The plants used for this determination were tomato, tobacco, fuchsia and carrots.

The studies made to date indicate that certain vitamins, particularly B_2 or riboflavin, are present in the soil and that some plants take up vitamins from this source as they absorb essential mineral elements.

If any of our crop plants supplement their synthesized vitamins with vitamins from the soil at different growth stages the presence or absence of vitamins in the soil immediately becomes a vital factor in crop production and soils management.

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APPARENT TIME ACCELERATION WITH AGE OF THE INDIVIDUAL

THE apparent acceleration of time as one grows older seems a rather universal experience. All of us can recall what a long time a year used to seem when we were young children and how, as we grew older, the years seemed to pass faster. Even then, a year during our twenties was apparently a much longer space of time than a year in our forties, and as we approach sixty, a year seems much shorter still.

I have often heard questions raised as to the cause of this apparent acceleration of time with age. At one such discussion many years ago, I suggested that the reason might lie in that elapsed time as measured by the recollection of an individual seemed long or short according to what relationship it had to the individual's total time experience. For instance, at the age of eight, when our memory might go back over four years, a year would represent 25 per cent. of our total remembered time experience and hence seem like a very long time; at the age of twelve, memory may go back over eight years and one year would represent 12½ per cent. of total remembered time experience and could therefore appear to be only half as long as a year did at the age of eight. Similarly, at the age of fifteen, a year would be likely to represent only about 10 per cent. of remembered time and seem still shorter. At the age of 25 it would represent only about 5 per cent. of remembered time and hence seem only half as long as at the age of 15 and possibly one fifth as long as at the age of eight. At the age of 45 to 50, it would represent about 2½ per cent. of remembered time and at the age of 60 only 2 per cent. or less. Thus, as the years roll by, time would seem to be accelerating in speed. Off and on, since then, when such a matter would come up in conversation, I have offered this theory as a possible explanation of this experience, which I believe is quite general. Its reception by scientific friends has encouraged me finally to submit it for wider consideration.

F. W. NITARDY

SCIENTIFIC BOOKS

STRATIGRAPHY

Stratigraphy of the Eastern and Central United States. By CHARLES SCHUCHERT. xvii + 1,013 pp. 4 plates. 123 figs. 78 correlation charts. New York: John Wiley and Sons, Inc. 1943. $15.00.

THIS encyclopedic work by the late Professor Charles Schuchert, of Yale University, is the second volume of three in the series bearing the general title, "Historical Geology of North America." The first volume, "Historical Geology of the Antillean-Caribbean Region, or the Lands Bordering the Gulf of Mexico and the Caribbean Sea," was published in 1935. The third volume, dealing with the stratigraphy of Greater Acadia, eastern, central and Arctic Canada, the Arctic Archipelago and Greenland, was in essentially complete typescript at the time of Professor Schuchert's death and will be published in due time.

Together, the three volumes are designed to document an "Atlas of American Paleogeography," which is to be issued as a part of volume three in the series. They are the product of almost forty years of painstaking examination and correlation of published geological studies supplemented by years of careful field work, particularly within the areas involved in the present volume.

Following a concise and valuable introductory chapter on "Stratigraphic and Time Terms and their Grouping," this volume is divided into eight parts, as follows:

"Part I. The New York Standard." This discussion includes the Paleozoic formations of the State except the "much deformed and much metamorphosed Cambro-Ordovician area of the Taconic Mountains of the Hudson-Champlain valleys." This region is considered to be "in reality . . . but the western margin of Greater Acadia" and will be described in volume III.

"Part II. The States Athwart the Appalachian Geosyncline." Following an introductory statement on the Appalachian geosyncline, the discussion includes the Paleozoic and, generally, the Lower Mesozoic sequences of Pennsylvania, New Jersey, Maryland, Virginia, West Virginia, eastern Tennessee, North and South Carolina, Georgia, Alabama and Mississippi.

"Part III. The Atlantic Coastal Plain." Complet-

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.