

There was a remarkable fact observed by Mr. Dunwell which deserves notice, viz., that the rock was seen to rise into the air at the time of the formation of the pit. This has been supposed to shew that these pits are due to some chemical process going on in the earth, by which a large quantity of gas is suddenly set free, and in this manner the hole is *blown out*. Such an explanation, however, scarcely agrees with the fact that all the materials of the pit fall to the bottom, and not any are thrown out. What Mr. Dunwell saw may be accounted for by supposing that the first fall of the rock, which produced the sound like thunder, caught and compressed a certain amount of air, which immediately afterwards, finding vent, threw upwards a quantity of earth and stones.

A Paper was then read by Mr. Lawson Tait, of Wakefield, entitled "Recent Speculations on Primæval Man," which, as it was of a partly controversial character, has not been forwarded for publication.

REMARKS ON THE EXTINCT FAUNA OF THE EAST RIDING OF
YORKSHIRE. BY MR. EDWARD TINDALL, OF BRIDLINGTON.
[READ BY MR. DENNY.]

IN that part of the western boundary of the German Ocean between Flamborough Head and Spurn Point, is situated a tract of low land called Holderness, which, in early times, exhibited the alternate appearance of morass and lake, as the river Hull overflowed or subsided in its progress to the Humber. Trees and shrubs sprung up in the uncultivated land, and, spreading by degrees, formed large forests, which, confining the exhalations of the soil and obstructing the course of streams, caused the rivers to overflow, and stagnate into lakes and marshes. A great

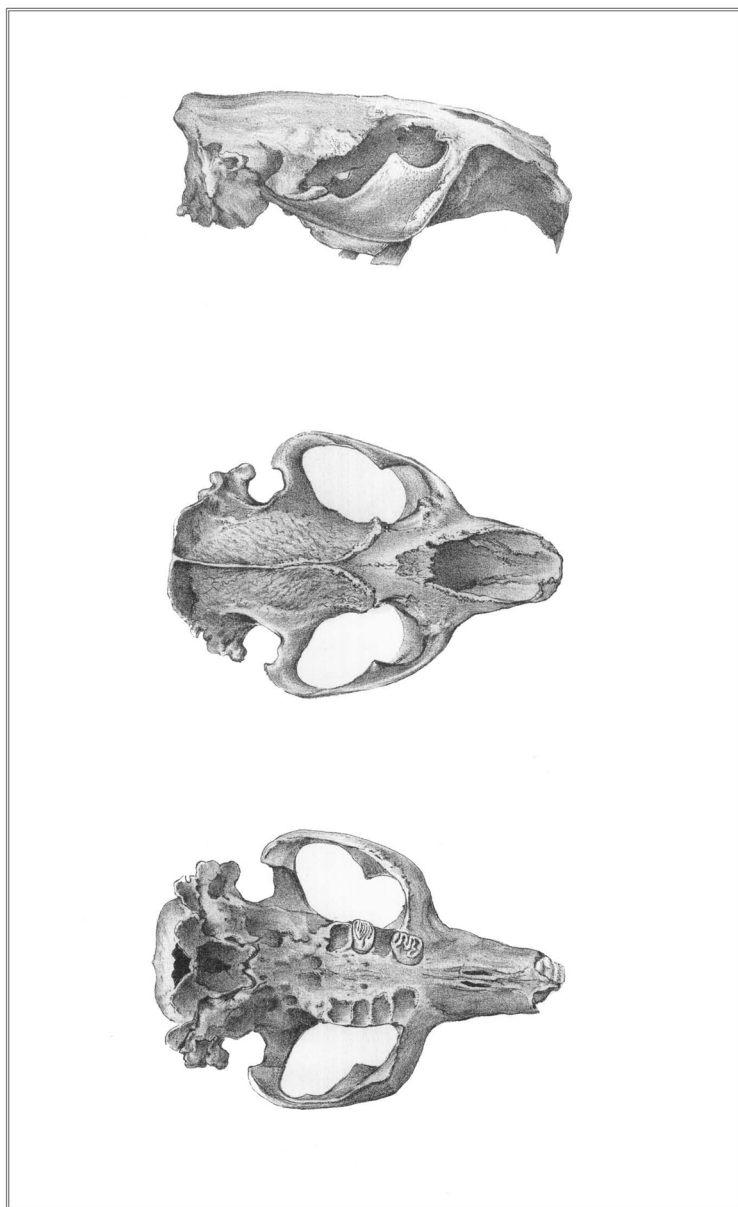
many of the marshes and the woods of Deira remained at the time of the Domesday survey, for its waters were "so abundant as to afford a fishery of 70,000 eels, and wood pastures eleven miles long and three miles broad."

