



RAILWAY CUTTING NEAR STOKE TUNNEL, IPSWICH.
Showing the Black Bone Deposit.

ANIMAL REMAINS FROM THE RAILWAY CUTTING AT IPSWICH

(INCLUDING BONES AND TEETH OF A
HEAVY-LIMBED HORSE).

By NINA FRANCES LAYARD, F.L.S.

A few years ago when seeking for traces of the handiwork of Palæolithic Man in the low-lying gravels of Ipswich, I remembered that a considerable number of the bones of his contemporaries, the Pleistocene Mammals, had been discovered during the cutting of the tunnel through the Stoke Hills. No local record had been kept of the animal remains found, but a series of large Mammoth teeth, and a horn or two, in the Ipswich Museum, testified to what was in reality an extensive discovery of the remains of animals of the Palæolithic period. The boring was made sixty-five years ago, and although Nature has been at work ever since healing up the scar left by the excavation, I hoped that a continuation of the dépositions in which the remains had occurred might still be traced in the cuttings at either end.

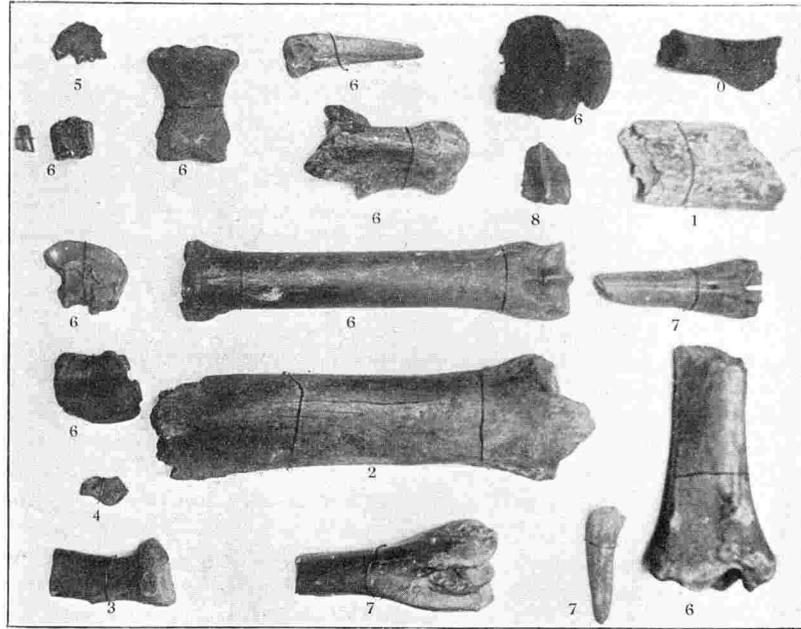
The tunnel, which is 360 yards in length, was made by the then existing Eastern Union Railway Company. Though the North end is close to Ipswich Station, the South can only be approached by a circuitous route, involving a journey "over Stoke," as it is locally called. A tortuous pathway threaded between allotments belonging to the Company's men, led to the coveted spot, and arriving at length at the South end of the tunnel, I found the cutting beyond it

thickly overgrown, not only with grass, but with formidable briars, some of which had become trees of considerable size. Here and there a foot or two of the earth was exposed, and five minutes' search brought to light a stag's horn as brittle as bread, the tip of which appeared protruding from the bank. It was dislodged with no better tool than an umbrella point, but with thirty feet of loamy soil rising above it, the horn was not to be despised, and was at anyrate enough to prove that the required level was located. Later, an appeal to the Railway Engineer resulted in his kind permission to examine the section thoroughly. This was at a considerable distance from the mouth of the tunnel (Plate 1.)

Within some seven square yards which were presently opened, an extraordinary number of animal remains came to light (Plate 2). These were crowded together, and included bones and teeth of several individuals of Mammoth, bones of a small Ox, also those of *Bos primigenius* (the gigantic bull that Julius Cæsar described as "as large as an Elephant"), bones and part of the claw of a large bear, the jaw of a small wolf, teeth and bones of a horse, and remains of deer and bird. Last, but not least, three Palæolithic implements and flakes showing bulbs of percussion, linked these examples of prehistoric animals with the man who was their contemporary (Figs. 1, 2, 3, 4, 5, 6, 7, 8).

In the Geological map (Plate 3) which includes this area, it will be seen that we were working in the river gravels. An arrow marks the exact spot, and although the print does not give the colours, the gravels may be recognised by darker shades. How they came into this position is seen on the Map, for they follow the course of what was at that time the bed of the river Gipping, which did not end its course as a fresh-water stream, as it now does, at Ipswich.

