

is lucid and the adaptations and modifications of models ingenious. It is by far the best introduction available today to the objectives and approach behind the new look in psychophysics.

In the chapter on stochastic latency mechanisms, interest is in using the stochastic properties of the time interval between stimulus and response, or between one response and another, to deduce properties of the processes that intervene. McGill covers a variety of latency mechanisms ranging from the most simple to those composed of rather complex chains. The chapter is most impressive. Much the same can be said for the next chapter (by Newell and Simon) on the use of computers in psychology. This is an excellent introduction to a new approach that many feel represents the only real hope for objective, precise theory for the more complex—and hence more interesting—cognitive processes.

The final chapter, by Bush, is concerned with parameter estimation and evaluation of goodness of fit. Although the chapter is aimed at people with a rather strong background in mathematical statistics, most experimenters in the behavior sciences can benefit from the wisdom it contains.

This first volume of the *Handbook* has succeeded admirably in its purpose. It is hoped that the fields covered in the other volumes will fare as well.

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Linear Algebra

A Geometric Introduction to Linear Algebra. Daniel Pedoe. Wiley, New York, 1963. xii + 224 pp. Illus. \$5.95.

This textbook for use in an undergraduate course in linear algebra is excellent with respect to the mathematics it sets forth and the manner in which the material is developed. That linear algebra is an essential subject in undergraduate mathematics education has become increasingly evident, and a great many textbooks for courses in this area have been published in the past few years. But few of these texts have all the virtues of Pedoe's book. The student who uses this book should obtain a just idea of what linear algebra is about, of what a vector space

is, and of the important problems of geometry and algebra which find a natural formulation and solution in this setting.

He should also obtain a just idea of how the concepts and calculations of this subject are interrelated, know in matrix algebra how to distinguish the tail from the rest of the dog, and have an adequate knowledge of determinants. He should also profit from having seen mathematics presented as something more structured than the collection of problem-solving procedures that he probably met in his calculus course.

The coordinate geometry of two and three dimensions is covered in the first 90 pages. It is assumed that the student is familiar with the classical analytic geometry of these spaces, and the linear aspects of this subject are re-examined from the point of view of vector spaces. This somewhat lengthy motivation for the later study of abstract vector spaces (with real scalars) derives from Pedoe's statement—"I do not believe that the most general definition is the one which should be hurled at the student on the very first page." In fact, before the student meets the axioms for a vector space, he encounters their counterparts as theorems in two contexts—in geometry and in the algebra of n -tuples—and it is only in chapter 4, which begins more than halfway through the book, that the definition in question is finally hurled at the student. From this point, the chapter titles are "Vector spaces," "Matrices," "The concept of rank," and "Linear mappings and matrices." Quadratic forms are not discussed since "a further course can deal with them adequately."

The choice of topics, the clear exposition, the carefully designed and worked out examples, and the excellent exercises all contribute to the high quality of this fine book. The only reservation that I have is concerned with the place of such a course in the undergraduate curriculum. The author uses geometry as a familiar vantage point from which to survey and eventually study linear algebra. This is certainly the correct order of events from the point of view of history, but it is not necessarily the most effective order. An alternative is to use linear algebra to develop geometry—to replace the obsolete classical course in analytic geometry with a course in vector spaces and geometric algebra. Such a course

would not presuppose the training in geometry needed in this book. Since this is almost what Pedoe does, this book can be regarded as a demonstration of the feasibility of this program as well as a distinguished realization of his own.

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Note

Meyrick's Microlepidoptera

Catalogue of the Type Specimens of Microlepidoptera in the British Museum (Natural History) Described by Edward Meyrick. vol. 4, *Phalonidae, Carposinidae, Chlidanotidae, Oecophoridae, Blastobasidae, Momphidae, Epermeniidae, Strepsimanidae, and Physoptilidae* (British Museum, London, 1963. 521 pp. Plates. £12 10s.), by J. F. Gates Clarke, is the latest volume on the enormous Meyrick Collection. Edward Meyrick was probably the last of the great namers who flourished in the 19th century, and he described thousands of species, chiefly of microlepidoptera, from all parts of the world. His original descriptions, although good by the standards of his times, are completely inadequate for modern work on the systematics of this very complex group. Fortunately, his collection is preserved in the British Museum. There Clarke studied it in detail, identifying and, when necessary, choosing type specimens and dissecting and mounting the genitalia, the chief modern criteria for identification. For each name there are photographs (from the type when possible) of the pattern, wings, and genitalia, sometimes of the head and palpi, and sometimes drawings of the venation. In many instances the species are placed in other genera than the original ones, as modern work has shown such changes to be advisable. More than 760 species are treated. Relatively few are North American, the majority being Neotropical, Ethiopian, or Indo-Australian. It is safe to say that Clarke's great work will always be an essential in the systematics of this large group, and that without it chaos would reign.

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