

William S. Ayres
University of Oregon

Recent research on Ponape, Eastern Caroline Islands of Micronesia, has produced archaeological evidence for formulating a cultural historical sequence and for examining the development of local chiefdoms. The prehistoric evolution of complex socio-political organization is revealed in archaeological remains because stone architecture reflects relative structural units within the political system. The most impressive example of this relationship is the massive coastal site of Nan Madol, which represents the end point of a trend in political centralization reflected by megalithic architecture. Considerable ethnographic and ethnohistoric data (e.g. Riesenbergs 1968, Bernart 1977) substantiate Nan Madol's position as the preeminent political and religious center on the island. Bernart's (1977) traditional three-fold sequence for early Ponapean cultural development provides a general model that is being tested using archaeological and other historical data (Fig. 1).

Nan Madol (Fig. 2) is a complex archaeological district built up on the coastal reef flat near small Temwen Island on the east coast of Ponape. The site core is enclosed by a wall 1.5 km long by 0.5 km wide and it contains nearly 100 major architectural units (stone and coral fill platforms or artificial islets). This area served as the main residential and ritual center for the highest ranking members of the society. According to oral traditions, the site was the seat of the Sau Deleur dynasty which united all of Ponape's estimated 25,000 people in later prehistoric times. The dynasty was overthrown by invaders reportedly from Kosrae (Kusaie), 480 km to the east.

Despite Nan Madol's obvious cultural and historical significance, very little archaeological work has been done there. European visitors had described aspects of the site in the early nineteenth century, but the first detailed map was drafted by the German ethnographer Hambruch in 1910 (Hambruch 1911, 1936). Of a number of minor excavations undertaken since the early 1800's, mostly in the site's largest tombs, only one provided accurate occupation dates (the 1963 Smithsonian project produced radiocarbon readings between A.D. 1200 and 1400 for cooking fires on one stone platform called Idehd). Two historic preservation surveys were done at the site in the late 1970's (Saxe et al. n.d., Athens 1980). Athens verified the presence of surface pottery which was originally reported by visitors in the early 1800's (Athens 1981:17).

No archaeological work, other than brief reconnaissance surveys, had been conducted on the main island of Ponape before the author began research there in 1977. As a result of this latter

