THE May number (volume 10, number 8) of the *Bulletin of the American Mathematical Society* contains the following articles: 'Report of the February Meeting of the American Mathematical Society,' by Professor F. N. Cole; 'Report on the Requirements for the Master's Degree,' by the Committee of the Chicago Section; 'On the Subgroups of Order a Power of p in the Linear Homogeneous and Fractional Groups in the $GF[p^n]$,' by Professor L. E. Dickson; 'The Exterior and Interior of a Plane Curve,' by Dr. G. A. Bliss; 'Ricatti Isothermal Systems—a Correction,' by Dr. Edward Kasner; Shorter Notices; Notes; New Publications.

ACCORDING to the annual announcement of the Marine Biological Laboratory at Wood's Hole, the *Journal of Morphology,* the publication of which was interrupted in 1901, at the conclusion of the seventeenth volume, is to be immediately resumed, and will be open for larger papers in animal morphology, requiring, as a rule, extensive illustration in lithographic plates. A *Journal of Animal Biology* is also to be undertaken in the interest of investigations upon living animals, dealing especially with the problems of evolution as presented in the phenomena of heredity, variation, hybridization, etc., and requiring experimental methods and methodical observation.

SOCIETIES AND ACADEMIES.

THE GEOLOGICAL SOCIETY OF WASHINGTON.

THE 152d meeting was held February 24, 1904.

Dr. Arthur L. Day presented a paper entitled 'The Study of Minerals in the Laboratory.' Dr. Day drew attention to the relation of some problems of physics to geology and pointed out the lines of investigation which had been undertaken by the Physical Laboratory of the United States Geological Survey. His paper was intended as an introduction to a summary of the results of certain investigations, an abstract of which will appear below.

This was followed by a discussion of the oil fields of Alaska, by Dr. George C. Martin. Indications of petroleum have been found at three distinct localities on the Pacific Coast of Alaska and have been reported from several others. The Controller Bay field lies adjacent to the coast, about twenty miles east of the Copper River delta. In this field one well has been drilled which struck oil and several others were being put down at the time of Dr. Martin's visit. The rocks, consisting of shales and sandstones, are closely folded and are probably of Tertiary age, and are overlain by coal-bearing horizons which are also Tertiary. The structure, as far as could be determined, is complex.

The second locality lies on the west shore of Cook Inlet, at Enochkin Bay. In this locality the seepages indicate the presence of petroleum, though the wells drilled thus far have not yielded any gushers. The oil-bearing rocks are of Jurassic age and are thrown up into broad, open flats.

One hundred miles to the southwest is Cold Bay, where a similar occurrence of petroleum seepages has been found. The geologic structure and rocks seem to be identical with those of Enochkin Bay. An account of these oil fields has been published by Dr. Martin in Bulletin 225, U. S. Geological Survey, pp. 362–385.

THE 153d meeting was held March 9 and the first paper was entitled 'Extra Morainic Pebbles in Western Pennsylvania,' by Mr. Lester H. Woolsey. Mr. Woolsey said that glacial pebbles, granites, diabases, etc., of probably Wisconsin or Iowan age, have been found in 950-foot terraces (supposedly Kansan) along Raccoon Creek in Beaver and Washington counties as far south as Burgettstown on the Panhandle Railway. Similar pebbles were found up to 1,100 feet elsewhere in Beaver County. This is some evidence of a general flooding of this region in post-Kansan time.

Mr. F. H. Knowlton then gave a paper on the 'Fossil Floras of the Yukon.' Up to about 1900 the known fossil flora of Alaska numbered about 110 species, all of which had come from the coast region from Sitka to Cape Lisburne. With the exception of the Cape Lisburne forms, which were regarded as of Jurasso-Cretaceous age, practically all those known were Tertiary in age. The discovery

of gold in the interior incited exploration, and soon small collections of plants were brought in, mainly from upper rocks of the Yukon. As these agreed in Tertiary age with those previously known from the coast region, it came to be accepted that only Tertiary plants occurred throughout this vast area. The U. S. Geological Survey desired to establish a type section, and in 1902 Mr. A. J. Collier was delegated to make a trip down the Yukon, studying the stratigraphy and collecting fossils from as many points as possible. When the plants were studied it was found that those from above Rampart were Tertiary (so-called Arctic Miocene), while below this point a very different condition was found. Near Nahoclatilten Mr. Collier obtained collections which appeared to be mixed, that is, a part of the material seemed to be Tertiary and the remainder Middle or Lower Cretaceous. Undoubted Upper Cretaceous plants were obtained from a number of other localities, especially in the vicinity of Nulato, but so much interest attached to the Nahoclatilten localities that in 1903 Dr. Arthur Hollick was commissioned to duplicate Mr. Collier's trip. From the combination of the two collections it is possible to decide with certainty that all points above Rampart are Tertiary, while below the plants indicate that the age is either undoubted Cretaceous or doubtful Tertiary. The Cretaceous plants include cycads of several genera, conifers and many dicotyledons, the combination resembling mostly the Middle and Upper Cretaceous flora of Bohemia.

