It should also be remembered that fishes in the spawning season would naturally betake themselves to shallow waters and partly sub-aerial sand-banks; no doubt we have all seen, along the course of some river, multitudes of fishes travelling to such a spot; though perhaps no migration in English waters is now upon a large scale: certainly not equal to the passage of fish down an Iceland stream, described by a recent traveller, the numbers of which were so great that when one leapt in sportiveness above the water, it had to remain outside, and flop about on the backs of its more steady companions.

Let us therefore study bone-beds, not as making catastrophic epochs in the progressive chronicle of organic life, but as evidences of transitional change in the contour of the physical surface; changes from wide, though perchance land-locked, seas, washing unbroken coast-lines, to shallower seas covering lesser areas, running into creeks and bays, and having their waters broken by sand-banks and dotted with islands.

Yet, though connected with quiet progress and the slow elaborations of an estuarine surface, "bone-beds" will still hold a distinguished position among the silent exponents of the past, and their teachings will be drawn from a philosophy higher than one which tells only of local derangements of the surface, and periodical destructions of organic life!

2.—"On a Superficial Freshwater Deposit near the Blackfriars-road." By C. Evans, Esq.

For the purpose of obtaining a firm foundation for the arches of the Charing Cross Railway, between London Bridge and Hungerford Market, trenches were sunk to a considerable depth (varying from about 10 to 25 feet) until a bed of gravel was reached, and the excavations were then filled with concrete, on which the brickwork was raised.

To the east of the Blackfriars-road, at a distance of about a quarter of a mile from the present bank of the river, these excavations have passed through various strata, the most constant of which was a bed of sandy clay with vegetable matter and fragments of unrolled flints. Near the bottom of most of the trenches beds of loam and clay were met with containing wood, freshwater and land shells, and insect remains. Mammalian bones have also

been found low down in the excavations. These deposits rest upon a bed of sand and gravel with unrolled flints and occasionally rounded flint pebbles.

I have been enabled to form sections of two of the trenches; but I must state that the measurements are merely approximations.

The first section is at the base of the arch passing over William-street. The trench is one of the deepest that has been cut.

Section at William-street:—

1. Made earth about seven feet.
2. Bluish clay with much vegetable matter and a few fresh-water shells, six feet.
3. Earthy peat, five feet.
4. Earthy peat, with patches of sand and woody clay, with numerous shells, and containing large blocks of wood; *Unio* or *Anodon* common; two feet.
5. Shelly sand and clay, with patches of peat, one foot.
6. Earthy peat, with patches of shelly sand and of a light drab-coloured clay. *Neritina fluviatilis* abundant; one foot.
7. Peat, four feet.
8. Gravel, mostly of angular flints, and sand, which was not penetrated.

Total thickness, about twenty-five feet.

The two beds of peat (3 and 7 of the above section) are of very local occurrence, and do not extend as far as the next parallel street to the east. The shell-beds extend rather farther, but appear to thin out to the east, for near the third street, I found the following section (where no shells were found):—

1. Made earth and woody black earth, four feet.
2. Yellow clay, with an irregular surface, one foot.
3. Gravel, of grey and yellow sand with broken and unrolled flints and irregular layers of sand, passing to black earthy gravel, with water, entered to a depth of five feet.

Mr. Meyer has observed a very similar sandy clay, containing *Unio* or *Anodon*, but with much more water, at the excavations for the same railway in the Waterloo-road; and I have observed traces of shelly clay at some drainage-works in the road leading to Southwark-bridge.

In naming the shells I have had the assistance of my friend Mr. Charles Meyer, of Milford, near Godalming (who first brought these deposits to my notice); and the following are the organic remains which we have been able to name from the locality :—

FRESH-WATER SPECIES.

Limnæa peregra.
 „ *auricularis*.
 „ *palustris*.
 „ *truncatula*.
 „ *stagnalis*.
Succinea putris.
 „ *Pfeifferi*.
Bithinia tentaculata, and *operculum*.
Physa fontinalis.
 „ *hypnorum*.
Valvata piscinalis.
 „ *cristata*.
Planorbis vortex.
 „ *marginatus*.
 „ *albus*.
 „ *carinatus*.
 „ *lacustris*.
 „ *spirorbis* ?
 „ *corneus*.
 „ *nautilus*.
 „ *contortus*.
Neritina fluviatilis.
Ancylus oblongus.
Cycas cornea.

Cycas rivicola.
Pisidium amnicum.
 „ other species.
Unio or *Anodon*.

LAND SPECIES.

Helix nemoralis.
 „ *hispida* ?
 „ *pulchella*.
 „ *rotundata*.
 „ *crystalina*.
Zua lubrica.
Pupa.
Carychium minimum.
Clausilia.
 ———
 Cranium of Goat.
 Lower tusk of Wild Boar.
 Jaw of Pig.
 Teeth, jaw, and other bones of Deer.
 ———
 Wood of Alder, Birch, Hazel, &c.
 Nuts and seed-vessels.
 ———
 Wing cases of Beetles.

This list gives a total of twenty-seven freshwater and nine land shells. We have found no marine nor brackish water shells.

These shells are all apparently of existing species, and the age of these beds is probably very recent, but it is difficult to assign a precise date.

The mammalian deposits in the valley of the Thames at Maidenhead, Brentford, Richmond, and other places, are in general associated with, and the bones and shells usually occur low down in, a deposit of ochreous gravel composed principally of subangular

chalk-flints, named by Mr. Prestwich the Low Level Gravel. This gravel extends in a continuous and uninterrupted sheet from the sea to Maidenhead, a distance of fifty miles, from two or three miles to eight or nine miles wide, and with a thickness of from five to fifteen feet (*Jour. Geo. Soc.*, vol. xii., p. 131). Extinct species of Elephant and Rhinoceros are the most characteristic Mammals of these deposits.

If I am correct in considering the flint-gravel which underlies the Blackfriars deposits as belonging to this low-level-gravel, the Blackfriars shell-beds would be more recent than the beds at Brentford, Grays, &c., and the absence of the remains of the Elephant and the Rhinoceros, and also of the *Cyrena consobrina* tends to support this conclusion.

Mr. Prestwich has described (*Jour. Geo. Soc.*, vol. xi.) a very similar shelly clay at West Hackney, which occurs between two beds of gravel and sand. Little of the clay is now to be seen in this pit; but from the sands below I have recently obtained fine specimens of the Grays *Cyrena*.

Ordinary Meeting, Monday, June 6th, 1862.

Professor Tennant, F.G.S., President, in the Chair.

The following gentlemen were elected members of the Association:—J. Bathgate, Esq.; W. K. Harrison, Esq.; Jas. Richardson, Esq.; C. P. Serocold, Esq.

The following papers were read:—

1.—“On Mine Surveying and Planning.” By M. W. T. Scott, Esq., F.G.S.

2.—“On the Older Parian Formation at Pointe à Pierre, Trinidad.” By R. J. L. Guppy, Esq.

The Government geologists, when in Trinidad, gave the name of Older Parian to a series of sandstones and shales extending across the island from east to west, and occupying an extent of about 97 square miles. This formation is only exposed for a short distance