PLATE 2.



1. MAMMOTH

2. BOS. PRIM.

7. DEER.

3. BEAR.

4. CLAW OF BEAR.

8. BIRD.

5. WOLF.

6. HORSE.

Tracing the remains of its gravels we find patches of them still left between Orwell Park and Broke Hall, again at Maresbrook Grove, opposite the Cat House, then at King's Ness on the one side and along the Strand to Bourne Bridge on the other, till including Halifax and the site of the old Union, they gradually broaden to take in the greater part of Ipswich, attaining their maximum width between Brooks Hall and the Chantry, and narrowing again as they approach Sproughton and Bramford.

Although the Valley is now known as the Valley of the Orwell, these gravels testify that it was originally scooped out by the fresh water River Gipping, which in Pleistocene times rolled down in glorious strength to mingle its waters with the Thames and the Rhine and the North Sea River, at the time when England was still joined to the Continent.

From time immemorial there has been great confusion as to the relation between the two Ipswich rivers, and in trying to distinguish the deposits left by them it may not be out of place to allude to this. Certainly Ipswich or Gippeswich derived its name from the Gipping, but historians and map-makers ever since Doomsday Book was written, have failed to recognize the simple facts of the case. Indeed, in Doomsday, the Gipping is merely described as "a river through which the Erewell or Orwell ran." This was later repeated by Bacon, and in ancient Suffolk maps such as Speed, Morden, Saxton, and Bowen, as also in Sam. Pepy's Admiralty Chart, I find it alternately called Orwell or Gipping, as though the rivers were identical, and had the same origin.

But the Orwell was a sea-born river or estuary, which when the land sank, rushed into the ready-made channel of the Gipping, usurping its position, and thrusting its more aristocratic rival into the background.

Doomsday says that the Orwell took its name Erewell from a well at Bacton, which, however, is a source of the Gipping; but is it not more probable that it was christened from its own source where a peculiarity had been noticed, in the bed of the sea whence it sprang.

In Reyce's "Breviary of Suffolk" we find mention of a "bottomless well" at the mouth of the haven "to which the River Ure (or Orwell) hasteneth, and never ceaseth, until it drouneth itself therein." But the river being tidal, and, in fact, an estuary, I think we may conclude that this hypothetical well was originally looked upon as its source, and was the origin of its name.

This well must be the same as that mentioned in Doomsday, as "A certaine place called Polles." (Anglo-Saxon Pol, Irish Poll, meaning a hole) from which we are told "that arm of the sea ran which entered the Port of Erewell."

Some idea of the encroachments of the ancient Gipping may be arrived at when we realize that its gravels are spread all over the greater part of what now forms the town of Ipswich, and that the sites of most of our churches were from time to time beneath its waters. These include St. Matthew's, St. Mary Elms, St. Nicholas, St. Stephen's, St. Lawrence, St. Peter's, St. Mary Quay, also, I think, St. Clement's and St. Helen's. Part of Bramford Road, St. Matthew's Street, Westgate Street, and part of Tavern Street all at one time formed the bed of the river, at anyrate when in flood.

Bones and teeth similar to those found in the Railway cutting, I have obtained in similar gravels on the low-lying grounds between the Station and the town, and there can be little doubt that they belong to the same series. Both are connected with Palæo-



RIVER ORWELL.

Showing the ancient Gipping Gravels left on either side.

lithic tools, and the fine flint chopper seen on Plate 4 came from Russell Road. This tool is an unusually fine specimen, and is an example of a large core, having been converted into a chopping tool. It has a lustrous bluish-white patination. The cutting edge is sinuous, and the back of the tool is perfectly fitted to the grasp. The rhinoceros bone, also shown on Plate 4, was not many yards distant, and both were at a considerable depth in the gravels. The bone which is on view at Christchurch Mansion is worth examination, especially as it testifies unmistakably to the presence of hyaena also in Ipswich. It will be seen in Plate 4 how all the softer parts of the bone are bitten off, while the broken end is scolloped out by the gnawing of the animal, and the inside is licked smooth as far as the tongue can reach. Professor Boyd Dawkins who saw the bone, tells me he has found them treated in precisely the same way in the hyaena caves of Derbyshire.

Returning to the Railway Cutting it will be plainly seen on Plate 1 that a distinct black line marks out the bone bed from which the animal remains were obtained near the tunnel. Doctor Duckworth, of Cambridge, who examined a typical portion of the material taken from this bed, wrote to me as follows :—

“ Under the microscope remarkably little of vegetable material is to be seen. When burned, there is a peaty smell, which, of course, indicates some vegetable matter ; but afterwards there is a strong smell of ammonia, which shows the presence of animal matter in abundance. The lump which I used (he continues) could be heated red hot without diminishing very much in bulk. This shows its mineral nature, so that on the whole, it would seem to be most likely a sort of bone deposit.”

