Book Reviews

Principles of Genetics. 4th ed. Edmund W. Sinnott, L. C. Dunn, and Th. Dobzhansky. New York: McGraw-Hill, 1950. 505 pp. $5.00.

In this new edition of the classical textbook of Sinnott and Dunn, Professor Dobzhansky has joined the original authors in the difficult task of bringing the subject matter up to date. The authors have eminently succeeded in this ambitious undertaking. A comparison of the present edition with previous ones serves best to demonstrate the enormous changes genetics has undergone in the past decade.

All too frequently in revising a text, the author is satisfied when he simply adds one or two chapters containing the new developments in his science. Often these chapters are not closely connected with the remainder of the book, which continues to describe its subject matter from an older point of view. This danger has been avoided in the present edition, with the result that the newer fields of genetics are presented so as to form an integrated part of the whole science.

The first ten chapters follow the logical sequence of earlier editions by first developing the methods and results of "formal" genetics and then proceeding to the discussion of the chromosome theory of heredity. The genetics of microorganisms, *Neurospora*, bacteria, and viruses are first introduced in this part. Examples from human genetics are found scattered throughout these chapters in appropriate places, emphasizing the fact that the laws of genetics apply to all organisms, including man. The chapters dealing with chromosome behavior have been profoundly altered, incorporating the vast amount of knowledge accumulated on chromosomal rearrangements, and their bearing on the arrangement of genes in the chromosomes.

Chapter 11 is devoted to mutations. Chapters 12–14 give a condensed and clear account of the problems and results of the field of population genetics and of its bearing on evolution. The modern theory of evolution is developed in a straightforward manner. The discussion of inbreeding and heterosis, which in earlier editions formed an unconnected chapter, is incorporated in the description of population genetics. This field is presented logically, as a natural consequence of the principles developed in the earlier chapters, and should offer no difficulty to the student.

An outstanding feature of *Principles of Genetics* is the group of 4 final chapters dealing with physiological and developmental genetics. The vast amount of material obtained in this field has not been treated adequately in any other text. As a matter of fact, no complete synthesis of developmental genetics has been attempted during the past decade, and it is therefore gratifying to read this first integrated presentation from a modern point of view.

Most of the chapters are supplemented by a large number of problems, which serve not only as exercises for the principles learned in the chapter but frequently will lead to amplifications and discussions. A bibliography of a number of significant books and papers in the field covered accompanies each chapter. Illustrations were selected with great care and are well executed. As an appendix, a translation of Mendel's classical paper has been reprinted. It is to be hoped that many teachers will make use of this opportunity to introduce to their students the beautifully clear logic and presentation and the great experimental skill of Gregor Mendel.

Teachers of genetics will be gratified to find that they have here for the first time a textbook of genetics adequately representing the facts and principles of classical genetics as well as the more recent findings and problems of our own time. It is to be hoped that this book will be widely adopted in college classes.

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Handbook of Psychological Research on the Rat: An Introduction to Animal Psychology. Norman L. Munn; Leonard Carmichael, Ed. Boston: Houghton Mifflin, 1950. 598 pp. $7.50.

The word "handbook" as used in the title to this volume may suggest misleading notions about its make-up. You could not fairly say that it is not a handbook, but you could truthfully say that it is not similar in tabular and formulae content to such works as Hodgman's *Handbook of Chemistry and Physics.* It is, rather, a review and hence possesses limitations imposed by the author's task of selecting what to include from each study and then of judging what studies bear on what topics.

The book, according to Munn, is a complete survey of psychological research on the rat. Following the introductory chapter (a discourse on the general nature of research and on the care and handling of laboratory rats), the book contains the author's abstracts, evaluations, and interpretations of almost 2,600 research studies arranged under many subheadings of 9 topical headings: "Unlearned Behavior;" "General Activity;" "Motives, Emotions, and Hoarding;" "Sensory Processes;" "Sensory Processes in Maze Behavior;" "Learning;" "Some Aspects and Conditions of Learning;" "Systematic Psychology;" and "Abnormal and Social Behavior." There are 3 appendices containing, respectively, 52 references for books on comparative psychology, some additional (other than rat) references on comparative psychology, and the bibliography. Both author and subject indices appear.

A knowledge of the general manner in which Munn presents the research material may be gained from a description of Chapter II, which is entitled "Unlearned Behavior." The 190 studies mentioned in this 42-page chapter are assembled under the subheadings of fetal behavior, behavior observable at birth, male sexual behavior, female sexual behavior, reproductive behavior, inheritance of the effects of training, inheritance of induced

degeneracy, and tropistic behavior. Each of these subtopics is introduced with appropriate definitions, background materials, or problems, and then the studies of factors influencing or concerning the topics are presented. A noteworthy thing about the chapter, as about the others of which it is typical, is the amount of information Munn has been able to include on methodology as well as on findings and problems of so many research studies.

