fonic acids, and sulfonamides may be quoted as examples. There is also a brief table of reagents giving the functional groups for which each is of value; the purpose of this is not clear, and its utility is doubtful. The general index appears adequate.

Flaws in this manual are neither abundant nor serious. Perhaps too much weight is accorded to aniline and its homologues as reagents for acids and too little to the benzyl pseudoureas, in view of the extravagance of sample demanded by the former. Several highly convenient reagents, such as piperazine for acids, saccharin for alcohols and alkyl halides, and triphenylchlormethane, the only satisfactory reagent for several of the glycols, are not even mentioned. The tables of Section 3 would be improved by the inclusion of the melting or boiling point of the parent compound. There are further omissions of comparable dimensions, but by and large the work has been very competently done and constitutes a valuable contribution to the field, fully deserving the place it will undoubtedly find alongside Mullikan, Huntress, and other standard texts on the subject.

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The South African fossil ape men: the Australopithecinae. **Robert Broom and G. W. H. Schepers. (Mem. No. 2.) Pretoria, South Africa: Transvaal Museum, 1946. Pp. 271. (Illustrated.)**

This long-awaited volume, delayed through the war years, ranks in importance with Dr. Weidenreich's recent monograph upon the skull of Sinanthropus. It concerns those mysterious beings of the human twilight, the apes almost men or the men almost apes who inhabited the caves of the Transvaal during the remote antiquity of humanity. The book includes a restudy of *Australopithecus africanus* and a detailed examination of the later adult finds of *Plesianthropus transvaalensis* and *Paranthropus robustus*. One of Broom's chapters deals with the affinities of the Australopithecines. Dr. Schepers, in a separate section, has made an exhaustive study of the endocranial casts and their significance.

In all this assemblage of strikingly new data, none is more fraught with interest than the discovery at Sterkfontein, the site of the Plesianthropus discovery, of a fauna which suggests an upper Pliocene horizon. If this correlation proves acceptable, the Australopithecus site, which is obviously older than the Sterkfontein deposits, must be assigned to the middle or lower Pliocene. The establishing of greater antiquity for Australopithecus removes one of the main difficulties involved in regarding it as lying near the human line of ascent. Every treatment of this subject in the anthropological textbooks will have to be revised in the light of these lowered dates.

Dr. Broom arrives at the conclusion that the South African man-apes were slightly built primates who walked and ran on their hind feet, hunted in groups, and probably possessed at least some mild tool-using proclivities. The hands he does not regard as having been used for progression, insisting that they are far too human in character. Moreover, he is inclined to agree with Dart that the mammalian and crustacean remains found in the Taungs deposits represent portions of the man-apes' dietary, and again would demand some slight instrumental activities.

Broom maintains, on the basis of the adult Plesianthropus and Paranthropus discoveries, that although the cranial capacity lies within what we are accustomed to term the "anthropoid range," this does not necessarily divorce these forms from human tendencies. A Paranthropus brain capacity of some 650 cc. in a creature weighing probably around 100 pounds is a far more striking phenomenon than the same brain size would be in a 500-pound gorilla.

Broom differs from Gregory in his belief that the Hominidae have arisen from a pre-Dryopithecid and very early terrestrial stock perhaps allied to Propliopithecus of the lower Oligocene. He regards the apparent resemblances between the later anthropoids and man as the product of parallel evolution. To explore the evidence upon which these views are based cannot be encompassed in a casual paragraph.

Dr. Broom, like all true scientists, is humble in the presentation of his beliefs and in his recognition of our inadequate accumulations of data. Yet, in propounding the view indicated above, he expresses doubts as to our orthodox interpretations of the human phylogeny. Interestingly enough, similar doubts have recently been expressed by others. Whatever our eventual interpretations of human prehistory may be, these intensive reexaminations and self-questionings shake us out of accustomed routine and force us to think along new lines. Dr. Broom belongs to that high company of pioneers whose discoveries leave an indelible impress upon the science of their time and often remold its dogmas.

In closing, this reviewer would like to point out that Dr. Broom has carried on a Titan's labor with very little in the way of financial assistance or support. The systematic exploitation of the cave deposits dotting the Harts Valley and other areas of South Africa promise results as spectacular as those obtained in Java or at Choukoutien. It is not to the credit of modern research foundations that the dynamite of the commercial lime worker and the singlehanded devotion of Dr. Broom are all that have rescued these few broken fragments from undoubtedly rich deposits known for some years, now, to science. Only their careful investigation on a large scale will reveal whether our small terrestrial human ancestors scampered on the plains of Africa during the Miocene.

South Africa has escaped the dread devastation of war. Where else can the student of human paleontology direct his attention during the next decade or so and expect greater reward for his labors? Dr. Broom has been on the ground and has seen the vision. It shines in the pages of his book.

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