The bones in this bed were lying in all directions as though brought down by flood. Unfriendly animals such as bear and horse, etc., lay in close proximity, while sometimes a huge mass of blackened earth

showed where a large portion of some carcase had been deposited. To prove that more than one individual both of Horse and Mammoth were present, I found an enormous tusk of an adult Mammoth, also tooth of adult, as well as the uncut tooth of a baby mammoth, measuring no more than $1\frac{1}{2}$ inches. (Plate 5). The tusk was in such a fragmentary condition that although it lay length-wise along the exposed section, the only means of securing it was to take out the side of a large wooden box, and push it underneath. By this means the whole of the ivory was obtained though it fell apart into hundreds of conical pieces. Bones of horse also belonging to more than one animal were found.

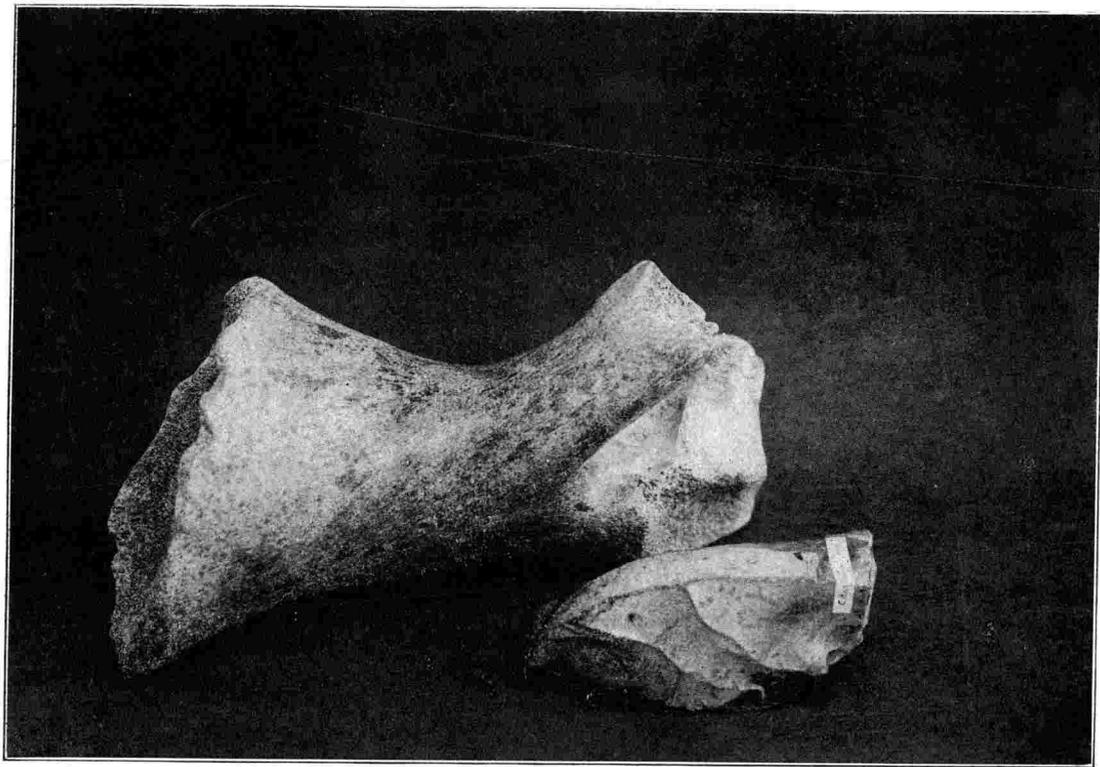
Although I have only one actual flint implement in my possession from this cutting, this being a fine Palæolithic scraper (Plate 6), two others of pointed shape were found when Sir Ray Lankester came to watch the digging, and these I gave to him and his niece. Flakes with bulbs of percussion also came to light. It was fortunate that we found them at this particular spot, as it gives greater significance to the discovery of the other remains.

With the help of Mr. Slater, of Ipswich, I have gone over the ground on either side of the tunnel and also above it, to trace the beds as they lie.

At the north end in a descending scale, the following were noticed:—

Middle glacial sands.
 Red crag (shelly and red sand).
 London clay.
 Oldhaven beds.
 Woolwich and Reading beds.

