

citations has papers by H. Lüth (on photovoltage spectroscopy), by M. R. Philpott (a very good review of surface excitons and polaritons in organic crystals), and by P. J. Hendra and M. Fleischmann (on Raman spectroscopy).

Surface chemistry is a very active research field at the present time. Even in a subfield such as the physical chemistry of solid surfaces one would have to read on the order of ten articles a day to follow the detailed developments at first hand. There is therefore an acute need for concise reviews of familiar topics, surveys of related areas, and accessible introductions to new ideas and techniques. The present volume is an admirable example of how this need may be satisfied.

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High-Energy Atomic Physics

Structure and Collisions of Ions and Atoms. I. A. SELLIN, Ed. Springer-Verlag, New York, 1978. xii, 352 pp., illus. \$36. Topics in Current Physics, vol. 5.

The years 1931 and 1932 were exciting ones for nuclear physics. They saw the discovery of the neutron, announcements by R. J. Van de Graaff of a 1.5 million volt electrostatic generator "for the investigation of the atomic nucleus" and by E. O. Lawrence and M. S. Livingston of the principles of the cyclotron, and publication of a paper by J. D. Cockroft and E. T. S. Walton on nuclear experiments with high-velocity positive ions. Except for a few early atomic experiments by Livingston and W. M. Coates, most immediate efforts were understandably directed at the use of the new accelerators for nuclear investigations, and many productive atomic physicists of the period turned to nuclear research, which was then the frontier of physics. Only in recent years has it become widely appreciated that accelerators that produce beams of ions with energies of 0.1 and 10 MeV per atomic mass unit are ideally suited for the study of dynamical detail in ion-atom collisions, since projectiles with velocities comparable to the velocities of some of the more tightly bound atomic and molecular electrons serve as effective probes of atomic structure.

One of the most active users of particle accelerators in atomic physics, I. A. Sellin, has brought together in this book seven reviews by ten authors, all of

whom report on the productive period of the last ten years in high-energy atomic physics, as atomic physics done with accelerators is sometimes called. (In this context, "high energy" means MeV energies, not GeV energies as is the case for elementary particles.)

The swiftness of progress in this field is underlined by the fact that this volume, which had an editorial deadline in 1976, has missed several major advances: the experimental demonstration of positron production in heavy ion-atom collisions (at the GSI accelerator in Darmstadt), for which the fine chapter by S. J. Brodsky and P. J. Mohr provides the theoretical background; the discovery of resonant coherent excitation of channeled ions by an Oak Ridge team with S. Datz, whose chapter on atomic collisions in solids sets the stage for this beautiful observation; and the detailed experimental investigations by Sellin and his collaborators of electrons emitted in ion-atom collisions as companions to the emerging projectile. Mention of this mode of electron emission in energetic ion-atom collisions is made briefly in the chapter by N. Stolterfoht.

The general physical scientist who wants an orientation to atomic physics done with particle accelerators will find particularly rewarding a systematic and careful chapter on the theory of inelastic atom-atom collisions by J. S. Briggs and K. Taulbjerg, a comprehensive report on x-ray production in heavy ion-atom collisions by P. H. Mokler and F. Folkmann, and the chapter by Brodsky and Mohr, although it is on a subject, quantum electrodynamics in strong and supercritical fields, that lies partly outside the scope of the title of the book.

The chapter by Stolterfoht, though especially rich in physical insights, is relatively narrow. It is complemented by Sellin's chapter on the information gained from beam-foil experiments about the spectroscopy of highly charged and highly excited ions, with emphasis on radiationless (Auger) transitions, which strongly compete with the more familiar radiative deexcitation of atoms. A chapter by L. Armstrong, Jr., on relativistic effects in highly ionized atoms, is both too technical in content and too casual in presentation. More than the rest of the chapters, this one suffers from not having been linked even superficially to the other pieces in the collection.

A volume like this, containing several contributions to which one may wish to refer during the next few years, would be much more useful if it included an author index, especially since the references accompanying the chapters are not alpha-

betically ordered and in some instances are not even sequential with respect to the text. A glossary of acronyms, such as FPES, PWBA, TIRS, and REC, would also have been handy even for the initiated reader. Few of these terms are mentioned in the subject index. These are more than matters of convenience, for the 753 references supplement the reviews in the book and direct attention to many still open questions.

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Books Received

Adults and Their Parents in Family Therapy. A New Direction in Treatment. Lee Headley. Plenum, New York, 1978. 194 pp. \$14.95.

Advances in Archaeological Method and Theory. Vol. 1. Michael B. Schiffer, Ed. Academic Press, New York, 1978. xvi, 426 pp., illus. \$24.50.

Avian RNA Tumor Viruses. Proceedings of a workshop, Pavia, Italy, Sept. 1977. Sergio Barlati and Carlo de Giuli-Morghen, Eds. Piccin Medical Books, Padua, Italy, 1978. xviii, 356 pp., illus. \$30.

