various vertebrate organ systems. This is followed by a section on the "cell as the basis of organic activity," which includes chapters on cell structure, embryology, genetics, and evolution. Then comes a section, occupying nearly half the book, on the animal kingdom, which is reviewed phylum by phylum. Finally, there is a short chapter on ecology.

Except for details of organization, I do not see that the Goodnight book differs very greatly from its fellows. Almost all of these zoology textbooks are written in that curious dehumidified prose that the mouse tried out on the victims of Alice's tears, which seems not to be effective even as a drying agent. This book, like the others, is full of big words that the student will forget the day after the final exam and full of facts that the student will also forget.

Science, in these introductory textbooks, becomes a cut-and-dried affair—and this the students are likely to remember. The first chapter of this book, like so many others, takes up the "scientific method"—the gathering of facts, the formulation of the hypotheses, on to the discovery of "scientific law." There is a good deal about patient observation and objective evaluation.

Somehow this unreal "scientific method" symbolizes for me all that seems wrong with our college introduction to science. Can the uncertainties, the doubts, the unknown not get any mention? Can we give no feel of the historical context in which science has developed? Can we not look at scientists as men, and at science as one product of their humanity? Sometimes I suspect that these teachers of introductory science really believe in this scientific method that they foist off on their students; and the students certainly learn to regurgitate it on the exams. There is no hint of the process so neatly summed up in a saying attributed to Gauss: "I have had my results for a long time; but I do not yet know how I am to arrive at them."

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Streams, Lakes, Ponds. Robert E. Coker. Univ. North Carolina Press, Chapel Hill, 1954. xviii + 327 pp. Illus. + plates. $6.

This book is intended to be a fresh-water counterpart to the author's *This Great and Wide Sea.* That is, it is a book for that well-known abstraction the general reader and is at the same time useful as an introductory textbook. It is perhaps more suitable for the latter purposes (especially for courses in state colleges), since it is a competent, comprehensive summary of basic concepts, characteristics of various fresh waters and their biota. For such a book it is surprisingly up to date, with references up through 1953. As reading matter, however, it impresses me as somewhat static, perhaps because there is so much familiar detail in it. It is illustrated with some fine photographs (none in color, however) and line drawings. A usage unbecoming a university press is the printing of generic names in roman, while those of higher groups are more often than not in italics; the usage is inconsistent in any event. Nevertheless, the book well fills the gap between the technical presentations of Welch and Ruttner and the general ecology textbooks that skip lightly over limnology.

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Trigonometry. Elbridge P. Vance. Addison-Wesley, Cambridge, Mass., 1954. viii + 158 pp. Illus. $3.

This is a compact and carefully edited textbook on plane trigonometry, attractive in format, and adaptable to courses for varying lengths. The approach is fairly standard with a few novel features. It begins with a discussion of one- and two-dimensional rectangular coordinate systems and an intuitive treatment of arc length. The distance formula is derived and plays an important role in numerous later proofs in general settings, for example, that of the length of a chord in a unit circle, the addition formulas, and the law of sines and of cosines.

The general angle is introduced early, and the definitions of the functions in terms of the ratios of the sides of a right triangle appear later as a corollary to the law of sines. Extensive use of radian measure is made throughout the book. Revolutions, degrees, and radians are treated simultaneously with their interrelationships. Radians are defined in terms of revolutions.

Although the emphasis throughout is on the analytic aspects of trigonometry rather than the computational, the solution of triangles is handled in a brief but excellent manner, including material on significant digits. Previous exposure to logarithms is assumed; however, a brief discussion, along with interpolation and the use of tables, is given in the appendix. The basic four-place tables needed are included.

Some novel features in the book are the derivation of the functions of 36° and 3°, some approximations for functions of small angles, an interesting treatment of complex numbers as ordered pairs of real numbers, and a final section on applications of the circular functions to periodic phenomena.

I noted only one typographical error (p. 94). Some minor criticisms are these: the Greek alphabet is not mentioned but portions of it are freely used; equations of curves shown in the figures are not given directly on the graphs; the functions of 30° and 135° are given, but not those for 45° or 60°, and "function" is nowhere defined. Also the false impression appears to be given (p. 53) that the only angles constructible with ruler and compass are those that are integral multiples of 3°. Important formulas are numbered, but no distinctive type is used.

The sections on angles, exact values of the functions for $\pi/5$, the general reduction formulas, and the inverse circular functions are somewhat ponderous and

probably would require additional clarification by the instructor.

