EXCURSION TO EAST WICKHAM AND BOSTAL HEATH.

SATURDAY, APRIL 28TH, 1906.

Directors: A. L. LEACH AND B. C. POLKINGHORNE, B.Sc.

Excursion Secretary: A. C. YOUNG, F.C.S.

(*Report by THE DIRECTORS.*)

THE party, numbering 23, met at Plumstead station, at 2.30 p.m., and proceeded by way of the High Street and Lakedale Road ("Cage Lane" in the *Geol. Surv. Memoir*) to Plumstead Common, where the first halt was made at the north-eastern corner of the common beside the path leading to Wickham Lane. In reference to former excursions the Directors remarked that the district was first visited by the Association in July, 1887, under the Directorship of the late Mr. J. G. Goodchild. Some of the sections then examined have long since been covered by the rapid growth of Plumstead, but the exposures now open are as good as, if not better than, any series formerly accessible, and exhibit very fully all the strata between the Chalk and the London Clay, together with good sections in the Pleistocene Brickearths of the Wickham Valley. The 1887 excursion is fully reported in the *Proceedings*; subsequent visits in 1894 and 1901 are only briefly recorded.

The Directors then drew attention to the chief features of interest in the geology of the district. To the north lay the broad valley of the lower Thames, the river itself being seen over the wide belt of alluvium which forms the marshes of Erith and Plumstead. Rising nearly 200 ft. above the marsh-land the Lower Tertiaries form the pebbly plateau on which Bostal Heath, Plumstead Common, Woolwich Common, Blackheath, and Greenwich Park stretch for 7 miles as an almost continuous belt of heath and common land. The edge of this plateau was seen to be crenated by valleys in every stage of formation: some mere hollows in Blackheath Beds, others cut down through the Woolwich loams (e.g., The "Slade"), or into the Thanet Sand, the more advanced stage being exemplified in the East Wickham Valley, which is practically an adult "combe" with a permanent stream that has eroded its bed through London Clay and the Lower Tertiaries down to and into the Chalk.

From the point where the members were assembled, successive sections could be traced, showing Chalk in the floor of the valley, Thanet, Woolwich, and Blackheath Beds on the slopes; about a mile to the south-west the London Clay mass of Shooters Hill stood out prominently. Attention was drawn to

the enormous amount of denudation accomplished between the deposition of the sands and gravels on the top of Shooters Hill

CONTOURS OF THE EAST WICKHAM VALLEY. THE LETTERS DENOTE THE SECTIONS VISITED ON APRIL 28TH, 1906.

- A. Section at N.E. corner of Plumstead Common.
- B. " near Hope Cottage.
- C. " in Jenner's Chalk and Sand pit.
- D. " "Cemetery" Brickyard.
- E. " South Metropolitan Brickyard.
- F. " Gregory's Brickyard.
- G. " Road cutting on Bostal Hill.

and the formation of the Pleistocene brickearths in the Wickham Valley, 350 ft. lower down.

After this general survey of the Geological position the following sections were examined in detail:—

(A.) Section near Bartlett's Hollow; (B.) Hope Cottage; (C.) Jenner's (Hoar's) Chalk Pit; (D.) "Cemetery" brickfield; (E.) South Metropolitan brickfield; (F.) Gregory's brickfield.

(A.) Here the Blackheath Beds were well displayed. A thick pebble-bed, showing great variation in the size of the pebbles, rested in a series of "scoops" upon a set of false bedded sands and gravels which, in turn, lay on an eroded surface of the Woolwich Shelly Clays.

The party now walked along the eastern edge of Plumstead Common, passing some wooded "combes," to the large sand-pit opposite Hope Cottage (B.), where the Blackheath Pebbles were seen cutting down into the Woolwich bottom bed (as at Abbey Wood). The section, recorded by Mr. Whitaker many years ago, is as under:

SECTION NEAR HOPE COTTAGE.

12ft. Blackheath Beds: A little laminated Clay at base.

10ft. Woolwich Beds: Greenish sand—clay at top—scattered pebbles at bottom.

56ft. Thanet Sand: Fine white sand—clayey near base.

A few yards lower down King's Highway, in Jenner's (Hoar's) pit, section (C) showed:

SECTION IN JENNER'S PIT.

