

# Reconnaissance Archaeological Research on Ngulu Atoll in the Western Caroline Islands

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MICHIKO INTOH

## INTRODUCTION

**P**REHISTORIC TRADING HAS BEEN one of the most important and intriguing topics for archaeologists. In the South Pacific area, trading routes have sometimes been successfully established through such archaeological findings as the distribution of obsidian, chert, and pottery.

In Micronesia, an increasing number of recent excavations are gradually producing interesting data concerning the relationships between different islands or island groups. In particular, the finding of Yapese potsherds in the Central Caroline Islands, for example on Lamotrek (Fujimura and Alkire n.d.), on Ulithi (Craib 1980), and on Fais (Rubinstein 1979), are of some significance. These sherds are assumed to have been brought from Yap to these islands as one of the *sawei* exchange goods. However, besides Yapese sherds, several Palauan sherds have also been found on Lamotrek Atoll and it is suggested that they were brought via Yap (Dickinson n.d.). Considering the scarceness of data, particularly on the relationship between Yap and Palau, premature conclusions should be refrained from until more complete archaeological data are available.

Test excavations conducted on Kayangel Atoll, the northernmost of the Palau Islands, yielded a rather early date ( $1910 \pm 70$  B.P.) as well as some evidence of Yapese cultural influence (Takayama et al. 1980). This would suggest the importance of carrying out further archaeological research on Ngulu Atoll, situated between Yap and Palau. Not only is this atoll strategically situated, but also its political, cultural, and economical ties with Yap, known as *sawei* as well, made it particularly useful for reconstructing the prehistoric interisland contacts.

With such considerations in mind, an archaeological reconnaissance survey was undertaken on Ngulu Atoll in August 1980 under the direction of Takayama and

