The Museums Journal of Great Britain for October contains articles on 'The British Association' and 'The Mannheim Conference on Museums as Places of Popular Culture,' and the concluding portion of the address of the president, which is illustrated by a number of plates. E. M. Holmes has an article on 'The Preservation of Natural Colours in Dried Plants.' There is the customary number of important notes concerning various museums and museum matters.

SOCIETIES AND ACADEMIES.

THE NATIONAL ACADEMY OF SCIENCES.

The academy held its autumn meeting at Chicago on November 17, 18 and 19. The event was of special importance owing to the fact that the academy has not hitherto met west of the Atlantic seaboard. Chicago has recently become one of the chief scientific and educational centers of the country, and, apart from the program of papers, there was much to interest the visiting members. The members of the academy were very generously entertained by the president and other officers of the University of Chicago and by the director of the Yerkes Observatory. Mr. Alexander Agassiz presided, and the following program was presented:

T. C. Chamberlin: 'Preliminary Report on the Agassiz Data relative to Underground Temperatures at the Calumet and Hecla Mine.'

C. E. Dutton: 'The Velocities of Earthquake Vibrations and their Significance.'

A. P. Mathews: 'The Relation between Solution Tension and Physiological Action of the Elements.' Introduced by C. O. Whitman.

S. W. Williston: 'On the Distribution and the Classification of the Plesiosaurs.' Introduced by T. C. Chamberlin.

C. O. Whitman: 'The Evolution of the Wing-Bars in Pigeons.'

Chas. B. Davenport: 'Evolution without Mutation.' Introduced by C. O. Whitman.

J. McK. Cattell: 'The Measurement of Scientific Merit.'

J. Stieglitz: 'Stereoisomeric Nitrogen Compounds.' Introduced by A. A. Michelson.

Charles Baskerville: 'On the Recent Investigations of the Rare Earths in the Laboratory of the University of North Carolina' (by title). Introduced by Ira Remsen.

E. E. Barnard: 'Some Peculiarities of Comets' Tails, and their Probable Explanation.' Introduced by George E. Hale.

Edwin B. Frost: 'Stars of the Orion Class.' Introduced by George E. Hale.

George E. Hale: 'On the Nature of the Solar Flocculi.'

Geo. C. Comstock: 'The Relation of Stellar Magnitude to Stellar Distances.'

A. A. Michelson: 'Spectra of Imperfect Gratings.'

Stephen Moulton Babcock: 'The Relations of Weight and Energy.' Introduced by Charles R. Van Hise.

C. S. Slichter: 'The Propagation of Ground Water Waves.' Introduced by Geo. C. Comstock.

William H. Brewer: 'Biographical Memoir of Sereno Watson.'

Charles R. Van Hise: 'The International Geographical Congress and a Geophysical Laboratory.'

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of October 19, 1903, when, for the first time, the academy met in its new building, Professor Nipher gave a verbal abstract of the results of his paper on the 'Law of Nebular Contraction,' which has just been published in the *Transactions*. He also remarked that the molecular conditions in nebulæ of different gases were being examined, and some very interesting results are at once evident. If a series of nebulæ of various gases have the same mass internal to the same radius, the average molecular velocities would be the same for all gases. The velocity which would enable a molecule to escape from the nebula is 2.71 times the average molecular velocity, and this ratio is constant for all parts of the nebula. If the entire solar system formed the core of such a nebula, and the mass of the solar system extended to Neptune's orbit, the density at that distance from the center of the nucleus would be less than that in a Crookes tube. This opens up some very interesting questions concerning the history of such a mass. It would appear that such a gravitating mass would lose some heat by the escape of the more rapidly moving molecules, as well as by radiation.

Professor Keiser read a paper on a method of determining the amount of free lime in cements. He finds that this can be done by determining the amount of water absorbed. By measuring this absorption in samples containing known amounts, the precautions to be taken in manipulation have been found. The determination only requires about twenty minutes.

