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-