

supposing the present form of the ground in the Weald to have been produced entirely by these agents.

With regard to the time which has elapsed since this denudation commenced, nothing can as yet be said with certainty save this, that the plain of marine denudation was formed *after the deposition of the Eocene beds*, and that, therefore, the present valleys of the Weald have been formed since that period. Should the doubtful beds occurring at intervals along the top of the North Downs turn out to be Crag*, as believed by some geologists, "then," to quote again Prof. Ramsay †, "the bay-like denudation of the Weald has probably entirely taken place since that epoch; implying another lapse of time so long that, by natural processes alone, in rough terms, half the animal species in the world have disappeared, and been as slowly replaced by others. This may mean little to those who still believe in the sudden extinction of whole races of life; but to me it signifies a period analogous to the distance of a half-resolved nebula—so vast that if it were possible to express it in figures the mind would refuse to grasp its immensity."

JUNE 7, 1865.

The following communications were read:—

1. *Note on OVIBOS MOSCHATUS*, Blainville. By MONS. E. LARÈT,
For. Mem. G.S.

[Translated by the late H. Christy, Esq., F.R.S., F.G.S.]

CUVIER has given the history of three skulls of *Ovibos moschatus* discovered in Siberia, and figured by Pallas and Ozeretzkovsky‡.

In 1846 M. Giebel§ noticed the existence, in the Museum of Halle, of part of a skull found in the neighbourhood of Merseburg.

In 1852, Sir John Richardson, in the 'Zoology of the Herald,' gave a list and some figures of some remains of *Ovibos moschatus* brought from the Bay of Eschscholtz, with bones of Elephants, Reindeer, and other Mammals.

In 1855 Professor Owen|| described, under the name of *Bos moschatus*, a fine fragment of skull of *Ovibos moschatus*, discovered by the Rev. Mr. Kingsley and Mr. Lubbock at Maidenhead, in Berkshire, on a bed of low level-gravel, of which Mr. Prestwich gave at the same time a description¶, with a sketch of the bed, in which he afterwards found an Elephant's tooth.

In the third edition of the 'Antiquity of Man' Sir Charles Lyell further cites a skull of *Ovibos moschatus* found by Mr. Lubbock, near

* Prestwich, 'Quart. Journ. Geol. Soc.' vol. xiv. 1858, p. 322. Sir Charles Lyell (Elements of Geology, 6th edit. 1865, pp. 232 and 368) considers these beds to be Upper Miocene. In the last edition of Mr. Greenough's Map (1865) they are coloured "Crag."

† 'Physical Geology and Geography of Great Britain,' 2nd edit. p. 84.

‡ Oss. Foss. 4to, vol. iv. p. 155-159.

§ Leonhard and Bronn's Neues Jahrbuch, 1846, p. 460.

|| Quart. Journ. Geol. Soc. 1856, vol. xii. pp. 124-31.

¶ *Ibid.* pp. 131-33.

Bromley, Kent, in the valley of a small affluent of the Thames; and also two other skulls, male and female, discovered in the drift of the Avon, near Bath Easton, by Mr. Charles Moore*.

In the same page of the 'Antiquity of Man' Sir Charles Lyell further mentions a skull of *Ovibos moschatus* preserved in the Museum of Berlin, and which Mr. Quenstedt had determined in the year 1836; but I have failed, even with the indications given by Sir Charles Lyell, to find the description of this skull.

In 1859 Professor Hébert communicated to me a molar tooth found by the Abbé Lambert in the diluvium of the Oise at Viry-Nouveau, near Chauny (Aisne), in association with remains of *Elephas antiquus* and *E. primigenius*, *Rhinoceros tichorhinus*, *Hyæna*, a small Bear, Reindeer, &c. This tooth I ascertained to be a molar of *Ovibos moschatus*.

In 1863 Professor E. E. Schmid, of the University of Jena, described, under the name of *Bos Pallasii* (De Kay.), a portion of skull of the same species discovered in 1862 in the ancient alluvium of the Saale†.

In 1864 Dr. Eugene Robert sent me a very fine piece of the skull of *Ovibos moschatus*, discovered by him in the diluvium of the Oise at Precy, near Creil (Oise), in the same spot where he had collected the remains of an Elephant's tusk. I announced this discovery to the Academy of Sciences at its sitting on the 27th of June, and I addressed to the Geological Society of London an extract from my communication, with a plate, in which were figured this skull and the molar teeth found at Viry by the Abbé Lambert‡.

