengchol have yielded radiocarbon dates, but those reported by Osborne (1979) for Ulong cannot be utilised because of the present uncertainties in the carbon dating of Palauan ceramics. Takayama's (1979) shell dates from Ngerengchol suggest that at least some rock island village systems may have been occupied into the seventeenth century A.D. However, it is not certain that his three sixteenth century dates are indeed associated with the presumed village features at Ngerengchol. It is perhaps of significance that Takayama also obtained a date of 555 ± 75 B.P., which is similar to the dates from the three village systems that we investigated, although this latter date is also not clearly associated with the village features.

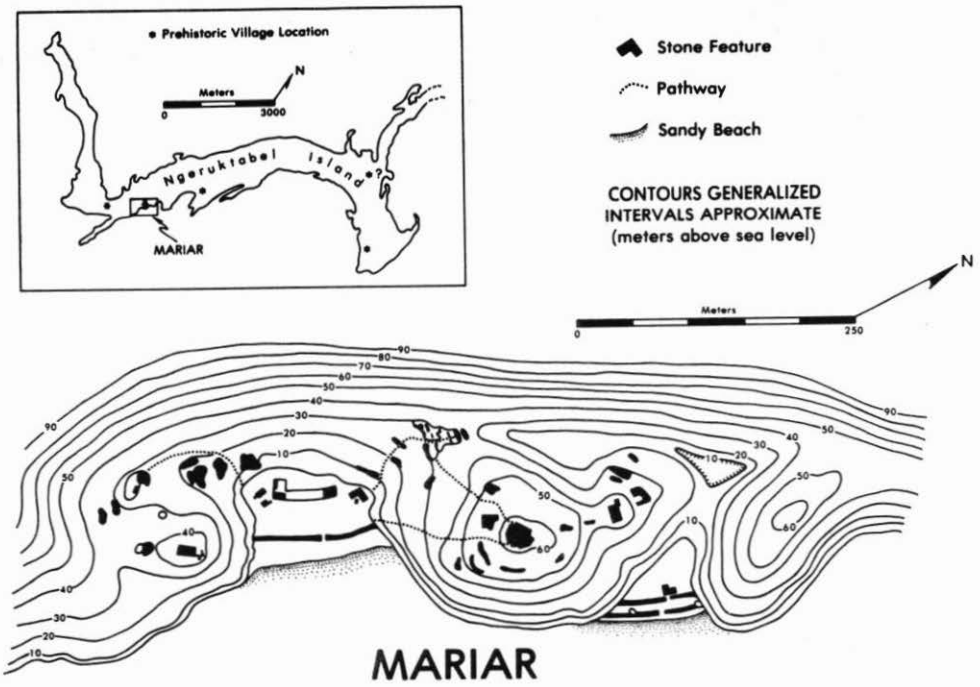

Figure 4: Mariar, a prehistoric (*circa* A.D. 1300-1400) rock island village on Ngeruktabel Island.

The evidence suggests to us that the rock island villages were a short-lived phenomenon, primarily dating to the time period around 1300 to 1400 A.D.; although Osborne (1966:460-461; 1983: pers. comm.) would perhaps argue in favour of Takayama's views that at least some, if not most, villages were occupied until the 1600s, and perhaps earlier than A.D. 1200 as well. The reasons for both the establishment and the eventual abandonment of the villages in the rock islands between Oreor and Peliliu are poorly understood. Palauan legends indicate that warfare among the rock island villages and between the rock islands and the volcanic islands was endemic during this period. Certainly the seemingly defensive posture of the rock island villages lends support to these oral traditions. Both warfare and starvation are mentioned in the legends as contributing to the abandonment of the rock island villages, but these hypotheses have yet to be tested archaeologically.

UCHULAROIS CAVE, *CIRCA* A.D. 850-900

The period before A.D. 1200 is poorly known in the Palau Islands. Data on settlement patterns come indirectly from two sources. The first of these consists of artefact assemblages from two apparently temporary or limited use activity sites in the rock islands, both of which date to around A.D. 900. The second source of data comes from terrace systems on the volcanic islands, which are believed to have been in use during this time period.

