Economic Interdependencies

Andean Ecology and Civilization. An Interdisciplinary Perspective on Andean Ecological Complementarity. SHOZO MASUDA, IZUMI SHIMADA, and CRAIG MORRIS, Eds. University of Tokyo Press, Tokyo, 1985 (U.S. distributor, Columbia University Press, New York). xxxii, 550 pp. $44.50. From Wenner-Gren Foundation for Anthropological Research symposium no. 91 (Cedar Cove, FL, May 1983).

One of the distinctive strengths of anthropological research in the Andes has been its commitment to the integrated study of the past and present. At the beginning of this century, pioneering scholars like Julio C. Tello, Luis Valcarcel, and Hiram Bingham engaged in wide-ranging investigations that unselfconsciously combined archeology, ethnography, folklore, geography, and history. Many of the senior scholars in the field today, people like John Rowe, John Murra, Richard Schaedel, and Tom Zuidema, have continued this tradition by carrying out research in history as well as in several of anthropology's subdisciplines. Though few younger Andeanists achieve this research breadth, most remain committed to a holistic perspective.

Andean Ecology and Civilization is the latest evidence of the enduring health of this approach. The volume brings together 23 papers from a conference sponsored by the Wenner-Gren Foundation of New York and the Kashima Foundation of Tokyo. Approximately half the papers have an ethnographic focus; most of the rest are historical or archeological in content. As Shimada points out in his introduction, most of the contributors confine themselves to their own specialties, and the interdisciplinary objective of the conference is effected primarily in the juxtaposition of diverse papers relating to a common theme: the interplay of Andean ecology and the organizational structures and strategies of Andean civilization. The book includes contributions from Japanese, English, Peruvian, and Chilean as well as U.S. authors and has a refreshing international flavor.

Shimada's thorough and lucid introduction presents the intellectual framework and potential contribution of the volume. Short synthetic statements by the editors introduce each of the book's five sections, and a concluding discussion by Schaedel and an overview by Salomon produce a sense of coherence.

The conference was the most recent offspring of John Murra's already classic 1972 article which isolated "verticality" as a fundamental organizational principle in the Andes. Murra focused attention on the nonmarket institutional arrangements developed in the Andes to insure access to basic resources produced in the vertically tiered production zones of the Central Andes. His purpose in this formulation was to explain why the demographic and political center of 15th- and early 16th-century Andean civilization occurred in lands 10,000 feet or more above sea level. Though Murra chose to concentrate his research on the achievements of these late pre-Hispanic highland societies, other scholars dedicated themselves to tracing the rise and fall of "verticality" as seen in the archeological, historical, and ethnographic record. After more than a decade of research, Murra now prefers the term "ecological complementarity" to "verticality," but his perspective has remained much the same. It is fitting that the book's opening two chapters present his current views on the utility and limitations of this framework.

Most of the rest of the volume is dedicated to the examination of Andean ecological complementarity in various regions and in sundry states of transformation and decomposition. These "moraines" of partially dismantled organizational arrangements can occasionally be fascinating. Masuda, for example, describes how farmers and pastoralists from the highlands engaged in seasonal collection and distribution of seaweed. He also traces the way in which this pattern changed with the introduction of truck transport and the desiccation of the coastal fog vegetation that nourished the llama caravans of the highlanders during their visits to the coast. Flores presents a more detailed consideration of the increasing articulation of the national market system with the tradition of ecological complementarity, using three case studies from Cuzco. Yamamoto, Tomoeda, and Fujii focus on the interdependency of valley farmers and high-altitude agropastoralists and the way their relationship is currently maintained without intermarriage between the groups.

Using Colonial documents, Julien masterfully reconstructs the way in which highland groups procured guano from islands off the Peruvian coast and then transported it to fields in the upper sections of coastal valleys to grow maize and hot peppers. The resilience of ecological complementary, despite the mobility and dispersal of populations and the intervention of the Spanish, is likewise discussed by Lehuede on the basis of 18th-century documents for northern Chile.

