the importance of the Turonian-Senonian orogenic phase which is important economically in both North and South America is well brought out.

Although much space has been devoted here to minor criticisms, this work easily excels the best previous efforts of its kind. It will be invaluable, not only to readers with an academic interest in South America, but also to those engaged actively in the task of finding petroleum and other mineral resources.

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Enfermedades Infecciosas y Parasitarias. vols. 1 and 2. Jose Ink. Lopez y Etchegoyen, Buenos Aires, 1953. xv + 1485 pp. Illus. + plates.

This work on infectious and parasitic diseases is intended as a textbook in Spanish for both medical students and practicing physicians. Its two volumes describe the diseases produced in human beings by bacterial, viral, fungal, and parasitic agents.

The author describes the etiology, pathologic anatomy, symptomatology, laboratory diagnosis, treatment, and epidemiology of each disease and gives a brief summary of the main facts that help in identification of morbid conditions. This book not only includes the classical descriptions of diseases but also presents the more modern developments in laboratory diagnosis and the new therapeutic measures that have changed the prognosis of infectious and parasitic ailments.

There are 32 pictures, many in color. The bibliography contains 114 references from both foreign and Argentine sources, and there is an analytic index at the end. The scope of the book is wide; there are references not only to diseases common in Argentina but to many others of world-wide prevalence.

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Causalités et Accidents de la Découverte Scientifique. Illustration de quelques étapes caractéristiques de l'évolution des sciences. R. Taton. Masson, Paris, 1955. 168 pp. Illus. F. 980.

The author of this interesting and unusual book has collected a large number of documents concerning scientific discoveries. The book has the positive merit of having a wide scope, ranging through mathematics, astronomy, physics, chemistry, instrumental techniques, biology, and medicine, and the negative merit of supporting no specific theory, historical, psychological, or other, but presenting each individual item in its variegated collection for the appreciation and judgment of the reader.

The author remarks in his preface that his objective presentation avoids forcing the complexities of actual scientific research into a systematic schematism. Unfortunately, this avoidance of rigidity has led him into the pitfall of disorder. We are made to jump from antiquity to modern times and to the Renaissance, from spectroscopy to hydrostatics and to typhus, from great names to obscure ones, from basic discoveries to chance observations and to dead ends, from original quotations to amusing anecdotes, so that the very richness of the collection leaves the mind in a whirl. In spite of this, the book will find its place on the shelves of the teacher, the historian, or the philosopher of science; each one will find recorded in it several cases that he has not met before as well as illustrations for his own pet theories. In this he will be aided by two excellent indexes, one of names and one, analytic, of subjects. The plates are also very good.

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Principles of Nuclear Reactor Engineering. Samuel Glasstone. Van Nostrand, New York, 1955. vii + 861 pp. $7.95.

Samuel Glasstone has attempted to cover the entire field of nuclear energy in one volume. He has been highly successful in presenting a large amount of detailed information, which includes the basic physics and engineering calculations for nuclear reactors. The large gap between the basic design theory and the applications to practical reactor design has been presented in sufficient detail for design of research reactors but not for the design of power reactors. The treatment of most subjects is extremely brief, and incomplete. A great many of the design problems that must be solved by the reactor designer and operator are not mentioned. Nevertheless, the book does contain a wealth of information of value to the beginner in the field of nuclear reactor design. The simple basic principles are presented in a readable manner. Lists of nomenclature are attached to each chapter as well as lists of problems. Some examples of typical calculations are included, but more specific examples would be desirable.

The contents of the book include a review of the calculations of critical mass, neutron flux distribution, and nuclear reactions; control of reactors; materials; shielding; thermal aspects of reactors; and descriptions of various reactors. The chapter on thermal aspects of reactors is perhaps the best presented.

STUART MCLAIN
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Scientific Method in Psychology. Clarence W. Brown and Edwin E. Ghiselli. McGraw-Hill, New York–London, 1955. ix + 368 pp. Illus. $6.