Takayama found evidence of a cultural horizon at Ngerengchol on Ulsbachel (Aluptaciel) Island, radiocarbon dated to between 1010 ± 60 and 1070 ± 75 B.P. (Takayama and Takasugi 1978; Takayama 1979). He suggests that the site was "settled"

by a population using pottery, baked clay sinkers for fish nets, and various kinds of shell tools. However, a final report on this site has not yet been published, and it is thus difficult to evaluate the actual permanency of site occupation. Osborne (1979) has claimed an early occupation for Ulong Island, but as his interpretations are largely based on sherd radiocarbon dates, these claims are open to question.

The second limited use site in the rock islands is the previously mentioned cave on Uchularois Island (Masse and Snyder 1982). This unpretentious-looking cave proved to have midden deposits more than 2 m in depth, containing a rich assortment of artefacts. Approximately 4 m^3 of midden deposit yielded more than 4000 sherds, 100,000 food shell remains, scores of shell, stone and bone tools, and the remains of over 1,500 individual fish (Masse 1982), 5 pigs, 4 turtles, and 3 unidentified cetaceans (Smith 1983). Among the ceramics were sherds belonging to several different vessels of a well slipped and polished redware. This redware has not yet received intensive study, but it does not appear to be related to redware reported from the Marianas (see Spoehr 1957). A charcoal sample from a depth of about 85 cm below surface yielded a date of 1070 ± 40 B.P., while food shell remains from a depth of 165 cm yielded a date of 1110 ± 50 B.P. These dates and the lack of evidence of permanent habitation, such as prepared hearths and living surfaces, suggest that the cave was intensively utilised by periodic fishing parties over the course of a few generations. Analysis of the fish remains suggests a strong reliance on resources within the lagoon and a continuity with historic traditional Palauan fishing practices (Masse *et al.* 1983). The presence of the pigs (which are in clear association with the above mentioned dates) and the large number of sherds may, however, indicate a somewhat more complex use of the cave and its immediate environs than that by simple fishing parties.

VOLCANIC ISLAND TERRACES, *CIRCA* A.D. 100(?)-1200(?)

The most visibly impressive and the most puzzling, aspect of Palauan prehistory is the numerous terrace systems which dot the volcanic islands. These terraces, in aggregate, probably exceed 5 percent of the land surface of Babeldaob Island, or more than 20 km^2. However, despite the obvious magnitude of these terraces, relatively little is known of their function, dating, or of the settlement system of which they were but a part.

The most detailed archaeological work on the terraces has been by Osborne (1966, 1979) and Lucking (1981). They have concluded that these terraces served both agricultural and defensive functions. Lucking has suggested that Palauan terraces can be divided into three basic types, all of which were formed by cutting into and shaping ridges and hillslopes. Type I is the so-called "brimmed" terrace. Brimmed terraces have a rim of earth 50 cm to more than 2 m higher than the inside basin of the terrace. Type II terraces have flat surfaces and are characterised by their step-like appearance. The risers of these terraces may sometimes exceed 5 m in height. Type III terraces are short, shallow and have gently backsloping surfaces.

Osborne and Lucking have noted at least three types of features commonly found in association with these terraces, all of which may be defensive in nature. These include long, deep ditches referred to locally as "footcatchers"; mounded earthen walls which are constructed across the tops of ridges, and are known only from southern Babeldaob; and finally, a feature termed a "crown", which is found at the top of many terrace systems, usually in association with brimmed terraces (Fig. 5). The crowns are at least partially constructed and shaped from mounded fill, and can be as much as 5 to 6 m in height above the surrounding terraces and more than 35 m in diameter. Aimeliik State in southwestern Babeldaob contains an unusually large number of crowns, with

Figure 5: Ngermelkii, a small brimmed terrace with crown feature, Ngetpang State, Babeldaob Island.

at least eight observed thus far.

Seven radiocarbon dates have been obtained from provenances postulated as representing periods of terrace construction or usage. These dates range in time from 785 ± 75 B.P. to 1800 ± 70 B.P., with five of the dates falling into the period of A.D. 700 to 1200. However, there is at present no way of assessing the contemporaneity of the various components and features of these terrace systems; and the reasons for such obviously labour intensive investment into dry-land agriculture are beyond our current data base. The nearly complete absence of oral traditions concerning the volcanic island terraces, and the lack, thus far, of radiocarbon dates from the terraces for the period 1200 to 1600 A.D., may indicate that the terraces were abandoned by the beginning of this period (see also Osborne 1979:240, 264-265; Lucking 1981). Cordy (pers. comm. 1983), on the other hand, has suggested that the terraces were utilised up to historic contact.

