

Nor indeed, with very few exceptions, has the work of European scientists. Nor indeed does any research which involves even the simplest sorts of statistics, such as counting.

Is it really possible to introduce students—for whom, after all, books of readings are assembled—to the study of Man in Adaptation, or to the Biosocial Background thereof, without reminding them of the utility, if not indeed the necessity, of precision in scientific research? Many of the authors whose articles are included are biologists whose conclusions are based upon statistical analyses of their data, yet the selections chosen would not indicate that this is so. European and Asian scientists have made outstanding contributions to the advance of knowledge in the fields covered by this volume, yet the student is left with the impression that anthropology is an American specialty. The Paleolithic encompassed between 90% and 99% of the time during which the genus *Homo* has lived, evolved and adapted to the results of his own inventions, yet Section V is devoted almost exclusively to the most recent periods of prehistory. The omission of tables, charts, illustrations and bibliographies is unfortunate, even if, as the Editor maintains, it was necessary.

Dr. Cohen states that "Where choices had to be made, I elected to include selections that displayed wit and imagination." This was a wise choice, and the articles are without exception written in an interesting and vigorous style as well as being, for the most part, clear. They are not, how could one expect them to be, all of equal relevance to the topic addressed, and a few appear to me to be simply misleading. Finally, it seems only fair to reveal my own biases by listing the contributions which I found most useful: "Cultural Factors Affecting the Study of Human Biology" by S. M. Garn; "Social Units of a Free-Living Population of *Hamadryas* Baboons" by H. Kummer and F. Kurt; "Bushman Hunter-Gatherers: A Study in Human Ecology" by P. V. Tobias; and "The Sociology of Pottery" by G. M. Foster.

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KALAMBO FALLS PREHISTORIC SITE. Vol. 1.  
By J. D. Clark. 253 pp., 32 plates and  
42 figs. University Press, Cambridge.  
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The long-awaited monograph on the Kalambo Falls site begins with this first volume on the geology, paleoecology and detailed stratigraphy of the excavations. (Volumes 2 and 3 are announced and will cover the history and ethnography of the Kalambo Falls area and the archaeology of the site which spans Acheulian to Iron Age industries.) Excavations by Desmond Clark and his associates at Kalambo Falls have been discontinuously spread over the 14 years since 1956. The major part of the field work was concentrated in three seasons, however, namely 1956, 1959, and 1963.

This volume consists of essentially three parts. Clark begins with a general description of the Kalambo Falls area—its geography, climate, and exploration. This is followed by contributions from the natural sciences; bedrock and Quaternary geology and the physiography of the area are described by E. G. Haldemann, and the formal geological stratigraphical nomenclature is defined by M. R. Kleindienst. An earlier study of the Quaternary sediments at the Kalambo Falls site by Geoffrey Bond is included as Appendix A to this volume. Some 28 pages are devoted to a description of the present vegetation and the vegetational history of the area by E. M. Van Zinderen Bakker. The third part, consisting of nearly one half of the text, is a very detailed description of the excavation of the four principal sites in the Kalambo Falls basin; these are accompanied by large fold-out drawings of the excavations. M. R. Kleindienst and G. H. Cole are joint authors with Clark in these descriptive chapters. There follow 11 appendices; the first of these by Bond was mentioned above and covers 18 pages, but the others are very short reports by various specialists covering identification of fruits, seeds, charcoal, bark, etc., a checklist of botanical specimens, heavy mineral analysis, and summaries of pollen analyses and radiocarbon dates.

The Kalambo Falls prehistoric site is located near the southeastern corner of Lake Tanganyika at latitude 8°30' S in a small

basin just above the lip of Kalambo Falls. This basin is traversed by the Kalambo River which forms the political boundary between Tanzania and Zambia, and the several excavated areas all lie in Zambia on the left bank of the river. This basin is characterized by a relatively sluggish, widely meandering river whose gradient is controlled by the Spillway Gorge, a narrow bedrock canyon that debouches into Kalambo Falls itself. (Kalambo Falls is the second highest falls in Africa and is twice as high as the more famous Victoria Falls, having a single uninterrupted drop of 221 m.) The character of the basin and the sluggish regime of the river above the falls apparently has not changed appreciably since Acheulian times. Most of the sediments enclosing the artifacts were deposited in relatively quiet water and in fact were interpreted in the early years of the excavations as lake deposits, e.g., by Bond (Appendix A). All the geologists, including Bond, now agree that the sediments were laid down by a sluggish stream very much like the present-day Kalambo. However, the periods of stream deposition were interrupted by episodes of erosion brought on by a more vigorous river regime. The alternation of periods of quiet water sedimentation and periods of erosion superimposed on an overall trend of sediment accumulation in the local basin has been attributed to periodic blocking of the Kalambo River in or near the Spillway Gorge. Collapse of the wall of the Gorge when it was much narrower in Acheulian times (Haldemann) and damming by heavily loaded tributaries (Bond) are suggested causes of this blocking. This alternation of fast and slow river regimes is in turn attributed to climatic change. During generally dry periods there was too little runoff to remove the decaying rock mantle, but during more humid periods this debris was rapidly carried to the Kalambo forming an "outwash fan" that restricted the flow of the Kalambo. During the succeeding dry period the tributaries were impoverished, and the Kalambo was finally able to remove the debris dam.

Pollen analysis by Zinderen Bakker unfortunately does not confirm these alternations of humidity because the alternating

high and low ground water conditions played a more determinant role than atmospheric moisture as far as the local vegetation was concerned. However, distinct fluctuations of temperature are recorded by the pollen. For the period from about 60,000 to 10,000 years ago three temperature cycles are recorded; they have a temperature range from  $+1^{\circ}$  to  $-4.1^{\circ}\text{C}$  relative to the present temperature of the area. The Paudorf interstade of Europe seems to be well represented between 27,000 and 30,000 years.

The oldest archaeological remains recovered are Acheulian, and the late Acheulian is dated at or beyond 60,000 years. Clark suggests that 60,000 years ago may mark the transition from Acheulian to Sangoan in this area, although "there is no direct continuum between the Acheulian and the Sangoan at the Kalambo Falls." Lower Lupemban begins around 31,600 years ago, and it contains the first appearance of the Levallois technique. The latest artifacts are of "Magosian" type, dated around 9,550 years ago. The transition between Lupemban and "Magosian" is obscure, however, because these artifacts are commonly found together in mixed rubble beds, not in primary position. Later Stone age and Iron age sites are also found in the basin and can be related to erosional stages of the Kalambo in sub-recent times. As Clark himself sums it up, "we now have the most complete, uninterrupted, stratified sequence of culture history from any site in southern Africa and a continuous record stretching from approximately 60,000 years ago up to the present day."

This book is well edited and well illustrated and constitutes an excellent example of the multidisciplinary approach in archaeological investigations. Geological, geomorphological, and botanical evidence combine to give us a coherent, although still somewhat incomplete, view of the climate and chronology of central southern Africa. Archaeologists and ethnologists should be anxiously awaiting volumes 2 and 3 of this work.

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