

# Early Pottery and Population Movements in Micronesian Prehistory

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**I**T HAS BEEN PROPOSED that the initial migrants entering Micronesia came from two different directions: first from the Philippines and Indonesia to western Micronesia, and later from eastern Melanesia to eastern and central Micronesia, eventually occupying the outer islands of the Palaus in the West (e.g., Davidson 1969:73; Alkire 1977:12). In this paper, on the basis of recent archaeological investigations mainly in western and partially in central Micronesia, I offer a somewhat different, hypothetical view. This view partially supports Howells's (1973:255) opinion, in that at least the central, volcanic, high islands of Truk, Ponape, and Kosrae may have been initially settled from the West (possibly Yap) by migrants carrying with them calcareous, sand-tempered pottery, prior to or around the beginning of the Christian era, and in that this area was subsequently settled from the East (eastern Melanesia or western Polynesia) by people without pottery.

## THE DIFFUSION OF POTTERY

Although potsherds as surface finds were discovered at the Nan Madol ruins on Ponape by the Thilenius Südsee-Expedition (Osborne 1961:156) and by Yawata (Chapman 1968:72), and although there were vaguely reported findings of pottery on Truk and Kosrae (Chapman 1964:32, 101), until several years ago known pottery distribution in Micronesia generally was regarded as limited to the marginal, volcanic, high islands of western Micronesia—the Marianas, Yap, and the Palaus (e.g., Spoehr 1957:18).

However, the recent discovery of pottery on Fefan Island in the Truk Lagoon (Borthwick and Takayama 1977:271) and on the atolls of Lamotrek (Fujimura and Alkire 1977:413–414), Ulithi (Micronesian Preservation 1979), Ngulu (Intoh 1981), and Kap-

ingamarangi (Leach and Ward 1980:50) has corrected the former misinterpretation that the absence of pottery in the eastern Carolines was due to lack of clay to manufacture pottery (e.g., Solheim 1952:12), or that its absence on the coral islands resulted from the destruction of old deposits by hurricanes (Howells 1973:253). Although the pottery recently found on these coral islands was imported from the high, volcanic islands, its recovery is of particular significance in demonstrating that even the atoll dwellers formerly used pottery. This fact suggests no great difference in either foods or their methods of preparation between the environmentally-poor coral islands and the richer volcanic islands. The *Cassia*-shell cooking pots in ethnographic times on the coral islands of the western Carolines may have been devised as a substitute for pottery by the coral islanders who had previously known its use.

As has been noted by Fujimura and Alkire (1979:58), in the light of the *sawei* gift-exchange system linking Yap to all the outer coral islands except Ngulu (Lessa 1950:47; Alkire 1965:6), the recovery of prehistoric pottery of Yapese origin on these islands was not unexpected. Ethnographic accounts collected on Yap describe the presentation of pottery as one of the *sawei* gifts by the Yapese people to the coral islanders, from Ulithi to Namonuito (de Beauclair 1974:227; Ushijima 1974:38, note 19). Also our ethnoarchaeological work on Ngulu Atoll and at Guror Village on Yap, both of which are linked by another *sawei* system, has verified the use of pottery as *sawei* gifts. Actually, in 1934 the use of cooking pots of Yapese origin, along with Japanese iron pots, was recorded on Ngulu, Ulithi, and Lamotrek by Someki (1945:364, 385, 409). Therefore, there is the strong possibility that the use of pottery among these outer islanders may date back to the beginning of these *sawei* systems.

In this connection, the recovery of sherds on Lamotrek by Fujimura and Alkire (1979) raises some significant questions. The test excavations on this island yielded 31 sherds consisting of two pottery types and a variant. Petrographic analysis of the sand tempers of these sherds indicates that Type A was of Yapese origin, corresponding to the Giffords' un laminated wares, and that Type B was of Palauan derivation. And a single, tan-colored sherd, a variant of Type A, is regarded as an example of the Giffords' late, laminated ware. Based on radiocarbon dates, both Type A and Type B are supposed to have been used on Lamotrek between 1200 A.D. and 1500 A.D. (Fujimura and Alkire 1979:58-63). If this is so, the problem of a considerable time gap arises in connection with the un laminated pottery between Lamotrek and Yap, because on Yap this type of pottery was dated to between 176 A.D. and 847 A.D. (Gifford and Gifford 1959:179). This inconsistency raises some serious questions about, for example, the authenticity of radiocarbon dates, the Giffords' pottery chronology, and so forth. This was one of the reasons why we re-excavated the Giffords' Pemrang and Boldanig sites in the southern portions of Yap in 1980.