Scientific Method in Psychology is meant to be a textbook at the undergraduate level. Its purpose is to state the general principles of science and the interpretation that these principles have in psychology. The book is divided into three parts of about equal length. The first part is a simplified idealization of both the scientific method and the scientist. The scientist is characterized as a straight thinker who is individually flexible, tolerant, and free of intellectual biases. He also has a good memory.

In the second part of the book, the authors detail the steps of the scientific method. These are: (i) the definition and delimitation of a scientific problem; (ii) the use of hypotheses in formulating a problem; (iii) collection of the facts; (iv) organization, analysis, and interpretation of the facts; and (v) generalization from scientific data. In part three, some specifically psychological procedures — psychological methods, structured and unstructured tests, interviews, and so forth—are described and compared.

The authors treat the experimental procedures quite competently and give a wide variety of examples. Their handling of more abstract problems of scientific method and particularly of theory, however, is not so sure. In a discussion of three types of facts, they distinguish one that is "remote from sensory experience." This type of fact is a fact that has been thought about by the scientist and thus has acquired meaning. This type of "fact" and "hypotheses," "theories," "interpretations," and "generalizations" become inextricably confused in later chapters. Because these terms are used frequently—and presumably systematically—throughout the text, the confusion is not helpful. Other topics are also perhaps more vague than they need be. For example, the following distinction is made: "Experience, knowledge, and understanding are closely related. They should be placed on a common continuum with experience at the beginning and understanding at the end. From experience we pass through knowledge on

our way to attaining understanding" (p. 96).

The attempt to simplify is frequently accompanied by the failure to make sharply the necessary distinctions. The result is often harder for the beginning student to understand than it would be if a more "difficult" but precise treatment had been offered.

DONALD J. LEWIS
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Electrochemistry in Biology and Medicine. Theodore Shedlovsky, Ed. Wiley, New York; Chapman & Hall, London, 1955. xii + 369 pp. Illus. $10.50.

The contributions to the symposium on Electrochemistry in Biology and Medicine held by the Electrochemical Society in April 1953 have been assembled in this volume. The 18 papers include both reviews and specialized presentations but fall rather naturally into four groups, depending on the relationship of the electric phenomenon under discussion to the chemical mechanism that produces it.

The first five chapters deal with situations in which the electric parameters can be discussed with some certainty in terms of specific equilibria and ionic transport systems. These are largely concerned with the properties of membranes and, as such, form an excellent, although not systematic, introduction to the following five chapters. In these the essence of the discussion is the identification of the equilibria, transport systems, and enzymatic mechanisms that underlie the transmission of the nerve impulse and other bioelectric phenomena.

There follow four chapters in which electrochemistry is chiefly discussed as a tool for the investigation of simple electrolytes, proteins, and the interaction between proteins and small ions. The final group of four chapters considers electric phenomena, the molecular basis of which is so poorly understood that it is scarcely discussed. The observations on electroencephalograms, for example, are described in terms of their reproducibility and their empirical correlation with physiological factors.

If a justification must be sought for the inclusion of so wide a variety of content in a single volume, it can be found only in the interest that chapters outside the reader's special competence may arouse. Judged in this way the book should prove useful to many. The chapters are stimulating and indicate the emphasis in current research while avoiding in most cases the restricted viewpoint of journal articles.

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The Roger Adams Symposium. Wiley, New York; Chapman & Hall, London, 1955. ix + 140 pp. Illus. + plates. $3.75.

This book contains the papers presented at a symposium in honor of Roger Adams at the University of Illinois (3–4 Sept. 1954). In addition to a biographic sketch by Ernest H. Volwiler, the following accounts are given in this historically significant book: "Steric effects in dyes," by Wallace R. Brode; "The structure of gliotoxin, a sulfur-containing antibiotic substance," by John R. Johnson; "The structure of nepetalic acid," by Samuel M. McElvain; "Chemistry of flavylium salts; reactions with amines," by Ralph L. Shriner; and "Some chemical studies on viruses," by Wendell M. Stanley.

