THE GEOLOGY OF THE DISTRICT VISITED DURING THE WHIT-
SUNTIDE EXCURSION, 1883.

By W. WHITAKER, B.A., F.G.S.

This short paper has been for the most part incorporated in the account of the Excursion. Whilst, however, the latter follows of course a topographical arrangement, the various sections being described in the order in which they were seen, in the former the author was fettered by no such commonplace matter; but described the formations in a more systematic way, that is, in stratigraphical order, from the oldest to the newest, or beginning from the bottom of the following table :—

Recent	...	Alluvial Deposits
Post-Glacial		Marine Shingle and Sand ("Hunstanton Gravel")
Glacial	...	{ Gravel
		{ Boulder Clay
		{ White Chalk without flints
		{ Red Chalk
Cretaceous		{ Neocomian (Lower { Carstone and sand
		{ Greensand) { Clay and loam
		{ Sand, with occasional Carstone
Jurassic	...	Kimeridge Clay

EXCURSION TO HOMERTON.

SATURDAY, MAY 5TH, 1883.

Director :—WORTHINGTON G. SMITH, Esq., F.L.S., &c.

The object of the excursion was the examination of the Palæolithic localities discovered in the Lea Valley by Mr. Worthington G. Smith. The party, numbering nearly sixty, were met at the Homerton Station of the North London Railway by the Director, and at once conducted to the western bank of the Lea, where the new buildings belonging to the School Board in Sydney Road have been erected.

The river-terrace is here 33 feet above the level of the Lea, and the opposing terrace on the east side of the Lea in Essex was seen exactly a mile and a half away. Mr. Smith explained that other terraces were more than 90 feet higher than the surface of the Lea and correspondingly wider apart. These heights were referred to as indicative of what a great change had taken place since Palæolithic times in the excavation of the wide and deep Lea Valley. The Director stated that very few implements were found in the valley lower than the 33 feet terrace on which they then stood. Stray examples were now and then found in the lower levels, but the evidence indicated to him that there was some sort of break in the continuity of the Palæolithic age at the time of the formation of the 33-feet terrace. He said that the gravel and sand there seen in the open excavations was of various depths, sometimes 12 feet and at others 30 feet, and that it rested on the London Clay. The implements are not common on the 33-feet terrace, and, as a rule, they are all abraded and ochreous. Mr. Smith called special attention to the "warp and trail," the ice-deposited material which he said covered nearly all the north-east of London. This "warp and trail" does not, however, go under the Lea; it gradually thins off further down in the valley, and by its deposition seems to indicate that it followed a natural depression belonging to an old surface into which the Lea afterwards ran. All the implements are older than the deposition of the "warp and trail," and enormously older than the Lea as known in modern and Neolithic times. As a proof that the valley had not materially changed since Neolithic times, he instanced the finding of Neolithic celts and other tools just beneath the surface *humus* at the bottom of the present valley. On the 33-feet terrace Mr. A. L. Lewis, one of the visitors, at once lighted on an implement, broken in Palæolithic times, in gravel thrown on a new road close to the Schools.

The valley was then descended, and a pit visited almost on a level with the river, in which little had ever been found of human origin. From here the bank was again ascended to Glyn Road, Lower Clapton, and the party went to a tavern kept by Mr. Poole. Mr. Smith desired that this visit should be made so that two exceedingly fine Palæolithic implements found close by might be seen. The implements were found by gravel-diggers many years ago, and the men, not knowing what they were,

were struck with their beautiful forms and geometrical precision of outline. The workmen sold them to Mr. Poole as ornamental objects. Mr. Poole himself did not know what they were when he bought them; indeed, he knew nothing of their nature and interest till after Mr. Smith's papers were published. After the publication of these papers many collectors went to the workmen and set them on to the search for tools. Some of the men, thus reminded, well remembered seeing such things in previous years, and, amongst other examples, Mr. Poole's specimens were called to mind.

The party then made their way through a wilderness of bricks and mortar to Clarence Road, about 57 feet above the Lea, and everywhere—on looking eastwards down the streets—corresponding heights could be seen across the Lea in Essex.

The collection of Mr. J. E. Greenhill, in the Clarence Road, was then inspected. This collection is a notable one, as it numbers some three hundred weapons and tools recently acquired in the Clapton district; the quest not having been commenced by Mr. Greenhill till two years after Mr. Smith's paper on the implements of the Lea Valley was read before the Anthropological Institute. Mr. Greenhill kindly showed his whole collection to the visitors, and then conducted them to the brick-pit at Upper Clapton, just east of the Clapton Railway-Station. The surface here is 44 feet above the Lea, and the brick-earth is rich in Mammalian remains. These were studied for several years by Dr. Cooke, of Stoke Newington, and many examples from this gentleman's collection are now in the Museum of Natural History at South Kensington. Mr. Greenhill explained the nature of the beds, and gave his own experience of the fossil bones contained in the brick-earth.

