deserves wide attention. The series of which it is a part will be an expensive one, but it should be a great help to students.

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Ways of Improving Behavior

John Mann's **Changing Human Behavior** (Scribner, New York, 1966. 249 pp. $5.95) is a provocative piece of work and it engages the reader in dialogue, but part of its provocativeness stems from its inconsistencies.

The earlier part of the work emphasizes the goal of changing the individual to conform to society, chiefly through psychotherapy. In the latter portion, beginning with the discussion of creativity and religion, emphasis is shifted to the goal of ultimate development of the individual. Mann describes three distinct systems, scientific, professional, and friendly, for changing human behavior. He concludes that common assumptions underlie the various behavior-changing processes, a conclusion which I, however, was unable to derive from the analysis presented.

The chapter on "Small groups" is the best and most carefully done in the book. Here not only are studies described but results are stated and placed in context. The chapter on "Attitude change through interpersonal influence" almost approaches "Small groups." One would guess that these two really represent the area of the author's competence. The book as a whole, however, was obviously designed for an audience that is not sophisticated in psychology, and suffers from weaknesses to which such books are subject. Among these are inconsistencies in level of writing. For instance, there are extensive references to individual investigators in some chapters and a complete lack of references in others (the theoretical model of cognitive dissonance is mentioned without any citation of Festinger). The brief chapter entitled "The psychopharmacology revolution" is mostly devoted to Timothy Leary, and no other drug research is discussed. The chapter on "Mass media" provides some discussion of methodology and presents the role categories of people who work in this area, but there is no real discussion of the findings of the "many studies" referred to.

Another weakness is oversimplification. The statement of the principle of homeostasis (p. 29) is an example: "[T]he fundamental law of [social] systems is that when an element changes in one direction, a move must be made in the opposite direction to compensate for it"; this principle is then applied to the psychotherapeutic situation, a long extension from its original biological meaning. In the brief discussion of conditioning, the description of the teaching machine as a major breakthrough in education is oversimplified and out-of-date, for psychologists are currently much more concerned with the program itself than with the means by which it is presented.

There are other, smaller difficulties with the book that might have been solved by careful copyreading and editing. But the main problem perhaps lies in the task that Mann has cut out for himself. It is to his credit that, recognizing that we have a long way to go, he constantly calls for careful research in all phases of the study of changing human behavior, even though at the same time he may lead readers mistakenly to expect him to present solutions to the problems he discusses, and though he himself makes use of findings or ideas based on procedures that have not been empirically validated.

Mann provides an interesting discussion of religious views, along with suggestions for their scientific verification. As a way of approaching the problem of changing human behavior, he sketches a "science fiction" Human Development Corporation which would collect, analyze, and become a repository for all scientific studies related to the problem of changing human behavior and in addition perform selective research, consult with others, and mount pilot projects designed to test in a scientific manner recently acquired knowledge. This Corporation is not quite as fictional as Mann indicates, for in its function as a repository it is very similar to many data-retrieval systems now being funded by the U.S. Office of Education under the name of ERIC, and its concern with carrying out research seems to be represented, in the field of education, by the regional education laboratories now coming into existence and the planned communication networks between these, the research and development centers, and ERIC.

I was disappointed that the book does not live up to its advertisement as "the first comprehensive account of modern scientific explorations into the alteration and enhancement of human behavior," but another reader from a different background might find much of value in it.

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Organic Nitrogen Compounds

The purpose of **The Chemistry of Open-Chain Organic Nitrogen Compounds** [Benjamin, New York. Vol. 1, *Functions Derived from Ammonia: Amines, Amides, Nitriles, Isocyanates, etc.* (368 pp., illus. 1965. $19.50); vol. 2, *Derivatives of Oxidized Nitrogen: Hydrazines to Nitrates* (543 pp., illus. 1966. $35)], by Peter A. S. Smith, is "to give an interpretative as well as a descriptive survey of the chemical behavior of functional groups containing nitrogen." The 15 chapters include inorganic nitrogen compounds, aliphatic amines, aromatic amines, amides, nitriles and isocyanides, derivatives of carbonic acid, ammonia derivatives of the carbonyl group (vol. 1), and hydroxylamine derivatives, hydrazine derivatives, nitrogen functions with adjacent unsaturated nitrogens (diazonium, azo, and so on), chains with three or more nitrogens, nitroso compounds, nitro compounds, and nitrogen oxyacids (vol. 2). Emphasis is placed upon nomenclature, properties, reactions, and preparative methods. A restricted bibliography is appended to each chapter, and a limited subject index concludes each volume. All this material has been compiled selectively, not encyclopedically. The discussion of the reactions and the presentation of the molecular structures harmonize with the conventional organic chemistry of a generation or two ago and are easily followed.

The title of these volumes is easily misinterpreted. "Open-chain" refers to the nitrogenous functional groups, not to the organic skeleton of the molecules. Chapter 3 of volume 1, for example, is devoted to the aromatic amines.

The index in each volume is inadequate. Many important, extensively discussed substances, aniline and benzal imine, for example, are not entered.

