

I conclude from such evidence as has hitherto been submitted to me, and for which I heartily thank Mr. Lee, that the *Anthrakerpeton* from the Welsh Coal belonged to that low, probably primitive, air-breathing type, which, with developmental conditions of the bones like those in some Fishes, and very common in Devonian Fishes, showed forms of the skeleton more resembling those in Saurian Reptiles than are attained by any of the more specialized Batrachian air-breathers of the present day.

I propose, in reference to the characteristic density and thickness of the walls of almost all the long bones hitherto obtained of this air-breather, to name it *Anthrakerpeton crassosteum*.

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. Portion of Coal-shale with impression of the integument and a few scutules.

2. Portion of Coal-shale with portions of two ribs.

3. Portion of Coal-shale with part of the cranium and of a long and slender bone.

4. Smaller portion of a similar bone on the opposite side of the shale.

5. Portion of shale with parts of two slender, straight, and pointed bones.

6. Portion of a symmetrical, grooved, flat bone; *qu.* from naso-palatine cavity?

7. Portion of shale with slender posterior ribs.

8. Articular end of humerus? or femur?

9. Articular end of connate leg-bones?

PLATE II.

Fig. 1. Transverse section of a long bone; magnified 50 diameters.

2. Section of part of the bone in the direction of the long axis of the bone-cells; magnified 222 diameters.

3. Section of part of the bone near the central cavity, taken transversely to the long axis of the bone-cells.

These sections were prepared, and the drawings of them made on stone, by JOHN EDWARD LEE, Esq., F.G.S., the discoverer of this extinct Coal Reptile.

II. ON THE BRICK-EARTH OF THE NAR.

By C. B. ROSE, F.G.S.

A POST-TERTIARY deposit, under the above denomination, lies upon the 'Drift' in the valley through which the River Nar takes its course towards its junction with the Ouse at Lynn; the united streams terminating in the Wash, an estuary bounded by the shores of Norfolk and Lincolnshire.

This Post-tertiary deposit I have traced along the valley from Narford to Watlington, a distance of about nine miles,

and it contains several genera of existing Testacea. From its situation, physical composition, and animal contents, we may safely conclude that its site was, at a not very remote period (speaking geologically), the bed of an extensive sea-creek, receiving the water of the Nar and Ouse; its embouchure towards the German Ocean being what is now called the Wash; and that its present emerged state resulted from an elevation of the land, aided by a depression of the trough of the German Ocean.

Having in the 'Philosophical Magazine' for 1836, when I first introduced this deposit to the public, given a description of its character and position at certain localities, I shall now only contribute some additional localities, which I have examined since the above date; and give an extended list of the organic remains found therein.

I may here express my conviction that the geological era of this Nar deposit coincides with that of the Post-tertiary deposits of the basin of the Clyde.

At East Winch Brick-field, now levelled and deserted, the blue clay (mud) varies in thickness from two to twelve feet, and towards the deeper part it becomes a sandy silt, containing shells (particularly Oysters) in great abundance. A tooth of *Equus caballus* was found deep in the clay, in the presence of Sir C. Lyell, who in 1839 accompanied me to this and other localities of the deposit. At another time, a *Buccinum undatum* was taken up from a depth of twelve feet. An epiphysial bone of a Ruminant was also taken out of the clay here. In this yard, between the old diggings and the road, the brick-earth lies within a foot of the surface; it is light-bluish-brown clay, gradually passing into a blackish-blue as it descends; and it is covered by a sandy loam. At the surface of the clay, or rather in the upper few inches of it, shells of *Corbula nucleus* are profusely distributed, affording unmistakable evidence of its being an original bed of that mollusc.

In a drain at the back of Mr. Spinks's farm-house, near to West Bilney Church, the section is as follows:—Immediately beneath the vegetable soil there is a deposit of silt, to the depth of four or five feet, probably the accumulation of repeated warpings; then occurs one foot of moor (peat), containing roots, &c., and immediately beneath it the brick-earth, with its characteristic Shells. Bilney Brick-yard, described in 1836, lies near to this spot.

Two hundred yards to the north of the Car-stone-pit at the back of Bilney Hall, in the valley, on Bilney Common, and opposite to Foster's Farm at East Winch, is a pit among fir-trees, where I observed, 1st, an upper layer of sandy ochraceous loam, containing small angular, reddish flints, one foot; 2nd, a grey sandy loam, two feet; 3rd, blue argillaceous earth, as at the brick-yard, containing Oysters; this was sunk into four feet. In a portion of this pit a

moor (peat) is visible lying upon the brick-earth, in which I understand Mammalian remains have been discovered.