Professor Nipher presented a diagram on which was drawn the curve of speed of the trotting horse. This curve represents the equation published by him twenty years ago. On the same diagram was shown a belt of observed values representing the performance of every horse who has broken the speed record since 1845. In some cases a single horse has broken the record several times in the same year. All such observations were included. The points representing these observations formed a belt within which was the curve of predicted speed. The agreement was considered very satisfactory.

AT the meeting of November 2, 1903, Dr. J. A. Harris presented for publication a paper on 'Polygamy in *Solanum*' and a paper on 'The Germination of *Pachira*,' and Mr. B. F. Bush presented a paper entitled 'A New Genus of Grasses.'

The secretary addressed the academy on its past history and prospects, in connection with the occupancy of its new home.

WILLIAM TRELEASE,
Recording Secretary.

THE BIOLOGICAL SOCIETY OF WASHINGTON.

THE 374th meeting, the first of the fall, was held Saturday, October 17.

Under the head of 'Notes' L. O. Howard stated that attention having been drawn to the great variance in the statements regarding the length of the thread of a silk worm's cocoon, he had had the threads of four specimens measured. They were found to be from 880 to 1,102 yards in length, the published figures referred to varying from 1,100 yards to 11 miles.

T. S. Palmer spoke on 'Indexing Scientific Names, with special reference to the Genera of Mammals.' After mentioning the recent appearance of Sherborne's 'Index Animalium,' and the volume of Waterhouse supplementing the 'Nomenclator Zoologicus' of Scudder, he said that for nearly fourteen years past he had been engaged in the preparation of a list of the genera of mammals, living and extinct. This work was to give the date and place of publication, the character and location of the specimen, etymology, and indicate whether or not it was preoccupied. The list, which contained about 5,000 names, was to be arranged both alphabetically and zoologically, so that it would be possible not merely to ascertain whether or not a given name had been used, but to see readily what genera were comprised in any given group. Mr. Palmer then spoke of some of the difficulties that had been encountered in tracing some of the names and their derivation, and said that it was hoped that the list would be issued in December.

O. F. Cook presented a paper on 'Central American Mutations of Coffee,' saying that some of the varieties of coffee were well marked and known by special names. He said that a study of these variations had led to conclusions directly opposed to those of de Vries drawn from observations on primroses; that instead of these variations being natural steps in the evolution of species, they were the result of close inbreeding and indications of degeneration.

W. P. Hay described 'Terrapin Culture in the United States,' giving the results of his observations on the diamond back terrapins in the region of Chesapeake Bay. He gave a résumé of the laws relating to terrapins, intimating that they were the most stringent where least needed and practically not enforced anywhere. The turtles were impounded in large numbers and the eggs were deposited freely and many hatched, but owing to the prevailing conditions and lack of care the larger proportion of young were destroyed. The young grew about an inch during the first year, but attained maturity slowly, probably agreeing in this respect with *Chrysemys picta*. Like this species, four distinct sizes of eggs could be distinguished in the diamond back terrapin aside from the general mass of small,

unfertilized ova. In order to supply the demand for terrapin many were imported from the southern states, including representatives of two distinct and, as yet, undescribed species. It had been thought that these might be crossed with the Chesapeake terrapin, but as none were kept a sufficient length of time, four years, after importation no results had been obtained. Owing to close hunting and disregard of the laws, the Chesapeake terrapin was threatened with extermination, and the simplest remedy suggested was to forbid the sale of the larger terrapins, since these were invariably breeding females.

F. A. Lucas.

THE TORREY BOTANICAL CLUB.

At a meeting of the club held at the Botanical Garden on October 28 the following scientific notes and papers were presented:

Dr. MacDougal called attention to the abnormal fall blooming of certain plants. In one case mentioned the spring flowering of certain plants was retarded till fall, owing to the presence of a mass of ice, this being a case of retarded development. He exhibited plants with flowers now open that should not normally open till next spring, this being accelerated development caused by the prevailing climatic conditions.

