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 antinuclear 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.

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.*

Diamond Dealers and Feather Merchants: Tales from the Sciences

Author	Irving M. Klotz
Publisher	Birkhauser Boston, Inc., c/o Springer-Verlag, Inc., New York (1986)
Pages	115
Price	$24.95
Reviewer	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), Jacobas 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

metawater. John Bernal, a pioneer in elucidating the structure of molecules from water to viruses, said, "In my opinion, this is the most important physical-chemical discovery of the century." Prophets of doom began to sound the alarm. A letter in *Nature* regarded, "... the polymer as the most dangerous material on earth." The same article said, "Scientists everywhere must be alerted to the need for extreme caution in the disposal of polywater." One of my colleagues reported in a well-known journal that the use of this curious substance had great implications for nuclear power. What if metawater, the moderator and coolant, suddenly was transformed into polywater? Polywater became moribund about 1980.

Twenty-eight references enable the reader to study this subject in detail. Young scientists and engineers, read some of these!

V. People Yearn to Believe: Dr. Fox Experiments

Here the author examines ideas accepted by various publics but viewed with caution by critical scientists. Psychic criminology and religious relics are fertile fields for creationists versus evolutionists, believers versus nonbelievers, or other polarized segments of the population. Student evaluation of teachers is now widely used as a criterion for promotion and tenure. Has anyone correlated grade inflation with student evaluation?

Klotz's examination of the repeated discovery of Noah's Ark shows how people want to believe. If scientific examination of a relic tends to disprove a belief, the believer immediately concludes that the method of examination is at fault. The saga of Noah's Ark achieved the status of being made into a documentary and shown on the Public Broadcasting System. I have seen it twice.

I sought for some time to find Professor Klotz's message. I finally decided that he states it very succinctly in the following passage:

> Scientists are first of all people. Some are saints, a few are charlatans, most try to abide by unwritten codes of good scientific practice. There are a few leaders, many followers, occasional rebels. Some act like intellectual dinosaurs, others are implacable skeptics, a few are free-floating undisciplined mystics, most go along with accepted doctrines. There are diamond dealers, feather merchants and those struggling to earn an honest scientific living. At some stage in his or her scientific life, an individual may fit into each of these categories. All of these facets of temperament and personality color one's view of the intellectual landscape.

In summary, we are, first and foremost, people!

John A. Wethington, Jr., is Emeritus Professor of Nuclear Engineering at the University of Florida. He is a great believer in leaves of absence, particularly sabbatical leaves. One of his long-time interests is great illusions in science including the N-ray affair, polywater, and possibly the magneto-optic effect.