On Pentney Warren, to the left of the East Walton Road, I found a moor (peat) containing all the fresh-water Shells of the neighbouring rivulets, lying immediately upon the marine brick-earth. In other parts of the Warren the brick-earth appears in a regularly horizontal bed, from three to four feet beneath a deposit of sand containing small angular flints, some of them having their angles slightly rounded off; this latter deposit having been in all probability the result of repeated inundations during the emergence of this district from beneath the water. On East Walton Common, adjoining the last-mentioned locality, may be seen in the margin of a pit containing water, a layer of large Oyster-shells, eighteen inches below the surface of the ground; and four feet below this layer, the Oysters, with *Aporrhais pes-pelecani*, and other Shells their usual associates, are jumbled together in great abundance.

In East Winch, at the late Mr. Foster's brick-yard, I observed that immediately beneath the vegetable soil lies a coarse red gravel, coarser than I have met with at any other site of the Nar brick-earth; it is here associated with a loam that is used to make a red ware; the blue brick-earth lying beneath this burns into an excellent white brick. The gravel and loam vary in thickness from two to seven feet; then appears the blue earth, which has been sunk into eighteen feet. It becomes darker as you descend, and at the depth of six feet you meet with large Oysters, forming layers, and a few are interspersed through the clay, associated with *Aporrhais pes-pelecani*, *Natica*, *Macra*, *Buccinum*, and *Tellina*; a Horse's tooth was also found here. This locality is on the side of the valley opposite to Bilney Hall, and is a portion of the northern margin of the original creek. With regard to the occurrence of a coarse gravel upon the brick-earth at this locality, I am disposed to attribute it to the excavating power of the waves upon that gravel of which the high ground immediately bordering the creek at this spot consists; and consequently it must have in part have belonged to a subaërial proceeding. I had not adopted this view when I described this locality in 1836.

A section at the the Tottenhill Brick-field exposes the following beds. This locality is on the south-western border of the valley, adjoining to Watlington, beyond which parish this deposit of Shells has not been traced; the River Nar, in its valley, here trending northwards towards Lynn.

Section at Tottenhill Brick-field.

- 1st. Vegetable soil, and a loam composed of sand and clay, enclosing a great abundance of smooth and rounded flint-pebbles, some as large as oranges, and others of smaller sizes, chiefly of an oval form, precisely like those on a pebbly beach; there are also among them a few angular flints, with their corners partially rounded. Depth of this stratum 3 to 6 feet.
- 2nd. Blue brick-earth, containing but few shells until near the bottom of the pit, the depth of which is 14 feet. Large

Oyster-shells are met with in a layer at the depth of 12 feet within the clay; and beneath them *Aporrhais pes-pelecani*, and other molluscs, are plentifully interspersed. In this bed, also, some blackened fragments of wood occur.

3rd. The above two beds lie upon a blackish sand of the Lower Greensand.

No. 1 of this section exhibits a portion of the south-western shore of the former marine creek; and the pit in the Walton field near Narford, described in my original 'Sketch of the Geology of West Norfolk,'* leads me to consider that spot to be a part of the north-eastern margin of the same creek. The outline of this deposit may be readily traced on the Ordnance-map of the district. To my 'Sketch' I added a copy of that portion of the map.

I believe that I have now exhausted my memoranda relating to this deposit;† I have before stated that its traced length is about nine miles, its average breadth is less than a mile. It is difficult to determine its thickness; I was informed at West Bilney, that, when sinking a well, shells were brought up from the depth of 40 feet.

Organic Remains from the Post-tertiary Deposits of the Valley of the Nar.

Vermilia triquetra (on *Ostrea*); West Bilney.
Ostrea edulis; the majority large old shells; at all the localities.
Cardium echinatum, rare; East Winch.
C. edule; East Winch and West Bilney.
Corbula nucleus; East Winch and West Bilney.
Macra truncata; East Winch and West Bilney.
M. solida; West Bilney.
Mytilus edulis; Pentney-Warren.
Pecten varius; West Bilney and Walton Field.
Tellina solidula; West Bilney and East Winch.
T. proxima; Tottenhill.
Cerithium reticulatum; West Bilney.
Turritella communis; West Bilney and East Winch.
Nassa incrassata; West Bilney.
Aporrhais pes-pelecani; very abundant at all the localities.
Litorina litorea; very numerous, of all ages, and at all localities.
L. litoralis; rare; West Bilney.
Natica nitida; abundant, of all ages; West Bilney and East Winch.
Pleurotoma septangularis; rare; Pentney.
Scrobicularia piperata (F. and H.); Pentney.
Mya arenaria, jun.; a fragment; Pentney.
Montacuta bidentata; Pentney.
Hydrobia ulvæ; Pentney.

* London and Edinb. Phil. Mag., vol. vii., Jan. 1836, pp. 197-199.

† See also Mr. Trimmer's remarks on these Post-tertiary deposits of the Nar and neighbouring valley of Gaythorpe, Geol. Soc. Journ., vol. xvii., pp. 23 & 26.