Mathematics for Scientists

A Course of Mathematics for Engineers and Scientists. vols. 1 and 2. C. Plumpton and B. H. Chirgwin. Pergamon, New York, 1961. vol. 1, 326 pp. $6.50; vol. 2, 382 pp. $7.50.

A Course of Advanced Mathematics for Technical Schools. N. P. Tarasov. Translated from the Russian by D. E. Brown and B. G. Walker. Pergamon, New York, 1962. 456 pp. Illus. $10.

Each of these works is most easily characterized by comparing it with Granville, Smith, and Longley's well-known *Elements of Calculus* (1946), (hereafter referred to as GSM), which each closely resembles in subject matter and level of mathematical rigor as well as in the degree of emphasis on, and the modernity of, applications in both text and exercises.

Plumpton and Chirgwin's *Mathematics for Engineers and Scientists* is more condensed and perfunctory than GSM. Proofs are omitted to the point that the treatise resembles a handbook. Exercises are plentiful and standard. In addition to the topics covered in GSM, there is a chapter on linear equations and determinants, one on vector algebra and coordinate geometry of three dimensions (this one is midway through volume 2), a 4-page treatment of least squares, and a brief introduction to difference equations.

Tarasov's book is apparently aimed at students aged 17 to 19 years, and its exposition is more complete than that in the volume by Plumpton and Chirgwin. The first quarter of the text is a traditional presentation of classical analytic geometry of two dimensions. Other differences, when compared with GSM, are its minimal treatment of ordinary differential equations (first order, variables separable) and its inclusion of a substantial amount of material on Fourier series (wherein, near book's end, integration by parts is introduced for the first time!). Exercises are plentiful and essentially standard. A surprising anachronism is the introduction and active use of the concept of infinitesimal in its fuzziest form [sic]: "Definition. A variable α is called an infinitesimal if, in the course of its variation, its absolute value becomes, and then remains less than any previously assigned positive number ϵ, however small." "Viewers-with-alarm" of the relative states of science in the U.S.S.R. and the U.S.A. may be heartened. Mathematicians of one-world persuasion may be dismayed.

On balance, it is difficult to see why Tarasov's book was chosen as a target for translation, since it is typical of a spate of books already existing in the English language, and inferior to most of them.

R. F. RINEHART
Institute for Defense Analyses, Washington, D.C.

Human and Animal Tissues

An Introduction to Comparative Pathology. G. A. Gresham and A. R. Jennings. Academic Press, New York, 1962. xi + 412 pp. Illus. $13.

In this book two distinguished British pathologists deal with the comparative aspects of pathology in a style that is simple and lucid. Such an introduction is long overdue.

The book's succinct subtitle reads: "A consideration of some reactions of human and animal tissues to injurious agents." Wherever possible, the authors show analogies between form and function throughout the animal kingdom, and they most certainly succeed in illustrating complex pathogenetic mechanisms by selecting common and naturally occurring diseases rather than examples "from the sometimes narrow and artificial field of experimental pathology." Fundamental reactions to injury—such as inflammation, cellular degeneration, and circulatory disorders—are not discussed in detail, since these topics are treated in any standard textbook of pathology.

The 12 chapters are arranged according to various pathogens—such as viruses, bacteria, fungi, protozoa, and helminths. The first chapter, on genetically determined disease, is followed by five chapters that deal with the actions of living organisms on tissues and organs. Chapter 7 contains a concise description of some diseases caused by inanimate agents. The reactions of lung, liver, bone, and muscle to a variety of injuries are used to illustrate general patterns of response. The effects of malnutrition, avitaminoses, mineral imbalance, magnesium deficiency, undernutrition, and overnutrition are dealt with in the chapter that follows. Brief consideration is given to antigen-antibody reactions. Other chapters cover diseases of endocrine dysfunction and ageing. The concluding chapter provides a description of the principles of neoplasia with respect to etiology and the manifestations in certain organs.

A wealth of knowledge has been accumulated in the 400 pages of this carefully written, well-produced book. The illustrations are generally good, but magnifications are not given for all photomicrographs. References are few and highly selective, and an index is included.

Pathologists working in human pathology and those in veterinary pathology will profit from and enjoy *Comparative Pathology*, and they will find many interesting crossroads between the two branches. The book should be most valuable to medical and veterinary students who need a bird's-eye view of pathology when they begin their study of that subject.

WERNER H. KIRSTEN
Department of Pathology, University of Chicago

New Books

Mathematics, Physical Sciences, and Engineering

Progress in Stereochemistry. P. B. D. de la Mare and W. Klyne, Ed. Butterworth, Washington, D.C., 1962. 376 pp. Illus. $13.50.

Scandium. Its geochemistry and mineralogy. L. F. Borisenko. Translated from the Russian edition (Moscow, 1961). Consultants Bureau, New York, 1963. 78 pp. Illus. Paper, $17.50.

A Short Course in Vector Analysis. Kenneth S. Miller. Merrill, Columbus, Ohio, 1962. 111 pp. Illus. Paper.

Space Systems Engineering. Francis E. Riley and J. Douglas Sailor. McGraw-Hill, New York, 1962. 332 pp. Illus. $12.50.

Spectroscopy. Report of the London conference held in March 1962. M. J. Wells, Ed. Institute of Petroleum, London, 1962. 313 pp. Illus. £3 3s.

Statistics. An intuitive approach. George H. Weinberg and John A. Schumaker. Wadsworth, Belmont, Calif., 1962. 350 pp. Illus.

Synthetic Methods of Organic Chemistry. vol. 16. W. Theilheimer, Karger, Basel, Switzerland; Interscience (Wiley), New York, 1962. 524 pp. Illus. $48.

Theoretical Physics. A. S. Kompaneyets. Translated from the second Russian edition (1961) by George Yankovsky. Dover, New York, 1962. 592 pp. Illus. Paper, $2.45.

Uranium Metallurgy. vol. 1, *Uranium Process Metallurgy* (777 pp. $18); vol. 2, *Uranium Corrosion and Alloys* (645 pp. $16). W. D. Wilkinson. Interscience (Wiley), New York, 1962. Illus.