is the effect on the disposition of the animals, and George M. Sternberg tells of the history and possibilities of 'Preventive Medicine.' Finally, J. McKeen Cattell presents 'A statistical Study of Eminent Men.'

The Plant World for January starts a new volume in a new dress, with a cover in two colors designed by Mr. Shull. Having changed its publisher and been copyrighted, it will henceforth appear promptly. It contains 'Obtusilobata Forms of Some Ferns,' by C. E. Waters; 'The Preservation of Our Native Plants,' by Ruth E. Messenger; 'Dimorphism in the Shoots of the Ginkgo,' by G. N. Collins; and numerous short articles and notes. 'The Families of Flowering Plants,' which has been running for three years as a supplement, has been completed, and for the present four pages are added to the size of the journal.

The Zoological Society Bulletin for January contains a description of the recently completed lion house in the New York Zoological Park with notes on its contents, which were mainly presented by friends of the society. A list of the more interesting animals includes a pair of snow leopards, another of Prejvalsky horses, a cape hunting dog (*Lycaon*) and a Tasmanian wolf. This last is the second specimen brought to this country alive, the first being in the National Zoological Park. It is rather surprising to learn that the cheetah is now rare in captivity, at least outside of India. The number contains a brief account of the New York Aquarium and its work.

The Museums Journal of Great Britain for January has an account of the Dutuit Bequest to Paris, which comprises, besides other art treasures, many rare and beautiful books. The collection has been in process of formation since 1832, and had been so well cared for that many of the specimens had never been unpacked. Among the many notes is recorded the formation for the Sydney Museum, New South Wales, of a collection of colors and chemicals used in color making, with samples of fabrics dyed with them.

SOCIETIES AND ACADEMIES.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 32d annual meeting was held December 20, 1902. A new code of by-laws was adopted, the principal change from the old code consisting in the statement of the powers of the general committee in conformity with the statute under which the society is incorporated, and the establishment of an executive committee to care for routine business.

The report of the secretaries showed a present active membership of 110, a net gain of 2 during the year; besides the annual meeting 16 meetings have been held, with an average attendance of 37; 38 papers were presented.

The treasurer's report showed a gross income of about $950 and expenditures of $460.

Professor J. H. Gore, of the Columbian University, was elected president for the ensuing year; Messrs. Hagen, Marvin, Littlehales and Abbe were elected vice-presidents. The treasurer, Mr. Green, and the secretaries, Messrs. Hayford and Wead, were reelected, and the following were elected on the general committee: Messrs. De Caindry, Paul, Winston, Watkins, Briggs, Fischer, Bauer, Day and Harris.

The meeting regularly falling on January 3, 1903, was ordered omitted on account of the meetings of the American Association for the Advancement of Science during the week on which that date fell.

THE 561st meeting was held January 17, 1903, with the new president, Professor J. H. Gore, in the chair.

The evening was devoted to reports from the committee on mathematical science.

Professor Cleveland Abbe, of the U. S. Weather Bureau, spoke of the German Mathematical Union and the new 'Encyclopædia of Mathematics.' The Mathematical Union or Association originated as a branch of the Association of German *Naturforscher und Aerzte* at the Heidelberg meeting of 1889, and its duties were definitely formulated at the Bremen meeting in September, 1890. It now numbers about 550 members; it has published two or three miscellaneous volumes, such as a list of German mathematical theses by can-

didates for the degree of Ph.D., and the catalogue of mathematical apparatus, by Professor Walter Dyck. Its principal publication has been eleven volumes of 'Annual Reports,' containing elaborate reviews of progress in the various branches of mathematics and its applications. In 1894, at the Vienna meeting, the publication of a ' mathematical lexicon' was decided upon, but at the Frankfort meeting of 1896 it was concluded best to combine this idea with the ' Encyclopædia of Mathematical Sciences,' undertaken by Professor W. F. Meyer, of Clausthal, and Professor H. Burkhardt, of Zurich. The mathematical union has, therefore, united with the Scientific Association of Göttingen and the academies of science at Munich and Vienna in becoming responsible for this latter work. It was originally estimated that the encyclopædia would consist of seven volumes in ten distinct parts besides the general index, but the portions already printed show that the whole work will be larger than was expected. The publication has proceeded by parts as follows: 1898, one; 1899, four; 1900, three; 1901, three; 1902, four. These parts are scattered through the encyclopædia as follows: Volume I., seven parts and completed; II., four parts; III., one part; IV., three parts. It may, therefore, be expected that five or six years will still elapse before we shall approach the end of this great work.

Mr. Abbe exhibited the fifteen parts already received, and they were examined in detail by the audience. He remarked upon the chapters treating of the theory of numbers; that on mathematical economics; the memoirs on differential equations; the chapter on mathematical apparatus and machinery, and especially the two memoirs by Professor A. E. H. Love, of Oxford, on the physical basis and the theoretical development of hydrodynamics.

