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## Excursion to Tonbridge

W. J. Lewis Abbott

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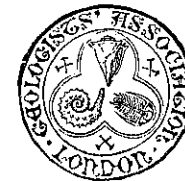
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about fifty in number. A walk was at once made to the top of Quarry Hill, south of the town above the quarry, from whence was displayed the configuration of the Weald extending to the Crowborough Ridge on the south and to the Lower Greensand escarpment on the north.

Mr. Lewis Abbott pointed out that the Association were about to give special attention that year to the two Wealdens, viz., beds of that age, and those which, with the present configuration and features, had resulted from the destruction and redeposition of those beds, and of others which had since been deposited in the area. He then gave what he considered to be the sequence of events in N.W. Europe from the elevation of the Portlandian sea bottom to Palæolithic times.

A large diagram had been prepared by the Directors giving a section from the heights of the central ridge, through the Quarry to the Folkestone Beds, upon the Lower Greensand escarpment. Mr. Hancock then went into further details of the section, and dwelt upon the numerous faults, more especially the large one shown in the quarry, pointing out that it was a strike fault with its hade sloping southward at a somewhat low angle. The upthrow of the Ashdown Sand was probably 150 feet, since over 100 feet of Wadhurst Clay was pierced in the well which started from the bottom of the quarry a few yards to the north. There was nothing in the shape of fault or crush-breccia.

The party then divided into two, one part going into the quarry under the guidance of Mr. Lewis Abbott, and the other part remaining above to hear further explanations by Mr. Hancock. The following is an approximate description of the Wadhurst Clay as seen here in section:

	ft.	in.
Yellowish Clay . . . . . Cypridiferous	2	0
Green Shaly Clay . . . . . "	2	0
Limonitic Shaly Clay . . . . . "	0	6
Green Shaly Clay . . . . . "	4	0
Shaly Clay . . . . . "	2	0
Green Shale . . . . . "	1	0
Green and Yellow Shales with layers of ironstone 2 to 4 inches thick, 4 layers of shells 1 to 2 inches	12	0
Hematitic layer with <i>Cyrena</i> . . . . .	0	3
Brown and Yellowish-brown Shales . . . . .	5	0
Clay ironstone nodule bed . . . . .	0	6
Black Carbonaceous Clay, breaking with a short hackley fracture with many Entomostraca <i>Equisetum Lyelli</i> , bands of <i>Paludina</i> (chiefly <i>P. sussexiensis</i> ), and <i>Cyrena</i> limestone, and layer of Cone-in-Cone, $\frac{3}{4}$ in. thick, . . . . . Seen	20	0
"Similar beds" pierced in well . . . . .	100	0
	149	3

Large quantities of Entomostraca were taken away by members of the party, the lamination of the paper-shales in the upper part being due to these tiny crustaceans. The lower black beds also yielded immense quantities of Entomostraca, the white shells showing up very brilliantly upon the black wet clay.

A drive was then made through Tonbridge to Dene Park to the north. Here the members of the party were entertained to tea by Sir John Hollams, who had invited a party of distinguished guests to meet the Association. A stoke-hole, 10 ft. deep, had recently been dug, the material from which was examined. This was seen to be composed of the wreck of the Lower Greensand, pieces of hard rag, angular and subangular, and sometimes hard-worn chert and Oldbury stone, with here and there an Eocene pebble. Mr. Lewis Abbott also showed a palæolithic worked flake from the same gravel. He pointed out that the deposit was quite different from any ordinary gravel, its composition and mode of arrangement being most remarkable. He exhibited the six-inch contour maps of the surrounding country showing the various patches of gravel (most of which were implementiferous) which lay upon the Greensand escarpment, and it was seen that these extended from the River Shode at Hadlow in a direction towards the Darenth Gorge. It was pointed out that the elevation of this Starve Crow gravel precluded its belonging to the early stage of the Darenth. Notice was then directed to the Valley of the Shode as it exists to-day, the banks of which rise to 700 ft. O.D. on Shingle Hill on the west and to 550 ft. at Hurst Wood on the east. It was further pointed out that as the Hythe limestones were only about 100 ft. thick and that their base at Plaxtol Spout was 550 ft. lower, it followed that the valley was now a syncline; a fact which, despite sections to show it, escaped the notice of the Survey. A few yards north of the first another section was opened which showed altogether different material, and could not be classed as a gravel, being composed of a confused mass of clay and sand carrying hard-worn boulders of Lower Greensand debris. Mr. Lewis Abbott contrasted this with river deposits and said he could suggest nothing but that it had been torn off the face of the Lower Greensand escarpment and forced up into this huge hummock at an elevation of nearly 300 ft. O.D., with a thickness of over thirty feet, covering several square miles, under glacial conditions, which conditions he contended were supported by extensive evidence on the escarpment and in the Holmesdale Valley. It was during this time when a glacial tongue was piled up upon the Lower Greensand escarpment in a manner absolutely identical with a case that he had in his mind in Alaska to-day that the extraordinary downthrow occurred, which reversed the direction of the Shode, and carried its waters into the Ightham Fissure, under those severe climatic conditions shown by the arctic

facies of its fauna. Mr. Hancock has since made careful analyses of the material from the second pit, which show the materials to have been derived from the Lower Greensand, and not from the upper sandy member of the Weald Clay, as was once claimed. Further details on this question will be published later.

Before leaving, the President, in the name of the Association, moved a vote of thanks to Sir John Hollams, both for his hospitality and for so kindly allowing the party to inspect these interesting sections. He asked the members to extend the vote to Mrs. Hollams, who had been so kind in entertaining them. The vote, needless to say, was carried by acclamation.

Starve Crow brick pit was next visited, by the kind permission of Mr. T. Collins, the steward of Lord Derby, who had had some further excavations made for the occasion. Mr. Hancock here pointed out that although no real zonal work had as yet been done in the Weald Clay he thought the lower band of *Paludina elongata* was about 200 ft. from the base, and on about the same horizon as it occurs at Biddenden. Here, however, there were two beds of Cyrena limestone at intervals of about ten feet, the lower one yielding *Planocera strombiformis*, Schlott, while a little higher up two bands of *Paludina elongata* limestone occur, these also being separated by about ten feet of shaly, somewhat sandy clay, of a dull yellowish-brown hue. About five feet above this last there occurs a band of cone-in-cone structure about three-quarters of an inch thick. The party then walked back to Tonbridge, where after tea in the Council Chamber in the Castle, kindly lent for the occasion by the Tonbridge Council, a visit was paid to the Museum. A hearty vote of thanks was accorded the two Directors, and a return was made to London by the 7.25 train.

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