SOCIETIES AND ACADEMIES.

GEOLOGICAL SOCIETY OF WASHINGTON.

THE 106th regular meeting was held December 12th at the Cosmos Club:

The following papers were presented:

Mr. C. W. Hayes. — 'The Geological Relations of the Tennessee Brown Phosphate.' Three distinct types of phosphate rock occur in Tennessee, named from their prevailing colors white black and brown. The white rock is a recent cavern deposit; the black rock, including two varieties, nodular and bedded, is Devonian and the brown rock is Silurian. At four or more distinct horizons in the lower Silurian occur beds of phosphatic limestone, which, on the removal of the lime by leaching, yield high grade phosphate rock, containing from 70 to 80 per cent. of lime phosphate.

The recurrence of these phosphatic beds through so large a portion of the Silurian and Devonian formations points to a recurrence of similar conditions in Silurian and Devonian time favorable for the accumulation of lime phosphate. The deposits are at present located along the western margin of the central basin of Tennessee in a belt extending nearly across the State. This belt coincides with the western side of the Cincinnati anticline and a genetic connection between the two is suggested. This belt is characterized by numerous unconformities, in part by erosion, but chiefly by non-deposition. During Silurian and Devonian time it was doubtless a region of shallow seas protected from the incursion of foreign detrital sediments. Under these conditions the lime carbonate was perhaps removed by solution nearly as fast as deposited, and the lime phosphate which elsewhere is disseminated through a great mass of limestones was here concentrated into a relatively small volume.

Mr. Lester F. Ward. — 'The Autochthonous or Allochthonous Origin of the Coal and Coal Plants of Central France.' Mr. Ward accompanied the excursions of the International Geological Congress to the coal basins of Commentry, Decazeville and Saint Etienne, and found this to be the principal geological problem presented. M. H. Fayol led the party through the two first-named basins, and lost no opportunity to demonstrate to the excursionists the validity of his well-known theory of deltas, according to which all the materials have been transported from the surrounding country and deposited in small lakes which have been thus gradually filled up. The excursion to St. Etienne was in charge of M. C. Grand'Eury, whose elaborate treatment of the 'Coal Flora of Central France' is familiar to all. He was not less zealous in seeking to make clear the autochthonous origin of the coal plants of that basin. Among the members of the party were Dr. I. C. White, M. H. Potonié and other competent judges of such questions. None of them had any *parti pris*, and all were open to the evidence, which, however, all admitted was in certain respects more or less defective. This was the fault of the conditions, and not at all of the able and courteous expounders of the respective theories. The result at least could not be positively stated in favor of either theory for all the beds, but M. Fayol may be said to have given a correct explanation of the mode of deposition of the Commentry basin and probably of most of that of Decazeville, although in the latter the underclays certainly hold the roots of plants. At St. Etienne M. Grand'Eury showed the party many cases in which the finest fibrils of the roots of erect Calamites were seen to pass across the planes of bedding and penetrate to the underlying conglomerates which formed the original floor; a condition which is wholly incompatible with the theory of transportation or the slightest disturbance of the plants.

Mr. E. E. Howell.—'A New Geological Relief Map of the United States.' This map, exhibited to the Society, is on a horizontal scale of about 40 miles to the inch, representing a portion of a globe 16½ feet in diameter. The vertical scale is eight miles to the inch. The geological data was obtained from the U. S. Geological Survey.

F. L. RANSOME,
DAVID WHITE,
Secretaries.

CHEMICAL SOCIETY OF WASHINGTON.

A REGULAR meeting was held October 11, 1900. The evening was devoted to the address of the retiring president Dr. H. N. Stokes, on

the subject, 'The Revival of Organic Chemistry.' SCIENCE, October 12th.

A regular meeting was held November 8, 1900. The first paper of the evening was read by Mr. L. M. Tolman, and was entitled, 'The Examination of Jellies, Jams and Marmalades,' by L. M. Tolman, L. S. Munson and W. D. Bigelow. The paper gave the results of the examination of jellies and jams manufactured in the laboratory from 13 varieties of fruits. The solids, ash, acid, nitrogen, reducing sugar and cane sugar, were determined, and the amount of cane sugar inverted and calculated. The juices and pulps from which the samples were made were also examined. The relation between the acid content and the amount of cane sugar inverted was especially noted.

