# Book Reviews

*The Anatomy of the Gorilla.* The Henry Cushier Raven Memorial Volume; a collaborative work of The American Museum of Natural History and Columbia University. William King Gregory, Ed. New York: Columbia Univ. Press, 1950. 259 pp. $15.00.

Readers with the common misconception that the 19th century saw the completion of all worth-while gross anatomical investigation may be surprised at the appearance of this volume. Anatomists, anthropologists, paleontologists, and a variety of experimental biologists, however, who know from sad experience the frustrating deficiencies in our knowledge of the primates, will give it a hearty welcome. There is hardly a primate genus for which the published accounts yield data adequate for modern needs, but in many respects the gorilla has been most in need of study.

Although the other great apes were first studied in the 17th century and early were the subjects of classic attempts at monographs (Tyson on the chimpanzee in 1699 and Camper on the orangutan in 1782), the gorilla has never been so treated. A partial explanation of this seeming neglect of so interesting an animal is not hard to find. In the first place, the gorilla was totally unknown to science until 1847, when it was described by Savage, a medical missionary to the Congo, and Wyman, a Harvard anatomist. Their accounts, plus the learned papers by Owen and the lurid accounts by Du Chaillu, soon brought the animal wide general and scientific attention. Because of the difficulties, however, in obtaining well-preserved, whole specimens of such a large, fierce, rare, and remote animal, most of the contributions were based on skulls, in some cases on complete skeletons, rarely on entire but poorly preserved cadavers. As a result no thorough account of the animal's structure has been published—the nearest approach being, perhaps, the well-presented account of the anatomy of a fetus by Deniker in 1885.

The present volume is the result of a long series of difficult and laborious efforts on the part of several individuals. The major share of the credit certainly belongs to the man to whom the volume has been appropriately dedicated—Henry Cushier Raven, late curator of the Department of Comparative Anatomy at The American Museum of Natural History. He actually collected the gorillas on the American Museum–Columbia University African Expedition, 1929–30 (chronicled in W. K. Gregory and H. C. Raven, *In Quest of Gorillas,* Darwin Press [1937]) and began their dissection and description, supervising the preparation of the plates. These excellent beginnings were cut short by his early death in 1944. John Eric Hill, his successor at the museum, undertook to continue the work, calling upon five noted anatomists to make special studies. His untimely death in 1947 once more brought the work to a halt, and interested scholars despaired of ever seeing this valuable work in print. Fortunately, Raven's senior colleague, the eminent comparative anatomist and paleontologist W. K. Gregory, undertook the task of putting the manuscripts in editorial order and writing the necessary introductory material.

As a result of its complex history this volume does not represent the finished monograph envisioned by its originator. It consists of five parts, of which only one is the work of Dr. Raven, and that not in its entirety. A one-page preface by Dr. Gregory explains something of these circumstances. Part I, also by Dr. Gregory, is a short biographical sketch and a bibliography of Raven's published work, with tributes by his friends and colleagues. Part II is the heart of the volume, containing all Raven's descriptions and the supplementary work of Dr. Hill. It is a regional presentation, dealing most thoroughly with the head, neck, and appendages, concentrating on the skeleton (exclusive of the skull), musculature, blood vessels, and peripheral nerves; there is very little on the abdominal and thoracic viscera, almost nothing on the articulations, central nervous system, and sense organs. The text is mainly a descriptive account of individual muscles presented in the classic pattern: form, position, origin, insertion, innervation. There are short sections on the articulated skeleton and laryngeal sac, and scattered notes on vascular supply. The 96 plates illustrating this section were executed by artists under the supervision of Raven and, later, Hill. They are exceedingly well done, rendering form and texture in a beauty and clarity that make their perusal a pleasure as well as a profit.

The text is frankly an edited transcription of Dr. Raven's notes, supplemented by those of Dr. Hill. This is apparent in the spottiness of coverage, the unrelieved cataloguing of details, the few comparative remarks, the almost total absence of bibliographical and historical references, and the casual quality of the text figures (hardly more than inked copies of the dissection sketches left unfinished by the artists of the plates). Exactly how Dr. Raven would have organized and finished these excellent beginnings we cannot know, but it is only fair to his memory to remind the user that this section is not to be judged as a finished product.

