

Pohnpei's Position in Eastern Micronesian Prehistory

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Abstract—A synthesis of available archaeological data from Eastern Micronesian islands provides a general understanding of prehistory in this area and a specific assessment of Pohnpei Island prehistory over more than 2000 years. Critical in any late prehistoric sequence formulation for Pohnpei is Nan Madol, and this complex is positioned chronologically and functionally within the broader island context. Possible inter-island relationships, for example, as reflected in the Kachaw complex and similarities between Nan Madol and Kosrae's Lelu complex, are considered.

Introduction

A continuing problem in perceptions of Western Pacific prehistory and cultural relationships is the view that Micronesia represents a monolithic cultural entity. This follows from the earlier characterizations of Pacific Island peoples in terms of culture areas of which the Polynesian exemplar provides such a neatly defined unit. While the ethnographic pattern and the linguistic connections at least from the Gilberts (Kiribati) west to Sonsorol and Tobi (Bender 1971, Shutler & Marck 1975) are not markedly at odds with such a characterization, this seems to be a relatively recent, emergent pattern, and the uniformity implied may be misleading when viewing the earlier prehistoric record.

Consistent with available archaeological, linguistic, and human biological data is a basic dichotomy between the large islands at the western extreme (Marianas, Belau, Yap,) of the Micronesian area and the remainder to the east (the remaining Carolines, the Marshalls, and the Gilberts). This reflects different origins for the first colonizers (Craib 1983) but, especially in the eastern groups, these origins have not yet been archaeologically documented. Recent evidence from the eastern islands, where archaeological study began much later than the pioneering research in the Marianas and Yap, provides only an outline of the major settlement and cultural development phases.

It is the archaeological data which offer at present the least clear but, in the long run, the critical information on the time depth of a Western/Central-Eastern Micronesian cultural dichotomy. This paper focuses on the Central-Eastern area, especially Pohnpei, reviewing archaeological evidence for early settlement and subsequent cultural elaborations during the last 2000–3000 years (Fig. 1). A general concern is with possible West Micronesian, Melanesian, and West Polynesian migrations into and influences on Central-Eastern Micronesia.

LIMITATIONS OF PRESENT ARCHAEOLOGICAL DATA

A continuing problem for eastern Micronesian archaeology is the lack of control over portable artifact type changes through time in a way that would allow refining cultural

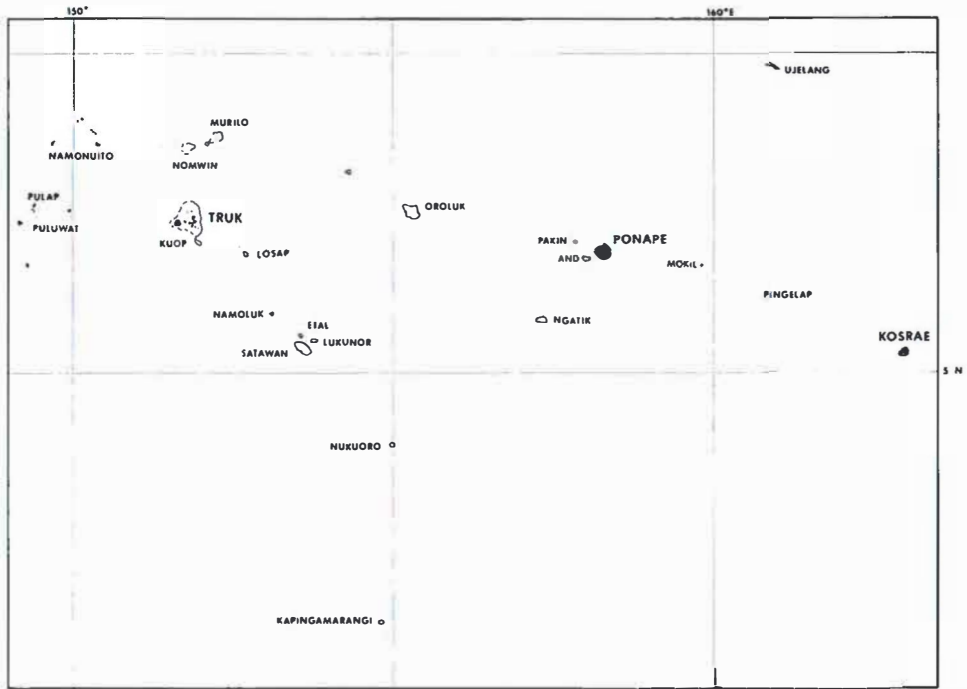
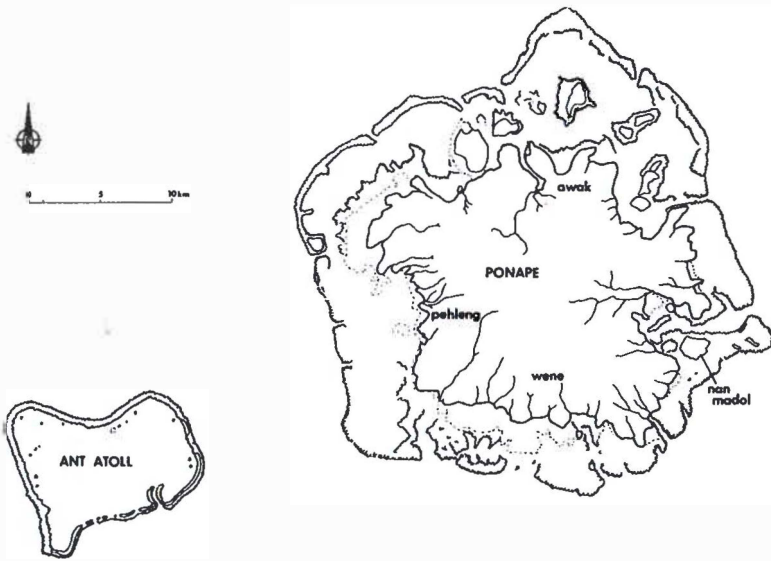


Figure 1. Map showing location of Pohnpei in Eastern Caroline Islands.

phases. To a large extent, the Pohnpei sequence is based on architectural change because portable artifacts are not common on main island sites. In Central-Eastern Micronesia only Truk has a preliminary sequence based primarily on artifact forms (King & Parker 1984); there, architectural remains are not a common feature of the archaeological record. A Kosraen sequence comparable to the Pohnpeian one could be formulated with reference to development of the Lelu complex; however, Cordy (1983) has stated recently that too little evidence is available from the precontact period to make such a phase sequence. No sequence is available for atolls, except a tentative one, for Nukuoro by Davidson (1971) and for Kapingamarangi by Leach & Ward (1981).

From Pohnpei, dated stratigraphic sequences are available from Awak, Uh, (for prehistoric Peinaiis through Historic Phase occupations); Wene, Kiti; Sapwtakai, Kiti; And Atoll; and, principally, from Nan Madol. However, these are primarily architectural sequences with few portable artifacts in association—except at Nan Madol. Earlier questions about the association of potsherds with Nan Madol islet architectural fill have been resolved in most cases in favor of a clear use-related context, and good building stage stratigraphy is available.

