is motivated—it reacts to, and is presumedly aroused by, stimuli to which it is less likely to react if the state in question is not present. A simple example of motivated behavior would be the sexual response of the male rat to the female under appropriate hormonal condition.

I think the nonpsychologists will find 13 of the 16 chapters readily understandable and that omitting the introductory, the psychoanalytic, and the last chapters will save him from bewilderment.

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Functional Analysis

Topological Methods in the Theory of Nonlinear Integral Equations. M. A. Krasnosel'skii. Translated from the Russian edition (Moscow, 1956) by A. H. Armstrong. J. Burlak, Ed. Pergamon, London; Macmillan, New York, 1964. xii + 395 pp. Illus. $10.

The purpose of this book, which is a translation of the Russian edition published in 1956, is to indicate that many problems encountered in the theory of nonlinear integral equations may be solved by a systematic application of the concept of rotation of a vector field in a Banach space. The material is presented at a rather advanced level and will be accessible to research scientists or graduate students with some previous knowledge of linear operators and the theory of simplicial approximation. Because the volume contains such a wealth of information, I simply list some of the topics covered in each of the six chapters to indicate its scope.

In chapter 1 the author introduces the integral power series of Lyapunov and the operators of Uryson and Hammerstein, which are used as illustrations of the subsequent theory, and gives criteria for the continuity and complete continuity of these operators. This chapter also contains material on the splitting of linear operators and criteria for the weak continuity and differentiability of functionals.

In chapter 2, he presents the Brouwer-Hopf theory of degree of a mapping of n-dimensional polyhedron without boundary onto a sphere and deduces as consequences the Hedgehog theorem, the Brouwer fixed point theorem, and the like. The concept and theory of the rotation of a completely continuous vector field is then given. The Leray-Schauder principle as well as some methods of calculating the rotation are also discussed. The author could have devoted a few more pages to the theory of simplexes and thereby made the introduction of the concept of rotation more independent of other sources of information.

Chapter 3 is devoted to existence and uniqueness theorems for solutions of nonlinear operator equations. The notion of resolvent is used to discuss operator equations $x = Ax$, where A is not necessarily completely continuous. Galerkin's procedure for the solution of such equations is also considered.

Chapter 4 is concerned with the problem of eigenvalues, continuity of the spectrum, continuous branches of eigenfunctions, bifurcation points, and the like. Chapter 5 is devoted to eigenfunctions of positive operators and the Krein-Rutman theory of cones in Banach space. It is shown that the methods can be used to study positive nonmonotonic operators. Chapter 6 deals mainly with the same problems as the previous chapters but for potential operators and by variational methods.

In my opinion, this book is a welcome addition to the literature on functional analysis and its applications. The topics chosen are extremely interesting, the presentation is, in general, sufficiently detailed, and the translation is good.

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Zoology

Annelids. R. Phillips Dales. Hutchinson, London; Hillary House, New York, 1963. 200 pp. Illus. $3.

This is a very welcome volume, clear, informative, and up to date. The emphasis tends to fall on the physiological and on the polychaetes, but this slant coincides with the major competence of the author, a lecturer at the University of London, and constitutes a source of strength. The nine chapters are concerned with general annelid organization, feeding and gut structure, the evolution of Polychaetes, the vascular system and respiration, excretion and body fluids, the nervous system and coordination, the sense organs and behavior, reproduction and development, and finally the origin and classification of Oligochaetes and Leeches.

American readers will be interested to know that the old differences between *Arenicola* at Woods Hole and in Europe continue to be reported. Prosser and Brown, in the latest edition of their *Comparative Animal Physiology*, show no "Bohr effect" in the oxygen dissociation curve of arenicola hemoglobin while Dales reports one, though slight. Other items which are sure to stimulate discussion include the apparent discovery that the biological clock of earthworms makes them learn T-mazes faster at night, and that regeneration, metamorphosis, gonad development, and other functions are controlled by neurosecretory cells in the brain.

The book does not attempt to be another Stephenson. Indeed, it is doubtful whether anyone will produce another magnum opus of those proportions. And Dales very sensibly leaves a detailed account of the systematics of the annelids to Grassé. The usefulness of Dales's book, certainly very great as it is, would have been enhanced had he included some reference to more of the standard monographs. G. C. Dixon's *Memoir on Tubifex*, for example, is not mentioned.

The chapter on reproduction and development invites comparison with the simultaneously published review, "Entwicklungsphysiologie der Anneliden" by O. Hess, in the *Fortschritte der Zoologie*. This review, which covers a much narrower field, presents much more detail, far more on fertilization and the earlier stages of ontogeny, and has a biochemical rather than a physiological approach. It is equipped with a more extensive bibliography in terms of the number of papers cited and includes titles, thus increasing its serviceability. Dales's book is similar to the recently published *Physiology of Earthworms*, by M. S. Laverack. Together they constitute a very useful and in many ways a complementary pair. A curious fact is that, although these books are almost identical in size and format and number of pages (200 versus 206), one costs more than twice the other!