0 to 10 ft. Drift: Fringe only of the main deposit in the valley.

50 ft. Thanet Sand: Cut off the east by "Drift."

1 ft. "Bull Head": Irregular.

12 ft. Chalk.

The "Bull Head" or "bed of greencoated flints" at the base of the Thanet Sand, attracted much attention. The typical flints were found and Dr. A. E. Salter detected a large flattened ferruginous concretion, an unusual constituent of this bed, but perhaps most interest was excited by the remarkable change in the junction of the Chalk and Thanet Sand. On the northern side of the pit the "Bull Head" was fairly uniform in thickness and rested on an even surface of chalk, while a few yards to the west, not only did its thickness vary considerably, but it was seen to rest upon a very irregular eroded chalk surface.*

Before leaving this pit the "Drift" was seen resting on an eroded slope of Thanet Sand, and consisting of brown sandy clay with scattered pebbles, probably all local tertiary material.

Crossing King's Highway to the "Cemetery" brickfield, the

* In *Proc. Geol. Assoc.*, v, 10, p. 193, Mr. Goodchild says, "It is evident from a study of this section [Hope Cottage] and others in North Kent, that what stratigraphical break there is above the Chalk is here in the Lower London Tertiaries themselves and is not at their base, where its existence seems to have been assumed rather than to have been proved." The section seen by Mr. Goodchild is now hidden, but it was probably only a few yards from "Jenner's" pit and, apparently, exhibited the even type of junction. Without discussing the interpretation of the "Bull Head," it may be noted that isolated sections even in this small pit (C.) might lead to quite opposite conclusions as to the existence of a "stratigraphical break," so greatly does the junction vary within a few yards.

fine section (D.) displaying almost the full development of the Woolwich Beds, was examined. The details are :

SECTION IN THE "CEMETERY" BRICKFIELD, NEAR EAST WICKHAM,
APRIL, 1906.

Attention was particularly directed to the bed of very coherent light grey sand underlying the *Cyrena* clays, and to the thin beds of bright yellow, orange, and brown sands, with alternating clays, which made a very striking section in the upper part of the brickfield. "Drift" was again seen rising over eroded Thanet and Woolwich Beds almost to the Blackheath Pebble beds. A small fault (downthrow 9 inches) in the Woolwich bottom bed was clearly shown.

While the members were assembled in the upper pit the Directors made some remarks upon ancient and modern chalk-workings in the Wickham Valley. The brickyards, four in number, obtain chalk by shafts, 120 ft., 80 ft., 150 ft. deep; the South Metropolitan mine is entered by a sloping tunnel. Below Gregory's brickyard the aggregate length of the galleries is stated to be at least two miles. The tunnels are, as a rule, 9 ft. wide at the floor level, diminishing to 3 ft. at the roof, and 25 ft. high; but these proportions are modified according to the harder or softer nature of the chalk, the presence of joints, etc. This mine was opened about 50 years ago. The existence of ancient workings can hardly be doubted. In April, 1904, for instance, a large subsidence occurred in the "Cemetery" brickfield and part of the western "puddle-pond" sank 8 ft. Several subsidences have taken place in the adjoining brickfield, and more than once the "puddle" has suddenly disappeared through unsuspected apertures. These subsidences can only be explained by the presence of old workings, but the entrance to these remains to be discovered. A "Dene-hole," discovered in the "Cemetery" brickfield a few years ago, ran down 90 ft. through Tertiaries and Chalk, branching at the bottom in three small tunnels, but these ran out only a few yards from the shaft.

In the Chalk raised from below Gregory's brickyard fossils are fairly abundant, but *Micraster cor-anguinum* has only been found in a crushed condition. The following fossils have been obtained by the Directors and Mr. R. H. Chandler:

<i>Micraster cor-anguinum</i>	<i>Rhynchonella reedensis</i>
<i>Holaster placenta</i>	<i>Parasmilia</i>
<i>Echinoconus conicus</i>	<i>Spondylus spinosus</i>
<i>Echinocorys scutatus</i>	<i>Neithea quinquecostata</i>
<i>Cidaris serrifera</i>	<i>Inoceramus cuvieri</i>
" <i>per-ornata</i>	<i>Axogaster</i>
" <i>sceptrifera</i>	<i>Ventriculites</i>
" <i>clavigera</i>	<i>Goniaster</i>
<i>Zeuglopleurus Rowei</i>	<i>Crania</i>
<i>Cyphosoma</i> , sp.	<i>Plicatula sigillina</i>
<i>Lima hoperi</i>	<i>Stomatopora</i>
<i>Bourgetocrinus ellipticus</i>	<i>Spinopora dixonii</i>
<i>Porosphaera globularis</i>	<i>Membranipora</i>
<i>Terebratulula carnea</i>	<i>Diastopora</i>
" <i>sub-globosa</i>	

This list and a few of the chief fossils were submitted to Dr. A. Rowe, who wrote, "Your evidence on the whole is strong for *cor-anginum* [zone]. I should have preferred to give an opinion with *Micraster* as part of the evidence ; still, I have no real doubt as to the horizon."

Leaving the "Cemetery" brickfield, the party was now conducted along a great section showing Tertiaries, grooved here and

SECTION IN THE SOUTHERN CORNER OF GREGORY'S BRICKFIELD.

there by small "drift"-filled valleys, to the south corner of Gregory's brickyard, where the relation of the "drift" to the Tertiaries was clearly shown. The Directors observed that Prof. Morris first described the Wickham valley deposits as consisting of brick-earth, sand, and gravel, 25 feet thick, and containing bones of horse, ox, and deer." Prof. Boyd Dawkins, Mr. Whitaker, and others have also noticed this "drift," but the thickness

(30 feet in *Memoir*) assigned to it cannot now be seen in any part of the valley. No flint implements have been found, nor are any shells recorded. The bones found in the brickearth and in the underlying gravel include elephant, horse, ox, deer, and musk sheep; those found in recent years have been presented by Mr. A. Gregory to the British Museum. The gravel which underlies the true brickearth (but not continuously) varies from a few inches to 9 feet in thickness. No good section was exposed on this occasion.

The "drift," as seen at present, appears to be largely a "rain wash" ("hillside drift" or "run of the hill"), and bears little resemblance to the well stratified deposits in the Crayford pits, but the main mass of the deposit, which has been almost entirely converted into bricks, may have shown more definite stratification.

The party now crossed the valley and strolled through "The Pines" to Bostal Heath, where tea was obtained at the Lodge. On the way homeward the President proposed a hearty vote of thanks to the Directors for this excursion through an interesting piece of country. The Directors having suitably responded, the members proceeded to Plumstead station, and returned to London by the 7.33 train.

REFERENCES.

- Geol. Survey Map (Drift Edition), Sheet 4.
 1838. MORRIS, PROF.—*Mag. Nat. Hist.*, Series 2, vol. ii.
 1867. DAWKINS, PROF.—*Quart. Journ. Geol. Soc.*, vol. xxiii.
 1886. SPURRELL, F. C. J.—*Rep. W. Kent Nat. Hist. Soc.*
 1887. GOODCHILD, J. G.—"Excursion to Plumstead and Bostal Heath," *Proc. Geol. Assoc.*, vol. x, p. 191.
 1889. WHITAKER, W.—"Geology of London," vol. i.
 1901. WHITAKER, W., and HOLMES, T. V.—"Excursion to Charlton, etc.," *Proc. Geol. Assoc.*, vol. xvii, p. 183.
 1905. SALTER, DR. A. E.—"Superficial Deposits of Central and Parts of Southern England," *Proc. Geol. Assoc.*, vol. xix, part 1.
 1905. HINTON, M. A. C., and KENNARD, A. S.—"Relative Ages of Stone Implements of the Lower Thames Valley," *Proc. Geol. Assoc.*, vol. xix, part 2.

EXCURSION TO ASHTEAD AND HEADLEY.

SATURDAY, MAY 5TH, 1906.

Director: GEORGE W. YOUNG, F.G.S.

Excursion Secretary: A. H. WILLIAMS.

(Report by THE DIRECTOR.)

LEAVING Waterloo Station at 2.7 p.m. the members alighted at Ashtead, where they were joined by several others, the whole party numbering 38. Soon after leaving the station a halt was