The problem lists are adequate, and answers are given to the odd problems. A reasonable number of illustrative examples to the theory are given, and ample material occurs on identities and on trigonometric equations.

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Tables of Integral Transforms. vol. II. Based in part on notes left by Harry Bateman. Bateman Project Staff, A. Erdélyi, Ed. McGraw-Hill, New York–London, 1954. xvi + 451 pp. $8.

This is the final volume of the Bateman Manuscript Project's tables of definite integrals. The first part of volume II continues the plan initiated in volume I [reviewed in *Science* **120**, 302 (1954)] of listing as many integrals as possible in the notation of transforms. The transforms tabulated here have never been tabulated extensively before: they are transforms in which the kernel is a Bessel function of some kind (not only the Hankel transform), fractional integrals, Stieltjes transforms, and Hilbert transforms. The second part of the volume contains assorted definite integrals, most of which are not in transform form. These integrals involve orthogonal polynomials, gamma functions and their relatives, Bessel functions and hypergeometric functions. As in volume I, there is an appendix, giving the notations used, so that each volume can be used independently.

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Monomolecular Layers. A symposium presented at the Philadelphia meeting of the AAAS. Harry Sobotka, Ed. AAAS, Washington, D.C., 1954. vii + 207 pp. Illus. $4.25; members, $3.75.

The recent progress in the study of monomolecular layers is aptly presented by current workers in the field. Included are "Modern film techniques and their application to biochemical reactions," by Hans J. Trurnit; "Determination of molecular weights of proteins by the horizontal surface balance," by E. Mishuck and F. Eirich; "Mechanical properties of the surface films on aqueous solutions of detergents," by A. P. Brady and A. G. Brown; "Study of adsorption at a solution-air interface by radiotracers," by J. K. Dixon, C. M. Judson, and D. J. Salley; "Deposited radioactive monolayers," by D. E. Beischer; "Hydrophobic monolayers and their adsorption from aqueous solution," by E. G. Shafrin and W. A. Ziswan; "Review of the properties of films at oil-water interfaces," by E. Hutchinson; "Chemical reactions of sample and mixed monomolecular layers," by Harry Sobotka and Shirley Rosenberg; and "Chemical reactions and electric potential in monolayers," by E. Havinga. Most of these sections are well balanced and illustrated summaries of talks presented at the symposium at the Philadelphia meeting. Each presents a well-balanced summary of historical background, experimental technique, practical applications, and current theory involved. Sufficient detail is given to convince the reader of the widespread utilities of film studies in the fields of physical, colloid, organic, and analytic chemistry, in addition to biochemistry and chemical engineering.

The new tools, including a recording ellipsometer, an automatic dipping device for building up a uniform series of step gages, a new horizontal surface balance accurate to .01 dyne, and techniques for the isolation of films directly from pure molten compounds are adequately illustrated. The authors all succeed in pointing out the potential usefulness of further study of two-dimensional chemistry.

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Das Glas im chemischen Laboratorium. Fritz Friedrichs. Springer, Berlin, ed. 2, 1954. viii + 144 pp. Illus. DM 16.50.

A chemical laboratory without glassware is unthinkable. Nevertheless, the average chemist knows very little about the substance glass, its history and manufacture. Fritz Friedrichs, who can look back on 40 years of activity in one of the world's leading manufacuring centers of laboratory glassware, makes an attempt to remedy this situation and introduces his book with a brief history of glass through the ages.

As a descendant of the founder of the first Thuringian apparatus glass manufacturing company and a partner of the leading house of Greiner and Friedrichs, Wertheim (Main), the author is uniquely qualified to give us a lively picture of the development of apparatus glass and the manufacture of different laboratory equipment. Guided by an authority, the reader learns what types of glasses are available and their main properties as far as they are interesting to the chemist. Even though we buy our laboratory equipment and take it for granted that our pipettes, burettes, thermometers, and so forth, are properly calibrated, it is of interest to learn how other instruments are made, which tools the glass blower uses, and what training he has to qualify him for the job.

After World War I the apparatus division of the German Chemical Society activated a program which led to a gradual standardization of the equipment and its dimensions. For example, from the 119 different types of apparatus for developing gases in the laboratory only a few were chosen to remain on the market. The decision as to which types were essential could be made only by carefully analyzing the advantages and disadvantages of each type of apparatus, both for the user and the manufacturer. In order to help the scientist select the proper condenser, suction pump, absorption flasks, and so forth, the author critically discusses their particular features.

The book is well written and has excellent pictures