the format of the text has been improved. There are a few typographical errors and some incomplete or erroneous references, but these do not detract from the general usefulness of the book. Curiously, "anlage" is consistently spelled as "anlagé," an error not present in the previous edition.

The author quotes W. B. Bean (page 103): ". . . criticism, an open and honest look at the world and at ourselves must be desired actively and courted assiduously. It must become the mistress of the scientist. . . ." If one embraces this mistress, one must say of the present edition that it does not reflect the progress in embryology during the 14 years since the previous edition was published. Few of the recent references that were added at the ends of chapters were incorporated into the text. Unfortunately, many significant recent references were omitted, particularly in the sections on early amphibian development and chemical embryology. Immunological procedures were ignored, and no reference has been made to the literature on the electron microscope. Chromatographic, electrophoretic, isotopic, and immunological techniques can be adapted to laboratory exercises suitable for advanced students, and exercises of this nature should be included in a modern course in experimental embryology.

Nevertheless, advanced undergraduate and beginning graduate students will find the manual useful, and within the framework of limitations outlined above, it is recommended.

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Mathematical Problems

Mathematics Manual. Methods and principles of the various branches of mathematics for reference, problem solving, and review. Frederick S. Merritt. McGraw-Hill, New York, 1962. xxi + 378 pp. Illus. $9.50.

In the preface the author says: "This manual has one aim: to make it easy for you to solve the mathematical problems you encounter in your work and hobbies." The book should be judged in the light of this aim.

The manual is a compendium of axioms, definitions, and theorems, taken from arithmetic, school algebra, synthetic and analytic Euclidean geometry of one- two- and three-dimensional spaces, real calculus, differential equations, matrices, determinants, vectors, tensors, functions of a complex variable, combinatorial mathematics, and statistics. The plan of the work and the arrangement of the material are excellent, and the fields covered are treated fully. There are some cross references in the text.

The usefulness of the book is destroyed, to a large extent, by poor editing. Any work of this kind could hardly be expected to be free of mistakes, but this one contains an inexcusable number of errors, inconsistencies, and unusual definitions. For example, on page 25 we find the statement: "A number or letter without a sign in front of it is assumed to be positive," but, on page 34, $p = -1$. This kind of thing appears on almost every page.

The index is inadequate, and the number of cross references is insufficient to accomplish the declared aim of the work. I experimented by attempting to trace information on certain topics. Frequently I encountered terms for which no cross reference was given and which could not be found in the index; yet these terms were defined elsewhere in the book.

The manual might be useful for finding a specific piece of information, provided the user has a good general knowledge of the mathematics involved, but, even in this case, care would have to be exercised to avoid being led astray by one of the numerous errors. It is doubtful that the book will be of any use to the mathematical novice.

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Notes

Geological Dictionaries

These volumes—the **Dictionary of Geological Terms** (Doubleday, Garden City, N.Y., 1962. 555 pp. Paper, $1.95), which was prepared under the direction of the American Geological Institute, and John Challinor's **A Dictionary of Geology** (University of Wales Press, Cardiff; Oxford University Press, New York, 1962. 241 pp. $5)—have similar titles and general aims, but they are not directly competitive. Students of earth science will find the two books useful supplements as guides to the meaning of words in a vocabulary that grows ever larger and more complex. The second edition of the *Glossary of Geology and Related Sciences* (1960), also prepared under the direction of the AGI, defined nearly 17,000 terms, and the Doubleday paperback is an abridgment of the *Glossary*, with the number of terms reduced to about 7500. Challinor's book, a far more selective list, gives attention to some 1500 items; the author states in the preface that the book is offered as "an essay towards a critical and historical review of a selected ABC of the subject."

A difference in their approach to definitions is pointed out by comparing their treatments of broad, basic terms. The American volume defines geology in less than 50 words, merely outlining the general scope and principal divisions of the science. Challinor's definition, stated in more than 800 words, traces the gradual adoption of the term through more than a century, cites the work of outstanding pioneers, and lists several publications that record stages in the growth of geologic concepts. Similar short historical essays are devoted to the terms *geosyncline, granite, stratigraphy,* and many others. Contrasted with these lengthy definitions are a few that suffer from brevity. Readers who are not familiar with *décollement* get little help from the bare statement that it is "rupture resulting from folding."

Despite the limitations of his shorter total list, Challinor includes a number of terms omitted in the American dictionary; examples are *dendroidea, dinosaur, pterodactyl, Old Red Sandstone, Moine series, Millstone Grit.* Some differences in content reflect the natural diversity of interest among geologists in the two countries. Challinor also defines *clunch, clint, geofault, geogeny,* and other terms now practically obsolete; these definitions will help some readers of early geologic literature.

Aside from a preface and a lengthy list of helpers on the project, the AGI dictionary is devoted to definitions. Challinor's book includes three pages that explain derivations and meanings of prefixes and suffixes common in geologic terms, and a 19-page classified index in which terms are grouped in columns under 48 numbered headings. Since some groups contain more than 100 terms each (and the terms are not in alphabetical order), the list has only limited value as a finding index.

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