

sions within the chosen limitations. The examples have been chosen from such a wide array of biological areas that they will leave the student with the firm realization that embryology is an integral part of the indissoluble continuum of the biological sciences. The following casual list of items may illustrate how far this text has ranged into the domain of general biology.

Ovarial eggs of mealworms, to illustrate yolk relations; detailed chromosome chart of *Drosophila*; a fine discussion of biochemical genetics, stressing the contributions of both the Beadle-Tatum and the Kühn-Butenandt teams; morphogenetic contributions of nucleus and cytoplasm as studied in the alga *Acetabularia*; sex determination in moths and worms; embryonic determination in the sea urchin, expanded to five pages; Holtfreter's analysis of blastomere movements, likewise given five pages; studies on the causation of deformities and monsters, including the effects of the maternal milieu; a very competent account of comparative embryogenesis and placentation in different forms; endocrine regulations of estrus, not only regarding the underlying physiological mechanisms but in the context of the totality of biological and ecological conditions through which rates of development, nutrient perquisites, state of completion at birth, and other embryogenetic and endocrine events have gained their adaptive significance; pigment patterns in amphibians and birds; and Wolffian lens regeneration in amphibians.

Even such very recent developments as the experimental production of a whole rabbit from a single blastomere of the two-cell stage by Seidel, the demonstration of the derivation of ventral body musculature from the lateral plate in birds by Rawles and Strauss, and the evidence of functional polarization of the retina shown by Sperry and Stone, have been included.

The organization of the material follows customary didactic lines, as may be seen from the following topical outline (giving approximate proportions in percentage of total space):

1) General part. (i) "Germ cells and germ cell formation"; "Fertilization, genes, sex determination" (13 percent). (ii) "Cleavage" and (iii) "Gastrulation and embryogenesis in holoblastic forms," including germ layers, "organizer" actions, teratology (11 percent). (iv) "Early development of meroblastic forms," and (v) "Origin of blood, vessels, and mesenchym" (7 percent). (vi) "Early development of mammals," including comparative treatment of placentation. (21 percent). (vii) "Ontogeny and phylogeny" and (viii) "Evolutionary evaluation" (3 percent).

2) Special part. (i) "Nervous system

and receptors," including integument (16 percent). (ii) "Alimentary tract and respiratory organs," including coelom (9 percent). (iii) "Urogenital system" (5 percent). (iv) "Circulatory system" (7 percent). (v) "Skeleton and musculature" (8 percent).

The illustrations are clear and informative and in large part are originals. The language is concise and straightforward. Some tables of interesting systematic and comparative data are appended. There are 45 pages of literature references, including approximately 2000 citations, pertinently selected and carefully edited.

The author states that "the book addresses itself not only to the student, but to all those in medicine and biology who want an introduction into the problems of development, not just a compilation of data." It can be said that he has satisfactorily met his goal. He has produced what may rightly be considered a companion volume to the *Textbook of Anatomy* by Braus, published a third of a century ago, bridging the classical and the modern ages by doing justice to both and adopting the errors, biases and extremes of neither.

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Annual Review of Entomology. vol. I.

Edward A. Steinhaus and Ray F. Smith, Eds. Annual Reviews, Stanford, Calif., 1956. 466 pp. \$7.

This book, in all probability, is one of the most important and certainly one of the most useful general reference works on entomology to appear in a long time. The membership of our association and our colleagues everywhere will welcome its appearance with pleasure. Those of us who have had to struggle with the literature of entomology have long realized the need for a work of exactly this type. It has been conservatively estimated that there is appearing in world scientific literature well over 4000 papers on entomology each year. There is reason to believe that the actual number is considerably greater than this and that it will continue to grow. Some of this literature is scattered and inaccessible, and much of it appears in journals that are not primarily concerned with insects. Clearly, the mass of literature accumulating in all the various fields of entomology is beyond the ability of any one person to obtain readily, to read thoroughly, and to appraise critically. There has been, in recent years, a growing realization of this fact among entomologists generally.

