

these pioneers in Greek science modern readers should remember these men with gratitude.

L. C. KARPINSKI

*Funktionentheorie, Zweiter Teil: Anwendungen und Weiterführung der allgemeinen Theorie.* Vierte, verbesserte Auflage. By Konrad Knopp. Sammlung Götschen, No. 703. Berlin and Leipzig, Walter de Gruyter, 1931.

*Aufgabensammlung zur Funktionentheorie, Erster Teil: Aufgaben zur elementaren Funktionentheorie.* Zweite, verbesserte Auflage. By Konrad Knopp. Sammlung Götschen, No. 877. Berlin and Leipzig, Walter de Gruyter, 1931.

The Götschen collection of texts on mathematics provides a course for the student of the theory of analytic functions which is contained in five of the very convenient pocket size volumes. The two volumes entitled *Funktionentheorie* by Knopp have now appeared in a fourth edition. The second edition of the *Einführung in die konforme Abbildung* by Bieberbach appeared in 1927. The other two volumes contain collections of problems.

The first volume of the fourth edition of the *Funktionentheorie* was reviewed in the American Mathematical Monthly, vol. 38, page 529, by an enthusiastic writer who remarked "There is little doubt but that this is the best monograph on functions of a complex variable yet written." While this superlative statement is a little stronger than those of the reviewers of other editions, it indicates the general attitude of all.

The fourth edition of the second volume of the *Funktionentheorie* shows no extensive changes from the third edition which appeared in 1926. Definitions and proofs have received careful scrutiny and minor improvements are most noticeable in the section on doubly-periodic functions and in the chapter on algebraic functions. The book is divided into two approximately equal parts which treat single-valued functions and multiple-valued functions, respectively. The titles of the chapters are as follows: I. Ganze Funktionen; II. Meromorphe Funktionen; III. Periodische Funktionen; IV. Wurzel und Logarithmus; V. Algebraische Funktionen; VI. Das analytische Gebilde.

The first edition of the first volume of the problems appeared in 1923. The second edition brings the material up to date with references to the latest editions of the texts. Each group of problems contains a specific reference to one of the three volumes which cover the theory. In the first part of the book the problems are merely stated and an asterisk used to designate the more difficult ones. Of 183 problems, 41 are so designated. The second part contains solutions of varying degrees of completeness.

W. R. LONGLEY

*Mathematics.* By B. B. Low. London, Longmans, Green and Company, 1931. 448 pp.

In contrast to the purpose of this book, the author recalls, in the preface, the toast: "Here's to mathematics, and may it never be of use to anybody." The present work is intended to be useful to those who are engaged in technical work, such as engineering, physics, or chemistry.

The field covered is wide, extending from elementary algebra to differential

equations, including trigonometry, plane and solid analytic geometry, empirical equations, differential and integral calculus, calculus of finite differences, and the harmonic analysis of periodic functions. The extensive use of graphs and illustrations is indicated by the fact that the book contains 409 figures. In addition to many worked examples there are almost 800 exercises. A few of the examples and exercises are taken from the examination papers of Cambridge, the University of London, and the Board of Education, but a very large number are related directly to technical applications.

One might expect almost anything in a book with the title "Mathematics," but when the subtitle "A textbook for technical students" is added, the contents are accurately described. This volume contains practically everything that goes to make up the mathematical equipment of a graduate of one of the best American technical schools. There are, of course, variations. Some topics are treated less extensively and some receive more attention than in our usual curricula, but the reviewer knows of no other single volume which covers so nearly the ground that is commonly regarded as desirable in our technical schools.

W. R. LONGLEY

*Science and First Principles.* By F. S. C. Northrop. New York, Macmillan, 1931. xiv+299 pp.

In the preface it is stated that the first principles "involved in a given verified theory are those which it takes as primary" and that the author's "task is the purely impersonal and objective one of dissecting the given scientific theories which our technical scientists have verified, to determine what concepts and principles are taken as primary or undefined." The analysis is centered mainly on relativity, quantum theory, and biology. Since the treatment is not convincing to the reviewer, some main conclusions will be presented in the author's own words; usually the conclusions are reached by the author in connection with an elaborate argument. The following quotations are from pages 120, 202, 270, 280, 288, respectively. "We have but to bring these different requirements together to discover that this universe must be constituted not only of the moving microscopic atoms of the traditional atomic theory but also of one large physical macroscopic atom, spherical in shape and hollow in its interior except for its inner field, which surrounds and congests them." [The foregoing conclusion is reached by means of an analysis of relativity.] "Thus we find biological evidence giving us an entirely independent argument for the existence of the macroscopic atomic theory." "In the first place, the macroscopic atom is a primary substance, with a determinate conscious experience. Secondly, were it not present neither nature nor man would exist; all would be flux." "The spherical shell of the macroscopic atom is a tremendous object off at the edge of the whole physical universe." "Once the traditional theory of first principles is supplemented with the addition of this atom, the problem of knowledge is resolved."

R. D. CARMICHAEL

*The Emergence of Life.* By John Butler Burke. Oxford University Press, 1931. ix+396 pp.

In the subtitle this book is described as "a treatise on mathematical philoso-