than five thiocyanate groups is undermined by the appearance of $UO_2(NCS)_6^{-4}$ in a table of synthesized ions on page 266 and the inclusion of $[Co(en)_3]_2[UO_2(NCS)_6]\ (NO_3)_2 \cdot 5H_2O$ in a table of preparable compounds on page 255; the procedure for the preparation of this compound described on page 270 omits the use of a thiocyanate salt! The thermal data on page 428 for a series of sulfate complexes of U^{+4} suggest the formula $3(NH_4)_2SO_4 \cdot (NH_4)_2[U(SO_4)_3(H_2O)_3$ in which all waters are in the coordination sphere of U^{+4}. This suggestion is at variance with the interpretation given in the text.

The number of typographical errors is tolerably small and of minor importance. The reader will have to adjust to several awkward or unfamiliar expressions, e.g., "genetic series," "intraspheric coordination," and "localization" (for "location").

The authors occasionally point out those areas of the chemistry of uranium complexes which either are unexplored or are explored but whose results lend themselves to interpretations which are moot. Very little synthetic work has been done on cyanate complexes; only Pascal's study in 1914 represents this area. Chapter 15 lists over 200 UO_2^{+2} complexes with organic ligands (amines, phenols, hydroxyquinolines, polyprotic acids, and miscellaneous organics including adrenaline). The formulas given by various investigators, most of them from outside of Russia, are based on only chemical analyses. The structures are unknown and can only be guessed within the framework of modern coordination theory.

Complex Compounds of Uranium is an adequate survey which will serve as good background for workers in uranium chemistry and in reactor fuel processing.

H. A. Droll is an associate professor of chemistry at the University of Missouri at Kansas City. He obtained the PhD degree in chemistry at the Pennsylvania State University in 1956. His current specialty is coordination chemistry and chemical equilibrium problems, although his research interests have included fused-salt electrochemical cells, the chemistry of the rare-earth elements, and chemical problems in nuclear reactor technology.

AN EMPTY PROMISE

Title Successful Engineering Management

Author Tyler G. Hicks

Publisher McGraw Hill, 1966

Pages xii + 287

Price $8.50

Reviewer Joseph H. Bach

In 1890, this volume might have passed muster as an elementary description of industrial management techniques. The subtitle, "Modern Techniques for Effective and Profitable Direction of the Engineering Function," appears to be a promise to guide the reader through the new techniques specifically developed to control the ever growing complexity of the engineering manager's job. It is an empty promise. While CPM, PERT, OR, etc. are mentioned, the description and analysis of these and other management techniques is compressed into a few uneven pages. The reader is then advised to read all about it in the references which follow each chapter. The balance of the text is a mish-mash of banalities and generalities, which indicate that the author is unqualified to discuss the subject and that the publisher did not have the fortitude to reject a worthless manuscript.

Written in three parts, the first of these deals with the advantages of becoming a manager (you get two extensions on your phone!) and equally puerile advice on how to get there. This is followed by chapters listing various functions often performed by managers, ranging from technical writing through labor negotiations. With minor exceptions not a single subject is adequately described, nor are alternatives or application critically discussed. Typically, the chapter on proposal writing shows the last 4 of 8 major (sic!) steps as "Typing, Binding, Final Check and Submission." Not a word on proposal organization, what to put in, or how to describe the work program. Twelve pages on contract negotiations can be summed as "be alert, and nice to the customer."

The planning process, although mentioned often is left to the readers' imaginations, as are other major engineering management problems such as Evaluation of Alternatives, R & D Program Selection, etc.

The final part of the book describes some typical management jobs which usually fall to an engineer, and repeats the generalities of the first two parts. Redundancy is not the least of the book's many deficiencies. Whole paragraphs are repeated, often three or four times throughout the text, leading one to suspect that the editor was too bored to read either the manuscript or the proof in its entirety.

The book's high price need not discourage anyone who may wish to own it. This reviewer predicts that it will appear shortly on the shelves marked "Any 3 for 50¢."

Joseph H. Bach obtained his formal education as a metallurgical engineer at Purdue (BS 1942) and the University of Idaho (MS 1951). For the last 20 years, he has worked at Hanford, Sylvania, and Westinghouse in a variety of nuclear energy programs including weapons, naval propulsion, space application, and central power stations. He has held both line and staff engineering management positions and is currently a planning consultant at the Atomic Power Divisions of Westinghouse Electric Corporation.

INTERESTING AND THOROUGH RECAPITULATION

Title Scientific and Managerial Manpower in Nuclear Industry

Author James W. Kuhn

Publisher Columbia University Press, 1966

Pages xv + 209

Price $7.50

Reviewer R. L. Doan

This book represents a study of the role of manpower in the development of nuclear technology, with particular reference to the nuclear power industry. It is part of a

series of studies in the broader area of Manpower Resources And Economic Growth, carried out by the Conservation of Human Resources Project at Columbia University under the sponsorship of the United States Department of Labor. The author, Professor James W. Kuhn, cites an impressive list of references to individuals prominently involved in the development of nuclear power who contributed information and viewpoints summarized in the book.

