

The book is written by a teacher; this is evident throughout because of the wealth of examples and analogies. But, as is true in many texts, it is encyclopedic and will require the careful editing of the teacher who uses it.

A LABORATORY SURVEY OF BIOLOGY, 2nd Ed., William A. Cooper and Lawrence S. Dillon, 295 pp., \$5.95, The Macmillan Company, New York, 1969.

The small type in this volume is somewhat difficult to read and follow. The organization follows a rather classical approach leading from the microscope to the plant and animal kingdom to genetics and evolution. The heavy stress on invertebrates and vertebrates with lesser attention to lower plants leaves little time for developmental biology, environmental biology, or population biology. With the exception of tasting PTS paper and examining for hairs on upper surface of fingers, the genetics labs are essentially dry labs. The evolution labs are somewhat refreshing in using comparisons of monkey, ape, and man in the laboratory.

This laboratory manual follows the typical didactic observe, identify, sketch and label, and fill-in-space approach. An interesting attempt is made to provide a functional aspect of organic chemistry to students but it is mainly expository. The models developed however may still be worth the space and time.

About 90% of the laboratory manual deals with structure of biological organisms, 8% deals with plant and animal function, with 2% skills. Little or no serious consideration is given to the development of understanding of biological concepts. If the authors consider the concept of evolution one of the key concepts in biology, there ought to be frequent reference to the concept in the host of laboratory exercises on plant and animal phyla. Little or no attention is given to principles or concepts of biology unless perhaps the authors like so many others believe that students will intuitively relate data from various sources to arrive at biological principles and understanding.

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PATHWAYS IN SCIENCE, THE MATERIALS OF LIFE, BIOLOGY I, Joseph M. Oxenhorn and Michael N. Idelson, 177 pp., \$1.50, Globe Book Company, Inc., New York, 1968.

This book on biological science is so unique in concept and approach that all biology teachers at the secondary level could well afford considering it. But right away, before any misapprehension of its novel contribution might occur, it should be noted that

it is one volume of a series designed for secondary-school *slow learners*. The format can be characterized by the terms brevity, attractiveness, succinctness, repetition, drill, and practical up-to-date application. Each chapter is short, to-the-point, well-illustrated, and high-lighted with side-headings and sub-headings. One simple question heads each chapter; the question is answered by uncomplicated observations and examples; illustrations reinforce the single concept under consideration; a concise summary section, "You Now Know," finalizes the learning in a forthright manner. Technical terms are definitely employed—but with a difference. They are judiciously used and kept to a minimum; their pronunciation is clarified parenthetically by phonetic spelling; they are repeated in a glossary at the close of each unit, a glossary that is ideally designed for its intended readership. Simple—but meaningful—experiments are included, and, once again, presented in a novel, pictorial manner.

Rounding out the usefulness of this publication for slow learners (high-schoolers who read at the fifth to sixth-grade levels) is a comprehensive teachers guide including lesson plans, tests, test answers, summaries of concepts, and suggestions for special didactic methods.

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PHOTOBIOLOGY, Jerome J. Wolken, 113 pp., \$2.25, Van Nostrand-Reinhold, New York, 1969.

A paperback on various aspects of the organism's response to light, or more accurately, a small portion of the electromagnetic radiation spectrum. Thus, the subject is treated under the headings of: 1) Pigments, 2) Photosynthesis, 3) Chloroplasts, 4) Photomotion, 5) Vision, and 6) Compound eyes.

The author writes easily and uses his favorite organism, *Euglena*, frequently. There are many diagrams and a few illustrations. It is a fine summary of our current state of knowledge on this important aspect of biology which defies the botanical and zoological dichotomy.

EXPERIENCES IN LIFE SCIENCE, Eugene H. Kaplan, 229 pp., \$3.95, The Macmillan Company, New York, 1969.

Few courses in the college biology department cause as much difficulty as the introductory course. The obligation to prepare a course which has meaning to non-majors and which can convey something of the spirit and the nature of science weighs heavily upon the instructor. An additional factor which is becoming increasingly important is the change in science education which is slowly coming to the elementary-sec-

ondary scene. This book provides an interesting alternative to the typical "show me" laboratory experience so prevalent in general biology.

Oriented around problems the student investigates, the guide provides background information and suggests questions bearing on the solution of these problems. Stress is placed upon a better understanding of the nature, of science, though the content areas of biology are also well represented. The approach used may be illustrated by describing the first exercise. Students are introduced to the role of observation via the use of a closed "puzzle" box. Having inferred the contents of the box, the student uses his knowledge of observation, coupled with logical scientific analysis in a hypothetical problem—the purchase of a car (the other problems are biological in nature). Selected readings are introduced to illustrate the relationship of science to society and to the individual. Tools typically used in the laboratory are introduced as devices to extend man's senses and not as an end unto themselves. Generally, the questions are leading, open-ended, and thought provoking.

Many instructors will find it difficult to refrain from telling the students what to do or what to answer and others will be concerned about items not present. But for the instructor who wants a different approach, who is concerned about his obligation to help develop an understanding and informed laity, this guide is highly recommended and certainly worthy of consideration.

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PHOTOGRAPHIC STUDY GUIDES FOR MODERN BIOLOGY, C. Berger and G. Zailer, 170 pp., \$8.95 (also available as separate sheets in packets of 30), Educational Methods Inc., Chicago, 1968.

The authors of this work have discovered a much more expensive way of presenting the kinds of information available for years in such forms as Turtoz Quiz sheets. Instead of lucid line drawings, they have used photomicrographs of biological materials. Unfortunately, many of the photographs are of poor quality. The *Euglena*, page 71, is nothing more than a dark blob and the *Eudorina*, on the same page, offers little more detail. There are literally hundreds of better photographs of the paramecium than appear on page 167 and, without the title, it would be difficult to know that the authors had stomates in mind in the illustration on page 105. Many of the photographs are too small to see the detail called for. A cross section through a planarian, for example, on page 9, asks students to identify longitudinal muscle from a series of what must appear to them to be nothing but tiny dots. On page 35