Torreya is the title of a new monthly journal of botanical notes and news edited for the Torrey Botanical Club by Dr. Marshall A. Howe. A half-tone medallion of Dr. John Torrey, in whose honor the periodical is named, adorns the cover. The object of the journal is to provide a medium for short and semi-popular articles and for reviews, news items, etc., the *Bulletin* of the Club being thus reserved for the longer and more technical papers. It is expected that considerable prominence will be given to notes relative to the teaching of botanical science. The first number of *Torreya* (January) includes the following articles: 'Notes on *Rudbeckia hirta*,' by Dr. N. L. Britton; 'Seedlings of *Arisæma*,' by Dr. D. T. MacDougal; 'Notes on the Genus *Lycopodium*,' by Professor F. E. Lloyd; 'The Summit Flora of King's Mountain and Crowder's Mountain, North Carolina,' by Dr. J. K. Small; 'A simple Dynamometer,' by Dr. H. M. Richards; 'The rare Mosses of Bashbish Falls,' by Mrs. N. L. Britton; and 'Economy in Nature,' by Dr. P. A. Rydberg. The February number contains: 'The Value of Forestry in a Course of Nature Study,' by Miss Elizabeth Carss; 'A new Hygrometer suitable for testing the Action of Stomata,' by Dr. D. T. MacDougal; 'The *Lygodium* at Home,' by Frederick H. Blodgett; 'A new *Senecio* from Pennsylvania,' by Dr. N. L. Britton; and '*Rosellinia ovalis*,' by William A. Riley.

MR. HARRY F. WITHERBY, who has lately made an expedition to the White Nile in search of birds, will commence, in the next issue of *Knowledge*, a series of illustrated articles descriptive of the country, its people, its wild animals and its birds. In the first instalment the author deals with his journey by river and the Desert Railway from Cairo to Khartoum, and gives his impressions of Khartoum and Omdurman.

SOCIETIES AND ACADEMIES.

SECTION OF BIOLOGY OF THE NEW YORK ACADEMY OF SCIENCES.

THE regular monthly meeting for February was held on the 11th, Professor C. L. Bristol presiding. The following program was offered:

D. T. MacDougal: 'The Critical Points in the Relation of Light to Plants.'

A. G. Mayer: 'The Variations of a Newly-arisen Race of Medusa.'

Dr. MacDougal stated that an examination of all the data at hand shows no correspondence among the maxima, minima and optima of intensities of light with regard to the various influences exerted upon the plant by light, and that the current conception of *phototonus* is not based upon well-defined generalizations. Etiolative phenomena of plants are irritable reactions, consisting chiefly in the elongation of organs which would carry the chlorophyll screens and reproductive bodies up into the light. Light is not necessary to the motility of protoplasm, nor for the activity of the motor mechanisms of such plants as *Mimosa*. The condition known as *darkness-rigor* does not exist. Appearances commonly supposed to be due to rigor of darkness are pathological phenomena occasioned by the disintegration of chlorophyll and other substances. Light may exert a direct chemical (disintegrative) effect upon the constructive material of the cell, but it does not retard growth; on the contrary, it accelerates growth in algæ. Evidence that light exercises a paratonic influence upon plants is not at hand, and no observations could be found by the speaker supporting the conclusion that a similar retarding influence of light upon growth occurs among animals. In discussion of Dr. MacDougal's paper, Mr. M. A. Bigelow called attention to some experiments made by him, under the direction of Professor C. B. Davenport, to determine the influence of light upon embryonic development and post-embryonic growth in Amphibia. Light does not retard, but rather accelerates developmental processes, the effective rays being red in embryonic and blue during post-embryonic stages.

Dr. Mayer stated that in 1898 he had discovered a pentamerous Hydromedusa at the Tortugas, Florida, and had named it *Pseudoclytia pentata*. In this form there are five radial canals, five lips, and five gonads 72° apart, instead of four of these various organs at intervals

of 90°, as in other Hydromedusæ. In its anatomy it is related to the genus *Epenthesis*, being indeed very close to *E. folleata*, which also occurs at the Tortugas. It is probably the descendant of some *Epenthesis*, and seems to be a newly-arisen species. No studies have as yet been made by zoologists upon the variations of such forms. The medusa is highly variable. Out of 1,000 individuals 703 are normal radially symmetrical medusæ, with five radial canals and five lips at intervals of 72°, while 297 are abnormal in some respect, having 4, 3, 2, or 6, 7, 8 canals or lips. It is remarkable that fully 50 per cent. of the abnormal individuals are radially-symmetrical. The greater the departure from the normal form the smaller is the ratio of radially-symmetrical individuals. Thus only 11.2 per cent. of the medusæ having five canals are irregular, while 30 to 33 per cent. of those with four or six canals are irregular; in medusæ with seven or three canals 50 per cent. are irregular, while 100 per cent. of those with two or eight canals are so. The lips show a decided tendency to revert to the ancestral number of four, at intervals of 90°, but the canals, on the contrary, incline toward the higher numbers. We have here a medusa which is continually producing radially-symmetrical sports, and is initiating, so to speak, what might become new species were conditions favorable. On comparing the variations of *P. pentata* with those of *E. folleata* or *Eucope*, one is struck with many remarkable family likenesses. This is especially true in the former comparison. The similarity of the variations, the likeness of their abnormalities in these closely-related forms, indicate apparently a race kinship. The abnormal young of *P. pentata* appear to survive fully as well as normal individuals, and abnormal medusæ mature their gonads quite as commonly as the normal forms. The former are not weeded out by natural selection, yet they have not succeeded in establishing new types of medusæ.

