comment little on the physical basis; Kadanoff and Baym emphasize especially strongly the physical significance of the equations. Mathematicians will prefer the work of the former authors, while experimental physicists will find Kadanoff and Baym more satisfying. Both works are heartily recommended to theoretical physicists.

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## Gerontology

**Time, Cells, and Aging**. Vernard L. Strehler. Academic Press, New York, 1962. x + 270 pp. Illus. Paper, $2.95; cloth, $5.

All serious workers in gerontology who are hungrily threshing about for a good idea to enable research on senescence to get off the ground should find this little volume good reading. Strehler brings up a number of good points of a general nature and lucidly defines the problems confronting research on senescence. In this area he is excellent.

His attempts to broadly survey research on senescence phylogenetically comes out a poor second to Comfort's recent *Biology of Senescence*. One has the impression that Strehler could have been more thorough. For example, aging in protozoa is disposed of in a very brief treatment, and the processes of endomixis and autogomy are confused. His description of orthoclone experiments on rotifers leaves much to be desired; although the papers in this area are few, they apparently have not been read by the author. Child's classical investigations of *Planaria* are disposed of in less than one page.

The sections on age pigments and mathematical concepts of aging are very well done and provocative. These could well have been expanded at the expense of at least 16 full pages of direct quotations from various workers.

Quite correctly Strehler points out that to define aging one must be able to define the living system. We have a long way to go before we can precisely do either. Strehler is to be commended for his attempt to bring together the material in cell biology that is pertinent to aging.

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## Natural Products Chemistry

**The Chemistry of Flavonoid Compounds**. T. A. Geissman, Ed. Pergamon, London; Macmillan, New York, 1962. viii + 666 pp. Illus. $24.

The chemistry of naturally occurring oxygen heterocyclics is a fascinating area of natural product chemistry, and a comprehensive modern textbook dealing with this subject has been needed for a number of years. Although other classes of compounds, including, for example, the alkaloids, steroids, terpenes, carbohydrates, amino acids, and proteins, have been given acceptable coverage in recent reviews and textbooks, this has not been the case with naturally occurring phenolic compounds. This area of natural product chemistry is very considerable, and it is doubtful if one person could provide a critical treatment of the subject in its entirety. It is therefore possible to welcome this book which is mainly concerned with natural products of the flavonoid type; the contributions are by a number of internationally recognized authorities, and they are presented in 19 chapters. T. A. Geissman edited the volume.

The coverage is certainly greater than its title suggests. The classes which are discussed include not only flavones and their derivatives but also catechins and related tannins, leucoanthocyanidins, leucoanthocyanins, anthocyanins, chalcones, aurones, and isoflavonoids. Critical accounts are given of modern methods for isolating plant materials and for determining their structure and stereochemistry. Useful correlative summaries of the ultraviolet spectroscopic properties of these compounds are included. Three chapters which are of particular interest because they contain unusual material are those which discuss the economic importance of flavonoid compounds. The recent interest in the biosynthesis of natural products certainly justifies its full treatment in a book of this type. The phytochemical relationships between and the biosynthesis of natural phenolic compounds should have been discussed in somewhat greater detail.

Contributors to the volume are T. A. Geissman, T. R. Seshadri, M. K. Seikel, K. Venkataraman, L. Jurd, K. Freudenberg, K. Weinges, J. W. Clark-Lewis, K. Hayashi, M. Shimokoriyama, S. Hattori, W. D. Ollis, J. Gripenberg, W. B. Whalley, E. A. H. Roberts, T. Swain, H. L. Hergert, J. B. Harborne, and A. J. Birch. The editor is to be congratulated not only for encouraging the production of these authorative accounts but also for coordinating the authors' efforts so that the final product is an excellent contribution to the chemical literature.

The standard of presentation is first class, but it should be for a book of this price. It is a book which should certainly be available in chemistry libraries, but the price is such that its purchase for personal use cannot be recommended.

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## Illuminating and Stimulating

**Affect, Imagery, Consciousness**. vol. 1, *The Positive Affects*. Silvan S. Tomkins. Springer, New York, 1962. xi + 522 pp. $8.

