tra proposed by Walden, Roll-Fischer, Darbyshire, and Gelci, he has provided a more than 600-page volume that will be a useful textbook for a good many years. Also, the preface itself contains a most entertaining bit of personal philosophy presaging the delightful style and extensive scholarship which pervade all of *Wind Waves: Their Generation and Propagation on the Ocean Surface.*

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Quantitative Biology

Theoretical and Mathematical Biology. Talbot H. Waterman and Harold J. Morowitz, Eds. Blaisdell (Ginn), New York, 1965. xviii + 426 pp. Illus. $12.50.

This book contains a series of papers dealing with various aspects of the effort to make biology a quantitative science, and it aims to persuade more biologists to adopt analytical techniques in their work.

One can distinguish roughly three categories of papers. Some describe the successful application of analytical techniques in connection with experimental work for the investigation of a specific biological system. Others present some well-known mathematical tools and computer techniques and show how these could be successfully used for the investigation of biological problems. The third category consists of papers that deal with what could be described as philosophical questions about the possibility of making biology a quantitative science.

It is difficult to say how influential this book can be in persuading biologists to adopt the use of quantitative methods. This is so because unawareness of the advantages of such an approach is not the only reason many biologists are reluctant to use such methods.

For the student of biology who is inclined to follow the modern approach, the book is of unquestionable value. Among the contributions are descriptions of "classical" work like the studies on the nerve impulse described by K. S. Cole and the ones on cochlear mechanics by G. V. Békésy. These present excellent examples of successful application of analytical methods in biology. The same can be said about the papers by W. Reichardt (on the limulus eye and the movement perception by insects) as well as about those by B. Chance (transients in metabolism) and others.

In the papers by H. T. Morowitz and N. Rashevsky the reader will find an extensive presentation of the thesis that living organisms are not too complicated to be treated analytically and through general principles.

Although the book is primarily intended for biologists, it is also of interest for engineers and mathematicians who consider working in this field. They may find certain parts of the book uninteresting (for example, the descriptions of elementary computation techniques), but they will definitely benefit from other parts which show particular areas of biology where the application of analytical techniques is especially profitable, although the list is not complete. For example, one important area of quantitative biology (biological clocks) is not considered at all.

A final remark is that one would expect such a book to have a tighter and more systematic interconnection between its various parts. This expectation is especially justified because the presented works are not original but mostly reviews and summaries of work previously published by the contributors.

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Structural Chemistry

Electrons and Chemical Bonding. Harry B. Gray. Benjamin, New York, 1964. xvi + 223 pp. Illus. Paper, $3.95; cloth, $8.

Chemical Bonding. Audrey L. Companion. McGraw-Hill, New York, 1964. xii + 155 pp. Illus. $4.50.

All teachers of college chemistry will wish to peruse these two little books about chemical bonds.

At a level appropriate for well-prepared undergraduates in their first or second year, Gray presents a finely toned and systematic discussion of chemical bonding in a large number of molecules, from diatomics through organic molecules and octahedral complexes. He employs almost exclusively the simple molecular-orbital method. Companion covers almost the same ground, although her treatment is less mathematical. Both books contain discussions of elementary quantum-mechanical concepts, a number of problems, many tables, and very many illustrations. Both books necessarily are somewhat oversimplified. With respect to style, I prefer Gray's, which is straightforward, but some readers will prefer Companion's, which embodies special efforts at readability.

Chemists, a distinguished chemical physicist has remarked, are people who love molecules—for neophyte chemists these books should provide stimulating and helpful reading. Physicists take a more austere view of molecules—for them these books may seem curious. For the undecided, between the two professions, it still is the original research works on chemical bonding that, in my opinion, provide the best prospect of modern structural chemistry.

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New Books

Mathematics, Physical Sciences, and Engineering

Electricity and Magnetism. B. I. Bleaney and B. Bleaney. Oxford Univ. Press, New York. ed. 2, 1965. 780 pp. Illus. $11.20.

Elements of the Theory of Nonlinear Oscillations. N. V. Butenin. Blaisdell (Ginn), New York, 1965. 236 pp. Illus. $7.50.

Geology: A Survey of Earth Science. Edgar Winston Spencer. Crowell, New York, 1965. 692 pp. Illus. $9.50.

Hydrogen in Titanium. V. A. Livanov, A. A. Bukhanova, and B. A. Kolachev. Translated from the Russian edition (Moscow, 1962) by A. Aladjem. Israel Program for Scientific Translations, Jerusalem; Davey, New York, 1965. 208 pp. Illus. $10.25.

Industrial Chemicals. W. L. Faith, Donald B. Keyes, and Ronald L. Clark. Wiley, New York, ed. 3, 1965. 862 pp. Illus. $25.

Inelastic Behavior of Load-Carrying Members. James O. Smith and Omar M. Sidebottom. Wiley, New York, 1965. 461 pp. Illus. $12.75.

Inorganic Chemistry. vol. 1, *Principles and Non-Metals.* C. S. G. Phillips and R. J. P. Williams. Oxford Univ. Press, New York, 1965. 699 pp. Illus. $8.

Instrumental Methods of Analysis. Hobart H. Willard, Lynne L. Merritt, Jr., and John A. Dean. Van Nostrand, Princeton, N.J., ed. 4, 1965. 802 pp. Illus. $10.75.

Introduction to the Atmosphere. Herbert Riehl. McGraw-Hill, New York, 1965. 377 pp. Illus. $8.95.

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