the pink quartzites were supposed to have come from the Lickey Hills; and the flint-pebbles had come from Tertiary beds, in which they had originally been deposited after the denudation of the Chalk in which the flints were first formed—a vast quantity of chalk having been denuded to form such extensive gravel beds.

The Hagden Lane gravel-pits were next visited, and here the irregular surface of the Chalk under the gravel was well seen. In continuation of his demonstrations of the geology of the neighbourhood, Mr. Whitaker remarked that all gravels tended to form flats, very nearly level, whenever, as here, there was a large extent of gravel of any age. The gravels here, which belonged to the same sheet as those last seen, were noteworthy as showing no lines of bedding. The very uneven surface of the Chalk seemed to be due to its disintegration, by water, holding carbonic acid in solution, percolating through the gravel above; and the gravel last seen, where not let down by this disintegration of the chalk, was not more than 20 feet in thickness, being comparatively insignificant in section though occupying large areas.

Before leaving the pit a vote of thanks was accorded to Mr. Whitaker, and on the way to Watford Station the members of the Geologists' Association and a few members of the local Society had tea at Wansford House, the residence of Mr. Hopkinson.

EXCURSION TO KNOCKHOLT AND SEVENOAKS.

SATURDAY, MAY 24TH, 1879.

(Second of the Weald Series.)

Director—J. LOGAN LOBLEY, Esq., F.G.S.

(*Report by* WILLIAM FAWCETT, Esq., B.Sc.)

The weather on this occasion was inviting, and the country beautiful and interesting. Members assembled in good force. Starting from Halstead Station, the route lay through Halstead Place Park, by the "Beeches" again, through Lord Stanhope's Park, Chevening, Chipstead, Riverhead, and Sevenoaks. At Halstead Mr. Lobley showed how much more complete had been the denudation than about Cudham; here there is but little soil, or valley

gravels. The Chalk has bands of flints, characterising it as Upper Chalk.

From Knockholt Beeches there is an easy descent through the woods of Chevening Park, down the Chalk escarpment, until suddenly there bursts upon the view the beautiful Gault valley in which Lord Stanhope's house is situated. Universal were the exclamations of admiration. The tints of the leaves almost rivalled anything to be seen in autumn, for the oak loves the clay, and here it was to be seen in profusion, mingling its hues of brown with the fresh green of the beech, which favours the Chalk, and the darker shades of the chestnut and holly.

At Chipstead Tile Yard, Pleistocene Brick-earths are seen overlying the Gault clays. They are both worked and often mixed. Here in the Gault are found *Am. interruptus*, *auritus*, and *lautus*, *Belemnites mininus*, and *Inoceramus concentricus*; but *Am. splendens* was not seen, though it is a characteristic fossil of the Gault elsewhere. From the blue Gault clay are made red bricks and dark tiles. The redness is due to the peroxidation of the iron of the clay by the burning, and the dark colour is produced by the oxide of manganese being mixed with the clay. Iron is plentiful in the Upper and Lower Greensand and Gault, but there is little in the Chalk, and that chiefly in the form of sulphuret or iron pyrites. From the tile-yard the way lay across the bottom of the valley, and over the infant Darent to Chipstead village, where the Lower Greensand, which forms the hilly and beautiful ground to the south begins to rise and form the southern side of the valley. This having been traversed for half-a-mile the village of Riverhead was reached, and the party then dined at the Amherst Arms Hotel.

At Riverhead the Folkestone Beds of the Lower Greensand are exposed, of a foxy-brown colour; but they are better seen in the quarry at the Bat and Ball Station, Sevenoaks. In this latter place the sand is loose, the grains only being cemented together here and there in thin irregular layers of ferruginous sandstone. These layers at first sight give the appearance of false bedding, but Mr. Lobley was of opinion that they were not due to that cause. He pointed out the "Box-stones," large irregular ferruginous concretions, or rather shells, with loose light-coloured sand in the middle, many of them being of very considerable size. They are

very dark in colour, and so hard are the shell-like exteriors that they are used for road material. Some good specimens having been secured, the party proceeded to the Tubs Hill Station, and, while awaiting the train for London, noted the grand exposure of the Hythe Beds of the Lower Greensand here seen, but which was reserved for more extended observation at the next Excursion of the Series.

EXCURSION TO BATH.

WHIT-MONDAY, JUNE 2ND, 1879, AND FOLLOWING DAY.

Director—CHARLES MOORE, Esq., F.G.S., Hon. Memb. Geol. Assoc.

(Report by Mr. CHARLES MOORE).

The Whitsuntide Excursion, which was fixed for Bath, and which promised to be one of the most agreeable and interesting of the year, was unfortunately marred by unpropitious weather, there being an almost continuous downpour of rain during both days.

The Members were met at the railway station by their Director, Mr. Charles Moore, F.G.S., and, after necessary hotel arrangements, accompanied him to the Free Museum, of which he has been the founder. On arrival there, Mr. Moore informed his audience that the fine room in which his collection was located had been placed at his disposal for its reception 27 years ago by the Committee of the Literary and Scientific Institution, and that during that period it had been entirely under his own supervision, unaided by any public or private funds, except that when, in consequence of the growth of the collection, no more space being available, a generous contribution from Mr. Handel Cossham, F.G.S., enabled him to place a gallery round the Museum, considerably extending its table and wall-space. In speaking of its contents, Mr. Moore remarked that his visitors would at once observe the fine series of reptilian remains arranged on the walls, and that, including others that would be found in the table-cases, there were not less than forty-three more or less perfect examples in the collection, in the pleasurable development of all of which his hammer and chisel had alone been employed.