It is conceivable that the process of terrace construction itself actually removed much of the thin surface layer of agriculturally suitable soil, and thus hastened the exhaustion of the soil, the reduction of productivity and the eventual abandonment of the terraces

(Lucking 1981). However, this hypothesis is somewhat at variance with the lengthy duration at present ascribed to terrace usage in the Palau Islands (1100 + years), unless during most of this period population was small enough and fallow cycles long enough to permit the continuous reuse of these terraces. Alternatively, but not mutually exclusively, the period of terrace usage may have been of much shorter duration, only a few hundred years rather than more than a thousand. Also, it has been assumed (e.g. Osborne 1966: 150-155, 1979:269, Lucking 1981:173-178) that the agricultural and the defensive aspects of Palauan terraces represent a contemporaneous and integrated system of terrace usage. However, we should not overlook the possibility that the defensive features may actually be a late development associated only with the terminal period of agricultural usage of the terraces, or may be a completely separate phenomenon altogether. The relative lack of intensive archaeological fieldwork on the terraces and the limited number of radiocarbon dates obtained thus far make it difficult to evaluate the role of the terraces in Palauan culture history.

No platforms or other evidence of contemporaneous habitation have been documented in association with the terraces, although presumably later traditional village components are occasionally encountered on terraces. Thus it appears that associated villages were situated away from the terraces in locations unknown at present (see Osborne 1979: 109, 112 for a somewhat contrastive view). The single known possible village site dating to this time period is that of Badrulchau in northern Babeldaob, tested and extensively reported by Osborne (1979:154-200). This site contains two sets of massive, shaped, upright columns of andesite, which presumably served as roof support beams for large community structures. A plaza or open courtyard area and several carved stone heads are also associated with these two structures, but there is no direct evidence of associated domestic households. Osborne reports a radiocarbon date of A.D. 1665 ± 80 in dubious association with one of the community structures, a date he dismisses as too late (1979:240). Cordy (1983: pers. comm.), on the other hand, feels the date may be reliable. Another set of large stone uprights has been reported by Osborne (1980) from southern Babeldaob, but has not yet received detailed archaeological study.

EARLY SETTLEMENT IN PALAU, PRE-A.D. 700

Five radiocarbon dates have been secured for the time period before A.D. 700, but these are not from provenances that really help to shed much light on prehistoric settlement patterns. Dates in the first and fifth centuries A.D. were obtained from sparse midden deposits on Kayangel Atoll (Takayama *et al.* 1980), and from two terrace provenances on Babeldaob Island. These dates suggest the early utilisation of atolls (and rock islands), and hint at an early construction date for the terraces. The permanency of occupation on Kayangel during this time period remains an unresolved question. A perplexing date is that from charcoal at Ngeburch Village in Melekeok, which yielded a date of 3330 ± 85 B.P. Unfortunately, this date was obtained from a depth of only 10 to 15 cm below the ground surface, and may conceivably represent a mixed horizon. A Palauan glass money bead and several sherds were found in association with the radiocarbon sample.

CONCLUSIONS

The data presented here clearly demonstrate that Palau has a rich and complex culture history, and settlement patterns have undergone major transformations during at least the past two millennia. However, our knowledge of these patterns and especially the mechanisms or events that precipitated the various transformations of these patterns

is critically deficient.

We do have a fair understanding of historic contact period settlement patterns. We know that in the late eighteenth century several districts in Palau contained hierarchical political structures and evidence of rigid social stratification; each of these districts had a paramount chief whose village was considered the capital of that district and whose clan was most highly ranked within that village and district. These districts can (with some reservation) be equated with the current anthropological concept of "chiefdom". We also know that there was much conflict and political strife, and that alliances among districts (and possibly relations within districts) were fluid and inconstant. The eventual consolidation of power by Koror and Melekeok and the reduction in power of all other districts in the Palau Islands can be attributed, at least in part, to foreign intervention during the late eighteenth to mid-nineteenth centuries. And finally, we have some understanding of the spatial distribution of villages in response to biogeographical factors such as access to rivers for irrigation and domestic water supply, defensive security, and access to the sea. However, we still have much to learn about initial contact economic systems, subsistence practices, community structure, cosmology and other important aspects of traditional Palauan society. At least some information on these problem areas can be gleaned from further study of oral histories, historic documents and general ethnography, but additional archaeological fieldwork will be necessary in order to resolve many fundamental questions.

