tion of caustic potash for mercerization. The lecture was illustrated with lantern slides as well as the fibers, which were also projected upon the screen.

The annual address before the club and student body was delivered on April 30, by Dr. Henry Louis Smith, of Davidson College, who selected for his subject 'The Intellectual Value of Scientific Training.' In further celebration of the date of organization, a banquet was given by the active members.

At the meeting of May 15, Professor P. T. Brodie gave a paper on 'The Development and Design of the Modern Bridge Truss.' Professor Brodie traced the evolution of the simple truss from the king-post to the types exemplified in the great bridges of to-day. The general criteria for maximum shear and moment from a given system of locomotive and train loading were deduced, and their applications of stress determination as used in the actual design of a Pratt railway bridge were clearly demonstrated. The lecture was illustrated with lantern slides and blackboard drawings.

The following officers have been elected for next year:

President—Chas. E. Chambliss.
Vice-President—R. N. Brackett.
Secretary-Treasurer—F. S. Shiver.

CHAS. E. CHAMBLISS,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE PROPOSED BIOLOGICAL STATION AT THE TORTUGAS.

TO THE EDITOR OF SCIENCE: I have been much interested in the discussion of the question as to the best place for the location of a tropical marine laboratory for research, which has been going on in the columns of SCIENCE for the past few weeks, and since we are all agreed on the desirability of such a station it is very proper that the problems involved in its establishment should receive careful consideration. I may be pardoned, therefore, if I say a few words in support of Dr. Duerden's contention that Jamaica is the best available place, for although I have never visited the Tortugas, I have spent two weeks in Bermuda, and have made three trips to Jamaica, for zoological purposes.

My experience leads me to believe that a marine laboratory, and especially one in the tropics, ought to be situated where the advantages of civilization are reasonably accessible, and particularly the important one of competent medical assistance in case of accident or disease. We never plan to be sick or to meet with accidents, but we ought not to locate a permanent station where there is no possibility of help when it is most needed. The other advantages of a civilized community, such as good mail and telegraph facilities, good markets and satisfactory means of reaching other places, are of real importance and should not be ignored.

For these reasons the Tortugas seem to me seriously handicapped and even if regular service between them and Key West were maintained, I can not believe that in point of either time or expense, they would be as accessible to students from the central west as are the Bermudas. As between the latter and Jamaica, there can be little question that the larger island has the advantage, not only for the reasons so well presented by Dr. Duerden, but also because of the greater variety and abundance of its marine fauna. Good as is the collecting in Bermuda, it is better in Jamaica, partly because the latter island offers a greater variety of shores and bottoms. While Bermuda is undoubtedly more accessible, and can be reached at less expense, from New York, from all parts of the south and southwest Jamaica can be almost as easily and cheaply reached by means of the excellent steamers from Baltimore. Living expenses in Jamaica are very low, though perhaps not much lower than in Bermuda.

The one claim that is made for the Tortugas is the remarkable abundance and accessibility of the marine life, in both deep and shallow water. While this may be a point in which that station excels Jamaica, I am sure any one who has collected on the reefs of the latter will find it hard to believe that such is the case. But even were it so,

the superior facilities for land and fresh-water work offered by Jamaica are a far more than compensating advantage.

Finally, I should like to emphasize the very great advantage which would come to the laboratory from being located in the midst of such a hospitable community as is to be found in Jamaica. This is a point upon which Dr. Duerden would naturally not care to enlarge, as he was himself for four years a leader in extending courtesies and favors to visiting scientists. The government officials and the officials of the fruit company, which virtually controls communication with the United States, are simply unwearying in their efforts to put the visiting scientist under lasting obligations, and if Jamaica were selected as the site of the proposed laboratory, there is nothing the people there would not do to make the establishment a success, and to convince all comers that there is no place like Jamaica.

Hubert Lyman Clark.

Olivet College,
June, 1903.

SHORTER ARTICLES.

ON THE STRUCTURE OF THE PLESIOSAURIAN SKULL.

An excellent example of a plesiosaurian skull, recently kindly entrusted to me for study by the authorities of the National Museum, confirms so well the rather remarkable determinations of the frontal elements recently published by me, that I desire to make a brief mention of the matter in Science, in anticipation of a more complete description, which may be delayed a year or two. The specimen is from the Eagle Ford Shales, from the vicinity of Austin, Texas, and is, I have little or no doubt, both generically and specifically identical with the type of *Brachauchenius lucasi,* recently described by me from the Cretaceous of Kansas. The specimen lies with its dorsal surface exposed, beautifully supplementing the type specimen of the species now exhibited in the National Museum.

I have no longer any doubt that the so-called frontal bone in all plesiosaurs is in reality a rostral prolongation of the parietal bone, extending forward to meet the premaxilla, and completely excluding the frontals from union in the median line. There is no supraorbital bone, and the so-called postorbital is really the postfrontal, or postfronto-orbital. The nasal has never yet been certainly found as a distinct ossification, but the lachrymal exists as a distinct bone, though often fused with the maxilla.

The study of this specimen confirms my belief that the genus is closely related to *Pliosaurus* of Europe, from which it is distinguished by the entire absence of double-headed cervical ribs. I am, furthermore, convinced that the genus belongs to a family distinct from the true plesiosaurs, and I believe that this family is the Pliosauridæ, hitherto rejected by most students of the order. Whether all the characters given below will apply to the European forms I do not know, since the palatines are *thought* to be separated in *Pliosaurus,* and others may occur in true plesiosaurians. I would, however, define the family as follows:

Pliosauridæ: Skull depressed; no parietal crest; palatines broadly contiguous in the middle line; pterygoids with a prominent ridge and abutting mandibular process. Neck short; cervical ribs single or double headed; all vertebræ without infracentral vascular foramina.

S. W. Williston.

THE REACTIONS OF PARAMŒCIA AND OTHER PROTOZOA TO CHEMICAL AND ELECTRICAL STIMULI.

The recent work of Mathews * on the nature of the chemical stimulation of the motor nerve, and that of R. S. Lillie † on the reaction of nuclear and cytoplasmic structures to the electric current, have greatly strengthened the theory that protoplasm, at least in some of its forms, consists of a colloidal solution whose particles may be either positively or negatively charged.

The present paper is a brief preliminary account of some experiments on the reactions of *Paramœcia* and other protozoa to chemical and electrical stimuli, and the visible changes

*Mathews, Science, XV., 1902, p. 492, and XVII., 1903, p. 729.

† Lillie, *American Journal of Physiology,* VIII., 1903, p. 273.