

of moving spins phenomenologically, the author gives a straightforward account of the effects due to electrons' diffusive motion and related lineshape broadening mechanisms. Comparison between theory and experiments shows that the present understanding of electron spin resonance is by no means complete.

On the whole, the book contains much useful information, but the diversity of the subject and the lack of clear organization make reading rather difficult. The book assumes its readers to be initiated in the field of magnetic resonance. For beginners it is advisable to have a copy of Abragam's *The Principles of Nuclear Magnetism* or Slichter's *Principles of Magnetic Resonance* close at hand for reference.

P. SHENG

*School of Natural Sciences,
Institute for Advanced Study,
Princeton, New Jersey*

Atmospheric Phenomena

The Optical Aurora. A. OMHOLT. Springer-Verlag, New York, 1971. xiv, 200 pp., illus. \$17.30. Physics and Chemistry in Space, vol. 4.

The Radiating Atmosphere. A symposium, Kingston, Ontario, Aug. 1970. B. M. McCORMAC, Ed. Springer-Verlag, New York, and Reidel, Dordrecht, 1971. xii, 458 pp., illus. \$29.40. Astrophysics and Space Science Library, vol. 24.

Two books on the same subject could hardly differ more than *The Optical Aurora* and *The Radiating Atmosphere*. The first presents a concise and unified synthesis of our current understanding of the optical and spectroscopic aspects of the aurora. The second is a collection of papers of mixed quality and purpose, based on lectures presented at a symposium entitled "Aurora and Airglow, 1970."

In 1961 there appeared the monograph *Physics of the Aurora and Airglow* by J. W. Chamberlain. The physical principles required for an appreciation of auroral problems were presented in that book, and Omholt does not repeat the basic concepts, nor does he discuss the historical aspects of the subject in his compact work. He does provide an up-to-date (1970) description of the physical processes that produce the optical aurora. The emphasis that is placed on physical processes rather than phenomenology is especially evident in the brief chapter devoted to

radio aurora and its relation to the optical aurora. The book is not for leisurely reading; it is for the serious student (in a broad sense) of the subject, and provides the sort of quantitative information required for working on current research topics. Key references to original papers are given at the end of each chapter, and there are even references to private communications and to unpublished theses that might not be easy to obtain for many readers. The newcomer to auroral physics will find the book by Omholt and the older book by Chamberlain an excellent combination. The two works are written in a similar style by authorities in the field.

The editor of *The Radiating Atmosphere* has made no attempt to unify the papers assembled in this book. The papers are grouped into eight parts, but the headings of the groups do not provide meaningful descriptions of their contents. The book contains 37 papers, and there is an "institute review" and a highly personal conclusion by the editor and two colleagues. Of the 37 papers I would classify 24 as review papers, a few containing relevant new material. There are 13 papers that present primarily new (and unrefereed) material. In my opinion, these papers do not belong in this book. The good ones will not be read as widely as they would be had they appeared in a standard journal in the field, and the bad ones might never have appeared in a journal at all. One should not, however, allow a few rotten apples to spoil the entire basket; there are some very well written and thoughtful articles in this collection. These include reviews on the airglow, including dayglow, twilight radiations, and the night glow; these subjects are discussed in terms of ionospheric chemistry, where appropriate. The auroral papers cover a wide range of topics: spectroscopic studies, electric fields, particle precipitation, substorm phenomena, radio aurora, x-ray events, and theoretical studies on the formation of aurora. I found the introductory review by D. M. Hunten most informative. In the "institute review," Hunten discusses results reported in the lecture by A. T. Stairs concerning the observation in aurora of a spectroscopic feature at 9.6 micrometers, but I could not find this point in Stairs's paper. Evidently, the written version lost some of the more exciting results reported verbally.

Anders Omholt has left the field of auroral physics; *The Optical Aurora*

may be his swan song, a very good one, in my opinion. Billy McCormac's book has been a biennial undertaking on the same subject. First there was *Aurora and Airglow* in 1967, next *Atmospheric Emissions* in 1969, and now *The Radiating Atmosphere*. What will be the title of the next offering on this subject?