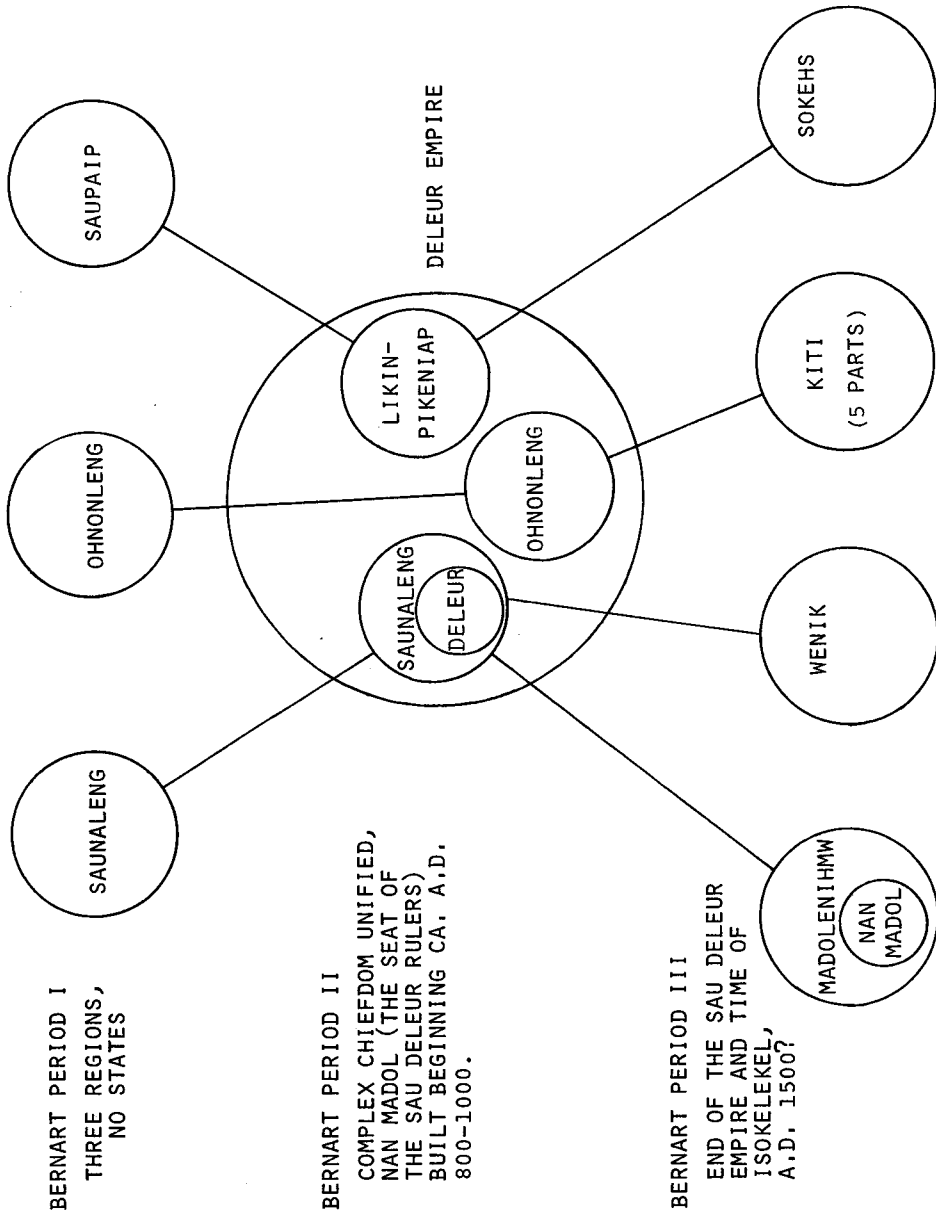


Figure 1. A Model of Political Relationships Among the Major Segments of Earlier Ponapean Society According to Oral Traditions and Archaeological Evidence.

