ing the examination of the eastern states, this area is divided into three subregions: the northeastern, the middle and the southeastern Atlantic Coastal Plain.

"Part IV. The States Athwart the Cincinnati Anticline." Included here are Central and West Tennessee, Kentucky, Ohio, Indiana and Michigan.

"Part V. The States Around the Ozark Dome." Illinois, Missouri and Iowa.

"Part VI. The States of the Upper Mississippi Valley." Minnesota and Wisconsin.

"Part VII. The Eastern Plains States." North Dakota, South Dakota, Nebraska and Kansas.

"Part VIII. The States to the North and West of the Borderland Llanoria." A general introduction describes and discusses the "Late Paleozoic Oklahoma Mountains of the Llanorian Geosyncline." This is followed by the description of the stratigraphy of Arkansas, Oklahoma and Texas.

Except for Part III the chapters in each part are concerned with the geology of a separate state. In general, each chapter begins with a short history of the early geologic work in the state, followed by a synopsis of the physiography and structure of the area. The major portion is, however, devoted to a highly condensed description of the various formations, and their members are listed together with notes on their general lithology, thickness, important faunal contents and correlation, all being completely documented with bibliographic references. Thus, in contrast to the more narrative style of the first volume of the series, the present has of necessity become almost "telegraphic" in style and is essentially almost an encyclopedia of the stratigraphy of the region covered. It will prove an invaluable tool to the stratigrapher, wherein he can at once find the essential data regarding any formation but from which he will be led, as was clearly intended by the author, to consult the original works for more detailed information.

The three volumes of this series will form Professor Schuchert's most enduring monument. They are a lasting tribute to the insight, organizational ability and untiring energy of a great scientist.

H. E. VOKES

MINERALS AND ROCKS

Minerals and Rocks—Their Nature, Occurrence and Uses. By RUSSELL D. GEORGE. xviii + 595 pp. 68 plates. 150 figs. New York: D. Appleton-Century Company, Inc. 1943. $6.00.

IN this book Dr. George has done an excellent job of bringing together and co-ordinating material from several branches of the geological sciences. It is written especially for use as a textbook in economic mineralogy, and might be considered a reference book on that subject. Because of its broad scope, considerable material useful to a beginner in mineralogy or petrology has necessarily been omitted.

The physical properties of minerals, crystallography and the origin and form of ore deposits are considered in two introductory chapters. Parts I, II and III (Part I, "Metallic Elements and Minerals"; Part II, "Non-Metallic Elements and Minerals"; Part III, "Rock-Making Minerals"), which make up the main portion of the book are devoted principally to the description of mineral species. The minerals are grouped, in general, according to the most important economic element which each contains. Such a classification is, no doubt, desirable in this book, but it has its attendant disadvantages, for it is difficult to pigeonhole many minerals in such a manner. Thus, pyrite and arsenopyrite are considered under iron, although the former is chiefly an ore of sulfur, while the latter is principally an ore of arsenic. Although dolomite is appropriately described under sedimentary rock minerals, it might equally well be considered under ores of magnesium. Before giving the individual descriptions of the minerals brought together under the heading of a common element, a brief account is given of the element itself, its uses, sources and production. These paragraphs contain much valuable information and are particularly instructive.

Part IV, "Determinative Mineralogy," briefly describes blowpipe tests and equipment, lists tests for most of the elements, and includes tables of minerals grouped according to color and luster.

Part V, "The Common Rocks," considers the origin, description and classification of the igneous, sedimentary and metamorphic rocks. The last chapter on "Industrial Uses of Rocks" gives much valuable and interesting material not usually included in books on petrology.

C. S. HURLBUT, JR.

HARVARD UNIVERSITY

QUALITATIVE ANALYSIS

The Theory and Practice of Semimicro Qualitative Analysis. By G. B. HEISIG. xiii + 331 pp. 15 figs. 14 × 21 cm. Philadelphia and London: W. B. Saunders Company. 1943. $2.50.

To the already long list of available texts in qualitative analysis, Professor Heisig has added another which must be justified mainly on the basis of its extensive treatment of the anions, and a thoroughly modern approach to the theoretical matters underlying the practical work. The book is designed for students who have already had a college course in general inorganic chemistry, and follows a strictly semimicro procedure. Very small samples are used (1 mg or 4 drops of unknown solution) and provision is made for filtering by the pressure-bulb method of Barber, as well as for centrifuging.

