densed matter and related topics and techniques.

Baltes and Hilf have provided a detailed and concise review of Weyl's problem for which, having researched in this area extensively, they are well suited. The monograph is quite readable and stresses physical applications as opposed to pure mathematics, in contrast to Clark's review. The bibliography is large and the various contributions well documented, so that the monograph is a valuable guide to the literature. A post-deadline note brings the review up to 1975.

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Remote Sensing of Environment

J. Lintz Jr, D. S. Simonett, eds.
694 pp. Addison-Wesley (Advanced Book Program), Reading, Mass., 1976. $27.50

With the launching in 1973 of the Landsat-1 satellite, a new era in remote sensing began. The relatively low cost and wide availability of Landsat data have aroused the interest of scientists and planners throughout the world. During the ensuing years, the data have been applied to a wide variety of problems, such as mineral exploration, mapping and monitoring of water resources, land-use mapping and planning, and the monitoring of agricultural crops. Landsat thus joins a list of remote-sensing data sources: aerial photography, aerial gravity and magnetic surveys, and imaging radar, to name a few.

PHOTO, RCA ASTRO-ELECTRONICS

Giant Antarctic iceberg photographed by the NOAA-5 satellite from 900 miles aloft.

Now we are beginning to see texts—of which this is one—that bring together the diverse aspects of remote sensing.

The authors concentrate on the group of measurements involving electromagnetic fields, from the ultraviolet through the visible to the radio frequencies. They treat remote sensing, with the associated techniques for data interpretation, as a more or less unified field, in which the various sensors all play a part. The editors, Joseph Lintz Jr and David S. Simonett, have assembled a series of papers on the science aspects of the field (atmospheric effects, photographic systems, nonphotographic sensors, passive microwave systems, active microwave systems—including imaging radar—and airborne geophysical systems), on some of the data-processing techniques (computer multispectral processing, in particular), on the need for system design and for adequate ground truth, and on remote-sensing applications.

The first section of the book deals with the principles of sensing with the electromagnetic field, then with the effects associated with the atmosphere; this is followed by a thorough discussion of a number of philosophical points affecting the interpretability of the data. All of the points are well taken, although the treatment is somewhat uneven: The section on the atmosphere leaves one with the feeling that the atmosphere causes a lot of problems, but it does not indicate any good solution for them. The remainder of this section conveys the feeling that remote sensing is here to stay.

In the second part, the authors discuss a number of systems for remote sensing. Treatment of the photographic systems is superficial, although this may be justified on the grounds that a number of other excellent volumes cover the subject; little information is transferred to the reader. The chapters on nonphotographic sensors and on passive microwave systems, on the other hand, give the reader a good feel for these subjects, with enough mathematics to illustrate the techniques and the problems. The discussions on both passive and active microwave measurements leave the reader with the feeling that the sensors are seeing something, but it is not clear just what. A better apologia would have been useful, although this probably represents the current state of the art. The discussion on the Landsat-D (scheduled for 1981) spectral bands shows the problems the editorial process has in keeping up with the designers—several of the parameters listed (some of the spectral bands and the local time of sensing) have been changed during the time it took to assemble the book; but the discussion of the parameters is good—it is to be hoped that the authors have a chance to update this in a second edition.

The discussion on data processing and ground truth is by no means a textbook on the subject, nor was it meant to be. The discussion is heavy on pattern recognition and multispectral analysis. This gives the reader a good feel for the generalities of the subject, but it must be left to other texts to give practical embodiments of the ideas. A number of other areas of machine processing, such as geographical registration and data-base systems, are treated only lightly; the unwary reader may be left with the idea that multispectral analysis is the only important area of machine processing. I found the treatment of ground truth and mission operation refreshing: This is the area in which it all comes together—the total system approach, with the realization of requirements for the totality of data necessary to solve a given problem. Landsat by itself (or any other single sensor) is not necessarily the total solution. The problem being solved is the driver, not the need to use any given sensor. Bravo!

In the final portion of the book are a group of sections on various real-problem application areas. These form a fitting end to the discussions. Each section, in its own area, pulls together the concepts elucidated in the preceding portions of the book and serves as an overview of its discipline.

This book will be excellent reading for an introductory college-level course or for anyone desiring a general overview of the field of remote sensing with strong emphasis on potential future systems and wishing to obtain the concepts without being troubled with the details of the techniques. For the technique-oriented, other, more detailed texts will be required.

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Medicine and Clinical Engineering

B. Jacobson, J. G. Webster
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The impact of physics and engineering on the technology related to the medical care of patients in hospitals continues to increase. With the exception, however, of some areas of instrumentation and, particularly, in radiology and nuclear medicine, a friendly environment for physicists and engineers in hospitals is developing at a much slower rate than many people expected when the concept of "health-care delivery" became a national objective some years ago. Nevertheless this effort, which is beginning to gather under the banner of "clinical engineering," is showing steady growth. Many hospitals now have established departments of clinical engineering, and a number of