At the same time, another time gap is indicated between Yap and the Marianas, since the Giffords' un laminated wares were identified by Spoehr (Gifford and Gifford 1959:179; Pellett and Spoehr 1961:322-323) as being from the same time as Spoehr's Marianas Plain wares, which predominated during the Latte Phase, dating back to 857±145 A.D. However, Reinman's subsequent excavations on Guam seem to resolve the question. According to Reinman's results on Guam, his Volcanic Sand-Tempered (VST) wares and Spoehr's Marianas Plain wares were the predominant pottery type from c. 1500 B.C. until historic contact, while his Calcareous Sand-Tempered (CST) wares were intermediate in time between Spoehr's Marianas Red (and Lime-filled, Impressed pottery) and the later VST wares (Reinman 1977:90).

In our test excavations on Rota, Marianas Red and CST sherds were often difficult to

distinguish owing to the complete erosion of the red slip on Marianas Red and because both wares were contemporary. The paste of both of these wares is characterized by numerous white inclusions used as temper. Both wares were found in the same cultural deposits, below those containing Marianas Plain. Furthermore, our conclusion, gained from the excavations, is that it is necessary to reclassify Spoehr's Marianas Plain into two chronological sequences: Lower and Upper Marianas Plain. The radiocarbon date obtained from a single 2 m<sup>2</sup> test pit at the M-13 latte site on Rota shows that both Marianas Red and CST wares appeared by 640±85 B.C.; after 690±80 A.D. they were completely replaced by Lower Marianas Plain. The exact date of this replacement is still unknown, owing to lack of <sup>14</sup>C dates. At a time of latte construction dating to around 1590±60 A.D., the coarsely manufactured Upper Marianas Plain appeared (Takayama and Intoh 1976:21-22). Strictly speaking, however, some noncalcareous, sand-tempered sherds were found associated with both Marianas Red and CST wares. At present, the relationship between them is uncertain, but it seems that Reinman's pottery sequence is plausible.

Judging from the Marianas Red found by Jeff Marck and James Moses at the Laulau site on Saipan, the technically best-made Marianas Red was developed on this island. On present evidence Marianas Red seems not to have diffused into Pagan Island in the northern Marianas (Egami and Saito 1973:216). From this and other results obtained from the Marianas, I conclude that there was no relationship in pottery types between the Marianas and Japan in prehistoric times.

At the end of 1976, sherds were discovered by Borthwick on Fefan Island, Truk (Borthwick and Takayama 1977:271). Interestingly enough, a characteristic of most of these sherds was numerous inclusions of calcareous sand temper, very similar to the temper of Marianas Red and CST wares. Subsequent test excavations on Fefan indicate that these sherds were manufactured in Truk, dating to c. 2000 B.P. (Shutler, Sinoto, and Takayama 1977). Shutler mentions that some of them are superficially similar to Marianas Red, and some also resemble Marianas Plain in surface appearance (1977:92-93). From observation of Fefan pottery, I am inclined to think that the difference of surface color between Marianas Red (and CST wares) and Fefan wares was probably due to the clay from which they were made, and that a diagnostic trait of early pottery in Micronesia is the use of calcareous sand temper, consisting of finely-ground coral and/or small shells. For convenience of description, I call this type of pottery Micronesian CST wares, according to Reinman's terminology. In this paper, I describe it simply as CST wares.

At present, it appears that both calcareous and noncalcareous, sand-tempered pottery exist in the Fefan pottery assemblage, and that only the calcareous, sand-tempered pottery can be said to be related to the Marianas CST wares tradition. Yet, the differences in slip and rim forms between Fefan and Marianas CST wares suggest the strong possibility that the Fefan CST wares were not directly derived from the Mariana Islands, but rather derived from the Palaus or Yap. On the basis of the geographical position of both Yap and Palau, it has been mentioned that Marianas Red might have come from there to the Marianas. In addition, the recovery of beaked, *Tridacna*-shell adzes in Truk also suggests a parallel with the Palaus, while the *sawei* overseas exchange system implies ties with Yap.