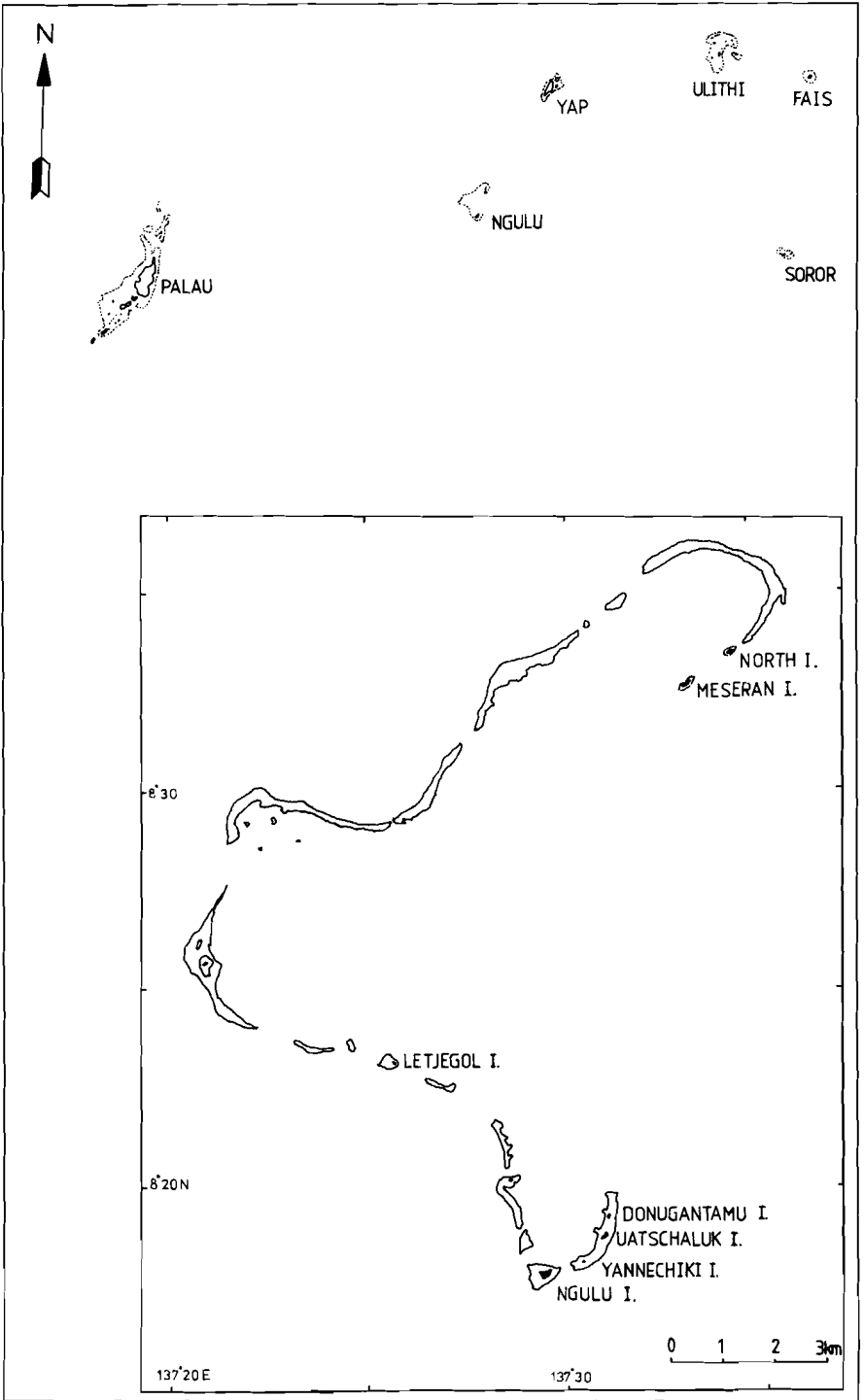


Fig. 1 Map showing the location of Ngulu Atoll.

myself, assisted by two Japanese graduate students as well as local workers from Ngulu Islet. Funds for the research were provided by a grant-in-aid for overseas scientific research from the Ministry of Education in Japan, and also a grant-in-aid from the Historic Preservation Office, Trust Territory of the Pacific Islands, Saipan.

#### PHYSICAL SITUATION AND CULTURAL BACKGROUND

Ngulu is an atoll situated about 200 km SSW of Yap and about 300 km east of Ngajangel Islet in Kayangel Atoll, which is situated at the northern end of the Palau (Fig. 1). It has a large lagoon with an approximate area of 380 km.<sup>2</sup> It consists of 19 low islets as well as a number of openings through the reef to the deep lagoon. Only the southernmost islet (8° 18'N, 137° 29'E) is presently inhabited. The total land area of the atoll amounts to only 43 ha while Ngulu Islet itself is only 14 ha. This islet, approximately 0.47 km long, 0.3 km wide, and semicircular in shape, is so tiny that it can be walked around in only 20 minutes. It lies in the heaviest rainfall belt north of the equator and is also situated in the southern channel of the typhoon region (Wiens 1962:142, 154, 179).

Although Ngulu was discovered by Alonso de Arellano in 1565 (Sharp 1960:36), the atoll has not often been visited, and as a result it is less well known than most of the Caroline Islands (Lessa 1975a:57-58). Another factor contributing to this is that the lagoon is frequently rougher than the outside ocean, and at times anchorage is dangerous or impossible.

Although wells which reach a brackish Ghyben-Herzberg lens are found on Ngulu, the water is unsuitable for cultivation of wet-land taro, while it is used for bathing. Neither banana nor betel nut grow on Ngulu. The main foods comprise fish and copra supplemented with breadfruit, fermented breadfruit, and dry-land taro. Sea turtles are also caught in large numbers, particularly on the northern small uninhabited islets of Meseran and North. Animals presently domesticated are pigs, cats, and chickens. The first two were apparently introduced to the islet after European contact. Rats also exist on the islet.

Ngulu, owing to its small size, has been one of the lesser populated atolls in the Carolines. According to ethnohistorical accounts, the population has numbered less than 100 for the last two centuries (Lessa 1975b:76-78; Hainline 1965:1176; Someki 1945:362). This population has continued to decline, and in 1980, only 24 persons still inhabited the island.

