Reduction of Hyperelliptic Integrals of Genus Two to Elliptic Integrals by a Transformation of the Fourth Order,' by J. H. McDonald; 'On the Theory of Improper Definite Integrals,' by E. H. Moore; 'On the Convergence and Character of a Certain Form of Continual Fraction,' by E. B. Van Vleck; Notes and Errata, Volumes 1 and 2.

The October number (Volume 8, No. 1) of the *Bulletin of the American Mathematical Society* contains the following articles: 'The Eighth Summer Meeting of the American Mathematical Society,' by F. N. Cole; 'The Ithaca Colloquium,' by Edward Kasner; 'Upon the Non-Isomorphism of two Simple Groups of Order 8!/2,' by Ida M. Schottenfels; 'Concerning Surfaces whose First and Second Fundamental Forms are the Second and First Fundamental Forms respectively of another Surface,' by Alexander Pell; 'Notes,' and 'New Publications.' The November number of the *Bulletin* contains: 'On Wronskians of Functions of a Real Variable,' by Maxime Bôcher; 'The Configurations of the 27 Lines on a Cubic Surface and the 28 Bitangents to a Quartic Curve,' by L. E. Dickson; 'The Fiftieth Annual Meeting of the American Association for the Advancement of Science,' by G. A. Miller; 'Riemann-Weber: Partial Differential Equations of Mathematical Physics,' by J. S. Ames; 'Notes,' and 'New Publications.'

SOCIETIES AND ACADEMIES.

AMERICAN PHYSICAL SOCIETY.

The fall meeting of the American Physical Society was held at Columbia University on Saturday, October 26, President Michelson presiding. The first paper, by F. L. Tufts, described experiments on the effects of stationary sound waves on unignited gas jets. The disturbances caused in such jets by sound waves were made visible by means of the 'Schlieren Methode,' the source of illumination being the spark of an induction coil. The jet was found to assume a vibrating sinuous form, with increased amplitude at greater distances from the orifice. The results could be explained upon the assumption that the initial velocity of the gas, upon issuing from the orifice, is the resultant of its own proper velocity and that due to the vibration of the sound wave. Photographs of unignited jets when disturbed in this way were shown. A second paper by Mr. Tufts dealt with experiments with the ordinary organ pipe. The Schlieren method was applied in this case to show the vibrations of the blast of air blown against the tongue of the pipe, and photographs were shown which gave excellent confirmation of the usual theory of the action of such pipes.

A note on the use of the Arons' mercury lamp as a source of illumination in certain color experiments was presented by Ernest Merritt. The light from the mercury arc is chiefly due to three lines in its spectrum, lying respectively in the violet, the green and the yellow. These lines are sufficiently near to the three primary colors to make the light of the lamp seem not greatly different from white; but when the lamp is used to illuminate colored objects the absence of the red is rendered evident. Red objects, for example, usually appear black when seen by this light. When a selection is made from colored worsteds, such as are used in the ordinary test for color-blindness, the selections are much the same as those made by a red-blind individual.

After the noon recess the Physical Society joined with the Mathematical Society during the reading of a paper by M. Hadamard on the 'Theory of Elastic Plates.' In the afternoon session a note was presented by Wm. Hallock on 'Measurements of Subterranean Temperatures,' in which were given the results of the most recent work on this subject. An instrument for the measurement of entropy was described by A. G. Webster. This 'entropy meter' had not been actually constructed, nor did the speaker think that it would make a very practical apparatus. It showed a possible method, however, by which entropy changes might be automatically registered and measured. Mr. Webster also reported the results of experiments upon the audibility of sound over grass and water. It was found that under similar conditions of quietness, etc., a given sound could be heard almost exactly four times as far over water as over grass. The assumption that water is a perfect reflector, while grass

is a 'black body' toward sound waves, is not sufficient to explain this difference.

ERNEST MERRITT.

BIOLOGICAL SOCIETY OF WASHINGTON.

THE 342d meeting was held on Saturday evenning, November 2.

Mr. H. J. Webber exhibited specimens of the pineapple suffering from the disease termed 'root bind.' This was caused by planting improperly trimmed cuttings, which caused the roots as they developed to wind tightly around the stalk, causing defective nutrition and finally death.

Charles Louis Pollard gave some 'Notes on a Trip to Mount Mitchell,' made during the present spring for the purpose of obtaining botanical specimens and of studying incidentally the distribution of certain species of violets.

