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place virtually everything that has been revealed in the technical and patent literature, as well as much previously unpublished material, concerning the products and uses of powder metallurgy, the materials being used, or that could be used, and the conditions of manufacture and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

dispensable one. His conclusion is that the fraction of genes with but a single function is at least 71–73 per cent. This makes it "unlikely that selection can account for the observed high frequency of unifunctional genes." The discussion of the nature of gene action is well balanced and stimulating.

E. B. Lewis has written a very much needed review of "The Phenomenon of Position Effect." Perhaps it marks the end of an era in the study of this phenomenon, for the more recent studies of Barbara McClintock on the "activator" and "dissociation" loci in maize and their extraordinary capacity to produce position effects may well require a complete revision of current concepts. The question of the generality of the V- and S-types (variegated and stable) of position effects distinguished by Lewis remains: what proportion of genes is subject to position effect? And what is the ratio between V-type and S-type effects among susceptible genes?

A. R. G. Owen has contributed a theoretical study of genetical recombination. As a review of that field, the paper appears limited by a lack of cognizance of many previous efforts to develop mathematical theories for this phenomenon—e.g., those of Körösy and Ludwig. The author might have been more cautious by reason of the forgotten failures of others. More serious is the defect imposed by unsound or weak basic assumptions, in this case (1) complete reliance on Mather's theory of the serial formation of chiasmata from the centromere, and (2) the assumption that interference is a purely intrachromosomal effect. The Drosophila data suggest that the tip of the chromosome, as well as the centromere, has a primary effect upon interference; and the existence of *inter*-chromosomal interference, first established by Schultz and Redfield and independently by the reviewer, has been repeatedly confirmed by others. For these and other reasons, it seems doubtful that the theory advanced by Owen will be superior to the empirical relations established by Haldane and Kosambi.

A review of "Corn Breeding," by Frederick D. Richey, is highly informative but strongly marked by the author's individual views. A very different review would have been written, for example, by Brieger, whose recent analysis of the causes of heterosis has led to conclusions at variance with those presented here. The extent of the chasm may be seen in the failure of Richey to cite Brieger's work at all.

"Parthenogenesis in Animals" has been very extensively surveyed and summarized by Esko Suomalainen. This comprehensive review will long remain a chief reference work on the subject.

Volume 3 of *Advances in Genetics* is 105 pages shorter than Volume 2, which was 88 pages shorter than Volume 1. This represents a reduction of 41 per cent in subject matter. The price being $6.80, the cost to the purchaser of the series has increased from 1.63 cents per page to 2.54 cents per page, an increase that seems to be completely out of line with the cost of most comparable volumes, either of the same or of other publishers. Publishers, as well as purchasers, ought to be aware of the yardstick of cost per page. For a largely unillustrated book (only the Delaporte article has more than one illustration), the cost of this volume is exorbitant, and once again raises the question whether the less expensive form of a review journal for such articles is not better.

BENTLEY GLASS

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Encyclopédie Entomologique: La Biologie des Diptères, Vol. XXVI. E. Séguy. Paris, France: Paul Lechevalier, 1950. 609 pp. 4,000 fr.

This new volume on the Diptera is the result of years of study of this order and it follows a long series of well-known descriptive papers and monographs, including three earlier monographs in the *Encyclopédie Entomologique* series, by this author.

Because of the economic significance of the Diptera, they have been the subject of many investigations in the field and laboratory. Indeed, as Séguy points out in the introduction, more than 60,000 papers have been published on the order since the time of Redi. To attempt to include more than a fraction of them in any one work would be a herculean task. In this volume the author presents the characteristics of typical representatives of the 120 families of the order, stressing field observations more than laboratory experimentation. The literature covered is tremendous, and is presented in two ways: a special bibliography after each section, and a summary bibliography at the end of the book.

Following a very brief summary of the ordinal characteristics, the first section of the book deals with the morphology and physiology of the organ systems of typical imagoes. This is followed by several chapters on modes of reproduction, mating behavior, oviposition, and a description of the egg and eclosion. Similar treatment is given to the larval forms, followed by a discussion of metamorphosis, pupation, and emergence. A general consideration of habitats, diets, and reactions of imagoes to environmental factors introduces the discussion of the spread and zoogeography of the Diptera. The larger portion of the second half of the monograph presents a most thorough annotation of the dipterous fauna of every conceivable aquatic and terrestrial environment, from high arctic to tropic, from bamboo internode to man's domicile. The reviewer found the microcavernicolous category (plant galleries, arthropod burrows, etc.) a very convenient one for grouping a number of heterogeneous habitats. The fauna of the various environments are considered by developmental stage, reproductive and feeding behavior, and systematic position. A chapter on parasitic Diptera completes this section, although representatives of this group are mentioned throughout the earlier text. A brief descriptive classification of the Diptera completes the book.

The material is very well organized and simply