A Review of the Pohnpei Evidence

POHNPEI CULTURE-HISTORICAL SEQUENCE

A broad phase sequence for Pohnpei has been formulated (Ayres 1983, unpub.) and follows here in a slightly modified form:

Settlement and Adaptive Integration Phase	pre-500 BC–A.D. 1
inland forest clearance, Awak; calcareous tempered pottery in use	
Peinaiis Phase	A.D. 1–1000
stone house foundations, breadfruit storage pits, pottery with rim notching, rare punctate and incised line designs; Nan Madol islets with some columnar basalt construction as early as A.D. 500–600	
Nan Madol Phase	A.D. 1000–1500
expansion and formalization of Nan Madol complex and associated sociopolitical aspects (Deleur “Empire”), chiefly residential architecture, stylized tombs (<i>tolong</i>), pottery declining in use—increasingly plainware—or absent	
Isokhelekel Phase	A.D. 1500–1826
disintegration of the Deleur polity, Nahnmwarki title in use, chiefly complexes and new style meeting house (<i>nahs</i>), post-pottery phase	
Early Contact Phase	A.D. 1826–1885
Western contact; Nan Madol occupation continues but in a non-center role	
Historic Phase	A.D. 1885–present
Western contact and colonial governments	

POHNPEI ARTIFACTUAL EVIDENCE

An aspect of Pohnpei archaeology also found throughout eastern Micronesia is the strong emphasis on shell and limited use of stone as raw material for tools. In contrast to

the atolls where basalt is not locally available, Pohnpei, as a volcanic high island, has several kinds of stone suitable for percussion flaking, pecking and grinding to shape adzes and other cutting tools, but these were rarely worked.

It has been proposed that Pohnpei was first settled by atoll dwellers island-hopping their way across Micronesia either from the west (Buck 1938, Howells 1973) or from the east (Goodenough 1957, Shutler & Marck 1975), and because any long-term atoll adaptation would preclude the systematic use of stone for tools, the shell emphasis would be understandable. However, the locally-made Pohnpei pottery dating to at least A.D. 1 and presumably back to 500–1000 B.C. (Ayres 1983, Ayres *et al.* unpub., Athens 1981) shows that the early occupants of Pohnpei were derived from a high island where a pottery tradition was present and where, in general, the use of stone for tools would be expected, (although not necessarily as the major raw material).

Data for formulating a regional prehistoric sequence are available now from a wide variety of Pohnpei sites (Athens 1980a, 1981, Saxe *et al.* 1980, Ayres 1983, 1985, Ayres *et al.* 1980, 1981, 1985, unpub., Bath 1984, Streck unpub.). A number of pottery-bearing sites are now known. Portable artifacts are numerous only at Nan Madol (and And atoll); several thousand shell ornaments, mainly beads, and over 2000 potsherds were recovered from Nan Madol in 1981 and 1984. Several thousand sherds have been recovered in 1987 excavations at Dauahdpeidak Islet. Stone implements and shell woodworking tools, fishing gear, and ornaments are other major artifacts recovered.

Pottery—All known Pohnpeian pottery is of local manufacture and dated examples span a time range falling into the first 1000 or 1200 years A.D. Colors include grays, yellowish browns, and the most common, reddish browns. Vessel wall thickness ranges from approximately 2 to 25 mm (small bowl rims to pot bases), but most fall into a 4–8 mm range (see, e.g., Athens 1980b). Vessel shapes include principally large open-mouthed, globular pots, bowls, including some very small ones, and rare constricted neck jars/pots (Fig. 2).

The only manufacturing technique evident beyond hand shaping is paddle and anvil but this is shown solely by anvil impressions. Lines on the exterior of outcurving pot rims illustrate a characteristic method of folding over lip finishes. Pohnpei pottery shows a considerable range of tempering materials, including calcareous sand, volcanic rock fragments/sand, and crushed potsherds. While some sherds show varying combinations of volcanic rock fragments and crushed sherds, a high percentage of later pottery shows no tempering at all. "Temper" here refers to the potter's purposeful addition of non-plastic tempering materials such as sand to the clay during manufacture. No sherds show a definite slip, although the friable nature of most sherds and the surface deterioration from periodic immersion in tidal waters makes this determination difficult. Decorative attempts include a characteristic interior and exterior rim edge notching or, more rarely, lip top notching/incising on diverging rims and punctate lines on lip tops; body sherds show rarely incised lines, punctate marks, and fingernail impressions. Ayres (in press) distinguished Coarse and Fine varieties based on a limited Awak pottery collection; now typological characterization of Pohnpei pottery is being revised based on a substantial Nan Madol and main island collection.

One interesting facet of Pohnpei ceramic technology is the use at later time periods of

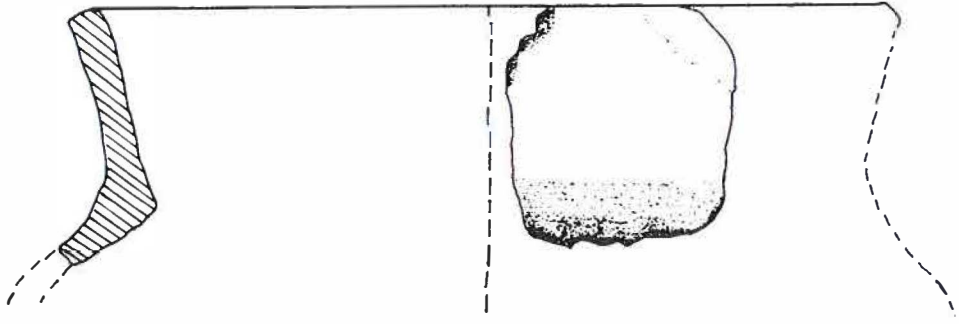
crushed sherd tempering; as this is presently known to have been employed elsewhere in Micronesia only in Belau and Yap it poses a question of origin. The absence of other West Micronesian-Pohnpei connectors suggests local innovation.

A hypothesis offered here for Pohnpeian, and probably also Trukese, ceramic developments is that stages of ceramic styles will be encountered: 1) Lapita (ca. 1000–500 BC) characterized by Melanesian Lapita design and other attributes; 2) a stage with punctate and incised decoration (representing a deterioration of Lapita design) accompanying a shift away from calcareous sand tempering a volcanic rock sand or possibly crushed sherd tempering, or little/no tempering; and 3) a plainware stage which eventually is replaced as a container system by wooden vessels and a change in cooking practices. This pattern would be truncated in Truk, and, if it applies to Kosrae, it would be substantially shortened given the more limited clay sources on that island. The above sequence is suggested in part by the Samoan ceramic developments and by the kind of ceramic replacement model Kirch (1984) has formulated for Polynesian outliers in Melanesia (e.g., Tikopia). In the Eastern Carolines case, as in Samoa, evidence for population replacement or full-scale cultural change is not present.

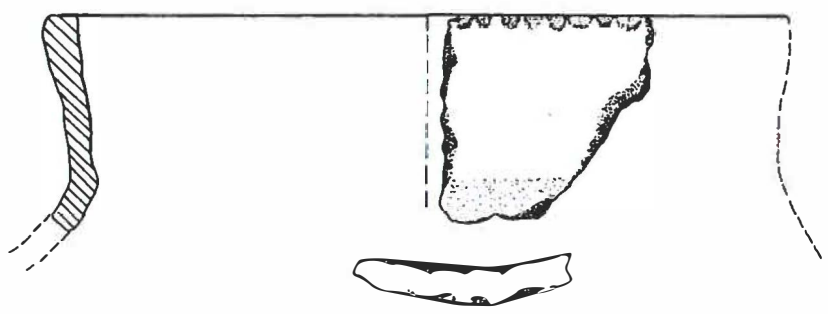
Stone Tools—The majority of Pohnpei stone implements are unmodified basalt cobbles used as pounding stones, large slabs used for pounding kava (*sakau*), small rectangular slabs used as abraders/files, and unretouched or minimally retouched flakes used as knives. Artifacts of coral are limited largely to pounders—not common—and unshaped abrading tools. Small pumice abraders are also known.

