

FRESHWATER CRUSTACEAN.

Candona? Fragment.

Portions of Bryozoans and other minute fossils derived from the Chalk also occur in this deposit.

I am indebted to the kindness of Prof. Owen for the determination of the Bones enumerated in the above list of the *Mammalia*; and for ascertaining several of the species in the list of shells from the Fisherton deposit, I have to thank my friend Mr. John Pickering.—[J. B.]

Since Mr. Prestwich's paper was read before the Society, I have further examined the gravel under the shell-bed, and I have found it composed of numerous flints, of all forms, from the size of the fist to an inch in diameter, angular; of grey quartz-sandstone in pebbles, 1 to 2 inches in diameter; limestone, angular in form and highly crystalline; chalk, both hard and soft, in nodules of various sizes and in angular portions, angles smoothed by trituration; flint-sponges (and other chalk-fossils, see below); the whole are imbedded in a mixture of clay and sand. Amongst this debris I have found the following Microzoa derived from the Chalk:—

List of minute Chalk-fossils from the Gravel below the Freshwater bed, Fisherton.

Nodosaria Zippei. Abundant; fragments.
Cristellaria rotundata. Abundant; worn.
Marginulina ensis. Fragment.
Inoceramus, fragments of. Abundant.
Bourgueticrinus, ossicles of. Not rare; some worn.
Echinodermata, spines of. Not rare; fragments.
Bryozoa. Abundant; fragments, mostly worn.

For the determination of these minute and beautiful fossils I am indebted to Mr. Rupert Jones.—[Feb. 1855. J. B.]

2. *On a FOSSILIFEROUS DEPOSIT in the GRAVEL at WEST HACKNEY.* By JOSEPH PRESTWICH, JUN., Esq., F.R.S., F.G.S.

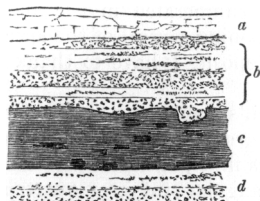
IN the summer of 1853, Dr. Beeke informed me of the discovery of some large mammalian bones in a gravel-pit belonging to Mr. Hindle, at Shacklewell Lane, between Hackney and Stoke Newington*. In company with the former of these gentlemen, I visited the spot, which is 60 feet above the level of Trinity high-water mark, on several occasions, and found many points which I deem of sufficient interest to lay before the Society.

I found that the bones were not actually in the gravel, but in a bed of clay between two beds of gravel,—which clay forms a distinct and separate deposit with an abundance of freshwater and land shells. The occurrence of the bones was an exceptional case, no other

* The pit is in Hackney parish. It is only distant, however, exactly a quarter of a mile, in a direct line due east, from West Hackney Church, Newington high road.

bones having been previously met with at this pit, though common at some others in the neighbourhood. The following is a sketch of part of the pit :—

Section in Gravel-pit, Shacklewell Lane, West Hackney.



- a. Brick-earth, removed at this spot, but worked in an adjoining pit 2 to 3 feet.
- b. Ochreous flint-gravel, with subordinate irregular layers of ochreous and yellow sand. (This is the only bed worked at this pit.)..... 6 feet.
- c. Dark-grey sandy clay, full of vegetable matter, with some bones and numerous shells. (This bed is only occasionally exposed.)... 2½ feet.
- d. Light-yellow sands and ferruginous gravel. (Depth not proved at this spot.)

No fossils have been found in the brick-earth (*a*) of this district. The gravel (*b*) is spread out in large sheets which produce an appearance of rough stratification; it consists of subangular broken flints, with some very large nearly whole flints hardly at all worn, flint-pebbles from the Lower London Tertiaries, a few quartz and sandstone pebbles, and some rolled pieces of very hard, compact, siliceous sandstone. Only a few feet square of the underlying clay (*c*) was uncovered. The line of separation between these two beds is merely slightly waved, except at one spot, where the gravel lay in an indentation in the clay, filling a rectangular trough, one foot deep (see fig.). This bed (*c*) presents some features of considerable interest; it consists of a laminated clay more or less sandy, of a dark-grey colour, and abounds in many parts with the small broken branches and leaves of trees; scattered here and there are also found portions of the stems and trunks of trees, some 3 or 4 feet long and 6 to 12 inches in diameter, all lying prostrate and in no one given direction*. This clay also contains numerous very fragile but generally perfect shells. Of these ten are land shells, and thirteen are water shells; they are all of recent species, and constitute a group which seems to indicate a deposit formed in shallow fresh water.

