

Book Reviews

Progress in Biophysics and Biophysical Chemistry. vol. 4. J. A. V. Butler and J. T. Randall, Eds. Academic Press, New York; Pergamon Press, London, 1954. viii + 339 pp. Illus. + plates. \$9.50.

This volume will be a welcome addition to the libraries of many workers in the biological sciences. I was greatly impressed by the catholic selection of topics, not only in this volume but also in the preceding ones. The editors, in not limiting themselves to topics that require an advanced knowledge of physics or physical chemistry, have been able to satisfy the needs of a large group of biologists. For example, in the chapter on chromosome breakage, the emphasis is on the biological aspects rather than on the use of x-irradiation as a tool. This approach was used particularly by J. C. Kendrew in his review of the elucidation of the structure of crystalline proteins. He has attempted, with a certain amount of success, to avoid the use of the jargon common to the crystallographer in explaining the techniques and results of x-ray diffraction studies.

Throughout this volume, the authors have presented critical reviews, occasionally taking part in the current controversies, but more often presenting many views without committing themselves to a particular theory. The latter approach, unusual in the field of muscle physiology and chemistry, is evident in the two chapters on muscle physiology, one by Weber and Portzehl, and the other by Wilkie.

The remaining articles include a review of the advances made in the study of nucleoprotein of the cell nucleus by Davison, Conway, and Butler; a discussion of polyelectrolyte gels by Katchalsky; and a chapter on the elucidation of the structure of nerve fibers by Fernandez-Moran.

I look forward to the continuation of this fine series.

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Chemistry of Lichen Substances. Yasuhiko Asahina and Shoji Shibata. Japan Society for the Promotion of Science, Tokyo, 1954 (Order from Maruzen, Nihonbashi, Tokyo). v + 240 pp. Illus. \$2.50.

This is an English translation, *in toto*, of the authors' book that was published in Japanese in 1949. It has been made to conform to the date of publication only by the inclusion of some references that appeared as recently as 1953. The translation permitted the correction of errors that were in the Japanese edition.

The book is divided into three parts. Part I includes a very brief historical account of the study of lichen substances; a classification of these substances into 10 groups on the basis of chemical structure; a short

chapter on their extraction, isolation, and purification; and a description of microchemical methods, including paper chromatography, for the detection and separation of lichen substances. Part II is devoted to a description of the occurrence and properties, including methods of isolation, of the lichen substances, and also to a discussion of their structure; this accounts for 185 of the 240 pages. Part III contains a discussion of biogenetic relationships and an account of the antibiotic properties of lichen substances. Each chapter includes a list of references that adds value to the work.

The authors have brought together the data found in the literature and have supplemented it with their own experience and knowledge. This book is a ready and authentic reference and should be of value to those who are especially interested in the plant sciences, particularly in plant chemistry.

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Introduction to Theoretical Mechanics. Robert A. Becker. *International Series in Pure and Applied Physics.* Leonard I. Schiff, Ed. McGraw-Hill, New York-London, 1954. xiii + 420 pp. Illus. \$8.

This book, designed to meet the needs of undergraduate juniors and seniors majoring in engineering physics at the University of Illinois, clearly reflects an engineering emphasis and consequently does not have the structure usually associated with the term *theoretical mechanics* as it is used by a physicist. In his preface, the author states that the topics are arranged in "order of increasing difficulty as to both mathematical maturity and physical insight required," and there is a heavy emphasis on the solution of problems. The 400-odd problems in the book, as well as the text itself, display a rather amazing range of difficulty and intellectual challenge. Thus, for example, at the end of the first chapter one finds problems that could be expected in high-school courses in physics, whereas toward the end of the book the problems take on the stature of graduate courses.

After a first chapter devoted largely to the elements of vector analysis, which is used consistently throughout the text, and an elementary statement of Newton's laws of motion, the statics of a particle, statics of rigid bodies, and statics of the suspended string or cable are developed in considerable detail. Then a chapter on work and the stability of equilibrium and an elementary chapter on the motion of a particle in a uniform field follow. The text then develops into what one usually expects to find in a textbook on theoretical mechanics.

