BOOK REVIEWS

Electrons in Chemistry

Electronic Structure and Magnetism of Inorganic Compounds. Vol. 1. Senior Reporter P. Day. Pp. ix+225. (The Chemical Society: London, February 1972.) £5.50.

THE two halves of the Annual Reports of the Chemical Society have been supplemented with a flexible and somewhat provisional and pragmatic choice of so-called "Specialist Periodical Reports". Everybody welcomes this addition; it is more difficult, but also more interesting, to review new ideas than new compounds. This particular volume, however, enters in competition with certain series such as Annual Reviews of Physical Chemistry. Further on, the topic most rapidly developing, photoelectron spectroscopy, covered thoroughly by Hamnett and Orchard, suffers a bit by the strict limitations to 1970. Though the dark past (1967-69) is invoked a few times, not a single instance of new information or changed opinions in 1971 is included. For comparison, it may be noted that Hercules has written a review about 1971 in the April 1972 issue of *Analytical Chemistry*. The chapter is, obviously, more about 21 eV work on gaseous molecules (and is to a large extent a paraphrase of the magnificent book by Turner) than about 1,486 eV induced spectra of solids.

The second chapter on electronic spectra (by Day and Sanders) considers both high-resolution, low-temperature studies of crystals and more chemical work on solutions. It is interesting how the emphasis has moved from internal transitions in partly filled shells to electron transfer spectra. Hardly any gases are mentioned. The third chapter on optical activity (by Denning) is closely connected with the (sometimes slightly circular) attempts to identify the symmetry types of excited levels; important recent progress in magnetic circular dichroism and absolute configurations is discussed. The fourth chapter on magnetic susceptibility by Cox has a less glamorous subject and tends to concentrate on collective effects. I am agnostic whether the final chapter on theoretical calculations really belongs to this useful series; at least it is nice to see a few chemical elephants walking into this mathematical china shop.

I agree entirely with the authors that a critical compilation by active scientists

is better than output from a computer. Actually, the dream of some information fanatics seems to be a reading machine connecting wires directly to the brain. Even if this series only survives to 1983, it is still highly attractive.

C. K. JORGENSEN

Surface Chemistry

Principles of Surface Chemistry. By G. A. Somorjai. Pp. xviii+283. (Prentice Hall: Englewood Cliffs, New Jersey, May 1972.) \$10.95.

THE book is described by the author as a "useful introduction to surface chemistry", but if one looks at the chapter headings—"Structure of Solid Surfaces", "Thermodynamics of Surfaces", "Dynamics of Surface Atoms", "Electrical Properties of Surfaces", and "Interactions of Gases with Surfaces"—one cannot but be impressed that Professor Somorjai has at the same time been comprehensive in outlook. I think he has achieved a good balance between the more recent sophisticated advances in the subject with the background material treated in a "low key" manner which is essential in any introductory text. The author has had to be selective in choosing his material but his own diverse experience in the field lends a basis of authority to the individual chapters.

The first chapter, "Structure of Solid Surfaces", is particularly well placed in that it gives those readers unfamiliar with the field an immediate impression of the challenge that awaits those about to embark on research work. The advantages of electron microscopy, field ion microscopy and electron diffraction are highlighted. More attention is given to the basic background of LEED, which undergraduates will find particularly helpful.

There is a good blend of what is well established and what is reasonably tentative and this is the essence of any good book. Somorjai's "Rules of Ordering" are clearly in the tentative category, but they incorporate very succinctly some of the more important points that have emerged in the field of surface chemistry over the last 20 years. LEED has been able to put many of these ideas to the test, provided it is not too insensitive to structural anarchy.

This is one of the crucial factors in translating LEED data into real situations.

The book is generally well produced, but one figure (p. 166) did puzzle me. I presume it does not represent (as is claimed) a typical field emission pattern from a tungsten tip?

M. W. ROBERTS

Alkaloids

The Alkaloids. Vol. 1. Senior Reporter, J. E. Saxton. Pp. xiii+505. (The Chemical Society: London, June 1971.) £11.

THIS volume is the first of a series on alkaloids planned for the recently inaugurated Specialist Periodical Reports of the Chemical Society.

Fifteen contributors review, in twenty chapters, almost the whole of alkaloid chemistry published between January 1969 and June 1970. The steroidal derivatives of the *Solanum* and *Veratrum* groups and a few minor classes of alkaloids have been omitted but will, no doubt, appear in later volumes. As befits the first volume of a series, several chapters are devoted to retrospective surveys of topics which can usefully be presented in definitive style: the biosynthesis of indole alkaloids, the chemistry of bisindole alkaloids, and the applications of pharmacologically active alkaloids are treated in this way.

The book offers a vast and fascinating range of chemical information presented in compact, but by no means telegraphic, style. The reader is assisted by generous provision of clearly displayed structural formulae (about 1,600 in all) illustrating the contents of about 1,400 papers. Inevitably, in a work of this magnitude, some errors in formulae and citations are to be found but these do not seriously detract from the great value of this compilation for natural product chemists. An author index, but no subject index, is provided. An index of alkaloid names would have been helpful but the reader will be able to locate rapidly most classes of compound by using the detailed list of contents.

This volume provides an excellent start to an important new series and the editor is to be congratulated on gathering together such a distinguished and industrious team of co-authors.

G. W. KIRBY