Stone adzes are very rare, although heavy duty pecked ones of rounded cross section are known (Hambruch 1932–1936). One adze found on Nan Madol's Reitik Islet (RET) is of a form not previously reported for Pohnpei and is certainly an import. It is equivalent to a Duff Type 2C Polynesia adze; the most similar adze form from neighboring regions is the Type I/III from Samoa (Ayres & Mauricio 1987). Green & Davidson's classification (1969: 22–23) of Type I and the more fully ground type III accommodates this specimen. The most similar adze specimen known is one illustrated by Burrows (1936: 126, Pl. 5C) from Futuna, West Polynesia. On the basis of form and provenience, another Pohnpeian stone adze discovered in dredged reef sand is of some antiquity (Athens 1981: Fig. 1). This adze is trapezoidal in face view, has a thin oval cross-section, and is finely polished.

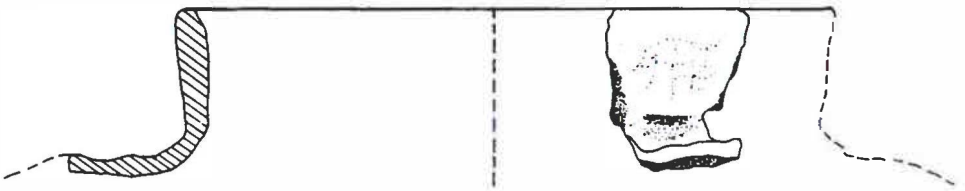
Shell Artifacts—Certainly the most numerous Pohnpei artifacts are of shell; these principally include perforated shells (especially *Anadara* sp.; Pohnpeian *lipwei*), cowrie bases and tops (scrapers/peelers?) with the broken edges ground in earlier specimens, adzes and chisels, and a wide variety of ornaments. Adzes are made from shells used commonly throughout the Western Pacific: Tridacnadae family, *Conus*, *Cassis*, *Terebra*, and *Mitra* (see Ayres *et al.* 1981 and Ayres *et al.* unpub. for a classification system; Fig. 3 here). The only temporally discrete adze form identified thus far is the *Terebra/Mitra* form (Type IA/B) which dates to after ca. 1000 A.D. based on evidence from Nan Madol and And Atoll. Fishing gear includes the perforated shell used potentially as net sinkers and pearl shell lure shanks and lure points for trolling [cf. Intoh & Leach (1985: 101) who identify a composite shell hook point found in Yap as the first known from Micronesia;



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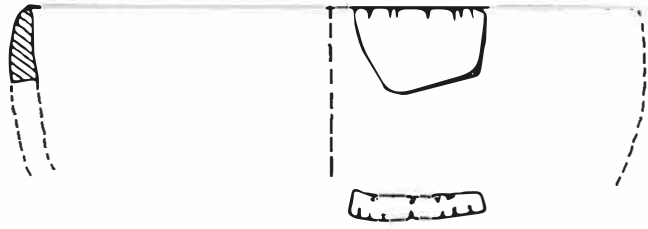


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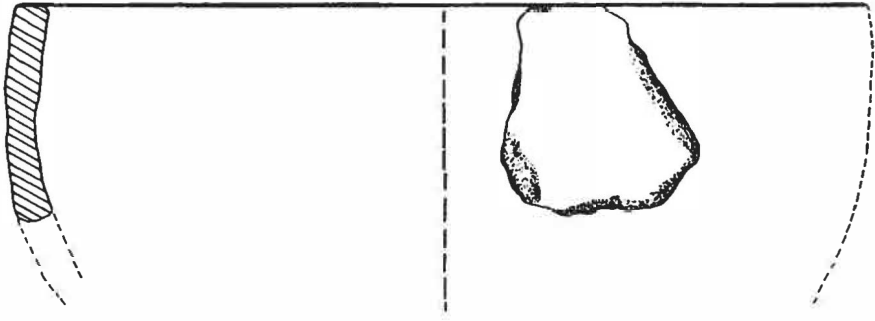


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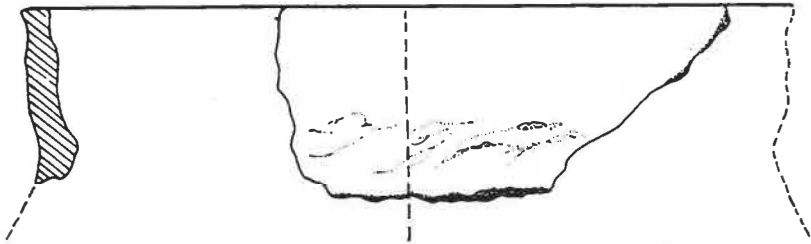
Figure 2. Pohnpei Ceramic Vessel Reconstructions from Sherds. a) Cat. WAS-3141-3, b) Cat. WAS-14, c) Cat. WAS-3141-1, d) Cat. WAS-259, e) Cat. WAS-3160-1, f) Cat. WAS-3149.1. All from Wasau Islet; age: A.D. 500–800.



b.

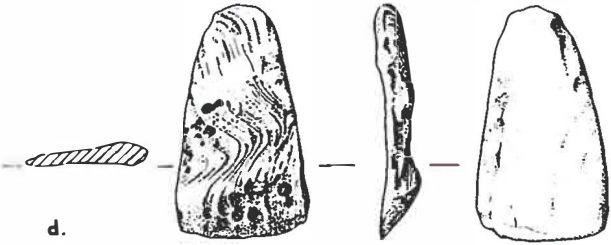
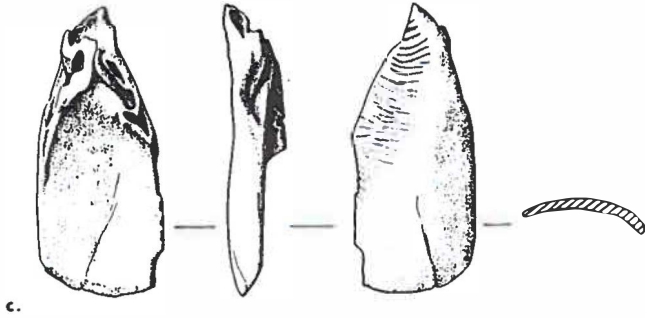
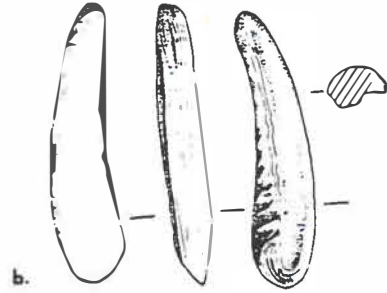
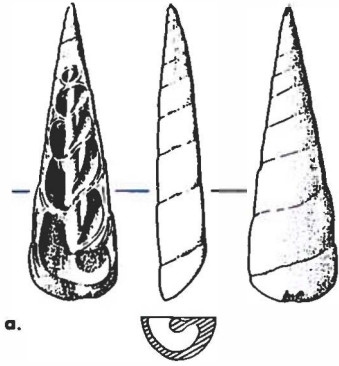