Benefit Financing in Unemployment Insurance. A Problem of Balancing Responsibilities. Paul J. Mackin. W. E. Upjohn Institute for Employment Research, Kalamazoo, Mich., 1978. xii, 124 pp. Paper, \$3. Studies in Unemployment Insurance and Related Problems.

The Biology of Aging. John A. Behnke, Caleb E. Finch, and Gairdner B. Moment, Eds. Plenum, New York, 1978. xii, 388 pp., illus. \$18.95. A Publication of the American Institute of Biological Sciences.

Current Trends in Programming Methodology. Vol. 3, Software Modeling. K. Mani Chandy and Raymond T. Yeh, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1978. xiv, 380 pp., illus. \$19.95.

Current Trends in Programming Methodology. Vol. 4, Data Structuring. Raymond T. Yeh, Ed. Prentice-Hall, Englewood Cliffs, N.J., 1978. xiv, 322 pp., illus. \$19.95.

The Death of the Asylum. A Critical Study of State Hospital Management, Services, and Care. John A. Talbott. Grune and Stratton, New York, 1978. xvi, 186 pp. \$22.50.

Design of Reinforced Concrete. Jack C. McCormac. Crowell (Harper and Row), New York, 1978. xx, 508 pp., illus. \$20.95.

Explanatory Structures. A Study of Concepts of Explanation in Early Physics and Philosophy. Stephen Gaukroger. Humanities Press, Atlantic Highlands, N.J., 1978. viii, 262 pp. \$21.

Exploring with Martin and Osa Johnson. Kenhelm W. Stott, Jr. Martin and Osa Johnson Safari Museum Press, Chanute, Kans., 1978. 134 pp., illus. Paper, \$5.

Farmers and Towns. Rural-Urban Relations in Highland Bolivia. David A. Preston. Geo Abstracts, University of East Anglia, Norwich, England, 1978 xii, 196 pp., illus. Cloth, \$13; paper, \$9.90.

Future Directions in Health Care. A New
(Continued on page 1010)

BOOKS RECEIVED

(Continued from page 944)

Public Policy. Papers from a conference, New York, Feb. 1977. Rick J. Carlson and Robert Cunningham, Eds. Ballinger (Lippincott), Cambridge, Mass., 1978. xxiv, 240 pp., illus. \$15.

Geographic Medicine for the Practitioner. Algorithms in the Diagnosis and Management of Exotic Diseases. Kenneth S. Warren and Adel A. F. Mahmoud, Eds. University of Chicago Press, Chicago, 1978. xii, 136 pp., illus. \$25. Studies in Infectious Disease Research. Reprinted from the *Journal of Infectious Diseases*.

Health Care. Regulation, Economics, Ethics, Practice. A Special *Science* Compendium. Philip H. Abelson, Ed. American Association for the Advancement of Science, Washington, D.C., 1978. iv, 258 pp., illus. Cloth, \$14; paper, \$6. AAAS Publication 78-12.

Health Manpower Planning. Principles, Methods, Issues. T. L. Hall and A. Mejía, Eds. World Health Organization, Geneva, 1978 (U.S. distributor, WHO Publications Centre, Albany, N.Y.). 312 pp. Paper, \$24.20.

Information Retrieval. Computational and Theoretical Aspects. H. S. Heaps. Academic Press, New York, 1978. xii, 344 pp., illus. \$19.50. Library and Information Science.

Inorganic Polymers. N. H. Ray. Academic Press, New York, 1978. viii, 174 pp., illus. \$17.35.

Input/Output Databases. Uses in Business and Government. Jay M. Gould. Garland STPM Press, New York, 1979. x, 128 pp. \$19.95.

The Living State and Cancer. Albert Szent-Györgyi. Dekker, New York, 1978. viii, 86 pp., illus. \$7.50.

Lobbying the Corporation. Citizen Challenges to Business Authority. David Vogel. Basic Books, New York, 1979. xii, 270 pp. \$14.95.

Making Medical Choices. Who Is Responsible? Jane J. Stein. Houghton Mifflin, Boston, 1978. xviii, 270 pp. \$10.95.

Man, Cancer and Immunity. Alistair J. Cochran. Academic Press, New York, 1978. xii, 206 pp., illus. \$16.15.

The Neurophysiological Aspects of Human Mental Activity. N. P. Bechtereva. Translated from the Russian second edition (Leningrad, 1974). Oxford University Press, New York, 1978. x, 182 pp., illus. \$11.95.

Neurotransmitter Receptor Binding. Henry I. Yamamura, S. J. Enna, and Michael J. Kuhar, Eds. Raven, New York, 1978. x, 196 pp., illus. \$17.

Oxidation in Organic Chemistry. Part C. Walter S. Trahanovsky, Ed. Academic Press, New York, 1978. xii, 382 pp., illus. \$34. Organic Chemistry, vol. 5.

The Painted Message. Otto Billig and B. B. Burton-Bradley. Schenkman, Cambridge, Mass., and Halsted (Wiley), New York, 1978. xii, 260 pp., illus. \$19.50.