Dr. Britton exhibited two forms of the common marsh mallow, one with pink flowers, the other with white flowers with a crimson center. The first is the well-known *Hibiscus Moscheutos* L. The second form is not uncommon in various localities, but has been considered merely a color variation. Recently it has been observed that the fruits of the two forms are very different, showing that they should be considered distinct species. Drawings of the fruits were exhibited. No name has as yet been proposed for the white-flowered form.

Dr. Livingston spoke on the 'Influence of Osmotic Pressure on the Cell.' One of the widely accepted theories of the action of osmotic pressure is that it is comparable to gas pressure. It can only act, however, in the presence of water. Soluble salts tend to diffuse throughout a given volume of water just as gases do in a confined space. In cellular tissues there is no break in the water connection, since the cell wall is permeable by water and by the salts dissolved in it. The protoplasmic lining of the cell is, however, only semi-permeable, since it allows the passage of some substances while preventing that of others. When living cells are transferred from a thin dilute medium to a denser one the tendency is for them to lose part of the water they contain. The cell contents thus become more or less shriveled. Conversely, when a cell is transferred to a more dilute medium it swells and becomes more turgid. Strong solutions tend to check vital activity. Removal to a dense medium often materially alters the form of growth of an organism, the tendency being to assume short thick forms in the dense medium and longer and more slender forms in the dilute ones. With different substances that are not poisonous the cell seems to give the same response when a strength of each is used that would exert the same osmotic pressure, showing that it is the pressure and not the character of the substance that produces the effect. The extraction of water from the cell means the concentration of the solution of all the various salts and other dissolved substances that are contained in it. Varying strengths of the same salt are known to affect the growth of plants very diversely, and this suggests an interesting field for further investigation.

The paper brought out an interesting discussion as to the probable effect on the aquatic vegetation of a gradual change from fresh to salt-water conditions.

Mr. Earle discussed 'Generic Limits among the Agaricaceæ.' He called attention to the artificial character of the genera that are now recognized and the unnatural grouping of species that resulted from the use of only two or three characters as the basis of genera. A more natural grouping would require that the sum total of all the characters should be considered in defining genera.

F. S. Earle,
Secretary.

CLEMSON COLLEGE SCIENCE CLUB.

THE club held its first regular meeting of the present scholastic year on the evening of September 18. Professor W. M. Riggs presented a communication entitled 'The Fixation of Atmospheric Nitrogen.' Priestley's observation of the effect produced in the atmosphere by the discharge of an electric spark was mentioned as being the basis of the present experimental work now being done on this subject. The work now being done at Niagara Falls by Messrs. Bradley and Lovejoy for the purpose of making the process of 'fixation' a commercial success was described in detail. The machines used in the process were illustrated by drawings. The great economic results that would flow from a successful commercial application of the process were emphasized. Professor H. Benton discussed 'Soil Inoculation.' The speaker referred to the fact, long since known, that the cultivation of legumes has always been found beneficial to the growth of succeeding crops. The reasons for this were explained. In view of the fact that each species of legume has its own species of nitrogen-assimilating bacteria, it is necessary that there be present in the soil the particular species of bacteria adapted to the crop to be grown. The different methods of inoculation were described in detail. The speaker closed by giving some figures showing the efficacy of soil inoculation in the case of some hay crops grown in Alabama.

Professor F. S. Shiver read a paper entitled 'The Centenary of the Metric System.' This paper gave in detail the evolution and development of the metric system. Some of the earlier attempts at unification of the French *measures,* prior to the advent of the metric system, were referred to. Picard's work was shown to have furnished the scientific principle upon which the metric system rests. The attempts to legalize the new system in France and elsewhere were recounted. The system was shown to have entered a new phase, that of becoming an international standard, in 1875. The work of the International Commission, as well as of the International Bureau of Weights and Measures, was explained. The methods of preparing the international copies of the meter and kilogram were noted. In conclusion, the work of Michelson in comparing the basis of the metric system with a natural unit, namely, the length of a wave of the red light of cadmium, was referred to. The work of Guillaume on nickel steels and their application to metrology was also mentioned.

