

The general aspect of the calyx, the component plates of which were described in detail, is exceedingly pentacrinoid, whether it is viewed from the side or from above; and the arm-joints are short and nearly oblong in outline, having pinnules alternately upon opposite sides. The nearest allies of *Millericrinus Pratti* are *M. Nodotianus*, d'Orb., and the var. *Buchianus* of *M. Munsterianus*; and of *Pentacrinus* the one which most resembles it in the characters of the calyx is the North-Atlantic *P. Wyville-Thomsoni*.

The remainder of the paper was devoted to the description of two Jurassic Comatulæ, namely, *Antedon colloviensis*, from the Kelloway Rock, described before the Society on June 22, 1851, and a new species, *Antedon latiradia*, from the Great Oolite of Bradford.

3. "Notes on the Polyzoa of the Wenlock Shales, Wenlock Limestone and Shales over the Wenlock Limestone. From material supplied by G. Maw, Esq., F.L.S., F.G.S." By G. R. Vine, Esq. Communicated by Dr. H. C. Sorby, F.R.S., V.P.G.S.

The author has received from Mr. Maw about $1\frac{1}{2}$ hundredweight of materials washed out of the Wenlock deposits of Shropshire, representing the contents of from 6 to 8 tons of unwashed material. From this material he extracted the specimens of Plants, Actinozoa, Echinodermata, Crustacea, and Polyzoa, and he gave a tabular synopsis of the species and their distribution, with the addition of types from the Wenlock Limestone and of the species of Brachiopoda referred to in a paper by Messrs. Maw and Davidson in the GEOLOGICAL MAGAZINE for 1881.

With regard to the Polyzoa, the author remarked that below the Cretaceous series the two great divisions of Cheilostomata and Cyclostomata do not hold good, and suggested that the classification of Palæozoic Polyzoa should be based on the arrangement and character of the cells in combination with habit. The forms characterized in the present paper were:—*Stomatopora dissimilis*, Vine, and vars. *elongata* and *compressa*, *Ascodictyon stellatum*, Nich. & Eth., *A. radiceforme*, sp.n., *A. filiforme*, sp.n.?, *Spiropora regularis*, sp.n., *S. intermedia*, Vine, *Diastopora consimilis*, Lonsd., *Ceritopora*, Goldf., *Hornera crassa*, Lonsd., *H. ? delicatula*, sp.n., *Polypora ? problematica*, sp.n., *Fenestella prisca*, Lonsd., *Glaucanome disticha*, Goldf., *Ptilodictya lanceolata*, Lonsd., *P. Lonsdalei*, sp.n. (= *P. lanceolata*, auctt.), *P. scalpellum*, Lonsd., *P. interporosa*, Vine, and *P. minuta*, Vine.

CORRESPONDENCE.

THE SUDDEN EXTINCTION OF THE MAMMOTH.

SIR,—In speaking of "the old and, I had hoped, extinct theory of violent changes and the sudden extermination of a species," I intended to have said extinct in *England*; for no one acquainted with continental opinion would venture to call it extinct there, though at last foreign geologists are beginning to abandon such misleading terms as "Diluvium" for the deposits known in this country as Pleistocene. It may be from too exalted a view of the advances

recently made in this country that the conclusion has been arrived at, but my impression after reading a number of foreign papers is that for this particular period we are a good deal in advance of most other nations. The wonderful variety of the beds in Britain, their fossiliferous character, and the splendid series of cliff sections and caves in our islands has given us unequalled opportunities for the study; opportunities well used by such careful observers as Lyell, Prestwich, Ramsay, Geikie, and Boyd Dawkins. In most parts of the Continent the Pleistocene deposits appear to be represented by one tolerably uniform mass, like the Loess of the Rhine or the Tundras of Siberia; but in England we have beds showing great alternations of climate, but gradual changes allowing time for the migration of species.

Frozen carcasses of Mammoth and Rhinoceros were spoken of as of occasional occurrence, for the greater number that are found are merely skeletons, or portions of skeletons, from which the flesh has long decayed. The extermination of the Mammoth in Britain and Germany may be referable to human agency, while in Siberia it was gradually killed by the increase of cold and want of food—there is as yet no evidence that the extinction in the different districts was simultaneous. A change of temperature of 1° in a century would be extremely rapid from a geological point of view; but Mr. Howorth would bring into play a change of probably 20° in a few months. At present only two modes are known by which a marked alteration of the climate can be brought about, extensive modification in physical geography and astronomical changes; but both these would be of slow operation, and unless a strong case can be made out, we can scarcely accept a sudden fall of temperature referable to no known cause.

Perhaps Mr. Howorth, as an antiquary, is inclined to pay more attention to authority than a field geologist is likely to do; but the training on the Geological Survey is such as to lead one to believe nothing we are told and only half what we see. Of course, if we accept such authorities as Cuvier, Buckland, and d'Archiac as examples of modern opinion, diluvial theories are still in full vigour. But the systematic study of Pleistocene Geology only commenced about forty years ago, and even now the beds are often treated as abnormal deposits, to which ordinary rules do not apply.

Mr. Howorth scarcely does justice to the views of the followers of Hutton and Lyell, for the uniformitarian theory does not necessarily preclude much more rapid changes than are now taking place. After several years study of Pleistocene Beds, I think that, as a rule, things did then progress faster, and that we are now in a period of exceptionally slow changes. I take uniformitarianism to mean that no cataclysmic explanations must be adopted until it is clearly proved that the phenomena are inexplicable by reference to forces now in operation, and it is only from this point of view that I have ventured to criticize Mr. Howorth's papers.

WITHERNSEA, HULL,
Dec. 5th, 1881.

CLEMENT REID.