

original contributions in several places. There are five chapters on the hydrophenanthrene alkaloids—morphine, codeine and thebaine—including chapters on synthesis, stereochemistry and biogenesis. These three chapters in particular are up-to-date and should be pertinent instruction for any graduate student embarking on research in natural products. Several examples also are presented of a historical and classical approach to structure elucidation. This approach certainly has its value in the presentation of logical reasoning and a large variety of degradative reactions. The last chapter on papaverine illustrates the labyrinths into which one may be led by reasonable but incorrect conclusions.

In general, Ginsburg's exposition and explanations are lucid and valid, although we disagree with the conclusion drawn from hydroxycodone on page fifteen. The book is singularly free of typographical errors, and the structural formulas are clearly drawn and liberally presented. The avowed purpose of a teaching monograph has been achieved—it is unfortunate that it could not have appeared as a paperback so as to get into more of the hands for which it was intended.

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Direct Analysis of Diffraction by Matter. By R. HOSEMANN, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin, and S. N. BAGCHI, Calcutta University, India. Interscience Division, John Wiley and Sons, Inc., 440 Park Avenue South, New York 16, N. Y. 1962. xxi + 734 pp. 16 × 23 cm. Price, \$21.75.

This book is exactly what its title implies. It is a treatise on the direct analysis of diffraction by matter, where matter is taken in its most general sense and includes any type of structure, whether it be crystalline, liquid, amorphous, gaseous, etc. The exposition of this subject is excellent and elaborate. The book is not intended for use by the novice but rather for experienced theoretical chemists and X-ray crystallographers and physicists in the field of optics. The presentation is authoritative, quantitative in a rigorous manner and elegant. The mathematical formalism required throughout the latter part of the book is developed exhaustively in the first five chapters (197 pages) and includes such topics as: the fundamental equations of diffraction of wave fields, convolution operations, Fourier transformations, convolution polynomials and function algebra. After this detailed introduction, a large number of widely varying physical systems are considered, some of which are: the single crystal, the single paracrystal, Compton scattering by a single atom and electron, polydispersed globular aggregates, micellar and fibrillar systems, fluids and others. Crystal structure analysis through the use of convolution integrals and the problem of uniqueness of solution are also discussed. Of the remaining topics, one of the more important and probably more neglected fields in general, the analysis of small angle scattering, is given a fine treatment in a relatively long chapter.

The book contains very many mathematical expressions which seem to be remarkably free of error. In addition, it is abundant with excellent illustrations and photographic reproductions. The reviewer's opinion of the book is extremely favorable. It serves as a superb theoretical reference on diffraction by matter.

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