physical constants, toxicity, and use of the commercial and important experimental organophosphate pesticides. The limited information available on the mode of action of pesticides other than insecticides is also described in this chapter. Individual pesticides are presented according to their use and chemical group. If a reader is interested in a specific pesticide and knows the chemical, common, or commercial name, he must consult the subject index in order to locate the information about it in chapter 5.

Eto has thoroughly reviewed the literature through the middle of 1974. This readable book will prove useful for students and other beginners as well as for specialists. It provides over 1000 reference citations and a reasonably good subject index, though it lacks an author index.

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Organolithiums

The Chemistry of Organolithium Compounds. B. J. WAKEFIELD. Pergamon, New York, 1974. x, 336 pp., illus. $22.50.

In the 44 years that have elapsed since the first report of the preparation of an organolithium compound by the reaction of an organic halide with metallic lithium by Ziegler and Colonius, the chemistry of organolithium compounds has developed broadly and in great depth. The organolithium reagents now play an important role in organic and organometallic synthesis. The discovery that they could initiate the polymerization of 1,3-dienes, styrene, and other olefins to give commercially useful materials led several companies to produce a number of alkyllithiums on a large scale. Their commercial availability has greatly accelerated the rate of development of organolithium chemistry, and this field has flourished during the last ten years. As a graphic illustration of this, D. W. Slocum's survey of organolithium chemistry in 1973, soon to be published in the *Journal of Organometallic Chemistry,* covers 347 references. The first such annual survey of organolithium chemistry, written by this reviewer to cover the 1964 literature, cited only 89 references.

The question of structure and bonding has been a fascinating aspect of organolithium chemistry, and the research efforts devoted to these problems have made important general contributions to our knowledge of "electron-deficient" compounds. In view of the importance of organolithium compounds, it is surprising that a book devoted exclusively to them has not been available until now. The 1970 Houben-Weyl volume on organoalkali compounds was devoted mostly to organolithiums, but the constraints of the Houben-Weyl concept restricted the scope of the coverage. Other monographs and review series have had chapters on organolithium compounds, but these have dealt with specific aspects of their structure or chemistry. The book under review thus fills a need, and it will be welcomed by synthetic organic and organometallic chemists.

A summary of a such a vast field (several thousand references) that is restricted to about 270 pages of text, exclusive of reference sections, must of necessity be very concise. The author has succeeded admirably in his stated aim of presenting an account of organolithium chemistry that is comprehensive but not exhaustive. The book is organized into four parts dealing with the constitution of organolithium compounds, their preparation, their use in organic synthesis, and their applications in the synthesis of organometallic compounds of other metals.

The brief chapter on the constitution of organolithiums nicely summarizes what is known about the solid state structures of these compounds, about the nature of organolithium species in hydrocarbon and in donor solvents, and about the configurational stability of organolithiums in solution. The preparative routes to organolithiums are covered well and the discusssions of mechanisms are useful. The longest part of this book is devoted to the use of organolithiums in organic synthesis —additions to multiple bonds, alkylation reactions, and so forth. An excellent chapter discusses organolithium compounds as precursors for reactive intermediates: carbenes, arynes, cycloalkynes and cycloallenes, ylides. The final part presents a good summary, with many examples, of how organolithiums serve in the preparation of organic derivatives of the main group and transition metals. A useful index concludes the book.

This well-organized, well-written, critical survey presents an excellent overview of the field. It is indispensable for all chemistry libraries and will be well worth the price to individuals who wish to become better acquainted with this highly reactive and versatile class of organometallic reagents.

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Nuclear Properties

Nuclear Magnetic Resonance Spectroscopy of Nuclei Other than Protons. T. AXENROD and G. A. WEBB, Eds. Wiley-Interscience, New York, 1974. xvi, 408 pp., illus. $18.95.

