REVIEWS AND NOTICES OF BOOKS

Linear Sequential Switching Circuits. Edited by William H. Kautz. (Holden-Day, Inc., 728, Montgomery Street, San Francisco), 1965. Pp. v + 234. Price $ 6.75.

The present volume under review brings together reprints of well-known papers comprising the important technical contributions in the theory of linear sequential switching circuits. This theory not only provides the fundamental basis for the design of error-detecting and error-correcting circuitry used with error-checking codes in communications and computers; it also constitutes an integral and central part of the theory of sequential digital networks in general, which theory lies at the heart of the design of digital logic circuitry such as is found in digital computers and control systems and in digital communication systems. The scope of this collection is almost entirely theoretical, and the material is fundamental in nature.

C. V. R.

Energetics in Metallurgical Phenomena. By William M. Mueller. (Based on the Proceedings of the 1962 Seminar on Energetics in Metallurgical Phenomena, University of Denver.) (Gordon and Breach, Science Publishers, 150, Fifth Avenue, New York-11), 1965. Pp. xiii + 425. Price: reference edition $ 19.50; paperback edition $ 9.50.

In a serious attempt to consolidate up-to-date thinking on the energetics approach to the study of metallurgical phenomena and to provide a means by which science faculty members and other researchers may keep abreast of this fast-moving field, the First Seminar on Energetics in Metallurgical Phenomena was held at the University of Denver in the summer of 1962. The Seminar was sponsored by the Department of Metallurgy at the University of Denver with financial support provided by a grant from the National Science Foundation. Eight one-week lecture series were presented, covering subjects of fundamental importance to an understanding of the behavior of materials.

This volume contains the subject-matter presented in these lectures. Their titles are as follows: 1. Intermetallic Diffusion, by David Lazarus; 2. Solid Solutions, by Rudolph Speiser; 3. Nucleation Processes, by Michael B. Bever; 4. Transformations, by Earl C. Roberts; 5. Metastable Phases Obtained by Rapid Solidification, by Pol Duwez; 6. Annealing Mechanisms in Deformed Metals, by Paul Gordon; 7. Energetics in Dislocation Mechanics, by John E. Dorn; 8. The Oxidation of Metals, by Kenneth R. Lawless.

C. V. R.

An Atlas of Models of Crystal Surfaces. By J. F. Nicholas. (Materials Science and Engineering Program). (Gordon and Breach, Science Publishers, 150, Fifth Avenue, New York-11), 1965. Pp. 256. (9 × 12" format). Price $ 27.50.

This volume is concerned entirely with the geometry of atomically-flat surfaces, defined in the following way. If an ideal crystal, consisting of an infinite regular array of atoms (or ions), is cut by a plane and all atoms whose centres lie on one side of this plane are removed, then the remaining half-crystal is said to possess an *atomically-flat surface*.

Ball models showing the atomic arrangements at such surfaces have been constructed for surfaces of about twenty different orientations in each of the face-centred cubic, body-centred cubic, sodium chloride, diamond, and hexagonal close-packed structures. In Section 1, the specification of a surface is discussed. In Section 2, the way in which the models represent crystal surfaces is explained, but details of the actual construction of the models are deferred to Section 5. This last section can be omitted without loss of understanding unless the reader is interested in actually constructing models for himself.

For each surface, a scaled plan of a unit cell of surface has been drawn and the exact positions of the surface atoms associated with this cell have been tabulated. The interpretation of these plans and tables is described in Section 3. Further, for each surface atom, the number of nearest neighbours has been found and the co-ordination type is listed in the table of atomic positions. The terminology is explained in Section 4. Again, the largest part of Section 4 (Section 4.3) can be omitted without serious loss unless the reader wishes to study the co-ordination of surface atoms in great detail. In particular, Sections 4 and 5 can be read independently of each other.

This book will be found to be of great value by practising surface chemists, physicists and crystallographers.

