

ARCHAEOLOGICAL RESEARCH ON KOSRAE (EASTERN CAROLINE ISLANDS)

*Ross Cordy
Historic Preservation Office
Trust Territory of the Pacific
Islands*

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INTRODUCTION

Kosrae is an oceanic high island, located 515 km. southeast of Ponape (5°20' N, 163°00' E). The island is roughly round, c. 13 by 8 km. in area (109 km²). It has 600m pinnacle mountains. Small streams descend to the shore which is fringed by mangroves in some areas and sand beaches in others. Rainfall is high (c. 5000mm/year), and vegetation is lush.

Prior to 1979 archaeological work had been extremely limited on Kosrae. Stone ruins similar to Nan Madol are on small Lelu Island in the northeast harbor. These ruins mark the site of Lelu, the former 'capital city' of Kosrae, still in use at European contact (A.D. 1824). They were the focus of study by the 1910 German Sildsee Expedition and by Japanese researchers between 1915-1940. Remains on the main island were not studied prior to 1977. In that year Paul Rosendahl and Jerry Watson (both then affiliated with the Bishop Museum) identified a few sites in very brief reconnaissance surveys. John Craib of the Pacific Studies Institute inventoried two sites the following year in a construction project survey done for the Trust Territory Historic Preservation Office. In sum, before 1979, information on Kosrae's archaeological remains and prehistory was still extremely scanty. Little was known of the range of site and artifact types, and even less of the island's prehistory.

Since 1979, intensive research has taken place. A number of surveys and one excavation project occurred on the main island prior to construction work. These projects were Trust Territory Historic Preservation studies conducted by the central and Kosrae offices under my supervision. A number of surveys on the main island also were done by the Kosrae Historic Preservation Office as research projects under my indirect supervision. In 1979 a Japanese sub-grant enabled Yoshihiko Sinoto (Bishop Museum) and myself to do research. Sinoto did test excavations in a few coastal sites, and I conducted initial work in the Lelu Ruins. Last, I headed a major research project in the Lelu Ruins with Bishop Museum assistance in 1980 and 1981. This paper summarizes the work I have undertaken and/or supervised since 1979.¹

RESEARCH PROBLEMS

My primary research interest is the prehistoric development of

complex hierarchical societies in Micronesia, a topic yet to be intensively studied in Micronesian anthropology despite marked parallels with Polynesia. Kosrae has been suggested to have been the pinnacle of hierarchical development in Micronesia (Alkire 1972). In 1824 (European contact), the island was unified with 4 strata (king or tokosra, high chiefs or lem fulat, low chiefs or mwetsuksuk, and commoners or mwetsrisrik). The tokosra and high chiefs owned all the land and issued use rights to commoner households through their village managers (low chiefs) - a feudal system as in Hawaii and Tonga. One of my research aims is to reconstruct how this political system developed. Work on this problem is to be initially focussed at Lelu.

Secondary research foci include (1) defining site types and settlement patterns (a basic problem in any virgin archaeological area) and (2) reconstructing community population, social organisation and activity patterning.

METHODS

Historical research has played a vital role in studying these problems. An intensive review of early published and unpublished documents on Kosrae was done in 1978 and 1979. This review provided expectations (models) of how house types, site types and settlement patterns would appear archaeologically. It also established a Contact Era baseline of the nature of social organisation and population sizes at both the societal and community levels.

I have directed three archaeological field sessions at Lelu. The entire site was remapped with transit by Kanalei Shun (my assistant in 1980-81). I mapped intact compounds individually to locate architectural features and artifacts. Surface artifacts were collected. Wall junctions were studied to identify construction sequences. Most recently 19 meter squares were excavated in different locations to determine stratigraphy and to recover datable samples in order to determine the site's building sequence. The aim of all this work is to reconstruct the history of this 'capitol city' and to identify the number of social strata present at different points in time, thereby extending back our picture of hierarchical organisation. Social strata will be reconstructed by comparing labour expenditure in the housing of contemporaneous households.