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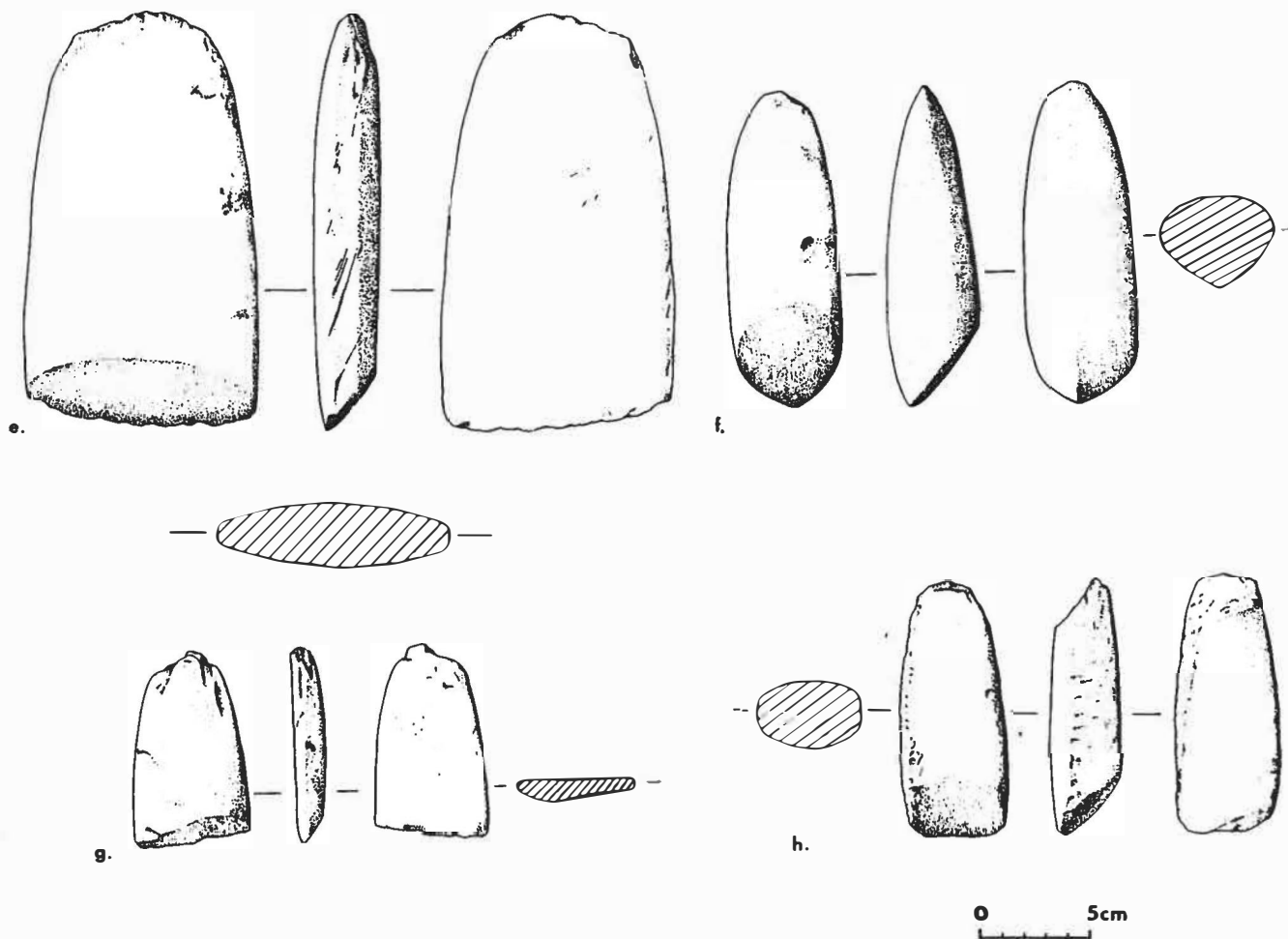


Figure 3. Selected Pohnpei Shell Adzes: a) Type I, Cat. At4-1-1043; b) Type II, Cat. At4-1-1017; c) Type III, Cat. At4-1-1069; d) Type IVB, Cat. At4-1-1002; e) Type VA3, Cat. At4-1-1072; f) Type VD2, Cat. At4-1-1026; g) Type VC, Cat. At4-1-1037; h) Type VB1, Cat. At4-1-1071.

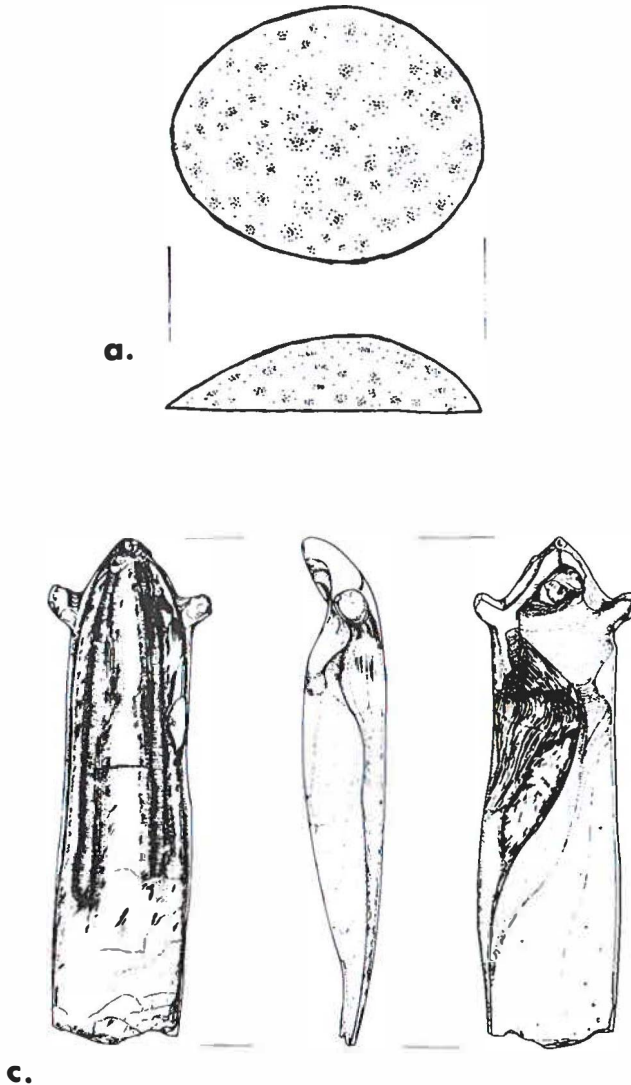
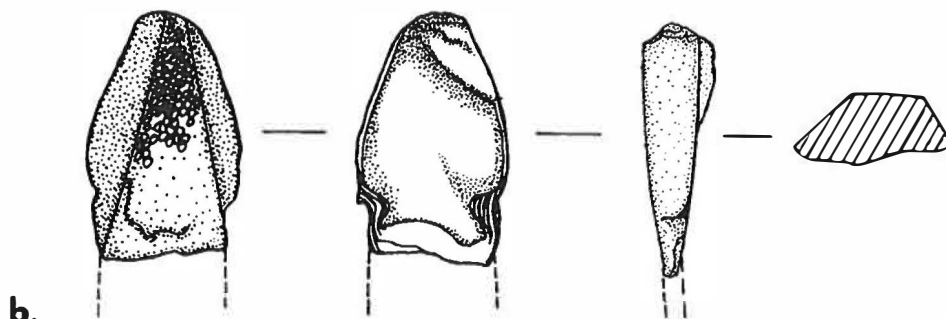
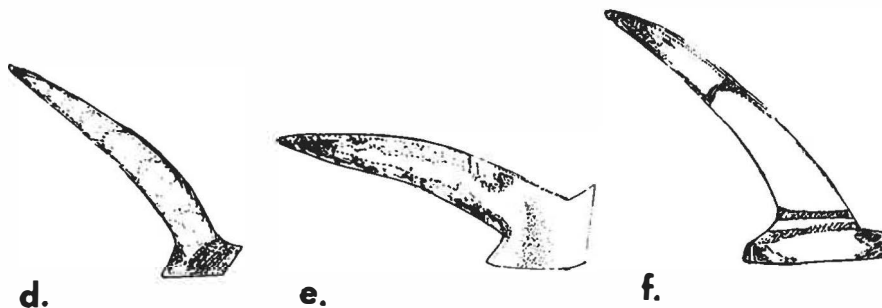