MANFRED H. REES

*Laboratory for Atmospheric and Space Physics, University of Colorado,
Boulder*

Organogermanes

The Organic Compounds of Germanium. MICHEL LESBRE, PIERRE MAZEROLLES, and JACQUES SATGÉ. Wiley-Interscience, New York, 1971. xii, 702 pp., illus. \$44. Chemistry of Organometallic Compounds.

The authors of this book, all from the University of Toulouse, have produced a most comprehensive account of organogermanium chemistry which includes, in a variety of tables, reference to all compounds described up to 1968. Many references to the 1969 literature are also included.

The text is divided into ten chapters and may be described as acceptably readable, though the nonspecialist will have some difficulty because of the very detailed treatment. The most disappointing part is the introductory chapter (seven pages), where one would have hoped for much more by way of comparative discussion of germanium in relation to the organic chemistry of silicon, tin, and lead.

Each of the remaining nine chapters is devoted to a discussion of the formation and the physical and chemical properties of compounds containing germanium: Ge-C (aliphatic and aromatic); Ge-C (cyclic); Ge-H; Ge-halogen; Ge-O; Ge-S (Se, Ti); Ge-N(P); polygermanes; Ge-metal. Individual chapters are well subdivided and the detailed table of contents is a great help in locating compounds of a given type. The chapters vary in quality: not surprisingly those most closely connected with the research interests of the authors are the most stimulating. The chapter title "Polygermanes" is somewhat misleading, for the chapter includes not only true di- and polygermanes (that is, compounds in which germanium atoms are bound together) but in addition organogermanes such as $(C_2H_5)_3Ge(CH_2)_3Ge(C_2H_5)_3$.

The book contains a fair number of errors, though most of these are trivial

and obvious. The presentation of structural formulas is not as systematic as it should have been, and abbreviations vary from page to page in a rather disconcerting way. The subject index is comprehensive, but a book of this size and scope should certainly have included an author index.

F. GLOCKLING

Department of Chemistry,
Queen's University,
Belfast, Northern Ireland

Books Received

Abstract Lie Algebras. David J. Winter. M.I.T. Press, Cambridge, Mass., 1972. x, 150 pp., illus. \$12.50.

Addison and the White Corpuscles. An Aspect of Nineteenth-Century Biology. L. J. Rather. University of California Press, Berkeley, 1972. x, 236 pp. + plates. \$8.50. Publications of the Wellcome Institute of the History of Medicine, New Series, vol. 22.

Advances in Free-Radical Chemistry. Vol. 4. G. H. Williams, Ed. Academic Press, New York, 1972. x, 308 pp., illus. \$19.50. Logos Press Limited Scientific Publications.

Advances in High Temperature Chemistry. Vol. 4. LeRoy Eyring, Ed. Academic Press, New York, 1972. xiv, 282 pp., illus. \$17.50.

Advances in Neuro-Psychopharmacology. Proceedings of the symposia, Prague, Aug. 1970. O. Vinař, Z. Votava, P. B. Bradley, Eds. North-Holland, Amsterdam; Avicenum, Prague, 1972 (U.S. distributor, Elsevier, New York). xii, 570 pp., illus. \$32.50.

Advances in Teratology. Vol. 5. D. H. M. Woollam, Ed. Academic Press, New York, 1972. 184 pp. + plates. \$13.50. Logos Press Limited Scientific Publications.

Adventures in Physics. Phillip E. Highsmith and Andrew S. Howard. Saunders, Philadelphia, 1972. xii, 272 pp., illus. \$9.50. Laboratory Manual. vi, 142 pp., illus. Paper, \$4.50.

The Agave Family in Sonora. Howard Scott Gentry. Agricultural Research Service, Washington, D.C., 1972 (available from the Superintendent of Documents, Washington, D.C.). ii, 196 pp., illus. Paper, \$1.25. Agriculture Handbook No. 399.