As mentioned above, Ngulu has the *sawei* relationship with Guror, one of the high-class villages of Yap. Although the same name is used and similar materials are exchanged between Yap and Ngulu, it is not included in the *sawei* system between Gachpar village in the Gagil Municipality of Yap with the outer islands as far west as Ulithi and as far east as Namonuito in the Central Caroline Islands. Exchange goods consist mainly of handicrafts from Ngulu and foods from Yap (Intoh n.d.). The voyage to Yap is made with the southwest wind, usually in August, and the return voyage is made with the northeast wind around January.

#### SUMMARY OF THE SURVEY RESULTS

##### *Surface Features*

Thirteen houses, of which eight are inhabited today, lie scattered near the center of the islet (Fig. 2). They are built on raised coral blocks about 60 cm in height and are hexago-

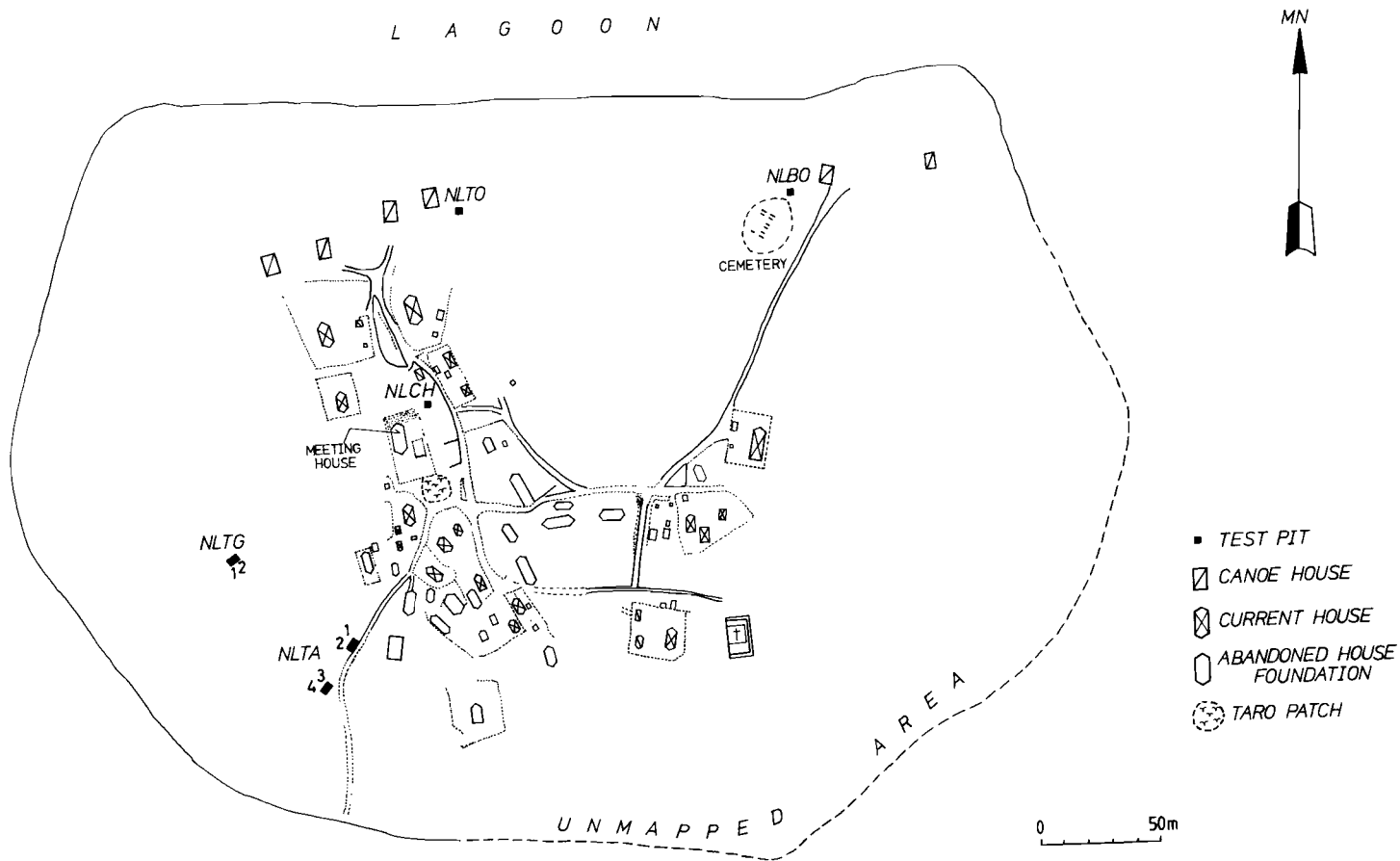


Fig. 2 Plan of Ngulu Islet showing the location of test excavations.

nal in plan, similar to Yapese houses. The essential difference lies in the far greater cleanliness and more careful construction of the Nguluan houses, as was pointed out by Eilers (1936:216). Houses are enclosed by a line of coral blocks to which individual names are given.

In addition to these present houses, 24 abandoned coral-lined platforms once used as house foundations were also observed. Most of these old stone foundations are situated inland from or toward the southernmost of the current houses. All of them are hexagonal in plan with one exception which is rectangular. Two types of stone platforms were noted. One was built with coral blocks for the entire surface while the other has stones only for its circumference. Some contain a fireplace in the center of the platform.

In some cases a cookhouse, smokehouse, storehouse, a menstruation house, or a well is associated with the main dwelling. Of these, the cookhouse and menstruation house are today built directly upon the ground. Most of the houses have one or two pits for fermented breadfruit, called *mar*. The normal size is about 70 cm in diameter and 60 cm in depth. Wells, about 1.7 m in diameter, are also dug beside some houses. The brackish water in such wells is used for bathing.