It is regretted that space limitations here forbid even brief discussion of any

of the 21 papers making up this volume. However, some idea of the scope, the subjects, and the selection of authorships may be gained by enumeration of the papers given in the newly issued volume I of the series: "The physiology and biochemistry of diapause," by A. D. Lee, University of Cambridge, England; "Insect nutrition," by H. Lipke and G. Fraenkel, University of Illinois; "The language and orientation of the honeybee," by K. von Frish and M. Lindauer, Universität München, Germany; "The stability of scientific names," by R. L. Usinger, University of California; "Some aspects of geographic variation in insects," by T. H. Hubbell, University of Michigan; "Arthropod resistance to chemicals," by W. M. Hoskins and H. T. Gordon, University of California; "The mode of action of insecticides," by C. W. Kearns, University of Illinois; "The chemistry of insecticides," by H. Martin, Canada Department of Agriculture; "Persisting insecticide residues in plant materials," by F. A. Gunther and R. C. Blinn, University of California; "Repellents," V. G. Dethier, Johns Hopkins University; "Soil insects and their control," by J. H. Lilly, Iowa State College; "Stored products entomology (The assessment and reduction of losses caused by insects to stored foodstuffs)" by E. A. Parkin, Pest Infestation Laboratory, Slough, Bucks, England; "Apparatus for application of insecticides," by J. L. Brann, Jr., Cornell University; "Ecology of forest insects," by S. A. Graham, University of Michigan; "Some recent advances in apicultural research," by C. G. Butler, Rothamsted Experiment Station, England; "Insect transmission of plant viruses," by F. F. Smith and P. Brierly, U.S. Department of Agriculture; "Non-biting flies and disease," by D. R. Lindsay, National Institutes of Health, and H. L. Scudder, U.S. Public Health Service; "Veterinary and medical acarology," by H. S. Fuller, Walter Reed Army Medical Center; "Modern quarantine problems," by A. F. Camp, Florida Citrus Experiment Station; "The fundamental theory of natural and biological control," by W. R. Thompson, Commonwealth Institute of Biological Control, Canada; and "Effect of pesticides on balance of arthropod populations," by W. E. Ripper, Fisons Pest Control, Ltd., Cambridge, England.

Each paper has been accompanied by appropriate bibliography, making a total of 2308 references. These vary from 11 to 269, but average approximately 110 references per paper. Author and subject indexes to the volume also are included. As would be expected in the first volume of a work of this kind, there may be found here and there occasional lack of uniformity not only in the selection but also in arrangement of material—this occurs

both in the text and in the bibliographies. Then too, in this first volume, the word "Annual" in the title should not be taken very seriously, for it was necessary in numerous instances, in order to make the subject matter complete, that a much longer period of time should be included—in some cases, the author had to go back several years to make the narration fully understandable. Obviously, this will not be needful in later volumes of the series, once the subject has been discussed and brought down to date in a previous volume within the series.

Also, despite some fears to the contrary, it seems obvious that this newly inaugurated Annual Review series ought not to have adverse effects on any other publications in related fields—it covers a type of reference work that is not duplicated elsewhere. Now that a start has been made—now that the ice has been broken—it is easy to visualize that each succeeding volume of this series will average up gradually better in every way than those previously published, that minor flaws will be eliminated, that the scope of the whole plan will be expanded, and that the series will gain steadily in practical utility and general usefulness.

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Traité de zoologie. Anatomie, systématique, biologie. vol. XVII. *Mammifères*. Les ordres: anatomie, éthologie, systématique. Parts 1 and 2. Masson, Paris, 1955. 2300 pp. Illus. Paper, F.22,000; cloth, F.23,600.

The seventeenth volume of this important series of zoological monographs is devoted to a systematic account of the living and extinct orders of mammals. It is a large and impressive contribution. Some idea of its magnitude may be gained from the fact that the two bulky fascicles include a total of 2300 pages and are illustrated with 2106 text figures and four colored plates.

In scope and manner of presentation, there is a strong resemblance to the second volume of Max Weber's *Die Säugetiere*, which in its editions of 1904 and 1928 has served as a primary source book for two generations of mammalogists. This volume of the *Traité de zoologie*, along with the forthcoming sixteenth volume that is to be devoted to anatomy and reproduction, promises to provide a worthy successor to Weber's monumental work. The thirteen authors who have collaborated to produce it are leaders among modern French zoologists and paleontologists.