In discussion of Dr. Mayer's paper, Dr. MacDougal spoke of a sport of *Populus tremuloides*, discovered by Dr. Britton, in which the irritability to gravity of the leaves had been reversed so that they now pointed downwards. The reversal appeared in the buds. New plants propagated by grafting retained the positive geotropism of the leaves. It was also stated that the 'weeping' varieties of certain trees were usually produced in this way.

Henry E. Crampton,
Secretary.

Section of Anthropology and Psychology of the New York Academy of Sciences.

A regular meeting of the Section was held on February 15th. Dr. D. R. Major reported the results of physical and mental tests on school children of high and of low class standing, the aim of these tests being to discover what relation, if any, exists between class standing and the ability shown in the particular tests used. The tests were as follows: Visual and auditory memory for figures and words, striking out of A's, naming 100 words, copying of figures, weight discrimination, perception of size, sensation-area test as used in the Columbia laboratory, eyesight, age and talkativeness. The tests were made on 150 New York City school children, 68 having high class standing, 82 low. The results of the tests tend to show that the class standing bears a close relation to the ability to pronounce words, to carefulness or accuracy in striking out A's, to memory for words, to eyesight, to age (the average age of the good pupils being less than the average age of the class), and to talkativeness (the good pupils being as a rule talkative). There is apparently little, if any, relation between class standing and the ability shown in the other tests mentioned. The study, however, is not completed and the opinions expressed here are subject to change. In addition to the use made of the standard psychological tests, an attempt is being made to devise tests to determine the presence, nature, and quality or worth of apperceptive activities.

The second paper by Mr. E. A. Spitzka described with special reference to their similarities, the brains of two distinguished physicians, Dr. Edouard Seguin, and his son, Dr. Edward C. Seguin. The most striking similarity discoverable in these brains is the unusual development in the left Insula. This similarity was attributed by the author to heredity, and was

held to be the physical basis for the high type of ability shown by both the Seguins in the use of language. CHARLES H. JUDD,
Secretary.

SECTION OF ASTRONOMY, PHYSICS AND CHEMISTRY OF THE NEW YORK ACADEMY OF SCIENCES

A REGULAR meeting of the Section was held on March 4, 1901. The annual election of officers of the Section was held, Professor William Hallock being elected Chairman and Dr. F. L. Tufts, of Columbia University, Secretary for the ensuing year.

The first paper was by Professor R. S. Woodward and Mr. J. W. Miller, Jr., on 'The Elastic Properties of Helical Springs.' This was part of an investigation now in progress and the details will be published later when the investigation is completed.

Dr. F. L. Tufts then read a paper on 'A Photographic Study of the Air Movements near the Mouth of an Organ Pipe.' In this paper the author described experiments in which he applied the 'method of striæ,' similar to that used by Toepler, C. V. Boys, R. W. Wood and others, to the study of the vibrations within an organ pipe. The pipe used had sides made of plane parallel glass plates. The tongue of air at the mouth of the pipe was made visible by using air mixed with alcohol vapor which changed its optical density. The vibrations and air currents within the pipe were made visible by the introduction into the pipe of small jets of illuminating gas. The intermittent illumination used was the spark between magnesium ribbons from an induction coil. It was found quite easy to adjust the rate of interruption of the coil so as to produce a stroboscopic effect, and thus the movements of the tongue of air in the mouth of the pipe and the vibrations and air currents in the pipe could be readily followed.

The same method was also applied by the author to study the behavior of unignited jets of illuminating gas when acted on by sound waves. The paper was illustrated by a number of photographs of the phenomena observed.

WILLIAM S. DAY,
Secretary.

THE LAS VEGAS SCIENCE CLUB.