Most of the towns within the area here spoken of are, like the land, wet and damp. Woodmansea, near Beverley, and Rotsea, near Watton, bespeak the existence of meres in those places. Indeed, Watton—Saxon *Wetadun*—signifies a *wet town*, describing its situation as surrounded with waters and marshes. *Skipsea*, *Withernsea*, and *Kilnsea* indicate that a mere has existed in each of these places, as there is yet at *Hornsea*. The termination *sea* (or *sey*, as it is occasionally spelt) is not the modern word denoting the *ocean*, but is nearly synonymous with mere.

From the above remarks, it will be evident that the physical geography of the district, diversified as it appears to have been by forests, lakes, and morasses, was eminently favourable to the habits of such mammals as those whose remains are now found buried in its bogs. The beaver had its natural haunts in the lake solitudes of Holderness; while the elk, gigantic deer, and reindeer would have the shelter of the primæval forests which then abounded in East Yorkshire; and from these sources an abundance of food for each tribe was always available.

The neighbourhood and coast of Holderness possesses much local interest, from the various relics of a geological or archaeological nature which occur there, such as stone axes, stone hammer-heads, and rude canoes formed from the hollow stems of trees by the primæval inhabitants of the district; as also the remains of several extinct animals, which have enriched the museums of the late Mr. Strickland and myself, the latter of which contains bones of the *elephant*, *bear*, *elk*, and *deer*.

Amongst the most interesting remains of animals which



have been discovered in Holderness, may be enumerated those of the *Beaver*, *Elk* or *Moose deer*, and *Reindeer*—three species of mammals new to the Extinct Fauna of Yorkshire. Of the former animal, a very fine skull was exhumed during some extensive draining operations on the banks of a river near Wawne, in the neighbourhood of Beverley, in 1861, by Dr. Brereton, and who has kindly allowed the specimen to be exhibited at this meeting. The skull, it will be observed, has every indication of having belonged to a mature individual; measuring six inches in length, and four inches in width across the posterior part of the zygoma. The nasal bones, one incisor, and six of the molar teeth are wanting; in every other respect the skull is in a fine state of preservation, and deeply coloured by the peat.* Previous remains of this singular rodent have been found in lacustrine formations in *Scotland*, *Wales*, *Northumberland*, *Berkshire*, *Cambridgeshire*, and *Norfolk*; and it is very evident the beaver existed in Britain down to historic times, as the names of many places are derived from some peculiarity of the site in connection with that animal, as Befer-burne or Bever-brook, Befer-ige and Beferic, Bever-island, and Befer-lac or Bever-lake or fence; so evidently referring to the ordinary habits of the beaver as to prove its existence in the localities so named at that period. Leland, writing in the early part of the 16th century, mentions the town of Beverley, in Yorkshire, as not only having for its arms the animal “quod vocatur bever,” but afterwards, on the authority of a writer of the life of St. John of Beverley, gives the name of the town as derived from that animal, which abounded there:—“Diere-wald locus nemorosus, id est sylvā Deirorum, postea Berlac, quasi locus, vel lacus castorum, dictus a castoribus, quibus

* For the different views of the skull in the accompanying plate I am indebted to Mr. Hanson, photographic artist, of Leeds.

Hulla aque vicina abundabat" (tom. iv., pp. 34-100).* The correctness of this tradition, however, like many others, although very probable, has been questioned. Professor Phillips says Beverley, instead of being Bever-lac, owing its name to beavers and lakes, is simply Pedwar-llech, the Greek Petouaria, chief city of the Parisoi, from whence we have Bevorlac and Beverley.† Our specimen, therefore, possesses peculiar interest, both *geological* and *historical*, as being not only the first instance of the remains of the beaver which has been found in Yorkshire, but also as corroborating the former tradition of its actual existence in the neighbourhood of Beverley at remote periods, and therefore giving some plausibility to the name of the town.