C. V. R.

Planets for Man. By Stephen H. Dole and Isaac Asimov. (Methuen & Co. Ltd., Publishers, Ludgate Circus, 9855, 11, New Fetter Lane, London E.C. 4), 1965. Pp. x + 242. Price 25 *sh*. net.

In the course of millions of years the human species has adapted itself to the narrow ranges of temperature and air pressure, the availability of food and water, the chemical and physical components of our earthly environment. Now that the means are at hand for mankind to transcend this environment, the questions arise · Where else in the universe can such physical conditions be found? Does our medium-sized planet, circling a medium-sized star in the outer reaches of a typical spiral galaxy, have a counterpart among the countless heavenly bodies which surround it? What will men find as they gradually extend the range of their explorations? In speculating on some future consequences of manned space flight, this book looks forward to a time when human beings will be able to travel the vast distances to the other stars. It then attempts to determine—on the basis of our present biological and cosmological knowledge—whether there are other worlds where man can survive. C. V. R.

Statistical Theories of Spectra : Fluctuations. (Academic Press, New York and London), 1965. Pp. xv + 576. Price $ 5.95 ; Clothbound Edition $ 9.50.

This volume under review comprises a collection of fifty reprints and original papers and begins with an introductory article entitled "Fluctuations of Quantal Spectra" which covers the first 87 pages by the late C. E. Porter, who also appears elsewhere in the volume as author or joint author in eight other papers covering in all 126 pages. Nine other papers by E. P. Wigner in the aggregate cover 112 pages. Other authors who figure extensively in the collection are F. J. Dyson and M. L. Mehta who separately or jointly contribute ten papers covering an aggregate of 119 pages. The volume is concluded with an Appendix on Averages and Variances of Nuclear Cross-Sections covering 15 pages by R. G. Thomas. C. V. R.

The Upper Atmosphere Meteorology and Physics. (Vol. 8 of *International Geophysics Series*). By Richard A. Craig. (Academic Press, New York and London), 1965. Pp. xii + 509. Price $ 12.00.

Designed for graduate students and research workers in meteorology, aeronomy, atmospheric science, and for physicists, chemists, and astronomers interested in the upper atmosphere of the earth, this book emphasizes results and problems that pertain to composition, structure, and circulation of atmosphere between the tropopause and about 300 km. Most of the relevant observational material gathered during and since the International Geophysical Year is included and summarized. In addition, there is considerable reference to and discussion of some closely related physical, chemical, and astronomical problems. These include the solar ultra-violet spectrum, absorption by upper-atmospheric gases, ozone, infra-red transfer, atmospheric tides, geomagnetism, aurora and airglow and ionization phenomena. C. V. R.

Oriented Nuclei Polarized Targets and Beams (Volume 20 of Pure and Applied Physics). Edited by J. M. Daniels. (Academic Press. New York and London), 1965. Pp. xii + 278. Price $ 9.00.

The purpose of this book is to present for the first time in one volume a concise account of nuclear orientation. Written as an introduction to the subject of angular effects, this book eschews mathematical detail and presents basic ideas. Only an elementary knowledge of quantum mechanics is required ; calculations may be made without using Racah algebra. The subject in this volume is dealt with in seven chapters whose titles are as follows : I. Introduction ; II. Thermal Equilibrium Methods of Orienting Nuclei ; III. Non-thermal Equilibrium Methods of Nuclear Orientation ; IV. Experimental Techniques for Nuclear Orientation ; V. Beams of Polarized Particles from Nuclear Reactions ; VI. Polarized Ion Sources for Accelerators ; and VII. Experiments with Oriented Nuclei.

The book will be valuable to all research workers and graduate students in nuclear physics, magnetism, and related fields.

C. V. R.

Screening Methods in Pharmacology. By Robert A. Turner. (Academic Press, New York and London), 1965. Pp. xv + 332. Price $ 12.00.

This book contains detailed descriptions of most of the modern methods used for the detection of pharmacological activity and modifications of older techniques used in the field. In addition, discussions on the organization of screening programs are included. Experimental procedures and their biological basis are

emphasized. New agents are compared with classical drugs, and quantitative comparisons by measured responses are given throughout.

