At present the work is proceeding, and is thus incomplete, but he had succeeded in sifting about 5 tons or more of Crag, obtaining rather over 100 different species of mollusca, polyzoa, etc. These serve to show that in this particular section the fauna is decidedly more Waltonian than Newbournian in its affinities. Mr. Harmer informed him that S. V. Wood always held that opinion.

For this visit he had been working overnight and since six o'clock in the morning sifting for fossils, so that all the members were able to get a large number of very good specimens. His friend, Mr. S. J. Batchelder, had kindly taken a large number of photographs of the actual working, and of the crag sections, illustrating decalcification, induration, and current-bedding, prints of which he distributed among the members of the Association.

The party then proceeded to the Park Farm, Tattingstone, to examine the section figured and described by Sir Joseph Prestwich, but the coralline crag has now entirely disappeared, and no traces of it could be found. After visiting another red crag pit nearer Tattingstone White Horse, the party were very hospitably entertained to tea by Mr. and Mrs. Booth at Bentley Lodge, and the members returned to London from Bentley at 8.5 by a train, specially stopped for the party, having had a very pleasant day's excursion and a very good opportunity of collecting in the Red Crag.

REFERENCES.

- Geological Survey Map, Sheets 48, N.W. and N.E.
 Geological Survey Index Map, Sheet 12. Price 2s. 6d.
 1885. PRESTWICH, SIR JOSEPH—"Crag Beds of Suffolk and Norfolk,"
 Part II, *Quart. Journ. Geol. Soc.*, vol. xxvii, p. 325.

EXCURSION TO BOROUGH GREEN, ETC., AND IGHTHAM.

SATURDAY, JULY 21ST, 1906.

Directors: F. J. BENNETT, F.G.S., AND B. HARRISON.

Excursion Secretary: G. E. DIBLEY.

(*Report by THE DIRECTORS.*)

ARRIVING at Wrotham Station at 2.40, a party of twenty-two, Mr. F. J. Bennett took the first and Mr. B. Harrison the latter part of the direction. The first section seen was that in the sand pit just north of Borough Green Station, and consisted of a Drift deposit of Loam and Gravel, resting on the north flank of a slope of

Folkestone Beds close by, but the junction with the Gault is not visible, though the Gault is exposed in the brickyard.

The first point to be noted was the immense amount of denudation that had taken place to form the Chalk escarpment, part of which they saw before them, and the paucity of the resultant Drifts.

The factors that caused that denudation, and Mr. Bennett believed that it could be referred to no one cause, and the paucity of these Drifts were, he submitted, problems still to be solved.

So impressed had he been with the fact that some of the Drift due to the waste of the Chalk scarp must still be left, that since his settlement in this district, now some seven years, he had spent much time in searching for this drift. He thought he had found it, and they would see a section in this shortly.

He then pointed out the reasons that led him to look out for a Chalky rather than for a Flinty Drift, which he had termed Scarp Drift, and in the excursion to Cuxton, June 4th, 1904, some important sections in this were visited under his direction.

The section before them showed the combination of two Drifts, and Mr. Harrison, he believed, agreed with him in this, viz., the well-known Southern Drift (with a difference, perhaps) of Prestwich, here also known as Plateau Drift, and the new Drifts he had termed Scarp Drift. In the above excursion of June 4th, this was seen to rest on the Southern Drift (redeposited) in the Aylesford Gravel Pit, and to be mainly composed of chalky material—indeed the men there call it “mortar.”

Though this Plateau Drift was a very widely distributed one, it consisted—especially in the area in question—of small, isolated patches, and they had to thank Mr. Harrison for his life-long work in this area, for the discovery of these patches, and for much of what they would see to-day. He (Mr. Bennett) had found a similar Drift at Seaford, at the cliff near the old camp; and from there he and his friend, the Rev. J. D. Gray, of Nayland, had got nothing but Eoliths, as was the case here, and they had also seen a similar Drift capping the Chalk cliff near the golf links at Newhaven, but had only paid one visit to that. These isolated patches must be the remnants of a once very large mass, which had vanished with the departed crest of the Weald.

This section again was a most important one, as it was the only Plateau Drift section yet found off the Chalk Plateau, and in which Eoliths only, after much diligent search, had been found.

Now, if this represented the true Plateau Drift it could have no relation to any existing rivers; how, then, could they account for its existence in the position they found it? That, he submitted, was a difficult problem to solve, and the only solution that occurred to him was that, as this must once have capped the chalk that must once have been above them, it was the insoluble

residue of what had intervened, and that it had been let down by solution into its present position. This, of course, was very difficult of acceptance, but he had seen much lately in the district that made this more easy of acceptance by him than, no doubt, by them.

He next called their attention to the loam, thin and sandy at the upper part, but thicker and stiffer at the northern and lower part, due, he considered, to its nearness to the outcrop of the Gault. This loam he referred to the decalcification of the chalky Scarp Drift.

They next visited the Gault exposure close by, dug for making bricks, and here capped by a brown loam which was seen to pass into a pellety Chalk Drift, and due, he considered, to the decalcification of that Chalky Drift.

This chalky Scarp Drift he classed as a Residual Drift, a term, he considered, much needed to distinguish it from Drifts of Transport brought from a distance, and containing matter foreign to the district.

He next commented on the absence of any fossil remains, and contrasted that with what had been found in the famous Ightham Fissure discovered by Mr. Harrison in 1891, when he found there the bones of an extinct badger. This fissure has been most assiduously worked by Mr. W. J. Lewis Abbott, F.G.S., and others.

