tions of process applications for the manufacture of paper, adhesives, plasticizers, copying materials, pigments, perfumes, and many other substances including drugs.

My biggest criticism of the book is that the original text by Asaji Kondo is 10 years old. As a result, the English version by J. Wade Van Valkenburg contains reference material published prior to 1970. However, microencapsulation is a highly patented field and several patents discussed in the book will expire in the 1980's. Therefore, the text could prove to be of great assistance to scientists working in this field.

Reviewed by James W. McGinity
Drug Dynamics Institute
College of Pharmacy
University of Texas
Austin, TX 78712

Catecholamines: Basic and Clinical Frontiers, Vols. I and II. Edited by E. USDIN, I. J. KOPIN, and J. BARCHAS. Pergamon Press, Maxwell House, Fairview Park, Elmsford, NY 10523. 1979. Vol I: 1003 pp. Vol. II: 946 pp. 17 × 25 cm. Price $200.00 per volume.

The material in both volumes represents the phenomenal growth of research in catecholamines. Although the impact of catecholamine research in medicine has been universal, this international symposium represents research carried out mainly in the United States, France, Sweden, Britain, and Germany. The opening chapter presents a coherent, concise, and important summary by the internationally respected scientist–teacher, Arvid Carlsson, concerning the impact of catecholamine research on medical science and practices.

Compared to the previous symposium, a meaningful morphology appears on many pages. Dopamine occupies the central theme with which other endogenous substances such as enkephalins, substance P, and γ-aminobutyric acid (GABA) are intertwined. Drug-induced side effects and their influence on neurochemistry receive only limited attention. The value of genetics in relation to psychotropic illness with or without coherent neurochemical markers is included. One occasionally sees a marked overlap between the material published in these symposia and that published elsewhere. In the present era of rapid scientific communication, publishing the same material repeatedly should be discouraged. Catecholamine receptors occupy a large section in Vol. I.

The cost of both volumes may produce mental and neurochemical disturbances in the poor scientist who may want to buy them, so only departmental and institutional purchases are recommended.

Reviewed by P. N. Patil
College of Pharmacy
Ohio State University
Columbus, OH 43210

Introduction to Powder Surface Area. By S. LOWELL. Wiley, 605 Third Ave., New York, NY 10016. 1979. 199 pp. 15 × 23 cm. Price $17.95.

The subject of micromeritics should be important to pharmaceutical scientists. The features of a powder, *e.g.*, particle size, shape, and area, can greatly influence product development and processing as well as the properties of the finished product. However, the articles published about powders often present complicated dissolution equations derived for idealized situations. Thus, the important term for powder surface area in many pharmaceutical papers is calculated from assumed particle distributions for regularly shaped, isotropic particles. The assumption of no pores, no surface irregularities, and no interparticle forces leading to aggregation is far from reality. It should be of interest in pharmacy to characterize powders in regard to actual surface area and then to seek valid relationships between area and powder behaviors. This book may provide the proper introduction into this field for many pharmaceutical scientists.

Lowell treats powder surface area and pore-size distribution mostly as a subject of gas adsorption. However, mercury porosimetry is discussed. The book is relatively small (199 pages) and is divided into two parts. The author discusses the theoretical bases for surface area measurements in the first part. The topics discussed in these first 11 chapters also may be found in books on surface chemistry or particle-size measurement, but Lowell's presentation is clear and generally easy to follow. For example, in Chapter 5, he carefully leads the reader through the Brunauer, Emmett, and Teller theory using 25 equations.

The second section, the experimental section, should be quite helpful to those entering the field of surface area measurement. The basic techniques are described, but the narratives on vacuum volumetric methods (Chapter 13) and particularly on dynamic flow methods (Chapter 14) are somewhat less clear than the discussions in the first part of the book. Quick comparisons on various points (gas mixtures, calibration, speed, *etc.*) of the three important gas adsorption techniques (*i.e.*, vacuum volumetric, continuous flow, and gravimetric methods) are given in Chapter 17.

One frustrating feature of this book is the large number of typographical and content errors. These errors reduce reader confidence in the text. Many of these are immediately recognizable as errors but some are not. Thus, while trying to understand the vacuum volumetric method in Chapter 13, we depend on Eqs. 13.3–13.8 to help, not hinder, us. Here, a simple sign error can lead to considerable confusion.

The real advantage of this book may be psychological. The author has separated the topic from the generally larger subject of particle-size measurement. By limiting the topic, he has made it possible for us to become more immediately interested in surface area measurement and, perhaps, more willing to use such measurements.

Thus, this book should be worthwhile for self-study or as a basic reference and should be recommended to pharmaceutical scientists. Nevertheless, it is only an introduction. The implication given on the dust cover that meaningful measurements of powder surface areas will immediately result from study of this book is probably too optimistic.

Reviewed by Dana Brooke
Mead Johnson Pharmaceutical Division
Evansville, IN 47721