11. "Oxford Clay; Bromham Brickyard. South of Sandridge Hills, between Melksham and Devizes." H.B.W.

A few fragments of shells, but no Microzoa, were found.

12. "Oxford Clay; Upper Studley, Trowbridge." H.B.W.

Very pale, yellowish-grey, sandy clay, yielding after washing, about 50 per cent. of extremely fine, white, subangular, quartzose sand. No Microzoa.

13. "Oxford Clay; Southwick, Trowbridge." H.B.W.

Like No. 12, leaving, after washing, the same remarkably fine, white sand, and presenting no trace of Microzoa.

Note.—Beside the Jurassic specimens we have one from the Cretaceous series of the same district, namely:—"Clay seam in Lower Greensand; Seend." H.B.W.

A ferruginous sandy clay; bound together in places by the iron and forming "pan."

By washing, this specimen yielded abundance of subangular sand, with a little mica.

No Microzoa were met with.

NOTICES OF MEMOIRS.

I.—M. Dollo on the Evolution of the Teeth of Herbivorous Dinosauria.

All palæontologists who are interested in the marvellous reptilian life of the Secondary epoch owe a debt of gratitude to M. Dollo of the Royal Museum of Brussels for the ability and care with which he has elucidated the structure and affinity of the unrivalled collection of Dinosaurian and other reptilian remains preserved in that Museum. One of the most interesting of his

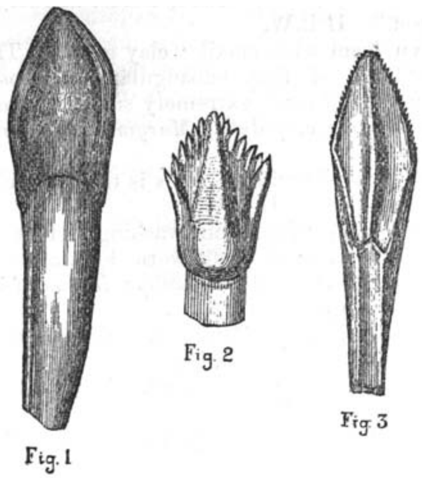

Fig. 1 Fig. 2 Fig. 3

Diagram A.—Fig. 1. Tooth of *Morosaurus*. Fig. 2. of *Scelidosaurus*. Fig. 3. of *Hadrosaurus*.

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contributions[1] to our knowledge of the Dinosauria shows how the teeth of the herbivorous members of that order have gradually increased in complexity of structure, and as the author has kindly allowed the use of some of the woodcuts illustrating his memoir, we have great pleasure in laying before our readers a sketch of this line of evolution.

In the generalized suborder Sauropoda, which is mainly Jurassic and died out after the Wealden, we find that the teeth, as in *Morosaurus* (Diagram A, Fig. 1), are perfectly simple, having neither serrated edges, nor carrying ridges on their lateral surfaces. In the generalized Jurassic Stegosauria the teeth still retain the same simple structure, but in the more specialised members of this suborder (e.g. *Scelidosaurus*, Diagram A, Fig. 2), which occur in both the Jurassic and Cretaceous, they have developed serrations on the edges, although not distinct lateral ridges. The next step is presented by certain members of the Ornithopoda, as *Hadrosaurus* (Diagram A, Fig. 3), where a distinct vertical ridge is developed in addition to the serrated edges. Advancing to the more specialised Ornithopoda-like *Iguanodon* (Diagram B), we find that secondary lateral ridges are

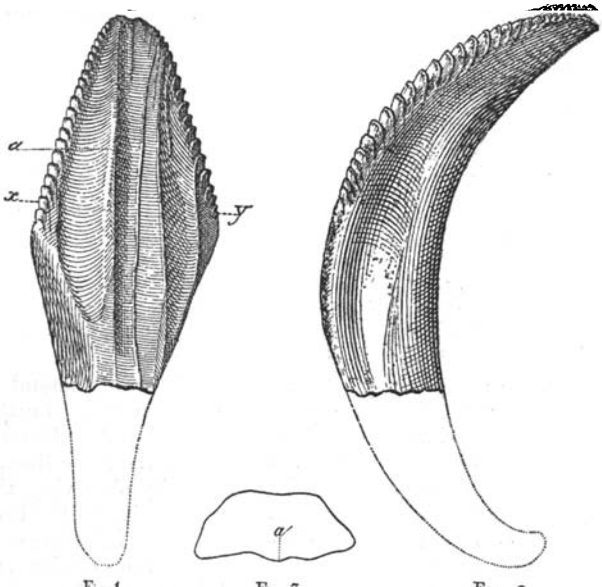

DIAGRAM B.—FIG. 1. Tooth of *Iguanodon Prestwichi*; from the enamelled surface. FIG. 2 in profile. FIG. 3 section from *x* to *y*, $\frac{1}{1}$. *a* shows the principal lateral ridge without serrations.

developed; and we may further observe that while in the Jurassic *I. Prestwichi* both primary and secondary ridges are simple, in the Wealden *I. Mantelli* the former has become serrated. The last step

[1] Ann. Soc. Sci. Bruxelles, 1835, pp. 309–338.

but one is afforded by the remarkable teeth from the Upper Cretaceous (Senonien) described by M. Dollo under the name of *Craspedodon lonzeensis* (Diagram C), in which, in addition to antero-posterior