Along the shore line on the lagoon side, six canoehouses (about 9 m × 5.5 m in size) are found. One of them was built after Krämer visited this islet in 1909. One to three canoes of various sizes are stored in these today.

One coral platform for a men's house, destroyed by a storm several years ago, exists almost in the center of the islet. This platform is enclosed with coral stones (16 m × 28 m) and within this is an enclosed area for dancing and meetings. A considerable number of uprights for backrests were observed in this enclosed area, where assemblies by the islanders take place.

Attached to the southern part of this enclosure, an area 60 cm deep and about 10 m square with rounded corners has been dug out, and serves as a taro patch. Its use is stated to have been a temporary storage garden for *Colocasia* sp. which was brought from Yap as a *sawei* gift. Although *Colocasia* sp. can be kept for a while in this specialized storage pit, it does not grow, due to the salty ground water.

A Japanese concrete structure used as a meteorological station before World War II remains in the northeast just behind one of the canoe houses. This is the only evidence on this islet of habitation by outsiders.

One earth oven used for cooking turtles was observed near the southeastern beach. Turtles are caught mainly on the northern small islets and are brought back and cooked here in order to be distributed among four chiefs.

In the lagoon, several arrow-shaped stone weirs are built which are almost the same shape as those on Guror, Yap. Some of them were destroyed by a storm. Compared with angling, these stone weirs seem to be of less importance and are seldom used at the present time. No shell middens were recorded for this islet.

### *Test Excavations*

Five locations were selected for test excavation. The test pits measured 2 m × 2 m.

#### 1. *Bolgochol (NLBO)*

This area is situated in the northeast of the islet and is 18 m × 8 m in size. It has been used as a dumping area for discarding materials used during mourning. It is located about

40 m inland and is 1.75 m above sea level. The ground surface of this area is covered in small bush as well as several dry-land taro plots. A single test pit revealed its shallow depth of deposit which consisted mainly of numerous fishbones, turtle carapaces, and some chicken bones. No artifacts were encountered except for an egg-shaped piece of coral.