When, however, it became extinct in Britain it is not so easy to determine; but that it was beginning to be scarce in the 9th century is evident, as Pennant cites a passage from an early record—the Leges Wallicæ, or the Laws of Howel the Good—to show the value of a beaver's skin was 120*d.*, while that of an otter was only 12*d.*; and again, we find that in the reign of Henry I., in the 11th century, an export duty of 4*d.* per skin was authorised to be levied at *Newcastle-upon-Tyne*—a large amount in those days.

The second animal whose remains I have to record as a former inhabitant of Yorkshire, is the Elk or Moose deer (*Alces malchis*), which has occurred in two instances. In the spring of 1822, as some workmen in the employ of Messrs. G. and W. Tindall, nursery and landscape gardeners, of Beverley, were employed in digging out some drift gravel to construct a lake at Thorpe Hall, near Bridlington, the seat of Lord Macdonald, they found, at the depth of about four and a half feet from the surface, some of the bones and the

* Bede called the place where Beverley now is, *Sylva Deirorum*; *Anglicè*, *Deirewald*, p. 42.

† *Rivers, Mountains, and Sea Coast of Yorkshire*, pp. 105-201.

horns of the Elk (the largest of the Cervine family which still exists on the surface of the globe), and also a fine horn of the stag or red deer; and in the month of February, 1868, a horn and the occipital portion of the skull of a female specimen of the Elk were found during the process of draining, in a peat bog, about two feet below the surface, on the property of Sir George Cholmley at Carnaby, near Bridlington; and it is very probable the remaining parts of the skeleton of one of these animals may still be entombed in the same locality. Although the bones of this noble animal are said to have been found in different parts of the kingdom, the first authentic instance is in the *Transactions of the Tyneside Natural History Club* for 1861 (vol. v., pt. xi., p. 111), which contains a paper on the discovery of a fine shed horn of the Moose deer or true Elk at Chirdon Burn, North Tyne, near the bottom of a peat formation, resting partially on the coarse gritty marl formed by the weathering of the subjacent strata. Mons. Lartet detected a lower jaw of the Elk amongst other mammalian remains found in the cave of Llandebie, in South Wales, in 1861. There is a statement that in 1710 the horns of a Moose deer were dug up out of an old pond at Mainfort, near Sedgefield; and also that in 1827 a very fine specimen of an elk's horn was dug up in the vicinity of West Water, near Chatteris, in Cambridgeshire. From the date, however, given (1822), it will be evident the Yorkshire specimen is the first reliable example on record of the *moose* occurring in Britain, as Professor Owen does not include it in his *History of British Fossil Mammals*, published in 1846, or in his *List of Fossil Mammals* in the *Reports of the British Association*; which he most undoubtedly would have done had these instances been authenticated. I therefore suspect that in both the cases alluded to the horns have been of the large red deer or of the *Megaceros*, and not those of the true Elk,

as the term elk was formerly indefinitely used for any large deer's horns, without their precise identity having been determined—a point very easy to decide by a competent authority.

Although we have no historical records of the former existence of the Elk in Britain, it is enumerated by Cæsar as living in the great Hercynian forest during the Roman period; since which, by the destruction of the ancient forests and other effects of civilization, the Elk, like many of its contemporaries, has entirely disappeared from its early haunts, except Northern Europe, Northern Asia, and the wooded districts of Canada and the United States. It appears to have been well known to the lake dwellers in Switzerland, amongst whose rejectamenta its remains occur, and from which district it has, however, also long since disappeared.*

The third addition to the Extinct Fauna of the East Riding of Yorkshire is of another interesting species of the same family—the Reindeer. In 1860 I found, at the base of the cliff, in a lacustrine deposit near the top of the lake at Skipsea, the horn of the Reindeer, and also of the large variety of the Red deer, both of which are now in my possession.

It is somewhat remarkable that the three animals to which I have called attention, as formerly inhabitants of East Yorkshire, are all of strictly *boreal* habits, and afford evidence, as Mr. Boyd Dawkins observes, “that the climate of Pleistocene Britain was more severe than it is now; that at a time when Britain formed a portion of the Europæo-Asiatic continent, it more closely resembled that now obtaining in the fur-countries of Northern Asia than elsewhere.” As connected with this portion of my subject, I cannot

* *The Lake Dwellings of Switzerland and other parts of Europe*, by Dr. F. Keller; translated by J. E. Lee. 1866.

conclude better than by quoting the following apposite remarks by a writer in *Land and Water*, signed "Alces":—