F. S. SHIVER,
Secty.-Treas.

CLEMSON COLLEGE, S. C.,
October, 1903.

THE GEOLOGICAL SOCIETY OF AMERICAN UNIVERSITIES.

ABOUT three years ago the members of the Geological Society at Leland Stanford Junior University began considering the possibility of forming a general geological society among the students of the various American universities or schools of mines having efficient departments of geology or mining. A thorough canvass of the situation resulted in the conclusion that such an organization would not only be possible, but most advisable. The Stanford society, acting on this belief, sent letters to the departments of geology or mining at a number of the principal universities, enclosing in each a constitution for a general society which was tentatively offered for their consideration.

Answers favorable to the formation of the general society were received from a majority of the departments addressed, and at two of the universities, where before there had been no such organizations, the students formed local sections. A rather intermittent correspondence between the Stanford society and these two sections and several other local geological clubs followed, but no definite action looking toward the permanent organization of a general society took place.

The matter of such an association now having been more or less favorably discussed at several institutions for the past year or more, the time seems opportune to proceed with a permanent organization. As nearly all the institutions interested now have local clubs or societies, the forming of a gen-

eral society will practically only require the affiliation of the local sections which are already in existence. This may be done by correspondence through the secretary of the originating society at Stanford University.

The desirability of such an organization can not be doubted, as it would form a basis for an acquaintanceship among students in geology and mining which could not but be a benefit and a pleasure to them. The social or fraternal element would be paramount in the general society, but the usefulness of the organization would by no means be limited to this factor. Such an organization would have a wide influence as a medium of exchange of thoughts and ideas among college men interested in geology or mining, both before and after their departure from their alma mater. These are but two of the many advantages which such an organization would develop as its membership and influence grew.

A constitution embodying the organization and aims of a general society has been tentatively drawn up. Its features are, in the main, similar to those common to such societies, and but a few points, some of which pertain more properly to the constitution or by-laws of the local sections, will require explanation here. The name, 'Geological Society of American Universities,' is thought to indicate as nearly as possible the exact nature of the society; and 'section' is deemed a good designation for the local branches. Active membership is restricted to those students whose major subject is geology or mining, and who receive a three fourths vote of the society. Another requirement for membership, which, however, is left optional with each section, but which appears advisable where practicable, is that making it necessary for the candidate to receive a recommendation for good scholarship from the head of his department. It is the history of 'open' societies that sooner or later the interest in them lags; hence, the placing of restrictions on the membership. The society aims to take in only such men as really strengthen it, and to that end have made superior scholarship a requisite. Although practically a senior and graduate society its membership is not so limited, for it is intended to take in men who enter the universities possessing geological or mining experience and are considered otherwise eligible. Honorary and associate members are elected from outside the departments of geology and mining.

The society is a social as well as a technical organization, and in the local as well as in the general organization this fact is well emphasized; the meetings being held for the most part at the rooms or homes of its members. The formal atmosphere surrounding a meeting in a lecture hall or laboratory is thus removed and the effect is most wholesome on the life of the society.

At each meeting some member is assigned to read a paper or give a talk concerning some geological or mining problem; all papers or talks being based on the speaker's own experience or work. Friendly criticism and discussion generally follow each paper, and both the speaker and the society derive much benefit from this informal exchange of ideas. A social hour, interspersed with refreshments, usually terminates the meetings. Open or special meetings are sometimes held at which more formal talks are given, generally by some one outside of the section.

The emblem of the society consists of a design wrought in gold of a miniature geologist's pick, on the handle of which is impressed an irregular gold nugget, bearing in enamel the initials 'G. S. A. U.' The seal of the society is an image of the emblem.

