

isms of protein synthesis, but the author's valiant effort (pp. 8–36) is not entirely successful. Nevertheless, throughout the book the bibliographies are extensive, well ordered and of great value to those wishing to gain a thorough familiarity with the field. There is an author index and a well prepared subject index.

MICHAEL WARING

Red Light Life

Photobiology of Micro-organisms. Edited by Per Halldal. Pp. x+479. (Wiley Interscience: London and New York, December 1970.) £7.

THIS book is a collection of fourteen papers, each edited by an expert in the field. "Photoresponses of Fungi" is the only chapter on heterotrophic microorganisms and most of the chapters deal with micro-algae and photosynthetic bacteria—a change to have a microbiology book where the term "microbiology" is not equated with "heterotrophic bacteria and fungi". On the whole, the approach is biological, although Duysen's introductory chapter on "Photobiological Principles and Methods" lays the physical foundation for what follows. The two chapters on the photosynthetic apparatus in algae (Halldal) and photosynthetic bacteria (Sybesma) which follow are complementary in spite of unavoidable overlap. The blue-green algae are placed firmly in the algae rather than in the photosynthetic bacteria. The chapters by Weissner on "Photometabolism of Organic Substrates" and on "Light Effects on Ion Fluxes" and Lorenzen's contribution on "Synchronous Cultures" are easily read and informative, but I found some difficulty with parts of Kowallik's chapter on "Light Effects on Carbohydrate and Protein Metabolism in Algae". Three chapters by Nultsch (photomotivation), Hand and Davenport (phototaxis and photokinesis in flagellates) and Haupt and Schönbohn (light orientated chloroplast movements) cover light dependent movement in microorganisms. Then comes Carlile's chapter on "Photoresponses of Fungi" and the final three chapters on "Photoperiodism in Microorganisms" (a nice chapter by Dring), "Circadian Rhythms in Protozoa" (Ehret and Wille) and "Bioluminescence" (Airth *et al.*).

Collectively, the chapters provide a rounded picture of photobiology of algae and photosynthetic bacteria in the visible region. The book is well edited although there is a fair share of typographical errors and the legends to the figures require considerable tightening up. It is a pity that more room could not be found for responses in the ultraviolet such as mutagenesis, or photo-

reactivation, or photoinactivation, but an editor cannot include everything without pricing the book out of the market.

The book is fairly expensive but nevertheless a welcome addition to the field. The reference lists are excellent and comprehensive. The chapters contain a wealth of information which will be useful to graduate students and research workers on the algae and photosynthetic bacteria in particular, as well as to microbiologists in general.

W. D. P. STEWART

Catalogue of Strata

History of the Earth: an Introduction to Historical Geology. By Bernhard Kummel. Second edition. Pp. xix+707. (Freeman: San Francisco and Reading, February 1971.) £5.20.

THOSE geologists who used and studied the first edition of this book will, no doubt, welcome this the second edition a decade later. The book retains the sequence and layout of its predecessor, but as so much new material, published over the last ten years, has been incorporated, it is in effect a new book. But the aims of the book are still the same—to demonstrate the purpose and methods of stratigraphy and to present a basic framework of the geological history of each of the continents.

To introduce the subject, two short chapters, on fossils and sedimentary rocks, provide much of the elementary knowledge, while brief accounts of the geological column and time scale set the subject in perspective. Each of the geological eras then receives a three-fold approach; the constituent systems in North America are described, the rocks representing the era in different countries and continents are documented and the organisms characteristic of the time period receive particular attention. The author has also included accounts of the Precambrian Shield areas and has also described the distribution, lithology and characteristic fauna of the important Gondwana Series. Such an approach covering so much ground is necessarily brief, but despite this Professor Kummel seems to have included the salient geological facts and has provided a "handbook" to world geology which is unique.

At the end of the book there are two appendices. One gives an elementary introduction to animals and plants covering mainly fundamental morphology (this is included for those readers who have insufficient exposure to zoology to cope with the palaeontology chapters, but since a preliminary knowledge of such matters is assumed throughout the book, it seems somewhat unnecessary). The second appendix consists of a set of twenty-three double-

page correlation charts, two for each of the stratigraphic systems, except the Carboniferous which has four and the Gondwana Correlation which has a single chart. In each case, one chart correlates the North American sediments and the other the rest of the world. North American stage names are inserted at the side of the "world charts" and hence a truly global correlation of the sediments is achieved, although not of course in great detail. However, their equal is not to be found in any recent textbook, and advance workers can always insert their own detail into the framework.

While the inclusion of so much basic palaeontology seems superfluous in a book of this nature, this compendium of world stratigraphy is an important addition to the literature. It provides a condensed account of many and often little-known parts of the globe, and may indeed be used as a source book for further study.

JOHN BROOKS

Scientific Smørgasbord

Structural Characteristics of Materials. Edited by H. M. Finneston. (Elsevier Materials Science Series.) Pp. x+318. (Elsevier: Amsterdam, London and New York.) £8.

THIS volume belongs to the category of scientific smørgasbord. The six chapters, all by different authors, cover widely different aspects of materials science, yet have something in common; they resemble smørgasbord in that they can all with advantage be consumed together. In this they differ from a scientific journal—an expense-account meal as it were—where one paper may be prawn cocktail to the crêpes suzette of another, and the consumer needs to take his time if he is to avoid indigestion or even nausea. The only feature the two categories have in common is the rapid inflation of the price tag.

The particular volume under review resembles Swedish table in another respect: from internal evidence, most, if not all, of the chapters were written several years ago: it preserves, like pickled herring. The chapters are not necessarily the worse for this, for even today most branches of science at any given point in time advance at a fairly leisurely pace. The breakneck pace that would have been appropriate, say, to a review of pulsars a year ago is not needful when writing today on martensitic structures in steel. I have cause to know that the problems of keeping n authors to a deadline increase at least as n^3 ; six sets of authors, however, should have been somewhat more amenable than this group appears to have been. It may be, of course, that the editor was overworked, to the extent that he has not even provided a preface