BOOK REVIEWS

Organic VB Chemistry

Organometallic Compounds of Arsenic, Antimony and Bismuth. By George O. Doak and Leon D. Freedman. (The Chemistry of Organometallic Compounds: a Series of Monographs.) Pp. xiv + 509. (Wiley-Interscience: New York and London, March 1971.) £12.

ALTHOUGH the first organoarsenic compounds were prepared by L. C. Cadet de Gassicourt in 1760, it was not until 1910, when Ehrlich announced that a synthetic arsenical was an effective cure for syphilis, that organoarsenic chemistry became one of the favourite research areas of the synthetic organic chemist. The search for new arsenicals for the treatment of syphilis came to an abrupt end in 1943, when it was shown that the disease was readily cured by penicillin. Organoarsenic research fell off for a time, but interest has revived in recent years and chemists' attentions have been more concerned with the structure and stereochemistry of arsenic compounds or their use as ligands in coordination chemistry and as analytical reagents. Similarly, although early work in organoantimony chemistry was stimulated by their use for the treatment of such tropical diseases as schistosomiasis and leishmaniasis, much recent work has centred on the use of organostibines as ligands in coordination compounds.

This volume has been written by two acknowledged experts. It contains a critical evaluation of the methods of preparation of organic derivatives of arsenic, antimony, and bismuth, and the authors emphasize those procedures that appear to be of most general application. The nine sections of the book cover: comparisons of organic derivatives by types of compound, bond energies, force constants, bond lengths and angles; arsonic and arsinic acids; arsonous and arsinous acids; organoarsines; arsine oxides and halides; trivalent and pentavalent stibines; and the reactions and structures of bismuthines. Constant mention is made of the uses of some of these compounds in coordination chemistry.

Although this is primarily a reference work the authors have succeeded in making the book easy to read. Over 2,500 references have been included, and so I can readily forgive the occasional appearance of the same paper under different reference numbers in the same chapter.

This volume will have much appeal to both organic and inorganic chemists,

and no serious worker in this field can afford to be without it. It will undoubtedly become the standard reference work on the organic chemistry of the heavy Group VB elements, and although most books of this type are overpriced, this one seems very good value for money. C. A. MCAULIFFE

Parallel Processing

Parallel Processor Systems, Technologies and Applications. Edited by L. C. Hobbs, D. J. Theis, Joel Trimble, Harold Titus and Ivar Highberg. Pp. ix + 438. (Spartan: New York and Washington, 1970. Distributed in Great Britain, the British Commonwealth and Europe by Macmillan: London.) \$22.50.

THIS book, a collection of papers first presented at the symposium on "Parallel Processor Systems, Technologies and Applications" held in California in June 1969, is more concerned with parallelism within a single problem rather than the more trivial application of parallel processing to the simultaneous processing of several independent jobs, although this subject is touched on.

The book's major asset probably lies in the wide range of subjects covered, rather than in the depth of coverage of any particular topic. Subjects range from hardware cost/effectiveness (for example, chapter 9, "Interconnection/Economic Tradeoffs with Large Scale Integrated Circuits") to the detection of inherent parallelism in serially written computer programs (for example, chapter 19, "Parallelism Exposure and Exploitation").

There are four main sections to the book, along with an introduction and summary written by two of the editors, Hobbs and Theis. The first section covers parallel processing applications and, as the symposium was part government sponsored, it is not surprising to see urban defence radar data processing cited as the typical parallel problem, having high data processing requirements which must be accomplished within a very small real time—tracking of up to 3,000 possible targets from a set of up to 10^{11} return signals per second. Other than signal processing, only one application, matrix handling, is dealt with in this section. Jesse H. Katz presents some valuable comparisons between the performance of a conventional serial processor and a parallel processor in such applications as solution of systems of linear equations, inversion of matrices and determina-

tion of the dominant eigenvalue of an n th order matrix.

The second section, "Device Technology Utilization in Parallel Processors", contains three papers concerned with state of the art technology in large scale integrated circuit design (LSI) and the application of this technology to multiple processor configurations. While of prime interest to designers, these papers are still sufficiently readable to provide a usage-oriented reader with an insight to some of the problems encountered in realizing any particular machine architecture.

Section three deals with the various machine organizations so far conceived of, and the communications problems inherent in multiple processor configurations. One paper in this section, on "Multiple Instruction Stream Processor with Shared Resources", provides a complete description of a hypothetical parallel machine, together with some useful results derived from a simulation of this machine, giving a good indication of the amount of resource utilization that may be expected in a parallel machine organization when applied to various problems.

The final section, "Programming and Software Techniques", is largely concerned with methods for detecting implicit parallelism within serially written programs, rather than with the explicit handling of parallelism at machine level. The authors of the four papers in this section have implemented their techniques to a working state, developing models capable of detecting parallelism in programs written in both Fortran and Algol. Presumably these systems will be adapted to take in Cobol when the growing commercial interest in parallel processing reaches a sufficiently high state.

The need to detect parallelism within serially written programs is two-fold; first, in order not to waste the effort put into writing existing programs, and second, because it is often more convenient for a programmer to consider a problem serially, leaving the compiler to detect and handle the parallel implications of the problem.

In its broad handling of the subject, this book provides a much needed base for any student of computer science who should be aware of the current growing commercial interest in parallel processing. The extensive references and bibliographies cover in-depth expositions of all the subjects summarized in the volume, and the papers themselves are in sufficient depth to be of value in their own right. The book is eminently readable and should be in