Books

Complex Variable Theory and Transform Calculus with Technical Applications (Second Edition). By N. W. McLachlan. 388 pp. Cambridge University Press, New York, 1953. $10.00. *Reviewed by Philip M. Morse, Massachusetts Institute of Technology.*

This is not a text on complex variable theory, it is a review of some of the useful techniques of contour integration and of the Laplace transform and a discussion of their application to engineering problems, written for the user of mathematics. Proofs of the basic theorems are not given, but numerous references are made to texts of fundamental theory and a large bibliography is appended. The examples of applications are drawn from engineering fields: electrical, acoustical and mechanical. A large number of illustrative problems are included and a short table of Laplace transforms is appended.

This book will be useful to engineering students, who have taken a course in advanced calculus, to acquaint them with the simpler aspects of modern transform methods of analysis. It will perhaps not be as useful to physicists as the recently published *Fourier Transforms* by Sneddon (McGraw-Hill Book Co., 1951), which includes examples from modern physics but even here it will be useful as an introduction to the field. The text is quite readable, there are plenty of figures for visual clarification and the index is adequate.

The Physics of Viruses. By Ernest C. Pollard. 230 pp. Academic Press Inc., New York, 1953. $5.50. *Reviewed by Joseph G. Hoffman, Roswell Park Memorial Institute.*

This is a unique book written by a nuclear physicist on the subject of viruses. An expert in a modern subject of physics has written expertly about one of the recent developments in biology. The result is most stimulating and welcome. Specialists in the two vastly different sciences of physics and biology, will each find here new insight into living processes.

Physicists especially will find a point of view with which they are familiar. The treatment is consistently carried out in the manner of a physics treatise. Quantitative descriptions are given in the form of graphs, tables and mathematical analyses. The wealth of experimental virus data amenable to analysis by the procedures of physics is surprising. The author has performed a good service by accumulating this pertinent data. But there is more than an accumulation of data: the material is organized in a systematic study of the properties of viruses and the physical theory of viruses.

There is brought together information based on many diverse physical techniques such as x-ray diffraction, electron microscopy, exposure to ultraviolet and ionizing particles, heating, and sonic irradiation. The author has examined all possible methods for obtaining knowledge about the physical entity of viruses. The resultant concise description of this smallest and perhaps elementary form of life is pleasing to the physicist.

Close scrutiny of the text shows that the unified effect achieved by the author depends on his brief summaries of the biological data. These summaries are nicely documented, as is the entire book, for those who need to pursue further the biological literature which in itself is massive. Examples of this simmering down to barest essentials are the sections on Virus Serology, and Hemagglutination. In this respect the author has performed another good service, for physicists at least: he has provided the minimum biological facts in a readily assimilated form.

The process of conveying ideas as divergent as those arising in biology and physics is admirably achieved here. This process touches upon many fundamental aspects of biomolecular physics. If the old saying still holds that a problem is partly solved when it is properly stated and defined, then this book is a valuable contribution to biophysics in that it helps to define some of the fundamental problems.

For example, the method of the exact reduplication of viruses and the nature of forces in reduplication are central problems of biophysics. Thus, the reduplication problem prompts (on page 66) the sixty-four dollar question: "Presumably—the formation of duplicates is by physical forces—Van der Waals, valence or electronic. How does a spherical object so influence its surroundings as to generate a second spherical object?" In chapter eight, entitled Virus Genetics, Virus Multiplication, and Virus Physics, central problems are discussed in such a provocative manner as to constitute required reading for most physicists. While there is of necessity much speculation in this discussion, there are pointed up many fascinating avenues of research into the molecular structure of living matter.

The modern biophysicist should have this book. It shows the exciting possibilities that arise when sufficient data are available to support physical theories of living things. The numerous illustrations and tables are excellent. These along with the author and subject indices serve to carry the reader nicely through the interesting text.

The Nature of Light and Colour in the Open Air. By M. Minnaert. 362 pp. Dover Publications, Inc., New York, 1954. Paperbound, $1.95. *Reviewed by S. F. Singer, University of Maryland.*

This little book can best be described in one word—fascinating! A distinguished astronomer, director of the Observatory of Utrecht, Holland, who is also a keen