THE third meeting of the Science Club was held February 12th. Mrs. Cora W. Hewett exhibited shells of *Pyramidula strigosa* varieties *depressa*, *Cooperi* and *major*, which she had collected between Mora and Peñasco, N. M. It was remarked that, though occurring together, the *depressa* and *Cooperi* forms did not appear to intergrade. Miss Mary Cooper exhibited numerous species of New Mexico Mollusca, including *Ashmunella thomsoniana porteræ* from Manzanares Valley, a new locality. Mr. T. D. A. Cockerell exhibited and discussed a number of shells from a pleistocene deposit at the Arroyo Pecos, Las Vegas. The shells appeared to be all of living species, but he had found in the deposit part of the jaw and a tooth of a species of *Microtus* which, judging from the enamel pattern, was clearly distinct from any species now recognized as living in America. Mr. Cockerell also exhibited specimens of a wax-scale, *Ceroplastes sinensis*, Del Guercio, received from the Agricultural School at Portici, Italy, with the information that it was infesting lemon trees at Chiavari, Italy. It was supposed that the insect reached Italy from China, but it was very close indeed to *C. mexicanus*, Ckll., a species not uncommon in Mexico.

T. D. A. C.

OTTAWA FIELD NATURALISTS' CLUB.

AT the last meeting of the Club held at Ottawa, January 29th, the following papers of special interest to geologists were presented:

Observations on the Crows' Nest Pass. By MR. JAMES MCEVRY, of the Geological Survey of Canada.

Mr. McEvry spoke of the geological structure and economic resources of the Pass and illustrated his paper by means of lantern slides prepared by Mr. J. Keele.

Explorations in Baffin Land. By DR. ROBERT BELL.

This paper gave a graphic *résumé* of the researches carried on by Dr. Bell and his party along the North Shore of Hudson Straits and in the interior of Baffin Land. Numerous lantern slides illustrating the geological struc-

ture and orographic features of the regions traversed accompanied Dr. Bell's paper.

The 'Report of the Geological Section, for 1900–1901,' was then presented by Mr. H. M. Ami, in which were pointed out the nine important discoveries in the Chazy, Trenton, Utica and Lorraine formations in the Paleozoic about Ottawa as well as those in the Pleistocene and marine clays, sands and gravels, etc., of the same district.

H. M. Ami.

SHORTER ARTICLES.

ARSENIC TESTS.

The note concerning arsenic tests on page 313 of the current volume of Science brings to my mind some experiments made while testing for arsenic in glycerol, an account of which is found in the *Journal American Chemical Society* for Nov., 1895. I found the destruction of the organic matter (before applying the Marsh test) by a mixture of sulphuric acid and nitric acid (30 to 1) caused a loss of arsenic in some samples but not in others. In one sample treated with this mixture it was found impossible to detect even added arsenic. My conclusion at the time was "that some at least of the samples contain, or are decomposed into, something capable of holding back arsenic. This leads to the query: What is the effect of the combined glycerol present in the toxicological examination for arsenic? May not the trouble with the glycerol be due to a decomposition product which could also be formed in the supposed case?" I have never had time to investigate this point myself, and as far as I know it has never been discussed in print. May not the trouble with the Marsh test as applied to beer be due to the same cause? I was able to detect arsenic in the above-mentioned case by adding the sample diluted with water directly to the reduction flask.

A very simple, convenient and delicate method for detecting arsenic in glycerol is mentioned by several writers. I am not certain who first applied it, but think it was Ritsert. The glycerol is diluted with an equal volume of water, HCl and zinc added, and a yellow coloration obtained, if arsenic is present by exposing filter paper, moistened with either silver nitrate solution (1 to 1) or saturated mercuric chloride solution to the evolved gas. A twenty-five cc. measuring glass is convenient for carrying out the test, the filter paper moistened with the solution being placed over the mouth. This test carried out with mercuric chloride is not as delicate as the Marsh test, but when silver nitrate is employed it is about five times as delicate. E. Ritsert (*Pharm. Ztg.*, 1888, 715 and 1889, 104, 360 and 625) finds this test to show 0.001 mg. of arsenic in 1 cc. of solution where the Marsh test only shows 0.01 mg. in 1 cc.

G. E. Barton.

Millville, New Jersey,
Feb. 25, 1901.

PRELIMINARY NOTE ON THE EMBRYOGENY OF NELUMBO.

For two years the writer has had *Nelumbo lutea* under observation and has demonstrated among other points those enumerated below. The discoveries, and the conclusions arising from them, are of such importance that publication in advance of the complete memoir seems advisable. They are as follows:

1. The membrane surrounding the plumule has been shown to be, as conjectured by Wigand, a true endosperm arising within the embryo sac.

2. The embryo is genuinely monocotyledonous in development and the conclusions of Mirbel are erroneous. The plumule arises laterally and at first there is but one cotyledon. Later this bifurcates to form the two fleshy bodies which since Mirbel's researches have been generally regarded as separate cotyledons. For the views of Barthélemy, Richard, Clos and others who have altogether denied the cotyledonary nature of the fleshy bodies, there is no foundation in fact.

3. There is no primary root. The first roots are adventitious and spring from the epicotyl.

Nelumbo, both in its anatomy and embryogeny, conforms to the type of the Monocotyledons and, probably with the other Nymphaeaceae, should be classified in the general vicinity of the Alismaceae.

Harold L. Lyon.

The University of Minnesota,
March 14, 1901.