Mr. Marius R. Campbell then discussed 'Glacial Erosion in Western New York,' devoting special attention to the origin of the Finger Lakes. Mr. Campbell's paper is soon to appear as a publication of the Geological Society of America.

The 154th meeting, held March 23, was devoted to a communication by Dr. Arthur L. Day, entitled 'The Study of Minerals in the Laboratory.' The following brief abstract contains the more important conclusions.

The paper is a summary of an extended experimental research by Dr. Day and Dr. E. T. Allen upon a series of artificial feldspars corresponding to albite (Ab) and anorthite (An) and the following plagioclases: Ab_1An_5, Ab_1An_2, Ab_1An_1, Ab_2An_1, Ab_3An_1 and Ab_4An_1. These were prepared with great care from the purest chemicals, and, with the exception of albite, which could not be crystallized on account of its extreme viscosity, were fully identified microscopically.

Melting-point determinations were obtained, beginning with anorthite and continuing down the series as far as Ab_3An_1. The viscosity was found to increase enormously toward the albite end of the series and appeared to veil the melting point completely below Ab_3An_1. In a specimen of natural albite (Mitchell County, N. C.) the viscosity of the glass during melting was found to be of the same order of magnitude as that of the crystallized portion, and crystals of microscopic size sustained a slow heating to a temperature of 150° above where melting began, and preserved their original orientation. It was also shown that in viscous liquids, capable of considerable undercooling, the solidifying point did not coincide with the melting point or bear any necessary relation to it.

The chemical purity of the artificial feldspars enabled very accurate determinations of the specific gravity to be made of both the vitreous and the crystalline form.

The following conclusions were offered as tending to show that the soda-lime feldspars form an isomorphous series and not a eutectic mixture:

1. In Ab_1An_5 the spherulites and the glass matrix were analyzed separately and proved to be identical in composition. In Ab_1An_2 a portion was crystallized rapidly and the matrix crystallized very slowly in a subsequent heating. The two sets of crystals, although very different in size, proved to be identical in composition.

If the relation had been that of a eutectic mixture, the component in excess must have crystallized out first.

2. The curve of melting points of the pure (artificial) feldspars of the series is a straight line for some two thirds of the distance from anorthite to albite (as far as it could be established). There is no reason to suspect a discontinuity in the lower portion of the curve.

3. The fact that natural albite (Mitchell Co., N. C., Amelia Co., Va.) is too low in melting point and too high in specific gravity to fall into line with the observations upon the pure feldspars is readily explained by the impurities established by the chemical analyses.

4. The curve of specific gravities of the artificial crystalline feldspars which admit of exceptionally accurate observation, on account of the chemical purity of the specimens, is also a straight line over practically the same range.

5. No natural feldspar is known with a lower specific gravity than albite.

The following preliminary figures were given:

	Melting Points.	Specific Gravity (Crystals).	Specific Gravity (Glass).
An	1532° C.	2.764	2.70
Ab_1An_5	1503°	2.736	2.65
Ab_1An_2	1464°	2.702	2.60
Ab_1An_1	1420°	2.670	2.55
Ab_2An_1	1374°		2.48
Ab_3An_1 ..about	1345°		2.46
Ab			2.38

ALFRED H. BROOKS,
Secretary.

THE PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 583d meeting was held March 26, 1904. The election of twelve new members was announced.

Mr. L. A. Bauer reported that magnetometer records showed slight earthquake shocks on March 16 and 21.

Mr. Bergen Davis, of Columbia College, spoke on 'The Theory of the Electrodeless Discharge.' A receiver containing gas is placed in the field of a coil through which an alternating current passes; when the field reaches a certain minimum potential there is a white discharge through the gas; this potential was determined as a function of the gas density and alternation-frequency. The results were found to be in close accordance with the theory of electrons.

Mr. P. G. Nutting then spoke on 'The Dynamics of a Moving Charge,' presenting systematically the dynamical principles that underlie the theory of electrons, and pointing out among other things the great differences in the nature of the fields produced by electrical charges moving at different velocities.

THE 584th meeting was held April 9, 1904, Vice-president Littlehales presiding.

Dr. Bauer reported that the earthquake shock of March 16 was recorded by the magnetograph at Baldwin, Kansas; such records have now been found made on about thirty different dates.

Dr. R. A. Harris, of the Coast and Geodetic Survey, presented a paper on 'Some Indications of Land in the Vicinity of the North Pole.'

