Book Reviews

• Readers' comments on reviews should be addressed to the Editor.

BOTANY

THE MYXOMYCETES, by George W. Martin and Constantine J. Alexopoulos. 1969. University of Iowa Press, Iowa City. 560 pp. $30.00.

Both professional and amateur myxomycete collectors will look to this monograph for many years as the most authoritative reference available. The major portion of the book is taxonomic, but in addition to the concise formal description for each taxon the authors provide valuable informal comments reflecting many years of first-hand observation. The illustrations, representing most species, are in color, and they show gross as well as microscopic aspects of fruiting bodies. The simple dichotomous keys, along with the illustrations, allow for relatively easy identification of specimens. Very useful also is the extensive taxonomic bibliography.

Twenty-two pages of introduction give an overview of the morphology, life cycles, cultivation, ecology, and geographic distribution of the Myxomycetes, and there is an historical sketch of myxomycete taxonomy. References cited in the introduction constitute a good cross-section of the available literature.

With the publication of this volume, the authors have given us the benefit of their long years of devotion to the Myxomycetes. The result is a testimony to their expertise.

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HOW TO KNOW POLLENS AND SPORES, by Ronald O. Kapp. 1969. Wm. C. Brown Co., Dubuque, Iowa. 249 pp. $3.25 (softback).

This book, in the "Pictured-Key" series, is designed primarily as a general key for the casual polynologist and for those involved in the diverse fields in which a limited knowledge of polynology (pollen and spore classification) would be of some value. Basic information on structure, preparation techniques, and sampling procedures takes up the first 19 pages. The remainder of the book is a comprehensive pictured key to major spore and pollen types.

Like other books in this series, this one would be useful in the field. In most cases it would provide at least enough information to establish the generic classification of the specimen.

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PLANT AGRICULTURE: READINGS FROM SCIENTIFIC AMERICAN, ed. by Jules Janick, Robert W. Schery, Frank W. Woods, and Vernon W. Ruttan. 1970. W. H. Freeman & Co., San Francisco. 254 pp. $10 hardback, $4.95 softback.

For readers in today's urbanized society this collection of articles is particularly well chosen and comprehensive. As Frits Went says in his contribution: "In our elaborately industralized country we tend to lose sight of the fact that modern man's life still depends fundamentally on agriculture. And it is difficult to appreciate how insecure this foundation is, from the standpoint of feeding a growing population."

The articles appeared in *Scientific American* between 1950 and 1969. They are organized into five general sections: agricultural beginnings, plant growth and development, plant environment, production technology, and food needs and potentials. The views of archaeologists, historians, food scientists, and cell biologists meld with those of agriculturists into something worthwhile. The reader sees the spectrum of time and technology in the development of plant agriculture, its contributions to society over the ages, and the projections of plant agriculture's future, as well as what society will demand from plant agriculture.

A most refreshing feature of the volume is that many of the authors speak from outside the agricultural establishment; that is, the U.S. Department of Agriculture and the land-grant colleges.

If there are scientific subjects that are slighted, they are the problems of managing insect-pest populations and the reduction of attacks on plants by diseases, nematodes, and other competing biological forms. Additionally, the human element might well have received more emphasis, to achieve balance. However, the book is a comprehensive reference work for teachers of biology and their students. An outstanding feature for the young man or woman is that it opens up vistas of scientific and technologic opportunity in fields related to plant agriculture. These opportunities should increase as time goes on, according to several of the authors.

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AN INTRODUCTION TO INDUSTRIAL MYCOLOGY, by George Smith. 6th ed., 1969. St. Martin's Press, New York. 390 pp. $14.50.

This new edition is a posthumous work, completed by the author before his death and seen through the press by the author's son and wife. It is intended to meet the needs of those who wish to study "moulds" rather than fungi in general, and its organization reflects this. To a general mycologist the chapter organization is somewhat puzzling; for example, yeasts are not discussed in the Ascomycetes chapter, and *Aspergillus* and *Penicillium* are not included in the chapter on Fungi Imperfecti.

The bibliographic entries at the end of each chapter are rather good and are current up to about 1966. However, citations of some rather important recent works that would be useful to teachers and students are missing. The chapter on laboratory equipment and techniques is extremely well written but is somewhat dated: there is no mention of the use of metal or plastic closure-caps for culture tubes or of autoclavable plastic plugs. The appendix dealing with microscopy, photomicrography, etc., is useful, especially since many "industrial mycology" applications necessitate innovations beyond the usual laboratory microscopy.

Teachers of biology will find the book useful in its sections on technique. It does not pretend to be a general text and will likely find greatest use by those teachers and students who are engaged in research problems with fungi.

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EDUCATION

FUNDAMENTALS OF LEARNING AND MOTIVATION, by Frank A. Logan. 1970. Wm. C. Brown Co., Dubuque, Iowa. 226 pp. $3.95.

This is a beginning book dealing with learning and motivation. It is free of the formal vocabulary, the technical detail, and the completeness that would result from the inclusion of alternative theories and interpretations. The author has used examples from the common experiences of most readers—even though, as he points out, this may create the illusion that psychology is "simple, familiar common sense." Logan further cautions the reader (in the preface) that any general book can create misconceptions through omitting detail, exceptions, elaborations, and qualifications. He states his belief, however, that "the most useful introduction to a complex topic is a coherent oversimplification." Logan admits that the book is a heavily biased, selective presentation that paints a consistent and integrated picture of the fundamental principles of learning and motivation. The book is based predominantly on research involving simpler animals or man in very simple laboratory situations, and this may lessen its attractiveness for some.

Logan points out what some will insist is a glaring weakness of this book.

