4. *On the occurrence of a Bed of SEPTARIA, containing fresh-water Shells, in the series of Plastic Clay, at NEW CROSS, KENT.* By HENRY WARBURTON, Esq. M. P. F. R. S.

HAVING occasion, in the Spring of 1843, to travel along the South Eastern Railway, I observed at the distance of about 200 yards to the south of the New Cross Station, on the western side of the cutting which there lays bare the junction of the London and Plastic Clays, and at the very foot of that cutting, what seemed to be a continuous bed of stone, forming a part of the Plastic Clay series.

I applied, in consequence, to Mr. Simms, a Fellow of our Society, (who, as one of the resident engineers, had ready access to every part of the line), to procure for me specimens of this bed; and he not only complied with this request, but also made a vertical section of the beds exposed in the cutting, extending from the base of the London Clay to the bed of stone in question.

The specimens which Mr. Simms procured contain, imbedded in the substance of the stone, two fresh-water shells, a *Paludina* and a *Unio*, which Professor E. Forbes has examined and described. The stone proved, on examination, not to form a continuous stratum extending to any distance, but to occur at intervals only; and to be, in fact, a bed of *Septaria*, of a texture considerably more earthy than the *Septaria* of the London clay usually are. These *Septaria* may be traced along the base of the railway cutting from the point already mentioned, south of the New Cross Station, to beyond the first bridge which crosses the railway south of that station, and rising, like the railway itself, at an inclination of 1 in 100.

The position of this bed of fresh-water *Septaria*, in relation to the London clay, will be best understood from the following section by Mr. Simms:—

	Ft. In.
1. London clay, the lowest bed of which, from 10 to 15 feet thick, is of a blue colour.	
2. Rolled flint pebbles - - - - -	1 10
3. Fine fawn-coloured sand - - - - -	0 3
4. Lignite - - - - -	0 0½
5. Fine fawn-coloured sand - - - - -	2 0
6. Ferruginous sand, with fragments of oyster shells, and <i>Cerithia</i> - - - - -	0 4
7. Grey sand, with fragments of <i>Cerithia</i> - - - - -	0 8
8. Strong black clay - - - - -	0 10
9. Black clay and sand, with fragments of oysters and <i>Cerithia</i> - - - - -	0 9
10. Black sand - - - - -	0 4
11. Dark sand, with oyster shells - - - - -	0 6
	<hr/>
	7 6¼
12. Calcareous stone, with fresh-water shells - - - - -	0 6
13. Sand and stone in a rotten state, with oysters - - - - -	0 3
	<hr/>
	8 3¼

The following is the description of the shells, by Mr. E. Forbes :

1. *Paludina*.

A species with 5 ventricose whorls which appear to have been slightly striated by lines of growth; the largest perfect specimen measuring 1 inch in height by half an inch in greatest breadth of the body whorl.

I can find no character by which to separate this fossil from the existing *Paludina vivipara*; some of the southern varieties of which it closely resembles in external form. That species is very widely distributed, at present being common to a great part of Europe and Asia. I am not aware of its ever having been previously noticed as an older tertiary shell, but its allies, *P. achatina* and *P. unicolor*, are both recorded tertiary species, having a wide range both geologically and geographically; the identity of the living species with the fossils discovered by Mr. Warburton and Mr. Simms is thus rendered the more probable. I regard this species as quite distinct from the *Paludina fluviorum* of the Wealden, which was confounded with *P. vivipara*, a confusion which has led to several erroneous statements and reasonings.

2. *Unio*.

An ovate, very inequilateral, depressed species, wrinkled transversely, growing to a length of between 2 and 3 inches.

The extreme difficulty of determining living species of *Unio* must render us very cautious in giving an opinion on a fossil. The remains, though not imperfect of their kind, and certainly those of *Unios*, are not sufficient to warrant the bestowal of a specific appellation on them. They are, however, probably distinct from any of the recorded British tertiary species.

E. F.

I have only to add in conclusion, that in the Paris basin, which lies to the north of Paris, in the Département de l'Aisne, fresh-water shells belonging to the same genera occur in the plastic clay series, accompanied by lignite; and among the fossils of one of these beds, M. D'Archiac enumerates four species of *Paludina*, and an undetermined species of *Unio*. Mons. Charles d'Orbigny also, in a section of the beds in the Paris basin, intermediate between the calcaire grossier and the chalk, near Meudon, enumerates plastic clay, lignite with *Paludinæ* and *Anodontas*, and a conglomerate containing fresh-water shells.

This point of correspondence between the plastic clays of England and France, viz. their containing several of the same genera, at least of fresh-water shells, besides *Cyclades*, which have been before noticed as common to the two, and *Cerithia*, and other shells, inhabitants of brackish water, I have thought of sufficient interest to make the subject of a notice to the Society.