

EXCURSION TO THE CUTTINGS ON THE NEW
RAILWAY BETWEEN UPMINSTER AND
ROMFORD, ESSEX.

SATURDAY, MARCH 5TH, 1892.

Director: T. V. HOLMES, F.G.S.

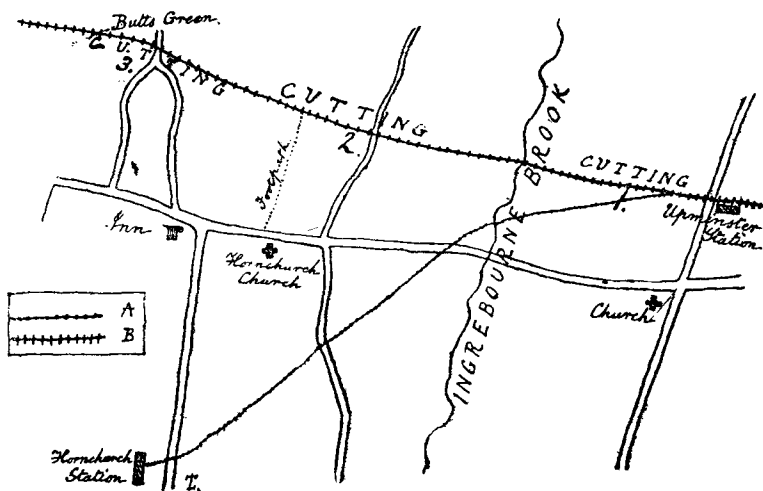
(*Report by THE DIRECTOR.*)

Last year the Association visited the sections on the southern half of the new railway from Grays Thurrock to Upminster, the party returning to Grays from a point about midway between the Mardyke and South Ockendon.* This year it was decided to inspect the cuttings between Upminster and Romford, towards the northern end of the same line, those between the spot reached last year and Upminster being not only shallow and of little geological interest, but having been also much sloped and obscured last autumn.

The early date fixed for this excursion this year was caused by the progress made during the winter in sloping the most important and interesting of the cuttings, that at Hornchurch. On arrival at Upminster, the party, numbering about twenty-five, turned westward to inspect the section resulting from the widening of the cutting between Upminster Station and the Ingrebourne, to receive the line from Upminster to Romford in addition to that connecting Upminster and Barking. The section consisted of London Clay, with a slight and variable capping of gravel or loam, the former predominating. This gravel seldom appeared to be more than six or seven feet thick, and frequently the London Clay was seen forming the surface for a horizontal space of two or three feet between two festoon-like beds of gravel. It belongs to a higher terrace of Thames Valley deposits than the gravel and loam covering the surface along the course of the line between Upminster and the Mardyke, lying from ninety feet to above a hundred feet above ordnance datum, while south of Upminster the plateau varies from sixty to seventy feet in height.

The party then crossed the Ingrebourne and entered the cutting in the plateau on the Hornchurch side of the valley. This cutting lies mainly westward of the road which ranges in a northerly direction from that connecting Hornchurch and Upminster, about a quarter of a mile east of Hornchurch Church. Here, as at Upminster, the surface consists of gravel belonging to the highest of the Thames Valley terraces, the greatest thickness of it

seen being from ten to twelve feet. At each end of this cutting nothing can be seen beneath the gravel but London Clay; but in the central part there is a bed of Chalky Boulder Clay, having a horizontal extension of about 300 yards and a maximum thickness of fifteen feet, resting in a slight hollow on the surface of the London Clay. Towards the eastward limit of the cutting this Boulder Clay ends about 100 yards west of the bridge on the above-mentioned road, and towards the westerly termination it can be seen up to a point between fifty and sixty yards east of the bridge which connects the fields on each side of the line. The depth of the cutting where the Boulder Clay exists is from eighteen to twenty-five feet, the surface of the ground being close to, or a little above, the 100 feet contour line. On the day of the



A. Existing Railway. B. Line in course of construction.
Scale about 2 inches = 1 mile.

SKETCH-PLAN, SHOWING POSITION OF THE THREE CUTTINGS ON THE
NEW RAILWAY BETWEEN UPMINSTER AND ROMFORD.

excursion the cutting had not been entirely sloped, and we were fortunate enough to see a fairly good section of the Boulder Clay close to its north-west termination, and to be able to note that it was in every respect typical Chalky Boulder Clay.

