in the former. Considering the financial state of science, it is interesting that several of the authors indicate the potential medical or social value of research on their subjects. This may contribute to the motivation of researchers tackling biological problems.

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Biological Compounds

Aspects of Terpenoid Chemistry and Biochemistry. Proceedings of a Phytochemical Society symposium, Liverpool, Apr. 1970. T. W. GOODWIN, Ed. Academic Press, New York, 1971. xiv, 442 pp., illus. $24.50.

Terpenoids and Steroids. Vol. 1. A Review of the Literature Published between Sept. 1969 and Aug. 1970. K. H. OVERTON and seven others. Chemical Society, London, 1970. xii, 558 pp., illus. £11. A Specialist Periodical Report.

Perhaps I am getting old, but I regret to find lately as I peruse new technical books that the trend is simply toward cramming more and more facts onto each page; a consequence of this is that the books are more difficult and far less enjoyable to read. Regrettably, this is the case for the two volumes under review. The purpose of these volumes is identical—to review the literature of their subject. The first volume covers a four-year span; the second comprises coverage of only 12 months.

Goodwin's volume consists of 12 contributions by researchers in various disciplines from Europe and the United States. A record of the first symposium, entitled *Terpenoids in Plants*, was reviewed by me in 1967 (*Science* **158**, 1558). In four years, sufficient new material became available to warrant another symposium on essentially the same topic, and, surprisingly enough, there is little actual overlap in the material presented at the two symposiums. Of the two new works, the symposium proceedings is the more readable, some effort having been made by the editor and the various contributors to move from sentence to sentence with the hope that the reader will stay with it.

The book places emphasis on the insect hormones and carotenoids. Pfiffner's chapter enlarges one's appreciation of the nature and multifaceted role of the juvenile hormones in insects. Nonexperts in this field, such as this reviewer, must stumble through mountains of tongue-twisting words to follow the text, but the fascination of the subject sweeps one along. Rees adds an additional chapter on the ecdysones, the insect moulting hormones. Goodwin's interest in the carotenoids is evident in that over one-fourth of the book is devoted to various topics of carotenoid chemistry and biochemistry. Recently, several C_{50} carotenoids have been isolated and their structures determined. A thought-provoking aspect of this is that to date these C_{50} compounds have been found only in bacteria and especially in Gram-positive, aerobic forms. All are nonphotosynthetic.

After reading Francis's chapter on monoterpene biosynthesis one can only remark yet again how little we know of the function and relationship of the monoterpenes to the overall physiology of the plant—and we must wait still longer to find the answers.

Overton's book is simply heavy going. Its deadpan presentation of the facts make it difficult and dreary reading. The "editor" considers himself as a "senior reporter" and his seven associates as more simply "reporters," and that's exactly what they do—report. Although the book offers little interpretation or evaluation of the reported research, the coverage appears to be thorough and accurate. The plenitude of structural formulas should prove quite useful to workers in the field.

The space is divided about equally between terpenoids and steroids. The first part of the book is further divided into chapters based on structural and biogenetic relationships—covering monoterpenoids, sesquiterpenoids, and so on—and biosynthesis of terpenoids and steroids. The second part consists of only two chapters, on steroid properties and reactions and steroid synthesis.

Both volumes contain excellent line drawings and have clear, well-executed printing. The indexes of both seem quite complete and are easy to use. If one accepts these books not as works to enjoy but simply (and to me with some distaste) as "reference works," then one can get on with using them as I presume they were intended to be used.

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Developmental Sequences

Changing Syntheses in Development. A symposium, Albany, N.Y., June 1970. MEREDITH N. RUNNER, Ed. Academic Press, New York, 1971. xiv, 272 pp., illus. $13.50. *Developmental Biology*, supplement 4.

The major questions posed in this book are the traditional questions of development biology: how cells become different from one another during embryogenesis, how they organize into identifiable organs, and how, once differentiated, they respond to external stimuli. These problems are approached and discussed at levels ranging from the molecular biology of gene transcription, to cell dependence upon or response to hormones, to electron microscopic studies of cell and tissue organization. In spite of the diversity of the systems and approaches presented, the articles are related by the unifying theme implicit in the title of the book: they all stress sequential developmental events, whether at the biochemical, the cellular, or the morphological level.

Several of the papers present systematic descriptions of the developmental events and are valuable contributions for the information they contain. A few of the authors develop models in an effort to explain the changes they observe. Flickinger, for example, presents a provocative and speculative argument for the role of redundant nucleotide sequences during early amphibian embryogenesis. He suggests that most "DNA-like" RNA from very early embryos is transcribed from more redundant, evolutionarily old DNA sequences and that restriction of embryonic competence results from a restriction of transcription of these sequences as they become late-replicating. Bernfield and Wessells have neatly combined cytochemical and other biochemical studies with observations from light and electron microscopy to help elucidate the forces involved in the formation and maintenance of salivary gland epithelial structure. They find two independent factors, a mucopolysaccharide-protein complex at the epithelial surface and organized microfilaments, that appear to play a requisite role.

The most basic form of cell differentiation is the transition from germ cell to somatic cell. *Volvox*, a colonial flagellate, consists of only these two cell types, although the reproductive cells may be asexual, male, or female.