

abundant Latinisms, ambiguous phrases, and awkward statements reveal that this process has not been very successfully accomplished in the present instance.

JOSEPH JASTROW.

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BOOKS RECEIVED.

Plane Trigonometry. DANIEL A. MURRAY. New York, London and Bombay. Longman's Green & Co. 1899. Pp. xiii + 95.

Irrigation and Drainage. F. H. KING. New York and London, The Macmillan Company. 1899. Pp. xxi + 502. \$1.50.

The Logical Bases of Education. J. WELTON. London and New York, The Macmillan Co. 1899. Pp. xvi + 288. \$1.00

Muscle, Brain and Diet. EUSTACE H. MILES. London, Swan, Sonnenschein & Co. New York, The Macmillan Company. 1900. Pp. xv + 339.

Elementary Chemistry. ALBERT L. AREY. New York and London, The Macmillan Co. 1899. Pp. xi + 271. 90 cents.

Plant Structures. JOHN M. COULTER. New York, D. Appleton & Co. 1900. Pp. ix + 349.

Central Station Electricity Supply. ALBERT GAY and C. H. YEAMAN. London, Wittaker & Co. New York, The Macmillan Co. 1899. Pp. xiii + 467. \$3.00.

Water and Water Supplies. JOHN C. THRESH. Philadelphia, Pa., Blakiston's Sons & Co. 1900. Pp. xx + 438. \$2.00.

A Text-book of Physics. W. WATSON. London, New York and Bombay. 1899. Pp. xii + 896. \$3.00.

SCIENTIFIC JOURNALS AND ARTICLES.

THE New York Botanical Garden has begun the publication of a monthly journal to contain notes, news and untechnical articles of general interest. It is edited by Dr. D. T. MacDougal, director of the laboratories, and is sent free to members of the Garden. The first number, containing sixteen pages, opens with an article on the Museum building by Dr. N. L. Britton, with a plate, and this is followed by short unsigned articles on 'Coöperative Forestry,' 'Etiolated Plants as Food,' 'Micorhizas of Orchids' and 'Colors.' At the end there are notes on recent accessions to the Gardens and on other subjects of botanical interest. The New York Botanical Garden now has four series of publi-

cations. The *Journal* just mentioned, the *Bulletin*, containing official documents and technical articles, *Memoirs* and *Contributions*, the latter being reprints from other journals.

THE December number of the *Bulletin of the American Mathematical Society* contains a report of the October meeting of the Society, by the Secretary; 'Note on the Simply Transitive Primitive Groups,' by Dr. G. A. Miller; 'On the Commutators of a given Group,' by Dr. G. A. Miller; a review of Oltramare's 'Calcul de Généralization,' by Professor E. O. Lovett; 'Shorter Notices'; 'Notes'; 'New Publication.' The January number of the *Bulletin* contains the Presidential Address of Professor R. S. Woodward. 'The Century's Progress in Pure Mathematics,' delivered at the annual meeting of the Society, December 28, 1899; 'The Status of Imaginaries in Pure Geometry,' by Professor Charlotte Angas Scott; 'Notes'; 'New Publications.'

SOCIETIES AND ACADEMIES.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the 94th meeting and 7th annual meeting, held December 13, 1899, the following officers were elected for the ensuing year: *President*, Whitman Cross; *Vice-Presidents*, J. S. Dilller, C. W. Hayes; *Treasurer*, M. R. Campbell; *Secretaries*, F. L. Ransome, David White; *Members-at-large of the Council*, G. P. Merrill, Bailey Willis, A. H. Brooks, Waldemar Lindgren, G. O. Smith.

THE 95th regular meeting was held January 10, 1900. Under informal communications Mr. G. P. Merrill exhibited and briefly described a nepheline-melilite-basalt from Rocky Hill, Oahu, where it had been found in place by Professor C. H. Hitchcock. It was stated that while a rock of this type had been previously described by Wichmann and others from fragments brought by vessels as ballast, this was, it was believed, the first discovery of the rock in place.

Under the regular program the following papers were presented:

(1) Mr. Joseph A. Taff: 'Structural Features

of the Ouachita Mountain Range in Indian Territory.'

This mountain range is 200 miles long and trends west from the vicinity of Little Rock, Arkansas, into Indian Territory. It is separated from the Ozark uplift on the north by the east and west trough of the Arkansas valley. It is abruptly terminated on the east by the Tertiary overlap of the Mississippi embayment. The Cretaceous peneplain comes up on the south side of the range and Cretaceous rocks conceal much of the structure. On the west the strike of the folds turns toward the south, and the latter pass under Cretaceous sediments. As far as known, the rocks involved in the Ouachita uplift are Silurian shales, sandstone, limestone, and novaculites—2560 feet; Lower Carboniferous (Branner)—18,480 feet; and Upper Coal Measures—5300 feet; making a column nearly five miles in thickness. The sandstones become thicker and coarser toward the south.