Tomkins states that "the emergence of ego psychology, the theory of cognition, and a renewed interest in neurophysiology are signs that the excesses of Psychoanalytic theory and Behaviorism alike are in process of radical modification." I would agree and add that this volume, reopening as it does "issues which have long remained in disrepute in American Psychology: affect, imagery, and consciousness," is another refreshing sign of an impending reorientation in our approach to understanding the human being.

The unifying theme of this first volume, on the positive affects, is the belief that "the primary motivational system is the affective system, and the biological drives have motivational impact only when amplified by the affective system." Tomkins has read widely and quoted aptly from contemporary work in neurophysiology and emotion, and he has integrated it well with the classical material. Where he cannot locate experimental findings to support his theses, he does not hesitate to fill in with interpretive opinion or even authoritarian fiat. One can quibble by wishing that when the author discusses the reinforcing effect of fear upon the sex drive he would not rely solely upon the "lure of the tabooed and the forbidden" but would also consider the possibility of simple "overflow" phenomena in the autonomic nervous sys-

tem. One is startled by the continual sharp transitions from neurophysiology to such broad topics as the effect of culture upon the evolution of the nervous system or the affect dynamics of the current world revolution. This is certainly no book for Occam's razor; it would be dulled within the first few pages, and Lloyd Morgan's canon overwhelmed by a human wave of rhetoric. Yet even the most critical of reviewers could not deny that the book is full of illuminating insights and stimulating conceptions.

The reviewer's task is complicated by the fact that volumes 2 and 3 have not been published and, consequently, are not available for reference and perspective. Nor is it made easier by the fact that any index or bibliography is apparently being reserved for the last volume. On the basis of volume 1, Tomkins' tour de force does not quite come off, but it does remain interesting and thought provoking. Few psychologists *could* write this book, and of those that *could* still fewer *would*, but many of them could read it with profit.

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## Complex Ions

**Absorption Spectra and Chemical Bonding in Complexes**. C. K. Jørgensen. Pergamon, London; Addison-Wesley, Reading, Mass., 1962. xii + 352 pp. Illus. $10.

Jørgensen provides a brief historical introduction, reviews the essential features of the theories of atomic structure and the ligand field, and then presents a rather complete summary of our present understanding of electronic energy levels and absorption spectra of complex ions. The research worker or graduate student who has some prior experience in, or knowledge of, the area and who wishes to broaden his knowledge and understanding will find this book especially useful. It should be noted, however, that two topics of considerable current interest—polarization and vibronic interaction studies—are touched upon only very briefly.

This book is not, and does not pretend to be, a self-contained presentation of the relevant theory and its application. Appreciative study will require some previous knowledge or concurrent study of quantum mechanics, group theory, and ligand field theory. Moreover, most readers will find that frequent consultation of the original literature is necessary, a procedure that is facilitated by the bibliography of more than 600 entries.

The rambling style of writing found in some sections and the many peripheral topics touched upon, sometimes in a superficial manner, detract from the book's effectiveness. Despite the author's suggestion in the preface that the reader may wish to consider the chapters in an order different than the one in which they are presented, it would be especially unfortunate if the introductory chapters discouraged some uninitiated readers from pursuing the sections more germane to the book's central theme. A much more crisp presentation of the material, the deletion of references to technical, theoretical terms that have little bearing on the main topic discussed (for instance, the reference to first- and second-order density matrices, which make their only appearance on pages 21 and 22, could well be omitted), and the inclusion of more references to standard texts would greatly improve the opening section. Among the attractive features, the many summaries of experimental data are outstanding. One whole chapter is devoted to the tabulation of spectral data.

This book will reward the careful and critical reader with both broadened knowledge and inspiration for further work.

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## New Books

### Biological and Medical Sciences

**Allergy and Anaphylaxis as Metabolic Error**. vol. 1, *Dual Response to Antigenic Stimulation*. Z. Z. Godlowski. Immunometabolic Press, Chicago, 1962. 468 pp. Illus.