H. J. Webber described 'A Cow Pea Resistant to Root Knot Worm,' stating that in examining an extensive series of cow peas and other plants this one variety had been found entirely free from the parasites, although growing immediately between two varieties that were badly affected. The root knot worm, a small nematode, not only affected cow peas, but very many plants, doing serious damage, and the finding of the cow pea led to the hope that other plants might be found equally resistant, while by planting the pea as an alternating crop it would be possible to lessen the numbers of the worms.

Frederick V. Coville gave an 'Exhibition of Specimens of Alaskan Willows,' including examples of all species from that region. For descriptive purposes the speaker grouped these willows in three divisions, the tree, bush and procumbent forms, exhibiting a series of slides showing the floral divisions of Alaska and illustrating the habitat of the various groups. The different species were described in some detail as to their range, abundance or rarity, date of discovery and economic value when the species was of sufficient size.

M. A. Carleton spoke of the 'Characteristics and Distribution of Xerophytic Wheats,' illustrating his remarks with lantern slides of the Russian wheat region. The speaker said that wheats were grouped in eight divisions: (1) Common; (2) Club or square head; (3) Poulard; (4) Durum or macaroni; (5) Polish; (6) Spelt; (7) Emmer; (8) Einkorn.

What might be called xerophytic or drought-resistant wheats belong to several of these groups, but the most important ones belong in the durum or macaroni wheat group. This is the group, therefore, which was chiefly discussed. These wheats differ from the ordinary wheats as now known in this country by having rather large flattened heads with large chaff and very large yellowish white grains which are extremely hard and vitreous in fracture, and often rather transparent. They always have beards, which are usually very long. In some varieties the heads and beards are black. These wheats are very resistant to drought, being able to grow where the rainfall is as low as ten inches per annum. They also resist the leaf rust very greatly, but are more or less subject to stem rust when it occurs in very great abundance. They are also seldom injured by bunt, smut or other diseases. Naturally they are adapted to semi-arid or arid regions, and at present are growing mainly in east and south Russia, Algeria, Argentina, parts of India and in various portions of the Orient and Mediterranean region. In this country they are especially adapted to our semi-arid plains from North Dakota to Texas.

The investigations of this department on the basis of soil and climate have led us to believe that those wheats will yield about one-third more to the acre in our semi-arid regions than other wheats, and what is more important, produce a constant yearly crop in large portions of that region where other wheat cannot be grown at all. Numerous practical tests have since proved this prediction to be justified. At the same time these wheats are the very best adapted for making macaroni, and there is now a great demand for them from this country, the people in Europe having learned of what good quality they are. Wherever they have been tried for the purpose, they also are considered to make excellent bread. In the establishment of these durum wheats we have a striking example of the beneficial results that may follow purely scientific investigations.

T. W. STANTON,
Secretary.

THE TORREY BOTANICAL CLUB.

At the meeting of the Club on October 8 the scientific program consisted of informal reports of summer's work, including reports from Dr. Rydberg, of his visit to Sweden and Norway; from Mr. Murrill, of his attendance on the Botanical Congress at Geneva; from Mrs. Harris, of work among the lichens in the Adirondacks; and from Mrs. Britton, of work among the mosses there and in the Catskills, with advance notes reporting Dr. Britton's collection in the West Indies. Dr. Underwood spoke of his collecting in Porto Rico, examining thoroughly the eastern part of the island during five weeks spent there. He collected over 1,000 numbers of dried plants and sent back a large number of cacti now growing in the Botanical Garden. He was afterward in the Berkshire Hills for two weeks, then attended the A. A. A. S. meeting at Denver, Colorado, and spent some time in botanical work throughout many parts of that State, collecting about 600 numbers of the fall flora, particularly about Ouray and Pikes Peak.

The secretary reported extension of range of *Aster curvescens* by his discovery of its growth in quantity in the southern Berkshire Hills.

Dr. MacDougal reported his work in Montana where he aided in maintaining a summer laboratory for four weeks at Big Fork, at the north end of Flathead L., and entertained Dr. H. C. Cowles and twenty students of the University of Chicago. Dr. MacDougal then joined a collecting party exploring a part of northern Montana not known to have been before visited by a botanist, except as Canby gave it a flying trip in 1884. Dr. MacDougal collected about 900 flowering plants. Some days of every week the work was among snow and ice, with alpine flora, lakes a mile long of snow-water, chiefly without outlet and without life, as they freeze solidly to the bottom. He exhibited a panoramic view of the mountains seen across Flathead L., with numerous photographs showing the technique of collecting and camp equipment.