Aging and Society. Vol. 3, A Sociology of Age Stratification. Matilda White Riley, Marilyn Johnson, and Anne Foner with contributions by John A. Clausen and 10 others. Russell Sage Foundation, New York, 1972. xviii, 652 pp., illus. \$20.

Aminoacidopathies, Immunoglobulinopathies, Neuro-Genetics, and Neuro-Ophthalmology. J. François. Karger, Basel, 1972 (U.S. distributor, Phiebig, White Plains, N.Y.). x, 218 pp., illus. \$18.20. Monographs in Human Genetics, vol. 6.

Analytical Profiles of Drug Substances. Vol. 1. Klaus Florey and 6 others, Eds. Academic Press, New York, 1972. xii, 480 pp., illus. \$14.

Anelastic Relaxation in Crystalline Solids. A. S. Nowick and B. S. Berry. Academic Press, New York, 1972. xvi, 678 pp., illus. \$27.50. Materials Science Series, vol. 1.

Angular Scattering Functions for Spheroids. Wilfried Heller, Masayuki Nakagaki, and Gary D. Langolf. Wayne State University Press, Detroit, 1972. xii, 106 pp. \$12.

Annual Review of Physiology. Vol. 34. Julius H. Comroe, Jr., Arthur C. Giese, and Ralph R. Sonnenschein, Eds. Annual Reviews, Palo Alto, Calif., 1972. x, 514 pp. + foldout chart. \$10.

Antarctic Map Folio Series. American Geographical Society, New York, 1971. Folio 14, Birds of the Antarctic and Subantarctic. G. E. Watson, J. P. Angle, P. C. Harper, M. A. Bridge, R. P. Schlatter, W. L. N. Tickell, J. C. Boyd, and M. M. Boyd. 15 plates in folder. \$10. Folio 15, Coastal and Deep-Water Benthic Fishes of the Antarctic. Hugh H. DeWitt. 5 plates in folder. \$6.

Antigen-Antibody Reactions. Contributions to a symposium, Leipzig, Dec. 1970. H. Ambrosius, K. Malberg, and H. Schäffner, Eds. Fischer, Jena, 1971. x, 158 pp., illus. Paper, 30 DM. Wissenschaftliche Beiträge der Karl-Marx-Universität Leipzig.

Anti-Pollution Lab. Elementary Research, Experiments and Science Projects on Air, Water and Solid Pollution in Your Community. Elliott H. Blaustein. Sentinel, New York, 1972. 128 pp., illus. Paper, \$1.50.

Applied Functions of a Complex Variable. A. Kyrala. Wiley-Interscience, New York, 1972. xx, 374 pp., illus. \$17.95.

Applied Graph Theory. Wai-Kai Chen. North-Holland, Amsterdam; Elsevier, New York, 1972. vii, 484 pp., illus. \$38. North-Holland Series in Applied Mathematics and Mechanics, vol. 13.

Aquariums. Anthony Evans. Drake, New York, 1972. 94 pp., illus. \$4.95.

The Architecture and Engineering of Digital Computer Complexes. Boris Beizer. Plenum, New York, 1971. 2 vols. Vol. 1, lii pp. + pp. 1-394, illus. Vol. 2, xxxiv pp. + pp. 395-848, illus. Each vol., \$22.50.

Aspects of Isomerism. Peter Uzzell. Methuen, London, 1972 (U.S. distributor, Harper and Row, New York). x, 54 pp., illus. Paper, \$2.75. Methuen Studies in Science.

Atlas de la Vie Souterraine. Les Animaux Cavernicoles. Georges Thinès and Raymond Terafs. De Visscher, Brussels, 1972. 162 pp. 600 BF. Planète Vivante.

Attitudes, Conflict, and Social Change. A symposium, College Park, Md., May 1970. Bert T. King and Elliott McGinnies, Eds. Academic Press, New York, 1972. xiv, 234 pp. \$10.50.

