

in the Old Red Sandstone of Herefordshire, the deepening of which he had no doubt was largely due to natural causes.*

During the course of the day the party became reduced, as some members desired to leave Bridport by an afternoon train. Some again parted at the Bull Hotel, Bridport. In the evening a faithful band of nine dined with the two Directors at the Mermaid Hotel, Yeovil, after which they went, each to his separate destination.

EXCURSION TO READING.

SATURDAY, JUNE 6TH, 1885.

Directors: J. H. BLAKE, F.G.S., Assoc.M.Inst.C.E., of the Geological Survey; and Dr. JOSEPH STEVENS, Hon. Curator of the Reading Museum.

(*Report by THE DIRECTORS.*)

Notwithstanding the unfavourable state of the weather, between thirty and forty took part in this excursion. The Members from London were met at the railway-station at Reading at about 11.15 a.m. by the Directors, and were shortly afterwards joined by some members of the Henley Field Club, and also by a few belonging to other local societies.

The assembled excursionists, crossed the Thames by the road-bridge and proceeded to the top of St. Peter's Hill, Caversham, where the Chalk is overlaid by implementiferous gravel. Here, in a pit on the east side of the Wallingford Road, a clean-cut section down to the Chalk showed the gravel to be six feet in thickness. Dr. Stevens exhibited a few specimens from his large collection of palæolithic flint-implements obtained from the gravel in this locality, the surface of which is about 119 feet above the level of the Thames, and $234\frac{1}{2}$ feet above sea-level. He stated that the palæolithic implements differed in some respects from those found at Grovelands, on the opposite side of the valley, where the gravel was at a lower level. Those from Grovelands were mostly oval or oval-pointed; whereas here they were chiefly acutely-pointed or spear-shaped, but occasionally oval ones were found. No animal

* This explanation of deep hollow lanes in sandy strata has been given by Gilbert White, 'Nat. Hist. of Selborne,' Letter v, 1789; and W. Topley, 'Geology of the Weald' (Mem. Geol. Survey), p. 380, 381;

remains had been noticed in this Drift-gravel, but he had discovered British pottery in the upper part of it.

The President, addressing the excursionists, said that the finding of flint-implements in the Drift at that elevation was of great interest; as one must believe that at the time those gravels were laid down, the water then flowed at the level now occupied by the gravels, and that the face of the country had since been wholly changed. None of the valleys before them then existed; and this alone served to point out what a vast period of time had elapsed since that gravel was deposited.

Professor Rupert Jones did not consider that an ice-cap had occupied this district, but that drifting ice had been a powerful agent in effecting local changes.

On the return to Reading a pause was made for a few minutes at the Caversham Chalk-pit, where some curiously-shaped "pipes" in the Chalk were pointed out. Professor Rupert Jones remarked that much sponge material was to be observed here in the flints in the Chalk, and that many of them were hollow and contained a whitish siliceous dust consisting of minute, but very beautiful, microscopic organisms.

A movement was then made to the New Museum, which was diligently looked over for about an hour, attention being chiefly directed to the flint-implements and other pre-historic remains found in the district, and to a fine collection of Upper Chalk fossils from North Hants, which were mostly collected by Dr. Stevens.

The party next visited the brickyards at Coley Hill,* to the south of Reading, where good sections of the Reading Beds, showing their junction with the Chalk, had been kindly prepared by Mr. Wheeler. The surface of the Chalk presented a very even line at its junction with the "Bottom-bed" of the Reading Series. A short discussion took place regarding the perforations which extended downwards from the basal beds into the Chalk, to the depth of several inches, Mr. J. Starkie Gardner regarding them as due to boring animals, while Professor Rupert Jones believed them to be the result of the roots of marine plants. These tube-like cavities were in most cases filled with greenish sand containing glauconitic grains, etc., derived from the "Bottom-bed." The oyster beds were well exposed in the latter, overlying the Chalk, and several good specimens of *Ostrea bellovacina* were obtained; as well as

* See the papers by Mr. Hudleston, and by Professor T. R. Jones, and Capt. C. Cooper King, referred to below.

some shark's teeth from the greenish beds. Several green-coated flints also were extracted from the layer which occurs at the junction of the Reading Beds with the Chalk. Above the "Bottom-bed" occurred fine buff-coloured sands, which in places were false-bedded, and in other parts of the brickyard were overlaid by the characteristically mottled plastic clays of this formation. A few impersistent seams and beds of grey loam and clay were exposed in the buff sands, particularly in the lower part; and also some apparently rolled lumps of the same or similar clay, varying in size from about one inch to one foot in diameter, and known as "clay-galls." Mr. Blake drew attention to a well-defined "fault" traversing the brickyard in a S.W. and N.E. direction, and bringing the mottled clay against the buff-coloured sands, with a sharp and nearly vertical divisional line between them; owing to which the workable clay in the brickyard had come to a sudden and unexpected termination, and Mr. Wheeler—the proprietor—had been obliged to go elsewhere for his clay.

Winding their way in a westerly direction along the road on the southern side of the Thames Valley, the members of the party eventually reached the gravel-pit at Grovelands, where a fine section exhibited about 16 feet in thickness of gravel resting on the sands of the Reading Beds. The surface of the gravel is about 81 feet above the Thames. Numerous palæolithic flint-implements and some animal remains, mostly found in the lower part of the gravel, have been obtained by Dr. Stevens from this pit since 1879. The bones, he stated, were always much broken and water-worn, and consisted of those of ox, horse, red-deer, perhaps reindeer, and portions of teeth of the mammoth. Many flint flakes had also been found, and were in most instances so unworn as to imply, in his opinion, that they were wrought not far from where they were found.*

Returning by tram to Reading, the classic brickyard at Kate's Grove, or Cat's Grove,† and the adjoining one of Waterloo—now worked by Mr. Poulton—were next briefly inspected. Fine sections of mottled plastic clays underlaid by whitish and buff-coloured sands were in both brickyards well exposed. In that of Waterloo, Mr. Blake pointed out the locality where a large quantity of fossil leaves were imbedded in the more or less lamin-

* *Vide* Proc. Geol. Assoc., Vol. viii, pp. 347-8.

† Described by Buckland in 1814, 'Geological Transactions,' Vol. iv, p. 278, and in Conybeare and Phillips' 'Outlines of the Geology of England and Wales' (1822), pp. 42-44. See also Mr. Hudleston's report, referred to below.

ated grey loams and clays—in places resembling fuller's earth—interbedded in the lower part of the buff sands. Many specimens were extracted from these "leaf-beds" and taken away by different members of the party. Mr. Starkie Gardner very assiduously applied himself to the work, and was rewarded by obtaining some fine specimens of leaves (with stalk attached) of the plane tree. Those of the willow, however, were most abundant.

On the return journey—the weather having cleared up—a diversion was made by scaling "Bob's Mount," where a fine view showing the physical features of the surrounding country was obtained. Here, Mr. Blake pointed out the fossiliferous "Basement-bed" of the London Clay resting on the Reading Beds, and also the capping of Drift-gravel, which was well shown in section—an irregular line strongly marking the unconformity between the gravel and underlying London Clay.

Having dined at the Queen's Hotel, the excursionists—previously to separating—expressed themselves to the effect that notwithstanding the inclement state of the weather, they did not regret their day's outing at Reading.

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