

Various charts, tables, and comparisons are utilized throughout. On occasion the diagrams and chemistry necessitate a thorough background in order to be useful. However, this is not likely to be a limiting factor for the use of the book as intended by the author. The contributing authors have provided in most instances excellent bibliographies which are up-to-date and do allow the potential of much more intensive review of a particular topic or area.

This book is recommended as an excellent quick reference to immediate broad concept applications. As a textbook it would be relative to a more specialized group of students, but as implemented by a master teacher it would have many very diversified uses. The authors have handled their subjects expertly and, further, they demonstrate a recognition of the ever-present problem of inevitable change and the necessity for continual attempts to "keep up to date."

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THREE CENTURIES OF MICROBIOLOGY, by Hubert A. Lechevalier and Morris Solorovskiy. 1974. Dover Publications, Inc. New York. 536 p. \$5.00 softback.

This book is not recommended for the novice biologist, nor is it recommended for one interested in "three" centuries of microbiology; however, for one seeking a thorough and detailed account of the last hundred years of medical microbiology, it will provide many hours of enjoyable and thought-provoking reading. By intertwining the lives and fortunes of many of the pioneers of microbiology, the authors create an exciting research fraternity which soon captures the reader's imagination. Although the focus is on selected individuals, dozens of their colleagues and collaborators are given deserved recognition in this very comprehensive survey. The terminology is oriented to medical research and is highly technical but should read easily for a student with previous experience in microbiology or for teachers seeking to spice their lectures.

The authors' style is to utilize the published writings of the particular investigator and to minimize romantic accounts. Thus, Pasteur's words are used to tell the story of spontaneous generation, and extended sections on Koch's anthrax and tuberculosis work read like a detailed laboratory manual. This provides a valuable tool for demonstrating to students the bench techniques of the masters and for showing the origins of common laboratory practices. To the unwary, though, the immense significance of these early papers may be missed since the authors do not pinpoint the critical passages nor do they interpret the findings in light of modern

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beliefs. A certain degree of background is likewise necessary to realize that tuberculosis organisms are not ". . . spore-bearing tubercle bacilli . . ." or later to decipher Kluver's great weakness for the ". . . host of Beijerinck's *contagium vivum fluidum*." Loeffler's writings on diphtheria are especially stimulating because they vividly portray the failures and frustrations which often precede discovery. The budding scientist will find solace in such experiences.

A refreshing change from the medical orientation is presented in Winogradsky's work in soil microbiology. This should interest ecologists and biochemists. The chapter on viruses includes a unique description of the development of the electron microscope but omits much of the recent discoveries in virology. The authors pay homage to mycology with a history of man and the fungi and an extensive treatment of Raulin's studies on fungus growth. Particularly good accounts are given of the excitement which accompanied the development of penicillin and streptomycin.

In general, the narrative moves smoothly from one investigator to the next and covers virtually all aspects of microbiology by subject. Keen attention is paid to the passage of information and experiences from each of the masters to his students. The book contains a helpful index as well as numerous references. The reading tends to be ponderous at times and requires attention to detail, especially the early chapters on Pasteur and Koch. For the

serious historian, though, this book is one of the best in its field and is well-worth the \$5.00 investment. Two questions, however, still perplex this reviewer: where are the two missing centuries of microbiology and why is the cover adorned with a full color photograph of the intestine of a frog?

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Physiology

INTRODUCTION TO HUMAN PHYSIOLOGY, by Mary Griffiths. 1974. Macmillan Publishing Co., Inc., New York. 575 p. \$12.95 hardback.

This is a textbook intended for a general course in human physiology. Contrary to the author's belief, the book is not suitable for almost any group of students but rather for those who have an adequate background in biology, human anatomy, and chemistry. The main emphasis is on how the body meets changing demands while maintaining the internal constancy necessary for the functioning of cells and organs. Besides basic concepts and well-established facts, many controversial areas are also touched upon. Difficult concepts are clearly explained with excellent illustrations. In many instances technical terms have been put in parentheses or into footnotes that appear in the index for further reference. Additional references and selected readings are listed at the end of each chapter along with excellent review questions.

