decisions of the courts. His work in connection with the harmonic telegraph, a very interesting invention which belongs to him, led him to an understanding of the principles underlying the telephone, and the caveat which he filed in the patent office showed that he was very close to the realization of his ideas in this direction. Nevertheless, the fact that Mr. Bell had shown and described an apparatus capable of actually transmitting speech and one which survives to-day as the receiving instrument, gave him a more positive claim which, in connection with other technical and legal facts, resulted in a final decision in his favor. The telautograph, like the harmonic telegraph, has not yet become of great practical value, although both are ingenious and beautiful devices. It would seem that Dr. Gray had been most unfortunate with his inventions in spite of his natural genius. It was not due, however, to lack of mental clearness or grasp, but more likely resulted from insufficient business ability. The books which he has recently written reflect very faithfully the mind of the man. To him science was not abstruse or formal, but a familiar, matter-of-fact and attractive subject. In a clear and picturesque style, he treats the principles and applications of electricity as well as other branches of science. These books could be understood sufficiently to be interesting even by the least technical of readers. On the other hand those well acquainted with the subjects would find at least a new point of view. It is notoriously difficult to write a really satisfactory scientific book of an elementary character. This inherent difficulty is magnified by the fact that most persons who undertake it are not masters of their subject. No such criticism can be made of Dr. Gray, and the lucidity of his ideas and his language are adapted to the task. The writer was well acquainted with Dr. Gray personally and knew his great enthusiasm for science, which is another quality necessary in the writer of an elementary work, in order to inspire his readers who are beginners or those who have comparatively little taste for such matters. For these reasons the series of books that Dr. Gray has written are to be recommended as interesting and instructive to the general or even casual reader, but they are too conversational for use as text-books, except perhaps to supplement other more formal works.

F. B. Crocker.

Columbia University.

March 6, 1901.

BOOKS RECEIVED.

Hygiene and Public Health. Louis Parkes and Henry Kenwood. Philadelphia, P. Blakiston's Son & Co.; London, H. K. Lewis. 1901. Pp. xix + 732.

The Agricultural Experiment Stations in the United States. A. C. True and V. A. Clark. Washington Government Printing Office. 1900. Pp. 636.

Experimental Psychology, a Manual of Laboratory Practice. Edward Bradford Titchener. New York and London, The Macmillan Company. 1901. Pp. xviii + 214.

The Human Nature Club. Edward Thorndike. New York, London and Bombay, Longmans, Green & Co. 1901. Pp. vii + 235.

Practical Organic Chemistry. Julius B. Cohen. New York and London, The Macmillan Company. 1899. Pp. xiii + 200.

Practical Gas-Fitting. Paul N. Hasluck. London, Paris, New York and Melbourne, Cassell & Company, Limited. 1900. Pp. 160.

A Manual of Elementary Science. R. A. Gregory and A. T. Simmons. New York and London, The Macmillan Company. 1901. Pp. viii + 429.

The Industrial Revolution. Charles Beard. New York, The Macmillan Company. 1901. Pp. x + 105. 40 cts.

SOCIETIES AND ACADEMIES.

BIOLOGICAL SOCIETY OF WASHINGTON.

The 336th regular meeting was held on Saturday evening, March 9th.

C. W. Stiles presented a note on a recent visit to Texas, whither he had been called to investigate a disease of cattle ascribed to the presence of a parasite in the lungs. He had discovered that the disease was really due to a parasite of the genus *Strongylus* which infested the fourth stomach of the animals infected.

Barton W. Evermann read a paper on 'The Feeding Habits of the Coot and other Water Birds,' based upon observations made at Lake Maxinkuckee, Indiana, by Dr. Evermann and Mr. H. Walton Clark. In 1899 the observations

covered the period from July 1st to October 18th, and in 1900 they began July 1st and have been continued up to date.

Many very interesting observations were made regarding the feeding and other habits of the coot and numerous species of ducks. The paper was devoted chiefly to the coot, the habits of which, at this lake, were found to differ widely from most of the published records of its life history.

It was found that the coot is quite as aquatic in its habits as are most ducks; it swims freely and easily in all parts of the lake. It dives regularly and gracefully when feeding, and in water as deep as twenty-five feet, though its usual feeding grounds were in water four to eighteen feet deep. The longest time any individual was observed to remain under water was sixteen seconds in water ten to twelve feet deep. In deeper water the time was doubtless longer, but could not be definitely determined.

