still much to be said for the classical arrangement of proceeding from the simple to the complex; from the known to the unknown. Many instructors in medical biochemistry cover the material included in the appendix of the present volume in the early part of their courses.

The chapter on "Reproduction and Heredity" contains a 30-page section on genetics and blood groups. The necessity of including this and a 23-page chapter on cancer in a textbook of medical biochemistry may be questioned, especially when "Lipid Metabolism and Ketosis" is covered in 12 pages, and "Proteins and Starvation" in 27.

In general, the authors have been successful in integrating the basic and clinical aspects of the subject. The clinical applications are well chosen and of current interest. The volume should be especially valuable to physicians and interns who wish to review recent advances on the subject. Assessment of its value as a text for students beginning the study of biochemistry must await the test of usage.

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Problems in Physical Chemistry. English ed. Lars Gunnar Sillén, Paul W. Lange, and Carl O. Gabrielson. New York: Prentice-Hall, 1952. 370 pp. $5.50.

For some time this reviewer has felt the need for a problem source book as an aid in teaching physical chemistry. To a very large extent this need is satisfied by the translation of Sillén, Lange, and Gabrielson's Swedish text, which contains more than 700 problems, with answers, covering "classical" physical chemistry—e.g., 100 problems relating to thermodynamics, 75 to electrochemistry, 75 to chemical kinetics. The problems in each set are graduated as to difficulty, and, in most cases, reference is given to the original literature.

It is unfortunate that contrary to American usage the work done by a thermodynamic system is defined to be negative and, thus, the first law is written $\Delta E = q + W$. However, since this convention, and all others, are very clearly stated in the text, this change in sign should cause only momentary confusion in the mind of the reader. It is felt that the inclusion of problem sets relating to nuclear chemistry, atomic and molecular structure, and the more elementary concepts of quantum mechanics would have greatly enhanced the usefulness of the book when used in conjunction with a modern textbook such as Moore's.

Although of minor importance, it is very pleasing to see the book begin on page 1 with the generalized mol concept and ignore completely the superfluous terms gram-atom, gram-ion, etc.

Sillén's manual clearly can be useful to the lecturer, but its adoption for student use may be problematical. The discussion accompanying each problem set is exceptionally lucid, but necessarily concise; therefore, it seems doubtful that the book could stand alone as a text. On the other hand, there may be a reluctance to ask students to purchase this problem book in addition to a conventional textbook. The usefulness of this manual to the student, however, may well outweigh the monetary consideration.

The authors begin the introduction with the statement: "The student who would learn to solve physicochemical problems with confidence must be prepared for a fair amount of mental effort." The reader who works his way through the book will also have used "a fair amount of mental effort" but will be more than amply repaid for his labor.

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The Stars: A New Way to See Them. H. A. Rey. Boston: Houghton Mifflin, 1952. 143 pp. Illus. $4.00.
Pictorial Astronomy. Dinsmore Alter and Clarence H. Cleminshaw. New York: Crowell, 1952. 296 pp. Illus. $4.50.

There are unfortunately many authors who must "talk down" to their readers because they have no confidence in the earnestness and intelligence of the ordinary fellow. These authors are usually amateurs in the fields in which they write. Others, who are professionals, have learned the knack of writing lucidly, yet informatively and authoritatively. In these books we have examples of these two contrasting types.

The jacket blurb for the book by Rey speaks of the author as having "swept out the meaningless and confusing geometrical shapes that have baffled the beginning star-gazer for centuries." To justify this statement, there are pages of contrasting "old" and "new" representations, but few will recognize the "old" ones as authentic. In many instances the author has drawn absurd "old" diagrams which he has then contrasted with "new" ones that many of us have been using right along. When he does do a really new one, such as for Ursa Major or for Pegasus, he often corrupts the traditional descriptions and reverses the figures, doing a far worse job than has been done in the past.

I know from my own experience that in several planetarium cities the "new" figures of Rey have been used for many years, and some others that are far superior to his. Not all the figures are bad; many of them are good "old" ones. The jacket itself, when unfolded, is a very useful map of the Northern sky. The text and illustrations in the second half of the book, devoted to general information in astronomy, are rather good. Certainly, some new stargazers will be attracted by this book—always a good thing.

The second book is written by two professionals who have devoted many years to extending public knowledge and appreciation of astronomy at the Griffith Planetarium in Los Angeles. There are 10 pages of star maps of various kinds, but most of the 56 chapters are devoted to very lucid discussions of specific topics in astronomy, intended for the average interested but uninformed person, even some rather young ones.

Alter and Cleminshaw have had millions of people

in their lectures, and they have tried out the material of this book in the monthly magazine published at their institution. The great number of illustrations includes diagrams and sketches, as well as fine photographs, well reproduced. Not as fresh-looking as Rey's book, this one has perhaps twenty times as much information in it, while requiring about twice the concentration to dig it out. When dug, however, it is sound.

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Soil Physical Conditions and Plant Growth. Vol. II of *Agronomy.* Byron T. Shaw, Ed. New York: Academic Press, 1952. 491 pp. $8.80.