In his "Concluding Remarks" he says:

> There are many behavior scientists who do not find the approach taken in this book attractive. By-and-large, these are ones who have begun their study of human behavior in more complex contexts and who have found these principles wanting, at least at their present stage of development. And their response has been to devise other language systems which appear more amenable to the variety of emotions, interests, personalities and intellects encountered in such contexts. And this, too, is a reasonable approach since no one can confidently foretell what a comprehensive theory of behavior will look like.

A particular strength of the book is its exemplification of the nature of science. Logan is careful to outline the basis for theoretical statements. He cautions the reader concerning interpretations. He welcomes the new discoveries that will come and the effect they will have on the theories and explanations he proposes now. The book is a good one to illustrate psychology as a science and the nature of a relatively "young" science.

The book is recommended for students of educational psychology: it is a good "first book." It is also recommended for practicing teachers who desire a review of learning theory and motivational techniques. The ideas are perhaps most useful for in-service teachers, who have had experiences with students and their problems of learning and adequate motivation. The true–false items found at the end of each chapter provide an interesting self-testing device for summarizing and applying the principles in each chapter.

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AMERICAN BELIEFS AND ATTITUDES ABOUT INTELLIGENCE, by Orville G. Brim, Jr., David G. Glass, John Neulinger, and Ira J. Firestone, with the assistance of Sally C. Lerner. 1969. Russell Sage Foundation, New York. 291 pp. $7.75.

Standardized tests are one of the foundation stones of the American educational system. Everybody is aware of them, and most people take them. But, as this study points out, there are wide lacunae in popular understanding of the rationale of such tests.

This volume is part of a program of studies focusing on the social impact of intelligence tests. The program is jointly underwritten by the publisher, the Carnegie Corp., and the U.S. Office of Education. The present volume is essentially a public-opinion survey of 10,000 secondary-school students in three groups: public, private, and parochial.

An introductory explanatory chapter is followed by 11 substantive chapters, each of which summarizes student opinion on one aspect of intelligence testing. Following the authors' recommendation to treat each chapter as a separate essay, I read several chapters carefully and with interest: those dealing with the origin and stability of intelligence, the accuracy of intelligence tests, ability grouping in schools, and self-estimates of intelligence. I skimmed some of the remaining chapters: on experience with tests, attitudes toward testing, reporting of results, and perceived consequences of testing.

The authors' conclusion, stated in the introductory chapter, is that there is wide variance, and much confusion and misunderstanding, in student beliefs and attitudes about intelligence testing. This conclusion seems to be supported by summaries of results in the 11 substantive chapters. Several appendices deal with the methodology of the study, and thus amplify the summaries given in the body of the book. The authors also indicate how access may be gained to the full returns—a commendable procedure. A final appendix compares a survey of adult opinion with returns from students. There are differences, but they do not appear to be striking.

The authors have some recommendations. Because of the importance of intelligence and other standardized tests in the American social structure, they urge that "major national efforts be made to educate the American population about the nature of intelligence and its testing." This effort should reach students, school personnel, and the general population, including parents. They also urge that schools be more open in giving out test results.

This careful study should be of great interest to people working in psychology, evaluation, guidance, and administration. The classroom biology teacher who picks it up will probably feel as the boy did about the book on elephants: there is more here about intelligence tests than he wants to know.

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SCIENCE FOR THE ELEMENTARY SCHOOL, by Edward Victor, 2nd ed., 1970. Macmillan Company, New York. 796 pp. $10.95.

This is a new edition of a widely used textbook of elementary science education. Although this is a new edition, a comparison with the previous edition reveals few significant changes other than the rewriting of certain sections for greater clarity. Only five pages are devoted to the development, philosophy, and objectives of federally financed projects in elementary science curricula. One sample lesson is provided from four separate projects; however, no analysis or comparison is offered.

The book separates well into two parts: (i) pedagogic aspects of teaching science and (ii) basic science information and learning activities. Basic science information is treated mainly by way of an outline of facts (content), and the section on learning activities suggests a demonstration approach to the teaching of science and does not emphasize process skills. The content section on aerospace and space travel has not been rewritten since the 1965 edition, and the content section dealing with weather does not include information on weather satellites or on other, recently developed means of predicting and analyzing the weather.

The section devoted to methods of teaching science does not encourage the teacher to emphasize the activity approach. No help is given the teacher in developing questioning techniques and skills. Little attention is paid to the development and use of behavioral objectives. Teachers are encouraged to use quantitative as well as qualitative results in the classroom, but no information is provided on how to help children obtain quantitative data and then deal with the data.

The book is well organized and may be a useful reference for the elementary teacher. The subject matter, or topic, outline will be most useful to pre- and in-service teachers. The book has no particular interest for biology teachers unless they are assisting in an in-service program.

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INNOVATION IN LIBERAL ARTS COLLEGES, by Michael Brick and Earl McGrath. 1969. Published for the Institute of Higher Education by Teachers College Press, Columbia University, New York. 173 pp. $3.95.

The system of higher education in America is undoubtedly under stress. Whereas innovation in the curriculum of secondary schools started dramatically with SMSG math, PSSC physics, and BSCS biology at least a decade ago, such awareness of need for change and innovation in higher education became most apparent to educators soon after the Berkeley uprisings. The liberal arts college by its very nature should have been the scene of innovation. The authors describe such innovation in separate chapters on curriculum, instructional methods, the new role of students, and organization of the liberal arts college.

One of the most refreshing developments was the interdisciplinary approach: some institutions began to teach the interrelatedness of physics, chemistry, biology, and mathematics. In extending this concept, faculty were