Human Ecology in Savanna Environments.

David R. Harris (Ed.).

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Reviewed by Karl W. Butzer

THIS attractive volume consists of the invited papers of eighteen natural and social scientists participating at a Burg Wartenstein Symposium of the Wenner-Gren Foundation in August, 1978. The objective was to gain broad comparative perspectives on the ways in which past and present populations have adapted to and utilized the savannas of the Old and New World tropics.

Harris prefers to define savanna in climatic terms, as a tropical environment with a 2.5 to 7.5 month dry season, and characterized by a great variety of physiognomic vegetation types ranging from grassland to rain forest with open patches. The continuous herbaceous layer central to the savanna concept is dominated by bunch grasses of C4 photosynthetic type. Dry-season fires of natural or artificial origin are almost ubiquitous, serving to favor herbaceous over woody plants, so accentuating the contrasts of the grass-forest ecotone. Harris performs a major professional service in outlining the pollen-documented vegetational history of eastern and southern Africa, southern India, northeastern Australia, Mesoamerica, and northern South America to show that mesic grassland/savanna everywhere antedates human intervention or even human origins. In fact, the evolution of Africa's characteristic, gregarious grazers was predicated on the emergence of extensive grasslands during mid-Miocene times. Combined with the palynological documentation of open vegetation in the American Great Plains throughout the Pleistocene, as outlined in *Pleistocene and Recent Environments of the Central Great Plains,* edited by W. Dort and J. K. Jones (1970), this information will hopefully put to rest long-cherished views that the major world grassland habitats were of cultural origin and subsequently maintained through the human use of fire.

Authoritative overviews of prehistoric exploitation patterns are provided, firstly for Africa, by Desmond Clark. Here human origins, some 2 million years ago, can be located in mosaic habitats; pastoralism, established in the Saharan oases by 6000 B.C., was practiced in the Kenya Rift at latest by 2000 B.C., and had reached the Cape of Good Hope two millennia later; unfortunately, the archeological record continues to be obscure on early cultivation, and the record of both wild and cultivated plant foods remains fragmentary in sub-saharan Africa until the Iron Age. A similarly thoughtful overview for Middle and South America by Norman Hammon places the gradual development of farming cultures in Mesoamerica and Peru, after about 5000 B.C., and the subsequent emergence of complex societies into an ecological perspective. Rhys Jones provides both a detailed ethnoecological analysis of aboriginal subsistence in northeastern Australia and a synopsis of early human settlement in tropical Australasia prior to 40,000 years ago. Contemporary livestock and/or crop ecologies are discussed for West Africa by Philip Burnham, for East Africa by Neville Dyson-Hudson, India by David Sopher, Southeast Asia by Georges Condominas, New Caledonia by Jacques Barrau, and Colombia-Venezuela by James Parsons. Collectively these papers demonstrate that current textbooks on tropical agriculture or geography lag far behind the research frontiers in matters of cultural ecology.

The second part of the book deals with ecology and management problems, beginning with informative discussion of the adaptations of savanna vegetation to a long dry season and recurrent fire in Africa (B. H. Walker), South America (Ernesto Medina), and Australia (John Calaby). P. A. Jewell deals with herbivore ecology in Africa and argues that an integrated system of ranching, with both game and domestic livestock that exploit, graze, and browse, could provide the greatest sustained yields. The developmental perspective, in the context of local systems of land and water use, is interestingly presented by Thayer Scudder in regard to dam building and downstream development. A short essay by Ester Boserup on population dynamics rounds off this part.

The final section of four papers, integrated by J. S. Weiner, is devoted to human biology and deals with physiological adaptation, nutritional status, and epidemiological problems. The im-

plications of their arguments are somewhat unexpected and give grounds for reflection. So, for example, Weiner shows that the working capacity of the savanna dweller is significantly affected by heat load, seasonal fluctuations in food and water supply, endemic disease, as well as inefficient technology. Erica Wheeler complements this picture by emphasizing widespread protein-energy malnutrition, while Robert Desowitz's paper on the ecology of disease vectors serves to highlight the insidious, debilitating role of such afflictions on savanna populations.

Overall, or as a sum of its parts, *Human Ecology in Savanna Environments* stands out as a powerful volume that substantially enriches our understanding of tropical land use from many different vantage points. Its breadth, professionalism, and freshness are exemplary. David Harris is to be thanked for conceiving such a well-integrated suite of papers and bringing them into thematic focus with such care. As one of the last of the Burg Wartenstein symposia, this collection will long continue to remind us of the very best of the Wenner-Gren Foundation's twenty-year program of specialist conferences in the social and related sciences.

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