ences and, of these, more than 200 were published in the period 1930–55.

The subjects covered in the six chapters include transpiration and cuticle structure, excretion and osmoregulation, gain of water, and water and body temperature. Despite the limitation suggested by the title, material on aquatic insects is also discussed. Edney's treatment of these subjects is concise and clear, and his criticisms of methods and conclusions—including some of his own—are illuminating. Transpiration, for example, has turned out to be a far more complex process than it was, until recently, believed to be. The many questions which Edney raises should stimulate new and better work in the field.

A search for factual errors in those aspects of the subject with which the reviewer is personally familiar has yielded only one sentence which might be questioned. On page 71 it is stated, "The evidence so far considered shows that in most eggs which absorb water this is restricted to a given period of development—it may be before diapause as in *Melanoplus,* or after, as in *Austroicetes.*" This statement holds for *Melanoplus bivittatus,* as Salt's work has shown, but is not true for *Melanoplus differentialis,* where water is taken up by the eggs both before and after diapause. The fact that two species of the same genus of grasshoppers behave so differently in this respect illustrates both the variety which may be encountered in closely related organisms and the risk of making generalizations even for a genus. Since there are more than 150 species of *Melanoplus* in North America, a considerable number of surprises, no doubt, still await those who investigate the water relations of their eggs.

Edney's compact and well-organized volume is a valuable addition to the series of monographs presently being published by the Cambridge University Press. All who are concerned with the important part played by water in biological processes will be interested in this book.

ELEANOR H. SLIFER
State University of Iowa

Nonparametric Statistics for the Behavioral Sciences. Sidney Siegel. McGraw-Hill, New York, 1956. 312 pp. $6.50.

Prior to the publication of *Nonparametric Statistics for the Behavioral Sciences,* isolated descriptions of nonparametric statistical tests and the necessary accompanying tables were inconveniently scattered throughout a highly varied literature. Sidney Siegel has performed a great service for behavioral scientists by cataloging, in a single volume, most of the available nonparametric procedures, along with tables of critical values. As a reference work, this book is not only convenient but almost indispensable. As an elementary textbook, it combines simplicity and systematic organization with many instructive illustrations, but there is, intentionally, very little presentation of the rationale and derivation of the techniques.

The book is organized around experimental designs; this makes it possible for a research worker to locate an appropriate procedure without knowing the associated significance tests by name. Each technique is described in terms of function, method, and, when relevant information is available, power and power-efficiency. Examples of each method follow a uniform format: null hypothesis, statistical test, significance level, sampling distribution, rejection region, and decision. Instead of producing annoying redundancies, this consistent treatment serves to clarify distinctive properties of the various tests and tends to pinpoint the differential advantages of alternative procedures.

The book also contains a section on measurement, in which the author takes a firm but polemical stand on scaling requirements. He makes a puristic but somewhat overstated case for the widespread application of nonparametric statistics by dismissing interval scales as rare phenomena in the behavioral sciences and then forbidding, for ordinal data, the operations of arithmetic necessary for computing means and standard deviations. However, even though ordinal scales are not completely isomorphic with the real number system, they do reflect certain numerical characteristics, and the sum of a random sample of ordinal numbers possesses statistical properties upon which significance tests may be based. Interpretations of arithmetic operations performed upon noninterval scales are by no means trivial, as pointed out by Lord in his discussion of nominal numbers and Chebyshëv's inequality [F. M. Lord, *Am. Psychologist* **8**, 750 (1953)].

Most nonparametric tests require only ranking information, and some are applicable even to nominal classes. One strong justification that is offered for their use in the social sciences is the difficulty experienced in meeting, for behavioral data, the interval scaling requirements attributed to parametric statistics. However, this issue is complicated by the problem of dimensionality in measurement, which is not mentioned in the present volume. Some of the nonparametric techniques that require ordinal data are illustrated with the California F Scale of Authoritarianism, which is a set of heterogeneous, multidimensional attitude statements. In a multidimensional domain such as authoritarianism, even unique ordinal properties are questionable, and, unfortunately, practical solutions for dimensionality are available only for interval numbers. However, nonparametric statistics are also recommended because of their distribution-free character, ease of computation, and the generality that is obtained by not making numerous and stringent assumptions about parameters. Because of these important properties, nonparametric techniques are widely applicable, and the present volume constitutes an excellent, nontechnical handbook for their use.

SAMUEL MESSICK
Educational Testing Service
and *Princeton University*

Advances in Cancer Research. vol. 4. Jesse P. Greenstein and Alexander Haddow, Eds. Academic Press, New York, 1956. 416 pp. Illus. $10.

The fourth volume of *Advances in Cancer Research* continues to maintain the high scholarship, completeness, and critical evaluation of the preceding reviews. Three of the eight papers deal with chemotherapy. The first chapter, by Sidney Farber and his associates, on "Advances in chemotherapy of cancer in man," is a remarkably up-to-date analysis which, with Stock's review in volume 2, forms a rather complete summary of the whole of this active area of current research on cancer. Galton's presentation, on "The use of myleran and similar agents in chronic leukemias," not only meets the requirements of the title but contains a discussion of clinical assessment, by a mature investigator, that is worthy of consideration by the younger clinicians now entering this field. Goldin, in a review entitled "The employment of methods of inhibition analysis in the normal and tumor-bearing mammalian organism," effectively demonstrates the valuable additional data that can be derived from carefully designed dose-response laboratory studies in which the drug, the host, and the tumor are considered as an interrelated system.

The very selective review on "Some recent work on tumor immunity," by Gorer, is a reflection of the revival of interest in this approach to cancer. The author is very helpful in orienting the reader to the relevant aspects of modern immunology, but this specialty has acquired a language of its own which will be a source of ever-increasing despair to the general biologist.

Grobstein's consideration of "Inductive tissue interaction in development" is an engrossing account of the recent