

Homo, a small form different from both *A. africanus* and *H. erectus* occurring about 1.8 million years ago and a large form close to *H. erectus* occurring in the uppermost beds dated at about 1.0 million years ago.

The exciting archeological data from East Rudolf are summarized by Glynn Isaac, J. W. K. Harris, and D. Crader. The oldest known human cultural evidence, dated at about 2.4 million years ago, suggests that some hominids had already developed behavioral patterns that were of fundamental importance for the evolutionary differentiation of modern *Homo sapiens* from other primates. These included tool manufacture and use, meat eating, operation out of a home base, and possibly some form of cooperative division of labor. This evidence is entirely consistent with the fossil data indicating that some early hominids were bipedal, with hands free for tool use.

In summary, this is a valuable volume that brings together more than a decade of research not previously available in such comprehensive form. It will prove extremely useful to anyone interested in geological, paleontological, or archeological problems in Pleistocene Africa, and will certainly be the starting point for all further research in this area.

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Stratigraphy of a Famous Site

Geology of the Olduvai Gorge. A Study of Sedimentation in a Semiarid Basin. RICHARD L. HAY. University of California Press, Berkeley, 1976. xvi, 204 pp., illus. + plates. \$22.50.

The Olduvai Gorge, in Tanzania, is probably the world's best-known site in connection with early man, largely through the work of the late L. S. B. Leakey and his wife, Mary, who have received both financial support and publicity through the National Geographic Society. Mammal fossils were first found there by Kattwinkel in 1911, and in 1913 a preliminary geological survey was made by Hans Reck, who recognized five stratigraphic units and numbered them from the base upward. Leakey began his work in the gorge in 1931 and persisted with scanty funds until the discovery in 1959 of the australopithecine skull popularly known as "Zinj," after which

money became available for large-scale excavations and detailed study. A turning point in the reconstruction of the history of early man was the 1961 dating by Evernden and Curtis of tuffs in bed I as 1.75 million years old, which gave for the first time a real indication of the antiquity of the human family.

Richard Hay began in 1962 a systematic study of the stratigraphy and sedimentological characters of the deposits, and this volume is the report of some 12 years of investigation. It is a most impressive document and must surely be one of the most detailed and thorough studies of a single small area ever published. Each of the component beds is discussed in detail, including lateral variations and facies changes, and the characteristics are used for environmental interpretations and paleogeographic reconstructions. The Olduvai basin is bordered on the south and east sides by volcanoes that have contributed detrital sediment and pyroclastic debris. Hay has shown that Ngorongoro furnished the volcanic floor but Olmoti supplied much of the tuff material in beds I and II. Within bed II, an eolian tuff known as the Lemuta member forms a striking and useful marker horizon. Widespread faulting caused erosion of bed II so that beds III and IV were deposited in a different setting and are themselves separable only in the eastern part of the basin. The former upper part of bed IV is now separated as the Masek beds, which rest unconformably on the earlier deposits, and the former bed V constitutes two units, the Ndutu beds and the Naisiusiu beds, deposited under conditions of tectonic instability. The unraveling of the complex of lithofacies into half a dozen different types of depositional environments has resulted in a very complete history of events in the gorge, well summarized in chapter 11, and there is evidence for a close association of hominid activities with particular lithofacies that indicate a perennial supply of fresh water.

The volume is very well illustrated, both by clear figures and relevant photographic plates, and there is a glossary that will be useful to the many anthropologists and archeologists who will need to read it; appendixes provide radiocarbon dates and a list of all archeological sites. The size and format match those of the Cambridge University Press volumes *Olduvai Gorge, 1951-1961*, to which Hay's book is an essential companion.

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A New World Culture

The Hohokam: Desert Farmers and Craftsmen. Excavations at Snaketown, 1964-1965. EMIL W. HAURY. Published in collaboration with Southwest Parks and Monuments Association by University of Arizona Press, Tucson, 1976. xii, 412 pp., illus. \$19.50.

Quibblers will perhaps object to the principal title of this book, which is primarily a report of the results of a year's excavations carried out at one site in southern Arizona. But in reality these excavations together with the excavations Haury carried out at the same site in 1934-35 do indeed constitute the major study of the Hohokam culture.

Rarely does an archeologist have the opportunity that Haury had of returning after 30 years to reexcavate a major site employing an array of new methods and techniques. He and his colleagues have made excellent use of this opportunity. The importance of the Snaketown excavation—and the Hohokam—is well illustrated by the storm of contention regarding chronology, internal development, and extent of Mesoamerican affiliations that followed publication of the original Snaketown report in 1937. For example, in the present report Haury charts (fig. 16.1) no fewer than six greatly differing chronologies for the Hohokam—the one he and his colleagues advanced in 1937, two others by one of the original authors, and three proposed by other outstanding Southwestern archeologists.

The stated objectives of the new research included clarification of chronology (using new dating techniques and methods); expansion of knowledge regarding the earliest Hohokam periods and their presumed origin in the preceding Cochise culture; evaluation of the nature, extent, and time of Mesoamerican influence on the Hohokam; and finally, concentration on the history of irrigation agriculture as developed at Snaketown.

The various chapters and appendixes of the book demonstrate the thoroughness, skill, and craftsmanship of the field and the laboratory studies and the soundness of Haury's conceptualization and interpretation of the data, both new and old. The "new archeology" dedicated to processual studies notwithstanding, Haury states without apology that he has utilized the "historico-cultural approach," noting that processual studies will come in due time—following, as they must, studies such as this.

The new excavations at Snaketown verified the phase sequence established