The second paper was read by Dr. Bigelow and was entitled, 'The Nitrogenous Compounds of Meat Extracts,' by W. D. Bigelow and R. Harcourt. The authors examined about fifty commercial extracts making use of the following methods: Precipitation by bromin as directed by Allen; precipitation by zinc sulphate; precipitation by ammonium sulphate; precipitation by bromin in filtrate from the zinc sulphate precipitate; precipitation by tannin and phosphotungstic acid (filtered separately), the latter precipitate being filtered at about 90° C., as directed by Mallet. The bromin precipitate from the original solution was found to hold only a small and variable portion of the proteids present. The zinc sulphate precipitate plus the bromin precipitate in the filtrate from the same gave results which were fairly satisfactory. The best results were obtained by use of the Mallet's method. Mixtures of digested egg albumin and purified meat bases were also subjected to the above methods.

WILLIAM H. KRUG,
Secretary.

NEW YORK ACADEMY OF SCIENCES.

SECTION OF GEOLOGY AND MINERALOGY.

THE section met on November 19th, Dr. A. A. Julien presiding. The following communications were presented:

'Recent Progress in Investigation of the Geology of the Adirondack Region,' by J. F. Kemp. Three classes of rocks are present in the area discussed: (1) those certainly igneous in their nature, including labradorite rocks, basic gabbros and trap dikes; (2) those certainly sedimentary, best illustrated by the crystalline limestones; (3) extensive areas of gneiss of uncertain origin. The distribution of the first class and the results obtained have been quite accurately ascertained by H. P. Cushing, C. H. Smyth and the speaker. The augite-syenite first discovered by Cushing near Loon Lake has since been found to be widely distributed in regions farther south. The ages of the trap dikes and their distribution were discussed.

Recent additions to the knowledge of the sedimentary rocks involve the recognition of quite large amounts of quartzites in a considerable number of new localities. Besides these, small beds of limestone have been discovered in the southern areas, especially in Warren and Washington counties, which are thoroughly interstratified with the gneisses and which leave no escape from concluding that the gneisses are also sedimentary in their origin and that a regularly stratified series of rocks is present. This conclusion removes many of the gneisses from the group of uncertainties.

The speaker enumerated the discovery of new outliers of Cambrian and Ordovician strata in the midst of the crystallines. He also noted the distribution of the glacial striations throughout the eastern mountains and their nearly uniform northeasterly bearing. The physiography is chiefly due to a series of faulted blocks which afford a very characteristic saw-toothed sky line.

'Notes on the Origin of the Pegmatites from Manhattan Island by A. A. Julien.

Dr. Julien, after discussing the prevailing theories of the origin of pegmatites, and showing that they did not adequately explain pegmatitic developments *in loco* in the districts mentioned, advanced the following conclusions:

1. The existence of at least two series of pegmatite developments, marked by a succession of intersections. Of these the oldest series is the most extensive, intercalated among the foliation-seams, and coincident with the strike. The later series cuts the schists in all directions and inclinations.

2. Every pegmatite occurrence on Manhat-

tan Island retains more or less structural evidence of having begun its existence as a vein, segregated from a magma or igneo-aqueous emulsion. Even the notable dike near 205th Street, crossing the dolomite, retains the vein structure, perfectly in places and imperfectly throughout.

3. Contact phenomena are confined mainly to the earlier alteration along seams, to projection of veinlets rather than intrusion pophyses, and, at one dolomite intersection, to a thin selvage of phlogopite and tremolite.

4. The vein structure presents distinct lamination, correspondent deposits on the two walls, comb structure, passage from less to more acid minerals toward the center, and final concentration of minerals of the rarer elements in association with the significant matrix, smoky quartz, along lenticular bands, often near a central suture.

5. Some of the most prominent features are the results of pressure upon the original veins through orogenic movements of the stratum of schists, viz., fissuring, faulting, crushing, shearing with development of aplite, refusion and development of new phenocrysts (granite-porphyry), and generation of reaction borders outside of each wall of a vein. Where flowage has taken place and some transferrence of the crushed vein material along the plane of the vein, the appearances of a dike begin. Many of these results may be distinguished along the course of the same vein at short intervals, but in the most characteristic dikes the vein structure is rarely, if ever, completely obliterated.

THEODORE G. WHITE,
Secretary.

SECTION OF ASTRONOMY, PHYSICS AND CHEMISTRY.

A MEETING of the Section was held at 12 West 31st Street, New York, on the evening of December 3, 1900.

