

The Growth and Collapse of Pacific Island Societies: Archeological and Demographic Perspectives, edited by Patrick V Kirch and Jean-Louis Rallu. Honolulu: University of Hawai'i Press, 2007. ISBN 978-0-8248-3134-9, xvi + 390 pages, maps, notes, bibliography, index. US\$35.00.

Although not always at the fore, historical demography is among the most significant dimensions for understanding the evolution of human societies. In the Pacific, anthropological and other integrated research—ranging from island colonization to resource use, subsistence, human-induced environmental impacts (eg, deforestation and extinctions), social complexity, cultural elaboration (eg, monumentality), collapse, and contact-induced genocide—have drawn on demography, or at least implicit assumptions about evolutionary trends in population. This volume edited by Patrick V Kirch and Jean-Louis Rallu considers demography from historical and archaeological perspectives for an impressive array of Pacific Island cases. The collection is the result of an invited workshop on demographic evolution held on the idyllic shores of Paopao Bay on the island of Mo'orea, French Polynesia, in December 2003. The sixteen chapters offer readers an up-to-date review of mainstream anthropological demography and recent applications in the region. At the same time, the authors of these chapters—some more explicitly than others—acknowledge and sometimes illustrate the difficulties remaining in efforts to evaluate models of ancient population size and dynamics.

Kirch and Rallu (chapter 1) frame the focus of the book with substantive questions concerning the size and density of Pacific Island populations at contact, and thus the resulting severity of demographic collapse. These substantive questions have been debated for decades, drawing on estimates of early European visitors, later missionary censuses, and now a critical assessment that drops the ball squarely in the court of archaeologists. Kirch and Rallu embed long-term demographic evolution in questions that pervade the evolutionary dynamics of island (and other) societies.

In chapter 2, Rallu illustrates the frustrating complexity—indeed the many significant yet often unknowable details—of demographic models for prehistoric Pacific Islands. Slight changes in growth rates, colonization dates, or the number of people in a founding population result in dramatically different outcomes. The magnitude of difference resulting from such slight changes provides a reality check for anyone tempted to take specific arguments about prehistoric population too seriously. The contributors to this volume share caution on this point. While critical values remain unknown, Rallu shows how working backward from census data and recorded epidemics permits another estimation of population size around the time of European contact.

In a welcome theoretical contribution to the volume (chapter 3), Shripad Tuljapurkar and colleagues address the critically important issue of population and resources in terms of Malthusian limits. Whether or not it is acknowledged explicitly, this

relationship is the basis for most of the thinking in demographic evolution—for humans and other animals. The authors go on to consider the interaction of soils, plants, and food production in human-environmental dynamics.

The next four chapters (4, 5, 6, 7) describe archaeological and historical approaches to population in the Hawaiian Islands, the focus of much recent debate. As Kirch and Rallu describe in chapter 1, archaeologists have attempted to measure relative and absolute population values using osteological data (eg, fertility and life history aspects), settlement counts by temporal units, dating curves (ie, “dates as data” for human use of landscapes), and estimations of environmental carrying capacity (usually meant to be assessments of maximum, average, or sustainable productivity, particularly in agriculture). Archaeologists have routinely considered one or more of these analytical dimensions in case studies, although osteological studies are not represented here. In chapter 6, regarding his research in Kahikinui, Maui, Kirch provides a concise, well-researched exemplar of estimating absolute population values from an archaeological case. From these values, in turn, there are implications for density and rates of growth. I suggest that this is as good as it gets in carefully, and critically, using archaeological data in paleodemographic research. While difficult to say with greater certainty, as Kirch cautions, working backwards from historic census records to estimate the degree of population decline—indeed collapse—of six- to eightfold at Kahikinui in the five decades following

European contact may imply the kind of larger population values that David Stannard has suggested for the Hawaiian Islands. Kirch correctly concludes that many more detailed regional studies will help to resolve questions of Hawaiian population size and its degree of contact-induced collapse. His Kahikinui study has set a standard for others to emulate.