The discontinuous distribution of ethnic groups is one of the most distinctive features in some systems of ecological complementarity, but it has never been clear when and how these ethnic "islands" were established. Rostworowski presents new evidence that coastal and central highland groups controlled resources in Cajamarca prior to the arrival of Inca colonists (mitimaes) and that migration and military conflict may have played a part in the initiation of this archipelago pattern of ethnic groups. In a complementary paper, Ramírez uses historical sources to suggest that in pre-Hispanic and Colonial times land was sometimes worked for alien ethnic groups in recognition of their rights to the resource and that these claims may have originally derived from military subjugation. This newly identified "sharecropping" variant of resource sharing did not require the presence of ethnic colonies in distant zones or changes in ethnic affiliation or loyalty. According to the paper by Morris, the diversity of pre-Hispanic organization in the Andes was both accepted and fostered by the Inca. Evidence from the Inca site of Huanuco Pampa suggests that even in the "urban" centers of the Inca religion and ritual remained central in coordinating political and economic activities. In light of this conclusion, it is disappointing that only the contribution of Harris breaks new ground on the ideational dimensions of "ecological complementarity."

The chapters mentioned above are part of a large ethnohistoric and ethnographic literature that has substantiated and refined Murra's original formulation. Unfortunately, archeologists have been less successful in documenting prehistoric ecological complementarity and tracing its origins. Though the widespread distribution of exotics and the economic interdependency of resource zones can often be delineated, the inference of the sociopolitical mechanisms responsible for these patterns usually remains problematic. The archeological contributions in this volume by Mujica, Schaedel, and Onuki do not represent breakthroughs in this regard. Mujica proposes a plausible evolutionary sequence in which seasonal highland migration to the coast during the Early Horizon is replaced by tenuous exchange links between coastal and highland groups during the Early Intermediate Period, which in turn gives way to direct exploitation through the establishment of highland colonists by the Tiahuanaco state during the Middle Horizon. Though archeological data are presented, they are insufficient for evaluating the model. Schaedel's "state of the art" discussion of the origin of Andean ethnicity in the context of ecological zonation also abounds with stimulating hypotheses, but does not muster

the kinds of archeological evidence necessary to make a compelling case for them.

The contributions of Mayer and Shimada merit special attention because they go beyond the substantiation and refinement of the Murra framework. Mayer demonstrates how new insights can be gained by studying the way in which groups transform Andean environment into production zones and then maintain or change them in response to fluctuating demands and conditions. This approach allows him to trace how and why linked sets of production zones become independent of each other, and it is far more satisfying than viewing these changes as the vanishing moraines of ecological complementarity.

Shimada's study of arsenic-bronze production by the pre-Hispanic Sican state likewise pays special attention to the means and relations of production. He considers the procurement of fuel, ores, and labor as well as the varying social and spatial context in which the productive activities were carried out. Sican metallurgical production is then viewed in terms of exchange relations with adjacent highland polities and other coastal groups on the Ecuadorian and northern Peruvian coast. Shimada is cautious in reconstructing organizational relationships and distributional mechanisms, but at the same time he demonstrates that problems at this scale and level of abstraction are amenable to archeological research.

RICHARD L. BURGER
Department of Anthropology, Yale University, New Haven, CT 06520

A Nexus of Transformations

Sweetness and Power. The Place of Sugar in Modern History. SIDNEY W. MINTZ. Viking, New York, 1985. xxx, 274 pp. + plates. $20.

In *Sweetness and Power*, Sidney W. Mintz has blended the methodology and theory of his discipline of anthropology with historical data to provide a provocative history of a foodstuff—sugar—and its impact upon modern British society.

According to Mintz, between 1650 and 1900 the production and consumption of sugar mirrored significant changes in the social, economic, and political structure of Britain. First used only by the nobility as a seasoning, medicine, or symbol of status, sugar had by the middle of the 19th century become a mainstay of the working-class diet. This transformation did not occur accidentally. In effect, sugar was made available to British workers for political and economic purposes.

