piece could undoubtedly be made to look like the conventional programmed temperature chromatogram if the sample were accumulated on the column at a low temperature prior to starting the program.

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The Cell Periphery

The Specificity of Cell Surfaces. A symposium held at Woods Hole, Mass., September 1965. BERNARD D. DAVIS and LEONARD WARREN, Eds. Prentice-Hall, Englewood Cliffs, N.J., 1967. 300 pp., illus. $10.25.

The first section of this unusually broad symposium is concerned with bacterial cell walls and membranes. Those of us who work with animal cells can only envy the mass of biochemical and genetic data that are available for bacteria. However, it is indicative of the complexities of the problem that the structural assembly of the chemical units to form membranes is as little understood in bacteria as in animal cells.

One of the major blocks to understanding membrane structure in animal cells is that, apart from erythrocyte ghosts, few chemical analytical data are available because of the difficulties in obtaining specimens. The second section of the book, which is concerned with animal cell membranes, contains two very useful papers on different isolation techniques. The main difficulty in assessing any method lies in determining the purity of the isolated membrane preparations. Thus, the technique employed by Warren *et al.* provides surface membranes which are contaminated by 500 to 1000 Å of "cytoplasm"; Wallach also discusses this difficulty and describes his search for surface markers. An interesting paper by Revel and Ito takes up the problem of molecular and fine structural arrangements within the membrane. Why do so many electron-microscopists have an apparent mental block in regarding carbohydrates and their charged groups as part of the membrane proper and use the misleading term "coat"? Is a membrane by definition only the trilaminar structure seen by electron-microscopists? The immunochemists have known a great deal about blood-group substances for some time, and this knowledge is summarized in a short, authoritative review by Watkins in the third section of the book; the antigenic groups are sugars. These are very much part of the cell periphery, and if this is inconsistent with electron-microscopic terminology, then it is time this terminology was changed.

Although the subject matter is by no means completely covered—a short review of transport mechanisms would have been in place—this thoughtful and readable text in a field of rapidly increasing interest is recommended.

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Botanists' Reference

A Dictionary of the Flowering Plants and Ferns. J. C. WILLIS. Seventh edition, revised by H. K. AIRY SHAW. Cambridge University Press, New York, 1966. 1289 pp. $18.50.

Willis's dictionary has gained a firm reputation among botanists, agriculturists, horticulturists, and others through six editions and many reprintings extending over nearly 70 years. The seventh edition, revised by H. K. Airy Shaw, of the Kew Herbarium, now replaces (at least in part) the sixth edition, published in 1931.

First published in 1897, in two volumes, under the title *A Manual and Dictionary of the Flowering Plants and Ferns*, the work was a kind of encyclopedic vade mecum for students working in botanic gardens and in the field. Subsequently reduced to one volume, the book is best known as a concise reference covering five main subjects—family names of flowering plants and ferns, important generic names, economic products (with descriptive information for many entries), common and vernacular names, and botanical terms. The telescopic format has always been a particularly attractive and practical feature of the dictionary and is retained in the present edition. It is indeed true that Willis "provided in a convenient and accessible form a range of knowledge gleaned from a vast and scattered literature," as Sir George Taylor, director of the Royal Botanic Gardens, Kew, says in his foreword to the seventh edition.

The decision to restrict the new edition to families and genera and to delete the other subjects was undoubtedly dictated by Airy Shaw's preoccupied interest in angiosperm families and disposition of genera in the scheme of classification, "coupled with a strong sense of the advantages of a work that at least aims to cover one subject fully." This course will no doubt arouse controversy among users of the book.

The 40,000 entries include every published generic name (whether validly published or not), from *Species Plantarum* of Linnaeus (1753) up to the present time, and every published family name since the appearance of *Genera Plantarum* of Jussieu in 1789. Literature citations are not included. Listed also are names of intergeneric hybrids (natural and artificially produced), as in Orchidaceae and some other families, and asexual and graft hybrids and periclinal chimaeras, as for example + *Laburnocytisus,* + *Crataegomespilus,* + *Pyro-cydonia,* and + *Amygdalopersica.* R. E. Holttum deals with the ferns and fern allies, and at least 41 other specialists are acknowledged contributors in selected groups of plants. Also included are keys to the families of flowering plants, based upon Engler's classification, and an outline of Bentham and Hooker's system of 1862–93.