The structure of the range is Appalachian. In the center of the range the folds, in massive sandstone, are wide and long. Near the periphery the folds are shorter and generally overturned, compressed and faulted. Some of the faults have vertical displacements of several thousand feet. The uplift began before or during the Carboniferous and culminated after that period.

(2) Mr. Geo. P. Merrill: 'The Gem Mines near Bakersville, North Carolina.' Specimens were shown and a brief account given of the pegmatitic veins in which the beryls (emeralds and aquamarines) occur.

(3) Mr. Arthur C. Spencer: 'A Peculiar Form of Talus.'

In some of the high basins of the San Juan Mountains, Colorado, the encircling cliffs have supplied at certain points an excess of débris, which has advanced across the floor of the glacial cirque as a tongue, simulating the form of a small glacier. The slope of these lobes may be as low as one in six, and their thickness may reach fifty feet. The surface of the talus-stream shows, in each case, a series of roughly concentric ridges, suggestive of differential and periodic downward movement. The chief force involved has doubtless been gravity, acting

upon the mass of loose rock. The movement within the mass may, however, have been facilitated by interstitial ice derived from sifting snow or percolating water.

F. L. RANSOME,
DAVID WHITE,
Secretaries.

BIOLOGICAL SOCIETY OF WASHINGTON.

316TH MEETING, SATURDAY, JANUARY, 13TH.

W. R. MAXON exhibited an abnormal flight feather from the peacock, in which the shaft was double for nearly its entire length.

William Palmer exhibited a series of specimens of *Onoclea sensibilis* showing variations due to conditions of environment, such as shade, exposure to light, moisture or dryness.

Vernon Bailey told 'Where the Grebe Skins come from,' and how the birds are killed by thousands among their nests on the lakes of eastern Oregon and California. Three species, the western, the eared, and the pied-billed grebe were found breeding among the tules in the shallow waters of Tule Lake, California, and here the hunters were engaged in shooting the old birds, stripping the skins from their breasts and shipping them to San Francisco. From twenty to fifty cents were received for a skin and the hunters were making from twenty to thirty dollars a day. At the present rate of destruction the birds will not last many years and the speaker raised the question, can they not be protected?

William Palmer spoke of 'the Ferns of the Lower Shenandoah Valley,' illustrating his remarks by specimens, showing their variation as compared with similar species from the vicinity of Washington due to the conditions under which they grew. In the case of every species but one the valley habitat was the dryer of the two resulting in the production of narrower fronds and less herbaceous plants. The deforestation of the valley and the grazing of sheep and cattle have caused the almost complete extermination of ferns, except in favored and very rocky localities, among the limestone bluffs and mountain streams. Many species common about Washington, and growing luxuriantly in wooded situations, were either absent

or represented by few examples and these reduced in size and starved.

J. W. Daniels described 'Zoological Collecting in Cuba' speaking of the richness of the fauna and the difficulties that attended the work owing to the thickness of the vegetation.

E. L. Morris presented 'a Revision of the Species of *Plantago*, commonly referred to *P. Patagonica* Jacq.' stating that a number of distinct species had been combined under this name or its variety *gnaphalioides*, some of which were as yet undescribed. The species could be divided into two groups, distinguished by the form of the bracts, *Plantago Patagonica*, the speaker stated did not occur in North America.

T. W. STANTON,
Secretary.

WASHINGTON CHEMICAL SOCIETY.

THE regular meeting was held on January 11, 1900. The following officers were elected for the ensuing year: *President*, Dr. H. C. Bolton; *Vice-Presidents*, Mr. V. K. Chesnut, Dr. Peter Fireman; *Secretary*, Mr. William H. Krug; *Treasurer*, Mr. W. P. Cutter; *Executive Committee*, the above officers and Messrs. Wirt Tassin, E. E. Ewell, H. N. Stokes, F. K. Cameron and W. F. Hillebrand.

WILLIAM H. KRUG,
Secretary.

THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY.

IN addition to the program as announced for the January meeting of the New York Section of the American Chemical Society, Dr. George F. Barker, of the University of Pennsylvania and a past president of the Society, was present and made a very interesting address on the more recent developments growing out of the Röntgen ray investigations, describing and exhibiting a sample of radium or 'Radio-Active Substance A,' as named by the German chemists who are working on the subject. This substance emits rays which cause an impression of feeble phosphorescence to the eye, but which are not light. In other words, they are rays which cannot be reflected nor refracted. Nor can they be prevented from acting on a

photographic sensitive plate by three thicknesses of black paper added to as many thicknesses of orange yellow paper; and images were shown on a plate which had been made through all this thickness of protective covering.