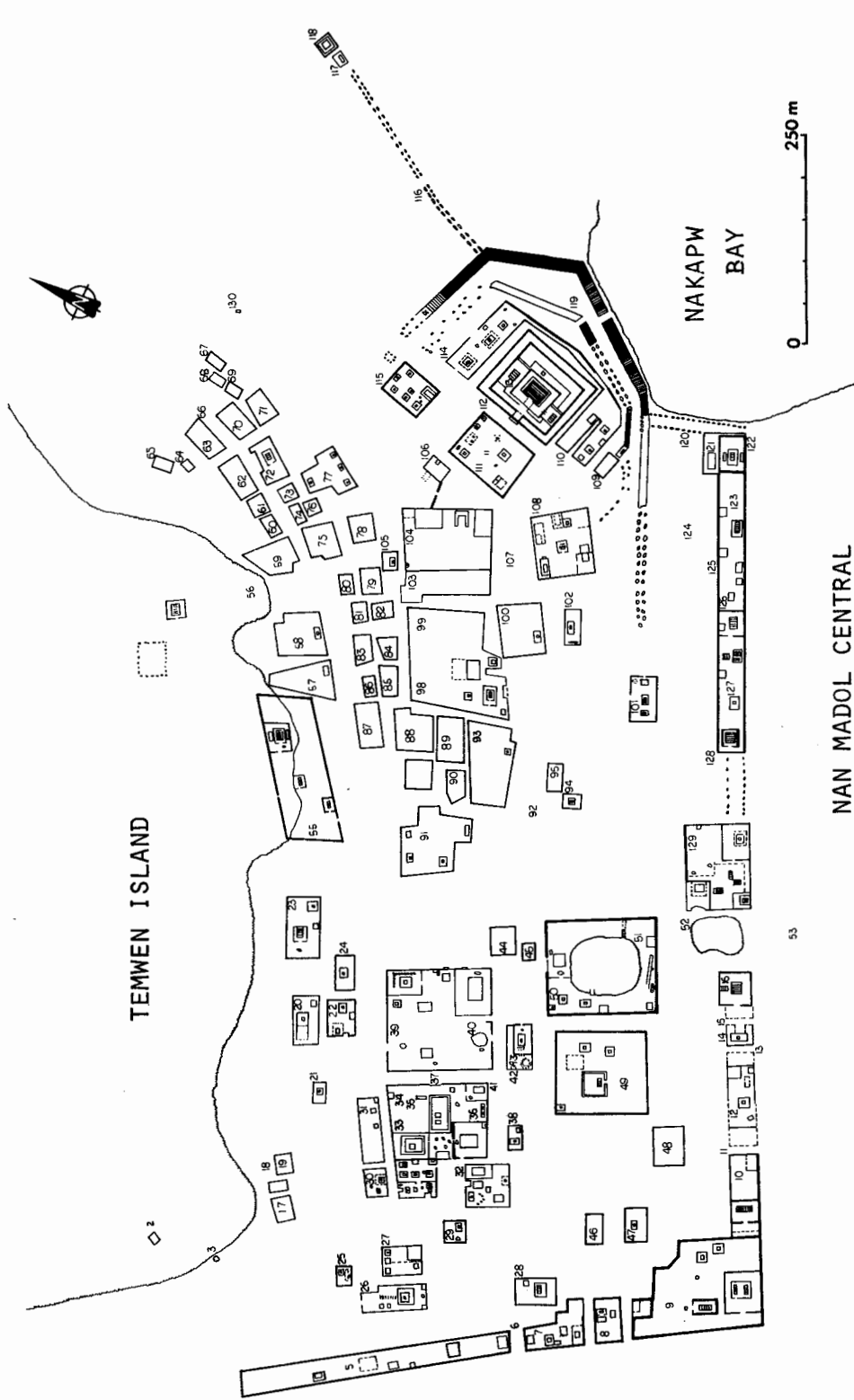


Figure 2. Plan of the Nan Madol Central architecture based on Hambruch's sketch maps of 1911 and 1936 as modified in Sketch No. 328 of the Ponape Lands and Surveys Office; the scale is a close approximation for most of the site except the Nan Dauas tomb (No. 113), which Hambruch drew about 1.5 times larger than its actual size relative to islets such as Pahn Kadira (No. 33-36).

The aims of the Nan Madol project are: (1) to establish a cultural historical framework for the site; this is necessary to relate it to similar developments on the main island and on other islands in the Eastern Carolines; (2) to document Ponapean relations with other Micronesian islands - e.g., trade goods, such as pottery, are likely to be found at Nan Madol if anywhere on the island; (3) to examine archaeologically the use of specific islets and platforms and to test functional hypotheses derived from oral traditions; (4) to determine the amount of control the resident chief exercised over resources and their distribution, as reflected in trade items, tribute, and corvee labor for construction; and (5) to gather information relevant to site conservation.

The 1981 work at Nan Madol (designated site MiECPo C3-1) concentrated on and around the Sau Deleur residential compound at Pahn Kadira and on the priestly complex at Usendau; these are major platforms in "Lower" and "Upper" Nan Madol respectively (Fig. 2, No. 33 and 104). These two platforms were mapped and controlled surface collecting was completed. The recorded platform sizes illustrate the magnitude of the Nan Madol complex; Pahn Kadira covers approximately 1.3 hectares and Usendau 0.7 hectare, and they contain somewhat over 40,000 and 20,000 metric tons of building materials respectively.

Four pits excavated in Pahn Kadira yielded information on architectural stratigraphy, construction methods, shellfish and animal bone food remains incorporated into the fill (down to a depth of 1.65 meters beneath the platform surface), and provided a series of charcoal samples for dating. At least five major construction levels underlie the foundation of the stone-walled enclosure which is traditionally identified as the residence of the Sau Deleur chief.

Collected artifacts include shell adzes, ornaments, coral and stone pounders, pearl shell lure shanks - of the sort Hambruch (1936:51) called "money" - and a carved bone thatching or weaving tool. Cultural remains at the lowest levels of Pahn Kadira were embedded in a matrix of sand and coral which suggests that the initial utilization of this reef area may have been on low, sandy islets.