The indications of land were based chiefly upon (1) the direction and velocity of the surface currents, known, in part, by the drifting of the *Advance* and *Rescue,* the *Jeannette* and the *Fram;* (2) the very old ice found northeast of Alaska; (3) the tides at Bennett Island, at Pitlekaj, along the northern coast of Alaska, and in the Arctic Archipelago. At Bennett Island the mean range of tide is 2 feet; at Pitlekaj, 0.2 foot; at Point Barrow, 0.4 foot, the flood there coming from the west.

The main conclusion arrived at was that a large trapezoidal tract of land may extend from near the North Pole towards Alaska and eastern Siberia—one corner lying nearly north of Bennett Island; another, a little west of north from Point Barrow; a third, a comparatively short distance northwest of Banks Land; and a fourth corner, north of Lincoln Sea.

The observations of Thomas Simpson show a remarkable change in the time of tide on the northern coast of Alaska near the eastern boundary. This seems to indicate that one or more islands probably lie not very far off to the northward of this locality.

The subject was further discussed by Dr. Dall.

Mr. George R. Stetson then read a paper on 'President Stiles and his Times, Yale, 1778–1795,' based on the recently published voluminous diaries. These were summarized, presenting a vivid picture of the political, intellectual, social and religious conditions of the times.

CHARLES K. WEAD,
Secretary.

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY GEOLOGICAL JOURNAL CLUB.

THE club during the last month has devoted much of its time to the reviewing of standard papers on ore deposits, for the benefit of students interested in economic geology. These articles were reviewed by L. T. Buell, C. H. Clapp, M. Rubel, G. G. Wald, A. H. Allen, W. G. Ball and B. L. Johnson. The other articles reviewed were:

B. L. Johnson, 'Native Gold Original in Some Metamorphic Gneisses' (*Eng. and Min. Jour.*, February 4, 1904); S. Shapira, 'Mining in Korea' (*Eng. and Min. Jour.*, March 3, 1904); W. L. Whittemore, 'Origin, Properties and Uses of Shale' (*The Michigan Miner*, November, 1899, to February, 1900); J. G. Barry, 'Controlling Sand Dunes in the United States and Europe' (*Jour. of Geog.*, March, 1904); E. Burton, 'The Glacial Geology of Tasmania' (*Quart. Jour. of the Geol. Soc.*, February, 1904); H. W. Shimer, 'Evolution of the Mosasaurs' (*Jour. Geol.*, February, 1904); C. E. Danforth, 'The American Mining Engineer' (*Eng. and Min. Jour.*, February 25, 1904).

Dr. D. W. Johnson spoke on 'A Problem in River-Capture.' His paper dealt with the present and former courses of the Tennessee River, and showed evidence for and against the present theory of its capture as proposed by Hayes and Campbell. Dr. Johnson is now in the field, making further investigation in this problem.

G. F. LOUGHLIN,
Secretary.

THE OHIO STATE ACADEMY OF SCIENCE.

THE thirteenth annual meeting was held at Denison University, Granville, November 27, with about thirty members in attendance.

In the course of the year the academy has published, in addition to its 'Annual Report,' three 'Special Papers': No. 5, 'Tabanidæ of Ohio, with a Catalogue and Bibliography of the Species from America North of Mexico,' 63 pages, by James S. Hine; No. 6, 'The Birds of Ohio, A Revised Catalogue,' with copious notes, 241 pages, by Lynds Jones; No. 7, 'Ecological Study of Big Spring Prairie,' 96 pages, by Thomas A. Bonser. The studies upon which these papers were based were largely carried on by aid from the Emerson McMillin Research Fund, and the expense of publication was mainly met by the further aid of the same fund. The series of special papers and the annual reports will be continued, but hereafter the *Ohio Naturalist* will be the official organ of the academy and in it will be published the abstracts and papers of less than 1,500 words.

The officers chosen for the ensuing year are:

President—E. L. Moseley.

Vice-Presidents—Lynds Jones and L. H. McFadden.

Secretary—F. L. Landacre.

Treasurer—Herbert Osborn.

Members of the Executive Committee—W. E. Wells and W. F. Mercer.

Member of Publication Committee—James S. Hine.

Trustee—W. R. Lazenby.

Librarian—W. C. Mills.

Correspondence regarding publications may be addressed to W. C. Mills, Page Hall, Ohio State University, Columbus, O.

The address of the president, C. J. Herrick, was on 'The Doctrine of Nerve Components and Some of its Applications.'

The following papers were read:

EDWARD L. RICE: 'Preliminary Report on the Development of the Gill in *Mytilus*.'

CHARLES S. MEAD: 'Comparative Chart of the Vertebrate Skull.'

