

June 9, 1893,) is twenty-five miles by the river above Trenton, these much smaller and less noticeable workings lie only fourteen miles inland east northeast from the site of the celebrated gravel discoveries.

Neshaminy Creek flows into the Delaware (right bank) about three miles below Bristol, (Bucks Co., Pa.) and a walk to the quarries by following up the winding stream from the river would cover a distance of about twenty miles.

BOOK-REVIEWS.

Iowa Geological Survey, Volume I: First Annual Report, for 1892. By SAMUEL CALVIN, State Geologist, Des Moines, 1893. 472 p., 8vo. 10 plates and 26 figures.

In addition to the administrative reports, the first report of the new survey contains seven papers, one of which is by the state geologist, three by the assistant state geologist C. R. Keyes, and the others by various members of the survey staff. The introductory paper, by Mr. Keyes, on the Geological Formations of Iowa is a summary of present knowledge of Iowa rocks. The author has here taken occasion to revise the classification of these formations to correspond with the progress made in their study in recent years with a very satisfactory result.

The Sioux quartzite is referred to as a doubtful element still in the geological section. The discovery of undoubted eruptive rock within these beds in southeastern Dakota by Culver and Hobbs, and in presumably the same beds in northwestern Iowa by the present survey, as set forth in fuller detail in Mr. S. W. Beyer's paper, is a matter of much interest and tends to add probability to the view entertained by Hayden that these rocks are much younger than commonly supposed.

The changes in nomenclature are much for the better, as for example, Oneata for Lower Magnesian; St. Croix for Potsdam; while in the Devonian the attempt to correlate the Iowa rocks with the New York section is abandoned. Prof. Calvin's work upon these formations has resulted in a four-fold division with names from places where the best sections are shown.

In the Lower Carboniferous, or Mississippian, the term Augusta is advocated for the terrane which Williams called the Osage, a name here shown to be inapplicable. We would differ with the author as to the advisability of dropping the term Warsaw as a sub-division of the Augusta in so far as concerns the rocks of Iowa, for though probably of limited development they present constant and easily recognized characters throughout the southeastern part of the state. An error occurs in the definition of the St. Louis limestone on page 72. The brecciated limestone is not the basal member, as asserted by the author, but in many sections along the Des Moines River there is shown to be from five to fifteen feet, or more, of a brown, quite regularly bedded magnesian limestone underneath the brecciated member and resting upon the arenaceous division of the Warsaw beds below.

In his discussion of the structure of the Coal Measures the author presents a valuable contribution to the literature of this subject, and advances conclusions acceptable alike for their simplicity and adherence to generally accepted principles of deposition.

The description of the Cretaceous formation is professedly taken from Professor Calvin's notes. Evidence is accumulating to show that these rocks have a much greater development in Iowa than heretofore considered. Three divisions are recognized and correlated with Hayden's Dakota, Fort Benton and Niobrara groups. The position of the Fort Dodge gypsum beds and the Nishuabotua sandstone are left undetermined.

In Mr. Beyer's paper there is given an account of the

discovery in a deep well at Hull, Sioux County, Iowa, of quartz-porphry—an eruptive rock, interstratified with sandstone. It occurred all the way from seven hundred and fifty-five feet down to twelve hundred and twenty feet, aggregating about one hundred and eighty-seven feet in thickness. To account for the presence of these rocks, the author advances two theories: (1) that they were due to secular outflow of lava upon the ocean bottom in Palæozoic times, (2) that they represent intrusive subterranean sheets from a Post-Carboniferous volcano. The latter view is considered the most probable. In the absence of evidence as to the age of the sandstones, however, we see no reason why a third view may not be entertained, viz., that they were secular overflows from a Post-Carboniferous volcano.

In Mr. H. F. Bain's paper we have an interesting and instructive discussion of the St. Louis limestone as found in Mahaska County, Iowa, while Mr. G. L. Housen's paper deals with the economic phases of some Niagara limestones.

An Annotated Catalogue of Minerals and a Bibliography of Iowa Geology by Mr. Keyes, complete the volume. The latter paper occupies more than half of the report and shows evidence of much care and painstaking labor, though a paper by the writer on the Keokuk limestone, published in the *American Journal of Science* for October, 1890, has evidently escaped the attention of the author.

