and numerical values. It is outstanding, even in this well-documented book, for the care with which the purport of each reference cited is described in the text.

In all, a useful collection; it is hoped that further volumes will appear from time to time.

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Integrated Approach

Morphogenesis of the Vertebrates. Theodore W. Torrey. Wiley, New York, 1962. x + 600 pp. Illus. $9.95.

Admidst the repetitiousness of textbook publishing in the United States, something new is rare indeed. But Theodore W. Torrey, in his *Morphogenesis of the Vertebrates*, has achieved something new. This book is the first text to offer an integrated account of the materials that are generally considered separately in college courses of comparative vertebrate anatomy and embryology.

That embryological considerations make an all but indispensable contribution to the student's understanding of vertebrate history as revealed by comparative anatomy is universally granted. Every writer of a conventional text book on comparative anatomy acknowledges this fact by furnishing his work with a chapter on embryology; but in most cases these segregated chapters, usually limited to the initial steps in the formation of the embryo, succeed only in seeming awkward and irrelevant. Torrey, on the other hand, has taken the logical step of incorporating accounts of the development of each organ system into the discussion of the comparative anatomy of the system. Thus the embryological evidence can be drawn on wherever it seems useful.

After some introductory material devoted to vertebrate history, *Morphogenesis of the Vertebrates* proceeds through seven rather brief chapters dealing with basic embryological phenomena: these include gametogenesis, early amphibian and chick development, and mammalian reproductive cycles. Then follow the eight chapters that are the real novelty of the book. In these chapters on the special organ systems, the author weaves together the anatomical and developmental threads with a skill that convincingly demonstrates the value of the integrated method of presentation. Both text and illustrations are admirably clear.

Quite aside from its combining of matters traditionally dealt with in separate courses, this new text also deserves praise for its vital and dynamic character. Throughout the author has drawn on physiology, experimental embryology, and current research in paleontology to breathe life into facts that too many other writers are content to offer in an embalmed state. Thus one finds included such topics as the role of different kidneys in adapting animals to their environments, the identification of cardiac myosin in the chick blastoderm by immunochemical methods, and the significance of cartilage in the vertebrate skull.

Thirteen years ago I published a little text-manual designed for an integrated course in comparative anatomy and embryology. Though widely praised, this book has had slight influence on the teaching of anatomy and embryology in the great majority of American colleges. Many teachers who have admitted the logic of combining two interrelated subjects that were separated by historical accident have nevertheless gone on teaching their separated courses on the grounds that an integrated course requires a full-scale integrated text. This excuse (not very convincing at best) will hold no longer. Within the brief compass of 562 pages of text, Torrey has provided a book that fully realizes the potentialities of the integrated approach. His achievement is praiseworthy from every point of view.

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Modern Physics and Biology

Molecular Biophysics. Richard B. Setlow and Ernest C. Pollard. Addison-Wesley, Reading, Mass., 1962. xiii + 545 pp. Illus. $11.75.

This is not only a new book, it is a new kind of book as well. As far as I know it is the first *textbook* in which modern physics has been systematically applied to the study and behavior of biological systems, exclusively at the molecular level.

The level of presentation is that of the college senior or the first year graduate student, and the book "presupposes some knowledge of mathematics, physics, and chemistry and biology beyond the elementary level." It should be warmly received by both students and instructors who, through necessity, have previously depended on monographic materials and the current literature for use in course work.

It would be impossible to write a one-volume text on biophysics at this level (as it would be to prepare a one-volume, advanced physics text), but by restricting the discussion primarily to molecular phenomena, Setlow and Pollard achieve a surprising degree of completeness and continuity. The treatment of the material involves a number of concepts of intermediate physics, but quantum mechanics is not employed. In the choice and arrangement of individual topics, the authors indirectly emphasize the importance of selecting problems in (molecular) biology which are both significant in themselves and capable of treatment by physical methods. Although few biophysicists would choose the identical set of subjects treated here, probably fewer will object that many essential topics have been omitted.

Approximately equal emphasis is placed on general physical concepts and on the theory and practice of physical instrumentation. This is, however, not another 'how to do it' book, and the technical aspects of biophysics were not permitted to obscure the strategy of the physical approach. The text evolved during the presentation of this material to university students, and the previous preparation expected of students is fairly stated. The illustrations, both photographs and line drawings, are numerous and appropriate. Problems are given at the end of most chapters, and answers to selected problems are included. References to the recent literature accompany many of the discussions, and a list of relevant review articles and monographs accompanies each chapter. A few topics are developed to a somewhat speculative stage, unlike the practice in most texts; but this fact is clearly stated, and the evidence is given.

During the development of a new discipline, its successful maturation appears to depend upon its practitioners clearly stating its aims, appropriately circumscribing its subject matter, and then preparing textbooks which are faithful to these purposes. In this context I believe this book to be an important contribution to biophysics.

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