Our knowledge of prehistoric settlement patterns is frustratingly incomplete. The rock island village settlement systems and the agricultural/defensive terrace systems discussed above are each simply an aspect of a much larger complex regional system about which little is known. The surprisingly intact fourteenth century villages in the rock islands have yielded a wealth of data, the ongoing analysis of which should allow us to reconstruct in considerable detail the non-floral subsistence base, tool and pottery attributes, and the spatial structure of architectural units and activity areas. However, it is obvious that the rock island villages were not closed systems. The numerous pottery vessels present on these limestone islands and the general lack of arable land (and presumed concomitant need for agricultural produce) are indicative of active connections with the volcanic islands. We have no clear idea of what materials may have been flowing into the volcanic islands as a result of these interactions since volcanic island villages from this time period are virtually unknown archaeologically.

The period of terrace usage provides an even more nebulous picture of Palauan settlement. We have some idea as to the nature of the agricultural and defensive components of these terrace systems, but know little about their chronological age and the relationship of these components to each other. The limestone islands appear to lack substantial permanent occupation before A.D. 1200 (with the exception of Peliliu, Angaur and Kayangel Atoll), but the data from Uchularois Cave and Ngerengchol shed light on marine exploitation patterns and activities carried out in the rock islands. Once again, information on contemporaneous volcanic island village structure and distribution is totally lacking, with the exception of enigmatic and poorly dated Badrulchau. And except for isolated radiocarbon dates, the early culture history (pre-A.D. 700) of Palau is completely unknown.

From these data we can build a tentative scenario of Palauan settlement, beginning with the use of terraces during the first millennium A.D. Disregarding the still unknown early history of the terraces, we suggest that around A.D. 800-1000 the volcanic islands were in the throes of agricultural intensification, a process that might have continued until some time in the twelfth century. If most of these terrace systems were

contemporaneously in use, this considerable emphasis on dry-land farming suggests that population may have outstripped the productivity of contemporary irrigated pondfields (although we cannot rule out the possibility that social pressures were the impetus for this intensification). There was also the concomitant heavy exploitation of marine resources, and sizeable numbers of pigs were present on the volcanic islands (the latter may have provided additional incentive for agricultural intensification). Assuming that Badrulchau and the "Great Faces" date to this time period, then it seems likely that social complexity was well advanced, perhaps on a par with (or even greater than) that at initial historic contact, especially if population at this time was comparable to, or greater than, that at initial historic contact. And the defensive component of the terraces indicates that the regional system was imbued with competition and political strife.

The abandonment of the terraces by the thirteenth century and the seemingly related establishment of villages in the rock islands represent a major transformation of settlement pattern. Oral tradition and the apparent defensive posture of most rock island villages indicate that warfare was an aspect of this time period. It would be of interest to learn if the defensive features on the volcanic island terraces were also in use at this time. The occupation of the rock islands was brief, and can be viewed as unsuccessful from an adaptational perspective. Most rock island villages were probably abandoned by the end of the fourteenth century, and certainly by A.D. 1600. The reasons for the abandonment of these villages are at present unclear, but it is likely that this population relocation helped to shape the settlement distribution and structure observed at initial historic contact.

Throughout this paper we have confined our attention to events and processes in the Palau archipelago itself. It is notable, however, that Palauan ceramics have been recovered on Lamotrek Atoll from deposits dating between A.D. 1200-1500 (Fujimura and Alkire n.d.), and on Ngulu Atoll dating between A.D. 800-1400 (Takayama 1982; Intoh n.d.). Takayama (1982:94) has even gone so far as to hypothesise that there was a "Palau Empire", much like the *sawei* tribute and exchange system of the so-called "Yapese Empire" (Lessa 1950, 1966). Given the present data base, we suggest that Takayama is overzealous in his attempt to explain the distribution of these sherds and that his "empire" hypothesis is at best premature. Nevertheless, in concluding our remarks we stress that Palau was probably never completely isolated from other Pacific island groups during any point in its history. But before we can satisfactorily explore the possibilities of Palau's involvement in a regional system of long-distance movements of people and resources, we must first strive for a better understanding of settlement systems within Palau itself.