Work on the main island has consisted of several thorough surveys. All have used the fal (the feudal community land unit) as the basic region to allow comparability.² We have fairly complete data from 10 fal (Innem and Tofol in Lelu Municipality; Okat, Loal, Tepat, Wiya, Leap and Koasr in Tafunsak Municipality; Kuplu in Malem; and Yewal in Utwa). Excavation has occurred only in Wiya and Tepat, in scattered one-meter-square pits. Methods for reconstructing social organisation are the same as in Lelu. Population reconstruction are obtained using Naroll's floor- area estimate.

DATA

Main Island:

Basic dwelling site patterns are now apparent. Saka (kava) and food pounding stones and remnants of earth ovens (concentrations of fire-cracked stone) are found in close conjunction with house pavings, platforms or enclosures. These clearly reflect cooking and food preparation areas. Rare, larger house structures are interpreted as feast-houses (lom lulap). Nearly always these have more saka stones clustered about them. Smaller houses are usually interpreted as sleeping houses.

These architectural features are the basic means of activity area analysis to date. Artifacts are found, but no clear distributional patterns have yet been identified. These artifacts are largely shell; adzes (Tridacna and some Terebra), peelers (Tridacna and a hard-shelled bivalve locally called panak), bracelets, etc. Stone food and saka pounders are less common, and stone adzes are even rarer. No pottery has yet been found.

Typically, the architectural features are surface remains. Sub-surface pavings occur in some sand shore sites. A cooking area and 2-3 sleeping houses, often enclosed by a low wall, form the basic dwelling site. These clusters or compounds are scattered in valley and most coastal plain contexts. In a few cases with coastal plains only 10-50 meters across (Putuk in Tepat fal and Loal), compounds are packed together and built out into the mangroves, forming a site of abutted compounds lining the shore.

Agricultural sites (retaining walls along streams or gradual ridges, terraces on slopes, and drainage channels associated with swamps) typically are immediately adjacent to dwelling sites. A few place-spirit shrines (solitary small basalt uprights) have been found, and they are not directly associated with dwelling sites. Three sacred places (dwelling areas for priests affiliated with a spirit) are known. All were near secular dwelling areas, but with some isolation.

In the fal community setting, initial interpretations (without the benefit of dates) indicate maximal community populations ranging between 16 and 114 persons. These are slightly higher fal estimates than those obtained in 1827 by Captain Lutke of the Russian exploring expedition. They suggest a total island population near 5,000-6000, as indicated by Ritter (1980). Social organisation analyses identify the site compounds as households. Social ranking analyses indicate no more than 2 strata; equivalent to the commoners and low chiefs of contact.

Dates have been processed for the Wiya Coastal Site. All are shell dates, processed at the University of Otago. One is A.D. 95 $\pm$ 70; three others have means between A.D. 1402-1448. The latter

dates are similar to Sinoto's A.D. 1370 date from the adjacent Bird Cave. The early date needs further analysis. Unfortunately, these dates are not yet keyed to enough architectural features to extend social organization or population analyses back in time.

Lelu

Lelu Island is c. 3/4 mile long and 1/4 mile wide. It has a low hill at its eastern end with a narrow flat plain. To the west the plain extends out for c. 1/2 mile. The entire flat area of the island (barring recent fills) makes up the site of Lelu, which consists of walled compounds separated and connected by foot 'streets' and canals. Many compound walls today stand only as foundations. The central portion, which I term the 'core area', is intact and has high basalt compound walls (some up to 6 meters high). Our new map of the entire site indicates that Hambruch's and Sarfert's 1910 maps are inaccurate, although compound locations and names are roughly correct.

Analysis reveals 3 types of compounds in Lelu-(1) residential, (2) mortuary, and (3) sacred. Mortuary compounds contained 3 meter high, truncated pyramid tombs with central crypts. No housing features were present (with one exception belonging to an earlier compound used for residential purposes). Historical records indicate these structures were tombs for the royal family.