Contrary to our expectations, however, our archaeological investigations in the Palaus between 1977 and 1978 failed to yield CST wares, nor did Osborne's (1979) second, systematic investigations in these islands, although Osborne (1979:264) obtained the early date of 1120 B.C. on Aulong, and we obtained the date of 40±70 A.D. Ngajangel Islet in Kayangel Atoll (Takayama, Intoh, and Takasugi 1980:6). Our conclusion resulting from

our investigations in the Palau was that if early sites yielding CST wares are actually present, they are under water, as in the case of the Fefan sites. Yet I hesitate to support the view that Marianas Red was diffused to the Marianas via the Palau, although the theory that this type of pottery was derived from the widespread complex of red wares found in the Island Southeast Asian region is correct (Spoehr 1957:174; Pellett and Spoehr 1961:323).

In this connection, the recent archaeological investigations in Minahasa and the Talaud Islands, northern Indonesia, by Bellwood (1976:240-294) are of great interest because the pottery found there does not seem to me to parallel that of the Palau in appearance. If this is true, I am inclined to suppose that these Indonesian areas may not be the so-called immediate homeland of the Palauan pottery, although the beaked, *Tridacna*-shell adzes were derived from the Indonesian stone, beaked or pick adzes (e.g., Yawata 1943:142). In other words, as regards the origin of Palauan pottery it seems reasonable to search not only other Indonesian areas but also the Philippines, Melanesia, and other Micronesian islands. At the present time it can be said that, as has been noted by Osborne (1979:236), Palauan pottery does not show distinguishable changes in form (according to our data for the past 2000 years), but had developed its own characteristic forms.

Now I must look at the prehistoric pottery of Yap, lying roughly between the Palau and the Marianas. The Giffords' excavations on Yap in 1956 showed the existence of a two-pottery wares sequence. Their earliest date of 176 A.D. seems to me to be considerably late, when compared to the earliest dates obtained from the Marianas and the Palau. In other words, this Yap date suggests that much earlier sites exist on Yap but have not been discovered.

In the re-excavation of the Giffords' Pemrang site on Yap and in the excavations of Tadau and Tabgap sites on Ngulu, we encountered pottery-bearing cultural deposits to a depth of about 3 meters. As far as I am aware, these are the deepest cultural deposits so far found in Micronesia except for Polynesian Nukuoro (Davidson 1971) and Kapingamarangi (Leach and Ward 1980) in the eastern Carolines and the Tarague site on Guam. Interestingly enough, all the sherds found in the lower strata at the Pemrang site contain calcareous sand temper and are simple compared to Marianas and Fefan CST wares. In addition similar sherds are included in the early pottery assemblage on Ngulu (Intoh 1981).

Our impression gained from the excavation at the Pemrang site is that at least three types of pottery are chronologically present. The Giffords' laminated pottery, which is the same as that of ethnographic times, was collected from the present ground surface and subsurface. Below this cultural deposit, the Giffords' unlaminated wares, which had been identified as Marianas Plain by Spoehr, were found. Below this stratum a completely different type of unlaminated pottery, characterized by calcareous sand temper, appeared. Judging from the depth of its appearance this Yapese CST pottery seems to be much earlier in time than the Giffords' 176 A.D. date, though no radiocarbon dates have been obtained yet from our excavations. Our Yap pottery sequence seems to apply to that of Ngulu to a considerable extent, although the Ngulu pottery assemblage was considerably influenced by Palau.

From the results of our investigations at the Pemrang site, a question arises concerning the origin of the early Yapese CST wares: is it really related to Marianas Red and/or Marianas CST wares? Excluding the Palau, where no CST wares have been found so far, two possibilities are presented. First, the Yapese CST wares came from the Marianas, or second, came from the southern Philippines to Yap directly. If the latter is accepted, then

two more hypotheses must be presented. First, the Yapese CST wares may have diffused to the Marianas to become the Marianas Red and/or Marianas CST wares, and second, the CST wares found on Yap and in the Marianas may have been directly derived from the southern Philippines in separate diffusions. However, considering that the Marianas Lime-filled, Decorated pottery seems to be related to that of the southern Philippines (Spoehr 1973:274), the absence of it on Yap (and Ngulu) suggests the strong possibility that, as far as the Marianas Red pottery tradition is concerned, it was directly derived from the southern Philippines area. Yet, until data are obtained on the analyses of pottery found on Yap and Ngulu, including petrographic examination and assaying of radiocarbon samples which are now in process, we cannot draw any conclusion about the early relationship between Yap and the Marianas.

