judgment on the safety of proposed nuclear waste depositories, but at least we will be able to ask better questions. Most recently Charles D. Bowman and Francesco Venneri have theorized that leached plutonium from spent fuel rods in Nevada might collect in localized spots and create an underground explosion of 0.3 kilotons. (C. D. Bowman and F. Venneri, "Underground Autocatalytic Criticality from Plutonium and Other Fissile Materials," report no. LA-UR 94-4022, Los Alamos Nat. Lab., 1994.) My examination of their paper shows no application of the equations on underground water flow, which predict diminished concentration from speeding gaussian distributions, given in chapter 5.

Because of the high quality of *Environmental Physics*, it will be immediately useful to the environmental movement in the United States. Many of the environmental laws are now under attack and undoubtedly will be softened. It is a pity that, in the larger debate on the environment, the environmental movement has been wounded because each environmental group has wanted to maximize the regulations in its area without concern for the broader establishment of therapeutic priorities for "patient Earth." A good study of *Environmental Physics* should help us all in our efforts to separate the larger problems from the smaller ones.

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Industry's Future: Changing Patterns of Industrial Research

Herbert I. Fusfeld
American Chemical Society, Washington, DC, 1994. 369 pp. $39.95 hc ISBN 0-8412-2983-X

The unique characteristic used by Herbert Fusfeld in *Industry's Future* to distinguish industrial research from related endeavors is the former's combination of performers, funders and users of research output within an industrial firm. The author (who has served as director of research for Kennecott Copper and American Machine and Foundry, as well as having been a government manager and university professor) argues that this combination endows industrial research with unique properties of efficiency and effectiveness in converting technical discoveries into products and services of economic value.

Fusfeld's stated purpose is "to

provide a foundation of knowledge and understanding that can guide policies and strategic directions in industry, government and academia." While this goal may be achieved formally, the style of the presentation is better suited to supplementary reading for an undergraduate special-topics seminar than as a "must" for busy executives. The book is at least twice as long as its content requires; much of the discussion is generic; quantitative material is presented either in the text or in tables rather than graphically; and the author is not reticent about injecting his opinions into the discussion. Few policy makers accustomed to decision making under severe time pressure will have the motivation or patience to wade through 364 pages of discursive, often repetitive text.

An unexpected shortfall of the presentation is Fusfeld's reliance on the general business literature and studies from the Center for Science and Technology Policy (which he founded at Rensselaer Polytechnic Institute in 1978 and whose advisory board he now heads), while ignoring pertinent professional management literature on the topic. For example, he seems to think he invented the concept of the strategic management of research, when in fact an excellent reference on this subject has existed for several years in P. A. Roussel, K. N. Saad and T. J. Erickson's *Third Generation R&D* (Harvard Business School, 1991). Extensive literature on the influence of R&D on product innovation also is neglected, including a recent report on Hewlett–Packard's R&D management practices by M. L. Patterson in *Accelerating Innovation* (Van Nostrand Reinhold, 1993). Overall, the presentation is at the level of an introductory survey aimed at an academic audience rather than a substantive analysis useful to industrial research managers and practitioners.

For an academic audience, however, the book offers insights to the purpose, funding and organization of industrial research that are not widely appreciated outside the community of industrial R&D managers. The examples developed in chapter 11, on industrial research today, are illuminating and representative of current practices. The discussions given in chapters 8 and 9, respectively, on the corporate environment and on the basis of industry–university partnerships from the perspective of the industrial partner, are perceptive and, from my experience, accurate. Thus university administrators contemplating such partnerships and students considering careers in industrial research could glean considerable insight from studying selected portions of this work.

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Case Studies in Superconducting Magnets: Design and Operational Issues

Yukikazu Iwasa
Plenum, New York, 1994. 421 pp. $59.50 hc ISBN 0-306-44881-5

If problem solving is the essence of the engineer's art, then *Case Studies in Superconducting Magnets* provides a rich introduction to the essentials of superconducting magnet engineering. This graduate-level text has been designed around 86 practical problems that constitute the bulk of the book. The problem-set approach certainly has many advantages: The case studies contain a wealth of practical information, the real world examples provide ample opportunity to practice the art of problem solving and the detailed solutions help develop insight and understanding.

There are drawbacks to the approach as well. Although a secondary audience for such a book is the professional engineer, the large amount of information contained in the problems somewhat limits this book's usefulness as a reference work. For example, fully 95% of the 63 pages devoted to field and force calculations in chapter 3 is taken up by problems. Also, many half- or full-page sections of background or explanatory information are buried between lengthy problems. If the intent is to use this volume for general reference, then the reader should plan to rely heavily on the table of contents, which fortunately does a good job of describing problem topics.

A great strength of this book is the wealth of experience in high-field solenoid magnets that the author, Yukikazu Iwasa, brings to these problems. Much of this experience comes from high-field magnet technology developed at the Francis Bitter National Magnet Laboratory. Iwasa has long served as professor of mechanical engineering at MIT, and he has made solid contributions to high-field technology at the Bitter Lab. This technology includes high-power resistive magnets, which Iwasa treats in his book, and he shows their significance for hybrid superconducting–resistive systems, which presently generate the world's highest dc fields. An interesting series of problems deals with Hybrid III, a 35-tesla system in routine operation at the Bitter Lab.

The appendices, which contain much materials data useful for magnet design and operation, are another strength of the book. Iwasa's book is also sprinkled with delightfully eclectic quotations from sources ranging from Michael Faraday to Obi Wan Kenobi in the movie *Star Wars*. I detected a number of insignificant typographical errors, which will probably be corrected in a future edition. On page 46 a more serious error occurs, however, leading to an overestimate of the Lorentz stress on a 50-T solenoid by an order of magnitude. The error is repeated on the next page.

This textbook is only the second (to my knowledge) devoted to superconducting magnet technology, a field that has grown significantly in the dozen years since the first, Martin Wilson's *Superconducting Magnets* (Oxford, 1983), was published. Wilson's book provided the first systematic treatment of the field and remains useful for its elegant derivations and its extensive exposition of many basic concepts. While Iwasa's work does not provide much in the way of theoretical derivation, in its own way it gives an equally useful overview of the technology. It also adds contemporary treatment of ceramic superconducting materials and magnets, which hold tremendous potential for significant expansion of the field in the next 10 to 15 years.

I highly recommend this book for graduate-level engineering students. The overwhelming strength of *Case Studies in Superconducting Magnets* is its practical treatment of actual problems. As a practicing engineer, I expect to refer to this volume often.

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Fractal Concepts in Surface Growth

Albert László Barabási
and H. Eugene Stanley
Cambridge U. P., New York, 1995. 358 pp. $69.95 pb
ISBN 0-521-48318-2

About ten years ago a small group of statistical physicists began to apply notions of fractal scaling and renormalization to surfaces such as growing thin films. This rather unlikely intersection of ideas unleashed a