**Amino Acid Pools**. Distribution, formation, and function of free amino acids. Proceedings of a symposium held at Duarte, Calif., May 1961. Joseph T. Holden, Ed. Elsevier, New York, 1962. 826 pp. Illus. $21.50.

**An Annotated Bibliography on the Origin and Descent of Domestic Mammals, 1900–1955** (*Fieldiana: Anthropology*, vol. 54, No. 1). Shimon Angress and Charles A. Reed. Chicago Natural History Museum, Chicago, Ill., 1962. 143 pp. Paper, $2.75.

**Approaches to the Genetic Analysis of Mammalian Cells**. Donald J. Merchant and James V. Neel, Eds. Univ. of Michigan Press, Ann Arbor, 1962. 105 pp. Illus. $4. Seven essays based on lectures presented at the Michigan Conference on Genetics, University of Michigan, 1962.

**Atlas de Thrombodynamographie**. G. Marchal, M. E. Leroux, and M. Samama. Service de Propagande, Édition Information, Paris, 1962. 166 pp. Illus. NF. 60.

**Bibliography of Fossil Vertebrates Exclusive of North America, 1509–1927**. vols. 1 and 2. Alfred Sherwood Romer, Nelda E. Wright, Tilly Edinger, and Richard Van Frank. Geological Soc. of America, New York, 1962. vol. 1, 861 pp.; vol. 2, 776 pp.

**Biological Transport**. Halvor N. Christensen. Benjamin, New York, 1962. 141 pp. Illus. $6.50.

**Birth to Maturity**. A study in psychological development. Jerome Kagan and Howard A. Moss. Wiley, New York, 1962. 394 pp. Illus. $8.50.

**Comprehensive Biochemistry**. vol. 4, *Separation Methods*. Marcel Florkin and Elmer H. Stotz. Elsevier, New York, 1962. 297 pp. Illus. $13.

**Echinoderms**. David Nichols. Hillary House, New York, 1962. 200 pp. Illus. $2.50

**Explorations in Cognitive Dissonance**. Jack W. Brehm and Arthur R. Cohen. Wiley, New York, 1962. 348 pp. $7.95.

**Haematology of Some South African Reptiles**. Uys de Villiers Pienaar. Witwatersrand Univ. Press, Johannesburg, Union of South Africa, 1962. 315 pp. Ilus. $16.

**Homogreffes Cutanées**. Étude expérimentale. Georges Lejeune. Editions Arscia, Brussels, Belgium; Librairie Maloine, Paris, 1962. 214 pp. Illus. Paper.

**Ichthyology**. Karl F. Lagler, John E. Bardach, and Robert R. Miller. Wiley, New York, 1962. 558 pp. Illus. $12.50.

**The Interpretation of Ultrastructure**. Symposia of the International Society for Cell Biology, vol. 1. R. J. C. Harris, Ed. Academic Press, New York, 1962. 448 pp. Illus. $14.

**The Kidney**. Medical and surgical diseases. Arthur C. Allen. Grune and Stratton, New York, ed. 2, 1962. 780 pp. Illus. $26.50.

**Longmore's Medical Photography**. Peter Hansell and Robert Ollerenshaw. Lippincott, Philadelphia, ed. 7, 1962. 544 pp. Illus. $15.

**Maintaining Fishes**. For experimental and instructional purposes. William M. Lewis. Southern Illinois Univ. Press. Carbondale, 1963. 110 pp. Illus. Paper, $1.45; cloth, $5.

**Mineral Metabolism**. An advanced treatise. vol. 2, pt. B, *The Elements*. C. L. Comar and Felix Bronner, Eds. Academic Press, New York, 1962. 643 pp. Illus. $20.

**The Morphology of Pteridophytes**. The structure of ferns and allied plants. K. R. Sporne. Hillary House, New York, 1962. 192 pp. Illus. $2.50.

**The Nature of Psychotherapy**. A critique of the psychotherapeutic transaction. Walter Bromberg. Grune and Stratton, New York, 1962. 118 pp. $4.50.

**Physiology and Biochemistry of Algae**. Ralph A. Lewin, Ed. Academic Press, New York, 1962. 956 pp. Illus. $32.