However, the recovery of sherds with small, flange-rim form in the Yapese CST wares may contribute to the resolution of the origin of the same type of rim form in the Palauan pottery assemblage; this is the most striking rim form in the Palaus (e.g., Osborne 1966:84).

The recovery of Palauan sherds, together with Yapese pottery on Ngulu, is of particular interest in the relationship between the outer coral islands of the western Carolines and the Palaus in prehistoric times, because the same phenomenon has already been recorded on Lamotrek. As to Lamotrek, Fujimura and Alkire (1979:62) state that the Palauan sherd certainly could have arrived via Yap. However, it seems reasonable to pay special attention to the possibility of the direct introduction of Palauan pottery to these islands from the Palaus (Intoh 1981). The clay disks found on Ngulu are the same as those of Kayangel. In this connection, the investigations on Ulithi conducted by the Pacific Studies Institute on Guam are of special interest.

The Fefan CST wares were undoubtedly derived from the Yapese CST wares tradition rather than the Marianas Red wares tradition, although the rim forms are somewhat different between Fefan and Yap. Furthermore, I am inclined to suppose that the Micronesian CST wares tradition was probably diffused at least to Ponape and Kosrae, although the pottery found at the Nan Madol ruins on Ponape before World War I seems to date to the late prehistoric period. I believe that early CST pottery, probably dating back to before or around the beginning of the Christian era, will be found on Ponape and Kosrae sooner or later.

The recent discoveries of pottery in Micronesia remind us that Christian has noted the occurrence of common words denoting wooden and earthenware vessels in Micronesia, which suggests the gradual substitution of wood for pottery containers (Christian 1967:129). As I am not a linguist, I have no competence to discuss this problem, although it is of interest to archaeologists.

#### POPULATION MOVEMENTS

Why pottery disappeared or was abandoned in prehistoric times on the high, volcanic islands of the eastern Carolines, which yield clay to make pottery, is uncertain, although a tentative inference may be presented. That is to say, peoples who had lost pottery immigrated to these high islands from eastern (or northern) Melanesia or western Polynesia via Kiribati (Gilberts) and the Marshalls, where clay is lacking. These newcomers may have brought the earth oven, breadfruit as a staple food, and pit storage of fermented breadfruit, because these are or were not in general present on Yap and in the Palaus. The use of the earth oven in the Marianas may be a recent introduction. Also, these items appeared

in much earlier archaeological contexts in western Polynesia (e.g., Davidson 1974:236-238; Janetski 1980:125) and in eastern Melanesia (Kirch and Rosendahl 1973:89) than in eastern Micronesia.

Since no Lapita pottery has been found in eastern Micronesia, the date of the arrival of these newcomers to the high, volcanic islands in the eastern Carolines may have been after the beginning of the Christian era, at a time when Lapita had been abandoned in western Polynesia. These newcomers seem to have played an important role in establishing the Nuclear Micronesian Languages, as has been pointed out by Shutler and Marck (1975:105). On this point, Ayres and Haun (1978:10-11) have paid attention to the parallels of a ceramic culture between the eastern Carolines and the southern Solomons.

On the other hand, the early settlement of western Micronesia was probably from the West by peoples with pottery used for cooking taro and/or yam. From western Micronesia calcareous sand-tempered pottery may have diffused to Ponape and Kosrae prior to the new immigrants from the East arriving there. If this is true, we must consider a much earlier date for the initial human settlement of the central Caroline coral islands, possibly from Yap, than the date of c. 1000 A.D. obtained by Alkire (1978:114). Although no radiocarbon dates have been obtained yet from the deepest pottery-bearing layers on Ngulu, I would accept the rejected date of  $340 \pm 65$  A.D. by Fujimura and Alkire (1979:73, 81) on Lamotrek.

At present, Goodenough's (1957:125) opinion that the high islands of Micronesia were settled first and the atolls later does not seem to me to be true of at least the outer coral islanders in the western Carolines, because the excavations on Kayangel and Ngulu indicate that these atolls were settled from an early period by peoples with a culture adapted to the atoll environment.

