determining efficiency. The discussion of 'temperature and fire' is extended and good; that of the problem of smoke prevention, the account of the automatic stoker and the full elaboration of useful algebraic formulas are points of excellence deserving of special mention. The revelation of the effect of varying air-supply with variations of the rate of combustion is new and important as here presented, and the exposition of the value of flue-gas analysis is effected in an excellent fashion.

For a first edition, this seems exceptionally free from typographical or other errors, and it may be taken for granted that later editions will follow from which even these minor defects will be completely pruned.

The book-making is good, and the maps are printed upon a fine grade of paper to insure clearness. Many of the illustrations and nearly all the diagrams are new, and the whole constitutes a work which is likely to have extensive sale among professionals and professional schools. The mathematical work and the discussions of results of boiler-tests, of which the records are presented very fully, will find constant use.

R. H. THURSTON.

A Reader in Physical Geography. By RICHARD E. DODGE. New York, Longmans Green & Co. 1900. 12mo. Pp. viii + 237. Price, 70 cents.

It is gratifying to see the new point of view in physical geography coming into our education and our literature. The application of the theory of evolution to all branches of the subject has taken it bodily from the static condition in which it was conceived by our fathers, and reestablished it as a dynamic science, live and growing. There are no longer any 'everlasting hills,' but mountains and vales wax and wane, and record the histories of their mutations in the landscape so legibly that he who runs may read. And man comes on the scene, molded inevitably by the geographic environment in which his lot is cast, and in turn reacts upon that environment in many important ways. This is the outlook Professor Dodge has in his little volume. He has written it for beginners, and his fine quality as an instructor

is in evidence on almost every page. He is very happy in his ability to interpret the principles of land sculpture in the most homely similes. The beginner not only may, he must, relate the new knowledge to what is already well known to him.

The topics treated are, The Continents, The Industries of Men, The Origin of Land Forms, The Great Land Forms, Climate and other important physical features influencing man.

The book is intended as auxiliary reading for beginners in physiography, but it will also make good reading for the laity in other lines, who wish to know the way in which a physiographer looks at his problems.

J. PAUL GOODE.

Air, Water and Food. By ELLEN H. RICHARDS and ALPHEUS G. WOODMAN. New York, John Wiley & Sons. Pp. 230. Price \$2.00.

The first portion of the book covers the composition and impurities of air and their relation to human life. The problem of ventilation is dwelt upon, and very proper reference is made to the faulty argument so often advanced that, because carbon dioxide is heavier than air, that therefore the proper method of securing its removal from living rooms is to provide exits for it near the floor. The public forget that the gas, as the sanitarian meets it, is warm, not cold; and that, moreover, the principle of gaseous diffusion has caused a more or less complete mixture of all the gases present in the room.

Chapter IV. gives well stated methods for air analysis.

Some eighty pages are given to the subject of water, its source, properties, relation to health and the methods employed for its examination.

Following the directions for the 'determination' of each item in water analysis, there is found a paragraph entitled 'Notes,' wherein are given in a very acceptable form the sundry hints and cautions so necessary for the guidance of the beginner. An excellent statement is found on page 81, to wit: "The value of a water analysis is in direct proportion to the knowledge and experience of the one who interprets it."

Again, on page 66, "The conclusions are not infallible, but there are enough unavoidable

risks in human life without taking unnecessary ones."

This is very true. The analyst should ever stand between the public and a questionable supply, and the consumer, rather than the water purveyor, should be given the benefit of any doubt.

The book closes with a consideration of the adulteration and examination of milk, butter, cereals and fermented liquors.

The authors have had so large and varied an experience with the subjects upon which they write, that the excellence of the present contribution to sanitary literature was to have been expected.

WILLIAM P. MASON.

BOOKS RECEIVED.

Qualitative Chemical Analysis. ALBERT B. PRESCOTT and OTIS C. JOHNSON. New York, D. van Nostrand Co. 1901. Pp. xi + 420.

Tierleben der Tiefsee. OSWALD SEELIGER. Leipzig, Wilhelm, Engelmann. 1901. Pp. 49. Mk. 2.

Monographien aus der Geschichte der Chemie. Vol. VI. Pt. 2. Christian Friedrich Schönbein, 1799-1868. GEORGE W. A. KAHLBAUM and ED. SCHÄER. Leipzig, Barth. 1901. Pp. xii + 331. \$9.30.

The Induction Motor. B. A. BEHREND. New York, Electrical World and Engineer. 1901. Pp. 105.

SCIENTIFIC JOURNALS AND ARTICLES.

The Journal of Physical Chemistry, April. 'On an Improved Method of determining Latent Heat of Evaporation and on the Latent Heat of Evaporation of Pyridin, Acetonitril, Benzotrill,' by Louis Kahlenberg. Description of an improvement on the Berthelot apparatus for determining the latent heat of evaporation, in which the liquid is boiled by an electrically heated platinum spiral, and the results obtained by its use. 'A Class of Relations between Thermal and Dynamic Coefficients,' by George H. Burrows. 'Minumum Boiling-Points and Vapor Composition, II,' by Morris R. Ebersole. A study of acetone-benzene solution, with a classification of all mixtures of two solvents which have been studied, according to vapor-pressures and boiling points. 'On Clapeyron's Equation,' by Paul Saurel. 'Note on the Fundamental Equations of Multiple Points,' by J. E. Trevor.

In the *American Geologist* for March, S. W. McCauley presents a discussion on the 'Trap Dykes of Georgia.' He states that they are all of the same age, and vary from an inch to two hundred feet in width and extend from a few rods to many miles. The 'Plan of the Earth and its Causes,' by J. W. Gregory, is continued from the February number, in which the writer concludes that the plan of the earth may be attributed to the unceasing shrinkage of its internal mass. Professor E. W. Claypole contributes some interesting notes on 'Petroleum in California.' 'Some Salient Features in the Geology of Arizona' is discussed by William P. Blake. This is followed by 'The Lake Systems of Southern Patagonia.' The author of this article divides the lakes into three classes—residual or salt lakes, glacial and tectonic. The April number contains a valuable contribution to the geology of 'The Piedmont Plateau of Georgia,' by Thomas L. Watson. The rocks of the region are divided into three different kinds, viz., the even-grained, massive granites, the porphyritic granites and the granite-gneisses. Of the even-grained granites, all but two possess biotite as a principal element, while hornblende is entirely wanting; the porphyritic granites are, with one exception, massive, with a composition somewhat similar to the massive granites, and in some places showing a gradation from one to the other; the granite-gneisses form extensive areas of schistose rock, similar in composition to the other two, and are believed to be metamorphosed eruptive granites. The author, after furnishing considerable proof, concludes that the region consists of eruptive granite which has been subject to the action of metamorphism and weathering, thus differentiating into the other two kinds of metamorphic rock. The age of the area is supposed to be Archæan, but it is crossed by numerous dykes of a later origin. Mr. Oscar H. Hershey contributes a paper entitled 'California Metamorphic Formations,' in which he describes the formations of the Klamath mountain region. He concludes that the schists of the upper region are somewhere between the Archæan and Devonian in age, and favors the earlier rather than the later date. This is followed by a paper, 'Fossils near Montreal,'