Amphibians and Reptiles of Western North America. Robert C. Stebbins. McGraw-Hill, New York, 1954. xxii + 528 pp. Illus. + plates. $8.50.

Robert Stebbins' new work on the amphibians and reptiles of the western United States needs only a glance at its superb illustrations and the realization that the drawings are by the author himself to place it beyond comparison among the available handbooks in its field. The book grows naturally from Stebbins' earlier work on the amphibians of the West.

The book is noteworthy for its comprehensive mapping of geographic distribution, species by species. Its emphasis on the *species* as inclusive of its subspecies and the relegation of the discussion of the subspecies to the legends for the maps are still novel and certainly exemplary. The keys for identification have the "key characters" fully illustrated, and thus unequivocally defined. In line with the modern trend in such handbooks, there are references to enable student or amateur to pursue promising lines for further investigation. The introductory matter gives excellent suggestions for collecting and directions for preservation. I should have liked the addition of a section devoted to suggestions for the field and laboratory observation of behavior.

The area included is limited by the state boundaries westward of the Dakotas and Texas, with Canada west of the eastern border of Saskatchewan, and Alaska. This is an effective demarkation, set far enough to the west to exclude most of the distinctive elements of the Appalachian fauna. A few of these easterners have extended their ranges westward into the Great Plains along the water courses beyond the 100th meridian and require a place in the present volume, notably the snapping turtle, the soft-shelled turtle, and the painted turtle. Introduced forms, such as the bullfrog and greenfrog, are included.

Every herpetologist, amateur or professional, should have this work at hand; above all, if he has occasion or opportunity to travel in the West. Every professional zoologist who might be called upon to prepare a handbook on another group of animals or another region, should examine it. Finally, the work is at the level of competence that makes it especially desirable for high-school and college libraries throughout its territory.

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Biochemical Determinants of Microbial Diseases. René J. Dubos. Harvard Univ. Press, Cambridge, 1954. viii + 152 pp. $3.50.

Everyone interested in pathogenic microorganisms should read this monograph. It emphasizes "the properties of the infected host which determine the course and outcome of the infectious processes." These properties and processes are defined, insofar as possible, in chemical and physiological terms instead of such vague words as *virulence* and *invasiveness.*

The author has recognized a serious and common shortcoming of most textbooks on infectious diseases, namely, that they dutifully contain a chapter devoted to metabolic chemistry which is not used subsequently in the analysis of reactions betwen host and bacteria. He documents examples of phenomena which have a bearing on the fate of microorganisms *in vivo* and the biochemical disturbances resulting from infection which may give rise to the manifestation of the disease. A chapter on selected topics in tuberculosis is used to illustrate the range of bacteriological problems that remain to be solved before we understand satisfactorily the pathogenesis of this disease. The compact size of the book (121 pp.) precludes a recitation of many good examples of host-parasite interrelations but the careful choice of tables and references used to illustrate specific points in theory has given a clarity often lost in many longer treatises.

The reference to Table 32 (p. 57) is incorrect and the footnote to this table contains the same error found in the original publication—"aerated with CO_2-free water." No reference is listed for an article cited on page 54. As a whole, the book is well edited.

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Differential Equations with Applications. Herman Betz, Paul B. Burcham, and George M. Ewing. Harper, New York, 1954. x + 310 pp. $4.50.

From many points of view this book is a good one and is a welcome addition to the meagre collection of good textbooks for a first course in differential equations for applied scientists. It is replete with a variety of applications including motion of a particle, mechanical and electric oscillations of one and two degrees of freedom, law of mass action, biological genetics, deflection of beams and nonlinear oscillations. Besides the traditional material, the book includes introductory treatments of the Laplace transform, partial differential equations and Fourier series, and boundary value problems.

On the whole, the book is well organized and clearly written with many illustrative examples. It should be understandable to the average engineering or science student. The introductory chapter gives the usual definitions (more about this later) and then first-order differential equations are presented with considerable use of the idea of the direction field. It should be stated that the remark at the bottom of page 16 concerning exact differential equations is incorrect (it makes no difference which integral of Pdx is used). The treatment of implicit differential equations of the first order is unusually well done for a book on this level.

