On a simple automatic Sprengel Pump: By B. B. Boltwood. The author describes a form of pump which can be easily made and which he recommends as very satisfactory.

The following books are reviewed in this number of the *Journal:* The Practical Methods of Organic Chemistry, L. Gattemann (translated by W. B. Shober); Notes on Qualitative Analysis, W. P. Mason; Chemistry for Beginners, E. Hart; Manual of Determinative Mineralogy, Geo. J. Brush; Chemistry in Daily Life, Dr. Lassar-Cohn; Handbook for the Bio-Chemical Laboratory, J. A. Mandel.

J. Elliott Gilpin.

SOCIETIES AND ACADEMIES.

NEBRASKA ACADEMY OF SCIENCES, DECEMBER 30, 1896.

The seventh annual meeting of the Nebraska Academy of Sciences was held December 29th at Lincoln and the following papers were presented:

Annual address of the retiring President, Prof. E. H. Barbour, on the 'Economic and Educational Value of Academies;' a comparison of the methods of various academies, with recommendations for the betterment of our own.

'A new Plankton Pump,' Prof. H. B. Ward and Prof. Chas. Fordyce, a device for collecting aquatic organisms by pumping from any desired depth; followed by remarks by Prof. Ward on the importance of continued biological observations.

'Report of Progress in the Study of the Fauna of the State,' Prof. L. Bruner, showing how few species have been reported from Nebraska in most groups, although our number of species is undoubtedly very large.

'Some Methods of Collecting, Preserving and Studying Fossils,' Miss Carrie Barbour, illustrating the fact that forms apparently hopelessly disintegrated may be collected and preserved.

'Nomenclature of Nebraska Forest Trees,' Dr. Chas. E. Bessey, giving the history of changes in names of our trees with the names now adopted.

'Reflections on the Genus *Ribes*,' Prof. F. W. Card, urging the validity of species developed by cultivation as well as those found wild whose genealogy is not known.

'Chalcedony-lime Nuts of the Genus *Hickora* from the Bad Lands of Nebraska,' Prof. E. H. Barbour.

'Comparison of Nebraska Diatomaceous Earth from Nebraska and adjacent States,' C. J. Elmore.

'What is Mathematics?' Dr. E. W. Davis, showing how mathematics is designed to coordinate other sciences.

'A Family of Quartic Surfaces,' the sum of the distances of whose locus from two given surfaces is constant, Prof. R. Moritz.

'A Form of Weir Notch,' the flow of water through which varies directly as the head instead of following the more complicated law of the ordinary notch, Prof. O. V. P. Stout.

'An Observation upon annual Rings in Tree Growth,' Prof. F. W. Card, in which complete defoliation did not cause the formation of a second annual ring.

'Internal Temperature of Trees,' R. A. Emerson. Temperatures as high as 110° reached at a depth of one-half inch below the bark of trunks exposed to the sunshine; daily fluctuations greater in dead limbs than in live ones.

Owing to the late hour the following papers were read by title only: 'Notice of two Important Books on Systematic Botany,' Chas. E. Bessey; 'The Barites of Eastern Nebraska and the Bad Lands,' Erwin H. Barbour; 'Some Data as to Wind distribution of Seeds,' Ed. M. Hussong; 'Parasites of Nebraska Dogs,' Henry B. Ward; 'Discovery of the first Meteorite in Nebraska,' Erwin H. Barbour; 'Notes on Phyllopod Crustacea,' H. A. Lafler and A. S. Pearse; 'The Study of Botany in the School for the Blind,' Dr. C. E. Bessey.

The following officers for the ensuing year were elected: President, Dr. A. S. von Mansfelde; Vice-President, Dr. E. H. Barbour; Secretary and Treasurer, Prof. G. D. Swezey; Custodian, Prof. Lawrence Bruner; Directors, Dr. H. B. Ward, Prof. H. B. Duncanson, Mr. C. J. Elmore and Dr. H. Hapeman.

The next annual meeting will be held on the day following Thanksgiving. The volume of proceedings for 1894–95 is just issued. Price, 50 cents.

G. D. Swezey,
Secretary.

BIOLOGICAL SOCIETY OF WASHINGTON. 269TH MEETING. SATURDAY, JANUARY 3.

MR. F. A. LUCAS exhibited the skull of a Sea Lion, *Eumetopias*, in which one ramus of the jaw had been broken when the animal was quite young. The fracture had not united and, in consequence, only one side of the jaw was functional, the result being that this side had developed more than the other, making the cranium asymmetrical.

Mr. E. W. Nelson spoke on 'New Birds from Mexico,' stating that he had quite recently collected forty-four new species and subspecies, including one new genus, from a comparatively limited area in Mexico and western Guatemala.

Mr. F. A. Lucas read a paper on the 'Natural Mortality among Fur Seals' giving the results of the observations made during the summer of 1896, by the Commissioners of the United States, Great Britain and Canada. It was stated that there was a considerable mortality among very young seals, due to their being trampled on by the adult seals in the harems. This great loss took place only on ground free from obstructions, where the quarrelsome bulls and startled cows could move readily about. Some small number of seals starved from natural causes, a few were drowned, and some died from accidents and diseases, such as inflammation of the bowels, inflammation of the kidneys, etc. The *known* causes of death among the adults were few, principally fighting among the bulls and consequent injury to the females, but it was evident that for some reason the mortality among cows was great.