The chapters are well organized, giving the reader a basic foundation before entering the more complex physiology of the systems; each chapter serves as a building block for the following unit. One outstanding feature, in particular, is that Griffiths introduces topics of contemporary interest in most chapters.

Many physiology textbooks cover vast amounts of subject area leading, in many cases, to confusion, misunderstanding, and, more importantly, disinterest. This, however, is not the case of Griffiths' book. The author is to be commended for a well-organized, well-written, and well-illustrated book.

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AN INTRODUCTION TO ANIMAL PHYSIOLOGY, by James Larimer. 2nd ed., 1974. William C. Brown Co., Dubuque, Iowa. 168 p. \$2.95 (softback).

The text of this book is directed to the needs and interests of physiology students, particularly those who may need some of the more difficult concepts of

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physiology briefly clarified. Although this book is written for the beginning college student, advanced high-school biology students will find it useful.

The information in Chapter 2, covering the body fluids, illustrates and explains membrane physiology particularly well. The explanation on membrane function utilizes the most recently available concepts, but may leave the reader searching for more detail. The illustrations blend well with the descriptive material. The author uses some new diagrams to illustrate the active and passive membrane functions which are helpful. Many more traditionally used diagrams are found throughout the remainder of the text, which provides good orientation to the concepts.

The clarity and brevity of the topics will stimulate the student to seek additional sources. Students will find references listed at the end of each topic useful in seeking a detailed explanation of the topic.

The remaining chapters provide a broad base of information on cellular controls, such as nutrition, excretion, osmoregulation, respiration, and gas transport. The physiological systems' function are then presented.

The book is one an instructor would feel confident to place in a student's hands to provide him with a review of

fundamental physiological concepts. It will be a useful addition to the library.

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ANATOMY AND PHYSIOLOGY LABORATORY MANUAL, by Harold J. Benson and Stanley E. Gunstream. 5th ed., 1974. Wm. C. Brown Co., Publishers, Dubuque, Iowa. 240 p. \$5.50 softback.

This manual is intended for use in a one-semester introductory anatomy and physiology course that consists of two or three hours of lecture and three hours of laboratory per week. The text is a shortened version of *Anatomy and Physiology Laboratory Textbook* by the same authors, published also by Brown, and available in a ninth printing, 1974, \$7.95. It would be helpful for teachers to know that the publisher has available an answer manual called "Laboratory Report Solutions for Anatomy and Physiology Laboratory Textbook." But because of changes in pagination it takes much time to try to match up the answer key to the shorter version. It would be helpful if the authors and publisher made available an answer key designed especially for the shorter version.

This manual has 32 exercises, whereas the longer version has 40. Cat anatomy has been deleted, but there are dissections involving rat, frog, and viscera of sheep and cow. Also omitted are some physiology experiments involving skeletal muscle contraction, metabolism, and digestive enzymes. The exercises in this manual cover four types of activities: illustration labeling, anatomical dissections, microscopic studies, and physiological experiments.

The manual is organized into five general areas: (i) fundamentals (anatomical terminology, rat dissection, microscopic study of cells and tissues including mitosis); (ii) body support and movement (skeleton and muscle systems of man); (iii) perception and coordination (reflex experiments, brain anatomy [the sheep and human brains are compared], ear and eye); (iv) support of metabolism (blood, heart, respiration, digestion, skin, urinary system, endocrine glands); (v) reproduction (male and female organs and meiosis).

Laboratory reports for each area are grouped at the end of the manual. The pages are perforated and the student can tear out the report sheet and work on it while doing the experiment in the front of the manual and then turn in the report to the instructor. The manual is well illustrated and the experiments are clearly described with a de-