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APPENDIX

A SUMMARY OF PALAU RADIOCARBON DATES

A total of 41 radiocarbon dates has been obtained from various provenances in the Palau Islands, as of October 1983. These are presented below by location, site name, site type, material dated, the radiocarbon date itself, the laboratory number assigned to each sample, and the reference in which the context of the sample is described. Four different radiocarbon laboratories have contributed dates. Those laboratory numbers prefaced by "N" are from the Japan Radioisotope Association (Nishina Memorial); "UCLA" is the Isotopes Laboratory, Institute of Planetary Geophysics and Planetary Physics, University of California at Los Angeles; "DIC" is the Dicarb Radioisotope Company; and "I" is Teledyne Isotopes, Inc.

All dates presented are based on the 5568 year Libby half-life for radiocarbon, and none of the dates have been calibrated for secular trends or corrected for isotope fractionation or reservoir effect. However, the pottery radiocarbon dates have all had 1900 years subtracted from the initial radiocarbon age to conform with an estimate for the radiocarbon age of Palauan clay (see Osborne 1979:235).

FOOTNOTE: Twenty-one additional rock island radiocarbon dates have recently (December 1983) been obtained from the New Zealand Institute of Nuclear Sciences, but too late for inclusion in this paper. Of these dates six were from Uchularois Cave, four from Ngemelis Island locations, six from Mariar and the remaining five from Ngeanges Island. These dates support the basic model of rock island settlement presented here. The stone village features at Mariar and on Ngeanges, Ngemelis and Uchularois Islands now appear to be securely dated between A.D. 1200-1450 (based on the radiocarbon calibration curve suggested by Klein *et al.* 1982). Two distinct stratigraphic horizons are now apparent in Uchularois Cave, with the majority of deposits (those below approximately 60-70 cm in depth) dating very securely between A.D. 650-900. The deposits between roughly 30-60 cm in depth date to A.D. 1250-1500, and are probably contemporaneous with the Ngemelis Island village system. The distribution of faunal elements in the cave (Smith 1983) strongly indicates that pigs are present in both temporal horizons. Single dates in the A.D. 650-900 period were also recorded for midden deposits at Mariar and on Ngeanges Island, suggesting an intensive use of the rock islands during this time; single dates between A.D. 900-1200 were obtained from midden deposits on Ngeanges and Ngemelis Islands. It is unclear whether these remains represent a permanent resident population on the rock islands during the pre-A.D. 1200 period.

A detailed discussion of all Palau radiocarbon dates is presented in Masse (1984), and will be further amplified by SIUPAP reports now in preparation.