F. A. LUCAS,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

AT the meeting of the Academy of Science of St. Louis of January 4, 1897, Dr. Amand Ravold gave a microscopic demonstration of Widal's test for typhoid fever, demonstrating that after the disease has existed for four days or more the blood of typhoid patients, probably because of some contained anti-toxine, possesses the power of inhibiting the motion of typhoid bacilli from a pure culture introduced into it within a period of one hour or less, whereas in normal blood similar bacilli retain their power of locomotion for an indefinite length of time. It was stated that typhoid blood possesses this property even after having been dried for a period of four weeks or more, so that a few drops obtained from a person suspected of having the disease may be sent to suitable places for applying the test, thus rendering comparatively easy the early diagnosis of a disease which in its early stages presents many clinical difficulties.

Prof. F. E. Nipher gave preliminary results of partially completed experiments, made through the courtesy of the Burlington and Illinois Central Railroads, to determine the frictional effect of trains of cars on the air near them. His apparatus consists of a cup collector supported on a bar capable of sliding in guides on a clamp attached to the window sill of the car. The bar is thrust out to varying distances up to 30 inches. The mouth of the collector is turned in the direction of motion of the train. The pressure due to the motion is conveyed through a rubber tube attached to the rear of the collector and passing lengthwise through the bar to a water manometer. The manometer has a tube with a rise of 4 or 5 in 100 and is provided with a pivotal mounting and a level.

The pressure near the train is comparatively small and increases as the collector is thrust further out. It approaches a limit corresponding to the train velocity at the instant. Prof. Nipher finds the relation between the limiting pressure and velocity to agree exactly with the formula

$$P = \frac{\delta}{2} v^2$$

where v is the train velocity in centimeters per second, P is the pressure in dynes to the square centimeter, and δ is the density of air in C.G. units at the temperature and pressure of the observations. He finds the pressure a maximum when the axis of the collector is parallel to the direction of motion with the mouth to the wind. Turning the collector until its axis makes an angle of about 60° with this position, the pressure reduces to zero. At greater angles the pressure becomes less than atmospheric pressure by an amount which reaches a maximum at an angle of 90°, and passes through a

minimum at an angle of 180°, when the collector is in a trailing position. The sum of the coefficients for the two positions of maximum compression and minimum exhaust is almost exactly the same as Langley obtained with a pressure board when exposed normally to the wind.

The result shows that a large amount of air is dragged along with the train, the motion being communicated to air many feet away. This air is a source of danger to one standing too near the train when at full speed. One is likely to be toppled over, and the blow of the air communicates a motion of rotation which may cause one to roll under the train if the nature of the ground does not prevent such result. It was remarked, however, that where trains have a right to run at any speed no prudent person would stand so near to a train as is necessary in order to be in danger from this source.

The following officers were declared elected for the year 1897: President, M. L. Gray; First Vice-President, E. A. Engler; Second Vice-President, Charles R. Sanger; Recording Secretary, William Trelease; Corresponding Secretary, E. C. Runge; Treasurer, Enno Sander; Librarian, G. Hambach; Curators, Julius Hurter, J. H. Kinealy, E. Evers; Directors, M. H. Post, Joseph Grindon.

One person was elected to active membership.

William Trelease,
Recording Secretary.

NORTHWESTERN UNIVERSITY SCIENCE CLUB.

At the December meeting, Dr. Marcy in the chair, Prof. Crook presented 'Some Geological Causes of the Scenery of the Yellowstone National Park' as a report upon a trip to that region. The nature of the scenery is due: 1, to the fact that the country is geologically young, having begun to take its present form at the close of the Cretaceous; 2, to the fact that it is composed of volcanic materials which were erupted in this order, viz: Andesite, rhyolite, basalt; 3, to the fact that the rhyolite is not yet cooled; and 4, to the fact that the topography of the country causes precipitation of meteoric waters unusually great for that region and, consequently, low temperature and powerful erosion. The difference in chemical composition of the spring waters is accounted for on petrographical grounds.

Geyser action is satisfactorily explained in accordance with Bunsen's theory. The unique coloring in the region is due to biological and to mineralogical causes. Twenty hand specimens and thin sections and fifty lantern slide views illustrated points considered.

Evanston, Ill. A. R. Crook,
Secretary.

UNIVERSITY OF WISCONSIN SCIENCE CLUB, DECEMBER 16, 1896.

Prof. C. R. Van Hise, in his paper, 'The Deformation of Rocks,' discussed the subject in general. It was shown that, in order to adequately understand the phenomena of deformation, the position of rocks with reference to the surface must be considered. Observations in the field show that there are three somewhat distinct zones—an outer zone of fracture, a middle zone of combined fracture and folding, and a deeper seated zone of folding. However, whether folding or fracturing occurs depends largely upon the rapidity of deformation and upon the strength of the rock in question, as well as the superincumbent load. Therefore at the same depth may be found all the phenomena of the zones of fracture and flowage; but, broadly stated, the outer zone is particularly characterized by joints, faults and brecciation; the deep seated zone is particularly characterized by folding and cleavage; and the middle zone shows all of these phenomena with various complex relations.

Mr. L. S. Cheyney, in his paper, 'Résumé of Work done on the Flora of Wisconsin,' discussed briefly the history of systematic botanical investigation upon the vegetation of the territory now included in the limits of the State, from the journeys of the Jesuit missionaries to the present time.

Mr. C. H. Ford, in his paper, 'The Modern Telephone Transmitter,' gave an account of some original work done to test the comparative worth of modern transmitters.

Wm. S. Marshall,
Secretary.