## 2. *Tadau (NLTA)*

This area, 73 m inland and 2.16 m above sea level, is along the path from the village area to the south beach. Several potsherds as well as various shell artifacts were scattered upon the ground surface. Four test pits were excavated and 12 natural layers down to 190 cm to 230 cm from the present ground surface were recognized. A considerable number of potsherds, shell artifacts, and turtle carapaces, as well as the whole skeleton of a small dog, were found. The oldest type of Yapese pottery (Calcareous Wares) was found in abundance, particularly in the lower three layers. The lowest layer was below sea level.

## 3. *Choram e pebai (NLCH)*

This is almost in the center of the current village and close to the old men's meeting-house. The ground surface was covered with grass upon which some bone fragments were scattered. A single test pit revealed its shallow cultural deposit but yielded a number of sherds, fishbones, turtle carapaces, and one rat bone.

## 4. *Tomemu (NLTO)*

This is an old canoehouse site on the north beach situated 45 m from the shore and 7 m from the present house. A shallow cultural deposit yielded four sherds, one shell artifact, and some fishbones, as well as European materials in the upper layers. No fish hooks were recovered, contrary to the expectations of Fujimura and Alkire (n.d.:79).

## 5. *Tabgap (NLTG)*

This area is located at the highest elevation of Ngulu (2.64 m above sea level) among a scatter of trees. Besides some shell artifacts on the ground surface, no obvious evidence of habitation was observed. However, this site proved to be the most fruitful site from the two test pits excavated here. Twelve cultural and three natural layers reaching a depth of almost 330 cm from the present ground level were found. More than 100 sherds were obtained, along with various kinds of shell and coral artifacts.

The most significant and unexpected finds were typical Palauan sherds, two of which have the distinctive Palauan incised decoration on their outer surfaces (Fig. 3-1, 2).

Faunal remains include a considerable number of turtle carapaces, and some fish, bird, and rat bones.

### *Portable Artifacts*

#### *Pottery*

As an intensive analysis of the pottery is still in progress by Takayama in Japan, only a brief description will be presented here.

A total of about 300 sherds, including 15 surface finds, were collected from the test excavations on Ngulu. These can be classified into four main types: Yapese Late Laminated Ware; Yapese Middle Unlaminated Ware; Yapese Early Calcareous Ware; and

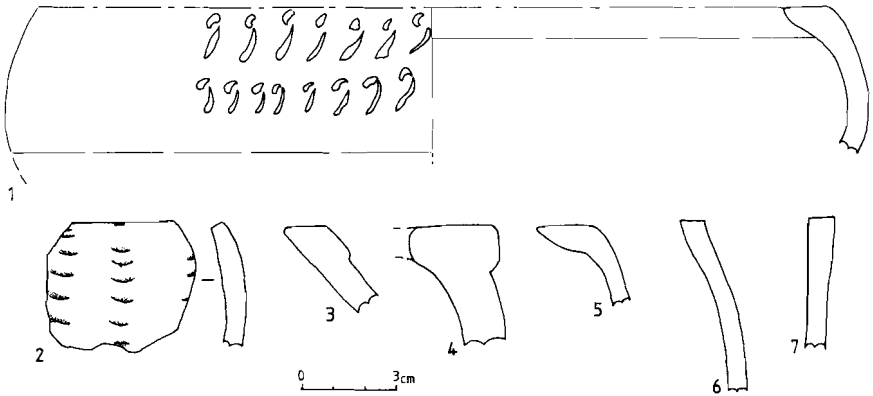


Fig. 3 Palauan sherds excavated from Ngulu. Right-hand side is the exterior of the pot in each case.

Palauan Ware. The chronological sequence of the first three types has been established at the Pemrang site in Guror village on Yap (Takayama 1982a), and the sherds excavated on Ngulu correlate with these. However, one notable difference between the two assemblages is that the calcareous tempered pottery is associated with the unlaminated sherds, although the calcareous sherds tend to appear in the lower layers. Moreover, the calcareous tempering materials such as shells and coral sand are not as fine as those of the Calcareous Ware excavated from the Pemrang site on Yap. The proportion of calcareous sherds is about 15 percent of the assemblage.