The following assumption may explain why the atoll peoples with Trukese culture and language in the outer coral islands of the western Carolines have oriented the *sawei* overseas exchange system toward Yap rather than toward Truk. The forebears of the modern outer coral islanders moved there from Truk after these coral islands had been settled by the initial migrants from Yap. Although the exact date when the Trukese movement was accomplished is uncertain, owing to lack of archaeological data, the absence of pottery of Trukese origin and of cowry-shell scrapers on these coral islands suggests that the Trukese migrants left Truk after the abandonment of the manufacture of pottery and before the appearance of the cowry-shell scraper in Truk. There are a fair number of stories concerning interisland fighting within the Truk Lagoon and on occupied, nearby atolls such as Satawan and Namuluk (LeBar 1964:4). It is uncertain whether or not these stories are true, yet our test excavations on Moch Islet in Satawan Atoll indicate the settlement of this island by people from Truk by about the tenth century A.D. (Takayama and Intoh 1980). This may imply that the Trukese migrants left the Truk Lagoon around or a little earlier than this date for the coral islands to the West.

Finally, I would like to allude briefly to some of the portable artifacts other than pottery in late prehistoric contexts, because their comparison is gradually becoming possible. As in other parts of Oceania, in Micronesia archaeological finds are often different from their ethnographic counterparts in form and raw material. In addition, sometimes the presence or absence of ethnographic specimens in archaeological contexts can be observed. For example, cowry-shell scrapers are found ethnographically and/or archaeologically in eastern Micronesia, while *Cassid*-shell scrapers are found on Yap and its outer coral islands. *Conus*-shell scrapers are present only on Yap and in the Palaus, while *Tridacna*-shell knives are limited to the Palaus. With the exception of one *Cassid*-shell scraper which

seems to be a recent introduction by the Carolinians, no such shell specimens as mentioned above have been found archaeologically in the Marianas. Whether these differences are due to cultural preference or environmental limitation is unclear, yet the establishment of chronological sequences of these portable artifacts, as well as pottery, in each island can contribute to the cross-dating of chronological sequences between islands.

One of the puzzles is the presence or absence of one-piece, shell fish hooks. Although one-piece fish hooks have been excavated in the Marianas, as well as on Nukuoro, no specimens have been uncovered on Truk, Satawan, Faraulep, Woleai, Lamotrek, Ngulu, Yap, and the Palaus. Their absence in the coral islands is strange, because ethnographically it is noted that the low, coral islanders knew more techniques and are better fishermen than the high islanders (Fischer and Fischer 1970:98), and because a greater variety of fishing equipment on the high islands is necessarily expected (Reinman 1967:109). At present, it is uncertain whether this phenomenon is due to the actual absence of one-piece fish hooks or owing to the utilization of perishable material such as wood in their manufacture. According to Rosendahl's (1977:11) preliminary report, shell fish hooks seem to have been more favored in eastern Micronesia than in western Micronesia, except for the Marianas. If so, I think that the shell fish hooks in eastern Micronesia, including Nukuoro, were probably derived from western Polynesia or eastern Melanesia. The relationship between eastern Micronesia and the Marianas is unclear. Yet there is no doubt that the fish hooks of the Marianas, including the two-piece type, have no relation to those of prehistoric Japan, although some scholars have suspected a relationship (e.g., Anell 1955:247; Reinman 1970:58).

#### CONCLUSIONS

According to Cordy (1980) over 125 archaeological projects have been undertaken in the Trust Territory of the Pacific Islands since 1977, so that we can expect that in the near future Micronesian archaeology will no longer lag behind other Oceanic areas. In conclusion, two points can be made. First, in order to elucidate Polynesian-Micronesian relationships in prehistoric times, archaeological excavations are essential in the Gilbert and Ellice Islands. Second, three decades ago, the Sub-Committee on Pacific Archaeology, National Research Council, reported that archaeological work on Micronesian atolls would be relatively unrewarding, and that, in priority, they would fall below the high islands (Spoehr et al. 1951:595). Now, however, all Micronesian islands, whether they are coral or volcanic, small or large, are of the same importance to archaeological study.

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MICRONESIAN PRESERVATION

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