Housing compounds had features and artifacts similar to house compounds on the main island, except in the core area where compound walls were higher, more dwelling houses were present, and large numbers of saka stones were found. Also, in the core area, nearly every compound had one large feast-house. Traditionally, this was the residential area of the king and high chiefs, and the archaeological record supports this conclusion. The other residences were similar to main island house sites, suggesting lower ranks.

Sacred areas are more difficult to distinguish archaeologically. Identification has been largely through historical accounts. One compound (Kenwen) has a large mound, 20 meters square and 2 meters high, consisting of earth-oven stones, ash, and charcoal. This mound was associated with turtle feasts and the spirit Sitel Nosrunsrup.

Excavations verified the 1910 German hypothesis that the entire west end of Lelu is man-made. We found c. 1 meter of stone fill on former shallow reef throughout the western parts of the island.

Datable samples (shell and charcoal) were recovered from most squares, so this year we should have a good idea of the site's building sequence. At present, we have a shell date of A.D. 1686 $\pm$ 58 from the surface of Foton compound (a residential compound), so subsurface deposits should go back several hundred years. Parallel dates to Nan Madol's A.D. 1200s-1400s at least are expected. Building sequences also have been revealed by wall sequences.

Last, the architectural styles of Lelu's walls were studied. Three main types predominate - (1) a stacked ('log-cabin') prismatic basalt style (like that at Nan Madol), (2) a squarish block-basalt style, and (3) a mixed coral and block-basalt style. Only a few stacked-prismatic compounds are present, so there are some real differences between this site and Nan Madol. The lack of stone house platforms and surface prehistoric pottery are other traits in which Lelu differs.

SUMMARY

There is now a great deal of information available on Kosrae. On the main island, 10 regions have been surveyed. Site patterns (within the region) are now much clearer - a walled compound with 1-3 houses and an earth oven being the basic dwelling unit. On Lelu, the ruins have been remapped, and surface collections and scattered excavations have been made. Initial dates have been recovered for both the main island and Lelu. And more dates will soon be submitted from Lelu.

Presently, all the work since 1979 is undergoing final analysis and writing. The Innem, Okat and Loal survey report will soon be printed by the Trust Territory Historic Preservation Office, and I anticipate all the other reports to be finished by the end of 1981.

Plans for future work on the main island and on Lelu also exist. Excavations in a number of main island sites (previously surveyed) should occur early in 1982 to yield information on early settlement and hierarchical organization. Funding proposals are also being prepared for multi-year work in the Lelu Ruins to learn even more about this unique site.

ACKNOWLEDGEMENTS

I cannot overemphasize the vital role of the Kosrae Historic Preservation Office and its Archaeological Survey Team in helping to recover the above information on Kosrae's past. They have been the main reasons why we perhaps know more now about Kosrae's archaeology than that of any other Micronesian island, when but 3 years ago we knew nothing about Kosrae. Their surveys have been invaluable, and they have provided quality assistance in all my excavation and survey work.

FOOTNOTES

1. Sinoto's work is not covered here. He excavated at the Wiya Bird Cave in Tafunsak Municipality. Deposits c. 3 meters deep were found at the mouth of this cave. No artifacts were recovered. A carbon date at 1.0 meters depth was A.D. 1370 $\pm$ 85.
2. Fal used are those identified in 1827, the first inventory of these units.

REFERENCES

Alkire, William. 1972. An introduction to the peoples and cultures of Micronesia. Addison-Wesley Modular Publications, 18.

Ritter, Philip. 1980. The population of Kosrae at contact.
Manuscript, personal copy.

Rosendahl's, Watson's and Craib's short manuscripts are on file at the Trust Territory Historic Preservation Office, Saipan, as are my brief preliminary reports on the Lelu and Wiya work.