While this reviewer would have preferred a new edition that merely brought the five subjects of older editions up to date, Airy Shaw should be congratulated for his fine accomplishment in producing the present volume. Despite its narrower scope, the use to which my copy has already been put indicates that the seventh edition will live on in the tradition of Willis.

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Solvents

The Chemistry of Non-Aqueous Solvents. Vol. 1, Principles and Techniques. J. J. LAGOWSKI, Ed. Academic Press, New York, 1966. 415 pp., illus. $16.50.

It seems both noteworthy and appropriate that this, the first volume in a proposed series, should be devoted to basic principles and experimental methods without emphasis upon any specific non-aqueous solvents. Almost two-thirds of the book is concerned with the more theoretical aspects of (primarily) solution chemistry; the remainder covers experimental methods appropriate to the study of physical and chemical

properties of solutions in low-boiling liquids and fused salts. The latter sections are well illustrated, and all of the chapters are well documented. The announced contents of volume 2 indicate that succeeding volumes in this series are to be devoted to more detailed consideration of individual solvents. Collectively, these volumes should become a major contribution to the literature of non-aqueous solvent chemistry and indispensable to those actively working in this field. The contributors to volume 1 and the editor are to be commended for a job well done. It is to be hoped that equally high standards of clarity of presentation and careful editing will be maintained in the volumes to follow.

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Endocrinology

Steroid Dynamics. Proceedings of a symposium on the dynamics of steroid hormones held in Tokyo, May 1965. GREGORY PINCUS, TAKESHI NAKAO, and JAMES F. TAIT, Eds. Academic Press, New York, 1966. 595 pp., illus. $20.

Endocrine research received great impetus from the synthesis, in the early 1950's, of radioactively labeled steroid hormones. Their use, both in studies in vivo and in laboratory experiments, has permitted significant advances in our understanding of the secretion, metabolism, mode of action, and excretion of the hormones produced by the adrenal gland, testis, and ovary.

Steroid Dynamics contains a number of contributions in this field, presented to a meeting of a group of American and Japanese workers assembled under the United States–Japan Co-operative Science Program. Although there are papers in most areas of steroid investigation, including control mechanisms, biosynthesis, metabolism, and action at target sites, the quality and breadth of the contributions show considerable variation. The reader seeking a comprehensive review of the title subject should be aware of the bias, in ideas and techniques, toward those of the American participants—many of whom are, nevertheless, leaders in the field.

Reviews by Lipsett, Tait, and Lieberman are particularly useful appraisals of current notions regarding the estimation of the secretion rates and metabolic transformations of the steroid hormones, particularly the androgens, and Kono provides confirmation of the usefulness of these techniques in small numbers of normal subjects and in patients with disorders of the pituitary and adrenal glands and with hypertension and renal disease. The interactions of steroids with plasma proteins are fully reviewed by Sandberg and Seal. Jensen and Edelman discuss the cellular actions of estrogens and aldosterone. The paper by Luetscher on the conjugation and excretion of aldosterone is of particular interest. In contrast, some of the Japanese papers are handicapped by poor translation and a rather overwhelming mass of detail; several of these seem barely to come within the scope of the title.

The individual papers and the transcripts of ensuing discussions show that the purposes of the meeting reported in this volume have undoubtedly been achieved, in the fostering of contacts between scientists in the fields concerned. However, the advisability of publishing the proceedings in book form is rendered somewhat doubtful when the participants are restricted to two countries and the subjects reviewed are on the whole adequately covered in other publications.

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Books Received

Advances in Electrochemistry and Electrochemical Engineering. vol. 5, *Electrochemical Engineering*. Charles W. Tobias, Ed. Interscience (Wiley), New York, 1967. 337 pp. Illus. $14.50. Five papers.

Advances in Heterocyclic Chemistry. vol. 8. A. R. Katritzky and A. J. Boulton, Eds. Academic Press, New York, 1967. 420 pp. Illus. $19. Eight papers.