The author warns that he was forced to select his material. The prospective reader should be advised of some of the omissions. As may be inferred from the subject matter of the chapters,

heterocyclic compounds (pyrroles, porphyrins, pyridines, imidazoles, triazoles, tetrazoles, and so on) and polyfunctional and multifunctional compounds (amino acids, nitro alcohols, various natural products, nitrogenous dyes, and many physiologically important nitrogen compounds) are excluded. Virtually all synthetic procedures have been omitted, as have important methods for the detection and quantitative estimation of organic nitrogen compounds. No reference is made to the applications of compounds containing nitrogenous functional groups in the field of analytical chemistry, nor is there any discussion of the relationship between physical properties (as ultraviolet, visible, infrared, and nuclear-magnetic spectra) and the structure of the nitrogen-containing compounds. Relationships between structure and physiological properties, so important in many fields (as antibiotics, hormones, and enzymes), are excluded. Franklin's American Chemical Society monograph, devoted to the ammonia or nitrogen system of compounds and recognized as one of the most refreshing contributions in this field, is cited only cursorily, as in connection with the structure of hydrazoic acid.

Many of the formal correlations appear to be remotely related to laboratory procedures. This is illustrated by the statement that ammonia will "burn readily to form nitrogen and water." The implication is that ammonia will burn in air, but this is not the case unless it is dissociated (as by heat and catalysts).

Who will find these volumes useful? The better students in the first-year course in organic chemistry would gain a clear concept of functional groups as well as additional information about the properties of nitrogen compounds by perusal of this material. More advanced students of organic chemistry and those seeking an introduction to the chemistry of organic compounds with open-chain, nitrogenous groups would also profit from a study of these volumes. In view of the omissions cited above, however, students of organic nitrogen compounds may not rely on these volumes as a sole source of information or as a key to the literature.

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EPR: A Nonmathematical Approach

The purpose of **An Introduction to Electron Paramagnetic Resonance** (Benjamin, New York, 1966. 286 pp., illus. $13.75) is, in the words of the authors, Malcolm Bersohn and James C. Baird, to "present the fundamentals of electron paramagnetic resonance (EPR) in a form suitable for chemists and biochemists who have no previous knowledge of the subject." To this end, most of the important concepts are explained in simple, nonmathematical language, with extensive use of analogies. Most of the book should be readily comprehensible to anyone who has had an undergraduate course in physical chemistry. Indeed, many with a more extensive background will find some illuminating insights.

There is, however, much to object to in the content of the book. Perhaps most important is that the nonmathematical approach simply does not permit sufficient development to give an understanding of much of the current research in the field. Many serious omissions are readily apparent. No mention whatever is made of the very useful Bloch equations; only four pages of very general discussion are devoted to EPR of metal complexes, and no examples are discussed.

Five appendices of variable usefulness are included. Appendix A, entitled "Why EPR instruments give derivatives of absorption lines," apparently takes the place of the chapter on instrumentation which might have been expected in a book such as this. Appendix E, which gives hyperfine splittings of some organic radicals in solution, is a generally useful addition to the book, although many of the examples are somewhat redundant, a number of interesting radicals are notable by their absence, and there are some cases in which credit is not given to the first investigator.

The literature references are generally incomplete or poorly chosen. For example, at the end of the chapter on relaxation phenomena, Abragam's excellent, but mathematically very sophisticated book is cited, while the more useful book by Pople, Schneider, and Bernstein is ignored.

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Rhenium and Technetium

A book on rhenium and technetium was published (in French) 9 years ago. From 1958 to 1964 there was an eightfold increase in the number of citations of these two elements in *Chemical Abstracts*. This rate of growth suggests that future books on these elements will of necessity be limited to certain fields of study or the texts considerably enlarged. In **The Chemistry of Rhenium and Technetium** [Interscience (Wiley), New York, 1965. 195 pp., illus. $8.50], R. Colton has pretty well covered the literature through 1963, but the coverage of 1964 is incomplete and only a few references for 1965, to work done by the author, are included.

Two chapters deal with the isolation of the elements and analytical procedures. The next four cover the oxides and sulfides, halides and oxyhalides, complex halides, and other complex compounds. Interest in these compounds has been stimulated recently by the discovery and theoretical investigation of the polymeric nature of some of the complexes which exhibit strong metal-metal bonding. New preparative techniques and more careful study of older preparations have yielded many new compounds. The author points out that no fewer than ten simple binary halides of rhenium have been prepared for the first time in the last 5 years.

The material presented on organometallic compounds and cyanide complexes demonstrates the use of the modern inorganic chemistry techniques of x-ray diffraction, infrared spectral analysis, magnetic susceptibility, and nuclear magnetic resonance measurements in order to characterize and determine the structure of compounds. The chapter on polarographic reduction and the rhenide state gives a good review of the experimental data on the "rhenide ion."

A reader familiar with a particular field in the chemistry of these elements may sometimes find the author's coverage a cursory one. This is not surprising in a book of this size and merely emphasizes the need to consult the original literature when more than a brief review is desired. The value of the book to the more-than-casual reader is that it aids in the literature search.

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