This book, prepared under the auspices of the American Society of Agronomy, is a compilation by nine authors of five principal divisions dealing with the effect of the physical condition of the soil upon plant growth. The introduction by the editor succinctly states the purpose of the book:

> It is the purpose of this monograph to provide students and professional agriculturists with a critical and authoritative evaluation of the present knowledge on this subject and to point out those areas in which additional data are needed.
>
> It is postulated that all physical attributes of the soil, such as apparent density, aggregation, pore-size distribution, friability, and others, influence plant growth through their effects on: (1) soil moisture, (2) soil air, (3) soil temperature, and (4) mechanical impedance to root development and shoot emergence. The first chapter of the monograph describes the soil as a physical system and considers methods by which the physical characteristics of the soil can be modified. The succeeding chapters deal with each of the four fundamental edaphic factors previously listed. In each chapter a description of the essential features of the phenomenon is first given. This is followed by a discussion of how the physical character of the soil affects the particular edaphic factor being discussed. An evaluation of the significance of that factor to plant growth follows. In the final chapter the interactions among the four fundamental factors are discussed in relation to other factors affecting plant growth.

In addition to consideration of the direct effect of physical properties of the soil on plant growth, indirect effects of these properties upon nutrient supply, pH, etc., are considered.

The five divisions of the book are: "Soil as a Physical System," by Lyle T. Alexander and H. E. Middleton; "Mechanical Impedance and Plant Growth," by J. F. Lutz; "Soil Water and Plant Growth," by L. A. Richards and C. H. Wadleigh; "Soil Aeration and Plant Growth," by M. B. Russell; and "Soil Temperature and Plant Growth," by S. J. Richards, R. M. Hagan, and T. M. McCalla. All chapters are thoroughly documented, including the most comprehensive review of the literature on the respective chapters that this reviewer has seen.

This book is of first importance to senior and graduate students in soils, to professional agriculturists, and to botanists engaged in research. In addition, this reviewer feels that the book could be used profitably as a text in soil classes where the application of soil physical properties to plant growth is emphasized.

The authors and editor are to be commended for an outstanding summary of the literature, of great value to all technical workers interested in the growth of plants.

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Scientific Book Register

Improving Undergraduate Instruction in Psychology. Report of a study group supported by the Carnegie Corporation of New York and the Grant Foundation which met at Cornell University, June 27–August 16, 1951. Dael Wolfle, Chairman. New York: Macmillan. 1952. 60 pp. $1.25.

Science and Hypothesis. Repr. H. Poincaré. New York: Dover, 1952. 244 pp. $2.50; $1.25 paper.

Forestry and Its Career Opportunities. Hardy L. Shirley. New York–London: McGraw-Hill, 1952. 492 pp. Illus. $6.50.

Investment Castings for Engineers. Rawson L. Wood and Davidlee Von Ludwig. New York: Reinhold, 1952. 477 pp. Illus. $10.00.

Food and Population and Development of Food Industries in India. Mysore: Central Food Technological Research Institute, 1952. 357 pp. Illus.

Styrene: Its Polymers, Copoloymers and Derivatives. American Chemical Society Monograph 115. Ray H. Boundy and Raymond F. Boyer, Eds. New York: Reinhold, 1952. 1304 pp. Illus. $20.00.

Annual Review of Physical Chemistry, Vol. 3. G. K. Rollefson, Ed., and R. E. Powell, Assoc. Ed. Stanford, Calif.: Annual Reviews, 1952. 416 pp. Illus. $6.00.

The Immaculate Forest. An account of an expedition to unexplored territories between the Andes and the Amazon. W. R. Philipson. New York: Philosophical Library, 1952. 223 pp. Illus. $4.50.

Semimicro Qualitative Analysis. 3rd ed. Paul Arthur and Otto M. Smith. New York–London: McGraw-Hill, 1952. 285 pp. Illus. $4.00.

Polarography: Inorganic Polarography, Organic Polarography, Biological Applications, Amperometric Titrations, Vol. II. 2nd ed. I. M. Kolthoff and James J. Lingane. New York–London: Interscience, 1952. 990 pp. Illus. $11.00.

Contributions to the Theory of Nonlinear Oscillations, Vol. II. S. Lefschetz, Ed. Princeton, N. J.: Princeton Univ. Press, 1952. 116 pp. $1.50.

The Evolution of Chemistry: A History of Its Ideas, Methods, and Materials. Eduard Farber. New York: Ronald Press, 1952. 349 pp. Illus. $6.00.

Fundamentals of Engineering Electronics. 2nd ed. William G. Dow. New York: Wiley; London: Chapman & Hall, 1952. 627 pp. Illus. $8.50.

Nerve Impulse. Transactions of the Third Conference, March 3–4, 1952, New York. H. Houston Merritt, Ed. New York: Josiah Macy, Jr. Fdn., 1952. 176 pp. Illus. $3.50.

Theory of Numbers. B. M. Stewart. New York: Macmillan, 1952. 261 pp. Illus. $5.50.

Organic Syntheses, Vol. 32. Richard T. Arnold, Ed. New York: Wiley; London: Chapman & Hall, 1952. 119 pp. $3.50.