Book reviews

Oceanography from Space
Marine Science, 13
978 pp., £95.00 (+ 20 per cent outside USA)

A heavy volume containing over 100 conference papers can be a daunting prospect for the reviewer. However, in this case the task has been most rewarding, hindered only by the requests of colleagues to borrow the book! It is in fact an example of the best kind of published conference proceedings, giving both a broad coverage of the state of the art and specific examples of particular areas of research which combine to provide a comprehensive introduction for a newcomer to the subject.

The subject in this case is the use of satellite remote sensing in oceanography, a relatively new and fast-growing research field. Oceanographers themselves have in general been slow to make use of the new vantage points in space available for the study of the oceans and much of the earlier work has been based on the optimistic speculation of space technologists. The value of this book is that it has brought together both the contributions of remote sensing experts, who explain what the satellite sensors can do, and the new research results of those oceanographers who have begun to apply the space-collected data to their particular branch of ocean science. Therefore whilst the book must inevitably find a place on the shelves of those who are themselves involved in satellite oceanography, it is also a volume which no physical oceanographer can afford to ignore.

As satellites are increasingly recognized to be an indispensable part of the oceanographers' observational equipment, this book will become a valuable reference source and starting point for the marine scientist who wants to find out what satellite remote sensing has to offer.

Because oceanography from space, like oceanography itself, covers such a broad field of scientific disciplines, this volume could have become a bewildering maze of unconnected papers. In fact it has been expertly edited into a clear and manageable structure, following the organization of the conference at which the papers were first presented, the COSPAR/SCOR/IUCRM Symposium on Oceanography from Space held in Venice in 1980 May. Basically the papers are grouped into sections covering identifiable research areas so that the reader can quickly find the papers of interest to him. The groupings relate either to a type of sensor or else to a field of application. The first is a general section with nine papers which did not fit into any of the other headings. This is perhaps the least valuable part of the book, since some of the plans for proposed satellite programmes already appear very dated.

The other sections bring together papers covering respectively sea surface temperature measurement using thermal-infrared sensors, ocean colour (visible and reflected IR) measurements, radar studies of the sea surface (principally the Seasat Synthetic Aperture Radar, Scatterometer and Altimeter used to measure wave height), passive microwave observations
(principally the *Seasat* and *Nimbus* SMMR), the remote sensing of sea ice, and satellite altimetry (applied to studies of the geoid, ocean circulation and tides). Each section is introduced by a brief survey of the field and reading these alone would provide a useful overview of the current state of the science of satellite oceanography. Thus it is readily apparent that the work on SST and ocean colour has reached a much more advanced stage of diverse applications to ocean science than the microwave techniques, reflecting the difference between an operational experience of 10 years with a variety of visible and IR satellites, and three months only of *Seasat* operation, from which the oceanographic conclusions are much more tentative and speculative.

In each section a good balance is achieved between definitive papers presenting the scientific principles of a sensor's operation or calibration, and others which describe a more specific application. This balance reflects the mixture of invited papers and poster contributions at the Symposium itself. They are all commendably brief, however, and so escape the danger of becoming too unwieldy or unreadable. In some cases the papers are condensed versions of reports published elsewhere, providing the key details of, for example, a sensor or a calibration/atmospheric correction algorithm, with clear reference made to where the specialist can examine the design or techniques in more detail. This is particularly valuable when material from several technical reports is condensed into a definitive article, such as that concerning the *Nimbus 7 CZCS* program.

The book has been well produced. The camera-ready typescript is uniform and of high quality throughout and care seems to have been taken to preserve contrast in the black and white images. It is of course a serious drawback to any remote sensing publication that the cost of colour reproduction is prohibitively expensive. The list of participants is helpful in a subject where traditional groupings of scientists are being breached, and to newcomer and experienced remote-sensor alike the thorough listings of acronyms and definitions are invaluable. It seemed to me that the index is annoyingly incomplete, but the structure of the book enables the reader to find what he is looking for without too much difficulty. It is then an excellent book to which all oceanographers and remote sensing workers will want access and which many scientists will undoubtedly consider worth purchasing for their own shelves despite its cost.

I. S. Robinson

*Applied Geophysics for Geologists and Engineers*, 2nd edn

230 pp., £12.50 cased, £5.95 paperback

It will come as no surprise to those who know and have used Griffith & King's excellent book on the elements of geophysical prospecting that a second edition has recently been published to replace the first one initially produced in 1965 and subsequently reprinted several times. Furthermore, the change in the title from *Applied Geophysics for Engineers and Geologists* to the same for *Geologists and Engineers* reflects the popularity of the book with geologists. The book covers the fundamentals of seismic reflection and refraction surveys, and of electrical resistivity, electromagnetic, gravity, magnetic, borehole logging and other remote sensing methods. Each of the sections on the different methods follows a similar pattern. First there is an introduction giving an outline of the theoretical basis of the technique, then a description of the types of instruments used to make the measurements. Next comes a treatment of field procedures and sensor configurations which is particularly