As it would probably be impossible for the society to hold annual meetings at once, temporary provision has been made in the constitution for the transaction of all necessary business by correspondence. The growth of the society, with its ever increasing number of graduate members, would soon make possible annual meetings or conventions, as is customary with like organizations.

The history, objects and a brief outline of the workings of the proposed 'Geological Society of American Universities' has now been given. All that yet remains to be done to permanently establish this society, which surely has a broad and useful existence before it, is for the college men of this country to

enter into it with the zest and interest worthy of the professions represented.

RALPH ARNOLD,
DE WITT C. WILEY.
U. S. GEOLOGICAL SURVEY,
WASHINGTON, D. C., and
STANFORD UNIVERSITY, CALIFORNIA.

DISCUSSION AND CORRESPONDENCE.

THE MEXICAN COTTON BOLL WEEVIL.

TO THE EDITOR OF SCIENCE: In your issue of November 13 (p. 640) you quote from *Bradstreet's* an item regarding the loss to the cotton crop of Texas through the ravages of the Mexican cotton boll weevil. In the course of the article *Bradstreet's* states that six months ago it advocated a careful consideration of the subject by congress. From this quotation alone *Bradstreet's* seems to be singularly misinformed as to what actually has been done by the government, and the quotation will, therefore, mislead your readers.

In 1894 an investigation of this insect was begun by the Division of Entomology of the U. S. Department of Agriculture, and in 1896 and 1897 circulars were published which indicated the great danger to the future of cotton in the United States and proposed remedial treatment. The governor of the state and the legislature were advised by the department of the condition of affairs and the dangerous prospects, and the legislature was urged to pass a crop pest law, the enforcement of which would have resulted in the confinement of the insect to a restricted region in extreme southern Texas, and possibly in its extermination even in that region. The legislation proposed was not enacted. For the past three years the Division of Entomology has been carrying on further investigations through appropriations from congress of $10,000 in the fiscal year 1901–2, $20,000 in 1902–3, and $30,000 in 1903–4. It has resulted from this work that, while no method of extermination has been discovered, it has been demonstrated beyond a doubt that it is possible, even under present conditions and in the worst infested portions of Texas, to raise a fair crop of cotton in spite of the weevil. Experimental demonstrations have been made the past summer on several hundred acres of cotton lands at six stations under the control of the Division of Entomology, and on this controlled land from a half of a bale to one bale per acre of cotton has been already harvested, while in adjoining territory the average crop has not exceeded one bale to from six to fifteen acres.

L. O. HOWARD.

SHORTER ARTICLES.

SOME INSECT REFLEXES.

IN the course of some experiments on the sense-reactions of honey-bees, I have kept a small community of Italian bees in a glass-sided, narrow, high observation hive, so made that any particular bee, marked, which it is desired to observe constantly, can not escape this observation. The hive contains but two frames, one above the other, and is made wholly of glass, except for the wooden frame. It is kept covered, except during observation periods, by a black cloth jacket. The bees live contentedly and normally in this small hive, needing only occasional feeding at times when so many cells are given up for brood that there are not enough left for sufficient stored food supplies. Last spring at the normal swarming time, while standing near the jacketed hive, I heard the excited hum of a beginning swarm and noted the first issuers rushing pellmell from the entrance. Interested to see the behavior of the community in the hive during such an ecstatic condition as that of swarming, I lifted the cloth jacket, when the excited mass of bees which was pushing frantically down to the small exit in the lower corner of the hive turned with one accord about face and rushed directly upward away from the opening toward and to the top of the hive. Here the bees jammed, struggling violently. I slipped the jacket partly on; the ones covered turned down; the ones below stood undecided; I dropped the jacket completely; the mass began issuing from the exit again; I pulled off the jacket, and again the whole community of excited bees flowed—that is the word for it, so perfectly aligned and so evenly moving were all the individuals of the bee current—up to the closed top of the hive. Leaving the jacket off