At the south end of the tunnel where I have worked, there is some 30 feet of a whitish loam above,



1

2

1. BONE OF RHINOCEROS GNAWED BY HYÆNA.

2. PALÆOLITHIC FLINT CHOPPER.

resting on valley drift gravels, and it is at the junction of these that the bone bed occurs.

After we had made these investigations, I was sent a copy of notes from Whitaker's "Geology of the Country round Ipswich," 1885, and found that it confirmed the above results.

Mr. Whitaker gives the following as the succession of beds cut through during the tunnel operations, and evidently including those of the south side, describes them as follows :—

- Recent (loam and brick earth).
- Valley drift (gravel).
- Boulder clay.
- Middle glacial sands.
- Red crag and so on.

As it is with the recent beds that this paper is concerned it is unnecessary to say anything about the older series. It had been generally believed locally that the remains of the Pleistocene Animals now in the Museum were derived from the actual tunnel, but it will be seen that in Mr. Whitaker's note in the Geological Memoir, he must be referring to a section corresponding in position to that in which I have discovered them. The spot is thus described by him :—

"Some little distance from the southern mouth of the tunnel, and on the eastern side of the cutting, is the interesting section in the river and valley drift which rises above the river terrace. This valley drift is post glacial."

And here occurs a passage which I was glad to find, for no fresh-water shells which would indicate Gipping gravels, had been observed by me while excavating. Mr. Whitaker, however, had either found them himself, or had heard of their being found, for he continued :—

"These deposits are of fresh water origin, for whenever fossils are found in them these are of land or fresh-water kind."

Professor Prestwich was present at the time of the tunnel cutting, and I now find that the list of animals which he discovered, comprises most of those which are in my collection, with a few others added.

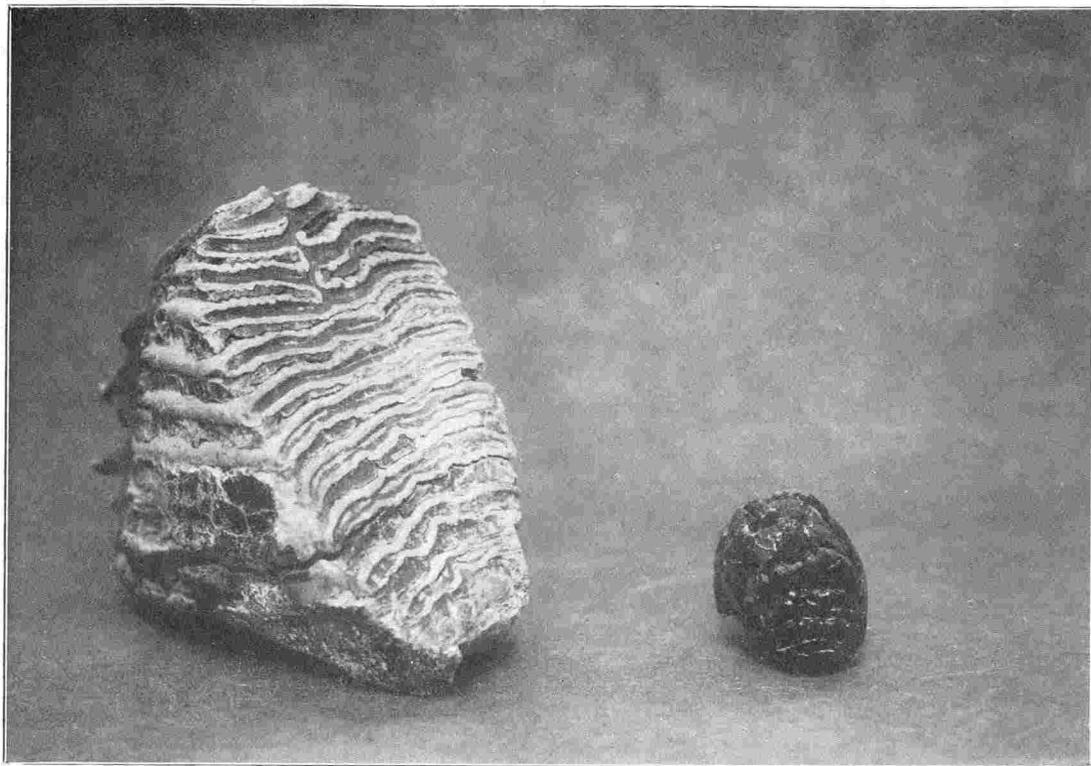
In my list are ox, wolf, deer, mammoth, horse, bear and bird, to which he adds bison, felis, lutra, and rhinoceros, but bird is absent.