After a well-written chapter on applications, linear equations with constant coefficients are taken up from the operator point of view. The treatment is reasonably complete. The authors regrettably omit any discussion of resonance, although 32 pages are written on

applications of linear equations. In the work on the Laplace transform the subject of the Heaviside function and impulse function are mentioned, but the authors miss a golden opportunity to bring in the superposition integral. Series solutions are given adequate attention, but the special functions are treated in a very cursory manner. The chapter on graphic and numerical equations contains a brief but welcome treatment of Van der Pol's equation. The last portion of the book contains a fairly standard introduction to partial differential equations and boundary value problems.

The main criticism I have is that the authors in their efforts to keep the work elementary and understandable to the applied scientist, have not been too careful in their statements of definitions and restrictions. A good example of this is the introductory chapter where, following the bad tradition of many others, the authors use "fuzzy" expressions like "general solution," "number of distinct arbitrary constants," and the like.

On the whole the book is a good one and should find wide use in first courses for engineers and scientists.

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Psychomotor Aspects of Mental Disease. An experimental study. H. E. King. Harvard Univ. Press, Cambridge, Mass., 1954 (for the Commonwealth Fund). xiv + 185 pp. Illus. $3.50.

In the early days of experimental psychology Kraepelin applied its methods to the study of abnormal states. King points out that the experimental study of simple processes that thus began was not really proved useless but rather was lost to view in the appearance of the more spectacular teachings of the psychoanalysts.

Encouraged by the outcome of his previous work on brain-operated patients, King undertook a comparison of several abnormal and normal groups with regard to what are called the fine psychomotor functions. Experiments of this sort require the subject to perform some simple movement or manipulation not requiring much strength on the occasion of the appropriate stimulus. It is well established that such performances, measured for speed and accuracy, do not correlate well with test intelligence in a normal group, nor indeed do they show great correlation with one another. It is usually stated that there is no general psychomotor ability, but it is possible to discern certain groupings of similar tasks from their correlations. By his choice of tasks, King has sampled three of these groupings: "Speed of single reactions," "finger, hand, and forearm speed in restricted oscillating movement," and, "precision." His subject groups are chronic schizophrenes, pseudoneurotic schizophrenes, neurotics, and normals, with the chronic schizophrenes further divided into three groups on the basis of severity of disorder.

His results show a clear, downward progression of average performance in all tasks from the normal through the most disturbed schizophrenes. The differences are quite apparent, ranging up to a 65-percent loss, and their statistical significance is demonstrated by a simple t-test. The tests discriminate well enough between groups to be useful, especially in combination, as diagnostic indicators, and, easy as they are to apply, they might be a standard aid to the clinician.

All the performances tested turn out to vary in a similar way with the severity of behavior disorder. Psychologically it is important that under such a powerful influence the discreteness of psychomotor functions is lost: fundamentally they must have much in common.

As King observes, his results generally agree with and extend the conclusions of a series of experimenters since Kraepelin. One reason that such results have received scant attention is their isolation. It is hard to see how deficiencies in simple reactions are related to the gross behavior disorders of the psychiatric patient. King has a suggestion to offer. He quotes Sperry's proposition:

> The entire output of our thinking machine consists of nothing but patterns of motor coordination. Cerebration essentially serves to bring into motor behavior additional refinement.

Such a unified view of behavior would be a bold solution, but King seems unwilling to venture quite so far. His view is that for the lower organisms all behavior is motor behavior and that for human beings motor behavior remains important, although they have, in addition, something called "mentation." This persisting Cartesian division still leaves our theory in a state of schizophrenia. With good reason, therefore, King favors study of the relationship of psychomotor functions to other kinds of behavior, and his work offers proof that it would be fruitful.

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The Elementary Chemical Composition of Marine Organisms. Memoir No. 2. A. P. Vinogradov. Trans. by Julia Efron and Jane K. Setlow. Sears Foundation, Yale Univ. Press, New Haven, Conn., 1953. xiv + 647 pp. $17.

In this monumental work, Vinogradov intended to provide a factual and theoretical basis for and to stimulate interest in the development of marine geochemistry from Vernadsky's biogeochemical point of view. In addition to surveys of the analytical data available for nonplanktonic marine algae, marine plankton, marine bacteria, marine flowering plants, and the marine representatives of each of the major invertebrate phyla, the lower chordates, and fishes, he has included separate discussions of the metal-containing respiratory pigments, of the mineralogical composition of skeletons of marine organisms, of the regulating influence of ocean salt on the chemical