The report has been printed from new and excellent type, the illustrations are exceptionally good, and altogether the volume in its make-up presents a pleasing contrast to many similar publications.

Typographical errors are not numerous, though some occur in prominent places, as, for example, in the word Survey on the title page, and in the words Tennessee and Territory on plate VI, though these can hardly be considered typographical. Errors appear also in the words Sandstone, p. 149, and Glacial, p. 139. A further criticism might be made on the lettering on the back of the volume, which scarcely seems in keeping with the pleasing effects of the text. But these are minor matters, and the survey and the state are to be congratulated upon the general excellence of their first report.

The Microscope: Its construction and management. Including Technique, Photo-micrography, and the Past and Future of the Microscope. By DR. HENRI VAN HEURCK, Professor of Botany and Director at the Antwerp Botanical Gardens; late President of the Belgian Microscopical Society; Hon. F. R. M. S. and New York M. S. English edition re-edited and augmented by the author from the fourth French edition, and translated by Wynne E. Baxter, F. R. M. S., F. G. S. With three plates and upwards of 250 illustrations. London, Crosby, Lockwood & Son, New York, D. Van Nostrand Co., 1893. 382 p., Roy. 8vo.

It is due mainly to Professor Abbe, of Jena, that, during the past twenty years, a real science of "microscopy" has come into existence, the aim of which is to develop the theory of the objective and to enlarge its hitherto limited powers. In fact the practical application which he has made of the laws of diffraction is the basis of by far the greater part of all the advance which has recently been made in the use of the microscope for scientific purposes. His investigations have not only resulted in the production of lenses of unequalled delicacy and perfection but have imparted a new interest to the study of purely theoretical optics and have given rise to a large and growing literature of the subject. The increased importance thus conferred on this phase of the matter, together with the rapid broadening of the field of research, has led to a desirable separation between the study of the microscope as an instrument, and the study of the results of its employment.

Dr. Van Heurck's book is in the line of this change of relation. Its purpose is a survey of microscopical science from its technical, or, perhaps we should say, manipulative side. Although the language into which the work is translated is seldom wholly easy and natural, and occasionally becomes even awkward and obscure, the author may feel that, on the whole, his subject is presented to English readers in an interesting and attractive form. Dr. Van Heurck has long been known as a patient student of certain difficult problems in interpretation and a diligent cultivator of lines of microscopical work calling for expert skill in the handling of accessories, and it is in these directions that his book is strongest and most complete. We should hardly be justified, however, in characterizing his work as a symmetrical and systematic résumé of even the mechanical side of what is commonly known as microscopy. In truth it seems to us to be somewhat lacking in order and in equality of treatment of its various topics. It is in a measure a record of the author's own contributions to the progress of his favorite department of learning and therefore of necessity bears an evident personal stamp. The pride which he feels in his long experience and creditable achievements doubtless affects to some extent his sense of proportion, so that points to which he has himself happened to give particular attention are at times accorded what we may regard as a little undue prominence. Thus, for example, we are inclined to think too much space is given, and too much importance attached, to the subject of electrical illumination (pp.109-117), and that the praise bestowed upon the stand devised by Dr. Van Heurck (pp.224-232) is rather more unqualified than is appropriate to the circumstances under which it appears. One may reasonably question his assertion that "electrical incandescent illumination is superior to any other kind of illumination" for the microscope, and may well doubt whether he is fully justified in pronouncing his own stand "a perfect instrument." But these criticisms need not be taken as any disparagement of Dr. Van Heurck's authority on questions of construction and manipulation. In these matters, as we have already said, his knowledge and ability are generally conceded, and the novice will not go far astray in following

his advice. If there is any fault to be found with his guidance it is likely to be that in places it is too profuse and painstaking. Thus, in common with most other writers of microscopical text-books, he appears to us unnecessarily lavish in the space devoted to the mere cataloguing of the instruments of many makers, which differ from one another mainly in pattern; and we feel disposed to ask whether a general description of the essential parts and qualities of a good stand, in each class, would not answer every purpose and enable the author to dispense with some pretty bad borrowed woodcuts. While on this subject, we venture to suggest, also, that much of the details under the heading "The Photographic Processes" might be omitted with profit, since they rehearse particulars which one may obtain in any manual of photography and which are not peculiar to photo-micrography. Indeed, some of the directions seem to be merely extracts from a general hand-book, as, for instance, where we are told (p. 272) that in development we shall get "first the sky and the high lights."

