

sometimes research on higher plants fares a little less well simply because it cannot borrow so readily from the developments of zoological and medical science and cannot be so readily intercalated into animal-oriented funding patterns.

In the introductory section, commendable effort has been devoted to sorting out the underlying similarities of different types of movements as well as to emphasizing the contrasting ways in which even quite similar organisms have sometimes evolved mechanisms of movement that are superficially similar. Four chapters are given over to broad considerations of stimulus reception and transduction and to endogenous aspects of movements. In these, useful encouragement to interdisciplinary communication is provided by the discussion of terms and concepts employed by students of different kinds of movements.

However, as one who believes that sensory physiology should not exclude the animal kingdom, I note that an attempt by the editors and some of the authors to encourage the standard use of "perception" to indicate the act of stimulus reception does not aid the biologist of comparative bent. Shropshire, in an introductory chapter entitled "Stimulus and perception," states that "the term perception . . . in the strictest sense is inappropriate to use . . . for all botanical systems"; in fact it is precisely defined in the zoological literature (as well as in general dictionaries) to mean the recognition of a signal or set of signals at a conscious or at least neurologically complex level. "Reception" should not be uprooted as a valid term for the elementary act of receiving sensory information.

Most of the authors have done an outstanding job of providing broad perspective and critical analysis. Therefore many of the papers should prove valuable as material for the classroom. For example, I will find immediate use for the papers by Raschke on stomata and by Satter on nastic leaf movements in my undergraduate course on plant biology because both are written in lively fashion and provide exceptionally thorough and scholarly views of their topics. The numerous papers on actomyosin- or microtubule-based movements, or any kinds of flagellar movement, or movements initiated or modified by light would be equally useful for students.

Almost any reader is bound to find some things to disagree with in a book covering such a wide range of topics that are still so incompletely explored, but

this simply reflects the state of research on plant movements. The wealth of information, up-to-the-minute structuring of ideas, and variety of opinions expressed in the volume are bound to elicit in almost everyone a sense of excitement about plant movements and quite a few ideas for experimentation.

Physiology of Movements is equally useful for browsing or for cover-to-cover study. It is indeed encyclopedic rather than conglomeratic. Like its still useful predecessor in the old series, it will long remain an outstanding guide to the stage of historical development it covers.

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Hormones in Vitro

Hormones and Cell Culture. Papers from a conference, Cold Spring Harbor, N.Y., Aug. 1978. GORDON H. SATO and RUSSELL ROSS, Eds. Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y., 1979. In two volumes. xlii, 982 pp., illus. \$95. Cold Spring Harbor Conferences on Cell Proliferation, vol. 6.

My dictionary defines a hormone as a substance found in some organ of the body and carried by a body fluid to another organ or tissue, where it has a specific regulatory effect. Hormonal regulatory functions thus presumably are played out only in a whole body. Cell culture frees the cells of the body from such distinctions as internal and external, tissue and organ, and makes them all equally accessible to experimental manipulation of their capacities to grow and to differentiate. For hormone physiology, what cell culture gives in convenience it takes in relevance: how can a hormone be defined without a body? In recent years, however, a convergence of the two lines of inquiry has come about as a result of the demonstration that serum, the stuff put in culture medium to get cells to grow, can be replaced in many cases by a mix of factors so like the hormones of classic physiology as to render their differences from such hormones merely semantic.

This convergence has had some of the awkwardness of battlefield armistices. In this two-volume set we see that, although the convergence has not been welcomed by all, the new territory formed from pieces of the old fields of growth factors, hormone receptors, endocrine cell culture, polypeptide and steroid hormone physiology, and of

course cancer is quite secure. One founder surely must be the late Gordon Tompkins, and it is fitting that the editors have dedicated the volumes to him and graced them with warm personal recollections.

The volumes are well put together and are worth the price. The research of the editors provides the basis for the organization of the 63 papers in the book. Ross has pioneered in the purification of a growth factor from platelets that renders serum more mitogenic than plasma and presumably permits a scar to neatly form in a wound. Sato has shown that many cell lines can grow without any serum at all, provided a mixture of hormones is added to an otherwise simple mix of nutrients. Thus it is not surprising that the collection is an exhaustive reference on the properties and isolation protocols of growth factors. Of 12 sections, three are devoted to the characterization of polypeptide growth hormones and one to steroid hormones. The standouts in these sections are papers by Ross *et al.* on platelet-derived growth factors, by Todaro *et al.* on growth factors produced by tumors and transformed cells, and by Serrero, McClure, and Sato on the defined media for 3T3 fibroblasts.