At least eight Palauan sherds (Fig. 3) have been identified thus far in this assemblage, on the basis of petrological examination (Dickinson 1982) and physical and typological analysis (Intoh and Leach n.d.). The appearance of Palauan sherds is limited above the layers in which the calcareous sherds appeared with the exception of one case from the NLTG site. It can be concluded that Ngulu had direct cultural contact with Palau during at least one period of its prehistory. The possible date for this period will be discussed below.

The profiles of almost all of the rim sherds (about 40) have been illustrated (Intoh 1980) and include eight Palauan-type rim sherds. The pointed lips of the calcareous sherds are more similar to those of the Marianas Red Ware excavated at the M-13 site on Rota (Takayama and Intoh 1976:Fig. 3-4) than to those of Yapese Calcareous Ware.

A clay disk was obtained from Layer VI of NLTG. The shape of this specimen is very similar to a specimen from Kayangel in Palau (Takayama et al. 1980).

#### *Shell Artifacts (Fig. 4)*

Since a thorough description of nonceramic artifacts has already been made (Intoh 1981), and a more extended relationship study of shell artifacts has been published elsewhere (Intoh 1981), only a listing of artifacts will be provided here in Table 1.

#### *Faunal Remains*

##### *Dog*

The skeletal remains of a whole, small dog was recovered from Layer IV of TP-3 NLTA, despite ethnographic information that dogs did not exist on Ngulu (Eilers

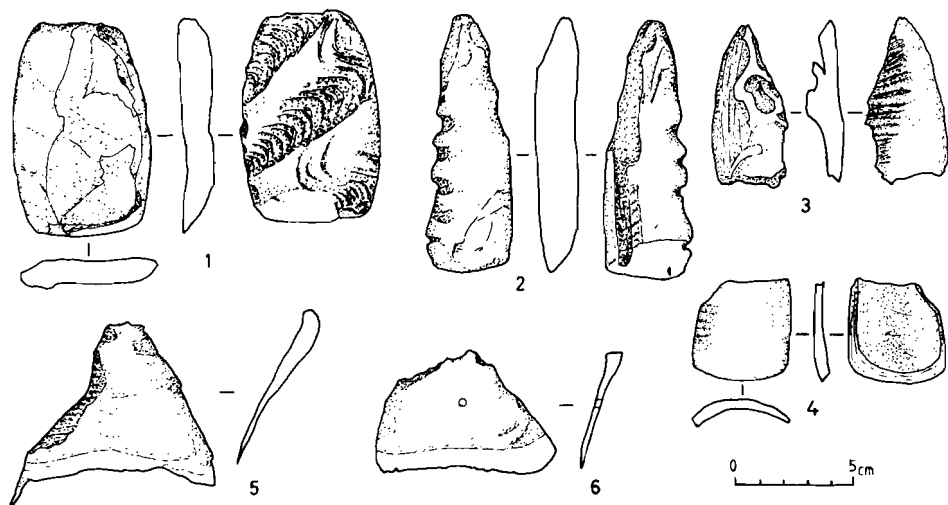


Fig. 4 Shell artifacts from Ngulu. 1. *Tridacna* sp. exterior adze; 2. *Cassis* sp. outer-lip adze; 3-4. *Cassis* sp. inner-lip adze/scrapper; 5-6. *Cassis* sp. scraper/peeler.