Beyond those portions which deal with the handling of the instrument and the preparation of specimens, this work undertakes to cover the theory, the history and the literature of the microscope. The chapter devoted to "Experiments on the Application of Dr. Abbe's Theory of Microscopic Vision" is a reproduction of Mr. J. W. Stephenson's very valuable paper presented to the Royal Microscopical Society in 1877, which Dr. Van Heurck has edited with a view to making it conform to the modifications which Prof. Abbe's views have since undergone. The chapter on "The Microscope in the Past and in the Future" is an abridgment of the Cantor Lectures of Mr. John Mayall, Jun., delivered in 1885. The chapter headed "The Microscopist's Library" is an incomplete list of periodicals and books not always up to date.

Notwithstanding the fact that the work before us is rather too sumptuous and bulky for everyday use by the student, it will doubtless prove a welcome addition to the library of the scientific amateur, and will perform a useful part in the promotion of interest in the instrument of which it treats.

FOSSIL RESINS.

This book is the result of an attempt to collect the scattered notices of fossil resins, exclusive of those on amber. The work is of interest also on account of descriptions given of the insects found embedded in these long-preserved exudations from early vegetation.

By CLARENCE LOWN and HENRY BOOTH;
12°. \$1.

N. D. C. HODGES, 874 Broadway, N. Y.

SOFTLY STEALS THE LIGHT OF DAY
when filtered through windows covered with

CRYSTOGRAPHS,

a substitute for Stained Glass that is inexpensive, beautiful, and easily applied.

20c. per square foot. Samples and catalogue, 10c.

CRYSTOGRAPH CO.,

316 North Broad St., Philadelphia.



Piso's Remedy for Catarrh is the Best, Easiest to Use, and Cheapest.

CATARRH

Sold by Druggists or sent by mail.
50c. E. T. Hazeltine, Warren, Pa.

ABOUT 20
MAGIC LANTERNS
ASK US
WE MAKE THEM
J. B. COLE & CO.
168 B'way N. Y. 189 ASA B'way
NEW YORK CHICAGO

BUILDING BOOKS.

DRAWING INSTRUMENTS.

1893 Catalogue

of Books on Building, Painting, and Decorating, also Catalogue of Drawing Instruments and Materials, sent free on application to

Wm. T. Comstock,
23 Warren St., New York.

RESTORE YOUR EYESIGHT

Cataracts, scars or films can be absorbed and paralyzed nerves restored, without the knife or risk. Diseased eyes or lids can be cured by our home treatment. "We prove it." Hundreds convinced. Our illustrated pamphlet, "Home Treatment for Eyes" free. Don't miss it. Everybody wants it. "The Eye," Glens Falls, N.Y.

Every reader of "Science" should subscribe for the

AMERICAN ARCHITECT, THE OLDEST AND BEST

Architectural publication in the country. Interesting articles on architecture, Sanitation, Archæology, Decoration, etc., by the ablest writers. Richly illustrated. Issued weekly. Send stamp for specimen copy to the publishers,

Ticknor & Co., 211 Tremont St., Boston.

THE AMERICAN RACE.

By DANIEL G. BRINTON, M.D.

"The book is one of unusual interest and value."—*Inter Ocean*.

"Dr. Daniel G. Brinton writes as the acknowledged authority of the subject."—*Philadelphia Press*.

"The work will be of genuine value to all who wish to know the substance of what has been found out about the indigenous Americans."—*Nature*.

"A masterly discussion, and an example of the successful education of the powers of observation."—*Philadelphia Ledger*.

Price, postpaid, \$2.

N. D. C. HODGES,
874 BROADWAY, NEW YORK.