The book follows a logical progression from the design of the experiment through the technical procedure, to the statistical evaluation of the results.

This work will be found useful by pharmacologists, physiologists, medical researchers, teachers and instructors in pharmacology, organic chemists, and laboratory technicians.

C. V. R.

International Review of Cytology (Vol. 18). Edited by G. H. Bourne and J. F. Danielli. (Academic Press, New York and London), 1965. Pp. ix + 428. Price $ 16.00.

Volumes 16 and 17 of this well-known series were reviewed in the issue of *Current Science* for May 20, 1965, Volume 34, page 306.

The present volume under review contains the following nine contributions by the authors shown against each : 1. The Cell of Langerhans, by A. S. Breathnach ; 2. The Structure of the Mammalian Egg, by Robert Hadek ; 3. Cytoplasmic Inclusions in Oogenesis, by M. D. L. Srivastava ; 4. Tabulation of Enzymes in Subcellular Fractions, by D. B. Roodyn ; 5. Histoenzymology by Substrate Film Methods, by R. Daoust ; 6. Cytoplasmic Deoxyribonucleic Acid, by P. B. Gahan and J. Chayen ; 7. Malignant Transformation of Cells *in vitro*, by Katherine K. Sanford ; 8. Deuterium Isotope Effects in Cytology, by E. Flaumenhaft, S. Bose, H. L. Crespi and J. J. Katz ; 9. The Use of Heavy Metal Salts as Electron Stains by C. Richard Zobel and Michael Beer.

C. V. R.

Human Chromosome Methodology. Edited by Jorge J. Yunis. (Academic Press, New York and London), 1965. Pp. xv + 258. Price $ 8.50.

Recent advances in human cytogenetics have stimulated widespread interest among many investigators in the medical and biological sciences. As a direct result of this interest, a genuine need has been felt for an authoritative and up-to-date treatise which would serve as a text and reference. Readily comprehensible chapters are offered covering each phase of laboratory investigation from the preparation of materials for sex chromatin and chromosome techniques for bone marrow, blood, skin, and gonadal specimens to the subject of autoradiography and chromosome identification. Included also are guides to microscopy and microphotography as well as a thorough treatment of chromosomes in disease. It is hoped that this volume will serve as an adequate guide to laboratory techniques and their applications for research workers, students of genetics, and members of the medical profession involved in setting up a laboratory of cytogenetics.

C. V. R.

Biochemistry of the Amino-Acids (Second Edition). By Alton Meister. (Academic Press, New York and London), 1965.

Volume I, Pp. xxvi + 592. Price $ 22.00.

Volume II, Pp. xxiii + 492. Price $ 20.00.

This revised and up-to-date treatise presents a comprehensive picture of the current status of amino-acid biochemistry—one of the most rapidly expanding fields in contemporary scientific research. Since publication of the first edition, many new amino-acids have been discovered and important advances have been made in our knowledge of the enzymes that catalyze the numerous reactions involved in amino-acid metabolism. The dramatic developments in the area of protein synthesis, such as the nucleic acid-amino-acid code, seem to be only a starting point for future investigations in biochemical genetics and the control of enzymatic activity.

Volume I contains information on the natural occurrence and properties of amino-acids and peptides, nutritional aspects of amino-acids, amino-acid antagonists, amino-acid transport, oxidative and non-oxidative deamination, amino-acid oxygenases, vitamin B_6 enzymes, and the synthesis of peptides and proteins.

Volume II is concerned with the biosynthesis and other aspects of the intermediary metabolism of the amino-acids, and with disorders of amino-acid metabolism in man.

Both volumes contain full references to the literature.

C. V. R.

Fish as Food. Edited by Georg Borgstrom.
Volume 3, Processing—Part 1, Pp. 489. Price $ 17.50.
Volume 4, Processing—Part 2, Pp. 518. Price $ 18.50.
(Academic Press, New York and London), 1965.