From these pits the party made straight for Stoke Newington Common, the scene of the more interesting of Mr. Smith's discoveries, as it is here that he lighted on an undoubted Palæolithic settlement of great extent, the sandy floor or working place remaining to this day just as it was left by the Palæolithic men who lived on the spot before the thick, tenacious, ice-laid deposit known as "warp and trail" was deposited.

At the time of the visit the excavations were not numerous or deep; indeed, Mr. Smith explained that large and deep excavations were seldom seen. The examples open were, however, sufficient to show the nature of the deposits, including the seam representing

rest hundreds of Palæolithic implements and flakes as sharp as on the day they were made, quartzite hammer-stones with ends abraded off, fossil-bones, antlers, teeth, &c. Above the "Floor,"

the "Palæolithic Floor." The accompanying illustration (fig. 1) shows a section, 300 feet long, from N. to S., through the back gardens on the west side of Kyverdal Road, made by Mr. Smith when the excavations were made for the basements of the houses and the drains. The surface of the ground at the south is 83ft. 3in. above the ordnance datum, and at the north 90ft. 6in. At from 4ft. to 6ft. from the surface there is a thin stratum of sub-angular flints, shown by the line A A A. This is the "Palæolithic Floor" or working-place, 60 feet of which is further enlarged to scale in the lower part of the illustration: B is Thames and Lea gravel much older than the "Floor," and containing slightly abraded lustrous implements; and C is fine sand, often full of fossil fresh-water shells, including *Corbicula fluminalis* (Müll.) and *Hydrobia marginata* (Mich.). D D D is the "Palæolithic Floor," on which

D D is sandy loam, loamy sand, and distinct warp and trail where it has not been removed for brick-making, &c. A characteristic section of "warp and trail" is shown in fig. 2. The

Fig. 2.

base, A, is generally about 12 feet from the surface, and agrees with stratum B in fig. 1. C to M are various deposits of white and coloured sand. The "Palæolithic floor" is here almost obliterated, but its position is between M and N. The "warp and trail" is seen at O and Q, whilst P is a pocket of London Clay. R is surface *humus*, containing Neolithic implements, bone tools, British and Roman pottery, Roman coins, and other objects of more recent date.

Fig. 3.

Fig. 4.

Figs. 3 and 4 illustrate two small and beautifully-made implements, and fig. 5 an abraded quartzite hammer-stone; all one-half real size, and (except fig. 4) now in the collection of Mr. John Evans,

Fig. 5.

Fig. 7.

D.C.L., F.R.S., of Nash Mills, Hemel Hempstead. The implements from the twelve-foot stratum of Thames and Lea gravel are sub-abraded lustrous and of greater age than the foregoing; one of these, now in the collection of Mr. John Evans, is illustrated one-half real size at fig. 6. At depths of 20 feet, and sometimes 30

Fig. 6.

feet, other gravel occurs with still older, more greatly abraded, and ochreous implements; one of which from the east side of the Lea, at Leyton, Essex, is illustrated at fig. 7. The localities and implements have been described and illustrated by Mr. Smith in 'Nature,' for October 12, 1882, and January 18, 1883, and more fully in the 'Transactions of the Essex Field Club,' Vol. iii., Part 7. Mr. Smith directed special attention to a small excavation at the S.W. end of Kyverdale Road, partly filled in with surface *humus* at the time of the visit, where the line of the "Palæolithic Floor" was defaced by the material which had

been thrown in. When this small excavation was re-opened a few days after the visit the workmen lighted on many excellent implements and flakes, at least ten or a dozen of the former, and more than a hundred of the latter. Three or four of the implements were the finest yet found in north-east London ; these were acquired by Mr. J. E. Greenhill. North-east London has produced nearly 1,000 implements since Mr. Smith published the localities in 1878.

From Kyverdale Road the party walked to Mr. Smith's house at Highbury, where about eleven hundred implements had been laid out for inspection. These included three or four hundred from the localities visited during the afternoon, and others from nearly every known locality in England. Hammer-stones, scrapers, cores, &c., from the "Palæolithic Floor," were also laid out so as to be easy of inspection, together with fossil bones—including the scapula of a Mammoth in contact with an unabraded implement—flakes, drift-wood, fossil shells, and two scraper-flakes which had been struck from the same block of flint in Palæolithic times, and had been replaced by Mr. Smith.

That everyone might take away some object in remembrance of the excursion, Mr. Smith produced two large wooden boxes containing many hundred artificial flakes, cores, &c., and the visitors were told to help themselves to as many as they thought proper.

Geological Map (without Drift) of the Neighbourhood of Hunstanton. (Reduced from the Unpublished Map of the Geological Survey, by permission of the Director-General.)

✕ The Red Chalk has been traced from Hunstanton Southwards, to beyond Snettisham.