The bibliography in Dales's volume is highly selective, which no doubt has its advantages. I was surprised, however, to find that Hyman, G. E. Gates, Bookhout, Hartman, Hubl, and Moment were missing. This seemed all the more surprising since all have published extensively in the field and the work of the last named investigator was presented in some detail in at least three different places! There is a good index and a useful table of annelid classification through families.

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Plant Anatomy

Vegetative Anatomy of Plants. H. G. Burström and Camilla Odhnoff. Svenska Bokförlaget, Stockholm, 1963. viii + 149 pp. Illus.

Although no book of this size could possibly be more than an outline of the vast field of plant anatomy, the authors specifically claim it is a textbook on the undergraduate level, intended to serve as an introduction of plant anatomy to plant physiologists. A preface and a brief introduction precede the four subdivisions in which the subject is treated: the plant cell; cell forms and their origin; ontogeny of the plant; and, ecologic anatomy. In the first subdivision, the authors include recent information on submicroscopic anatomy and on cell chemistry. Aside from this and their emphasis on ecology anatomy, their approach is conventional.

Although a treatise of this scope may be needed, brevity is about all these authors have achieved. Their English is often quaint or awkward, their terminology unusual or erroneous. Furthermore, their generalizations and conclusions, if not patently wrong, are all too often questionable. Only a few of the many infelicitous terms and expressions can be cited. The authors frequently employ "localized or located to" instead of "localized or located in" and "concentrated to" instead of "concentrated in." In referring to the rolling of grass leaves in dry weather, they say, "It is especially common in grasses as a cohesion movement on a water deficit . . ." (p. 106). Readers will also ponder the meaning of the following statements about sun and shade leaves, "Like xeromorphic modifications these leaf types have been supposed to be induced by the salt status more than directly by the light conditions. This is, nevertheless, undoubtedly a phenomenon parallel to that of true hygromorphic plants" (p. 113).

The following statements and uses of terms will seem strange to many plant anatomists: ". . . the content of the vacuoles has an unlimited capacity of expansion" (p. 10); "Attempts to find a workable classification of the cell types have failed, because only certain *trends of differentiation* can be distinguished" (p. 33); "Sclereids are formed from idioblasts" (p. 35); collenchyma cells are described as having "square end walls" (p. 36); a petiole bundle is called a "stele" (Fig. 15); nut shells are called "organs" (p. 40); in referring to trichomes, "The variation is so great that a classification of them is meaningless." (p. 42); throughtout the book, xylem and phloem rays are called "cambial rays."

It might also be useful to point out a few of the more blatant errors. In Fig. 10, a diagram of the shoot apex of a dicotyledonous plant, the central initial cells are said to "give off cells to the tunica." In Fig. 28, the sieve areas in pine are portrayed on the tangential walls of the sieve cells. In Fig. 47, the cotyledons of *Linum* are labeled "plumule." On page 75 the following surprising statement is made in referring to the food reserves of seed—"Carbohydrate and fat seem to exclude each other and do not occur in the same species."

The most merciful thing one can say about this book is that it may have suffered considerably in translation. On the surface it is only an egregious example of inaccuracy, over-generalization, and poor writing.

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Textbook on Computation

Methods in Numerical Analysis. Kaj. L. Nielsen. Macmillan, New York, ed. 2, 1964. xviii + 408 pp. Illus. $9.

This book was written to meet the demand for a textbook in numerical analysis "for a basic, one-semester course at the undergraduate level." In the second edition the author attempts to preserve "the theme of the original book in the development of the classical numerical analysis with a minimum of mathematical background."

The major changes from the first edition consist of the addition of a chapter on linear programming and a reorganization of the material in chapters 8 and 9 (on the analysis of empirical data) into a single chapter. However, those familiar with the first edition will notice immediately that the greatest change has been made by the publisher. Improvements in typography, page format, and the layout of tables, graphs, and the like demonstrate how important these items are in presenting material to the reader.

The author has included additional footnotes and references to the literature, as well as 86 new exercises, in the second edition. However, it appears that basically the book has not been updated sufficiently to enable it to compete with more recent books in the field.

The author still discusses computation from the standpoint of the desk calculator. In chapter 1, section 5, entitled "Calculating machines," and section 6 entitled "Programming," the material in the second edition has been repeated verbatim from the 1956 edition, despite the developments in electronic calculators and programming techniques since that time.

It appears that a similar criticism can be made relative to his discussion of numerical methods for solving algebraic equations and differential equations. Important contributions since 1956 are not discussed. For example, no reference is made to Muller's method for finding the roots of polynomial equations, to Wilkinson's papers describing "pivoting" techniques when solving large systems of linear algebraic equations, or to Henrici's classical book on the numerical solution of ordinary differential equations.

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Note

Plant Physiology

"Do not judge a book by its cover," or, one might add, "by its title." If you expect to find in this volume an assemblage of facts on plants as folk