Guide to Paperbacks

A Guide to Science Reading. Compiled and edited by Hilary J. Deason. New American Library, New York, 1963. 220 pp. Paper, 60¢.

Within 24 hours of the receipt of a review copy of this book, I was able to answer, quite specifically, two requests for information that might otherwise have left me blank-minded. Coincidence, perhaps, but I take it as significant evidence in favor of the endless usefulness of the *Guide* as a reference to inexpensive reservoirs of knowledge, something of great value, surely, to every teacher and student of science.

The *Guide* lists more than 900 paperback books on science, out of some 18,000 in print as of November 1962. The 900 are classified in half a hundred categories arranged according to the Dewey Decimal System. Within each category, the books are listed alphabetically, by author. The vital statistics for each book (publisher, number of pages, price) are given, together with a brief but pithy estimate of the nature and value of its contents.

Perhaps most important of all is the key with which each item closes: the book is classified as 1, 2, 3, or 4. The numbers indicate the general level of complexity of treatment from 1 ("suitable for students in the upper elementary grades") to 4 ("will appeal especially to the advanced college student"). Two indices—author and title—and a list of publishers, close the book.

To anyone interested in science education for himself or for others (and I presume that includes all of us), the book is as essential in this Age of the Paperback as a knife and fork are at a steak dinner. To those who doubt the importance of scientific literacy, four essays are included at the beginning of the book, and each sounds the familiar tocsin of the intimate relationship of science and modern life, of the growth of science and the danger of losing communicative touch, of the importance of a sympathetic understanding between scientist and nonscientist. The most rewarding of the four essays, perhaps, is Warren Weaver's "Science and people," precisely because it recognizes and emphasizes the importance of an understanding, among laymen, of the limitations of science as well as of its capacities.

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Geomathematics

Statistical Analysis in the Geological Sciences. Robert L. Miller and James Steven Kahn. Wiley, New York, 1962. xiv + 483 pp. Illus. $12.75.

Expansion of the geosciences into the salients of geophysics and geochemistry is now being complemented by extension into geomathematics (geostatistics or geometrics), and this is the first textbook devoted to this new development.

The first three chapters (about 12 percent by volume) contain an introduction to probability, probability density functions and moments, and expectation respectively; the next four chapters (about 30 percent) present a thorough discussion of various aspects of statistical inference, with an enlightening treatment of the two kinds of error (α and β errors) that arise in testing hypotheses. The next four chapters (14 percent) encompass linear regression, with application to paleobiometrics, the analysis of variance and covariance, and an example of the synthesis of these procedures in a "real world" problem—the measurement of packing in detrital sediments. Multivariate analysis is treated in the next two chapters (19 percent), and trends and time series analysis in the following two chapters (10 percent). The last two (14 percent) of the 17 chapters contain a miscellany that includes problems in sampling design (the distribution of points on a line and in a plane) and the effectiveness of various procedures for graphic and analytic presentation in mapping variation in the properties of rocks. Each section includes informative annotated references that serve to amplify the discussion. Two appendixes (A and B) describe special applications and propose models for paleontologic research; four short appendixes describe useful special properties of the F and χ^2 distributions respectively, and one is devoted to the Kolmogorov-Smirnov test. Examples of applications are taken from paleontology (paleobiometrics), lithology, stratigraphy, petrology, geomorphology, sedimentology, and geochemistry.

Mistakes are rare, largely misprints: for example, C_1 for C_3 (equation 1.25, p. 12). Perhaps the most serious criticism arises from the contrast that is evident when the brief treatment given to the rather abstruse multivariate analysis (80 pages) is compared with the excellent detail provided for the simpler and more familiar univariate and bivariate procedures (about 275 pages).

The marked contrast between the first 11 and the last 6 chapters suggests a lack of adequate and appropriate formulation for geological "real world" problems, and this is emphasized by the fact that formal models are proposed for paleobiometry but none for, say, sedimentology.

This pioneering book fully achieves the authors' objectives—"to present a reasonably general survey of methods of statistical analysis [and] illustrative applications . . . to a wide variety of problems in the earth sciences" and to survey the relevant literature. It will surely "serve as a general reference for research workers in various branches of [at least] the earth sciences."

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Invertebrate Paleontology

Echinoderms. David Nichols. Hutchinson, London; Hilary House, New York, 1962. 200 pp. Illus. $2.50.

Recent studies in evolution give particular importance to the echinoderms as possible ancestors of the vertebrate animals. Therefore, a synthesis of this significant group is especially welcome at this time. Nichols presents information of interest to the educated layman who may wish to trace his "family tree" to its ultimate origins, as well as to the specialized zoologist who seeks information on fossil and living echinoderms.

The author, David Nichols, demonstrator in the department of zoology at the University of Oxford, is well suited to write a book dealing with both fossil and living echinoderms. He has done significant research on the mode of life of both recent and fossil spatangoid echinoids and on the tubefeet of all echinoids. He is an excellent writer with a lucid and straight-forward style. The book is well illustrated with many line drawings that amplify and emphasize important points.

Approximately half the book is devoted to description of the anatomy and evolution of each of the major classes of echinoderms, including the lesser-known extinct groups. The discussion of anatomy is brief and relatively painless, and there is adequate description