TABLE I. SUMMARY OF SHELL AND OTHER ARTIFACTS FROM NGULU

	EXCAVATED SPECIMEN	DEEPEST FINDING	SURFACE FINDS	TOTAL
<i>Tridacna</i> sp. adze (interior)*	-	-	(1)†	(1)
<i>Tridacna</i> sp. adze (exterior)	23	NLTG-2,VI	33	56
<i>Tridacna</i> sp. chisel	1	NLTG-1,V	1	2
<i>Cassis</i> sp. chisel	-	-	1	1
<i>Cassis</i> sp. outer-lip adze	7+(8)	NLTG-2,V	5	12+(8)
<i>Cassis</i> sp. inner-lip adze/scrapper	-	-	3	3
<i>Cassis</i> sp. adze/scrapper	-	-	2	2
<i>Cassis</i> sp. scraper/peeler	11+(6)	NLTG-2,V	16	27+(6)
Bivalve shell scraper	some			some
Shell bracelets				
<i>Conus</i> sp.	1	NLTG-2,VII	-	1
<i>Trochus</i> sp.	(1)	NLTG-3,VIII	-	(1)
<i>Cassis</i> sp. pot	6	NLTG-2,V	-	6
<i>Tridacna</i> sp. sinker	1	NLTG-1,V	-	1
<i>Tridacna</i> sp. disk	1	NLTA-4,IX	-	1
<i>Triton</i> sp. trumpet	1	NLTG-2,III	-	1
<i>Terebra</i> sp. drill point	some			some
Coral stone pestle	1	NLCH-1,II	-	1
Coral stone file	1	NLTG-1,V	-	1
Coral stone sinker	-	-	1	1
Pumice abrader	3	NLTA-2,III	-	3
Turtle bone scoop	-	-	1	1
Iron axe/adze	1	NLTO-1,II	-	1

\*Most of the shell species are obtainable around Ngulu except for some bivalve shells such as *Anadara* sp. which were brought from Yap.

†Figures in parentheses ( ) refer to the number of unfinished specimens.



1936:214). This is the first evidence of pre-European dog in the Western Caroline Islands, and it is therefore not possible to say yet whether there was any nearby populated island from which the Ngulu dogs may have derived. The probable date for this dog is estimated at about 1400 A.D.

#### *Rat*

A number of rat bones were obtained from various layers. The lowest layer which yielded rat bone is Layer XI of TP-2 NLTA. Since no detailed study on rat bone has yet been done, it cannot be stated whether more than one variety was present.

#### *Bird*

Several fragments of bird bone were obtained from various layers. Chicken bones also appeared in the upper layers.

#### *Turtle*

Considerable amounts of unworked turtle bone, mostly pieces of carapace, were found throughout all test pits. Considering the large volume of an individual carapace in contrast to the bones of a single fish, the weight of turtle bone may not be the best indication of the importance of these animals in the prehistoric diet.

#### *Fish*

Types of fish which have been identified are Elasmobranchii, Katsuwonidae, *Monotaxis granoculis*, Scaridae, Labridae, Lethrinidae, Diodontidae, and Balistidae. These were identifiable through an analysis of their distinctive bones such as the dentary, premaxilla, pharyngeal clusters, vertebrae, and spines. Further descriptions must await the complete analysis of the whole assemblage.

### *Age Determination*

Eight radiocarbon dates from two sites (two from NLTA, TP-1,2; four from NLTA, TP-3,4; and two from NLTG) were obtained (Takayama 1982b:107). It was unfortunate that insufficient charcoal was available, and that young *Tridacna* sp. shells were used instead.

Figure 5 shows the stratigraphic relationship between sites. As the oldest cultural layer which yielded pottery has not yet been dated, the initial settlement of Ngulu Islet can be assumed to go back to the beginning of the Christian era. Three cultural periods were determined based on typological change of the pottery. These are: before 800 A.D.; 800–1400 A.D.; after 1400 A.D. The characteristics of these periods are described below.

### SUMMARY AND CONCLUSIONS

The survey on Ngulu Atoll revealed a surprisingly deep cultural deposit: two to three meters. The island has been occupied from as early as the beginning of the Christian era. This is contrary to the assumption made by Lessa that Ngulu was uninhabited before 1525 (Lessa 1975b:59). It should be noted that cultural material was found below sea level in one of the excavations. This is being found in an increasing number of archaeological sites in the Pacific region. In Micronesia, it is now known at Ngulu, Kapingamarangi (Leach and Ward 1981), Nukuoro (Davidson 1971) and Truk (Shutler et al. n.d.). It is

