

country to the north of Åbo and Helsingfors. Near Uleåborg, also, are extensive deposits of Post-Pliocene sand, smaller patches of which are met with at intervals in the western parts of the country and bordering the Gulf of Bothnia. In the interior of Finland this sand also occurs, and large outcrops are mapped to the north-east of Teisko and near Lake Ladoga, and on towards St. Petersburg; in the southern part of Finland, however, it is but sparingly represented, and it does not appear to occur at all in the northern part of the country above Uleåborg.

Perhaps, the most interesting glacial deposits of Finland are the åsar and stratified terminal moraines, which in some instances stretch uninterrupted for many miles across the country. We had abundant opportunity of examining these at typical localities, as will presently be described.

Confining attention to the neighbourhood of Tammerfors for the moment, I may remark that the geologists of Finland are of accord that glacial phenomena there are not so simple as in other parts of the Grand Duchy. Messrs. Sederholm and Ramsay state<sup>1</sup> that there are several systems of glacial striæ. The predominating directions are "S. 25°–30° E. et S. 60°–65° E. (côté frappé au N.–W.)." To the south of Tammerfors the striations run W.–E., and sometimes N. 65° E. These diverse directions are explained as being formed during the retreat of the ice; but to the north of the town there are striæ running S. 5° E., and belonging without doubt to a more recent system, which is connected with a large terminal moraine found to the north-west of Tammerfors and which, by its configuration and sandy composition, resembles an ås. What is believed to be the oldest system of glacial striæ in the district is in the country to the south of the town where the grooves run N. and S. The morainic gravel throughout is remarkably uniform. The glacial clays in the southern part of Lake Näsi are recognized as marine "*Yoldia*-clays," and there is also a fresh-water deposit.

(To be continued.)

#### V.—THE "IRISH ELK," *CERVUS GIGANTEUS*, IN THE ISLE OF MAN.

By P. M. C. KERMODE, Esq.,

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**I**N September last the Committee appointed by the British Association to "examine the conditions under which remains of the Irish Elk were found in the Isle of Man" commenced excavating at Close-y-garey, near Poortown; but owing to the unusual amount of water, considerable labour and expense were incurred in the preliminary work of draining, and by the 25th September the grant was exhausted.

Our local Committee thereupon took up the work, issuing a circular for subscriptions, the response to which enabled them to carry on the excavations with such success that on the 30th

<sup>1</sup> Guide (op. cit.), p. 8.

September portions of what appeared to be a perfect specimen were disclosed in the undisturbed marl.

The dub, or old marl-pit, in question, lies in a hollow in the glacial drifts, about half a mile south of the Peel Road Railway Station, on the east side of and close to the line. It had about sixty years ago been worked for marl, and the present well-defined banks mark out a rectangular hollow about three feet below the surrounding surface, measuring about fifty yards square.

Across one corner of this a trench was dug to carry off the water, and the operations of the Committee were confined to a triangular area on the west side of the trench, measuring about 15 yards east and west by 30 yards north and south. We excavated all over this space to a depth of nine feet and more. The first four excavations being through ground which had previously been disturbed yielded no definite results, but at one point, about 10 yards from the north bank and 8 yards from the west, a few elk-bones were met with in the disturbed soil. These and some other bones were submitted to Professor Boyd-Dawkins for examination, and he finds among them, belonging to this species, fragments of maxilla, the sixth cervical vertebra, the second lumbar vertebra, and a fragment of a rib.

The last excavation, about the centre of our area, brought us to the undisturbed marl at a depth of about three feet. On testing this I found it to extend to a depth of 10 feet 6 inches at a point about eight yards east of the bank, but four yards nearer to the bank it did not reach a greater depth than eight feet. Between this and the bank it appeared to have been disturbed.

In this bed of white marl, at a depth of about nine feet from the surface, we found the remains of a complete skeleton, lying on its right side, the head towards the bank, the legs drawn up to the body. We considered it necessary to get it out the same day (Saturday), as already many people had been to the place the previous evening, and some one had broken off a piece of the exposed antler. Had time allowed we should have endeavoured to have cleared away the marl from around the bones and had them entirely disclosed and photographed. Time, however, did not allow of this, and as it was very wet we probably should not have succeeded anyhow. Deemster Gill, Mr. Crellin, the Rev. S. N. Harrison, and I therefore took very careful note of the position of the bones as they were gradually uncovered and removed.

So perfect was the skeleton that we had no difficulty in doing so. The bones were nearly all in juxtaposition and in a fair state of preservation. The left antler had fallen back over the lumbar vertebrae; it was rather decayed, the tines had fallen off, and the beam was missing. The other antler had dropped down by the cervical vertebrae, and, except for the beam, was in good preservation, but in lifting it from the marl the tines dropped off. Unfortunately the skull had decayed away and only a portion of the left lower jaw and fragments of the upper jaws remained.