As to functions for which the book is adaptable, it would appear to be most useful to the investigator who already has a "problem" and wishes to know what work with the rat has a bearing on it. It should also be valuable to the advanced student and to the theorist as a reference source. Likewise, it should be of aid to the careless or forgetful teacher who has not kept his reference files in good shape. It cuts across too many course-areas in the curriculum of psychology to be indicated as a general textbook.

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Die Welt der Vektoren: Einführung in Theorie und Anwendung der Vektoren, Tensoren und Operatoren. Franz Ollendorff. Vienna, Austria: Springer-Verlag, 1950. 470 pp. $9.00 paper; $9.60 bound.

This book on vector and tensor analysis not only covers the algebra and calculus of vectors and tensors, but is especially rich in its applications, which range over affine space and the spaces of Minkoroski, Riemann, and Hilbert. The mathematical treatment is brief and largely formal; differentials and increments seem to be interchangeable, and the basic integral theorems are proved with but slight regard to rigor and are stated as if universally applicable to all kinds of functions and quite arbitrary regions. The distinction between necessary and sufficient conditions is not always sharply drawn. For example we are shown (p. 58) that div rot $V = O$; the next sentence assures us that, "conversely," the differential equation div $W = O$ has the *general* integral $W = \text{rot } V$, but without a word of proof or even a suggestion that there is anything to prove. Similarly it is taken for granted (p. 319) that a Riemannian n-space can always be embedded in a Euclidean $n(n+1)/2$-space.

The notation used makes the book very trying to read—scalars are denoted by Roman type, vectors by italic. In a complicated page of symbols these distinctions do not stand out as well as when the usual practice of denoting vectors by bold-face type is followed. Parentheses and brackets are used for the scalar and vector products instead of the customary dot and cross between the factors. The latter notation of Gibbs, which leaves the signs of aggregation for their proper uses, is gradually winning adherents in various parts of the world and seems destined to become standard.

In spite of these shortcomings the book is a valuable addition to the literature of vector analysis. The applications are very numerous and their scope is truly impressive, for they cover much of the "world" of mathematical physics: classical mechanics, space lattices and crystal structure, hydrodynamics, elasticity, Minkoroski's electrodynamics (special relativity), a brief glance at the gravitation problem (general relativity), electrical networks, and finally quantum mechanics. Even when the treatment is not too lucid and convincing, it is often suggestive and plausible. The book will be especially useful to those who are already somewhat familiar with the subject matter. The reader who approaches these matters for the first time will find the going quite rough.

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Scientific Book Register

Economic Aspects of Atomic Power. Sam H. Schurr and Jacob Marschak. Princeton, N. J.: Princeton Univ. Press, 1950. (For the Cowles Commission for Research in Economics.) 289 pp. $6.00.

Encyclopedia on Cathode-Ray Oscilloscopes and Their Uses. John F. Rider and Seymour D. Uslan. New York: Rider, 1950. 982 pp. $9.00.

Marine Geology. Ph. H. Kuenen. New York: Wiley; London: Chapman & Hall, 1950. 568 pp. $7.50.

Carotenoids. Paul Karrer and Ernst Jucker; trans. and revised by Ernest A. Braude. New York: Elsevier, 1950. 384 pp. $8.50.

Deciduous Forests of Eastern North America. E. Lucy Braun. Philadelphia: Blakiston, 1950. 596 pp. $10.00.

Oral Pathology: A Histological, Roentgenological, and Clinical Study of the Diseases of the Teeth, Jaws, and Mouth. 3rd ed. Kurt H. Thoma. St. Louis, Mo.: Mosby, 1950. 1,592 pp. $17.50.

Colloidal Dispersions. Earl K. Fischer. New York: Wiley; London: Chapman & Hall, 1950. 387 pp. $7.50.

Progress in Biophysics and Biophysical Chemistry, Vol. I. J. A. V. Butler and J. T. Randall, Eds. New York: Academic Press; London: Butterworth-Springer, 1950. 279 pp. $6.80.

Colorimetric Determination of Traces of Metals. 2nd ed. E. B. Sandell. New York: Interscience, 1950. 673 pp. $9.00.

Progress Volume: Modern Developments in Therapeutics and Methods of Treatment. Companion volume to "An Integrated Practice of Medicine." Harold Thomas Hyman. Philadelphia: Saunders, 1950. Pp. 4133–4867. $10.00.

A Manual of Physics. 5th ed. J. A. Crowther. New York: Oxford Univ. Press, 1950. 594 pp. $4.25.

How to Develop Your Thinking Ability. Kenneth S. Keyes. New York: McGraw-Hill, 1950. 246 pp. $3.50.

Principles of General Psychopathology: An Interpretation of the Theoretical Foundations of Psychopathological Concepts. Siegfried Fischer. New York: Philosophical Library, 1950. 327 pp. $4.75.