Figure 4. Pohnpei Shell Tools. a) Cowrie top, ground flat, Cat. WAS-1154; b) Proximal end of pearl shell trolling lure shank, Cat. UED-1146; c) Pearl shell trolling lure shank,

Hambruch (1932–1936) describes shell lure points from Nan Madol]. The points are known to date only after ca. A.D. 1200, but knobbed pearl shell lure shanks are known as early as ca. A.D. 500. Ornaments comprise a wide variety of ground shell pieces, including perforated *Spondylus* shell pendants, cut and ground *Tridacna* pendants, *Conus* tops, *Tridacna* rings and *Conus* bands used as arm bands and pendant rings, and disk beads of many sizes (Figs. 4, 5). One tomb on Pahnwi islet, Nan Madol, provided over 9,000 disk beads.



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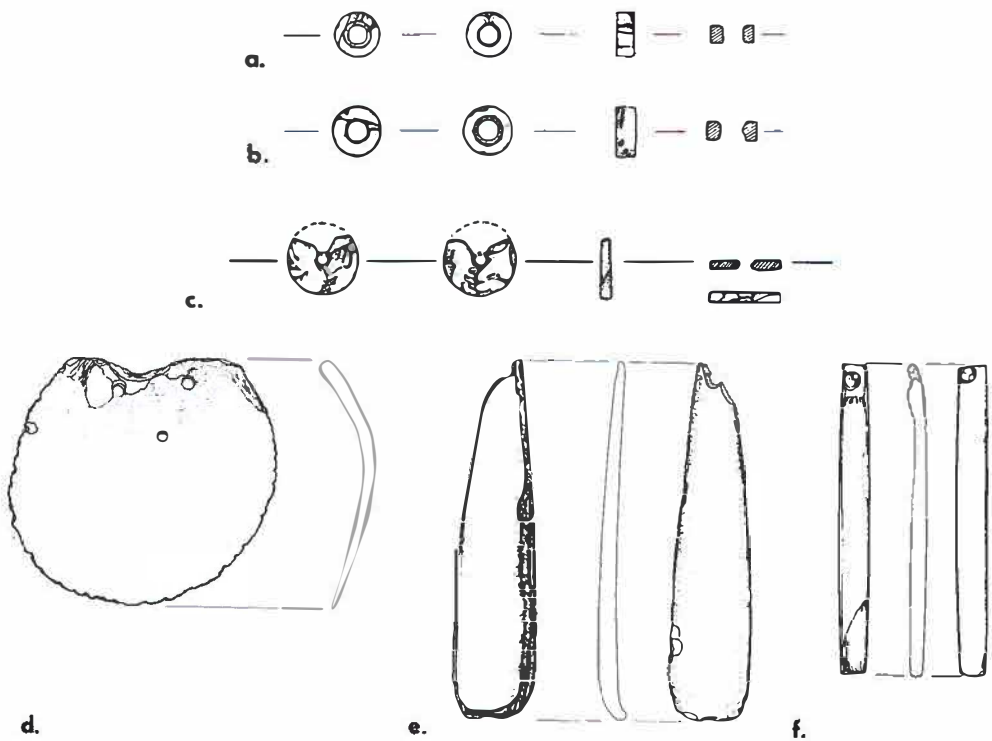
f.



Cat. PWI-1286; Pearl shell lure points: d) Cat. PWI-1078, e) Cat. PWI-1079, f) Cat. PWI-1077.

SUBSISTENCE PATTERNS AND EXPLOITATIVE STRATEGIES

Research has been undertaken on a variety of subsistence related questions on Pohnpei (Ayres 1985), including collection of agriculture and marine subsistence data (Ayres *et al.* 1981, Ayres & Haun in press, Ayres *et al.* unpub.). Pohnpei agricultural systems have been shown to be based on a yam-breadfruit association reflecting a well-integrated cropping system utilizing hundreds of varieties and developing over many cen-



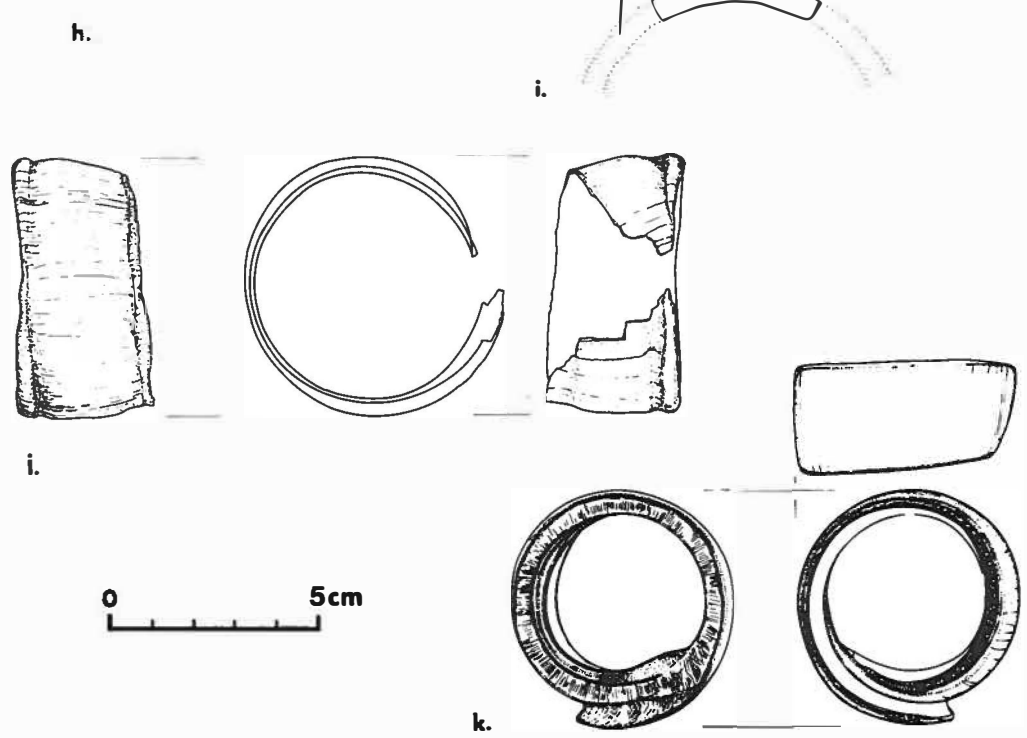


Figure 5. Pohnpei Shell Ornaments. Shell disk beads: a) Cat. PKI-1109, b) Cat. PKI-1129, c) Cat. PKI-1126 and 1146 refitted; d) *Spondylus* pendant, Cat. PWI-1075; e) *Conus* pendant, Cat. PWI-1076; f) *Conus* pendant, Cat. PWI-1366; *Tridacna* bangles or bands (fragments): g) Cat. WAS-1153, h) Cat. WAS 1106; i) *Tridacna* band fragment, Cat. DPK-1295; *Conus* bands or bangles: j) Cat. PWI-1329; k) Cat. PWI-1108.

turies. It is very different from Caroline atolls or Western Micronesian high islands, e.g., Yap (Ayres & Haun in press).