F. L. LANDACRE: 'The Protozoa of Sandusky Bay.'

F. L. LANDACRE: 'A New Peritrichous Infusorian.'

MAX MORSE: 'Report on the Reptiles and Batrachians of Ohio.'

L. B. WALTON: 'Cataloguing Museum Collections.'

L. B. WALTON: 'A Practical Dissecting Tray.'

HERBERT OSBORN: 'A Further Contribution to the Hemipterous Fauna of Ohio.'

J. G. SANDERS: 'Report on the Scale Insects of Ohio.'

CHAS. S. MEAD: 'Report on the Orthoptera of Ohio.'

JAMES S. HINE: 'A Supplement to the Odonata of Ohio.'

A. F. BURGESS: 'Notes on the Introduction of the Chinese Ladybird, *Chilocorus similis*, in Ohio.'

HERBERT OSBORN: 'Notes on a Macropterous *Phylloscelis atra*.'

MAX MORSE: 'The Breeding Habits of the Myriopod, *Fontaria Indianæ* Boll.'

EDWARD L. RICE: 'A Statistical Plea for Nature Study.'

LEWIS G. WESTGATE: 'Shore Line Topography between Toledo and Huron, Ohio' (lantern slides).

J. H. TODD: 'Some Rare Forms of Aboriginal Implements.'

EDO. CLAASSEN: 'List of the Mosses of Cuyahoga County and of Several Other Counties of Northern Ohio.'

J. H. SCHAFFNER: 'Extra-Floral Nectaries and Other Glands.'

JOHN H. SCHAFFNER: 'Notes on Nutating Plants.'

OTTO E. JENNINGS: 'Notes on Some Rare and Interesting Ohio Plants.'

WM. R. LAZENBY: 'The Keeping Qualities of Apples.'

WM. R. LAZENBY: 'Seeds of Celastraceæ.'

L. B. WALTON: 'Variation and Environment.'

W. A. KELLERMAN: 'Further Floristic Studies in West Virginia.'

W. A. KELLERMAN: 'Additional Infection Experiments with Species of Rusts.'

W. A. KELLERMAN: 'Mycological Flora of Cedar Point, Sandusky, Ohio' (abstract).

W. A. KELLERMAN: 'Group Names in Natural History.'

W. A. KELLERMAN: 'Historical Account of Uredineous Culture Experiments, with List of Species' (abstract).

W. A. KELLERMAN and O. E. JENNINGS: 'Annual Report on the State Herbarium.'

E. L. MOSELEY,
Secretary.

DISCUSSION AND CORRESPONDENCE.

'HORSES' NOT HORSES.

THE notice by E. C. Case of 'The Tree Dwellers' exposes a truly remarkable view of nature and the relations of 'horses' of the present epoch to animals of the past. That picture of 'tiny little creatures' with 'five toes on each foot' flying from dinosaurs and escaping by climbing trees involves as grotesque confusion of time, place and adaptation of structure as could well be conceived. But the critic has not shown up one of the most misleading characteristics. The author, after asserting that 'long before the tree-dwellers lived there were wild horses' which were 'tiny little creatures,' naïvely adds, 'Perhaps you would not think that they were horses at all'! If 'you' did not think so 'you' would be perfectly right and any one who thinks otherwise perfectly wrong. The use of the word horse in such an enlarged sense has been to some extent encouraged by those who know better, but it is extremely deceptive. I have asked a dozen persons of more than average intelligence and culture (school teachers and college graduates) what idea they derived from the paragraphs in question, and found that those who had no special knowledge of zoology were entirely misled; they imagined an animal like an ordinary horse (more like a horse than a zebra or an ass is like a horse), differing simply in having five toes besides stripes like a zebra. Now, every instructed zoologist would know that such a characteristic as five (or four) toes must necessarily be coordinate with innumerable modifications of other parts and that, consequently, an animal so endowed must differ vastly more from a horse than an ass or a zebra does. In fact, every student of recent mammals would place the extinct beast in an entirely different family from the horse.

But no ungulate in the line of the horses with five toes has been discovered! The nearest approach to it is the *Hyracotherium* or *Eohippus* of the lower Eocene and that type had only four front toes and three hind ones; its jaws were relatively short, its teeth quite different from a horse's, and, in fine, its associated characters compel zoologists to differentiate it as the representative of a peculiar family—the Hyracotheriids. In an article (Horse) by a special student of the subject (Dr. William D. Matthews), just published in the Encyclopedia Americana, it is aptly stated that the 'first ancestor of the horse line is very difficult to distinguish from the contemporary ancestors of tapirs and rhinoceroses.'

Furthermore, I object to the assumption that the early representatives of the equine phylum were striped like a zebra. The only basis for such an assumption is that most of