Although excavations in Usendau were limited to one test, a larger number of artifacts were recovered. Evidence of architectural stratigraphy was less pronounced than in Pahn Kadira but it was still observable. Of particular importance at Usendau are the potsherds recovered from the platform fill (down to about 1.1 meter depth) and the presence of surface pottery. No surface pottery was found at Pahn Kadira - one sherd was found in the fill - which suggests considerable variation in the use of ceramics at Nan Madol. This variable pottery distribution throughout the site appears to result from different building stages as well as from different functions of the islet platforms.

effort, artifact sequences and a detailed architectural classification system have been developed; these will pave the way for placing Nan Madol within a broader, island-wide context. An archaeological phase sequence (Table 1), community organization models, and a political evolution outline formulated in this research are based on records of over 200 surveyed sites, test excavations, and 18 radiocarbon dates (Ayres 1979, Ayres and Haun 1980, Ayres, Haun and Severance 1981, Ayres and Haun n.d.).

Phase I	<u>Settlement and Adaptive Integration</u>	pre 500 B.C.-A.D. 0
	Suggested by evidence of inland forest clearance ca. 500 B.C. (Ayres, Haun, and Severance 1981:119, Fig. 40).	
Phase IIA	<u>Early Developmental Phase</u>	A.D. 0 - A.D. 800
	Initial evidence of communal bread-fruit pit storage, stone platform house foundations; pottery present.	
Phase IIB	<u>Late Developmental Phase</u>	A.D. 800 - A.D. 1500
	Construction of Nan Madol and the appearance of the Deleur Empire; large residential complexes, chiefly residential architecture, stylized tombs, pottery.	
Phase III	<u>Dissolution</u>	A.D. 1500 - A.D. 1826
	Disintegration of the Deleur polity; Nahmwarki title for high chiefs; large residential complexes, chiefly residential architecture, stylized meeting houses; pottery no longer in use.	
Phase IV	<u>Early Historic</u>	A.D. 1826 - A.D. 1885
	Continuation of Phase III features and elaboration of the "U"-shaped meeting house form.	

Table 1: Ponapean Cultural Historical Outline.

Recent radiocarbon readings from these excavations indicate that the initial construction of Usendau began in the late 700's A.D. and that of Pahn Kadirā began perhaps 200 years later. The most recent dated structural addition to Pahn Kadirā was made after A.D. 1400 and pottery appears not to have been in use this late.

The Nan Madol pottery and that from the Awak Valley Peināis site (MiECPo B7-143) - which has plain red-brown ceramics dated to 1500 BP (Ayres and Haun n.d.) - are of particular interest because the distribution of pottery in the western Pacific has long been a subject of archaeological concern. New explanations for early Micronesian settlement and the development of local technological systems - which, through time, became less reliant on pottery containers - must be developed taking into consideration the new archaeological data from the area. Reformulations of linguistic relationships among the various Micronesian settlements (Grace 1968, Shutler and Marck 1975) have contributed quite a different view from those offered by earlier scholars such as Buck (1938) for the origins of the eastern Micronesian settlers. The prehistoric pottery technologies of the area that are just now becoming known archaeologically should provide a way to test the linguistic reconstructions. It is now clear that prehistoric pottery manufacture was widespread throughout the Micronesian high islands (probably including Kosrae also, although no pottery has been found there yet).

Truk, geographically the closest to Ponape, has pottery similar to that found at Nan Madol and in Awak; however, the Ponapean pottery is thinner and has less elaborate rim forms and the earlier ware lacks the white, web-like stripes and high (30-50%) calcareous sand temper of the Trukese pottery (Shutler, Sinoto and Takayama n.d.). Rim lip notching and construction details of the Ponapean pottery suggest a S.E. Melanesian-West Polynesian Lapita origin for the early eastern Micronesian settlers. Although the present Ponape ceramic collections are limited in size, they do provide an important new body of evidence for comparative studies of Micronesian pottery.