Further researches at one of our stations in the Gorge d'Enfer (Dordogne) have produced a hoof phalange exactly identical, both in form and dimensions, with the corresponding bone of the existing *Ovibos moschatus* (*Bos moschatus*, auct.). It was found, in association with remains of the Great Cave Bear (*Ursus spelæus*), Lion (*Felis spelæa*), Wolf, Reindeer, and Aurochs||.

It is to be noted that in the three localities where the bones of *Ovibos moschatus* have been observed in France, there have been also gathered the products of human industry.

At Viry-Nouveau worked flints were found by l'Abbé Lambert, of which two specimens were sent to London. At Precy was found, in 1860, an axe of the St. Acheul type, which was presented to the Geological Society of France by M. de Verneuil at its sitting of the 21st of May, 1860, and of which Sir Charles Lyell makes mention in pp. 152 and 153 of the 'Antiquity of Man.'

At the Gorge d'Enfer worked flints have also been found, as well as Reindeer-horn unbarbed lance-heads of a type differing from

* 'Antiquity of Man,' 3rd ed. p. 156.

† Ann. des. Sc. Nat. 8vo. 4ième série. Zool. vol. xv. p. 224.

‡ Leonhard and Bronn's Neues Jahrbuch, 1863, p. 541.

§ Comptes rendus de l'Acad. des Sci. Séance 27 Juin 1864.

|| Since this paper was communicated to the Geological Society, the author has discovered among the fossil remains of the same station in the Gorge d'Enfer, seven new bones of a hind leg and foot of *Ovibos moschatus*; the long and marrowed bones being split and broken like those of the other herbivora used for food by the ancient indigenous tribes of Perigord.

those found in any other of the Dordogne caves, but identical with those of Aurignac (Haute Garonne) and of Chatelperron (Allier).

The discovery of this fragment of *Ovibos moschatus* in the Gorge d'Enfer gives us the most southern spot where this species has been observed*, and by it its Quaternary habitat is carried down 15° to the south of its existing limit in North America, where it is known that this animal is rarely found below the sixtieth degree of latitude.

The Reindeer, whose migrations are still more extensive, was advanced yet further south during the Quaternary period, as I have found its remains on the northern slopes of the Pyrenees.

2. *On some ADDITIONAL FOSSILS from the LINGULA-FLAGS.* By J. W. SALTER, Esq., A.L.S., F.G.S. *With a NOTE on the GENUS Anopolenus*; by HENRY HICKS, Esq., M.R.C.S.

IN my last communication, of March 1864, I described all the fossils then known from the Lower Lingula-flags of Pembrokeshire. There are now several more forms to communicate, some of which are generically new, and others are new species of old and well-known genera. I must confine myself in this paper to one or two species of which a better knowledge has been obtained, and the description of which it is desirable to amend, as the forms differ in some marked peculiarities from any of the Trilobite-group hitherto described.

The new genus *Anopolenus* (see vol. xx. p. 36) was supposed, and with good reason, to be a blind Trilobite allied to *Paradoxides*, without facial sutures or head-spines, and with truncate body-segments not produced into spinous appendages as in most of its congeners (see pl. xiii. of the vol. above quoted, figs. 4, 5). All this was true so far as I then had materials; but the subjoined description, by my friend Mr. Hicks, of a new species of the genus will show that I then only had a part either of head or body of this curious animal, which turns out to be more truly intermediate between *Paradoxides* and *Olenus* than was before supposed, while it also presents characters contradictory to those of either genus. It possesses eyes, facial suture, and expanded pleuræ; but the arrangement of these is abnormal, as Mr. Hicks's description will show.

Before giving his description of them, however, I would call the attention of the Society to a new fact of some importance with respect to the fauna of the Lower Lingula-flags. As noticed in the paper above quoted, the fossils occur in a band, but a little distance above the base of the Lingula-flag series, in fact only one hundred feet or so from the grey Cambrian rocks. Having faith in the continuity of the band, I had begged Mr. David Homfray, of Portmadoc, to employ his first leisure in examining the same horizon in the Pfestiniog country, a locality which had hitherto been neglected. He met with his usual good success; and found not merely the same genera, but many of the species which we had discovered at

* The supposed skull of *Bos Pallasii*, De Kay, from the alluvium of Mississippi at New Madrid, has been recognized by Mr. Leidy as referable to his genus *Bootherium*.