My contribution to the history of this section therefore consists first in noticing a distinct bone bed clearly marked out by the black deposit; secondly, in finding flint implements in connection with these remains; and, thirdly, in ascertaining the size of the fossil horse; for though the horse was noticed by Prestwich, I am not aware that its size was recorded.

This I have been at some pains to determine, as the matter appeared to be of considerable importance (Plate 6).

The premature christening of the horse in the papers as "A Mammoth Horse found at Ipswich;" was the result of a printer's error. After a lecture given on the spot to the Ipswich Field Club, a paragraph appeared in the *Standard* giving a correct list of the animals found, and commencing with "Mammoth, Horse, Bear, &c." Other papers copying, omitted the comma between Mammoth and Horse, and in consequence the Press Cutting Association flooded me with notices of a gigantic and peculiar horse which was discovered in the section. Not knowing how to stop the mischief, I decided to determine indisputably the actual size of this Pleistocene animal, and to this end secured the kind assistance of Mr. Brown, an Ipswich Veterinary Surgeon.

One of the Great Eastern Suffolk horses of 17 hands was exhumed, and also a cob 14.2 in height. Mr. Brown undertook the work of having the bones cleansed and bleached, and these I have placed side



1

1. TOOTH OF ADULT MAMMOTH.

2

2. UNCUT TOOTH OF BABY MAMMOTH.

by side with those of the Pleistocene horse in order to compare the dimensions (see Plate 6). In each case the bones of the prehistoric animal are placed between similar bones of the modern horses, and it will be clear from the comparison that the Pleistocene horse could not have been far short of $15\frac{1}{2}$ to 16 hands in height. It will also be noticed that its stoutly built limbs correspond far more nearly to those of the shire horse, than to those of the cob.

The question now remains to which of the main races of the horse does this individual belong.

The belief that all domestic horses arose from one wild species, has only of late years given place to the opinion that there is evidence of at least four wild species from which they are descended. Professor Ewart has given special attention to the question.

It would perhaps be premature to assume that the remains of the horse found in Ipswich, will add yet another to those already recognized; but so far it does not appear to correspond either to the Forest type, the Plateau, the Steppe type, or the horses of the Siwalik type, into which Professor Ewart's collection has been divided.

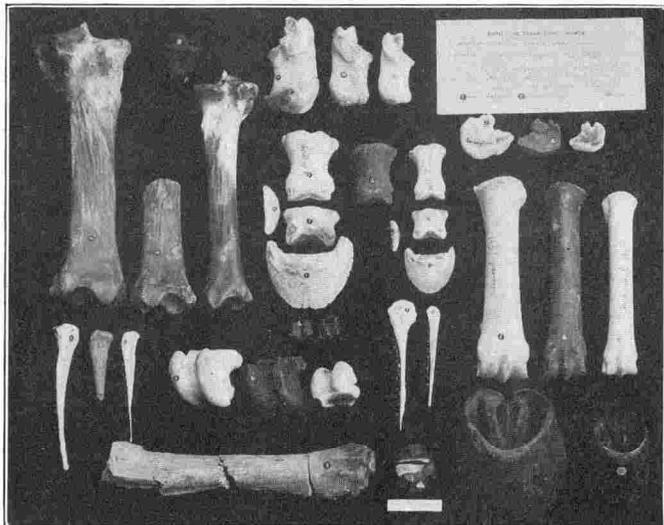
Certainly it was a giant compared with the small clumsy-headed animals so cleverly depicted by Palæolithic man, and from which Owen concluded that all modern horses were derived—a creature probably well under 13 hands.

Dr. Irving, who kindly took measurements to compare the Metatarsals of the Ipswich specimen with those of the Bishop Stortford, the Remagen and the Westeregala horses, shows that the Ipswich horse was more "heavy limbed" than any of these. He adds a note to the effect that possibly we have here discovered "the true ancestry of the Shire horse!"

This would be an interesting result of the excavation, but it is probably too early to come to a definite conclusion in the matter. Those interested in the subject will be able to study the series which will be on exhibition at the collection at Christchurch Mansion, Ipswich. The following is a list of the bones of horse which I obtained in the railway cutting :

- Tibia.
- Metatarsal.
- Astragalus.
- Os Calcis.
- Cuneiform Magnum.
- Os Suffraginis (the toe bone).
- Outer small Metatarsal (splint bone).
- Radius.
- Neck bone.
- Two molar teeth. (Plate 6.)

PLATE 6.



1. PALÆOLITHIC FLINT SCRAPER.

BONES OF PLEISTOCENE HORSE COMPARED WITH THOSE
OF TWO MODERN HORSES.