On leaving the Boulder Clay cutting we met Mr. Robertson, the engineer of the line, who had very kindly brought together, for our inspection, some of the more interesting specimens found in it. They included many lumps of Kimeridge Clay, some examples of *Gryphaea dilatata* from the Oxford Clay, and a vertebra of a *Plesiosaurus*.

Proceeding towards Butts Green, we saw, eastward of the road

there, nothing but sand and gravel; but westward of it London Clay appeared beneath the surface beds, without the intervention of any Boulder Clay. The gravel and sand in this cutting, and thence to the end of the railway at Romford, belongs to the same terrace as that of the cuttings just described. But as the excavations west of the stream half a mile west of Butts Green were not sufficiently advanced to be worth visiting, we retraced our steps to Hornchurch, and after looking at the church and the old gravel-pits adjoining it on the south-west, proceeded to the railway station.

The specially interesting feature of the excursion was, of course, the presence of the Boulder Clay. With this exception the most southerly exposure of it known in this district is that at Maylands, about three miles north of the Hornchurch cutting. Moreover, the outliers of Boulder Clay in South Essex, and at Finchley in Middlesex, all lie either on the London Clay or on Bagshot Beds—chiefly on the former—and do not show the nature of the relation between the Boulder Clay and the deposits of the Thames Valley. The Boulder Clay is now shown to be older than the highest terrace of the Thames Valley Gravel, and consequently still more decidedly older than the various gravels and loams of less elevation at Ilford and elsewhere, as to the affinities of which there has been so much discussion. Of course the highest terrace of any series of river-deposits is not necessarily certain to be the oldest; but in this case, as in most others, there is a strong presumption in favour of its superior age as compared with those nearer the level of the present stream. And this probability becomes practically a very near approximation to a certainty, in the absence of stratigraphical evidence to the contrary.

The terraces of this part of the Thames Valley, being cut in London Clay, are never even moderately distinct for more than a few yards. At Hornchurch, as regards the highest terrace, those who visited the church and walked through the old gravel-pits south-west of it, and the adjacent field, to the railway station, must have noticed a fairly distinct bank in the corner of the field nearest the pits. But in a few yards, both in the direction of the windmill and in that of the village, this band becomes simply a non-separable portion of a vague slope. Similarly the lower terrace, on which the railway station stands, and the surface of which is from sixty to seventy feet above ordnance datum, is bounded by a tolerably distinct bank near the railway, rather more than half a mile south-west of Hornchurch Station, but becomes untraceable in a very short distance in any direction. This impossibility of tracing the various terraces throughout their courses is characteristic of river valleys wherever they have been carved out of soft materials; but where rivers flow through harder rocks these terraces become much more clearly marked.

Instances of this could be given without leaving the valley of the Thames. One will probably occur to many members of the Geologists' Association: last year, on visiting Henley and Nettlebed, we saw the Thames flowing, not through London Clay, but through the comparatively hard Chalk; and many may remember the view eastward from No Man's Hill, including, as one of its most prominent features to a geological eye, the sharply defined high-level terrace some distance away, cut in the Chalk of the hillside at Remenham.

REFERENCES.

- Geological Survey Map, Sheet 1, S.W. (Drift edition.)
 New Ordnance Survey Map, Sheet 257.
 1889, WHITAKER, W.—"The Geology of London." *Mem. Geol. Survey*.
 1892, HOLMES, T. V.—"The New Railway from Grays Thurrock to Romford: Sections between Upminster and Romford."—*Quart. Journ. Geol. Soc.*, vol. xlviii, pp. 365—372. August.

VISIT TO THE BRITISH MUSEUM (NATURAL HISTORY).

SATURDAY, MARCH 19TH. 1892.

Director: ARTHUR SMITH WOODWARD, F.G.S.

(*Report by THE DIRECTOR.*)

The members were conducted through the Gallery of Fossil Mammalia, and the Director pointed out the principal features in the collection of Pleistocene Mammalia. The first table-case and the first two wall-cases are arranged to illustrate the association of man with extinct animals, and the distribution of the Pleistocene Mammal Fauna as known from the exploration of caverns. The remaining cases are arranged in zoological order. In addition to the Brady Collection of Mammalia from Ilford, and the large series of specimens dredged off the eastern coast in the collections of John Brown (of Stanway), J. Layton, and J. J. Owles, the numerous specimens obtained from other sources render the collection of British Fossil Mammalia remarkably complete. New excavations are continually yielding additional remains, and among the most recent acquisitions were pointed out the calvarium of a Saiga Antelope (*Saiga tartarica*) from Twickenham, and an antler of the Reindeer with a calvarium of the European Bison from excavations near Victoria Station.