Birds of Australia. Abram Rutgers. Methuen, London; Barnes and Noble, New York, 1967. 331 pp. Illus. $15.

Book of Minerals. Albertus Magnus. Translated from three editions (Paris, 1890–1899; Venice, 1495; and Oppenheim, 1518) by Dorothy Wyckoff. Oxford Univ. Press, New York, 1967. 351 pp. Illus. $13.45.

Bubble and Spark Chambers: Principles and Use. vol. 2. R. P. Shutt, Ed. Academic Press, New York, 1967. 331 pp. Illus. $16. Pure and Applied Physics Series. Five papers.

The California Oath Controversy. David P. Gardner. Univ. of California Press, Berkeley, 1967. 343 pp. $6.50.

The Cambridge Medieval History. vol. 4, *The Byzantine Empire*, pt. 2, *Government, Church and Civilisation*. J. M. Hussey, Ed. Cambridge Univ. Press, New York, 1967. 559 pp. Illus. $14.50.

Chemical Equilibrium and Solutions: A Programmed Introduction. James E. Banks. McGraw-Hill, New York, 1967. 184 pp. Illus. Paper, $2.50; cloth, $3.95.

The Child Analyst at Work. Elisabeth R. Geleerd, Ed. International Universities Press, New York, 1967. 316 pp. $7. Ten papers.

Chinese Economic Statistics: A Handbook for Mainland China. Nai-Ruenn Chen. Aldine, Chicago, 1967. 571 pp. Illus. $15.

Samuel Clossy, M.D.: The Existing Works. With a biographical sketch by Morris H. Saffron. Including a facsimile reprint of "Observations on Some of the Diseases of the Parts of the Human Body." Hafner, New York, 1967. Unpaged. Illus. $10.50.

Design for a Brain: The Origin of Adaptive Behavior. W. Ross Ashby. Chapman and Hall, London; Barnes and Noble, New York, ed. 2, 1967. 296 pp. Illus. Paper, $2.85; cloth, $7.50.

A Dictionary of Zoology. A. W. Leftwich. Constable, London; Van Nostrand, Princeton, N.J., 1967. 327 pp. $6.50.

Early Nineteenth Century European Scientists. R. C. Olby, Ed. Pergamon, New York, 1967. 191 pp. Illus. $5. Six papers.

The Ecology of Insect Populations in Theory and Practice. L. R. Clark, P. W. Geier, R. D. Hughes, and R. F. Morris. Methuen, London; Barnes and Noble, New York, 1967. 246 pp. Illus. $8.

Electrochemical Kinetics: Theoretical and Experimental Aspects. Klaus J. Vetter. Based on a translation of the German edition (Berlin, 1961) by Scripta Technica. Stanley Bruckenstein and Brian Howard, Translation Eds. Academic Press, New York, 1967. 822 pp. Illus. $36.

Freedom and Order in the University. Samuel Gorovitz, Ed. Press of Western Reserve Univ., Cleveland, 1967. 232 pp. $5.75. Six essays.

Fuel: Solid, Liquid, and Gaseous. J. S. S. Brame and J. G. King. St. Martin's Press, ed. 6, New York, 1967. 528 pp. Illus. $23.

Fundamentals of Mathematical Physics. Edgar A. Kraut. McGraw-Hill, New York, 1967. 480 pp. Illus. $11.

The Gamma Globulins. Charles A. Janeway, Fred S. Rosen, Ezio Merler, and Chester A. Alper. Little, Brown, Boston, 1967. 160 pp. Illus. $6.75. *New England Journal of Medicine* Medical Progress Series.

Generalized Networks. Proceedings of a symposium (New York), April 1966. vol. 16. J. Fox, Ed. Polytechnic Press, Brooklyn, N.Y.; Interscience (Wiley), New York, 1967. 823 pp. Illus. $18. Microwave Research Institute Symposia Series. Thirty-eight papers.

Genetic and Environmental Factors in Human Ability. A symposium, September–October 1965. Sponsored by the Eugenics Society. J. E. Meade and A. S. Parkes, Eds. Plenum Press, New York, 1966. 254 pp. Illus. $12.50.

The Genus Pinus. N. T. Mirov. Ronald, New York, 1967. 610 pp. Illus. $15.

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