

BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.



Materials Characterizations: Metals Handbook (Vol. 10, 9th ed.)

Coordinator Ruth E. Whan

Publisher American Society for Metals, Metals Park, Ohio (1986)

Pages 761

Price \$92.00

Reviewer Geoffrey G. Eichholz

This encyclopedic volume on materials characterization is a worthy member of the well-known Metals Handbook series. In a single volume the reader will find a concise but fairly detailed description of all major techniques used to characterize materials. The subject headings cover optical and X-ray spectrometry, mass spectroscopy, electrochemical and radiochemical analysis, resonance methods, metallographic techniques, diffraction methods, electron optical methods, electron or X-ray spectroscopy, sputtering or scanning phenomena, and chromatography. A guide is provided to indicate applicable methods for each type of sample, and the sampling process itself is discussed.

Within each group, every method is explained by principle and instrumentation, the procedure is outlined, and typical applications are presented. Diagrams are used to illustrate the procedure, and typical results are shown, whether they are spectral plots, micrographs, or chromatograms. Most of the newer methods have selected references updated to 1985 in many cases. A review table at the head of each chapter summarizes the applications, sample types, limitations, sensitivity, and capabilities of related techniques for the particular method described.

Most of the methods discussed here find widespread application in nuclear technology where characterization of materials is a key operation in quality assurance and material evaluation. Though, obviously, the format of the book makes the treatment of any method rather compressed and may send the reader to more detailed references for actual implementation, it is hard to think of any other single vol-

ume that would provide such a useful description of the various methods or such a convenient presentation for comparing the applicability of competing techniques. The volume is very competently edited, carefully indexed, and attractively presented. It will be a valuable reference book for any materials technologist or engineer and a useful reference book for courses on instrumental analysis or surface phenomena.

Geoffrey G. Eichholz is a Regents' Professor of Nuclear Engineering at the Georgia Institute of Technology, which he joined in 1963. He obtained his PhD in physics at the University of Leeds, England, and was awarded the DSc degree in 1979. He edited the book Radioisotopes Engineering and is the author of Environmental Aspects of Nuclear Power and Principles of Nuclear Radiation Detection, both published by Lewis Publishers. His research interests include the migration of radioactive wastes, environmental surveillance problems, radiation detector development, industrial radiation applications, nuclear materials technology, and the health physics of nonionizing radiations.

Radioactive Waste Management: Technical Hazards and Public Acceptance

Publisher Oyez Scientific & Technical Services, Limited, London (1985)

Pages 229

Price \$75.00 (softbound)

Reviewer Geoffrey E. Eichholz

This volume constitutes the proceedings of a conference held in London in 1985 and consists of the direct reproduction of the 14 papers presented and a transcript of the panel discussions that followed the four sessions. Although the intended audience is not identified, the papers are clearly directed to the general public rather than the specialist. As the subtitle indicates, a fair proportion of the conference and

the discussions was devoted to public reaction, media presentation, and public perception of waste issues. This reflects a situation that is not peculiar to Great Britain but is encountered in most countries, and comments made at this meeting are pertinent elsewhere.

The introductory session on the present status of waste disposal and the principles of radiological protection may be considered tutorial in nature. Several papers deal with the particular problems that have arisen at the Sellafield reprocessing plant and the waste disposal to the Irish Sea practiced there. A paper of wider appeal now is one by Knowles on decommissioning wastes, in which he reviews past experience, cost factors, and disposal options. Another pertinent paper by Bromley compares the control of and public reactions to disposal of radioactive and toxic wastes. A rather fierce discussion regarding the credibility of the press and its anti-nuclear bias may also strike some sympathetic chord in the technical reader.

Despite the high price, these proceedings may appeal to the nonspecialist who would like to find out what the control issues are in waste management and what the British response is to their solution.

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Diamond Dealers and Feather Merchants: Tales from the Sciences

<i>Author</i>	Irving M. Klotz
<i>Publisher</i>	Birkhauser Boston, Inc., c/o Springer-Verlag, Inc., New York (1986)
<i>Pages</i>	115
<i>Price</i>	\$24.95
<i>Reviewer</i>	John A. Wethington, Jr.

Professor Klotz's name is familiar to all protein chemists and all students of chemical thermodynamics. The book, developed over two decades, shows him to be an excellent writer even when stripped of the crutches of mathematical and chemical equations. I bet even money that he can give a talk without slides! I read this little group of essays twice. Each time I could see my own foibles on some pages; those of my colleagues appear on almost every page.

The book consists of five chapters: each an essay capable of standing alone and giving pleasure to the reader. I will attempt to capture the spirit of each.

I. Bending Perception to Wish: The Future as Froth and Fantasy

How does a reviewer recognize new and novel ideas? Avoid believing himself? Prevent or encourage the publication or funding of something new and different? "Recognition of the viability and potential of a novel conception at its birth, rather than at its maturity, has always been a tantalizing challenge." Professor Klotz quotes, from the scientific literature, assessments made at the time about the work of Thomas Young (physics), Jacobus van't Hoff (chemistry), Theodore Schwann (zoology), Jean-Baptiste Dumas (chemistry), Josiah Willard Gibbs (mathematics and physics), and others. Fire and brimstone were heaped on these still famous men by their contemporaries—many of whom were highly respected both then and now. Examples are Berzelius, Duhem, and Tail. Statements are not paraphrased; they are quoted.

II. The Clouded Crystal Ball: Creases of the Mind

Candid and incorrect judgments are often made because they are based on what is sound or accepted knowledge at the particular time a judgment is made. Lord Kelvin (born William Thomson) was an immensely talented and gifted individual; however, he regarded the enormous claims for time, as accepted by geologists and other technologists, as untenable. He considered the work of Charles Darwin unscientific.

Johann Gregor Mendel received no request for a reprint of his classic paper; it is worth noting that his work preceded the Xerox machine. I am sure that people do not request reprints of my work because it is easier to copy it at home.

Political leaders such as Stalin and Mao had misperceptions of science and technology, as did the great prime minister William Gladstone. While being escorted through Michael Faraday's laboratory and being shown new discoveries in electromagnetic induction, he remarked, "Very interesting, Mr. Faraday, but of what possible use is this?" These discoveries led directly to the electric power industry. Mr. Gladstone's crystal ball, based on the knowledge of his time, could not extrapolate ahead. In fairness, it is hard to extrapolate without at least one data point.

III. Great Discoveries Not Mentioned in Textbooks: N Rays

Books only mention iconoclasts who turned out to be right; those who were wrong or who had nothing to offer vanished without a trace. Sometimes an ecstatic personality or a striking idea can infect scientists and create almost mass hysteria. Rene Blondlot announced the discovery of N rays in 1903. Professor Klotz's book shows a reproduction of a page from *Comptes Rendus* for the first half of 1904 listing papers on N rays and on X rays: The ratio is 53 to 3. Zero papers were published in 1905.

The N-ray story should be read by every young scientist.

IV. Grand Illusions: Russian Water

This reviewer watched the saga of polywater explode in the scientific literature and die. Great illusions occur in modern times, circa the 1970s, as well as in the early 1900s. The material called orthowater, anomalous water, Russian water, and water II reportedly had physical properties vastly different from ordinary water also known as usual water or