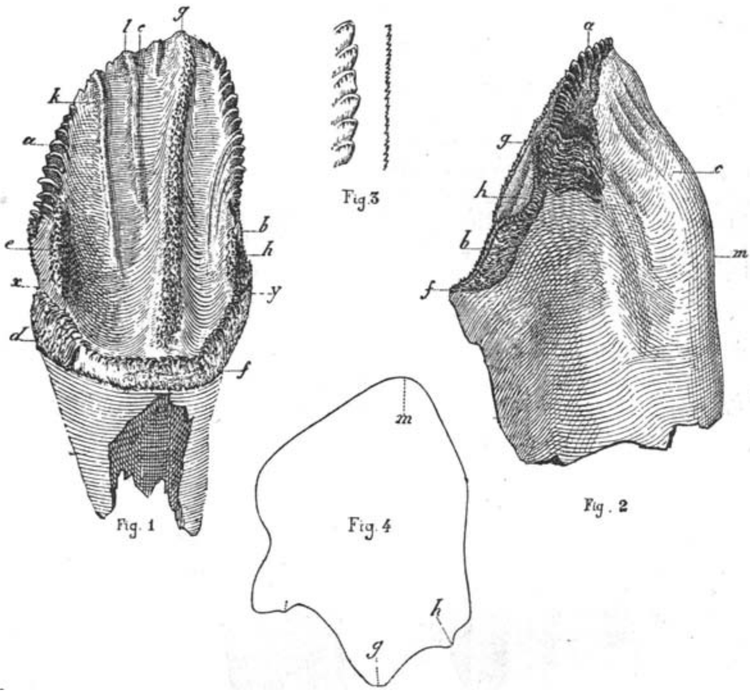

DIAGRAM C.—Tooth of *Craspedodon lonzeensis.* FIG 1 from the enamelled surface, $\frac{2}{1}$; *c* crown, *d f* cingulum, the letters *a b e g h k l* indicate the serrations and ridges. FIG. 2 in profile, $\frac{2}{1}$. FIG. 3 the large and small serrations more magnified. FIG. 4 section at *x y*, $\frac{2}{1}$.

serrations, there are primary, secondary, and tertiary lateral ridges, of which both primary and secondary are serrated. Finally the American *Cionodon* simulates the dentition of Ungulate Mammals in having numerous cheek-teeth in use at one and the same time.

M. Dollo concludes this interesting survey by observing that "it appears that while the specialization of the dentition in the Ungulata has taken place either by the development of infoldings in the enamel (*Equidæ*), or by the multiplication of tubercles (*Suidæ*), accompanied by gradual elevation of the crown, it has manifested itself in the herbivorous Dinosauria by the development of ridges and serrations, or by the simultaneous use of numerous teeth. While, however, the cause of the evolution of the dentition of the Ungulata is, so to speak, known to us, we can only guess at that of the dentary system of the great Reptiles which filled their place during the Secondary epoch."

R. LYDEKKER.

II.—Emmons' Original Taconic Series.

1. On Lower Silurian Fossils from a Limestone of the Original Taconic of Emmons. By J. D. Dana.

2. Preliminary Report of S. W. Ford and W. B. Dwight upon Fossils obtained in 1885 from Metamorphic Limestones of the Taconic Series of Emmons, at Canaan, New York. American Journal of Science, vol. xxxi. p. 241—253, pl. vii. April, 1886.

PROFESSOR DANA points out that the *original* and therefore *true* Taconic system of Prof. Emmons, which this geologist propounded and described in 1842, "lies along both sides of the Taconic range of mountains, whose direction is nearly north and south, or, for a great distance, parallel with the boundary-line between the State of New York and those of Connecticut, Massachusetts, and Vermont." Emmons described it as consisting of (1) "Taconic slates" in eastern New York, including the Hoosie slates; (2) the Sparry or western limestone, interstratified with the slates, west of the Taconic range, and for the most part lying against the west side of the range; (3) the "talcose" or "magnesian" schist, constituting the Taconic range, and Greylock or Saddle Mountain, the high ridge between Williamstown and Adams in the north-western angle of Massachusetts; (4) the Stockbridge Limestone, east of the range of Taconic schist; (5) Quartzite. Prof. Emmons concluded, on lithological grounds, that the system was older than the New York Potsdam Sandstone, and equivalent to the Lower Cambrian of Sedgwick. Subsequently, in Washington County, New York, outside the typical area of the Taconic system, Emmons discovered, in black slates, some Trilobites, pronounced by Barrande to be *Primordial* species. These black shales were regarded as more recent than the typical rocks, in which no fossils whatever had been discovered, and Emmons called them therefore Newer or Upper Taconic.

But now recently fossils have been discovered in the Sparry or Western Limestone, the oldest limestone of Emmons' original Taconic, and in a locality in the typical area of the system. The fossils are very fragmentary, and can only be examined by means of thin sections and polished surfaces of the rock. They show, however, the presence of distinct species of *Murchisonia*, *Pleurotomaria*, and *Fenestella*, as well as portions of Crinoids, probably of Brachiopods, and of a Trilobite. Prof. Dwight and Mr. Ford, who have studied the fossils, believe that they indicate the Trenton age of the limestone in which they are preserved.

It follows from this discovery that the age of the typical Taconic system of Emmons is not Cambrian or Pre-Cambrian, as stated by him, and that the black shales and limestones with Primordial Trilobites, forming his Newer or Upper Taconic system, really belong to a period much older than the so-called Lower Taconic. G. J. H.