The first two volumes of "Fish as Food" were reviewed in this journal in 1962 (Vol. 31, p. 172) and 1963 (Vol. 32, p. 526). According to the original plan the volume covering the general area 'Processing' was to have been the third and final volume in this work. However, the rich amount of information that has become available on the subject has necessitated the

division of the final volume into two volumes 3 and 4.

More than thirty authors representing an international cross-section of experts in the general field of handling and processing of fish and other aquatic catches have contributed to these two volumes. Topics covered in the third volume include drying and dehydration, smoking, salting of herring, marinades, anchovies and tidbits, fish sauces, pastes and sausages, whale products, fish solubles, and manufacture, properties and utilization of fish meal.

The majority of chapters in volume 4, are devoted to canning and preservation, and the topics dealt with include the following: Handling of fresh fish, Freshness tests, Tuna canning, Canning of sardine (Scandinavian and Maine), Brine refrigeration, Heat processing of shellfish, Squid meat, Fish and shellfish freezing, Processing at sea and factory ships. The potential advantages of radiation preservation, particularly the prospect of storing raw foods without refrigeration, have enthused interest among workers in the field of fish preservation, and there is a chapter which deals with this aspect of the problem giving some of the latest results.

The editor George Borgstrom, in collaboration with Clark D. Paris, has contributed to volume 3, a general article on "The Regional Development of Fisheries and Fish Processing" which surveys the present developments in fish processing industry in individual countries and regions.

The global problem of alleviating world hunger in the face of an explosive population calls for new methods of exploitation and maximum utility of available food resources of ocean waters, and to this effect this four-volume publication on "Fish as Food" will be particularly valuable to all those who are directly concerned in this problem. A. S. G.

Advances in Agricultural Sciences—*Golden Jubilee Commemoration Volume of the "Madras Agricultural Journal"*. Edited by S. Krishnamurthi. (Issued by the Agricultural College and Research Institute, Coimbatore, India), 1965. Pp. 666.

The *Madras Agricultural Journal* was founded in 1911 and has a record of uninterrupted publication ever since. To mark the Golden Jubilee (50 years) of its publication, the organizers decided to bring out a commemoration volume by inviting contributions from leading agricultural scientists in India and abroad, in the broad area of major advances in agricultural research. The manuscript which was released at a public function held to celebrate the occasion has now come out in print. It is a worthy volume and the Editor and his colleagues deserve the warmest congratulations from workers engaged in agricultural research in India.

The more than fifty articles contributed by more than sixty authors cover almost every field of agricultural research. Many of them are in the nature of review articles incorporating the latest developments in the subject and their applications; others are concerned with specific problems and give the results of original investigations. Besides the large number of Indian experts who have made contributions the list of authors includes well-known specialists from U.S.A., U.K., Japan, and the F.A.O.

The contributions are arranged under six chapters: The first chapter contains papers on Plant Breeding, Cytogenetics, Plant Physiology, and Plant Introduction. The second chapter contains papers on Agronomy, Meteorology, Soil Conservation, and Agricultural Economics. The third chapter deals with Soil Science. The fourth chapter is devoted to Horticulture under the three sections Fruits, Vegetables and Floriculture. The last two chapters are respectively on Plant Pathology and Entomology.

The volume which is a store-house of information on recent advances in agricultural science and their applications, should be welcomed not only by research workers but also by administrators and planners concerned with agricultural development in the country.

A. S. G.

Books Received

Annual Review of Biochemistry (Vol. 34). (Annual Reviews, Inc., 231 Grant Avenue, Palo Alto, California, U.S.A.), 1965. Pp. vii + 700. Price $ 9.00.

Elements of Structural Geology. By E. S. Hills. (Asia Publishing House, Calicut Street, Ballard Estate, Bombay-1), 1965. Pp. xi + 483. (Price not given).

Atoms and Molecules Simply Explained—An Introduction to Chemical Phenomena and their Applications. By B. C. Saunders and R. E. D. Clark. (Dover Publications, 180, Varick Street, New York 14), 1965. Pp. v + 299. Price $ 1.50.

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