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## BOOK REVIEWS

WORDS OF THE LAGOON: FISHING AND MARINE LORE IN THE PALAU DISTRICT OF MICRONESIA by R. E. Johannes. University of California Press, Berkeley. 1981. 245 p. \$24.95.—Johannes went to Palau to test an hypothesis about the productivity of reef fishes, using the Popperian approach of a competent scientist. Soon after he arrived, he began to realize that the local fishermen knew more of the ecology of reef fishes than scientists will know for decades if they use only the scientific method in the future. Furthermore, the cultural and economic matters of harvesting fishes interacted with the biology of fishes in a sophisticated manner. Therefore, he changed his approach to one of living with the native fishermen and learning all he could from them while accompanying them on their fishing activities. This book is an account of his experiences and summarizes what he learned about the ecology of reef fishes and the interactions of reef fishes with the culture of the native fishermen.

This book provides substantive materials for four purposes simultaneously. Explicitly presented is information new to science on the fishing techniques of Palauans and related information from their rich knowledge of fish and bird behavior, water movement patterns, and seasonal, lunar and diurnal rhythms on which their effective fishing and conservation customs are based. Implicitly presented is an essay on the scientific method. Third, the practical importance of traditional knowledge is presented, both for fisheries scientists as a shortcut for obtaining information and insights of patterns in a complex system, and for the Palauans themselves as a form of security to fall back on in case the future world economy does not turn out to be as healthy as we seem to assume it is at this time. The fourth purpose of the book is to call attention to the urgent need to record fishing and marine lore and to foster interest of islanders in their traditional knowledge and skills before

it fades from existence as the elders pass away.

A fair listing of topics to which this book makes substantive contributions can be found in the table of contents. The variety of Palauan fishing methods for various situations and kinds of fishes sought, the overlapping of old and new methods in the recent decades, and modification of traditional methods with modern equipment and its effects on resource utilization and management are described in Chapter 2. Palauan fishing is mainly in lagoons or near the reefs; information on methods of offshore fishing is given for islands southwest of Palau in Chapter 7. The sophisticated knowledge of Palauan fishermen of seasonal, lunar, and diurnal rhythms of marine animals is presented in Chapter 3. A chart is given which summarizes the preferred lunar period, tidal stage, season, and day or night period for each fishing technique. The knowledge of seabird behavior as indication of location, depth, and species of schooling fishes, the location and behavior of fish stocks in relation to current patterns around islands, the functional aspects of fishhook designs, and reproductive rhythms, spawning locations, good fishing days, seasonal and diurnal migrations and other biological information about fishes and other marine animals are given in other chapters and appendices. The chapter on island currents is the most elucidative material I have seen on the hydrography of tropical islands and its relation to fishes. An appendix on the design and proper use of 13 forms of Tobian fishhooks and glossaries of Palauan and Tobian words are provided.

All this new (to science) information helps to remind us that while the scientific method is the best procedure known for objectively testing hypotheses, it is a ponderous and usually biased procedure for generating hypotheses. If we try to obtain a new hypothesis by discerning new causal relationships through multifactorial analysis, stratified sampling, or controlled experiments, the relations we observe are restricted to those variables that we select ahead of time and between scales in time and space that we decide upon ahead of time. New hypotheses fit within established paradigms. We dismiss results as variance or as a result of a poorly-run experiment when they do not seem to fit our *a priori* alternatives. The wisdom and expertise of artisanal fishermen evolved independently of science and the accuracy of the predictions have been tested

by success in everyday life over hundreds of years. While we cannot formally accept them without rigorous testing, the generalizations obtained from local fishermen were derived unbiased by established paradigms of science and may be especially productive for providing new insights.

The practical importance of island lore for both scientists and islanders is the theme of the book. The author is widely recognized as a productive marine biologist, yet in the Preface he states that by interviewing local fishermen, he "...gained more new (to marine science) information during sixteen months of fieldwork using this approach than...during the previous fifteen years using more conventional research techniques." The tropical coastal marine communities are complex, and decades will pass before science can begin to obtain enough information to effectively manage nearshore marine biological resources. Local fishermen have by far the largest portion of the information available at this time that is important for the management of reef fisheries, e.g., spawning times and locations of various species, behavior in relation to water current patterns around islands, seasonal migrations, etc. It would be wasteful to ignore the rich and sophisticated working knowledge of Palauan fishermen that has been refined over hundreds of years of daily use. To search for patterns by multivariate analysis is indirect, ponderous and expensive. Multivariate analysis is a tool that should be brought forth when more direct shortcuts are not available. New hypotheses must be tested eventually, whether they were obtained from fishing lore or from multivariate analysis.