The theoretical section takes up about one third of the book. This includes modern concepts of complete ionization, acid-base relationships, etc., which are made an integral part of the later discussions in the experimental sections. Especially noteworthy are the up-to-date sections on hydrolysis and amphoterism, the author's treatment of "ammonium hydroxide" as ammonia, and the inclusion of a separate chapter dealing with the concept of activity. To this reviewer, the entire theoretical section, although admirable in its scope, was somewhat lacking in general clarity and readability. There might be mentioned, as contributing to this, rather poor arrangement of the topics discussed and occasional misplaced emphasis. Thus more space is devoted to the nomenclature of Werner compounds than is given to an explanation of their structure.

In the experimental section which follows, 100 pages are devoted to the 24 common cations. General discussion of the chemistry of the several metals and preliminary experiments on the reactions of their ions precede the actual group analysis. The latter follows customary procedure, employing sodium hydrogen sulfide to separate the copper and tin subgroups, and making use of only the most essential organic reagents. A good discussion of the analysis of each cation group follows the description of the procedure. It is unfortunate that a complete summary of the several cation groups is to be found nowhere in the section on cations, but only in the Introduction, and that here the sulfides of Group II are described as "sparingly soluble in water," while those of Group III are said to be "almost insoluble in water."

To the analysis of 24 anions the author devotes 72 pages. The selection is somewhat arbitrary, including for example chlorate, bromate, iodate and perchlorate, but excluding silicate, arsenite, acetate and oxalate. The procedure followed is that of Sneed and Duschak[1] adapted for semimicro use by the author and A. Lerner. It has the advantage of dividing the anions into five mutually exclusive groups, which are separated in order by means of successive precipitations of the calcium, barium, cadmium and silver salts under proper conditions. Without first-hand experience of the method, this reviewer can not form an adequate opinion of its merits.

The Appendix of 21 pages contains several valuable features, including a good review of mathematical operations used in qualitative analysis, and an exhaustive but uncritical list of reference books in qualitative analysis and inorganic chemistry.

This first edition of Professor Heisig's book is marred by numerous small errors and omissions. Misspellings, especially of proper names, are frequent; it is to be hoped that these will be corrected subsequently.

WENDELL H. TAYLOR

DISEASES OF DOMESTIC ANIMALS

The Infectious Diseases of Domestic Animals. By WILLIAM ARTHUR HAGAN, D.V.M., D.Sc., professor of bacteriology and dean of the faculty, New York State Veterinary College, Cornell University. 665 pp. 145 ill. Ithaca, N. Y.: Comstock Publishing Co., 1943. Price, $6.00.

THIS is a well-integrated and entirely adequate account of the host of infectious diseases to which domesticated mammals and birds are subject, of the specific microorganisms involved and of available methods of diagnosis and control. The introductory section of the book is a consideration of the general aspects of infection and disease production by microorganisms, and of the nature and development of the immune response, with a brief review of allergic conditions and of iso-antibodies. Discussion of groups of microorganisms is arranged under the following section headings: Pathogenic Bacteria, Bacteria-like Pathogenic Organisms of Uncertain Classification, *i.e.*, Spirochetes, Rickettsiae and Pleuropneumonia Group, Pathogenic Fungi, Pathogenic Protozoa and Viruses. For each of these groups or, where justified, for individual organisms, consideration follows the general pattern: morphology, reactions in culture, natural habitat, pathogenicity and types of disease in susceptible hosts, diagnostic and control methods, immune response, and, where appropriate, relation to disease of man. These divisions of the subject matter are clearly marked by subtitles in bold face type, giving ready access to any part of the material. To each chapter and to many chapter subdivisions short lists of well-chosen references are appended. This is not a textbook of bacteriology in the usual sense. Instead, its purpose is much broader, and it presents a well-balanced treatment of the important aspects of infectious diseases of lower animals.

HERBERT L. RATCLIFFE

SPECIAL ARTICLES

OBSERVATIONS CONCERNING THE ETIOLOGY OF PRIMARY ATYPICAL PNEUMONIA

THE clinical syndrome currently known as primary atypical pneumonia may be caused occasionally by viruses of the psittacosis group[1,2,3,4,5] or by Rick-

[1] *Jour. Chem. Ed.*, 8: 1177–86 and 1386–95, 1931.

[1] M. D. Eaton, M. D. Beck and H. E. Pearson, *Jour. Exper. Med.*, 73: 641, 1941.