Calcareous Fossil Algae

Limestone-Building Algae and Algal Limestones. J. Harlan Johnson. Colorado School of Mines, Golden, 1961. xi + 297 pp. Illus. $6.75.

It is particularly fitting that an outstanding authority on the subject prepared this introductory survey of calcareous fossil algae. The fossils are important because, in addition to their contribution to a knowledge of algal phylogeny, many are significant stratigraphic markers. Moreover, to geologists they are useful indicators of relatively shallow, clear water and marginal environments. It is of economic significance that calcareous algae sometimes played a conspicuous role in the formation of porous rock in reefs and related structures, potential reservoirs for petroleum and sites for the deposition of minerals from circulating solutions.

Although the book is not offered as an exhaustive treatment of these fossils, it covers the most important genera and provides a good guide to more detailed literature. Brief descriptions are supplemented by illustrations profuse enough to occupy more than a third of the book's pages—a most useful feature. There are critical remarks on many genera, and data is provided on the geologic range and the geographic distribution of all the fossils mentioned. Short general discussions cover classification, ecology, and the formation of rocks by algae. Much information is presented concisely in tables, and there are keys to assist in the identification of a few families and genera. Useful lists of genera that occur in each geologic period are appended. Although these lists contain an impressive number of calcareous algae and include a few noncalcareous genera, many of the algae are not otherwise mentioned; since the lists are not classified and there are no references to descriptions, their value to the nonspecialist is reduced. Figure numbers were omitted from several plates. Presumably, one should view plates 49 and 50 through a stereoscope, but this is not stated in the legends and the apparent duplication of figures may puzzle some readers.

But these are minor criticisms of a compact, attractively produced book that will be useful to both geologists and botanists.

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Electrochemistry

Advances in Electrochemistry and Electrochemical Engineering. vol. 1, *Electrochemistry*. Paul Delahay, Ed. (335 pp.); vol. 2, *Electrochemical Engineering*. Charles W. Tobias, Ed. (309 pp.). Interscience (Wiley), New York, 1962. Illus. $12 each.

The increasing interest in fundamental electrochemistry (particularly in electrode kinetics) and the growing importance of applications (fuel cells, semiconductors, and the like) have already resulted in the publication of a series entitled *Modern Aspects of Electrochemistry* edited by J. O'M. Bockris (1954 and 1959); we are now offered a new series *Advances in Electrochemistry and Electrochemical Engineering* (volume 1, on electrochemistry, is edited by Delahay and volume 2, on electrochemical engineering, by Tobias; the contents of volume 3 have been announced).

This is all to the good, but what is still lacking is an up-to-date, authoritative treatise on the fundamentals of electrochemistry which would provide at least a basic discussion of electrode kinetics. In my opinion the generally unquestioned acceptance of empirical procedures (in connection with the role of the transfer coefficient for example) and of Tafel-like formulas for current-potential relations mar much of the current literature on electrode kinetics, including (in volume 1 of *Advances*) the otherwise excellent contributions by R. Parsons, on the influence of double-layer structure on electrode kinetics, and by A. N. Frumkin, on hydrogen overvoltage and absorption on mercury.

M. Breiter's brief discussion of oxygen overvoltage is, at best, an entering wedge into a very complex problem. H. Gerischer's detailed discussion of semiconductor electrodes is a most welcome and useful contribution. P. Delahay's inexhaustible ingenuity is particularly well displayed in his presentation of relaxation methods applied to the study of fast electrode processes.

In volume 2, C. Wagner gives a lucid outline of the scope of electrochemical engineering, including suggestions for the handling and presentation of data on mass transfer and current distribution. R. E. Meredith and C. W. Tobias present a thorough treatment of conduction in heterogeneous systems. N. Ibl discusses in great detail (there are 505 references to the literature and patents!) the application of mass transfer theory to the formation of powdered metal deposits; O. Kardos and D. G. Foulke apply the same theory to electrodeposition on small-scale profiles. In the final paper M. Eisenberg presents a condensed but clear discussion of the design and scale-up of electrochemical fuel cells.

There is no question about the value and timeliness of these contributions. The editing is, in general, quite good, and the physical presentation is clear and attractive. The bibliographies are all extensive and reasonably up-to-date. Each volume is provided with a fairly adequate index. Occasional discrepancies in symbols between text and figures, misprints in formulas, and lapses from good English are understandable when one remembers the complex circumstances under which such material is assembled.

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Many-Electron Systems

Orbitals in Atoms and Molecules. C. K. Jørgensen. Academic Press, New York, 1962. vii + 162 pp. Illus. $6.

Jørgensen's short book treats various common features of many-electron systems which occur in atomic spectroscopy and in less complicated molecules that are mainly inorganic in nature. The 12 chapters are: "Well-defined electron configurations," "Degenerate orbitals in high symmetry," "Correlation effects," "Octahedral symmetry," "Systems with large internuclear distances," "Equivalent orbitals and microsymmetry," "Electronegativity and chemical bonding," "How to identify absorption spectra," "Energy levels of crystals," "Electrodynamic [relativistic] effects," "Lanthanides and 5f elements," and "X-ray spectra."

