Paleoenvironments and Cultural Adaptations

In the last few years we have been told that the evolution of man's culture and man's body have followed one-way roads, and that these processes are unique in that they can only have occurred once in the history of this planet. Harrison Brown, in *The Challenge of Man's Future*, concludes that "we are quickly approaching the point where, if machine civilization should, because of some catastrophe, stop functioning, it will probably never again come into existence." By this he means that the natural supply of wild plants that could be placed under cultivation, wild animals that could be domesticated, and metals and ores that have made it possible for man to surmount the narrow limitations of a technology employing durable tools of stone, have long ago been discovered, employed, and, for all practical purposes, exhausted. The Neolithic Revolution could happen only once on the earth. William Howells, in his *Mankind in the Making*, reaches a similar conclusion with respect to the reappearance of *Homo* in a world where "in a moment of idiot progress, we really killed ourselves off." The kinds of animals that could give rise to man have been eliminated, and man is thus left more alone than it is comfortable to think about. This philosophical question, by itself, justifies the effort to learn as much as we can about man's biological, economic, and technological history, as well as about the physical environments and ecological relationships which prevailed in prehistory —a time span that covers 99.5 percent of the human past. Although all of these matters have long been under investigation by specialists in the natural sciences (pedologists, zoologists, botanists, and geographers) working independently or in cooperation with archeologists, the results have been essentially limited in scope. The much-needed comprehensive review and synthesis of the varied data on paleoenvironments and the cultural adaptations to these environments through time has now been done, and for the first time, in Karl W. Butzer's **Environment and Archaeology: An Introduction to Pleistocene Geography** (Aldine, Chicago, 1964. 524 pp. $12.50). The author, now professor of geography at the University of Wisconsin, was trained in Germany; has had a great deal of field experience in Germany, North Africa, and Spain; has a delightful writing style; and has done a most skillful job of synthesizing a really huge mass of data, the references to which run to a 38-page bibliography.

The main concern of the book is to present the complexity of interacting physical and biological situations seen in the perspective of man-land relationships as the situations change through time. It is not by accident that a geographer with broad training in natural sciences and experience in archeology has undertaken to provide this comprehensive outline of paleoenvironmental studies, which includes methodological and theoretical viewpoints as well as a summary of substantive results of investigations made to date. The Pleistocene archeologist cannot hope to be a practicing specialist in paleoecological investigations, but he should know what has been done and how it is done, and thus be alert to potential information, which he might otherwise ignore, in his sites. This book demonstrates the need for the interdisciplinary natural science approach to the grand problem of the history of human occupancy of the earth. In pointing out that prehistorians have unduly emphasized stratigraphy and chronology, Butzer drives home the point that environmental reconstruction should be the larger aim to which such investigations ought properly to be directed. This ecological setting of prehistoric times is here called "Pleistocene geography," and Butzer, perhaps too modestly, characterizes this as "more a point of view than a scholarly discipline."

In this book Butzer reviews, in succession, the scheme of Pleistocene stratigraphy and chronology; the basic significance of vegetation; geomorphology and soils studies as indices of paleoenvironments; Pleistocene sediments and methods applied to their study; and the relevance of biological remains (pollen, wood remnants, and molluscan and vertebrate remains) to environmental reconstruction. He also provides a review of Pleistocene environments of Europe and Africa and a survey of man-land relationships through the Paleolithic, Mesolithic, and Neolithic stages. Special attention is paid to agricultural origins and dispersals in the Old World, and the author concludes that man, through the intermediacy of farming and herding economies, and efficient technologies developed after 5000 B.C., created a new artifact in the form of a man-made cultural landscape. A much more direct environmental influence on human distribution, population size, and food-collecting economy is apparent for the earlier time levels of the Pleistocene. The Acheulian site at Torralba, Spain (excavated by Clark Howell), and the Mousterian site of Salzgitter-Lebenstedt in north Germany (excavated by A. F. Tode), and other sites are summarized as examples of these relatively simple or direct interactions. Although man is still intimately tied to the environment, his post-Neolithic interactions with it tend to be obscured by sociocultural devices.

In a volume so full of interesting information and ideas, one can extract only a few to pass on to the readers of a book review. The numerous maps are especially useful because they provide up-to-date information on a variety of matters. Butzer cautions us that surviving food-collecting societies—for example, those in Australia, the Bushmen, the Congo pygmies, and the Fuegians—are survivors because they have taken refuge in disadvantaged desert or forest areas, and for this reason, together with the known fact of influences from more advanced cultures, are not to be taken as illustrating "optimal patterns of resource exploitation by Pleistocene food-collectors." The tropical savannas, mid-latitude grasslands, and lower-latitude Pleistocene