Dr. M. A. Howe reported on his eleven weeks' collecting trip for marine algæ in Nova Scotia and Newfoundland. He made about ten principal stays of a week each, at Yarmouth, Digby, Grand Pré; at Pictou, a station for *Fucus serratus*, and where he obtained it in quantity; at Cape Breton; on the south end of Newfoundland, the richest locality in the larger kelps. There and along the south and east coast of Newfoundland is almost treeless, as is generally reputed, but firewood and lumber are obtainable 20 miles inland, and the west shore is forested with spruce, fir and tamarack, with yellow and white birch. Journeying east through the practically uninhabited interior, a thin coniferous forest was met, especially all around the numerous lakes. Where fires had been through it, for 20 or 30 miles, all was a flaming purple of fire-weed (*Epilobium*).

Dr. Howe mentioned the current names for the three native berries eaten so commonly there, *squashberry* for *Viburnum pauciflorum; baked apple berry* for *Rubus chamæmorus;* and *partridge berry* for *Vaccinium vitis-idæa*, called Swedish cranberry in parts of the U. S. where imported from Scandinavia. Dr. Howe remained four weeks in Newfoundland, and was afterward at Halifax Harbor, N. S., where Harvey, author of the Nereis, had made important collections.

Dr. R. M. Harper reported collecting again in Georgia, with about 500 numbers, visiting many new localities, traveling about 1,400 miles by rail, and doing much work on plant-distribution. He spoke particularly of the remarkable flora of the sandhills in Bulloch Co., resembling the 'scrub' flora in Florida. Photographs of these and other parts visited were shown. Along shady banks of the Chattahoochee River, some 50 miles from Columbus, he found some southern species, reaching their northern limit. In the Pine Mountains, southernmost eastern extension of the Appalachians, he found on the northern slopes an interesting mixture of Southern and Northern species. The southern slopes are covered with the long-leaved pine, with the flora characteristic of the pine barrens of the southern coastal plain. Among the interesting plants collected by Mr. Harper were *Elliottia* and, at Thomasville, Ga., *Nymphæa orbiculata.*

Brief remarks followed regarding fall blossoming and foliation in New York City, and Dr. Underwood exhibited a fresh specimen of *Botrychium dissectum.* It was noted by Mrs. Britton

and others that the maples, lindens and buttonwoods in Union Square, Washington Square and Madison Square are now covered with fresh leaves as in May, owing to defoliation by caterpillars; that the catalpas, honey locusts and poplars were but little eaten, and are not, therefore, covered with fresh leaves, but were injured by an early drought, and have sent out new shoots to replace those lost; these new shoots are now covered with fresh young leaves. The English elms in Washington Square were little eaten and have no new leaves. Horse-chestnuts have new shoots and some have new blossoms. Cherry trees have also been in bloom again. The magnolias and tulip trees of Bronx Park have blossomed and fruited twice this year.

EDWARD S. BURGESS,
Secretary.

THE SCIENCE CLUB OF THE UNIVERSITY OF WISCONSIN.

THE first meeting of the Science Club of the University of Wisconsin for the present college year was held on Thursday evening, October 31. The newly elected officers of the Club are: President, Professor W. W. Daniells; Vice-President, Professor Wm. H. Hobbs, Secretary and Treasurer, Professor L. S. Smith.

Two papers of both scientific and economic interest were presented, the first by Dr. C. K. Leith, on the 'Mesabi Iron Range of Minnesota,' and the second by Professor C. R. Van Hise, on 'The World's Past, Present and Future Supply of Ores.'

Dr. Leith's paper was based on a monographic report on the Mesabi iron-bearing district of Minnesota which he is preparing for the U. S. Geological Survey. He sketched the marvelous development of the range from the time of its discovery ten years ago to its present position as the greatest iron range in the world. The range exhibits Archean, Lower Huronian and Upper Huronian rocks in typical development, and with relations so clear as to make the Mesabi almost a type district for these three pre-Cambrian series. The iron ores are confined to the 'iron formation,' which forms the middle horizon of the nearly flat-lying Upper Huronian series. The iron formation consists of ferruginous cherts, ferruginous slates and iron ore, all of which give evidence of having resulted from the alteration of a rock made up of green ferrous silicate granules. The granules contain fifty per cent. silica and thirty per cent. ferrous iron, with little or no potash. They were called glauconite by Spurr, but their study by the U. S. Geological Survey shows them not to be glauconite of organic origin, but a ferrous silicate deposited on the sea-bottom through chemical reactions. The iron ores have resulted from the alteration of this type of rock through the agency of underground waters. The ores are now found where the action of these waters has been vigorous. These places are the southward-pitching troughs of the gently folded iron formation, and in the parts of the troughs lying along the middle slopes. The bottoms of the troughs are mainly slaty layers within the iron formation itself.

