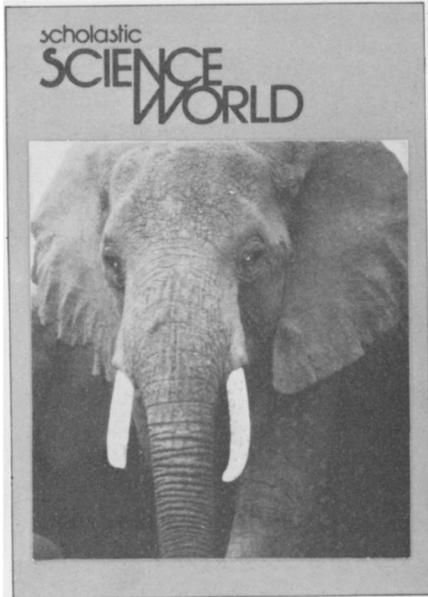


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ual to assist the student are many tables on solutions, pH, weights and measures, respiration and definitions. Many of the laboratories could be used in an advanced high school physiology course.

I recommend this manual as a sound aid to the study of human physiology when used in part or in total.

Clyde Joel Captenter
Moses Lake High School
Moses Lake, Washington

LABORATORY INVESTIGATIONS IN HUMAN PHYSIOLOGY

by George K. Russell. 1978. Macmillan Publishing Company, Inc. (866 Third Avenue, New York 10022). 347 p. Price not given.

This very good laboratory manual is intended to be used in undergraduate human physiology courses and is designed to accompany any textbook. I found that the manual itself does a very good job of teaching material related to each investigation. However, those instructors who consider using this manual should be aware that it presumes a knowledge of introductory college biology and introductory college chemistry. The manual also makes a very good resource tool for the high school teacher. Some of the exercises could be done by high school students, and others could be done as class demonstrations.

The manual is set up as a consumable text with perforated pages, which are also punched for use in loose-leaf notebooks. Each exercise begins with a statement of objectives and up to four pages of introductory material. This is followed by a complete list of materials, a thorough description of procedure, a series of "study questions," a list of references, and pages designed to record results and conclusions. I found the "study questions" particularly significant because they help to relate actual observations with practical considerations related to the content of the exercise. Frequently these questions require library research and considerable thought-provoking analysis. Bravo! This certainly beats simply looking back in the exercise to find the answer.

The author enhances the student's interest in human physiology by providing experiments that make use of the students themselves as experimental subjects; yet, much care has been exercised to provide experiments that are safe and still represent all the aspects of physiology.

The appendix includes an annotated listing of films and videotapes that the author feels will help to increase student

interest and motivation because the films unite theory with practical problems and considerations. Another useful feature of the manual is the inclusion of the name and address of suppliers of unusual equipment and reagents.

I strongly recommend this manual for use in college laboratories and secondarily as a reference and idea book for high-school teachers.

Calvin Reitsma
Covenant Christian High
Walker, Michigan

Zoology

GOATS, SHEEP, AND HOW THEY LIVE

by Marie M. Jenkins. 1978. Holiday House (18 East 53rd Street, New York 10022). 157 p. \$7.95.

This text deals with a complete approach to the history, evolution, physiology, and behavioral patterns of goats, sheep, and other similar animals. The book should be appealing and informative to any person who has an interest in animals. It is written in an easy fluent manner and contains suitable material to enrich the zoological backgrounds of junior and senior high school and college students.

A great deal of research has gone into the author's presentation. Many of the chapters make reference to research by authoritative sources that have been involved in conducting similar research.

The author continually emphasizes the need for conservation and preservation of most species to ensure their survival. Throughout the entire book, emphasis is placed on the interrelationships and interdependencies of these animals and their environments.

A very attractive feature of this well-written book is the drawings and illustrations of the various species of goats, sheep, and what the author refers to as goat-sheep puzzlers. Historically the book has very good organization. It starts with animals that existed in the past and continues to modern times.

