

XX.—On the Fossils of the Carstone Formation.

To the Editors of the Annals of Natural History.

GENTLEMEN,

In April the 'Geological Magazine' contained a short paper on the phosphatic nodules of Bedfordshire, which I first observed in company with my friend Mr. Knowles, of Emmanuel College, several years ago, when the cuttings for the Bedford Railway were being made. Both before and ever since then I have been gathering material for a memoir on the Carstone and its southern extension, in which this phosphate-bed is found; but I should not have been tempted to refer to the bed yet, had not the paper in the 'Geological Magazine' called forth another, from an old friend, which you have inserted in the last Number of your Journal.

The author of the former paper asserts that "every organism of this phosphatic bed is evidently extraneous, and probably was derived from the destruction of the Oxford and Kimmeridge Clays and intervening Coral Rag, from which the phosphatic matter must have been obtained, while the Lower Greensand was in process of formation."

To any one who knew the fauna of the bed in question (the Carstone) this would seem remarkable; for, instead of every fossil being extraneous (and I have *dozens of genera*), I have never obtained one that is extraneous: they all appear to me denizens of the old sea-bed where they abound. The multitudes of Saurians are chiefly Cretaceous species; and among the shells I seek in vain for fossils from the Oxford or Kimmeridge Clay, or for blocks of Coral Rag. The *Gryphæa dilatata* is perversely wanting; the *Ostrea deltoidea* cannot be found; the Ammonites will not answer to any of their Oolitic names, or show a trace of iron pyrites. And yet when fossils endurable like these, and abundant, are wanting, it is imagined that the fragile and very rare argillaceous casts of shells—no firmer than the clay they rest in—have withstood with impunity ages of buffeting on a gravelly beach.

The truth is, the "Sandy nodule bed," as this bed in the Carstone may be called, reproduces, earlier in time, the conditions of the Cambridge Greensand. There are specimens in it of other rocks in hundreds; but they are old rocks, like those the Carstone was derived from.

And if the fossils had been extraneous specimens from a clay, it would have been no more astonishing to have found that the alumina, magnesia, and fluorine in the nodules only make up 4 per cent. together than to have discovered Oxford or Kim-

meridge Clay, or even Coral Rag, so stored with phosphoric acid that its denudation would furnish nothing but a magnificent crop of nodules of phosphate of lime, like these.

The wood which occurs in the bed is like that which occurs in the Gault of the southern counties and Carstone here, and is mineralized with phosphoric acid, and therefore no more requires an appeal to extensive denudation of Purbeck beds to account for it than the occurrence of remains of *Iguanodon* can be held to prove denudation of Wealden beds; for the chief fame of that beast is from its occurrence in the Shanklin Sands in the *Iguanodon* quarry.

Like the Cambridge Greensand, the deposit offers many new facts of interest in the distribution of life. Thus *Phiosaurus*, so characteristic of Oxford Clay, Coral Rag, Kimmeridge Clay (and probably Portland), is now found in the approximate equivalent of the Shanklin Sands. *Dinotossaurus*, a new genus of the Oxford and Kimmeridge Clays, also abounds here, and thus, like *Ichthyosaurus*, *Plesiosaurus*, *Megalosaurus*, &c., helps to connect into one great life-system the lower and the upper Secondary Rocks.

I am, Gentlemen,

Faithfully yours,

H. SEELEY.

Sidney Sussex College, Cambridge.
July 17, 1866.

XXI.—*Description of Calamoichthys, a new Genus of Ganoid Fish from Old Calabar, Western Africa.* By JOHN ALEXANDER SMITH, M.D., F.R.C.P.E.; with *Observations on the Internal Structure*, by R. H. TRAQUAIR, M.D., Demonstrator of Anatomy in the University of Edinburgh*.

IN the beginning of January 1865, the author received from the Rev. Alexander Robb, Old Calabar, a package of specimens of natural history preserved in spirits. Among these were two small ganoid fish. They were, however, imperfect, having been torn across near the anal region, and their caudal extremities were wanting. The characters of the fish could not, therefore, be completely determined. The author, however, exhibited them at a meeting of the Royal Physical Society, on the 22nd March, 1865, and stated that they were allied to the genus *Polypterus*; but from various differences in character, to be afterwards detailed, and especially the great relative length of their bodies, and the apparently total absence of ventral fins, he would place them in a new genus, which, from their general aspect and form,

* Communicated by Dr. Smith, from the Proceedings of the Royal Society of Edinburgh.