"The study of northern zoology presents a variety of considerations interesting both to the student of recent nature and to the palæontologist. Taking as well-known instances the reindeer and musk ox, there are forms yet inhabiting the Arctic and sub-Arctic regions, which may be justly regarded as the remains of an ancient Fauna which once comprised many species now long since extinct, and which, with those already named, occupied a far greater southerly extent of each of the continents converging on the pole than would be possible under the present climatal conditions of the world. With those great types which have entirely disappeared before man had recorded their existence in the pages of history, including the mammoth (*Elephas primigenius*), the most abundant of the fossil pachyderms, whose bones so crowd the beaches and islands of the Polar Sea that in parts the soil seems altogether composed of them, the *Rhinoceros tichorinus*, and others, were associated genera a few species of which lived on into the historic period, and have since become extinct; whilst others, occupying restricted territory, are apparently on the verge of disappearance. 'All the species of European pliocene bovidæ came down to the historical period,' states Professor Owen, in his *British Fossil Mammals*, 'and the aurochs and musk ox still exist; but the one owes its preservation to special imperial protection, and the other has been driven, like the reindeer, to higher northern latitudes.' Well authenticated as is the occurrence of the rangifer as a fossil deer of the upper tertiaries, the evidence of its association, in ages so remote, with *Cervus alces*, has been somewhat a matter of doubt. The elk and the reindeer have always been associated in descriptions of zoology of high latitudes by modern naturalists, as they were when the boreal climate, coniferous forests, and mossy bogs of Ancient Gaul brought them under notice of the classic pens of Cæsar, Pausanias, and Pliny. And there is something in common to both of these singular deer which would seem to connect them equally with the period when they and the gigantic contemporary genera, now extinct, roamed over so large a portion of the earth's surface in the north temperate zone, where the fir-tree—itsself geologically typical of a great antiquity—constituted a predominant vegetation.

"The presence of the remains of *Cervus alces* in association with those of the mammoth, the great fossil musk ox (*Ovibos*), the fossil reindeer, and two forms of bison, in the fossiliferous ice-cliffs of Eschscholtz

Bay, as described by Sir John Richardson, would seem to be an almost decisive proof of its existence at a time when the temperature of the shores of the Polar Sea was sufficiently genial to allow of a vegetation affording forage and cover to the great herds of mammals which have left their bones there with buried fossilized trees, attesting the presence of a forest at a latitude now unapproached save by shrubs such as the dwarf birch, and by that only at a considerable distance to the south.

The elk of the present day, so far as we understand his habits, unlike the musk ox or reindeer, for which lichens and scanty grasses in the valleys of the barren grounds under the Polar Circle afford a sufficient sustenance, is almost exclusively a wood eater, and could not have lived in the locality above indicated under the present physical aspects of the coasts of *Arctic America*, any more than the herds of buffaloes, horses, oxen, and sheep, whose remains are mentioned by Admiral Von Wrangel as having been found in the greatest profusion in the interior of the islands of New Siberia, associated with mammoth bones, could now exist in that icy wilderness. On these grounds, therefore, a high antiquity is claimed for the sub-genus *Alces*, probably as great as that of the reindeer.

“Passing on to pre-historic times, when the remains of the species found in connection with human implements prove its subserviency as an article of food to the hunters of old, we find the bones of *Cervus alces* in most of the Swiss and other Lake Dwellings, and in refuse-heaps of that age; whilst in a recent work on travel in Palestine, by the Rev. H. B. Tristram, we have evidence of the great and ancient Fauna which then overspread temperate Europe and Asia having had a yet more southerly extension; for he discovered a limestone cavern in the Lebanon, near Beyrout, containing a breccious deposit teeming with the *débris* of the feasts of pre-historic man—flint chippings evidently used as knives, mixed with bones in fragments, and teeth, assignable to a reindeer, a bison, and an elk. ‘If,’ says the author, ‘as Mr. Boyd Dawkins considers, these teeth are referable to the now exclusively northern quadrupeds, we have evidence of the reindeer and elk having been the food of man in the Lebanon not long before the historic period; for there is no necessity to put back to any date of immeasurable antiquity the deposition of these remains in a limestone cavern. And,’ he adds, with significant reference to the great extension of the ancient zoological province of which we are speaking, ‘there is nothing more extraordinary in this occurrence than in the discovery of the bones of the tailless hare of Siberia in the breccias of Sardinia and Corsica.’”—Vol. v., No. 119, p. 233.