Auerbach on Microfilm Readers/Printers. Auerbach, Princeton, N.J., 1972. x, 134 pp., illus. \$19.95. Auerbach On Series.

Australian Butterflies. Charles McCubbin. Nelson, Melbourne, 1971 (U.S. distributor, Entomological Reprint Specialists, Los Angeles). xxxii, 206 pp., illus. \$30.

Auxiliaries in Health Care. Programs in Developing Countries. N. R. E. Fendall.

Published for the Josiah Macy, Jr., Foundation by Johns Hopkins Press, Baltimore, 1972. xvi, 200 pp., illus. \$9. Macy Foundation Series on International Problems of Medical Education.

Behavior Modification of the Mentally Retarded. Travis Thompson and John Grabowski, Eds. Oxford University Press, New York, 1972. xiv, 298 pp., illus. Cloth, \$7.50; paper, \$4.95.

Behavioral Sciences and Mental Health. An Anthology of Program Reports. Eli A. Rubinstein and George V. Coelho, Eds. National Institute of Mental Health, Chevy Chase, Md., 1972 (available from Superintendent of Documents, Washington, D.C.). viii, 420 pp. Paper, \$2. Public Health Service Publication No. 2064.

Biochemical Reasoning. Numerical Examples for Students. David Kerridge and Keith F. Tipton, Eds. Benjamin, Menlo Park, Calif., 1972. xvi, 266 pp., illus. Cloth, \$12.50; paper, \$5.95.

Biogenesis and Physiology of Histamine. Georg Kahlson and Elsa Rosengren. Williams and Wilkins, Baltimore, 1971. vi, 318 pp., illus. \$21. Monographs of the Physiological Society, No. 21.

Biology in the Nineteenth Century. Problems of Form, Function, and Transformation. William Coleman. Wiley, New York, 1971. x, 188 pp., illus. Cloth, \$7.50; paper, \$3.95. History of Science.

The Biology of Alcoholism. Vol. 2, Physiology and Behavior. Benjamin Kisin and Henri Begleiter, Eds. Plenum, New York, 1972. xxxii, 552 pp., illus. \$37.50.

Biology of Animals. Cleveland P. Hickman and Cleveland P. Hickman, Jr. Mosby, St. Louis, 1972. xii, 522 pp., illus. \$9.75.

Biology of Antibiotics. Hans Zähner and Werner K. Maas. Springer-Verlag, New York, 1972. viii, 126 pp., illus. Paper, \$3.75. Heidelberg Science Library, vol. 4.

Brain Mechanisms and Mind. Keith Oatley. Dutton, New York, 1972. 216 pp., illus. \$7.95. World of Science Library.

British Cenozoic Fossils (Tertiary and Quaternary). British Museum (Natural History), London, ed. 4, 1971. x, 132 pp., illus. Paper, 40 p. Publication No. 540.

British Mesozoic Fossils. British Museum (Natural History), London, ed. 4, 1972. vi, 208 pp., illus. Paper, 65 p. Publication No. 703.

The Careless Technology. Ecology and International Development. A conference, Warrenton, Va., Dec. 1968. M. Taghi Farvar and John P. Milton, Eds. Natural History Press, Garden City, N.Y., 1972. xxx, 1030 pp., illus. \$25.

Catadioptric Imaging Systems. Jonathan Maxwell. Elsevier, New York, 1972. viii, 102 pp., illus. \$17. Monographs on Applied Optics, No. 6.

Categories for the Working Mathematician. C. Mac Lane. Springer-Verlag, New York, 1972. x, 262 pp., illus. Paper, \$9.50. Graduate Texts in Mathematics, 5.

Change and the Future International System. David S. Sullivan and Martin J. Sattler, Eds. Columbia University Press, New York, 1972. x, 110 pp. Cloth, \$8; paper, \$2.95. Reprinted from *Journal of International Affairs*, Vol. 25, No. 2.

Chemical Additives. A symposium, Los

(Continued on page 946)