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EXCURSION TO KINGSWOOD AND WALTON-ON-THE-HILL.

SATURDAY, JULY 2ND, 1898.

Directors: W. WHITAKER, F.R.S., PRES. G.S., AND
 W. P. D. STEBBING, F.G.S.

Excursion Secretary: BEDFORD MCNEILL, F.G.S.

(*Report by THE DIRECTORS.*)

THIS excursion was arranged to give members an opportunity of seeing some sections on the new Chipstead Valley line of the South Eastern Railway, which, when finished, will extend from Purley to Tattenham Corner on Epsom Downs.

The party assembled at Charing Cross Station, and travelled by the 12.56 train to Kingswood, up to which point the new line is already open for traffic. Leaving the station, the Directors led the way westward along the top of the cutting. The section showed in places a very irregular surface of Chalk covered by a thin bed of clay, in some places perfectly black, with unwater-worn flints. Above the clay there was a loamy and sandy bed with masses of pebbly gravel, probably a reconstructed wash from Eocene beds. Near the entrance to the tunnel under Walton Heath, Mr. Whitaker pointed out a mass of fine white quartz sand from the Tertiary beds, left like a great saucer-shaped boulder in the loamy bed; its position, he explained, was due to piping in the underlying Chalk. No Eocene actually in place was to be seen at the eastern end of the tunnel.

On leaving this section, the party walked in a north-westerly direction across the corner of the Heath, following the line of the tunnel to a cutting which is in course of excavation. The following extremely interesting section was seen:

(1) Bedded sand and pebbles, probably Blackheath Pebble Beds, more or less rearranged. This pebbly bed lies with curved stratification on the underlying beds, but the curvature and the irregularities noticed are not wholly due to original irregularity of deposition, but partly to the subterranean dissolution of the Chalk beneath.

(2) Under the pebbly and sandy beds a little pink and greenish clay or loam from the base of the Woolwich and Reading Beds was seen; it was not *in situ*, but had been slightly moved owing to pipes in the Chalk below.

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Mr. Whitaker expressed the opinion that the Woolwich and Reading series has never had any great thickness here, although they are fairly well developed just to the west, at Headley, but that the Blackheath Beds had originally almost rested on the Thanet Sands, and he remarked that on the next Saturday the members would have an opportunity at Worms Heath of seeing the Blackheath Pebble Beds resting directly on the Chalk, all intermediate formations (except, perhaps, a trace of Thanet Sand), being there absent. He also commented on the extent originally of these pebble-beds southward from the main mass.

(3) Thanet Sand.—Great rounded bosses of this formation reached in places almost to the top of the cutting, the curves of the hollows between them being followed by the beds above, but the sections on the opposite sides of the cutting were very different. Mr. Whitaker remarked here on the difficulties of mapping a country of this kind and the uncertainty as to where a bed may begin or finish.

(4) At one place there was a small pinnacle of Chalk sticking up into the Thanet Sand, without the intermediate bed of green-coated flints; further north more Chalk was seen in the cutting showing good examples of pipes.

Leaving the railway the party walked across Walton Heath to some pits in sand and gravel. Dr. Hinde being called upon, stated that the members stood upon a plateau between the Rivers Wandle and Mole; and here, on the watershed of the former, they found a sheet of gravel at a level of 500 to 600 ft. above the sea. This gravel consists mainly of more or less rolled flints and pebbles from the Blackheath Beds, and contains green-coated flints from the base of the Thanet Beds, and a number of stones of irregular shape which came from the Lower Greensand Chert beds. These cherts were largely formed of sponge-spicules, and could be found *in situ* some two miles to the south of the gravel but separated from it by a valley 400 ft. deep. The valley could not have existed when the gravel was deposited. These deposits are the Southern Drift of Prestwich.

Mr. Whitaker asked if the chert might not come from the lower and the ironstone from the upper beds of the Lower Greensand. He said it was interesting to note that here we have chert, and elsewhere, in gravel of this age, ironstone, showing that one must not classify gravels solely by their mineral contents, and that two gravels may be of the same age and origin, though of different composition.

Mr. Stebbing mentioned that he had not found any ironstone here, but about a mile and a half to the south-west there was plenty to be seen on some ploughed fields. According to Mr. Salter the ironstone increases towards the river Mole, and came from Tertiary beds.

The President asked whether all agreed that when these

gravels were laid down, the valleys around did not exist, and also whether there was any general agreement as to the origin of the gravel; to which Mr. Whitaker replied that he thought there was a considerable difference of opinion as to the origin of the gravel.

On leaving this section the party walked through Walton village to the church, where the Norman lead font was inspected. Continuing the walk across the fields Frythe Park was reached, where Mr. and Mrs. Stebbing had invited the party to tea. After tea, the President heartily thanked the Directors of the excursion, and the members walked across Walton Heath to Kingswood Station in time for the 7.30 train to London.

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EXCURSION TO UPPER WARLINGHAM AND WORMS HEATH.

SATURDAY, JULY 9TH, 1898.

Director: W. WHITAKER, B.A.Lond., F.R.S., Pres. G.S.

Excursion Secretary: A. E. SALTER, B.Sc., F.G.S.

(*Report by* MR. SALTER *and* DR. G. J. HINDE, F.R.S.)

THE party left London by the 1.40 p.m. train, reaching Upper Warlingham Station at 2.15. Mr. Whitaker led the way to the pits at Whiteleaf, north of the station, where about 15 feet of chalky valley-gravel is being worked. Remains of *Rhinoceros* and *Reindeer* occur here, and a portion of a tooth of *Elephas primigenius*, was found by Dr. Johnston-Lavis during the visit. Dr. Hinde, at the request of Mr. Whitaker, gave an account of the composition of the gravel, and made special reference to the large blocks of conglomerate seen in the pit. Some of these blocks could be shown to have been derived from Tertiary beds higher up the valley but others of a more sandy nature had not been detected *in situ*. The party then proceeded to Worms

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