Professor E. R. von Nardroff presented a paper with an experimental illustration, on 'The Determination of the Wave-Length of Sound by the Grating Method.' As a source of sound the author used a miniature steam whistle made of brass and operated by a current of air from a tank of compressed air. The sound produced in this way was inaudible on account of its high pitch, the wave length being only about three-eighths of an inch. The whistle was placed at one of the conjugate foci of a parabolic metallic mirror, a sensitive flame being placed at the other conjugate focus. A transmission grating made of wood, and resembling somewhat a portion of a picket fence, was then interposed in the path of the reflected sound waves, and it was found that when the sensitive flame was shifted to one side, as many as four positions of maximum effect were obtained on each side of the central direct beam of sound. With this apparatus, the wave-length of sound, when the waves were short like those used, could be measured to within one per cent.

Mr. W. G. Levison read a paper on 'A Method of Photographing the Entire Corona on One Plate,' employed at Newberry, S. C., for the total solar eclipse of May 28, 1900. The method consisted in the employment of a specially constructed color screen most dense at the center and fading off to clear glass at the edges, which was placed close to the photographic plate. The size and density of the screen were adjusted as nearly as possible so that the image of the inner corona made by a suitable lens fell on the part of the plate covered by the screen, while the image of the outer corona passed through the clear glass. The color screen was made from a lens of colored glass with sharp edges which was cemented into a recess in a plate of clear glass, ground to receive it. Two screens were made, one of orange-yellow glass and one of dark greenish-blue glass. In testing these screens at the time of the eclipse, an arrangement of telephoto-lenses was used, but unfortunately the exposure was not long enough to give any image at all of the outer corona through the clear glass, although a considerable impression of the inner corona was produced through the orange-yellow glass, but none through the bluish-green glass. This should give some idea of the relative actinometric intensity of the light from the inner and from the outer corona.

Mr. Levison also presented a short note on 'The Action of Canada Balsam on Photographic Plates.' In making the experiments with the color screens he noticed that Canada balsam

that had been baked hard, when placed in contact with a sensitive plate, or separated from it by a layer of carefully selected black paper, and allowed to remain a week or more, affected the plate in the same manner as light, the part affected developing black. He verified this effect by a number of experiments. In the author's opinion this effect seemed likely to be caused by true Becquerel rays, as it passed through the black paper, which is perfectly opaque to ordinary light.

WILLIAM S. DAY,
Sec'y of Section.

THE NEW YORK SECTION OF THE AMERICAN CHEMICAL SOCIETY.

THE regular meeting of the Section was held on Friday evening, December 7th, at the Chemists' Club, 108 West Fifty-fifth Street, Dr. C. A. Doremus presiding.

Special invitations had been sent out to those interested in public water supply, as the feature of the meeting was an address by Professor William P. Mason, of the Rensselaer Polytechnic Institute, Troy, entitled, 'The Water Supplies of the Cities on the Mediterranean,' with lantern illustrations.

The address began with a description of Gibraltar, and its peculiar arrangements for water supply. From there to Tunis and other cities on the south shore, including the site of ancient Carthage ; then to Naples and Rome.

The system at Naples, once so primitive and unsanitary, is now on a scale and of a character to command admiration.

The typhoid epidemic at Hamburg in 1892 was alluded to, and a 'spot' map gave a graphic representation of the severity of the scourge in Hamburg, and the comparative immunity of the adjoining town of Altona, which, while having a separate water supply, was not more separated from Hamburg than Harlem from the rest of New York City.

A still more remarkable fact emphasized the value of filtration. The water supply of Altona was taken from below the sewers of Hamburg, passing through sand filters before distribution.

At the close of the address a vote of thanks was passed, and some routine business attended to. Four representatives in the council were elected, and a committee of three was appointed to confer with the Bureau of Combustibles in regard to the present existing restrictions as to storage of nitric, hydrochloric, and sulphuric acid.

Messrs. T. J. Parker, A. P. Hallock and William McMurtrie were appointed on this committee.

The situation, as it now stands, is such that a permit can be obtained for 1,000 pounds only of the acids named, whereas many establishments are using more than this amount every 24 hours, and, aside from the difficulty of having the acids delivered each day, any interference with daily delivery would result in suspension of large and important industries.

DURAND WOODMAN,
Secretary.

THE NEBRASKA ACADEMY OF SCIENCES.

THE Academy held its eleventh annual meeting in Lincoln at the University of Nebraska, on Friday, November 30th and on Saturday, December 1st. This was without doubt the most important as well as the most interesting meeting the Academy has ever held. The number of papers presented (as well as their subject matter) was especially noticeable for its high character. The meeting was called to order and presided over by President H. Gifford, who took for his address 'A Possible Explanation of the Shape of the Human Auricle.' This address was illustrated by well selected figures on charts and photographs, showing the external ear as found in a number of different types of animals both terrestrial and aquatic. In his treatment of the subject, Dr. Gifford called attention to the presence of a number of small muscles in the ear as found in these animals and indicated their influence in bringing about the prevailing form of this organ as found in man.