This book consists of 25 relatively short chapters, most of which were written to supplement lectures at a NATO Advanced Study Institute held in 1972. The purpose of the institute was to acquaint young research workers with the difficulties of and chemical uses for new techniques that now make possible the routine observation of important nuclei such as ^{2}H, ^{11}B, ^{13}C, ^{15}N, ^{29}Si, and ^{31}P. That purpose seems to have carried through into the book. Thus, the first three chapters, two of which were written quite carefully and lucidly by E. D. Becker, first provide the reader with an introduction to the relevant magnetic and relaxation properties of nuclei other than protons and next introduce him to pulse and Fourier transform methods as applied in NMR (nuclear magnetic resonance) spectroscopy. For the student who might wish to acquire a more detailed mastery of the material, adequate references to available specialized texts are provided.

Following the discussion of experimental methods, several aspects of nitrogen NMR are considered by the editors of the book. In one chapter Webb concisely reviews recent efforts to calculate nitrogen chemical shift values; two later chapters by Axenrod and co-workers treat ^{15}N coupling constants. The structural effects that influence measured ^{15}N-H coupling constant values are presented, and factors that determine ^{15}N-^{15}N spin couplings are discussed. Together, the several chapters on ^{15}N NMR provide a useful summary of the more important information available about that potentially interesting subject.

Several chapters are also devoted to ^{13}C NMR spectroscopy. The chapter

concerning ^{13}C-^{13}C coupling constants by G. E. Maciel is quite useful, since no extensive treatment of this subject has appeared to date. Both theoretical and experimental aspects of the topic are explored.

Another chapter is devoted to ^{29}Si Fourier transform NMR. G. C. Levy and J. D. Cargioli have performed much of the original ^{29}Si NMR research, and here they have produced a well-written synopsis that treats ^{29}Si chemical shifts and coupling constants and presents as well an informative exploration of ^{29}Si spin lattice relaxation parameters and their usefulness to silicon chemists.

Other chapters worthy of particular notice are the survey of recent advances in ^{3}H and ^{2}H NMR and the review of NMR studies of nonhydrogen nuclei in oriented molecules, both by Peter Diehl. Recent Fourier NMR studies of simple fluorocarbons are well presented by L. Cavalli. A chapter by E. G. Brame explores recent applications of ^{19}F NMR to the important topic of fluorocarbon polymers. Finally, Maciel summarizes applications of Fourier transform NMR studies of metal nuclei, a potentially most exciting kind of research. The chapter provides much needed introductory material and references for the worker just beginning such research. That, I think, was the overall purpose of the text, and, in general, the book succeeds as well as could be expected, given its origins in a lecture course.

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Low Temperature Physics

Superfluid Hydrodynamics. SETH J. PUTTERMAN. North-Holland, Amsterdam, and Elsevier, New York, 1974. xxii, 444 pp., illus. Cloth, $48.10; paper, $25. North-Holland Series in Low Temperature Physics, vol. 3.

As its title suggests, this book is mainly about helium below the lambda point, its remarkable mechanical and thermal properties, and their resolution through the two-fluid model. It is the work of an enthusiast who, moreover, has proved and reevaluated the theoretical bases of his subject, even those that are well known and generally accepted. Sometimes new light reaches murky corners. The author is well endowed with critical faculties and powers of exposition, and a fresh and stimulating text results from their application. The parts of the book interrelate well, and the material is presented in a consistent and generally attractive notation.

The book appears to contain original unpublished material. This includes: new thermodynamic stability conditions (analogous to $C_p > 0$) for the two-fluid model; a clarification of the boundary and shock jump conditions to which the governing equations must be subjected; a reconsideration of sound propagation in a counterflow; the prediction of superfluid transverse sound and an examination of its properties; a novel approach to normal fluid drag on a superfluid vortex; a study of the Brownian motion of such vortices; and many fresh ideas on thermal fluctuations in the two-fluid model. Also the discussion of the fluid mechanics of the condensed ideal Bose gas rests on the author's published work. Though reliable in its mathematics, the book strikes a physical attitude on most questions. Two-fluid equations are derived by the use of ideas of LTE (local thermodynamic equilibrium) that rational mechanists, such as Clifford Truesdell, are unlikely to bless.

