lar, the spectroscopic and photochemical properties of nucleic acids in frozen aqueous solution are reviewed. Finally, there are three chapters concerned with the methodology which has proved to be so useful in establishing the chemical structure and detailed conformation of the photoproducts—mass and nuclear magnetic resonance spectrometry, and X-ray crystallography. Also included is a chapter on radiation chemistry.

The publication of this book is particularly opportune, coming at a time when the repair mechanisms of nucleic acids are so extensively studied. It

should therefore serve as an important source of references. Some aspects are redundantly treated, and some others of peripheral interest to the authors are briefly and in a few cases inaccurately mentioned. More fundamentally I would have expected a more integrated presentation of the chemical and biological data for a book intended to be a classical treatise.

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View from space

Earth Sciences in the Age of the Satellite. By J. Pouquet. Pp. ix+169. (D. Reidel: Dordrecht and Boston, Massachusetts, 1976.) Dfl.58; \$22.50.

THE view from space of the Earth's surface is providing a distinctive new source of environmental information. This distinctiveness is based firstly on the overview of large areas which makes possible the detection of large scale features that cannot be easily recognised either on the ground or from aircraft, and secondly on the possibility of monitoring rapidly changing phenomena using the regular repetitive imagery obtained from many satellites. Although imagery from satellites has been available for some years, many earth scientists have been rightly sceptical of (perhaps because of) the over-optimistic claims made for remote sensing. The more cautious, more carefully considered study of remote sensing that is now becoming increasingly common is leading many earth scientists to examine its potential, not as a panacea, but as one of several alternative data sources.

Earth Sciences in the Age of the Satellite, was first published in 1971, and has more recently been published in an updated form in this translation. This may well account for many of the naive hopes expressed about the role of remote sensing and satellites.

In the first of the book's three parts, properties of radiation from various parts of the electromagnetic spectrum and their interaction with the Earth and atmosphere are briefly described. The second part on the role of satellites is out of date, although it is a very useful compilation of information about the earlier satellites. The final part concentrates on the applications to the earth sciences, with greatest emphasis being placed on geopedological examples (*sic*). Many of the examples are superficial or even trivial and will convince few that remote sensing has any substantial potential. No proper evaluation of the remote sensing methods

is presented, nor is there any sensible objective comparison of their merits relative to other more conventional data gathering methods. In this and previous sections, the illustrations are often unhelpful and more and better photographic reproductions are clearly needed.

The idiosyncratic style of writing will be annoying to most readers and does not merely arise as a result of poor translation. Finally, the book is costly (£14.50) considering its length (169 pages), and fortunately there are other much better books now available.

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Infrared and Raman spectroscopy

Infrared and Raman Spectroscopy. Part A. Edited by E. G. Brame and J. Grasselli. Pp. ix+345. (Dekker: New York and Basel, 1976.)

THIS is the first of a projected set of three volumes on infrared and Raman spectroscopy. The set is intended to cover all possible applications of these techniques in such diverse fields as the food industry, petroleum, textiles, biology, environmental science, and so on. This, the first volume, is more concerned with academic, rather than with industrial uses, but a sound understanding of the basic principles is obviously necessary before these techniques can be properly applied.

The first chapter is an introduction to molecular vibrations by Crawford and Swanson. It introduces the basic concepts in a manner suitable for those new to this field, with all the clarity and good humour one would expect from such a source. The chapter covers the origins of infrared and Raman spectra, and the experimental techniques, and introduces such concepts as selection rules, coupled oscillators, group frequencies, intensities and quantitative analysis.

The second chapter by Carter deals with inorganic materials. This delves more deeply into group theory, symmetry, and the selection rules, and shows in detail how the infrared and Raman spectra can be used to derive the structures of some specific inorganic molecules. It deals also with site-and-factor group analysis and with the spectra of oriented crystals. It concludes with some useful comments on experimental methods and with some character and correlation tables.

Chapter three, by Edgell, covers the vibrational analysis of organometallics. It extends the discussion of the selection rules to cover the concept of hidden symmetry, and again illustrates the application of the technique to a number of specific molecules. Finally, it discusses the derivation and significance of force constants in molecules of this kind.

Chapter Four, also by Edgell, is on ionic organometallic compounds. This deals almost entirely with a relatively new field, as the bands arising from the translational modes of ions in solution were not observed until 1965. The author shows that the study of the translational and intramolecular vibration bands can yield some very valuable information on the structure of solutions, on the motions in them and on the nature of the short range forces involved. This is a very highly specialised topic and includes some previously unpublished research by the author. Nevertheless it is a topic which is very properly included if the whole work is to meet its stated objective of covering all possible applications.

It is all too common to find that texts written by a number of different authors contain a good deal of overlap and repetition. It is therefore a pleasure to be able to report that this is not so in this case. The editors have done an excellent job of integration so that topics such as the selection rules are introduced in a preliminary way in the first chapter, carried further in the second and yet further in the third. The text is well presented, the diagrams are clear and the standards of proof reading have been high. I could detect only one error, the misplacing of DCN in Fig. 4.

New entrants to this field will find the first chapter comfortably simple and non-mathematical, but they must be prepared for increasing complexity as the book proceeds. This is however, a necessary requirement for the academic topics covered and they should not feel deterred from exploring the future volumes if their interests are primarily in industrial applications. Altogether this is an excellent start to what promises to be a very good and authoritative series.

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