The orders of mammals are treated in sequence and in remarkable detail, which extends in some instances down

to the generic and even the specific level. The number of pages allotted to each order reflects in general the amount of zoological (and to a lesser extent paleontological) knowledge that is available for it. For example, the presentation of the order Insectivora totals 139 pages and consists of sections on anatomy and reproduction (68 pages, 89 figures), zoological affinities (11 pages, 1 figure), systematic accounts including habits and distribution (45 pages, 34 figures), fossil history (7 pages, 11 figures), and bibliography (8 pages, 238 titles). Relatively obscure fossil orders such as Astrapotheria, Embrithopoda, and Tillodontia are each disposed of in two or three pages. The section on primates including man occupies 353 pages and in itself is a major contribution to the fields of primatology and physical anthropology.

The system of classification adopted here represents an adroit blending of old concepts of classical zoology and the revolutionary modern ideas of paleontology. Some decades ago the initiative in mammalian classification at the ordinal and familial levels passed from the hands of zoologists into those of paleontologists, whose investigations reveal actual rather than speculative lines of evolution. Adjustment to radically new arrangements of orders has been especially difficult for those zoologists who are encumbered by pedagogic tradition. The centuries-old concept that a system of mammalian classification must culminate with the Hominidae would find few champions among modern taxonomists, yet it is honored in the present treatise at the expense of a necessary reallocation of orders related to the primates. Controversial groups such as the monotremes and the tree shrews are comfortably left in their traditional niches. Some supra-generic groups have received new names.

Anatomy and reproduction, although primarily reserved for another volume in the series, are treated at some length and in a highly competent manner in each account of a recent order. Habits, habitats, and geographic distribution, which can be most satisfactorily dealt with at the specific level, receive rather cursory treatment. There is no general coverage of subjects such as zoogeography and population dynamics, which claim a large share of the interest of modern mammalogists.

It is inevitable, in a compilation so large and so complex, that errors should occur. One may note, for example, the statement on page 7 that the geographic range of perameloid marsupials includes New Zealand, and on page 1653 that Simpson's classification of 1945 is followed in placing the Tupaiodea in the Insectivora. Fortunately these slips are not repeated in the detailed accounts of the respective groups.

The text figures, including drawings and halftone photographs, are remarkably clear and greatly enhance the usefulness of the work. The bibliographies are extensive and well chosen; they include some surprisingly recent titles.

Teachers, advanced students, and systematic mammalogists will find this treatise to be an indispensable reference and source book. Its publication represents an important milestone in mammalogy.

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Evolution, Genetics, and Man. Theodosius Dobzhansky. Wiley, New York; Chapman and Hall, London, 1955. ix + 398 pp. Illus. \$5.50.

This is an excellent text book for college students. It develops the orthodox genetic point of view on evolutionary mechanisms but includes enough of the dissenting opinions to show why this field of research is now very active and interesting. As befitting a textbook, a list of references to more comprehensive treatments of the various subjects that will be of interest to the reader is included at the end of each chapter. But this short book is more than a text. Dobzhansky has written a scholarly book that is fun for any educated man to read.

In view of the fact that the theory of evolution is the great central indispensable theory of biology, it is necessary and important to explain it to all men. Dobzhansky's wide interests, always centering around evolution, range from human creative effort such as the frontispiece reproducing Michelangelo's "Creation of Adam" and Old Stone Age art on the walls of the Lescaux caves to the short concluding discussion of the relation of science to ethics. The following quotation from the preface clearly states the intent and central theme of the book: "Biological evolution is a part of the evolution of the cosmos. The rise and the development of mankind are a part of the story of biological evolution. Man cannot reach a valid understanding of his own nature without a knowledge of his own biological background. It may, then, be that the study of evolutionary biology is the most important practical endeavor open to the human mind. Accordingly, an effort is being made in this book to show to the student that biology is not only a craft which is interesting to technicians and devotees but also a part of the fabric of modern humanistic thought."

Until this book appeared, there was no simple textbook of evolution that was centered around the genetic mechanisms. Dobzhansky has carefully integrated