Production of sugar within the British empire began after the acquisition of Barbados (1627) and Jamaica (1655). There planters used African slave labor to produce and process sugarcane for the British market under a protectionist system. Their endeavors not only made them rich but contributed to the fortunes of British merchants who participated in the triangular trade with Africa. Profits from that trade provided the surplus capital that allowed the industrial revolution to flourish in Britain. Moreover, the planters also developed a prototype for industrial factories, for the processing of sugar required a disciplined and efficient use of labor. Each stage of the process demanded specialization, which led to the creation of a production line not unlike that found in the early British factories. Besides yielding profits for planters and merchants, sugar benefited the bureaucrats, who appreciated its importance as a source of tax revenue.

Mercantile and bureaucratic interests continued to benefit from sugar when, during the early 19th century, protection gave way to free trade and West Indian plantations gave way to sources that provided more plentiful and cheaper sugar. As sugar supplies increased and prices dropped, patterns of sugar consumption altered. The availability of cheap sugar coincided with the appearance in Britain of tea, coffee, and chocolate. Added to these bitter drinks and to fruit preserves, sugar soon became a basic part of the working-class diet, providing both nutritional and symbolic satisfaction to the masses. For the new capitalists who emerged as the mercantile plantation economy declined, increased sales to the workers brought increased profits despite falling prices.

New foods, especially sugar, altered the lives of working people. Sweet tea and jam on bread served as quick hot meals for laborers. Thus, sugar provided a cheap and convenient source of energy for fueling the labor needed for industrialization in Britain, and, Mintz suggests, elsewhere. In this way, culture, power, and economic realities merged and determined in large part the means by which capitalism developed during the 19th century.

Mintz has not written a definitive history of the role of sugar in the British empire. Nor has he presented a typical anthropological study of the role of food in social behavior. But he never intended to do either. What he has produced is a challenging and entertaining book that should appeal to readers of many stripes and interests.

WINTHROP R. WRIGHT
Department of History, University of Maryland, College Park, MD 20742

Marsupials

Evolutionary Ecology of Marsupials. ANTHON K. LEE and ANDREW COCKBURN. Cambridge University Press, New York, 1985. viii, 274 pp., illus. $54.50. Monographs on Marsupial Biology.

Lee and Cockburn have produced in *Evolutionary Ecology of Marsupials* the first broad-scale treatment of marsupial life histories and evolution since Tyndale-Biscoe's *Life of Marsupials* over a decade ago. More important, theirs is the first attempt to place marsupial reproductive ecology explicitly in an evolutionary framework. The organization of the book, which highlights evolutionary considerations, allows the authors scope to raise and treat fascinating issues like sex allocation theory that, as they point out, have been ignored by most workers on marsupial biology.

The authors tackle a diverse set of problems, structuring their approach around six major themes. The book is best viewed as a collection of essays, though with more coherence than most collections. Lee and Cockburn argue first that food quality and dispersion influence life histories and social behavior. They then suggest that any organism's life history, physiology, and behavior are the result of phylogenetic constraints and current adaptive response to environmental pressures. For example, they argue that marsupial diversity may have been constrained by specialization for early extrauterine life (though they give no convincing argument why this specialization may have been favored in the first place) and thus marsupials may be viewed as specialized, rather than "primitive" as many mammalogists have argued in the past. Three very thorough reviews follow: of the diversity in carnivorous and in herbivorous marsupial life histories and of *Antechinus* (small dasyurids in which males are semelparous) as a paradigm. Much of the work on *Antechinus* is the authors' own. A final essay attempts to set marsupials in a coevolutionary and community ecological context. There is a heavy emphasis on non-macropod marsupials.

The strongest chapters are those that assemble in a coherent fashion the diverse information about the details of specific marsupial life histories. The authors present a wealth of data in a clear general context. On occasion, their attempts to integrate current evolutionary theory with life history information seem to me to fall short. Sometimes it is simply a matter of an opinion's being asserted without a clear supporting argument. After reviewing the possible constraints on marsupial radiation imposed by developmental specialization, for example,