An interesting feature of the text is the author's insistence on applying continuum equations to flows on the microscale, for example, to motions in films only a few atomic layers thick. In these days of increasing dominance of the field by many-body theorists, this approach serves to remind us how successful continuum models can be. Even if the many-body approach is in some sense the "right" one, the day on which we hold an approximation as acceptable as that of BCS (Bardeen-Cooper-Schrieffer) for superconductors does not appear to be imminent. Meanwhile, the many-body theorists are sometimes forced to make drastic approximations motivated more by mathematical expediency than by physical reality. It is then hard to be sure that the consequent results are any more "right" than those derived from the (more tractable) continuum approach. I am sure that the author will think his time well spent if his book leads, as it ought, to a better recognition of the power of the continuum model, as distinct from its limitations.

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Books Received

Annual Review of Physical Chemistry. Vol. 25, 1974. H. Eyring, C. J. Christensen, and H. S. Johnston, Eds. Annual Reviews, Palo Alto, Calif., 1974. x, 566 pp., illus. $12.

Aquatic Vegetation and Its Use and Control. D. S. Mitchell, Ed. Unesco, Paris, 1974 (U.S. distributor, Unipub, New York). 136 pp., illus. Paper, $6.60.

Arterial Lesions and Arteriosclerosis. H. Jellinek, Ed. Translated from the Hungarian. Plenum, New York, and Akadémiai Kiadó, Budapest, 1974. 332 pp. + plates. $27.50.

Aspects of Zoogeography. Paul Müller. Junk, The Hague, 1974. viii, 208 pp., illus. Paper, Dfl. 35.

Astrophysics of Gaseous Nebulae. Donald E. Osterbrock. Freeman, San Francisco, 1974. xvi, 252 pp., illus. $17.

Atlas of Stereochemistry. Absolute Configurations of Organic Molecules. W. Klyne and J. Buckingham. Oxford University Press, New York, 1974. xvi, 312 pp., illus. $39.95.

Atlas of the Sea. Robert Barton. Illustrated by David Nockels. Maps by Geographical Projects, London. John Day Co. (Intext), New York, 1974. 128 pp. $10.

Buffers for pH and Metal Ion Control. D. D. Perrin and Boyd Dempsey. Chapman and Hall, London, and Halsted (Wiley), New York, 1974. viii, 176 pp., illus. $11.50. Chapman and Hall Laboratory Manuals in Physical Chemistry and Biochemistry.

By the Evidence. Memoirs, 1932–1951. L. S. B. Leakey. Harcourt Brace Jovanovich, New York, 1974. x, 276 pp. + plates. $9.95.

Carcinogenesis Testing of Chemicals. Proceedings of a conference, Washington, D.C., May 1973. Leon Golberg, Ed. CRC Press (Chemical Rubber Co.), Cleveland, 1974. xvi, 144 pp., illus. $25.

Cardiovascular Disease. Epidemiology, Prevention, and Rehabilitation. A Guide to the Literature. Vol. 1, 1960–1973. Senta S. Rogers and Irvin C. Mohler. IFI/Plenum, New York, 1974. xii, 606 pp. $49.50.

The Chemistry of Diacetylenes. M. F. Shostakovskii and A. V. Bogdanova. Translated from the Russian edition (Moscow, 1971). Halsted (Wiley), New York, and Israel Program for Scientific Translations, Jerusalem, 1974. xviii, 494 pp., illus. $45.

The Classical Dynamics of Particles. Galilean and Lorentz Relativity. Ronald A. Mann. Academic Press, New York, 1974. x, 300 pp., illus. $19.50.

Clinical Prediction in Psychotherapy. Leonard Horwitz. Aronson, New York, 1974. xxiv, 372 pp. $15.

Comparative Pathology of the Heart. Papers from a symposium, Boston, Sept. 1973. F. Homburger and I. Lucas, Eds. Karger, Basel, 1974. xii, 380 pp., illus. $95. Advances in Cardiology, vol. 13.

Comparative Physiology. Locomotion, Respiration, Transport and Blood. Proceedings of a congress, Acquasparta, Italy, Sept. 1972. Liana Bolis, K. Schmidt-Nielsen, and S. H. P. Maddrell, Eds. North-Hol-