tundras are proposed as optimal environments for early hunter-gatherer populations. Paleoenvironmental understanding of the Pleistocene interglacials remains a problem because these have generally (and incorrectly) been taken to be uncomplicated, warm-dry intervals, the main interest in them being in the function that they serve as stratigraphic markers. The importance of controlling fire—known since the Elster II glaciation at Choukoutien, China, and Torralba, Spain, about a half-million years ago—was that it allowed human penetration of mid-latitudes during cold periods. The environmental changes that occurred in Western Europe at the end of the Pleistocene, between 11,500 and 7500 B.C., marked the disappearance of the reindeer and mammoth, and the absence of these animals is viewed as the cause of a cultural crisis through food shortage, with consequent severe decline in numbers of human occupants of the area. The much-argued topic of man's influence as the agent responsible for the extinctions, at the end of the Pleistocene, of such animals as the elephant, rhino, steppe bison, cave bear, cave lion, and spotted hyena is reviewed, and human agency as a main factor is discounted. Climatic change, especially desiccation, as a factor to account for agricultural dispersals from the Near Eastern hearth area is seen to have little weight, and the alternatives of land-shortage owing to shifting agriculture and chronic overpopulation are proposed as more likely causes for this diffusion.

This volume, in attempting a synthesis of data of a variety and magnitude not heretofore attempted, most effectively shows the extent of our present knowledge of man-land relationships in prehistory, and, with respect to future investigation, it will no doubt be an important force in showing where the lacunae lie and the methods that are available to fill them. One finishes reading this book with a renewed sense of the greatness of the accomplishment of human survival, and an awareness of how little understood is the 2-million-year run of man's history. One also wonders where we have gone astray in our failure to persuade the public that a knowledge of human history is as useful and important, and equally as interesting, as a trip to the moon.

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Flowering Plants of Mexico: A Literature Survey

A Selected Guide to the Literature on the Flowering Plants of Mexico. Ida Kaplan Langman. University of Pennsylvania Press, Philadelphia, 1964. 1015 pp. $25.

This bibliography is the most important event in Mexican botany since Standley's *Trees and Shrubs*. In what amounts to both a love of labor and a labor of love, this *Guide* to the literature of Mexican seed plants has been arranged by the author and fully cross-indexed as well. There is a topical four-column index of 156 pages. Many authors (for example, Berlandier, Blake, Liebmann, Orcutt, and Purpus) take on a new dimension; for others the enormity of the bibliographic problem is only suggested. Books, articles, theses, manuscripts, archivia, and trivia—all come in Langman's purview. Some authors have supplied addenda; Ruggles Gates corrects his paper published 50 years ago. Librarians' comments spice the entries *passim*: See Miss Meeder's estimate of Orcutt. Just browsing will be rewarded.

Accuracy, said A. E. Housman, is a duty and not a virtue. Yet a bibliography that is both scholarly and meticulous will not be free from error. Unfortunately, this volume's narrow margins will not accommodate corrections, and, worse, rebinding will be a catastrophe. The indexes, like directions given by the man at the filling station, will prove to be approximate at best.

Sixty years ago J. Christian Bay insisted that the urgent needs of botanical bibliography would be solved only by the single-minded enthusiasm of individuals. The human mind remains irreplaceable in the face of mechanical devices often deemed the salvation in the compilation of a bibliography like Langman's. A computer has a medulla oblongata but lacks a cerebrum. The Swiss bibliographer Haller set forth the author's contribution, not the minutiae of the book's torso. Langman, like Haller, is concerned with what the book offers the reader. For society it is fortunate that such bibliographers have not gone with the chimney sweep. *Labor ipse voluptas*. Every user will be grateful to the foundations that have intermittently supported the enterprise, but most grateful to the compiler for her persistence.

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Evolution of Life on the North American Continent

Stratigraphy and Life History. Marshall Kay and Edwin M. Colbert. Wiley, New York, 1965. 775 pp. $9.75.

This profusely illustrated book attempts to set forth for beginning students the principles of stratigraphy and to give a summary of the main events in the evolution of life and of the North American continent. Either task is formidable in itself, and both call for skillful blending and summarizing of a vast and confusing array of data if a coherent and meaningful story is to emerge. A prodigious amount of information is assembled in this book, but assembled in such a poorly organized manner, and with so many sidelights inserted, that the point is often lost. The stratigraphic principles are obscured, and the main historical events tend to be isolated and rather meaningless.

The first 400 pages are devoted to presentation of stratigraphic principles, which are intertwined with summaries of the history of the Precambrian, Paleozoic, and part of the Mesozoic Eras. The principle of superposition of strata is emphasized in early chapters on Precambrian rocks, together with a somewhat cryptic treatment of the problems of correlation of nonfossiliferous rocks and dating by means of isotope geochemistry. The principle of uniformitarianism, the basis for all stratigraphic and paleoecological interpretation, is not mentioned. Rock-stratigraphic and time-rock units are introduced in a discussion of Cambrian rocks, but clear distinctions and good examples of these types of units are not given. Faunal zones are not defined until much later in the book. Sedimentary and biologic facies are illustrated in a series of chapters, drawing on examples from Ordovician and younger Paleozoic rocks. Tectonic control of sedimentation is suggested in a discussion entitled the "Taconian revolution."

The second half of the book is a more straightforward presentation of