The party next proceeded along the high road towards Wrotham, passing over what Mr. Bennett termed an old flood plain of the Shode, as shown by a spread of flint drift, much denuded and cut through in places. Turning off to the west they proceeded towards Newhouse Farm. About half-way a stop was made at a road-cutting. Here Mr. Bennett pointed out a section in Scarp Drift, showing some 7 ft. of Chalky Drift over Lower Chalk with some shells at the base. These appeared to belong to living species of land shells, and they may have made their way down by worm action, etc., as suggested by Mr. Elgar, one of the curators of Maidstone Museum, had found instances of living land shells let into the Gault through cracks in the soil, etc.

Mr. Bennett then called attention to the flat terrace-like feature through which this cutting was made. He pointed out how these terraces ran right up to the foot of the Chalk Scarp concealing the true valley bottoms, and being, he considered, distinctly drift features.

He showed also his new Drift Survey Maps, showing the extent in the area in question he had mapped of this Scarp Drift, the base-line of which coincides roughly with that of the railway.

Of this base line he thought he might say that it approximately marked the position of the Chalk Scarp at a later stage of its existence.

A little farther on, the site of the Bourne-source of the Shode was pointed out north of the road close to Newhouse Farm, where it rises at long intervals, the last time in 1902, when it flowed for about 14 days.

Mr. Harrison then took the leadership, having previously pointed out the site of Blacksole field.

On reaching the summit of the chalk escarpment he pointed out the site where the excavations were made for a reservoir.

The sections which were shown during the course of that work yielded Gault fossils which could only have been derived from a now vanished southern upland. Many of the specimens were found *in situ* in the drift at this place by Mr. Harrison. Among them the following species were identified by Mr. Crick, of the British Museum, *Hoplites interruptus*, Brug., *Hystotoceras variosum*, Sow., *Hamites* sp., *Belemnites minimus*, List., *Antinoceramus sulcatus*, Park.

The site of a pit dug close to the road and S.E. of the reservoir was also seen, and from this many Eoliths had been obtained.

Mr. Bennett had noted the following section here in 1902 at about 760 ft. O.D. Top soil of the meadow, then a very compact gravel with many ochreous flints and Eoliths, some being very small. Some pieces of Greensand chert were also found. This gravel at first escaped notice until the pick was used. It was tightly packed in a stiff clayey matrix. Its thickness varied from 1 ft. 9 in. to 2½ ft., and it seemed to become thicker to the west. This gravel rested on red and yellow mottled clay, with some very large unworn flints. Four feet of this clay was sunk into one place with no particle of change.

When the reservoir was made, a cutting connecting this with the road and close to the site and 6 ft. deep showed mostly red mottled clay, with very few flints, but in one place they were closely packed together. Clean, fine, brown sand was touched in one place beneath the red clay, which might be classed as Tertiary Sand. It also contained pebbles, and some of these so weathered as to look like chalk, and these crumbled easily under pressure. These pebbles are to be seen in the Knokwell Pit, two miles to the N.W.

A move was made to the pit sunk by Mr. Harrison at the summit level 770 O.D. Here is a similar section to that described, only that the gravel bed is not so well defined, and that at one place in the red mottled clay was a pipe of what looked like typical clay with flints.

Mr. Bennett then suggested that it might be classed as a glacial deposit, a kind of Boulder Clay made from Tertiary Clays, and clay with flints caused by ice coming off the vanished crest of the Weald, for if that were 2,000 ft. higher than now, surely

that elevation might have given rise to glacial conditions of a kind.

The party then proceeded by the old Hollow road, a very ancient trackway down the face of the chalk escarpment to the road leading to Ightham.

On the way down, at the 700 ft. level, Mr. Harrison called attention to a curious bed of Chalk, Pebbles, and Flints, cemented into a hard breccia, which was lying on the flank of the slope. This bed was so hard that, when broken with the hammer, the fracture passes through flint and chalk pebbles alike. A similar breccia is found at Shoreham and at Trotterscliff, and Sir J. Prestwich regarded it as marking an old saturation level.

On reaching Ightham the party partook of a hurried tea at the George and Dragon, and the greater number returned to London by an early train. The Excursion Secretary and one or two other ardent spirits resolved to brave the terrors of the last train. They were rewarded by a very fine exhibition of Eolithic implements, which Mr. Harrison had prepared in the village hall. Afterwards they had a charming walk towards Yaldham Manor to see some enormous blocks of Oldbury Stone which now rest on the Gault, and which must have been transported by ice acting in some form or other down and up the branches of the Shode valley from Oldbury Hill.

A vote of thanks to the Directors terminated the proceedings.

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- Geological Survey Maps, Sheet 6.
 New Ordnance Survey Map, 287.
 1875. TOPLEY, W.—“The Geology of the Weald,” *Memoir of Geol. Survey*.
 1889. PRESTWICH, J.—“On the Occurrence of Paleolithic Flint Implements in the Neighbourhood of Ightham, Kent, their Distribution and Probable Age,” *Quart. Journ. Geol. Soc.*, vol. xlv, p. 270.
 1891. PRESTWICH, J.—“On the Age, Formation, and Successive Drift Stages of the Valley of the Darent,” *Quart. Journ. Geol. Soc.*, vol. xlvii, p. 126.
 1893. “Excursion to Basted and Ightham,” *Proc. Geol. Assoc.*, vol. xiii, p. 157.

LONG EXCURSION TO THE YORKSHIRE COAST.

JULY 23RD TO 31ST.

Director: THE PRESIDENT (R. S. HERRIES, M.A., V.P.G.S.).

Excursion Secretary: H. KIDNER.

(*Report by THE DIRECTOR.*)

THE party travelled down to Whitby on Saturday, July 21st, by the 11.30 a.m. train from King's Cross, arriving at 5.30 p.m. The headquarters were at the Crown Hotel, but several of the