The remaining chapters fall into two classes, those that deal with general and those that deal with specific systems. The former are probably the more provocative. Certainly the chapters on the cell cycle, differentiation, transport, and cell shape are packed with exciting ideas, and the authors are unlikely ever to find themselves writing papers in the same book again. I especially liked the paper by Pardee, Shilo, and Koch on cell synchronization, in which they argue convincingly against the need to hypothesize a stochastic event in the cell cycle.

In the chapters on specialized systems either single hormones or single cell types are described in great detail. In one such chapter protease plasminogen activator is shown to be under regulation by many hormones in situ and in culture, and in another hormone receptors are discussed, albeit in the unusual context of localization rather than regulation. Here, a paper by Roth *et al.* on disorders of receptor design is a superb review of one of the most dramatic convergences of molecular biology and medicine, the insulin-resistant diabetes that results from auto-antibody to insulin receptor.

Compared with other volumes in this series, *Hormones and Cell Culture* is rather more diffuse and less biochemical. Considering the choice of subjects this is

perhaps unavoidable. I recommend it to senior graduate students and post-doctoral fellows and of course to persons who wish to extract the maximum amount of physiologically relevant information from the lovely simple systems of cell culture.

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Basin Analysis

Lithostratigraphic Analysis of Sedimentary Basins. C. E. B. CONYBEARE. Academic Press, New York, 1979. xii, 556 pp., illus. \$39.50.

Basin analysis constitutes a major focus of the activity of many geologists, geophysicists, and engineers, especially those engaged in exploration for various types of natural resources. Conybeare has provided a general synthesis of lithostratigraphic concepts and methodologies commonly employed in basin analysis. Many previous works have approached this topic from the more specialized standpoints of stratigraphy, sedimentation, geophysics, or tectonics. Few have attempted the broad integration that is presented in this book.

The author's purpose was to provide a general review of sedimentary basin analysis and a commentary on basin classification, evolution, and development. Secondly, it was to provide a general reference work on current approaches to integrated lithostratigraphic analysis. By and large, Conybeare has succeeded in this endeavor.

With increasing expansion and sophistication of all geologic subdisciplines, basin analysis by a single geologist has been largely replaced by analysis by teams of specialists who jointly are capable of vastly more detailed and accurate interpretations than have ever been possible before. Conybeare's approach is based on this development. Naturally, well-established lithostratigraphic practices, procedures, concepts, and principles are updated and reviewed. More interesting to those actively concerned with basin analysis is Conybeare's synthesis of basin classifications, development, and evolution as well as his applications of basin analysis to economic geology. Discussions of these topics constitute more than a third of the book. They are timely, stimulating, original in part, and the best summaries of these topics available.

Two disappointing aspects of an otherwise excellent coverage and presentation of lithostratigraphic methods in basin studies can be noted. There is only a rather superficial acknowledgement of seismic stratigraphy, which during the past decade has revolutionized basin analysis in areas where subsurface exploration is limited. That means nearly all the earth's continental shelves, which contain those basins that are being analyzed most actively today and will continue to be investigated over the next few decades. The contribution of seismic stratigraphy to basin analysis continues to grow each year, and its value is unsurpassed in areas of limited drilling; however, its significance remains largely unappreciated by those who have not been involved in recent offshore petroleum exploration. There is also a tendency to include in the text much explanation of figures and diagrams that could have been more appropriately included in their captions. For the most part, the detailed information is necessary and desirable, but its placement in the text often serves only to obscure the more important general points the author is attempting to make with the illustrations.

Although Conybeare has evidently been most often oriented toward basin analysis for petroliferous resources, he has carefully tried to demonstrate application of basin analysis for all types of purposes, including discovery of coal, metallic ores, nonmetallic minerals, and groundwater resources as well as environmental (waste disposal), general earth history, and pure academic studies. Any scientist involved with basins in any way will find the book informative and readable.

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Books Received

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Advances in Cancer Chemotherapy. Proceedings of a symposium, Tokyo, 1977. Stephen K. Carter and six others, Eds. Japan Scientific Societies Press, Tokyo, and University Park Press, Baltimore, 1978. xviii, 506 pp., illus. \$67.50.

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The Discovery of Neptune. Morton Grosser. Dover, New York, 1979. xii, 178 pp. Paper, \$3. Reprint of the 1962 edition.

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