Pohnpeian marine food remains and technology show a primary lagoon exploitative pattern during at least the last 1500 years. Elsewhere, marine faunal material from Kapingamarangi (Leach & Ward 1981) and from Truk (King & Parker 1984) has been analyzed as a dietary component. These studies are beginning to document the contrast between high island and atoll subsistence practices predicted from the environmental differences and the ethnographic record, and to clarify the extent of subsistence change associated with the emergence of complex chiefdoms (Ayres & Haun 1985).

Based on an analysis of subsistence patterns, Ayres & Haun (in press) note that of the two major directions of population influx into the Caroline Islands, evidence from the cultigen inventory and food production systems largely supports the east to west movement. Migrants coming to Pohnpei from the east-southeast (Eastern Melanesia-West Polynesia) could have brought the known yam complex but not by atoll-hopping through the Gilberts and Marshalls as has been suggested (Shutler & Marck 1975: Map 3).

SETTLEMENT RECONSTRUCTIONS

Considerable effort has been expended in developing Pohnpeian site distribution and settlement pattern data (Ayres 1985, Ayres *et al.* 1981, in press, unpub.); several distinct levels of architectural and other feature patterning provide a means of testing an ethnographic model of architecture and other material culture use (Mauricio 1986, Falgout 1982). Similar work has been done on Kosrae where architectural features facilitate such a study (e.g., Cordy 1983a, Bath 1984) but relatively few comparable data are available from Truk or the Eastern Micronesian atolls.

Structures from several parts of Pohnpei, including Nan Madol, Awak, and Wene, have been identified and compared. Sample survey has recently been initiated in Madolenihmw District inland from Nan Madol to supplement survey done elsewhere on Pohnpei (including intensive survey in Awak, Uh District, and Wene, Kiti District, and reconnaissance in Leh dau, Madolenihmw District, Peh leng and Pwudoi, Kiti District, and Palikir, Net District). This broadens the data base for comparative study of settlement-subsistence patterning at four different levels: 1) individual architectural structures, 2) family residential complex/household complex, 3) local chiefly complex, and 4) regional chiefly complex, e.g., one subordinate to a major center like Nan Madol. A synthetic characterization of all architectural remains is planned for a subsequent paper.

The Nan Madol Complex—Oral traditions identify Nan Madol as the seat of the Sau Deleur dynasty which united Pohnpei's estimated 25,000 people (Ayres *et al.* 1981) in later prehistoric times. The ruling line was overthrown by invaders from Katau Peidak (popularly known as Kosrae Island) after Nan Madol was fully built. These traditions (e.g., Bernart 1977) coupled with archaeological evidence substantiate Nan Madol's position as the pre-eminent political and religious center up until the A.D. 1500's when the centralized system collapsed.

Nan Madol now forms an archaeological district covering over 18 sq. km, including the reef flat architecture ("Nan Madol Central" following Saxe *et al.* 1980), other ar-

tificial islets, Temwen Island, and the adjacent coastline. The stone walls of Nan Madol's center enclose an area approximately 1.5 km long by 0.5 km wide and rise in some places to 10 m above the surrounding reef flat. This core area contains nearly 100 stone and coral fill platforms (up to 115 by 110 m in size) bordered by tidal canals.

Architectural Forms—At the basic level of settlement analysis, a distinct residential unit, a sleeping house, can be defined ethnographically and archaeologically. There is a size gradient for residential housing preserved in known Pohnpeian examples, including the Nan Madol islet complex but most individual dwelling structures fall into either a large (> 35 sq m) or small (< 35 sq m) category which, according to oral traditions and general comparative study, is interpreted as reflecting social status differences. At one extreme the residence of the highest chief on Pohnpei, the Sau Deleur in earlier prehistoric times, represents the expected high point of the range in size and associated characteristics; the numerous sleeping houses of the low class attendants for the high chiefs represent the other extreme of the size range.

Other important architectural forms are: 1) the meeting house (*nahs*), which doubles as a canoe house; marked behavioral differences among its users according to social status are expected based on the historic model, 2) temples/shrines (e.g., Nahn Keiel Mwahu at Pahn Kadira, Nan Madol), 3) stone tombs, *lolong*, representing clan/subclan burial places for persons of high status. These are often found as architectural clusters or complexes.

Pohnpei Settlement Reconstructions—Social rank differences can be identified at the level of: 1) the individual residential structure, 2) the functionally specific non-residential architectural units (with associated portable artifacts), e.g., tombs, meeting houses, and 3) combinations of the first two differentiated on the basis of size and numbers. The primary pattern relative to social status/ranking distinctions is evident in 1) variation in individual structures, and 2) the existence of centers—architectural complexes of varying size differentiated from other residential and special purpose units/architectural features by size, specific architectural features present, and number of distinct functional types. While portable artifact indicators of rank are not common outside of Nan Madol, they are present, e.g., kava (*sakau*) stones and ornaments. These are supplemented by food remains which also show status differences in the categories of “prestige” foods such as fish (Ayres *et al.* unpub.). The primary chiefly center, Nan Madol, is well known as are lower level complexes in Awak and Kiti Districts—in Wene and perhaps Sapwtakai (Bath 1982, 1984)—of the island. However, a rank ordering of centers representing administrative levels is not yet available for the island as a whole.

At one end of the rank-size range for chiefly architectural complexes stands Nan Madol Central, a true primate center, and a disembedded one (see Graves 1986); at the other end are numerous chiefly complexes, e.g., one in Awak Valley spread over an area of 6000 sq m. Only one true intermediate level center is known, that of Sapwtakai, in Kiti District, south Pohnpei (Hambruch 1932–1936, Bath 1982, 1984).

In sum, comparisons of Pohnpeian artifacts, architectural types, and food refuse from residential complexes have been used to distinguish the occupants' relative social status. In main-island Awak survey only commoner and chiefly residences were distinguishable; at Nan Madol the paramount chiefly complex is present. Patterning studies thus

far show a correlation of high status remains—artifacts, food remains, and architecture—and certain islets, and a decided temporal trend towards increasingly status-marked materials. Provenance data on lithic building materials and resources used for ceramic manufacture are being examined, along with evidence from artifact distributions and architectural styles, to aid in archaeologically documenting relationships among centers.