Paläozoische und mesozoische Floren Eurasiens und die Phytogeographie dieser Zeit. V. A. Vakhrameev, I. A. Dobruskina, S. V. Meyen, and E. D. Zaklinskaja. Translated from the Russian edition (Moscow, 1970). Gustav Fischer Verlag, Jena, East Germany, 1978. 300 pp., illus. 79 M.

Paleolithic Site of the Douara Cave and Paleogeography of Palmyra Basin in Syria. Part 1, Stratigraphy and Paleogeography in the Late Quaternary. Kazuro Hanihara and Yu-

taka Sakaguchi, Eds. University of Tokyo Press, Tokyo, 1978 (U.S. distributor, ISBS, Forest Grove, Ore.). vi, 122 pp., illus. \$29.50.

Referendums. A Comparative Study of Practice and Theory. David Butler and Austin Ranney, Eds. American Enterprise Institute for Public Policy Research, Washington, D.C., 1978. x, 250 pp., Paper, \$4.75. AEI Studies 216.

Reflections on Behaviorism and Society. B. F. Skinner. Prentice-Hall, Englewood Cliffs, N.J., 1978. xiv, 210 pp. \$15.95. Century Psychology Series.

Seeing Is Deceiving. The Psychology of Visual Illusions. Stanley Coren and Joan Stern Girgus. Erlbaum, Hillsdale, N.J., 1978 (distributor, Halsted [Wiley], New York). xvi, 256 pp., illus. \$18.

Selected Papers in Molecular Biology by Jacques Monod. André Lwoff and Agnes Ullmann, Eds. Academic Press, New York, 1978. xiv, 754 pp., illus. \$29.50.

Self-Involvement in the Middle East Conflict. Group for the Advancement of Psychiatry, New York, 1978. pp. 381-588. Paper, \$6. GAP Publication No. 103.

Senile Dementia. A Biomedical Approach. Proceedings of a conference, St. Louis, Mar. 1978. Kalidas Nandy, Ed. Elsevier/North-Holland, New York, 1978. xxiv, 308 pp., illus. \$28. Developments in Neuroscience, vol. 3.

Sensory Processing, Perception, and Behavior. Robert B. Livingston. Raven, New York, 1978. xiv, 106 pp., illus. Paper, \$8.50.

Sex Education for the Health Professional. A Curriculum Guide. Normal Rosenzweig and F. Paul Pearsall, Eds. Grune and Stratton, New York, 1978. xvi, 336 pp. \$19. Seminars in Psychiatry.

Sex Typing and Social Roles. A Research Report. Beverly Duncan and Otis Dudley Duncan with the collaboration of James A. McRae, Jr. Academic Press, New York, 1978. xxii, 392 pp., illus. \$22. Quantitative Studies in Social Relations.

Taxonomy of Fungi. Part 1. Proceedings of a symposium, Madras, India, 1973. C. V. Subramanian, Ed. University of Madras Centre of Advanced Study in Botany, Madras, India, 1978. viii, 304 pp., illus + plates. Paper, \$10.

A Teaching Manual on Food and Nutrition for Non-Science Majors. Daniel Melnick. Nutrition Foundation, Washington, D.C., ed. 3, 1979. x, 354 pp., illus. Paper, \$6.

Technology, Trade, and the U.S. Economy. Report of a Workshop Held at Woods Hole, Massachusetts, Aug. 1976. National Academy of Sciences, Washington, D.C., 1978. xii, 170 pp. Paper, \$8.25.

Topics in Stereochemistry. Vol. 10. Ernest L. Eliel and Norman L. Allinger, Eds. Interscience (Wiley), New York, 1978. xvi, 350 pp., illus. \$39.50.

Toxicity of Heavy Metals in the Environment. Part 1. Frederick W. Oehme, Ed. Dekker, New York, 1978. x, 516 pp., illus. \$45. Hazardous and Toxic Substances, 2.

The World Energy Book. An A-Z, Atlas and Statistical Source Book. David Crabbe and Richard McBride, Eds. Nichols Publishing Co., New York, 1978. 260 pp., illus. \$25.

Xeno-Grafting. The Future of Organ Transplantation. Ejvind Kemp. Illustrations by Peter Skaaring. Odense University Press, Odense, Denmark, 1978. 118 pp. Paper, 120 Dan.kr.

Your Own Pigs You May Not Eat. A Comparative Study of New Guinea Societies. Paula G. Rubel and Abraham Rosman. University of Chicago Press, Chicago, 1978. xvi, 368 pp., illus. \$24.

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Genetic Toxicologist/Cytogeneticist. Ph.D. microbiology, 1977. NIEHS predoctoral trainee; 16 years of predoctoral experience in virology, 6 years as project director; 2 years of clinical cytogenetics, including supervisory; 2-years postdoctoral at Belgian university directing program on mutagenicity of pesticides. Publications. Seeks research, clinical and/or administrative position in industry, government, or academic institution. West preferred. Box 168, SCIENCE. X