These are a selected few of the distinguished students of Adams. The papers given by them are, as one might have expected, excellent, up-to-date presentations by masters in their respective fields. The diagrams, tables, flow sheets, and illustrations are used effectively. Chemists generally are also indebted to C. S. Marvel and his symposium committee and to the publishers for making available a splendid work of this kind.

It is an altogether fitting tribute to Adams, whose classical studies in organic chemistry have been so inspirational and whose pronounced influence on chemists and chemistry generally have endeared him to so many.

HENRY GILMAN
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Antimetabolites and Cancer. A symposium. Cornelius P. Rhoads, Ed. American Association for the Advancement of Science, Washington, D.C., 1955. vi + 312 pp. Illus. $5.75; AAAS memb. $5.

This volume contains 18 contributions to a symposium presented in December 1953 at the Boston meeting of the AAAS. The variety and abundance of the findings in this area of research are impressive. C. P. Rhoads describes the development in the field of cancer research and professes some optimism in considering the probability of the discovery of specific therapeutic agents for neoplastic diseases by extension of the manufacture and screening of antimetabolites.

D. R. Ginder considers viruses as possible therapeutic aids in the treatment of neoplasms, and R. Hertz performs a similar service for hormones. Both men conclude that the lack of knowledge of the mechanisms of action and intermediary metabolism of viruses and hormones obscures any contemporary view of these agents as antimetabolites. S. Weinhouse finds that the high rate of glycolysis in neoplasms first demonstrated by Warburg is supplementary to other, more efficient metabolic processes that are similar to those demonstrable in normal tissues. Some interesting examples of the inhibition of microbial growth by normal metabolites are given by B. D. Davis, and L. G. Nickell cites numerous compounds that affect plant growth. M. M. Nelson writes of the production of abortions and/or congenital anomalies in rats with antimetabolites of pyridoxine, riboflavin, and folic acid. D. W. Woolley presents studies on the possible oncolytic properties of certain synthetic analogs of 1,2-dimethyl-4,5-diaminobenzene, a precursor of vitamin B_{12}.

It is revealing that 10 of the 18 papers in the book deal with antimetabolites of such precursors of nucleic acids as folic acid, leucovorin, purines, and pyrimidines. G. H. Hitchings explains the biochemistry involved and indicates probable sites of action of various antimetabolites with great clarity and precision. E. M. Lansford, Jr., and W. Shive discuss the action of aminopterin on bacteria and describe a microbiological assay method for thymidine. D. W. Visser presents some results on the action of substituted nucleosides in *Neurospora* and bacteria. J. R. Totter finds that aminopterin inhibits the uptake of C^{14}-formate into desoxyribonucleic acid in rabbit bone marrow *in vitro*. C. A. Nichol and A. D. Welch have discovered that A-methopterin inhibits the conversion of folic acid to folinic acid in *S. faecalis*, and they discuss some possible mechanisms of drug resistance in leukemic cells (including data on cell-free extracts suggesting the importance of cell permeability). H. E. Skipper considers resistance in leukemic cells to 8-azaguanine and A-methopterin in terms of alternate metabolic pathways.

The actions and metabolism of 8-azaguanine are thoroughly reviewed in two papers, one by R. E. Parks, Jr., and the other by H. G. Mandel. G. B. Brown describes the empirical testing program of the Sloan-Kettering Institute for the detection of nucleic acid derivatives with carcinocidal or carcinostatic activity. The only clinical essay in the book, a description of the treatment of acute leukemia, is contributed by J. H. Burchenal. He presents figures on the 50 percent survival time of children with acute leukemia in months: untreated, 3.9; treated with A-methopterin and steroids, 8.9; treated with mercaptopurine, A-methopterin, and steroids, 12. Each paper has a bibliography, and the volume ends with an 11-page discussion of the papers. There is no index.

This book is a good exposition of much of the empirical work and many of the theoretical concepts formulated in the