SOCIOPOLITICAL EVOLUTION

The ordering of centers is critical for resolving questions about hierarchical structural levels versus intra-level differentiation and variation (see, e.g., Cordy 1983b). Variability in political centers/status complexes within social or political rank levels is evident in the Pohnpei context as is the significant expression of social status and political ranking in Pohnpeian architectural forms. The emergence of complex chiefdoms archaeologically can be traced because of the pre-eminence of the Nan Madol center itself as the fully developed architectural model. The significance of this lies in the archaeological identification of political hierarchy levels (up to four) that forms a foundation for assessing factors considered critical to the emergence of a five-level geo-political structure representing a unification of Pohnpei island.

Pohnpei's archaeological and oral historical data help our understanding of socio-political evolution. Oral traditions provide both general and specific models for formulating relationships between material culture and social forms, e.g., in identifying ways to "translate" specific archaeological data into characterizations of social structure and ideology (Ayres unpub.). However, there are persistent problems with linking material culture and social ideology. Among these, architectural size alone is not sufficient to establish relative rank of associated individuals or social groups (see e.g., Kirch 1980)—although it may be one of the best measures we can use archaeologically, particularly in the absence of substantial numbers of portable artifacts. In addition, there is the question of whether one's status in death (burial complex) directly reflects one's status in life (Hodder 1982). From these considerations, the relationship of chiefly power to architectural magnitude is drawn into question.

Prehistoric Pohnpei polity relationships are also being examined from the standpoint of non-hierarchical structures, that is, a peer polity interaction model (Renfrew & Cherry 1986), at several levels. These include: a) pre-Nan Madol complexes of independent polities, b) an early island-wide polity described in oral tradition and represented hypothetically by Nan Madol, and c) the five independent "districts" (*wehi*) existing during the historic period. The island wide polity, that of the Sau Deleurs, may have been a focal point in a broader Eastern Carolines interaction sphere (see Goodenough 1986 for a discussion of an ideological basis, the so-called "Kachaw" complex, for such a position). The primary hypothesis is that Nan Madol's development as a chiefly and priestly center reflects an evolving chiefdom that controlled a Pohnpei polity from ca A.D. 1000 to 1500. The relative significance of volunteer versus coerced participation, that is, religious motivation as opposed to commanded labor, is one issue here (Peterson unpub., Graves 1986). While testing is incomplete at this point, there is little evidence to support a coercive model of expansive integration until perhaps late in the sequence when population growth and density of land utilization are archaeologically identifiable (see e.g., Kirch 1988).

POHNPEI DERIVATIONS

Two major ceramic traditions of SE Melanesia, the Lapita and the Incised and Applique, are both associated with a significant emphasis on shell as well as stone as a raw material for adz/ax manufacture. In some early aceramic cultures in the SE Solomon Islands there appears to have been a marked cultural preference for shell over stone even though stone was available (Green 1976, Garanger 1972). Thus the derivation of a largely shell-based Pohnpeian adz industry from SE Melanesia is not unexpected. For Pohnpei, it is most convincingly derived from early Lapita settlement of the Southwest Pacific area as evidenced by technological similarities and by the clearly established Lapita tie to early Polynesian dispersal taking place within this same time frame.

The linguistic associations of Pohnpeian with the Eastern Oceanic subgrouping of Austronesian languages (Pawley 1972, Shutler & Marck 1975), or Remote Oceanic (Pawley & Green 1984), tie Pohnpei's known settlement history more closely to SE Melanesia and early Fiji-West Polynesia than to any other region. In addition, the Pohnpei agricultural complex, as noted above, is most clearly traced to this region.

Although one must note that the archaeological record of the earliest occupation of Pohnpei is not available, present ceramic evidence does not suggest an early settlement from western Micronesia by connecting it to Marianas Redware (via Truk?; see Takayama 1982: 104). While possible, this is less supportable than an alternative hypothesis, the southeastern derivation from Lapita (Ayres & Haun in press). The latter is supported, for example, by pottery vessel form, including constricted neck pots/jars, and rim notching attributes found in SE Melanesia and Fiji-West Polynesia but rare or absent in western Micronesia. If it is confirmed that Pohnpeian pottery is derived from Lapita, it would represent its most northerly distribution and would verify expected early Melanesian-Micronesian connections.

Relation of Pohnpei to Other Central-Eastern Micronesian Islands

RELATIONSHIP OF POHNPEI AND KOSRAE

Parallels exist between Pohnpei and Kosrae islands in megalithic architecture as noted by the earliest visitors (Christian 1899, Hambruch 1932–1936, Yawata 1932). This is particularly noticeable when one compares the Nan Madol and Lelu centers in terms of construction and expansion, some building methods, and functional units within the complexes. This is not surprising, perhaps, given their geographical proximity, ca. 480 km, and the oral traditions specifying the conquest of the Nan Madol Sau Deleur rulers by the culture hero Isokelekel, who went from Pohnpei to Katau Peidak and later returned to depose the Sau Deleur. However, the oral traditions simply state that Isokelekel came from Katau Peidak, that is, “eastern/upwind Katau,” a mythical place. The identity of Katau Peidak with Kosrae is certainly not demonstrable (Mauricio 1987; see also Goodenough's 1986 discussion of the Kachaw concept in eastern Micronesia). Cordy (unpub.) has noted some differences between Nan Madol and Lelu construction; these and the disparate portable artifact inventories and temporal disjunction of several important features make the nature of prehistoric contact between Kosrae and Pohnpei unclear. The social and political hegemony of Pohnpei during the earlier Nan Madol/Sau Deleur era may have

been considerably greater than just Pohnpei Island and possibly resulted in Pohnpei and Kosrae connections. The late use of canoes suitable for long distance voyaging on Kosrae compared to their absence on Pohnpei—which by historic times had specialized canoe construction for lagoon use only—suggests that contacts would most likely have been from Kosrae to Pohnpei in later prehistoric times if there were any significant ones.

Temporal disjunction is noted in that Nan Madol megalithic construction begins as early as ca. A.D. 500 (from evidence at Wasau Islet, a 50m by 60m artificial islet) and becomes extensive by A.D. 1000. The Lelu construction and artificial expansion of the shoreland begins ca. A.D. 1250 (Cordy 1983b). While earlier building attempts or locations are reported by Cordy for centers like Lelu (as there are for Nan Madol; see Hambruch 1932–1936), no other large complexes are known on Kosrae. The use of columnar basalt prisms for construction appears late at Lelu as reported by Cordy, that is, after A.D. 1400 for walled compounds. While some walled compounds at Nan Madol are late, the early dates for basal layers of Wasau (A.D. 500), Usendau (A.D. 800), Pahn Kadira (A.D. 900–1000), and Pahnwi (A.D. pre–1250), show a very early use of columnar basalt construction in retaining walls around entire islets and in internal building alignments. Known walled enclosures existing on the Pahn Kadira surface and elsewhere at Nan Madol date to the later period of use and reflect the final periods of remodeling. While Cordy (unpub.) maintains that walled compounds were being repaired and/or built at Lelu up until the early 1800's, no evidence for such late construction exists for Pohnpei, and the termination of the building pattern coincides with the demise of the Sau Deleurs ca. A.D. 1500–1600. The termination of walled enclosures used as residence-tombs in Awak also fits into this same time frame (Ayers *et al.* 1981). Thus, the fall of the Sau Deleurs marks the end of major construction at Nan Madol, although many small houses were built and substantial modification of the islet surfaces for residential purposes occurred after that time. Given the overall building pattern similarities and the temporal priority of Nan Madol developments, it seems likely that Kosrae's Lelu architecture was influenced by Nan Madol's rather than vice-versa.