The choice food in September and October was the modified stolons or winter buds of the wild celery (*Vallisneria spiralis*), but later other parts of this plant, and other plants (among them *Myriophyllum verticulatum*, *Potamogeton pectinatus* and other Potamogetons) were utilized. When feeding, which it does at all hours of the day and night, it is not taciturn, as stated by Nuttall, but very sociable and loquacious, constantly talking to its associates day and night; as an article of food the coot is superior to many species of ducks.

Mr. Clark is continuing his observations at Lake Maxinkuckee during the winter and spring, and doubtless other interesting facts will be discovered.

Under the title, 'More about the Cocoanut,' O. F. Cook continued the argument brought forward in a previous paper that the cocoanut palm is an American and not an Asiatic or Malayan species, and that its original habitat is not to be sought on the sea-coast, but in the mountains of Colombia, where it has been reported far inland. It is apparently unable to establish or maintain itself in competition with the usual floras of tropical coasts, and its general dissemination and present range are believed to be the result of human agency. The prehistoric distribution, the Malayo-Polynesian names, and the uses attaching to the cocoanut, the sweet potato and other economic plants of American origin, suggest the probability of a very early westward migration of a primitive culture-race.

A. H. Howell gave some 'Notes on the Distribution and Nomenclature of North American Skunks,' recognizing seventeen species and subspecies and showing specimens illustrating their color variations. Several important changes in nomenclature were referred to, the details of which will be given in a revision of the group about to be published by the Biological Survey of the Department of Agriculture.

F. A. LUCAS.

CHEMICAL SOCIETY OF WASHINGTON.

THE 124th regular meeting was held on February 14th. Dr. H. Carrington Bolton, the retiring president, addressed the Society on the subject 'Physics and Faith.' (SCIENCE, XIII., 320.)

The following papers were then presented:

'The Solubility of Gypsum in Aqueous Solution of Sodium Chlorid,' by F. K. Cameron. This paper was a description of the continuation of investigations along this line previously reported by the author. It was found that the solubility curve presented a maximum point even when calculated on the basis of a given mass of solvent instead of a given volume of solution. A discussion together with the results of experiments was given on the nature of the hydrate of calcium sulfate in the solid phase in contact with certain solutions. A theoretical discussion of the results was presented, and some practical applications pointed out.

'Equilibrium between Carbonates and Bicarbonates in Aqueous Solution,' by F. K. Cameron and L. J. Briggs. The curves showing the distribution of the base between the two salts for solutions in equilibrium with ordinary air were shown. For solutions of the salts of sodium, potassium, or magnesium, as infinite dilution is approached, the bases are all combined as hydrogen carbonates. As the total concentration increases, the percentage of base combined as normal carbonate increases rapidly to a certain point, then asymptotically

and as the solutions approach high concentration, there is again a falling off showing the existence of maximum points on the curves. Solutions of calcium salt contain so little normal carbonate when in equilibrium with air, that practically they may be considered as containing only the hydrogen carbonate. With rise of temperature in all cases, there is an increase in the proportion of normal carbonate in the solution, and at 100° C. all the base is combined as normal carbonate for practically all concentrations. A theoretical discussion accompanied the paper, and practical applications of the results were pointed out.

L. S. Munson,
Secretary.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

The 531st meeting was held March 2, 1901. Under the head of informal communications Mr. Farquhar stated that eye observations on the Nova and Perseus showed considerable fluctuations in brilliancy from night to night. Mr. Bauer stated that the Toronto magnetic observations at the time of the Solar eclipse showed a slight disturbance coincident with the passage of the sun's shadow. Analysis shows that this is due to causes outside the earth's crust, and probably due to changes in the upper atmosphere caused by the passage of the shadow.

The first regular paper was a report by Father Hagen on 'Progress in Astronomical Photometry.' It grouped the facts into four classes:

1. *Photometric Catalogues* with regard to brightness and color of stars. Special mention was made of the Harvard Photometry and of Osthoff's catalogue of star colors.

2. *Original Observations of Variable Stars* were mentioned, in particular those published lately by Peck, Knott and Pickering.

3. The *Physical Explanation* of the light variations is advanced by the discovery of coincidence between the light curves and velocity curves in the three variable stars: δ Cephei, η Aquilae and ζ Geminorum.

4. Various *Charts for Variable Stars*, distributed or published for the convenience of observers, were mentioned, with special reference to Pogson's charts. This part of the report was illustrated by lantern slides.