Professor Frank H. Bigelow, also of the Weather Bureau, summarized the 'Applications of Mathematics in Meteorology.' Meteorology has suffered in the past by the misapplication of mathematical theories to the explanation of cyclones and anticyclones, and also of the general circulation. It has been shown that Ferrel's vortex and Oberbeck's vortex do not agree with the modern observations of the local circulation of the air; also, that the theories of these authors must be greatly modified to fit the facts of the movements of the atmosphere in general. Similarly, there has been a tendency to misapply the theory of least squares, and the probability curves, in discussing the periodic cycles observed in the solar and terrestrial atmospheres. These theorems require that the events shall be independent of one another, but in such thermodynamic circulations this is not the case.

The next paper was ' On the Foundations of Geometry and on Possible Systems of Geometry,' by Dr. Henry Freeman Stecker, of Cornell University. In the absence of Dr. Stecker his paper was presented by Mr. Radelfinger.

After an introduction on the assumption which must be made in constructing a geometry, Dr. Stecker reviewed the criticisms of Moore and Schur of Hilbert's classic paper of 1899, recently translated, and announced the conclusions that in spite of all criticisms and attempted improvements Hilbert's system has ' withstood all attacks and remains not only apparently sound in logic, but the simplest of such systems as have thus far been constructed.'

An account was next given of Hilbert's second, and recent, great memoir, *Math. Annalen,* Bd. 56, which has for its object to establish Lie's well-known and indispensable results, without the assumption, made by Lie, that the functions defining the displacements are differentiable. In solving the problem Hilbert makes use of Cantor's theory of point-assemblages and Jordan's theory of a closed curve free from double points. Hilbert's results, so far as they go, establish the independence of Lie's results of the assumption stated above, but they have yet to be extended to elliptic geometry and also to space.

In conclusion, a thesis by Hamel, a pupil of Hilbert's, was discussed, which leads to the conclusion that ' from the standpoint of the calculus of variations the Euclidean geometry is the simplest possible.'

A fourth paper, by Mr. F. G. Radelfinger,

'On the Analytic Representation of Functions,' was postponed till a later meeting.

CHARLES K. WEAD,
Secretary.

THE TORREY BOTANICAL CLUB.

THE club held its regular annual meeting for election of officers at the College of Pharmacy Building, January 13, Dr. Rusby in the chair. The following officers were elected for 1903:

President—Hon. Addison Brown.
Vice-Presidents—Dr. H. H. Rusby and Professor E. S. Burgess.
Treasurer—Professor F. E. Lloyd.
Recording Secretary—Mr. F. S. Earle.
Corresponding Secretary—Dr. John K. Small.
Editor-in-Chief—Dr. John H. Barnhart.
Associate Editors—Dr. N. L. Britton, Dr. T. E. Hazen, Dr. M. A. Howe, Dr. D. T. MacDougal, Dr. W. A. Murrill, Dr. H. M. Richards and Miss Anna Murray Vail.

The treasurer reported a favorable balance in the treasury. The editor reported that 1902 had been the most productive year in the history of the club both in number of pages printed and in plates. An increase of fifty per cent. in the outside subscriptions to Torreya was reported, making this publication practically self-supporting. F. S. EARLE,
Secretary.

THE AMERICAN BOTANICAL CLUB.

DURING the latter half of the year 1902 a new organization known as The American Botanical Club has entered the field of botany. While yet in its infancy, the club has met with remarkable success, having at the close of 1902 an enrolled membership of seventy-six, covering a large portion of the country.

While very liberal in its scope, so as to admit the less advanced students, the club has undertaken an important work by the encouragement of the study of plant life and the preparation of members for deeper research.

Officers for 1903 have been elected as follows:

President—Willard N. Clute.
Vice-Presidents—Miss Pauline Kaufman and Miss Angie M. Ryon.
Secretary—J. C. Buchheister.
Treasurer—Frank A. Suter. F. A. S.

THE BERZELIUS CHEMICAL SOCIETY.

THE 81st meeting of the Berzelius Chemical Society was held in the Agricultural Department Laboratory, Raleigh, N. C., Wednesday afternoon, January 28, 1903. The program was filled by Messrs. C. B. Williams and F. C. Lamb.

Mr. C. B. Williams presented a very interesting abstract of a report of work recently done at the Imperial University of Japan, on ' The Occurrence of Manganese in Plants,' pointing to the conclusion that this element plays a far more important part in plant nutrition than is usually supposed.