RELATIONSHIPS WITH ADJACENT ATOLLS

Little work has been done on Pohnpei's neighboring islands—two exceptions being the Polynesian outliers of Nukuoro examined by Davidson (1967, 1971) and Kapingamangi, studied by Leach & Ward (1981). The relationship of atoll peoples to Pohnpei is of interest; evidence for interaction may eventually be found at Nan Madol, but more likely on the atolls themselves.

Sapwaufik (Ngatik), Mokil, and Pingelap offer excellent opportunities in which to examine atoll and high island interrelationships within a coral complex as these changed through time (Alkire 1978). Ayres has done research on And Atoll, located only 15 km from Pohnpei. This has provided comparative material on atoll adaptations, adding to the information on contrasting adaptations of the Polynesian outliers. More distant comparisons can be made within the Marshall atoll chain (Shun & Athens this volume, Riley unpub.) and with those in the Gilberts (Kiribati); see Takayama *et al.* 1985. Research on the Pohnpei State atolls is being planned.

TRUK

A general prehistoric sequence has been developed for Truk Island to the west of Pohnpei based on work by Shutler *et al.* (1977), Takayama & Intoh (1978), Sinoto (1984) and a synthesis by King & Parker (1984). This includes early pottery which may relate to the Pohnpei ceramics. Similarities of some Trukese pottery to that of the Marianas originally described by Shutler and Takayama (Shutler *et al.* 1977) and since discounted (Takayama & Shutler 1978: 8) are also lacking for Pohnpei ceramic collections. Some contrasts and similarities of Pohnpeian and Trukese pottery are shown in Table 1 (note that the majority of the Pohnpeian pottery is ca. 500–800 years later than the Trukese pottery, and developmental changes may account for some of the differences observed).

EASTERN MICRONESIAN ATOLL CONNECTIONS

Archaeological research on eastern Micronesian atolls has been attempted only very recently. Streck's (this volume) dates for Bikini provide the earliest reported occupation but these predate expected occupation of the atolls in this area by 1000 years. Shun & Athens (this volume) provide recent evidence of Kwajalein settlement dating back to 100 B.C.; Riley's (unpub.) Majuro settlement dates to ca. 2000 BP. These sites thus show settlement of the Marshalls as early as the known Eastern Caroline high island occupations but the context and associated materials for these dates from the Marshalls have yet to be fully published.

The most recent work in the Gilberts (Kiribati), on Makin, by Takayama has offered a number of new items to clarify the nature of the early settlement (as early as A.D. 500; see Takayama & Takasugi [1987]) and, potentially, the origins of early Polynesian fishing gear, including lure shanks of *Cassis* shell. Pearl shell trolling lures can be dated now as early as A.D. 500 at Nan Madol—but not as early elsewhere in Eastern Micronesia. Thus, Takayama & Saito's (1987: 37) characterization of these as only of late prehistoric age in the Carolines is not correct.

MORE DISTANT RELATIONSHIPS

At the traditional Micronesian-Polynesian interface, Takayama's recent work in the Ellice Islands (Tuvalu) has produced additional fishing implements which he views as supporting the idea that East Polynesian gear can be derived from the Gilbert-Ellice-Rotuman area (Takayama 1987, Takayama & Saito 1987). Of interest here as well is the pottery found on Vaitupu said to be of Fijian origin and dating to ca. A.D. 1000. As such, it represents a relatively late trade ceramic into the Ellice Islands and not necessarily pottery in use by the initial colonizers (inference of Takayama *et al.* 1987: 1, 8). Stone adz fragments also support the external connections. Based on information offered by Takayama (1987), the age of the Vaitupu fishing gear would seem to be too recent to represent an ancestral Polynesian hook and line fishing form. No other one-piece fishhooks are older in eastern Micronesia.

Table 1. Selected ceramic attributes: Pohnpei and Truk collections.

	Pohnpei	Truk
<i>Manufacture</i>		
1. paddle and anvil	x	x
2. temper		
a. calcareous sand	x (early)	x
b. volcanic rock sand	x	(rare?)
c. crushed sherd	x	
d. both b. and c.	x	
e. no temper	x	
3. color (paste)		
a. reddish/brown	x	rare
b. yellow/brown	x	x
c. grey	x	x
d. black	rare	x
<i>Shape</i>		
1. vessel shape:		
a. large bowls, pots	x	x
b. small bowls	x	
c. narrow necked jars	x	
2. rim shape		
a. outcurved	x	x
b. incurved	x	x
c. straight	x	x
rim course		
a. parallel	x	x
b. divergent	x	x
c. convergent	x	x
3. body		
a. carinated shoulders		x?
b. rounded shoulders	x	x
4. base		
a. rounded	x	x
b. flat		x
<i>Decoration</i>		
1. body		
a. incised	x	x
b. punctate	x	
c. fingernail impressed	rare	
2. lip treatment		
a. flat	x	x
b. rounded	rare	x
c. pointed	x (early)	x
3. lip decoration		
a. irreg. impressed lines on top	x	x
b. lip notching	x	x
c. lip edge notching	x	
d. punctate on top	x	

Conclusions

Based on linguistic grounds the Trukic language group of Oceanic Austronesian forms a relatively coherent unit extending from the Mortlocks to Tobi in the west; thus far, archaeological evidence suggests that this is a relatively recent pattern developing within the last 2,000 years and, appropriately, of shorter time depth as one moves west. The pottery evidence from Truk shows a settlement before 2000 BP. It seems most likely that this ceramic industry is derived from the same populations who settled Pohnpei in the first millenium B.C., that is, ancestral Oceanic Micronesian peoples bringing with them Lapita, or at least Lapita-derived, ceramic and shell tool industries. Some features of the Trukese calcareous sand-tempered pottery, e.g., shouldered bowls and pots, may represent this. The Caroline Island atolls west of Pohnpei show thus far no evidence of colonization from the western Micronesian high islands. It is proposed as a hypothesis (see Ayres & Haun in press) that they constituted an atoll "barrier" to eastward settlement for the inhabitants of the western high islands. Colonization then came after an atoll adaptation pattern had developed in areas to the east. Later, contacts between these atolls and the western Micronesian high islands took place as indicated by the Belauan and Yapese pottery found on Lamotrek (Fujimura & Alkire in Sinoto 1984) and such artifacts as the distinctive *Cassia* shell scraper found in Micronesia as far to the east as the Mortlocks.

To the extent that architectural similarities between Pohnpeian and Kosraen sites like Nan Madol and Lelu document prehistoric connections between these islands, the influences are seen to have come from Pohnpei given the earlier appearance of the distinctive megalithic building style there. Also, based on similarities in sociopolitical organization, it seems likely that Pohnpei's neighboring atolls were influenced by developments on the larger high island due to possible low island dependency—perhaps ritual or social—but this is as yet archaeologically undocumented.

Archaeological research done in eastern Micronesia has had a major impact on our understanding of Western Pacific prehistory yet no overall prehistoric synthesis except in the broadest terms is possible. The early Caroline Islands pottery, especially that of Pohnpei and Truk, sheds new light on early migrations into the Caroline Islands and on subsequent cultural interaction and transformation.

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