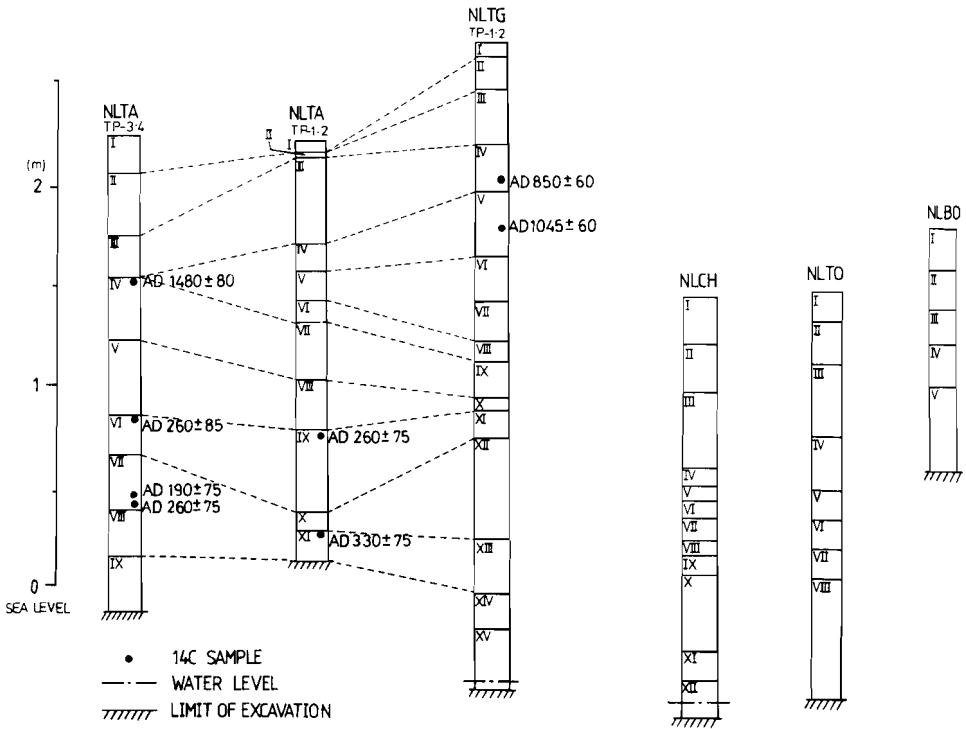


Fig. 5 Correlation of excavated deposits at Ngulu Atoll. Brackish water was reached considerably below sea level in two excavations.

unlikely that there has been a large sea level change in the last millennium. Local tectonic movements are probably responsible.

The materials excavated clearly suggest that the people on this islet have kept contact with other islands with richer resources. It is obvious that Ngulu had close contacts with Yap based on the study of the pottery assemblage, although the time when the *sarwei* exchange started is still unclear. On the other hand, Ngulu had some contact with Palau also, around the period of 800–1400 A.D. This was demonstrated through the discovery of several Palauan sherds including finely incised pottery. This contact is also supported by Nguluan usage of the *Cassia* sp. outer-lip adze. Furthermore, a number of *Cassia* sp. scraper/peelers suggest contact with the Central Caroline Islands. The date for these peelers may go back to 800 A.D. Another important finding from this excavation is the discovery of prehistoric dog, which dates back to around 1400 A.D.

Although Ngulu appears to have had continuous occupation, three cultural periods can be identified based on the pottery. These are listed below.

*Before 800 A.D. (?0–800 A.D.)*

Much evidence of turtle exploitation was observed in this period. A considerable number of Yapese potsherds was found, including some Yapese Early Calcareous Ware. Shell artifacts are rare.

*800-1400 A.D.*

A large number of turtles was caught, and pottery is still common, including some from Palau. Numerous shell artifacts were found, and dog was present on the island.

*After 1400 A.D.*

Yapese Late Laminated pottery was used along with Yapese Middle Unlaminated pottery. The practice of building stone platforms for dwellings was introduced from Yap during this period. Occasional contact with Europeans can be detected from iron and glass.

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