The left antler is the larger; it measures across the palm

15 inches, allowing for a piece of the front edge which has decayed away; the right measures 13 inches. With the tines restored, they are respectively  $56\frac{1}{2}$  inches and 53 inches long, and the beam would have been at least 10 inches more. They show six points or tines, besides the brow-tines, which had fallen off, the part where they joined the beam having decayed away.

On laying the bones in position I find that the animal must have been about 18 hands or six feet high at the shoulder. The fact of its having antlers shows it to have been a male; and their size and number of tines, that it was an adult. One of the ribs had been broken, no doubt the result of fighting with another buck in the rutting season, and had healed again. The teeth are in excellent preservation, showing no sign of weakness or decay. The limbs are perfect, all the small bones having, I think, been recovered; the vertebræ also are sound and appear to be all present. The right shoulder-blade, which lay beneath the other, is badly decayed, as are many of the ribs, but I think they can be pretty well restored, and, but for the missing skull and the beams of the antlers, the bones when articulated and mounted will make a perfect skeleton.

Having secured this specimen, we continued our excavations in an easterly direction, but very quickly got through the marl, and again found the soil to have been disturbed as far as our trench.

With regard to the formation in which it was found, the British Association Committee will no doubt have a full report for the meeting at Bristol next September. The result of all the excavations, allowing for the very disturbed state of the ground, shows the following beds:—

					ft. ins.
A.	Disturbed soil and peat, an average of about	...	...	...	3 0
B.	In one place a blue clay or silt was observed resting on the white marl.	...	...	...	...
C.	White marl, containing the elk-remains	...	...	...	6 6
D.	Blue marl	...	...	...	1 0
E.	Red sand with gravel	...	...	...	0 3
F.	Brown clay	...	...	...	0 3
G.	Sand and gravel	...	...	...	0 3
H.	Clay	...	...	...	4 0
	} ? Glacial drift				

As stated above, the whole surface had been lowered about three feet in digging for marl; the peat had for the most part been removed, and a great deal of the marl also; indeed, we were fortunate in finding this one spot in which the marl itself had not been disturbed.

The finding of detached bones shows that other individuals of this species had perished here, and is consistent with what we were told, namely, that a specimen had been seen when digging for marl, and that the antlers of yet another had been taken out and sold. We were told also that two skulls without antlers had been seen on the east side of our trench.

Samples of the marl and other beds were forwarded to Mr. James Bennie of Edinburgh, for preparation and microscopical examination, and so far as we have heard, the peat appears to be an ordinary lake peat, without anything very distinct about it. The marl contains no

fresh-water shells, but there seems to be a great number of Ostracoda, also some Chara-seeds. The Arctic crustacean *Lepidurus glacialis* and the Arctic willow *Salix herbacea*, which we found in our previous excavations at Ballaugh, seem to be absent from this section. Mr. Clement Reid, of H.M. Geological Survey, has kindly undertaken the determination of the vegetable remains, and we hope therefore to be able to give further information on the subject in our Report to the British Association.

In recording this latest discovery of the remains of the great deer, it is of interest to recall the fact that the first specimen to have been set up, if not, indeed, the first almost perfect skeleton found, is that now at Edinburgh, which was found at Ballaugh in the Isle of Man in 1819. Altogether we have been able to trace remains of about twelve individuals, and possibly more may yet be met with, so that a herd of this noble beast must have existed here after the kingdom of Man became an island. It is more easy to account for its disappearance in so small an area than for its original presence; the best explanation of the latter being that suggested to the writer by Mr. G. W. Lamplugh—that it had crossed over on the ice.

It is somewhat remarkable that no other contemporary remains have been met with, unless we may now except *Equus caballus*, some bones of which we found at Close-y-garey. From their appearance Professor Boyd-Dawkins thinks these may possibly be of the same age: most unfortunately they were only met with where the soil had been disturbed, but they at least suggest grounds for further search, which I hope we may be able to undertake in the near future.

#### VI.—NOTES ON THE RED-DEER, *CERVUS ELAPHUS*, LINN.<sup>1</sup>

By G. PRINGLE HUGHES, Esq.

THE Red-Deer (*Cervus elaphus*), or common stag, is a native of the more temperate regions of Europe, Asia, and North America. In Great Britain it has its freedom limited to the Highlands of Scotland, where, however, it is carefully protected, and affords the *crème de la crème* of British field-sports to the practised rifleman and mountaineer.<sup>2</sup>

In early English History, when the marauding disposition of the people made cattle a precarious property, the wild deer, which depastured the country in large numbers, afforded the staple article of food. Large hunting parties were collected, and as many as 1,000 stags are recorded as having been taken at one of these gatherings.<sup>3</sup>

The true stag and deer are at once distinguished by the presence of deciduous branching antlers in the male, the female being in nearly

<sup>1</sup> Read before the British Association, Toronto, in Section D (Zoology), 1897.

<sup>2</sup> The shooting of some of the deer forests, of from 25,000 to 35,000 acres, is let for between £3,000 and £4,000 per annum.

<sup>3</sup> The ballad of Chevy Chase records such a wholesale slaughter, though the history of field-sports relieves the statement of any suspicion of poetic license.