Book Reviews

The Permian Reef Complex of the Guadalupe Mountains Region, Texas and New Mexico. A study in paleoecology. Norman D. Newell *et al.* W. H. Freeman, San Francisco, 1953. 236 pp. Illus. + plates. $7.50.

This is a comprehensive and profusely illustrated technical sourcebook on the classic Permian reef complex of West Texas and New Mexico. It emphasizes paleoecologic analysis, with background chapters on regional geologic setting, general stratigraphic features, sedimentary phases, biotal associations, and diagenesis. Its farsighted sponsors and publishers spared no pains to produce a landmark in paleoecology.

The book begins with an excellent summary, which effectively presents the essence of the study. This will encourage many readers through the essential but tedious account of the stratigraphy and on to the more interesting sections that follow. The stratigraphic discussions are hampered by the casual stratigraphic nomenclature and the absence of a clear graphic summation.

The brief chapter on paleontology sticks to biotal distribution. It is supplemented by check lists of fossils in the appendix. The authors postpone critical discussion of problematica, such as *Gymnocodium* and the so-called hydrocorallines (?) as well as the "sycon" sponges.

The chapters on sedimentary phases, diagenesis, and paleoecology are outstanding. That on diagenesis is particularly good, despite some repetition necessitated by the systematic treatment of sedimentary provinces. The treatment of sedimentary phases is second only to this, although of uneven quality. A well-reasoned discussion on pisolites, for instance, contrasts with a rather diffuse section on reef channels. The chapter on paleoecology is lucid and satisfying. Geologists who have followed West Texas Permian stratigraphy will be prepared for many of the conclusions reached, but they will find new interest in the exposition of the stagnant-basin hypothesis, which maintains that the development of organic reefs is encouraged by the marginal upwelling of nutrient-rich waters controlled by a restricted outlet of the Mediterranean type.

A commendable feature of this work is the careful distinction it makes between the organic reef facies proper, the reef complex, and lenticular or otherwise reeflike masses of clastic materials that have nothing to do with organic reefs. These distinctions are important to the oil hunter. Another point of economic interest is the emphasis that the authors place on anaerobic conditions as a prerequisite for the primary accumulation of organic matter in oil-forming quantities. The discussions of fluid migration and silica-calcite replacement are clear and substantial.

Like most books that deal vigorously with current problems, the one under review has not settled all questions of fact and interpretation. A principal conclusion here reached is that aphanitic texture in limestone commonly originates through recrystallization of rocks of originally coarser fabric. Although the evidence is convincing for specific instances considered, the extent to which the interpretation applies remains unsettled. The question of origin of shelf dolomites associated with evaporites is also discussed with inconclusive results, although the authors favor diagenetic alteration from a primary calcium carbonate precipitate. The erroneous record of exclusively algal reefs in the Gilbert Islands (p. 201) should be corrected. Turbidity currents seem overworked in this book as a mechanism for the emplacement of sediments—perhaps because distinction is not consistently maintained between the submarine slide, the turbidity current to which it may lead, and ordinary sediment-bearing currents. Certainly the importance of slumping and density currents in reef-complex sedimentation and erosion deserve emphasis, however, and they have received it here.

The format of the book is good. To be sure, there are some inconsistencies in the bibliography, and some inexplicable omissions in the index. Also Fig. 73 is one-twentieth natural size, not twenty times enlarged. These minor defects, however, are far outweighed by the excellent photographic plates, the many clear and well-executed line drawings, and the large, plain print, so welcome in these times of ultra-economy in publication.

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Fields and Waves in Modern Radio. ed. 2. Simon Ramo and John R. Whinnery. Wiley, New York; Chapman & Hall, London, 1953. 576 pp. Illus. $8.75.

This new edition of an excellent textbook has been enlarged, and extensively revised. Wide use of the original text by the authors and others in courses and in engineering practice has resulted in a number of improvements. These include the use of the mks system of units throughout the text, the inclusion of many more problems and examples, the use of the Smith Chart for transmission line calculations, a new chapter on microwave networks, and some significant additions to the chapters on wave guides and on radiation. Almost every section has been rewritten with the objective of clarifying the presentation. This has been accomplished without loss of the lucid, readable style that was characteristic of the first edition.

The organization of material and method of presentation are essentially unchanged in the new edition. A review of lumped constant networks and transmission lines is followed by a discussion of static fields and the solution of static field problems; then the differential and integral forms of Maxwell's equations are introduced, boundary conditions are discussed, and

the reduction of the field equations to the familiar lumped circuit constants is derived. The remainder of the book is devoted to the problem of the propagation and guidance of electromagnetic waves, including the plane wave analysis in inhomogeneous media, wave guides, resonant cavities, and antennas.