Several contributors (chapters 8, 9, 10, and 13) variously consider historical sources, and archaeological measures such as house counts, environmental carrying capacity (primarily in estimates of agricultural productivity), and radiocarbon curves for populations from Mo‘orea, Ua Huka (Marquesas), Tonga, and Kosrae (Caroline Islands). These studies range in scope from microcosmic (valley settlements), to islandwide, to archipelago-wide, and span a temporal range from early colonization to late prehistoric and historic populations. Each author pursues a multidimensional approach, but they lament the difficulty inherent in addressing questions of prehistoric populations.

The contributions by Roger Green on Sāmoa (chapter 11) and by Christophe Sand and his colleagues on Grande Terre, New Caledonia (chapter 15) outline compelling evidence for significant post-contact declines pointing to larger populations for these islands than traditionally held. For Sāmoa, Green shows how the historical and archaeological data (from large-scale surveys on ‘Upolu in particular) converge on an answer that population decline from about 1790 to 1850 also resulted in its redistribution. Samoan communities shifted from larger dispersed settlements

to smaller numbers concentrated in nucleated coastal villages (nu‘u).

Matthew Spriggs (chapter 14) uses historical data, including the record for disease epidemics, with a refined carrying capacity model for variability in food production (following Tim Bayliss-Smith) to examine pre-contact population on Aneityum, Vanuatu. Spriggs offers due caution in the meaning of such estimates, and notes, as do other authors in the volume, that human populations rarely (if ever) reach or sustain levels near environmental carrying capacity. This point raises an issue that deserves greater attention in explanatory models for human demography and its historical dynamics. I also wonder about the antiquity of malaria (*P. falciparum* and *P. vivax*) and its demographic effects, particularly the resulting low human population densities found in Vanuatu and to the west elsewhere in Melanesia. Is disease, rather than food, a limiting factor for human population?

Of particular value is the piece by Valerie and Roger Green (chapter 12) on population histories for atolls in Tokelau. This chapter adds to a thin literature of historically documented population histories, especially for population growth and replacement. The atoll population histories offer a glimpse analogous to founding groups colonizing new islands over the millennia in Pacific prehistory. Green and Green also document growth and replacement rates for Tokelau on a par with those from oft-cited Pitcairn where the *Bounty* mutineers and their Tahitian spouses offered us a virtual experiment in historical demography. Finally, the details of life on atolls should remind archae-

ologists of the importance of individual and family life-history decisions (eg, concerning reproduction) and sustaining voyaging contacts with larger interisland communities. The Tokelau case points the way toward fuller understanding individual strategies and their role in density-dependent changes in populations, thus undermining old notions of cultures as “self-regulating homeostatic systems” or other vague abstractions. This case also illustrates the complexities of educating critical or limiting resources in population modeling and the slippery slope of concepts of environmental carrying capacity.

In the final chapter, Kirch offers some remarks on methods employed, the kinds of measures attempted, and models for population trajectories. He suggests that we have a long way yet to travel in paleo-demographic research. This volume offers a real start, but I agree that much lies ahead. Most of the chapters in this collection represent detailed case studies, forming a *descriptive* foundation. These studies certainly have relevance to a breadth of research problems in the Pacific. The next step, one certainly beyond the scope of this book, is to develop *explanatory* accounts for historical demography. In this greater challenge, we need to integrate anthropological demography with human evolutionary ecology as Eric Roth has described in his recent book, *Culture, Biology, and Anthropological Demography* (2004). Such integration dispels older orthogenetic (ie, non-Darwinian) foundations of some models for cultural change and demography. Human evolutionary ecology links life history, reproductive strategies, and aspects of

the social and natural environment in explanations for demographic change. For example, from an integrated perspective, the seemingly paradoxical observation that human populations rarely attain environmental “carrying capacity” evaporates as density-dependent demographic transitions reflect individual strategies to avoid the high

risks of living in a population on the edge of resource predictability. Several complex demographic processes will make more sense as we integrate anthropological and evolutionary approaches.

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