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.