Few people have had the opportunity of seeing this substance, and Professor Barker's address was listened to with the closest attention.

Mr. Allen Hazen exhibited lantern slides 'Illustrating Filters for Purifying Public Water Supplies,' many of them taken in different foreign cities, but the largest number showing the process of construction and the finished work of the immense covered filter beds at Albany, which are capable of delivering about 9,000,000 gallons a day.

J. A. Mathews read a paper on 'Laboratory Method for Continuous and Uniform Generation of Acetylene and its Purification' and 'Upon the Carbide of Gold'; C. W. Volney, 'On the Reactions of Alkalis with the Cellulose Nitrates.

Dr. McMurtrie, the recently elected president of the society at large, was present, and made a short address, expressing his appreciation of the honor conferred by his election, and the hope that he would receive the hearty co-operation of all the Sections of the Society.

Nearly one hundred members and friends were present, and the first meeting of the new year gives promise of increasing interest and enthusiasm in the work of the Section and of the Chemists' Club, the rooms of which prove so satisfactory for the purposes of the Club as well as for the meetings.

DURAND WOODMAN,
Secretary.

ZOOLOGICAL CLUB, UNIVERSITY OF CHICAGO. MEETINGS OF OCTOBER AND NOVEMBER, 1899.

AT the first session of the Club on October 18th a paper entitled, "The Significance of the 'Spiral Type' of Cleavage" was read by Mr. C. M. Child. The paper was the result of observations upon the cleavage of *Arenicola* and *Sternaspis* supported by a comparison with the cleavage of other forms which show the same type. The principal points urged are briefly as follows: the cleaving egg must be regarded as an organism, not merely as a cell

colony or cell mosaic. Differentiation and cell division, even in the spiral type of cleavage, are independent phenomena, though they may coincide more or less closely in point of time. The spiral type must have been originally due to mechanical causes, but is certainly, at present, hereditary. It is followed by a bilateral form of cleavage which is morphogenetic in character, *i. e.*, the direction and time of division and the size of the cells all contribute directly to the establishment of form in the embryo. This bilateral cleavage has encroached upon the preceding spiral period in consequence of a condensation of the process of development. The determinate character of the cleavage makes possible the massing of large amounts of material in certain cells, which thus become centers of distribution, but this segregation is quantitative rather than qualitative so far as 'organ forming material' is concerned. An adequate conception of the extreme plasticity of the cell is necessary for a satisfactory interpretation of the phenomena of spiral cleavage.

The second session of the Autumn Quarter was held November 1st. Mr. R. H. Johnson read a paper reviewing and criticising some of the recent statistical literature upon the subject of variation. A second paper was contributed by Mr. E. R. Downing reviewing the experiments of Loeb, Morgan and others on the production of cell division and development in unfertilized eggs by chemical reagents.

At the third session, November 15th, Mr. J. M. Prather contributed the results of his study upon the development of the hypophysis in *Amia*. The hypophysis arises about one hundred and sixty hours after fertilization, as a local differentiation of hypoblastic cells in the dorsal wall of the fore-gut far back of the point of union of fore gut with stomodæum. Here the base of the fore-brain is in very close contact with the hypoblast, and this fact indicates that its point of origin is determined by physical factors. Lobes begin to form about the fifteenth day and by the thirty-fifth day the organ is much lobed, chiefly around the edges. The first lumen appears near the center during the ninth day, while others form in the lobes as they arise. The lumina appear to have

no communication with each other or with the exterior. Neither blood-vessels nor nerves, nor glandular secretions could be found in it at the latest stage examined. The saccus vasculosus begins to form about the tenth day, as an evagination at the posterior lower angle of the infundibulum and grows backwards under the base of the hind-brain. It is thus quite remote from the hypophysis at all stages. Granular secretions were found in it as early as the twenty-second day. It is inferred that what Kupffer considered the earliest stage of the hypophysis in *Acipenser* is the anterior diverticulum of the fore-gut which is metamorphosed into the adhesive organ.

The second paper, read by Miss Anne Moore, was an account of the morphology and life history of *Dinophilus*, *D. Gardineri*, found at Woods Holl. Miss Moore succeeded in observing the actual encystment of *Dinophilus*, thus accounting for the sudden disappearance of the animal noted by other authors.

The fourth session, November 29th, was devoted to a paper by Mr. V. H. Lowe entitled, 'Photographing Insects and other Animals.' Mr. Lowe described in detail the apparatus and methods employed in photographing animals in the field and in the laboratory, including both living and mounted specimens. The paper was illustrated by a number of the author's lantern slides.