Several of the chapters made mention of the way in which it is thought goats and sheep migrated from Asia to America. A bridge of land between Siberia and Alaska called the Beringer that existed before the ice-age served as a migratory route.

The chapters that deal with the progressive development of physiological characteristics through natural selection and adaptation give a concise description of the need for these changes. The development of special

adaptations to ensure survival in changing environments is a predominant feature of the presentation. Of particular interest was the development of the hoof of the animal so that it could keep a foothold on the steep rocky cliffs in the high mountains of Asia and America.

Special emphasis is placed on the economical aspects of the domestication of these animals. That they are in most cases relatively easy to raise and require little food other than what nature provides makes them an attractive animal to raise for profit. The chapter entitled "Gifts of Goats," elaborates on the numerous products that can be obtained and marketed from this unusual group of animals.

The chapters that deal with the origin, propagation, and preservation of the sheep and goats in the United States present the reader with an interesting account of these animals in our country.

The text of this book is one of the most interesting accounts of animals that I have had the pleasure to read. I feel that any person who has an interest in animals would benefit from reading this book.

James E. Seiple
Huron High School
Huron, Ohio

BIOLOGY OF EARTHWORMS

by C. A. Edwards and J. R. Lofty. 2nd ed., 1977. Halsted Press, Division of John Wiley and Sons (605 Third Avenue, New York 10016). 333 p. Price not given.

The authors claim this book to be a comprehensive text on the biology of the earthworms; it is. It discusses in great depth the morphology, taxonomy, biology, physiology, and ecology of the earthworms. It also includes other chapters on the role of the earthworm in organic matter cycles, earthworms and microorganisms, the effects of agriculture on earthworm populations, and earthworms as pests and benefactors. Because of the breadth of the material covered in this text, it can be used in all levels of biological education. However, it would be especially valuable to graduate students doing earthworm research, particularly in the areas of biologic sludge digestion, and earthworms as a protein source. Further many commercial worm growers encouraged by the market potential of the redworm (*Eisenia foetida*) to convert sewage sludge to useful humus material will find this text valuable in developing a greater knowledge about the earthworms that they intend to raise.

Beginning with the first chapter on morphology, the reader is immediately brought into the world of the earthworms. The discussions on the structure of the worm are richly supplemented with exceptionally fine photographs and diagrams of the external and internal structure of the earthworm. This chapter alone would be instrumental in assuring the success of those students of biology who so early in their career must dissect the earthworm as part of their introduction to this science. The chapter on taxonomy is equally thorough; that on the "Biology of the Earthworm" gives a complete review of the reproductive behavior and life cycles of these organisms. Unfortunately in this chapter, the life history of so many species of earthworms are discussed that the text becomes confusing and difficult to follow. The last chapter in the book, "Simple Experimentation and Field Study with Earthworms," should be valuable to those students in general biology who must perform simple biological experiments as part of their coursework. Earthworms as an experimental organism, are plentiful, inexpensive, relatively easy to cultivate, and require no complex holding structures or licenses. The book also includes a very useful simplified key to common genera of terrestrial earthworms, a discussion of nomenclature, a short glossary and an excellent reference section.

This book may not be for everyone but it will certainly serve as a fine text or reference for those people interested or involved in the study of earthworms.

Richard B. Glazer
Ulster County Community College
Stone Ridge, New York

THE HYDRA

by Stanley Shostak. 1977. Coward McCann and Geoghegan, Inc. (200 Madison Avenue, New York 10016). 47 p. \$5.96.

The life history, morphology, physiology and behavior of the hydra are thoroughly explained in this text. The book also includes many excellent illustrations, photographs and photomicrographs of hydras. (The photomicrographs are credited to Jane A. Westfall.) It is well indexed and contains a glossary.

After describing the importance of hydra research on regeneration, aging and cancer, the author gives instructions on how to set up a home or classroom laboratory to study hydra.

The book would be useful in elementary and junior high science classrooms.

George H. Ratzlaff
Central Junior High
Hutchinson, Kansas

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