LOCATION	SITE NAME	SITE TYPE	MATERIAL	DATE	LAB NUMBER	REFERENCE
BABELDAOB ISLAND						
Aimeliik State	B:IM:11	Terrace	Charcoal	A.D. 720 ± 220	I-11,953	Lucking 1981
Airai State	B:IR:37	Terrace	Charcoal	A.D. 1165 ± 75	I-11,955	Lucking 1981
Airai State	Ngerkedam	Village	Charcoal	A.D. 1750 ± 70	DIC-2528	Masse & Snyder 1982
Airai State	Ngerullak	Village	Charcoal	A.D 1790 ± 70	DIC-2067	Masse & Snyder 1982
Airai State	Ngerullak	Village	Charcoal	Modern ± 195	DIC-2068	Masse & Snyder 1982
Melekeok State	B-37	Terrace?	Charcoal	A.D. 895 ± 80	UCLA-1762G	Osborne 1979
Melekeok State	B-37	Terrace	Pottery	B.C. 2350 ± 400	UCLA-1855S	Osborne 1979
Melekeok State	B-37	Terrace	Pottery	B.C. 625 ± 400	UCLA-1855Q	Osborne 1979
Melekeok State	Ngeburch	Village	Charcoal	B.C. 1380 ± 85	DIC-2533	Masse & Snyder 1982
Ngchesar State	B-40	Terrace	Charcoal	A.D. 470 ± 80	UCLA-1762E	Osborne 1979
Ngchesar State	B-40	Terrace	Charcoal	A.D. 1150 ± 80	UCLA-1762F	Osborne 1979
Ngerchelong State	Badrulchau	Terrace	Charcoal	A.D. 150 ± 80	UCLA-1762I	Osborne 1979
Ngerchelong State	Badrulchau	Village	Charcoal	A.D. 1665 ± 80	UCLA-1762K	Osborne 1979
Ngerchelong State	Badrulchau	Terrace?	Pottery	A.D. 90 ± 400	UCLA-1855BB	Osborne 1979
Ngerchelong State	Badrulchau	Village	Pottery	B.C. 4300 ± 400	UCLA-1855FF	Osborne 1979
Ngerchelong State	B-19B	Terrace	Pottery	B.C. 3760 ± 400	UCLA-1855X	Osborne 1979
Ngerchelong State	B:NE:2	Terrace	Charcoal	A.D. 810 ± 110	I-11,956	Lucking 1981
Ngeremlengui State	Uluang	Village	Charcoal	A.D. 1675 ± 75	I-11,959	Lucking 1981
Ngeremlengui State	Uluang	Village	Charcoal	A.D. 1520 ± 75	I-11,957	Lucking 1981
OREOR ISLAND	Ngermid	Village	Charcoal	A.D. 1785 ± 80	UCLA-1762A	Osborne 1979
OREOR ISLAND	Ngermid	Village	Charcoal	A.D. 1630 ± 80	UCLA-1762B	Osborne 1979
ULSBACHEL ISLAND	Ngerengchol	Village	Shell	A.D. 1600 ± 65	N-3287	Takayama 1979
ULSBACHEL ISLAND	Ngerengchol	Village	Shell	A.D. 1595 ± 80	N-3288	Takayama 1979
ULSBACHEL ISLAND	Ngerengchol	Village	Shell	A.D. 1530 ± 85	N-3289	Takayama 1979
ULSBACHEL ISLAND	Ngerengchol	Village?	Shell	A.D. 1395 ± 75	N-3114	Takayama 1979
ULSBACHEL ISLAND	Ngerengchol	Midden	Shell	A.D. 920 ± 75	N-3285	Takayama 1979
ULSBACHEL ISLAND	Ngerengchol	Midden	Shell	A.D. 850 ± 80	N-3286	Takayama 1979
ULSBACHEL ISLAND	Ngerengchol	Midden	Shell	A.D. 940 ± 60	N-3113	Takayama 1979
NGERUKTABEL ISLAND	Mariar	Village	Shell	A.D. 1350 ± 40	DIC-2532	Masse & Snyder 1982
NGEANGES ISLAND	Ngeanges	Village	Shell	A.D. 1400 ± 35	DIC-2531	Masse & Snyder 1982
ULONG ISLAND	Aulong 1	Village?	Pottery	A.D. 530 ± 400	UCLA-1855H	Osborne 1979
ULONG ISLAND	Aulong 1	Village?	Pottery	B.C. 2680 ± 400	UCLA-1855I	Osborne 1979
ULONG ISLAND	Aulong 1	Village?	Pottery	B.C. 1120 ± 400	UCLA-1855J	Osborne 1979
ULONG ISLAND	Aulong 1	Village?	Pottery	A.D. 70 ± 400	UCLA-1855K	Osborne 1979
NGEMELIS ISLAND	Beluu Ngemelis	Village	Shell	A.D. 1350 ± 45	DIC-2530	Masse & Snyder 1982
UCHULAROIS ISLAND	Rois	Village	Shell	A.D. 1300 ± 50	DIC-2529	Masse & Snyder 1982
UCHULAROIS ISLAND	Uchularois Cave	Cave	Charcoal	A.D. 880 ± 40	DIC-2387	Masse & Snyder 1982
UCHULAROIS ISLAND	Uchularois Cave	Cave	Shell	A.D. 840 ± 50	DIC-2388	Masse & Snyder 1982
KAYANGEL ATOLL	PAKG-2	Midden?	Shell	A.D. 1650 ± 75	N-3368	Takayama *et al.* 1980
KAYANGEL ATOLL	PAKG-3	Midden?	Shell	A.D. 500 ± 65	N-3369	Takayama *et al.* 1980
KAYANGEL ATOLL	PAKG-3	Midden?	Shell	A.D. 90 ± 70	N-3370	Takayama *et al.* 1980

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