The iron-ore deposits of the Mesabi are similar to those of other ranges of Lake Superior in having resulted from the alteration of some earlier rock, in having been concentrated by underground water, and in occurring in troughs with impervious basements. However, in the Mesabi the rock from which the iron ores resulted is the green ferrous silicate, while in the other districts it is iron carbonate. In the Mesabi the pitching troughs containing the iron-ore deposits have very gentle dips and great horizontal dimensions, while the pitching troughs in the other ranges are narrow and sharp, and have great vertical dimensions. Finally, and possibly in some way connected with these features, in the Mesabi district the ores are exceedingly soft and friable, while the old range ores are fairly hard.

Dr. Leith illustrated the various methods of mining the Mesabi ores, the most striking of which is loading by steam shovels directly on to cars. He described also the great mines of the district, several of which are shipping over 1,000,000 tons of ore a year.

The amount of ore in sight on the Mesabi is roughly estimated at 500,000,000 tons, or about twice as much as there is in sight on all the rest of the Lake Superior ranges together. It is also far in excess of all the ore now known in other parts of the United States. The development of the Mesabi range has lowered the

price of ore for the American steel manufacturers; and this fact alone, regardless of any superiority in methods, would give them the advantage in foreign markets. In Europe at the present time the situation as to the iron ore supply, as to the demand for same, and as to prices, is not greatly dissimilar to what it might have been in the United States had no Mesabi range been discovered to ease the demand for old range ores and to lower prices. A great basal factor, then, in the superiority of the United States in the iron and steel trade is the Mesabi iron range. The United States Steel Corporation controls from 70 to 80 per cent. of this raw material, and hence its future influence on the iron and steel trade of the world may be conjectured.

Professor Van Hise followed with a brief general discussion of the world's past, present, and future supplies of ores. He called attention to the tremendous revolution in mining ores of all kinds which has occurred in the past century, and ventured the opinion that in the past fifty years more ore has been mined in the world than in all its previous history.

The above papers were discussed by Professor J. Morgan Clements. Professor Clements also summarized the relation of the work which the U. S. Geol. Survey has been doing in the Lake Superior region, as well as in other mining districts of the United States, to an intelligent exploration for ore deposits and the scientific development of the same when they are found.

A resolution of sympathy in memory of the late Professor Nelson O. Whitney, of the Engineering Faculty of the University of Wisconsin, presented by Professors J. B. Johnson, F. E. Turneaure, and Louis Kahlenberg, was adopted by the Club. L. S. Smith.

THE SCIENTIFIC ASSOCIATION OF THE UNIVERSITY OF MISSOURI.

The Association has elected the following officers for the ensuing year: President, Professor W. G. Brown; Vice President, Professor C. F. Marbut; Secretary, Dr. Charles Thom; Treasurer, Professor C. A. Ellwood; Chairman of Executive Committee, Dr. C. M. Jackson. At a meeting October 14, Professor H. B. Shaw displayed a series of lantern slides illustrating the important features of the largest and most successful electrical plants in the United States. At its regular meeting on the last Monday night of each month a paper is presented embodying some original work done by the author. At its supplementary meeting held usually on the second Monday night, a popular presentation of some scientific subject offers each department an opportunity to present matters of general interest from any source.

Chas. Thom,
Secretary.

University of Missouri.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of the Academy of Science of St. Louis on the evening of November 18, twenty-four persons present, the following subjects were presented:

Mr. F. C. Baker, some interesting molluscan monstrosities.

Dr. Stuart Weller, Kinderhook faunal studies. III. The faunas of beds No. 3 to No. 7 at Burlington, Ia.

Professor William Trelease read an untechnical address on the progress made in botany during the nineteenth century.

One person was elected to membership in the academy.

William Trelease,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

THE PYTHON IN PENNSYLVANIA.

To the Editor of Science: On August 9, a python, probably *Python natalensis*, was found in the grass on Presque Isle, Pa., by three young men from Erie who, as they supposed, killed it and took it to the city. However, it revived and was exhibited in the window of the Tribune bicycle store. On August 29 I measured and weighed it. The length was about seven feet four inches, greatest girth eleven and one-half inches; weight, seventeen pounds. That evening it pushed away the wire netting from one corner of its cage and escaped. It probably took up its residence under a building in the rear of the store, but had not been seen when last I heard, October 14. Reports of the liberation of large snakes in the vicinity of