

(Continued from page 1)

If one can choose examples for chemical engineers from other sources, this book is highly recommended to anyone teaching a systems oriented course.

LEON LAPIDUS  
PRINCETON UNIVERSITY  
PRINCETON, NEW JERSEY

**Process Analysis by Statistical Methods**, D. M. Himmelblau, John Wiley & Sons, Inc., New York (1970). 463 pages. \$19.95.

In spite of the fact that the analysis of chemical processes by mathematical statistical techniques is a relatively new subject, the results of numerous experimental and theoretical investigations have been appearing in the literature during the past five years. This book systematically puts together these investigations on process analysis. It has the distinction of being the first book in this area. It is carefully written, authentic, and well documented.

The first three chapters introduce the fundamental, but indispensable, knowledge of mathematical statistics which are used repeatedly in the later sections of the text. These chapters are not sufficiently detailed for a newcomer and should be supplemented by other suitable text books. The discussions of linear models with one independent variable in Chapter 4 and linear models with several independent variables in Chapter 5 are well organized. The next three chapters describe the various kinds of modern techniques which are useful in building nonlinear mathematical models. The techniques include those in the domain of the estimation of nonlinear parameters and the discrimination and identification of rival models. Chapters 9 through 12 discuss how to estimate the

parameters within the models, which are related to transport processes. These models are those represented by ordinary and partial differential equations and transfer equations.

This excellent text will be of interest to both experts and beginners. Experts will be able to use it as a quick search for theoretical analyses and experimental information presently existing. Beginners, such as graduate students and postdoctorates entering this field, will find it extremely useful in obtaining the present status of affairs without being baffled by the numerous research papers. A large number of footnotes and references given throughout the textbook will prove helpful.

To summarize, Professor Himmelblau has done a commendable job in providing the mathematical statistical background needed to treat many problems of modeling in chemical engineering. Ample and pertinent examples are included in the text. It belongs in the library of anyone who is seriously interested in this subject.

REIJI MEZAKI  
NEW YORK UNIVERSITY  
NEW YORK, NEW YORK

**Hack's Chemical Dictionary**, 4th Ed., Julius Grant, editor. McGraw-Hill Book Co., New York, San Francisco, Toronto, London, Sydney (1969). 738 + xi pages. \$29.50.

This fourth edition of "Hack's Chemical Dictionary" reflects the tremendous advances in science in general and in chemistry in particular that have occurred during the 25 years since the publication of the third edition. The dictionary includes terms representing all the branches of chemistry and its related sciences—physics, astrophysics, mineralogy, pharmacy, agriculture, biol-

ogy, medicine, engineering, and the like. In addition, it brings in the collateral vocabulary of industry and commerce, including product names and trademarks. It also includes brief biographies of men who have contributed to the progress of chemistry and its related sciences; states clearly and precisely all important theories, laws, and rules; covers the significant reactions, processes, and methods; and describes chemical apparatus, processes, and methods.

The editor has successfully added most new words of any importance that have appeared since 1944, while carefully retaining the old and even many obsolete terms, indicating that they are obsolete. In the matter of chemical nomenclature and notations, he has adhered to the rulings of the International Union of Pure and Applied Chemistry. For other terms, he has followed the guidelines established by current procedures and by existing and accepted international standards or relied on customary usage.

In almost 200 fewer pages than in the third edition, he has incorporated 23,000 more entries, primarily by offering more concise definitions, but also by eliminating photographs of eminent scientists and many illustrations and diagrams. This reviewer has not counted the number of words defined, but the editor in his preface claims nearly 55,000 although 80,000 are claimed on the front flap of the jacket. In this new edition the defined terms stand out more clearly and the type font is easier to read.

The emphasis on accuracy, current usage, and conciseness indicates that this dictionary will maintain the authoritative position that it has occupied for many years and will contribute to the current demand for interdisciplinary knowledge.

VIRGINIA VALERI  
ARTHUR D. LITTLE, INC.  
CAMBRIDGE, MASS.