

Book Reviews

Cell and Molecular Biology

FUNDAMENTALS OF GENERAL, ORGANIC, AND BIOLOGICAL CHEMISTRY.

by John R. Holm. 1978. John Wiley and Sons (605 Third Avenue, New York 10016). 765 p. Price not given.

This is an excellent textbook designed for use in a one-year chemistry course by students in the health professions who do not require more rigorous chemical preparation. Students in nursing, dental technology, nutrition, and home economics, are often well served by such a course. The presentation is at a level that does not demand more mathematical preparation than arithmetic and simple algebra. Examples and illustrations are largely drawn from the health sciences. The book has 10 chapters on general inorganic chemistry followed by 9 chapters on organic chemistry and is completed by 11 chapters on biochemistry. Five appendices (calculations, exponentials, rules for naming compounds, etc.) and an adequate index are included. A soft-cover student guide and a laboratory manual to accompany this textbook are available. All of the chapters follow a similar format: (1) A photograph and caption to draw the attention of the student to the subject of the chapter. The photo is often medically related, e.g. a kidney dialysis apparatus for the chapter on water. (2) A paragraph or page of introduction and discussion of broad aspects of the subject. (3) Often terminology is introduced and defined at this point. (4) The subject at hand is then presented in an orderly fashion in numbered sections of the chapter. (5) Each chapter concludes with a brief summary of the important points covered in each of the sections of the chapter. (6) A few (3-8) selected references are then given with a brief sentence or two describing the contents. (7) Questions and exercises (5-30) are presented. These are exceptionally well done and will provoke thought and encourage real learning.

The book is obviously written by a master teacher who enjoys his work. Students will find the book easy and enjoy-

able to use. Instructors will like the well-organized approach and all of the helps and illustrations. The text not only reads well, but the format and typeface are clear and inviting.

This book does so much so well for the student that I am almost embarrassed to ask if it does too much. Is there a limit to spoon-feeding students? Should there be a difference between high school and college texts? A few minor points did bother me. The table on page 44 lists both atomic mass and atomic weight; however, neither in the table nor in the text is the difference between these columns clearly explained. Some of the organic chemistry sections are a bit intense—lots of information per square centimeter. A limit dextran (p. 457) contains 6-8 glucose units rather than 4-6 as shown. Also, the nature of iodine binding to starch is known. While plants are never mentioned, a β -amylase (p. 458) is illustrated with no mention that it does not occur in mammals. Personally I would prefer to present glycolysis before the TCA cycle and electron transport (p. 606, 608, 616). The presentation on gluconeogenesis and The Cori cycle is at least 20 years out of date (p. 624). Nowhere are the sugar nucleotide pathways for carbohydrate synthesis mentioned. I submit that students may find confusing the terminology common to mammalian biochemists of essential and nonessential amino acids (p. 663). All are necessary for protein synthesis and function. Some (essential) amino acids must be ingested by mammals. Many organisms have retained the capacity to synthesize even these. On the positive side I was delighted to see a fluid-mosaic model of a membrane. How exciting to see a photograph of a model for DNA reproduced from *Psychology Today!* Which discipline has matured, chemistry or psychology?

Despite minor reservations, if you require a well-written, beautifully produced textbook for a one-year course in chemistry (inorganic, organic, and biochemistry) designed for students in the health-related sciences I recommend Holm's book to you. Both you and your students will enjoy it.

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Physiology

HUMAN ANATOMY AND PHYSIOLOGY: A COMPLETE SELF-STUDY PROGRAM

by Joseph N. Muzio and Peter Pilchman. 1977. Burgess Publishing Company (7108 Ohms Lane, Minneapolis, Minnesota 55435). 716 p. Price not given.

Self-study programs provide an alternative to the traditional lecture-based courses. The program outlined in this book consists of 26 learning modules that include both lecture material and laboratory instructions. The level is that of an introductory course for students preparing for nursing and the allied health professions, and assumes some general knowledge of biology and chemistry.

Because the text is the primary agent of instruction, it has to be evaluated rather differently than it would be if it were just one of the sources of information supporting a lecture. A self-study text should have high clarity, be fairly comprehensive, anticipate the questions that cannot be directly asked, provide review material and self-tests, and give references to further information. This book successfully meets these needs. It is well-written and the original illustrations are generally good. It covers the usual subjects—cells, tissues, body systems—and also such topics as arthrology and musculo-skeletal relationships, physiology of exercise, and human genetics. There are a few places where independent learning will be difficult. For example, in Chapter I, the regulation of Ca^{++} ions and of rate of breathing are given as examples of homeostasis, but the students do not yet have the appropriate background to appreciate the examples. However, in most cases the examples are apt and helpful, particularly the many applications of physiological principles to health maintenance.