The author presents an interesting and essentially correct narration of the manpower problems that arose in the prosecution of the historic Manhattan Project during the war years. This reviewer, as the first director of the Metallurgical Laboratory at the University of Chicago, and first director of research at Clinton Laboratories in Oak Ridge, was privileged to have some of the first headaches that accrued from early attempts to forge the first large-scale multidiscipline approach to the many complex and urgent problems that faced the plutonium part of the project. The initial allergy between scientsits and engineers was only lightly concealed at the startup of activities at Clinton Laboratories in the autum of 1943, and, in fact, formed the basis for the organization set up to cope with it. This antagonism, however, disappeared progressively as each group learned to appreciate the talents and contributions of the other, and never constituted any serious deterrent to the accomplishment of laboratory objectives.

The large efflux of technical personnel from project laboratories at the end of the war caused a temporary dip in the nuclear manpower curve which, however, began to turn upward again with the generation of new peacetime projects. The advent of the nuclear power industry created a pressing need for massive manpower training in all aspects of nuclear technology. The author outlines how this need was met by training courses set up by the Atomic Energy Commission at its national laboratories and elsewhere. Neither the electrical equipment industry nor the electric utilities, who were the natural beneficiaries of the biggest peacetime fallout from the wartime nuclear effort, realized the magnitude of the manpower transition that would be required to make nuclear power an economic reality. This is understandable in the case of the utilities, at least, which had never had much occasion to develop any extensive research or engineering staffs. The major portion of this book is devoted to a recitation of the many problems involved in this nuclear manpower transition which is still going on as more companies embark on nuclear power plant operation. The licensing and regulation process makes it mandatory for each company wanting to build and operate such a plant to have a full understanding of its characteristics, and to assume full responsibility for the public safety aspects of its operation. Competent engineering staffs have had to be developed accordingly.

Professor Kuhn's book contains little that is new to any who have been actively associated with the developing nuclear technology for any considerable length of time, but it recapitulates the many facets of the manpower problem in an interesting and thorough manner which will make it worthwhile reading even for the "old-timers." The adequacy of the supply and capability of technical personnel to meet future needs of a rapidly escalating nuclear power industry is still a relevant and timely subject, as evidenced by the fact that it constituted the main theme of the Eighth Annual Nuclear Education Conference held late in January 1967, at the Argonne National Laboratory.

The book contains a few errors, but not many. Probably its most unforgivable one, in the eyes of the Atomic Industrial Forum, is to call that distinguished study and discussion group a "trade association." The author's style of presentation makes easy and interesting reading which the reviewer recommends to everyone newly embarked on a career in nuclear power.

Dr. Richard L. Doan is one of the "old-timers" in atomic energy, having served on the Manhattan Project at Chicago and Oak Ridge during the war years, spent 12 years as manager of the atomic energy division of Phillips Petroleum Company at the National Reactor Testing Station in Idaho, and recently completed 2½ years as Director of Reactor Licensing in the Regulatory Branch of the Atomic Energy Commission. He was a member of the Advisory Committee on Reactor Safeguards for nine years, and participated in all three international atoms-for-peace conferences in Geneva, Switzerland. He is a fellow of the American Nuclear Society and the American Physical Society, and was a 1963 recipient of an AEC citation for meritorious service.

A LACK OF UNITY

Title Progress in Nuclear Energy, Series IX, Analytical Chemistry, Volume 7

Editors H. A. Elion and D. C. Stewart

Publisher Pergamon Press, 1966

Pages v + 288

Price $14.00

Reviewer Clemens Auerbach

The latest volume in this well-known series consists of five chapters: 1) Electron diffraction techniques and their applications to the study of surface structure, by Raymond K. Hart, 2) Liquid scintillator solutions in nuclear physics and nuclear chemistry, by Donald L. Horrocks, 3) In-line analytical instrumentation of nuclear fuel reprocessing plants, by C. R. McGowan and J. K. Foreman, 4) Part I: A table of coefficients for the microprobe analyst, by R. D. Dewey, Part II: Tables of x-ray data, R. D. Dewey, R. S. Mapes, and T. W. Reynolds, and 5) The ion microprobe mass spectrometer, by A. E. Barrington, R. F. K. Herzog, and W. P. Poschenrieder.

In addition to the wide diversity of topics represented, the chapters differ appreciably in overall approach, scope, and length. Chapters 1, 2, and 5 deal with specific modern instrumental techniques which have recently come into their own. Chapter 2 (90 pages) is a thorough and ex-