There are several curious consequences as a result of the order in which the author has developed the material. For example, the first mention of kinetic

energy appears in a chapter concerned with statics, as do the concepts of work and potential energy. The discussion of the motion of a particle in a central field occurs very late (Chap. 10 of a 15-chapter book), so that the intimate relationship of the concepts of torque and angular momentum to this material is somewhat hidden.

A few minor points might be mentioned, such as the labeling of the first chapter as "Fundamental principles." In the discussion of the motion of a rigid body in a plane, it is gratifying to find the proper warning concerning the indiscriminate application of the torque-angular momentum relationship about an instantaneous axis, a point unfortunately omitted in most elementary and intermediate treatments of the subject. However, at this point it is curious to read about "accelerations acting on P ," where P refers to a point through which the instantaneous axis passes. An amplification of this particular section would be welcome, as would a similar amplification of the very brief treatment of motions involving variable mass and of nonlinear oscillations.

On the whole, this book appears, to a physicist, to be a mixture of theoretical applied mechanics and theoretical physics. Perhaps this is necessary for the proper education of a major in engineering physics, but it limits the value of the book as a textbook for students majoring in pure physics.

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The Application of Results of Research. Vera Connell, Ed. In collaboration with the British Commonwealth Scientific Offices. Academic Press, New York; Butterworths, London, 1954. vii + 212 pp. \$5.

This book is the result of a report presented to the British Commonwealth Scientific Conference that was held in Australia in 1952. It deals with the basic problem of how to translate the results of scientific research into practice.

For most readers, the meat of the work is probably in the five short chapters, which occupy only one-fifth of the book. These chapters give brief evaluations of the various methods that are used to obtain the rapid dissemination and application of research findings, and some attention is given to the obstacles to the use of scientific information. Unfortunately, some topics are treated in such a sketchy fashion that no new ideas are communicated.

For other readers, however, the real meat may well be the nine appendixes that make up the balance of the book. Eight of these are reports on research activities and practical applications in the various Commonwealth areas. There are, for example, brief summaries of the activities of the Rubber Research Institute and the Tea Research Institute in Ceylon, of the Fisheries Research Board in Canada, and of the Council for Scientific and Industrial Research in South Africa. The final appendix, incidentally, is en-

titled "Some novel methods employed in the U.S.A." Here the methods of research organization and implementation that are used by three of our agencies are summarized, with the Tennessee Valley Authority in the stellar role.

Although this book is somewhat brief and its scope is limited—in that it concentrates on government-sponsored research and its application in a few fields, namely, industry, agriculture, and health—it is a welcome addition to the literature that concerns itself with the uses of scientific knowledge.

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Psychological Testing. Anne Anastasi. Macmillan, New York, 1954. xiii + 682 pp. Illus. \$6.75.

In the 50 years since Binet and Simon produced the first practical psychological test, the development and use of new tests has increased at a phenomenal pace. Theory and practice have proceeded, occasionally apace, more often alternatively, but both have made great strides. In such a rapidly developing field, it is difficult for the practitioner to retain his perspective and for the student to acquire understanding and skill in the use of tests. Anastasi has contributed a well-written work intended to meet the needs of the beginning student and the practicing psychologist, the business executive, the psychiatrist, and the educator. It will be particularly welcomed by those already familiar with testing and a stimulating and challenging, but rather difficult, introduction for students.

The material is presented in four major sections: "Principles of psychological testing," "General classification tests," "The differential testing of abilities," and "The measurement of personality characteristics." Especially welcome is the treatment of materials so far omitted from most introductory textbooks, materials such as Cronbach's formulation of the reliability problem and the materials on factor analysis. Anastasi's well-deserved reputation for sound scholarship should be enhanced, an especially noteworthy achievement in the light of the book's introductory nature.

In the preface, Anastasi sets her task as follows:

The primary objectives . . . are to provide an introduction to the principles of psychological testing and to acquaint the reader with the major types of tests in current use.

In general, she has succeeded quite well. The first section on principles will serve as a vantage point from which the student can survey and evaluate the later descriptions of the many kinds of tests available.

There are two major difficulties that may make the book rather difficult as a text. In the first place, Anastasi has tried to write a book that assumes no previous training in statistics. She attempts throughout to weave in discussions of statistical concepts as