A clue to the content of the "lecture" materials is found in the lists of learning objectives that begin each chapter. These usually ask the student to be able to define, state, list, identify, describe, or outline a process or structure. If a class session is intended to do no more than this, this course should be very successful. I

would prefer to see a college course oriented towards more intellectual growth. Mastery of subject matter is a valid but limited objective. The student should also learn how conclusions were reached, how to analyze, compare, and develop ideas. Physiology is an excellent discipline for introducing students to scientific modes of reasoning. Unfortunately, a self-study course inevitably tends to emphasize the "learn and return" kind of education. If more is expected, the course must be staffed by instructors willing to guide the student's growth on an individual basis, in which case some of the potential convenience of a self-study course is lost.

It is difficult to compare this book with other anatomy and physiology books because its intent is different. In comparison with other anatomy and physiology books we have used (Anthony and Kolthoff, *Textbook of Anatomy and Physiology*; Langley, Telford and Christenson, *Dynamic Anatomy and Physiology*, McGraw-Hill; Crouch and McClintic, *Human Anatomy and Physiology*, Wiley; Jacob and Francone, *Structure and Function in Man*, Saunders), it compares favorably in general coverage of the material. In physical appearance, the book is

less attractive in that it is printed from a typed manuscript and is inconveniently large and bulky. It includes no photographs, micrographs, or colored illustrations. This soft-cover book is punched with 3 holes for ring binders. Additional instructional materials, such as audio-tapes, are available from the authors.

Within the limitations of the self-study format, this book does an excellent job.

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A LABORATORY MANUAL OF MAMMALIAN ANATOMY AND PHYSIOLOGY

by Sigmond Grollman. 4th ed., 1978. Macmillan Publishing Company Inc. (866 Third Avenue, New York 10022). 301 p. Price not given.

Designed to encourage student independence, Grollman's manual is easy to follow both in illustrations and narration. Though it is called a manual, it is actually more of a study guide. It is intended for undergraduates desiring a basic, overall knowledge of anatomy and physiology. *A Laboratory Manual of Mammalian Anatomy and Physiology*, and the ac-

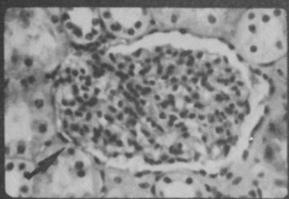
companying text, may be used as a one-semester program or extended over the entire year. Both books have been considerably improved by recent revision.

The material covered includes 36 units on mammalian structure and 36 experiments, half of which are physiology. The physiology experiments employ the use of older equipment, such as the kymograph, plus more modern devices, such as the electronic recorder.

Another up-to-date feature of the manual is the artwork. Actual photographs and excellent line drawings show body systems of typical mammals.

I feel that few teachers would use all of the experiments because there is a sameness of approach throughout the book. For students accustomed to the inquiry method in science, these conventional experiments may seem less challenging because most of them invite no further investigation. However, the laboratory techniques are varied, and if the student is permitted to choose which experiments s/he will perform, perhaps the real challenge is to select the set most beneficial to the individual.

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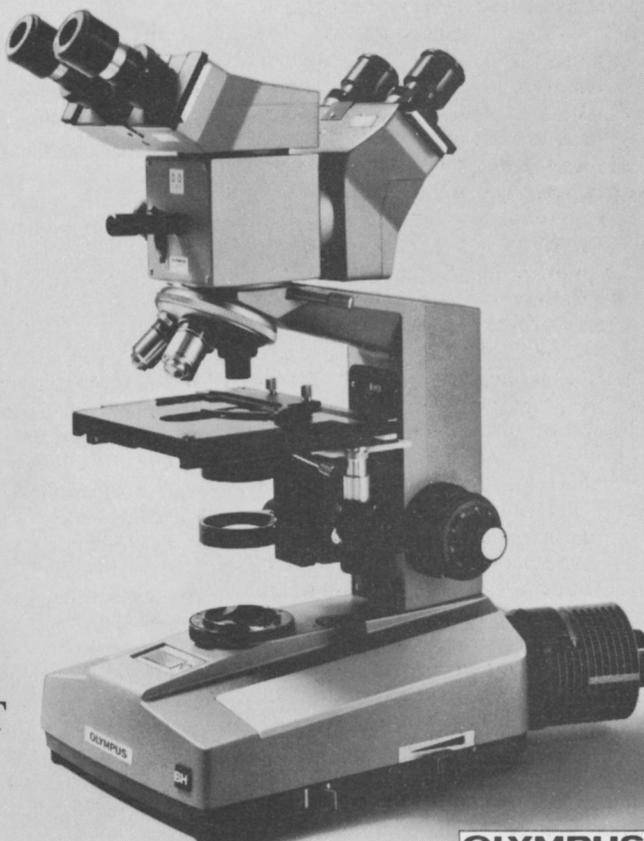


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