Part III consists of special studies which largely make up for the deficiencies in the Raven-Hill manuscripts; S. L. Washburn has treated the thoracic viscera and H. Elftman and W. B. Atkinson the abdominal viscera and female reproductive system. These chapters are also more typical of modern comparative anatomical methods, especially Washburn's analysis of the primary factors responsible for a whole complex of related structural features in the thorax. Part

IV, a study by W. L. Straus, Jr., of the microscopic anatomy of the skin, and Part V, a series of studies by A. H. Schultz on growth changes and certain skull features, fill out further deficiencies and exemplify more modern techniques and viewpoints. There remain regions of the gorilla's anatomy that are quite unrepresented in this volume, but published accounts of some of them are available elsewhere. Bibliographic references to these would have enhanced the value of the book.

Incomplete though it is, this large, handsome volume represents one of the best anatomical treatments of any infrahuman primate and stands as a fitting memorial to a worthy man and a real scientist.

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***Treatise on Powder Metallurgy: Applied and Physical Metallurgy,*** Vol. II. Claus G. Goetzel. New York: Interscience, 1950. 910 pp. $18.00.

Since the publication of the first volume of Goetzel's *Treatise on Powder Metallurgy* this reviewer has observed with satisfaction the excellent reception the book received and has awaited the release of this second volume with high expectations; nor has he been disappointed by the reality. In the field of applied powder metallurgy this is again a truly encyclopedic work, and it is well organized, well documented, and well indexed.

It is evident that the author has set himself the enormous task of gathering in one place virtually everything that has been revealed in the technical and patent literature, as well as much previously unpublished material, concerning the products and uses of powder metallurgy, the materials being used, or that could be used, and the conditions of manufacture and application. In so doing, many of the more important technical papers are abstracted so fully that the reader need refer to them only for minor details. Lesser subjects are treated briefly, but with sufficient reference to the literature to guide the reader in an exhaustive search of his particular field of interest. Among the valuable and unusual features of the book is the inclusion of references to materials and processes that have failed, either for technical or economic reasons. All this wealth of material is built into a coherent account that may be read in sequence, or be used as a subject reference source, with equal satisfaction.

Among the major classes of subjects treated are: refractory metals, hard metals, electrical materials, magnetic materials, ferrous and nonferrous structural materials, porous products, friction products, dental alloys, and many related materials. In addition the author has included whole chapters dealing with the comparison of properties of powder metal products with those of materials manufactured in other ways, a survey of potentially useful powder metals and alloys, stress analysis of sintered products, testing methods, and theories of bonding and sintering.

Although it would be untruthful, and possibly mischievous, to say or to intimate, that this book is without faults of omission and commission, this reviewer feels that its users will agree with him that Dr. Goetzel has produced a highly useful and usable treatise and one that is almost certain to be regarded as a "must" for the bookshelf of the metallurgist and the design engineer. The purchaser should be advised, however, that the first and second volumes are partially interdependent, so that the possession of both is to be recommended. A third, and final, volume will present a classified and annotated bibliography of the technical and patent literature of powder metallurgy.

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***Advances in Genetics,*** Vol. III. M. Demerec, Ed. New York: Academic Press, 1950. 267 pp. $6.80.

The third volume in this series contains six contributions, two or three of which may be praised highly, and all of which have considerable value. The chief criticism to be made is that certain of the reviews are too limited in scope or too biased by an individual point of view to be as useful as they might have been, were they more inclusive and more objective.

The first contribution, by Berthe Delaporte, is appropriately called "Observations on the Cytology of Bacteria," for it is in no sense a comprehensive review of bacterial cytology, but is more like a summary of the author's own observations. In picking out yeast cells as a comparative object, the author has done so because their "structure is well known"—this in spite of the vigorous controversy still going on about the identification of the true nucleus in yeast cells. Nor is there even a mention of the brilliant work of the author's own compatriots, Tulasne and Vendrely, who have so effectively used ribonuclease to demonstrate the distinction between desoxyribonucleic acid and ribonucleic acid in bacteria. The observations reported here represent an application of Giemsa and Feulgen stains to a variety of bacteria, along with stains for lipids, metachromatic granules, and glycogen made on organisms from the same culture and at the same age.

The competent review of "The Biochemical Genetics of Neurospora," by N. H. Horowitz, would raise the question whether another review of this field, so often covered in recent months, is really needed just now, were it not that the author has included an original section discussing the "one gene–one enzyme" theory of gene action. Here pertinent criticisms of the theory have been considered, particularly the question whether the methods of detecting biochemical mutants automatically lead to a selection of just those that fit the theory. Using mutants that have a biochemical requirement over a specific temperature range only, Horowitz has compared the proportions of mutants losing an indispensable function and those losing a