

poorly covered) and partly outdated by the rapid march of knowledge the book contains a wealth of synthesized distributional data and conveys a sense of the Phanerozoic patterns of growth and decay of provinciality.

While some chapters are excellent, others are ecologically naive. For example, we are told that salinity is the principal factor underlying marine distributions today, and ecological-evolutionary aspects of population biology, which have proved so fruitful in application to zoogeography, are scarcely mentioned. The concept of a province varies from author to author. Many of the confusions and inconsistencies, however, are rationalized and placed in perspective in the final chapter, which summarizes and evaluates the discussions at the conference, and demonstrates how valuable this volume really is in raising and clarifying many weaknesses of concept and data that remain in the field. The book is handsomely produced with coloured maps and other illustrations.

JAMES W. VALENTINE

Concise Photosynthesis

Biochemistry of Photosynthesis. By R. P. F. Gregory. Pp. xii+202. (Wiley: New York and London, December 1971.) £3.50.

How does one cover the vast field of the biochemistry of photosynthesis? The answer seems to be either to publish symposium and multi-authorship volumes which are usually encyclopaedic and complex or to choose the present course of one author covering the entire field to varying depths. Dr Gregory is to be congratulated on his endeavour to cover the field in 180 pages; this includes introductory sections explaining light phenomena, pigment characteristics, electron transport and redox reactions, and the path of carbon in photosynthesis.

The wealth of information contained in this book is remarkable and an excellent index (one of the best I have come across) makes the data most accessible. Much of the information could have been tabulated for even greater readability and ease of extraction. This is a minor fault; the data are there and are combined with figures, structural formulae and references to give a large amount of information to students and specialists alike.

The first part, comprising a third of the book, provides a very speedy introduction to photosynthesis and would have to be used very selectively; for example, chapter 1 broaches photoautotrophy, carotenoids in photosynthetic bacteria, the Heisenberg uncertainty

principle, and chloroplast structure. The discussion of redox reactions and electron transport is good but the path of carbon is very hastily dealt with and is hardly discussed again in the rest of the book. This section ends with numerical problems and topics for discussion which should be of use to teachers and students.

Part two of the book is primarily about light-induced electron transport with a chapter relating this to the structure of the chloroplast (thylakoid) membranes. This latter very difficult aspect of photosynthesis is well dealt with, even though the field alters continuously. The last chapter deals with the relation of the chloroplast to the rest of the cell. In this part of the book there are some highly complex and erudite discussions which admirably bring in experimental evidence from various sources to support them. However, one does sometimes become confused, for example, when one sees twelve different schemes for non-cyclic and five different schemes for cyclic photophosphorylation! Some drastic pruning and simplification would have helped. Some important topics are dealt with in only a paragraph and there is the surprising omission of the nature and occurrence of ion transport in chloroplasts.

This book should be an asset to all who study or teach photosynthesis—its figures, formulae, accurate data, electron microscope pictures, excellent index, and discussion of chloroplast, mitochondrial and chromatophore reactions from a unifying viewpoint, undoubtedly recommend the book. We should not quibble with what has been omitted, hastily covered, shows bias, or has changed over the last year—if we did no one would write science books, or if they did they would be excessively bland.

D. O. HALL

Testicular Function

The Testis. Volume 3: Influencing Factors. Edited by A. D. Johnson, W. R. Gomes and N. L. Vandemark. Pp. xv+596. (Academic; New York and London, March 1971.) \$36; £16.80.

THIS volume maintains the generally high standard of the first volume, which was reviewed earlier (*Nature*, **231**, 335; 1971).

N. S. Fehheimer takes a broad view of genetic aspects of testicular development and from an examination of the cytogenetics of sex goes on to review genetics of variations in testis structure and function and of sources of variation in sperm morphology and fertilizing capacity. In his chapter on immunological responses, D. W. Bishop

contributes an interesting and well documented discussion on experimental auto-allergic spermatogenesis. Reference is also made to auto-agglutination and phagocytosis of spermatozoa and the existence of blood group antigens on spermatozoa is discussed.

The effects of the thyroid, adrenal and pineal glands and of gonadal, pituitary and pancreatic hormones, together with some effects of prostaglandins and of antigonadotrophins, are treated by W. R. Gomes, who makes an unexpected digression into recent concepts of hormone action. External influences on testicular function are covered in sections on the effects of pressure and elevation changes by A. J. K. Cockett and A. D. Johnson, and on the effects of temperature by N. L. Vandemark and M. J. Free. As well as discussing the data on the effects of altitude on man and animals, Cockett and Johnson review the experimental evidence on those of atmospheric oxygen, carbon monoxide and neon. Dealing with the effects of space flight, they treat cursorily the data on weightlessness and immobilization and spermatogenesis in some primates and lower species.

Information on the effects of temperature is comprehensively reviewed, with descriptions of the effect of heat on testicular function in animals from fishes to mammals. This chapter includes an examination of effects on lymph flow, gas tensions, carbohydrate, nucleic acid and protein metabolism.

There is a very full discussion of the effects of ischaemia, in which the injury sustained by the ischaemic testis is contrasted with that sustained by the heat-damaged testis. Radiation effects, considered by L. O. Ellis, include those on testis histology and fertility. Factors affecting radiation damage include dosage, route, age, species and physiological and environmental factors. Evidence that irradiation induces a biochemical lesion in the androgen biosynthetic mechanism receives particular attention and there is discussion of possible roles for epinephrine, serotonin, histamine and melatonin in relation to radio protection of the testis.

S. A. Gunn and T. C. Gould give a valuable, comprehensive review of information on the toxic effects of cadmium. In the concluding chapter, W. R. Gomes surveys information about a number of chemical agents affecting testicular function and male fertility, with particular reference to antispermatic agents and those affecting endocrine function.

It is fair to conclude that this book deserves a very high place indeed on any list of books of reference relating to the physiology of mammalian reproduction.

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