The next paper was a report by Mr. Radelfinger, on 'Progress in Pure Mathematics in 1900.' This dealt first with important books, referring to the great Mathematical Encyclopedia now in course of publication, and to Forsyth's 'Differential Equations' in two volumes. A brief historical account of the treatment of the ordinary differential equation from the time of Briot and Bouquet introduced an outline of Painlevé's very recent and successful attack on the equation of the second order: he had discovered three new uniform functions, and completely solved the problem of determining all equations of the second order whose integrals are uniform functions. Painlevé's method promises important results from its application to equations of higher orders.

Professor See's report on the 'Progress of Astronomy in 1900' dealt very briefly with the publication of the results of the observations on the Transit of Venus; the observations on Eros, in which about 50 observatories are engaged; the discovery of several hundred double stars, and the publication of double-star catalogues; The observations at the Naval Observatory of planetary diameters with a color-screen; and Rees's new determination of the constant of observation, which he finds to be $20''.464$.

Charles K. Wead,
Secretary.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the 111th meeting, held on February 27, 1901, at the Cosmos Club, the following papers were presented:

Memorial of Thomas Benton Brooks: Mr. Bailey Willis. (Published in Science March 22.)

Morphogeny of Southern Alaska: Mr. G. K. Gilbert.

Mountain Structure in the Trans-Pecos Province of Texas: Mr. Robert T. Hill.

The last two papers were illustrated by lantern slides.

F. L. Ransome,
David White,
Secretaries.

SECTION OF GEOLOGY AND MINERALOGY OF THE NEW YORK ACADEMY OF SCIENCES.

AT the meeting of the Section on February 18, 1901, the following program was presented:

'The Granite of Barre, Vermont,' by George I. Finlay. The speaker described the occurrence of the granite as a single intrusion through the country rock, which is a biotite schist, in the southeastern portion of Barre township. Many inclusions of the schist are found in the granite, and this rock has almost surrounded other masses of the schist which remain in place, with their original strike and dip unchanged. The speaker employed a series of original lantern views to illustrate the character of the jointing, the 'onion structure,' and the zones of shearing, together with certain large systems of joints, standing at right angles to each other, resulting from pressure. Microscopic examination shows that the granite consists of microline and orthoclase, plagioclase, in very small amounts, quartz, biotite and muscovite, with occasional crystals of apatite and magnetite and rarely pyrite. Variations in the shade of the marketable granite, from very light to very dark gray, are due to the relative amounts of biotite which it contains. The rock is of medium grain and its constituent minerals are but slightly weathered. Pegmatitic offshoots, traceable directly to the granite mass were recorded by Mr. Finlay, and their dynamic effects on the enclosing schists were illustrated. The contact metamorphism of the schist is inconsiderable. It is chiefly shown in the greater abundance of biotite and quartz in the immediate vicinity of the granite. Two dikes of augite-camptonite were found; one in the granite, the other in the country-rock. They are notable for the manner in which they have weathered. At times sixteen successive shells may be counted which are ready to break away from the main mass of the dike. Mention was also made, in discussing the glacial geology of the region, of sand plains and of two well developed eskers.

The paper was discussed by Professors Kemp and Dodge and Drs. Julien and White.

'Note on a Sand Fulgurite from Poland,' by A. A. Julien. Dr. Julien exhibited a specimen of Fulgurite formed from sand, in Poland, with a series of micro-photographs which he had made from the same. Some new features in fulgurites were pointed out in this specimen: pustules of glass on the inner lumen, glass-fibers on the exterior, and adhering sand-grains, two-thirds of which consist of orthoclase. In the thin cross-section, examination of the minute gas-cavities showed the absence of condensed water-vapor, and this indicated a dilatation of both lumen and cavities by air, more than by steam. The radial arrangement of layer cavities, the hornlike projections on the exterior of the tube, and the pustules along the lumen were all shown to be connected with relief of intense pressure outwardly during the electric discharge, or inwardly during the reaction after its passage. This fulgurite is of further interest in presenting the first instance yet observed of devitrification, the glass being generally filled with delicate crystallites, apparently of feldspar. All the bubbles, however, are enclosed in pellicles of homogeneous glass, and some of the larger within a coating of suddenly chilled glass, which is free from crystallites. The relation of these facts was discussed in reference to Lagorio's view as to the difficult saturation of a magma by the constituents of feldspar.