Traditional practices should be of interest to those involved in studies of resource management and utilization, not only for the insight into the system that is provided but also for the practical reason that any new policies or regulations that are proposed will most likely be effective if they fit within the context of the existing culture.

Johannes also suggests that preservation of traditional knowledge of marine life and practices of resource management and utilization is of practical importance to Palauans themselves. While he does not suggest that islanders should refrain from participating in the international economy as the opportunities arise, he does suggest that reliance of an island economy on for-

eign investment, foreign aid, tourists, and on an international market for island resources is based on a faith in a continuously expanding world economy. To abandon completely the traditional expertise of their elders in resource management and utilization would be a commitment and faith in a healthy world economy; they would be burning the bridges to return to partial self-sufficiency of island communities if their faith in the world economy was not upheld.

The fourth and most urgent message is an implicit plea to quickly save as much of this knowledge as possible before it dissipates as the elderly pass away. Scientists should document knowledge of the natural history of marine life and traditional systems of utilization and management of marine resources in the culture, but the actual skills and knowledge adequate to use in daily life cannot be recorded in books. It would be of benefit to all if practical skills and expertise were retained by at least a few of the younger generation through experience. This is easy to suggest but difficult to accomplish because training in traditional fishery skills takes time and experience. It is understandable that as individuals, the island youths become impatient and ambitious for western world facilities and work in town.

The book was written smoothly, without technical jargon or erudite references in the text (although well over 300 references were cited from the literature for support of his statements). It can be read quickly and with enjoyment by laymen or scientists and the basic concepts and messages come across clearly. For the myriad of facts about fishes, fishhooks, and culture, it is best kept as a reference book. This book is of particular interest to both laymen and scientists interested in Pacific island culture, marine biology, resource management, fishing or folk lore.

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THE PALAU ISLANDS IN THE PACIFIC OCEAN by Karl Semper (translated by M. L. Berg, edited by R. D. Craig). Micronesian Area Research Center, University of Guam. 1982. 319p. \$8.50—Karl Semper's *Die Palau-Inseln im Stillen Ocean* is not only a very valuable document for students

of Palauan history and culture, it is also an engrossing travelogue in the best sense of the term. Now Mark Berg has provided us with a splendid English translation of this work which should entertain and inform anyone with even a casual interest in Micronesia.

Semper was a German zoologist who spent nearly a year in Palau in 1862–63. His account of his stay in the islands is no dry catalogue of zoological matters. In fact only a small part of the book deals directly with zoology. Semper's curiosity embraced many subjects beyond those in which he was formally trained. He became fascinated with Palauan people and his book contains the only known descriptions of certain of their customs and ceremonies. The varied ways in which individual Palauans perceived him and reacted to him—as a personal friend, potential husband or lover, political or economic ally or enemy—form the thread which holds his lively narrative together.

Imagine the errors that would be made by non-western anthropologists if they based their descriptions of western culture on what they were told about Christian rules of conduct. The same kinds of errors have often crept into the writings of western social scientists who based their description of a nonwestern culture on what they are told by informants concerning its formal rules. But Semper's account is free of such abstractions. He had time to gather his observations on Palauan life through day-to-day personal involvement in it, and this makes his conclusions more interesting and believable than if he had relied mainly on informants for his data.

Inevitably, nevertheless, Semper's perceptions of Palauan motives and beliefs were sometimes flawed. Palauan readers may find some of his gaffes amusing—a foretaste of some of the cultural blunders made today by Peace Corps workers, academics and other visitors to Palau. But such misunderstandings are inevitable when two cultures meet.

Palauan readers will also find much of interest in the book and will perhaps marvel at how different life was in Palau 120 years ago when to walk outside the limits of one's village was sometimes to risk literally losing one's head—when the chiefs held the power of instant death over commoners—when, according to Semper, there were three times as many Palauans as there are today—when a Palauan chief would object to a sketch of his head, maintaining that since his body was not