A paper was read from Mr. F. C. Lamb, which embodied work recently done by Mr. Lamb in behalf of the Department of Agriculture in the investigation of ' Condimental Stock Foods.' From the work done it is plainly evident that the claims made by the manufacturers of these condimental powders are in most cases perfectly absurd, and the prices charged exorbitant. The powders examined were found to be composed almost entirely of the simple home remedies which have been used by every country ' horse doctor ' from time immemorial.

The following officers have been elected for the ensuing year:

President—C. B. Williams.
Vice-President—W. G. Haywood.
Secretary-Treasurer—J. S. Cates.
Abstractors—G. S. Fraps, S. E. Asbury, P. R. French, F. C. Lamb, W. A. Syme, J. M. Pickell, W. G. Haywood and C. B. Williams.

J. S. CATES,
Secretary.

THE ONONDAGA ACADEMY OF SCIENCE.

THE academy met on January 23 and elected the following officers for the coming year:

President—Dr. E. H. Kraus.
Vice-President—John D. Wilson.
Secretary—Philip F. Schneider.
Corresponding Secretary—Dr. T. C. Hopkins.
Treasurer—Miss Louise W. Roberts.
Librarian—Mrs. L. L. Goodrich.

At the meeting on December 21, Dr. M. W. Smallwood gave an illustrated lecture on the dinosaur fields of Wyoming, based on his visit to that region two years ago. He showed

many interesting views of the dinosaur bones, the quarries and the scenery of the region in which they occur.   T. C. HOPKINS,
Corresponding Secretary.

DISCUSSION AND CORRESPONDENCE.

THE FALL OF BODIES.

THE report of Professor E. H. Hall on the motion of falling bodies recalls an interesting experiment. It was proposed by Newton in order to obtain a proof of the rotation of the earth. The experiment was made by Robert Hooke in 1680. Hooke dropped a ball 27 feet, and it fell toward the east and south. The most complete experiments have been made in Germany. Benzenberg dropped balls 235 feet, and found a small deviation to the south and a marked deviation to the east. His first sixteen trials gave a deviation to the north, but the last fifteen trials more than balanced this. Two years later Benzenberg repeated his experiments, and found a small deviation to the north. It appears to have been the erroneous investigation of this question by Olbers that led Gauss to examine the theory of this motion. Gauss says that, to his astonishment, he found by theory no deviation to the south. Afterwards Laplace examined this question ('Mec. Cel.,' Tome IV.) and found no deviation to the south. The most complete experiment is that of Professor Reich, who dropped balls 488 feet. From 106 trials the deviation to the east was 23.30 mm., and to the south 1.06 mm.

The result appears to be that the deviation to the east is decided, and that to the south or north is so small that it can be ascribed to errors of observation. The probable errors of the results are large. Perhaps good conditions for this experiment can be found in our country.   A. HALL.
February 4, 1903.

MOUNTAIN SPECTRE NEAR BOULDER, COLORADO.

THE term 'mountain spectre' is taken from the Encyclopedia Britannica, where it is noticed under the article 'Halo.' The best-known example is at the Brocken in the Harz Mountains. From the description of the phenomenon as observed at that place, it is in-

ferred that the appearance noted in Colorado was quite as distinct as that at that famous locality. It was observed February 1 from the top of Green Mountain, near Boulder, Colorado. This mountain is a high point in the foothill belt; its summit is 2,500 feet above the plains which it overlooks, or about 7,800 feet above the sea. On the day mentioned, at 4:30 P.M. patches of white cloud were drifting below its summit. Occasional snow flurries visited the plains below. The temperature was apparently below the freezing-point. At the hour of observation the sun, which was not more than twenty degrees above the horizon, was shining clear at the summit. Opposite the sun, a few hundred feet distant, was a mass of white or grayish cloud. Upon this cloud was seen a complete circle of rainbow colors. The diameter of the most pronounced red ring was estimated at nine degrees. Outside of this was a faint blue color, and then a suggestion of red in a still larger circle. Within the nine-degree red ring were blue and violet, the center appearing a dull lavender. In the field within the bright red ring appeared the shadow of the observer, which was so definite as to reproduce all movements of arms and hands. Each observer saw his own shadow and the reproduction of his own movements, and could see nothing of the shadow or movements of his neighbor if standing more than six or eight feet away. The phenomenon was watched about twenty minutes.

N. M. FENNEMAN.
UNIVERSITY OF COLORADO.

SIGNS OF THE GLACIAL PERIOD IN JAPAN.

IN my visit to Japan a few years ago I failed to find any distinct signs of glacial action, though I penetrated what seemed to be a typical place for extinct glaciers in the mountainous region one hundred miles northwest of Tokyo. But Mr. Yeijiro Ono, of the Bank of Japan, has just sent me a translation from a Japanese paper of some observations in the mountainous district a little farther south than that visited by me, which would seem to indicate that there are some relics of the glacial period in the central highlands