Professor Haven Metcalf presented a very interesting paper on 'Problems relating to the Individuality of Chromosomes,' which was discussed by Professors Duncanson, Metcalf and Ward. In this paper certain characteristics of these bodies were cited as explanatory of the possible ancestry of different hybrid plants.

Another paper that attracted an unusual amount of attention was that of Professor E. H.

Barbour on 'Sand-lime Crystals.' This latter paper was certainly an important contribution to the subject of crystallography, and will be received by geologists as a permanent contribution to the subject. Immediately following this paper some time was spent by Robert E. Moritz in presenting a discussion on the 'Extension of the Differential Processes' in a manner approved of by the mathematicians in attendance. Robert H. Wolcott then read by title a rather technical paper entitled 'A Review of the Genera of Water Mites,' in which the auther critically reviewed all the former attempts at the classification of these animals. He also suggested in that paper a more natural scheme of classification based on the derivation of the different forms aside from their chance present external resemblances.

Another paper of more than ordinary interest was that of Professor William Hastings, entitled 'The Nebraska Type or Norm for each School Age, and Vitality Coefficients.' 'Thunder Storms' was the title of a paper by J. H. Spencer, in which the author gave a very concise description of what constitutes such a storm, its cause, method of development, extent, importance, and the comparative annual number of such storms for the State of Nebraska and surrounding regions.

The feature of the evening session was the presentation of papers of a more general nature. Some of these were 'Notes on the Occurrence of Asparagus Rust in Nebraska,' by J. L. Sheldon; 'The Determination of the Longitude of the University of Nebraska Observatory,' by G. D. Swezey; 'A Report on the Morrill Geological Expedition for 1900,' by E. H. Barbour; 'Additional Observations on Plant Movements,' Wm. Cleburne; a paper on the 'Delimitation of the Field of Pedagogy,' by W. A. Clark, and one on 'Degeneracy,' by Dr. H. B. Lowry. In his presentation of this latter subject the doctor dealt chiefly with the criminal phase. It is needless to state that this paper will form very interesting reading when published.

The papers presented at the session on the morning of December 1st were 'The Geology of Saunders, Lancaster and Gage Counties,' by C. A. Fisher; 'North American Bees of the Genus *Agapostemon*,' by J. C. Crawford, Jr.; 'The Work of the State Geological Survey during the Summer of 1900,' 'Bone Tissue, Recent and Fossilized,' and one on the 'Extent of the Fiberous Arikaree Beds,' by E. H. Barbour; 'Some Tests of Camera Shutters,' G. D. Swezey; 'Notes on Beet Diseases in Nebraska,' Geo. G. Hedgecock; 'A Brief Account of some Rare Alaskan Worms,' H. B. Ward; 'Observations on Species of Nebraska Water Mites,' Robert H. Wolcott; 'Report on the Botanical Survey of Nebraska,' Roscoe Pound; 'Additions to the List of Nebraska Fossils,' Carrie A. Barbour, and 'Some Impressions of Biological Conditions in Arizona,' A. A. Tyler. As nearly all these papers were more or less technical in their nature, or of minor general interest, they were presented by their authors in abstract.

The officers elected for the ensuing year are: Ellery W. Davis, President; J. H. Powers, Vice-President; Robert H. Wolcott, Secretary and Custodian; G. A. Loveland, Treasurer; Board of Directors: William Cleburne, C. H. Gordon, H. B. Lowry and L. Bruner.

On motion of the chairman of the committee on publication it was decided to publish at once the proceedings of the present meeting, also the proceedings of the last two meetings, which have been held in abeyance awaiting the publication of the report of the Nebraska Historical Society with which they are to appear.

A committee of three was also appointed to await upon the members of the coming legislature for the purpose of securing any possible State aid in the future publication of the Academy's proceedings.

LAWRENCE BRUNER,
Secretary.

DISCUSSION AND CORRESPONDENCE.

A GASOLINE LAUNCH FOR FIELD WORK.

TO THE EDITOR OF SCIENCE: Three years ago I published in your columns a few brief statements regarding the feasibility of using gasoline for motive power in conducting geological work in the Eastern United States, and more particularly in New York. Since then several long, and I may venture to say successful, excursions have been made. It is, however, to show the