Other occurrences of fulgurites were discussed by Drs. Kemp, Levison and White.

THEODORE G. WHITE,
Secretary.

THE MINNESOTA ACADEMY OF NATURAL SCIENCES.

THE February meeting of the Academy was addressed by Professor N. H. Winchell and Mr. Warren Upham on the following topics, respectively: 'The Retreat of the Ice Margin Across Minnesota' and 'Giants' Kettles in the Interstate Park, Taylor's Falls.'

Professor Winchell called attention to the general topography by means of a map of the State divided into three areas, viz.: Those areas above 1,400 feet, those between 1,400 and 1,300 feet, and those below 1,300 feet, remarking that, as the ice must have slowly encroached, in the form of glaciers, in the low-

lands, so it must have left the State last in the lowlands. That necessitated the two great ice-lobes, one from the north and northwest and one from the northeast. The former occupied the basin of the Red river of the North and the Minnesota valley, and the latter the valley of Lake Superior with its western tributaries. These at length united in one general ice sheet, but when they retired they assumed again their lobate forms outlined by moraines, and finally allowed an uncovered interlobate area of the high lands about the region of the Upper Mississippi. By the growth of this uncovered area the ice lobes shrank to smaller dimensions and disappeared entirely, the latest to finally leave the State being the northeastern lobe.

The belt along which these ice lobes collided in the central part of the State can be traced by the overlapping and confusion in the characters of the drift, the northwestern drift being normally gray and the northeastern red. This belt he marked out in general as continuing from Rice county to St. Paul, thence northwestwardly to the region of Itasca lake where it turns eastward, passes along the range known as Giant's range, and leaves the State not far from the extremity of Pigeon point. Wherever these ice-lobes uncovered land that slopes northerly, or toward the ice itself, the discharged waters formed lakes whose outlets, beaches and areas are sometimes well known, the chief of which is Lake Agassiz, described by Mr. Warren Upham. Twenty-five other such lakes were defined by Professor Winchell within Minnesota, varying in elevation from 890 feet to 1,700 feet above sea level.

Mr. Upham, in his lecture on 'The Giants' Kettles in the Interstate Park,' stated in substance that within an area of two or three acres in the northern part of the Interstate Park are found about seventy rock potholes, or giants' kettles, as they may be called in agreement with their common designation in the languages of Germany, Sweden and Norway. This area of their abundant occurrence is unsurpassed in respect to their numbers, depth and difficulty of explanation, by any other locality in the world, although many places, as in Maine, nearly all the other New England States, the vicinity of Christiania, Norway, and the Glacier Garden in Lucerne, have very remarkable giants' kettles.

At Taylor's Falls they range in diameter from a foot or less to 25 feet, and in depth from one foot or a few feet to 65 feet and 84 feet, these being the depths to which two potholes 25 feet apart have been excavated and sounded, but without yet reaching to their bottoms. In many cases the ratio of diameter to depth is as 1 to 5 or 1 to 7 with nearly cylindric, but occasionally somewhat spiral or rifle-like, form. The rock is the very hard Keweenawan diabase, scarcely exceeded in hardness by any known rock. From many features of these giants' kettles, as notably their abrupt rims and the generally unworn adjoining rock surface, Mr. Upham attributed their erosion to torrent-falling through moulins, vertical shafts of the ice sheet which covered this region in the Glacial period. Some of these kettles were filled and covered by drift, but the greater number are empty, excepting scanty gravel at the bottom, with a few water-rounded boulders. The adequacy of moulin torrents to erode the smaller as well as the larger kettles is shown by small potholes of such origin, in some instances only about a foot or two in diameter and depth, on the high ridges and tops of hills and mountains in Maine, New Hampshire and Vermont.

The above is but a brief summary of these two very instructive lectures which were delivered to a large audience in the Academy Assembly Hall.

F. G. Warvelle.

SHORTER ARTICLES.

CHIASMODON IN THE INDIAN OCEAN.

The Indian government survey steamer *Investigator*, Captain T. H. Henning, R. N., commanding, which has recently been engaged in beam-trawling off Cuddalore and Point Calimere on the southeast coast of India, has obtained a small specimen of the rare deep-sea fish, *Chiasmodon niger* Johnson, from a depth of 1,100 fathoms.

This species has hitherto been known only from four localities in the Atlantic. It was first reported from the Madeira Islands in 1850,