Other Nan Madol artifact comparisons (e.g. of prestige items such as shell arm bands, beads, and other ornaments) and rank-related stone architectural similarities (e.g. in tombs) are expected to be useful in defining the status of the resident chiefs of the complex relative to others on the island. Also, estimates of construction costs in terms of time, personnel, and materials will give a concrete basis for comparison of "public works" projects undertaken at various chiefly levels. For example, the largest stone tomb (lolong) located during intensive survey of Awak Valley contains about 220 m³ of basalt, principally columnar prisms (Ayres, Haun and Severance 1981:25-26); the largest tomb constructed at Nan Madol, the Nan Dauas enclosure, contains roughly 4500 m³ of basalt and 13.500 m³ of coral fill. Estimated

weights of the transported building materials are just over 600 metric tons for the Awak tomb and over 45,000 metric tons for the Nan Dauas tomb.

Because the chiefly hierarchy is an important mechanism through which access to land is regulated on people-rich but resource-poor Pacific islands, determining Nan Madol's position within the broader Ponapean and Micronesian setting will aid in defining general relationships among population growth, sociopolitical integration, and resource distribution.

ACKNOWLEDGEMENTS

This is a revision of a paper presented at the 1981 Annual Meeting of the American Anthropological Association, Los Angeles. I wish to thank the University of Oregon students who participated in the Ponape fieldwork; the 1981 research was undertaken for the Pacific Studies Institute, Guam, and the Trust Territory Historic Preservation Program.

REFERENCES

- Athens, J. Stephen. 1980. Archaeological investigations at Nan Madol: islet maps and surface artifacts. Pacific Studies Institute, Guam.
- 1981. The discovery and archaeological investigation of Nan Madol, Ponape, Eastern Caroline Islands: an annotated bibliography. Micronesian Archaeological Survey Reports No. 3. Historical Preservation Office, Saipan.
- Ayres, William S. 1979. Archaeological survey in Micronesia. Current Anthropology. 20(3):598-600.
- Ayres, William S. and Alan E. Haun. 1980. Ponape Archaeological Survey: 1977 research. Micronesian Archaeological Survey Reports No. 1. Historic Preservation Office, Saipan.
- n.d. Ponape settlement archaeology. Report 79-2. Ponape Archaeological Survey. Submitted to the Historic Preservation Office, Saipan, 1980. In press.
- Ayres, William S., Alan E. Haun and Craig Severance. 1981. Ponape Archaeological Survey: 1978 research. Micronesian Archaeological Survey Reports No. 4. Historic Preservation Office, Saipan.
- Bernart, Luelen. 1977. The Book of Luelen. Translated and edited by J.L. Fischer, S. Riesenber, and M.F. Whiting. (Pacific History Series 8). University of Hawaii Press, Honolulu.

- Buck, Peter. 1938. Vikings of the Sunrise. J.B. Lippincott, New York.
- Grace, George. 1968. Classification of the languages of the Pacific. In Peoples and cultures of the Pacific (ed. A.P. Vayda), pp. 63-79. American Museum of Natural History, New York.
- Hambruch, Paul. 1911. Die Ruinen von Ponape. Korrespondenzblatt für Anthropologie, Ethnologie und Urgeschichte. 42:128-131.
- 1936. Ponape: Die Ruinen. In Ergebnisse der Sudsee Expedition 1908-1910 (ed. G. Thilenius). II.B.vii. Vol. 3. Friederichson, DeGruyter, Hamburg.
- Riesenberg, Saul. 1968. The native polity of Ponape. Smithsonian Contributions to Anthropology Vol. 10. Smithsonian Institution Press, Washington.
- Saxe, Art, Richard Allenson, Susan R. Loughridge. n.d. The Nan Madol area of Ponape: researches into bounding and stabilizing an ancient administrative center. Final report submitted to the Historic Preservation Office, Saipan, 1980.
- Shutler, Richard and Jeffery Marck. 1975. On the dispersal of the Austronesian horticulturalists. Archaeology and Physical Anthropology in Oceania. 10(2):81-113.
- Shutler, Richard, Yosihiko Sinoto, and Jun Takayama. n.d. Fefan Island survey and mitigation project. Report submitted to National Park Service. National Technical Information Service, Washington.