

change and the appearance of cultural materials is unclear, this interesting association requires more investigation.

From the standpoint of early man studies, one of the major outstanding questions is the date of the KBS tuff. The date of this tuff is crucial because there is good evidence of the presence of the genus *Homo* below this level. The results of radiometric studies have been contradictory, ranging from 1.6 to 2.6 Myr BP for this tuff. As Cooke's paper indicates, the earlier date for the KBS tuff may be suspect on palaeontological grounds. Cooke's studies on fossil pigs has shown that tooth size in one taxon, *Mesochoerus limnetes*, found below the KBS tuff at East Rudolf most closely resembles that in specimens from the

nearby Omo area dated to 2 Myr BP.

This important volume contains a wealth of detailed and important information, and will be very useful at the professional level. Its information, however, will be less accessible to students. Although each of the three major sections is prefaced with an introduction, these are far too brief to really open the major issues and questions posed by each area of research. Such interdisciplinary studies are most valuable when they result in a synthesised and comprehensive view. Although such synthesis is missing here it is a minor defect in an otherwise fine volume. □

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Hominid and the bathwater

W. W. Bishop

Geology of the Olduvai Gorge: A Study of Sedimentation in a Semiarid Basin. By R. L. Hay. Pp. xvi + 203. (University of California: Berkeley, Los Angeles and London, 1976.) £15.75.

RECENT interest in Earth science has promoted fruitful growth of such 'interface' studies as geochemistry, geophysics, and geobiology. It comes as no surprise to see the common ground between geology and archaeology also attracting attention. What is unusual is to find, within the 200 pages of a single-author volume, a blue-print for the application of various disciplines to the study of sediments yielding hominids and artefacts. These include stratigraphy, geochronology, sedimentary petrography, mineralogy, isotope geochemistry and amino acid chemistry, to mention but a few.

On this substratum Dr Hay builds a sophisticated time framework for the past 2 Myr and reconstructs palaeoenvironmental settings for the hominids, their artefacts and, by inference, their activities in the changing palaeogeography of the Olduvai region.

Olduvai was the area where large scale excavations by Louis and Mary Leakey showed geologists, vertebrate palaeontologists and even some archaeologists, how local microstratigraphy could be studied to set early hominids and their palaeolithic tool kits against a factual background from which to decipher the environment of burial and, with luck, the habitat of life. Dr Hay, with early experience of the stratigraphical complexity posed by arid intermontane basins in western USA, was the ideal successor to other geologists (Hans Reck, E. J.

Wayland, P. J. H. Boswell, P. E. Kent and R. A. Pickering) who worked at Olduvai. It was fortunate that he appeared on the scene in 1962 after initial over-concern with alleged pluvial-interpluvial 'climatic stratigraphy' had been passed over in favour of a return to 'normal' stratigraphical and geological methods.

The finding of the skull of *Australopithecus (Zinjanthropus) boisei* in 1959 was the trigger mechanism for new investigations. Olduvai witnessed the first application of K-Ar dating to rocks as young as 1 or 2 Myr. Dr Hay tabulates the 57 K-Ar ages established for Bed I since the initial investigation by Curtis and Evernden, and discusses them in relation to fission-track dating and palaeomagnetic polarity data. Beds II to IV yield few reliable K-Ar dates, but numerous radiocarbon ages are given spanning the past 30,000 yr at Olduvai.

For the archaeologist the most important sections of the book are those presenting palaeogeographic reconstructions, both descriptive and visual (18 out of 27 maps in a total of 63 text figures), based upon detailed stratigraphical columns, which are also excellently illustrated by pull-out sections. These provide the factual and the interpretative environmental record against which Dr Hay records the hominid and artefact content of each formation. The final chapters present a synthesis in the form of a four-page evolutionary history of the Olduvai basin and a discussion which in 7 pages distils evidence for the pattern of hominid activities.

Despite its high price this is a book to purchase as well as to read, for it seems certain to become a 'classic'. It demonstrates how geochronology and the study of palaeoenvironments may be used to obtain full value out of both the fossil baby and the sedimentary bathwater.

W. W. Bishop was Professor of Geology at Queen Mary College, University of London, UK. He died on 19 February this year at the age of 46.

THE BULLETIN OF THE BRITISH MUSEUM (NATURAL HISTORY)

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