C. M. CHILD.

OTTAWA FIELD-NATURALISTS' CLUB.

THE third of the series of Winter Soirées was held in the Assembly Hall of the Y. M. C. A. on January 9th. There was a good attendance of members and strangers. Zoology, ornithology and geology formed the topics of the evening. Professor E. E. Prince, B.A., F.L.S., Commissioner of Fisheries for Canada gave a most instructive paper 'On the Comparative Anatomy of the Ear,' in which he traced the unity of arrangement in the structure and mechanism of that organ from the lowest organism up to the highest, specially adapted to receive vibrations and impart them to the nerves connected therewith. By means of a beautiful series of exquisitely prepared original slides thrown upon the screen, Professor Prince

illustrated the anatomy of the 'true ear' in jelly-fishes, mollusks, birds, fishes, snakes and vertebrates. An interesting discussion followed this paper in which Messrs. Kingston, Evans, R. B. Whyte, besides the lecturer, took part.

Mr. Andrew Halkett of the Marine and Fisheries Department, then read his paper 'On Gannets and Cormorants, with special reference to Canadian forms.' His paper was full of interesting notes of observations in the field and on the shores of the Atlantic and Pacific in British North America.

(1) 'Note on the Occurrence of *Remopleurides* in the Upper Trenton (Ordovician) of Ottawa, Canada; (2) 'On a new species of *Turrilepas* from the Trenton limestone of Governor's Bay, Ottawa, Canada,' are the titles of two brief papers presented by Dr. H. M. Ami. Brief descriptions of each were given and the salient points of difference between them and their nearest allies indicated. The *Remopleurides* is new and nearer *R. Canadensis*, Billings of the Chazy, whilst the *Turrilepas* (opercular valve) is distinct from the only form known from the Ordovician of the Ottawa Valley, viz.: *Turrilepas Canadensis* Woodward, described in 1880, from the Utica formation.

Dr. Ami then drew the attention of the members present to Professor W. H. Hobb's paper 'On the Diamond Field of the Great Lakes,' a subject of considerable importance, and gave an abstract of the results reached from a careful scientific enquiry into the facts relating to the eight specimens of diamonds discovered in glacial and other gravels of Wisconsin, Ohio and Michigan—in material which came over during the glacial period from Canada. This paper was illustrated with lantern slides as was also the next 'On the Principal Places of Geologic Interest about Ottawa,' in which several interesting sections were given and the attention drawn to work still remaining to be done. Mr. A. E. Barlow's paper 'On the Bridge-water Conglomerates,' was taken as read owing to the absence of the author from town. Interesting discussions took place on the specimens exhibited at the meeting and other points of interest in connection with the papers read.

DISCUSSION AND CORRESPONDENCE.

BUCKLEY ON THE BUILDING AND ORNAMENTAL STONES OF WISCONSIN.*

PROFESSOR MERRILL's review of this book I have read, † and in some respects it seems to me to do an injustice to Dr. Buckley.

A State Geological report may be reviewed from the point of view of the citizens of a state, or as a report primarily designed for scientists. It is the latter view which Mr. Merrill, who is connected with a national institution, has naturally taken. The book is objected to upon account of its size. This criticism is perfectly justified from the point of view of general science. However, the citizens of the State of Wisconsin interested in the stone industry desire detailed descriptions and tests of the stones furnished by each of the important quarry centers of the State. Therefore the publication of this material is fully justified in a State report. Of course, the reader who is interested only in science may omit this part of the subject.

In respect to crushing strength tests, of which Mr. Merrill speaks so lightly, whether he is right or not in reference to their uselessness, they must be made in order to promote the building stone industry in a state, for the strength of a stone is one of the questions which an architect invariably asks, and therefore one which the owner of the quarry must be able to answer provided he wishes to put his stone on the market.

Moreover, beside being justified on account of the local value, Dr. Buckley's strength tests do contain material which is of general scientific interest. For instance, Dr. Buckley finds that a number of the limestones of Wisconsin have the enormous crushing strength of 30,000 to 40,000 pounds per square inch (p. 392). Also a number of granites in Wisconsin have crushing strengths which run between 40,000 and 50,000 pounds per square inch (p. 390). The strengths of these rocks are unparalleled by any previous rocks tested. They therefore have an important bearing upon the general scientific question of the depth of the zone of fracture.

* Bull. No. IV. Economic Series No. 2. Wisconsin Geological and Natural History Survey. 1898.

† SCIENCE, N. S., Vol. XI., No. 262, pp. 24-25.