The author's original contributions to the field coupled with those of other workers enable him to successfully provide a unified presentation of the usefulness of electron configurations as a classification of the symmetry types and relative order of low-lying excited energy levels, so important in inorganic complexes. The book is characterized by critical analyses of a number of original contributions published in journals, and many thought-provoking,

stimulating suggestions are made concerning solutions of problems in inorganic chemistry.

The author's style is concise and to the point; consequently, some points lack the clarity that is often so desirable for readers who are not advanced students of the subject. However, the references not only to original articles and review articles, but also to texts at various levels outline the task for the reader who wishes to pursue the subject.

Increasing emphasis on inorganic chemistry assures this timely volume of a welcome in the libraries of inorganic chemists, spectroscopists, and solid state scientists, but to realize maximum benefit from the book, readers should have some familiarity with group theory, molecular orbital theory, and ligand field theory.

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Chemical Laboratories

Laboratory Planning. Harry F. Lewis, Ed. Reinhold, New York; Chapman and Hall, London, 1962. xiii + 522 pp. Illus. $20.

Laboratory Organization and Administration. K. Guy. Macmillan, London; St. Martin's, New York, 1962. xiv + 386 pp. Illus. $12.

The book edited by Harry Lewis deals almost entirely with laboratory planning, construction, and design; Lewis included the expertise of nearly 30 specialists on such subjects as the selection of sites, the materials of construction, utilities, and furniture (for both office and laboratory). Of particular value is a consensus on the most desirable layouts for laboratory and office, which is based on a survey of more than 100 modern industrial and academic laboratories.

A special section is devoted to safety, and even such specialized facilities as high pressure and radioisotope laboratories are described. Laboratories for various academic functions, including teaching and research, are separately discussed. A recently completed chemical engineering building, for which the plans were based on an exhaustive analysis of many industrial and academic research facilities, is described in detail. Among the many minutiae are tabulations of the amount of office space (the number of square feet), allotted to the average chemist and chemical engineer in industrial and academic institutions.

This book should prove to be indispensable to both administrative and technical personnel who are responsible for planning new construction or for planning the modification of existing facilities; it should also be most useful to the scientist and engineer in their communication with the architect and constructor.

One problem in current design that remains unresolved in this book is the necessity for anticipating changes that will occur with time in the function of laboratories. For example, in instructional chemical engineering laboratories, the vogue for large-scale industrial equipment (for both research and teaching) is waning and may disappear in the next decade; thus, the whole complexion of the designing of facilities may change markedly. The entire topic of flexibility is barely touched upon, but it must play an extremely important role in effective planning.

Guy's *Laboratory Organization and Administration,* something of a compendium for the laboratory technician or for the person who directs the chemistry or chemical engineering laboratory, runs the gamut from laboratory lighting (where the theory of illumination is dispensed with in one page) to running a stockroom and a movie projector. Many handy bits of information obtained from firsthand experience are included. Because the coverage is wide, the treatment necessarily tends to be superficial. However, a guide for further study of each subject is provided in the ample bibliography provided with each chapter.

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Avifauna of Asia

A Synopsis of the Birds of India and Pakistan, Together with Those of Nepal, Sikkim, Bhutan, and Ceylon. Sidney Dillon Ripley II. Bombay Natural History Society, Madras, India, 1961. xxxvi + 702 pp. Rs. 25.

The Indian subcontinent's very rich avifauna is comprised of more than 2000 species and subspecies. Potential investigators need an accurate, up-to-date tabulation of such a large segment of the world's ornis, and in this case, the need for review and tabulation was particularly urgent, since more than three decades have elapsed since publication of the last comprehensive list (E. C. Stuart Baker's list). Not only has our knowledge increased greatly with respect to the distribution, occurrence, and relationships of Indian birds, but numerous changes have been made in taxonomic approaches and in the importance attached to much related data. Thus, there was a real need for reappraisal and a new listing of the birds of this vast portion of Asia.

Ripley's book is based on long and extensive study and experience, both in the field and in museums, and it gives every promise of meeting the need most adequately. It seems safe to predict that all who study the birds of southern Asia will use his book as their base of departure, and it also seems safe to predict that they will find that the book is a sound, reliable summation of the subject.

No book dealing with so vast a number of birds can possibly agree in all details with other recent technical treatises. Thus, to single out but one example, Ripley considers *Estrilda* and *Lonchura* as members of the Ploceidae, although other recent works have erected the family Estrildidae for them and their close relatives. In this matter, I agree with Ripley.

In addition to its digest of our current knowledge of this great fauna, this book will also be useful in clarifying the maze of name changes that were made when the Indian States reorganized in 1956. The maps afford a clear presentation of these complicated geographic alterations.

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Notes

Dermatology

Eccrine Sweat Glands and Eccrine Sweating (Pergamon, London, 1962. 266 pp. $10), edited by William Montagna, Richard A. Ellis, and Alene F. Silver, is the third volume in the series Advances in Biology of Skin, a series that provides up-to-date information on the form and function of the human skin and its appendages. It is also the proceedings of a symposium on the biology of the skin, which was held at Brown University. The work at the