The trees apparently did not grow on the spot, for no traces of roots *in situ* occur, although they probably flourished in the immediate neighbourhood; and as their remains are found dispersed irregularly throughout this clay, and are not confined either to the top or bottom of the bed, their presence here is not owing to the agency which spread the upper gravel (*b*) over this bed, or to that which

* Prof. Quekett, having kindly made a microscopical examination of the woody matter here referred to, informs me that he has recognized oak, elm, alder, and hazel amongst the fragments.

caused the extension of this deposit itself over the lower gravel (*d*),—that is to say, it was neither the flooding of a previously dry surface by the waters from which the shelly clay was afterwards deposited, nor was it by the detrital sweep of the upper gravel over this later area of water and dry land that the trees were destroyed. Their presence must, on the contrary, be due to some common cause in common operation during the whole period that the freshwater mollusks were living undisturbed in these waters. One cause might be occasional floods; although in that case we might have expected a greater change in the sediment, arising from the greater transporting power of the water,—the trees to have been more in seams, more of them showing uprooting, and more entire. Whereas the trees are in fragments, their branches and stems are sharply broken into short pieces, lying about without order, all prostrate, and in a sediment showing little or no change. I conceive such a result to have arisen partly no doubt from this cause, but probably chiefly from the occasional breaking off of boughs and the smaller stems of trees on the margins of these pools or meres, during gales of wind, which scattered them and the leaves over the surface of these waters, where they sank and got buried with the *Planorbis*, *Limnæus*, *Pisidium*, &c. The texture of the wood is generally but very little altered, and its colour is often almost unchanged. When dried, it becomes extremely light.

The bones were found at the base of the shelly clay, and consisted of part of the trunk of some large mammal (*Ox?*)^{*}; nine vertebæ and some of the bones of the legs were found together, but the skull was missing; nor, notwithstanding the diligent search established by Mr. Hindle and Dr. Beeke for several feet around, could we succeed in obtaining any further remains of this animal. Unlike the wood, the bones were much mineralized and very heavy.

The evidence afforded by the remains of this animal agrees with that afforded by the remains of the vegetation. The bones were tranquilly imbedded in the mud of a freshwater deposit, the animal probably having after death floated on the surface of the waters, the bones subsiding here and there as the carcase decayed and fell to pieces; for it must be observed that the bones show no traces of wear or fracture,—nothing to denote violence or distant transport.

Under the clay (*c*) is found a bed of gravel and sands, some light-coloured and others ferruginous, in the upper part of which shells, I was told, similar to those found in the clay have occasionally been found; I however met with none. This gravel consists of subangular flints chiefly, with a few flint-pebbles; not enough of it was dug up to notice whether there were any pebbles of the secondary rocks. Its thickness is not shown here; but as the London Clay comes out on the side of the adjacent Hackney Brook on a level a few feet lower, I do not think it can exceed 6 to 10 feet.

The shells procured from the deposit we have here described, present a general close agreement with those found in the Salisbury drift (see p. 106), except that the group of marsh and pond shells is more

^{*} The bones unfortunately have been mislaid.

developed; whilst land shells are scarcer and are in greater part such as frequent marshy places and damp woods.

With the Grays fauna, these two deposits present only a few species in common; but a difference of conditions, such as a greater body and depth of water, combined with a probable occasional slight brackishness, may account for this variation; for although many of the species are distinct at these three localities, yet they all agree in the common fact of the species being identical with recent species, and such as for the most part still remain associated in like position, under like conditions, in this country at the present day. All the three deposits belong, I believe, to a period subsequent to that of the Boulder Clay; but the arguments on this subject I must reserve to a future occasion, when I have gone into the evidence afforded by the various drift-beds of the valley of the Thames and of the adjacent counties more in detail.

One of the principal points of interest attaching to this particular section is the clear indication of two gravel-periods separated by an interval of dry-land surface,—a character common throughout this district, and to which also we shall have occasion to allude in greater detail on another occasion.

The following are the Mollusks I have found in this deposit. For the determination of the species I am indebted to Mr. J. Pickering:—

Shells from the clay beneath the gravel, Shacklewell Lane.

Bithinia tentaculata (Linn); and its opercula.	Carychium minimum, Müll.
Valvata piscinalis, Müll.	Zua lubrica, Müll.
Linnæus palustris, Linn.	Pupa muscorum, Linn.
—— truncatulus, Müll.	Helix pulchella, Müll.
—— glaber?, Müll.	—— aculeata, Müll.
—— stagnalis?, Linn.	—— hispida?, Linn.
Succinea putris, Linn.	Zonites radiatulus, Alder.
Planorbis marginatus, Drap.	—— nitidus, Müll.
—— spirorbis, Linn.	—— crystallinus, Müll.
—— nautilus, Linn.	Pisidium pulchellum, Jenyns.
Clausilia, sp.?	—— obtusale, Jenyns.
	—— pusillum, Turt.

The shells of this deposit are in a very rotten and often fragmentary state, and it is probable that there are many more species.

3. On a FOSSILIFEROUS BED of the DRIFT PERIOD near the RE-
CULVERS. By JOSEPH PRESTWICH, Jun., Esq., F.R.S., F.G.S.

THIS deposit is, like the one described p. 101, spread over the base of a hill, which here slopes down to the marshes separating this part of Kent from the Isle of Thanet. It is exposed in two pits near Wear Farm (see Ordnance Map), on the road from Chislet to the Reculvers. The height of the ground above the level of the adjacent marsh or of the sea, does not exceed 20 to 30 feet. The pit in a field to the east of the road offers the best section; it is as follows:—