In this textbook, Ramo and Whinnery have succeeded in combining the essential theoretical analysis with the practical viewpoint of engineering applications, so that the reader is led to a clear understanding of the present state of the electromagnetic art. The clarity of exposition and general readability of the text combine with a unity of concept and of presentation to make this an outstanding intermediate level textbook in electromagnetic theory.

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International Review of Cytology, Vol. II. G. H. Bourne and J. F. Danielli, Eds. Academic Press, New York, 1953. 245 pp. Illus. + plates. $11.

Cytology may be looked upon as the common meeting ground of cell morphology, cell physiology, biochemistry, embryology, and genetics—broadly speaking, cell biology. Interpreted in this way, the 14 papers included in the second volume of this annual review can properly belong in such a collection in spite of the wide variety of topics: cytochemistry, electron microscopy, active transport phenomena, growth and differentiation, nucleocytoplasmic relations, integration of enzyme activities, and the physiology of gustatory and olfactory epithelia. Of the 17 contributors eight are American, four English, two Belgian, one Dutch, one Irish, and one German, thus emphasizing the English-American contributions much as the first volume did. The marshaling together of such an assortment of papers is in keeping with the editors' avowed purpose of keeping the "scope as wide as possible" in the "publication of critical discussions of data published elsewhere, and of new theoretical work."

Inevitably the treatment in such a composite group is spotty and uneven. Some of the papers are little more than compendia; others are carefully organized and give critical evaluations and integrations of knowledge in their special areas. No particular orderly sequence of topics is apparent; for example, papers concerned primarily with histochemistry are scattered throughout the volume, interspersed with those dealing with bacteria, electron microscopy, and thermodynamics.

The most extensive review (76 pp. and 356 references), by Hewson Swift, describes and evaluates techniques of chemical analysis at the cellular level, dealing with quantitative aspects of nuclear nucleoproteins. The nature of the Feulgen nucleal reaction is discussed by M. A. Lessler, who concludes that it is the most reliable and specific test for DNA and that quantitative measurements can be made if the sources of error are properly controlled. J. Chayen's paper on ascorbic acid and its cellular localization compares the many methods and postulates the function of vitamin C in cell metabolism. W. L. Doyle's cautious evaluation of methods of microscopic histochemistry for the demonstration of alkaline phosphatase is the shortest paper in the collection (12 pp.; 51 references). Alkaline phosphatases of the nucleus are discussed by Chèvremont and Firket. A penetrating and critical analysis by David Glick of the quantitative approaches currently in use in histo- and cytochemistry overlaps and duplicates to some extent the other papers on histochemistry.

The physiological reviews include Ion Secretion in Plants by Sutcliffe, Multienzyme Sequences in Soluble Extracts, a masterly treatment by Henry Mahler of recent studies on the complex oxidative reactions within the cell, and Conway's treatment of the theory of the redox pump from the thermodynamic standpoint.

The remaining papers cover a wide range of subjects: tissue-culture studies by Gaillard, electron microscopy of tissue sections by Dalton, special cytology of gustatory and olfactory epithelia by Baradi and Bourne, bacterial cytology by Mudd and DeLamater, and grafting and regeneration experiments with *Acetabularia* by Hämmerling.

Included in the volume is a report of a conference of tissue-culture workers held at Cooperstown, N. Y., in 1950. Author and subject indexes are appended. Few typographical arrors are evident and the figures and plates are beautifully reproduced.

The volume should be extremely useful to cell biologists and indispensable to others who, although unable to search out and read all the original papers, require information on current developments in these special areas.

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Causality in Natural Science. Victor F. Lenzen. C. C. Thomas, Springfield, Ill., 1954. 121 pp. $3.

This small volume is a gratifying, unusually sane and complete account of the causality problem in modern science. Written by a philosopher of singular competence in the field of physics, its judgment can always be trusted to be mature in the eyes of scientists as well as philosophers. There is no attempt to present and defend a thesis: different views are impartially offered and discussed. Among the virtues of the book is emphasis upon modern phases of physical science, where causality is reputed to have become of doubtful status or even to have failed. To the reader who has previously been indoctrinated by popular and one-sided accounts, the last chapter, entitled "Causality and quanta," will be particularly helpful and illuminating.

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