spinulosa, Waht. (labelled *Olenus serratus*, Sal.), from Carreg-wen, near Tremadoc.

The Upper beds have long been known as the Malvern shales, and I should have preferred to call the group the Malvern Group, if the lower beds had been found in that locality. It is, however, appropriate that the Dolgelly district, where alone the whole of the Cambrian rocks known in Great Britain are represented, should give a name to one of the groups.

(To be continued).

V.—NOTES ON THE GEOLOGY OF SOUTH BEDS.

(No. II.)

By J. SAUNDERS, Esq.

SINCE my former communication on this subject, which appeared in the GEOLOGICAL MAGAZINE for April last, (p. 154) I have had several opportunities of re-visiting some of the cuttings, on the Midland Railway, therein referred to, respecting which some doubts were expressed in reference to the age of the deposits exposed to view, and, as they are now completed, more precise observations can be made than when they were only just commenced. The cutting, south-east from Westoning, (which, in an Editorial note, was suggested might be of Tertiary age) exposes a dark heavy clay, which, upon the most rigid examination, furnished not the least trace of rolled fragments of Chalk or flints, or any other substance so frequent in the Tertiary clays of this neighbourhood, which would lead to the inference that it had been deposited subsequently to the Cretaceous era. It, however, contains what would strongly indicate that it is coeval with the Greensand, namely, a continuous band of coprolitic nodules, averaging about a foot in thickness. This layer passes through about one-third of the cutting, and may be traced from its commencement on the north-west side of the hill, passing along the face of the cutting with a gentle dip, until it reaches the level of the line; when it passes out of sight, nor does it re-appear on the south-east side of the excavation. The fossils associated with the nodules are *Lamna*, *Belemnites*, *Parasmilia*, and *Terebratulæ*, all of which are abundant in the coprolite beds at Hexton and other places in the immediate vicinity. Both above and below the coprolites the clay is identical in character, and must have been deposited contemporaneously with its associated nodules, and, as far as I can judge, it is the equivalent of the bed *h* of the section given by Mr. W. Whitaker, in the Quart. Journ. Geol. Soc., vol. xxi., 1865, pp. 399, "On the Chalk of Bucks." About the middle of the cutting is a considerable accumulation of light-brown coloured drift-sands, that lie in a basin-like hollow, that has been eroded from the summit of the hill.

The cutting at Harlington, at the north-west side of the hill, facing the Kimmeridge Clay and Greensand strata, exposes a thick bed of heavy dark clay, containing a profusion of selenite crystals, with

occasional fragments of rolled chalk, indicating that it has been formed principally from the disintegration of the Kimmeridge bed. It furnished several fossils identical with those observed in this formation at Amptill, at which place also selenite crystals form a considerable portion of the mass of the upper beds. This bed of dark clay is succeeded by others of a lighter colour, containing a greater proportion of rolled Chalk and flints, until at the south-east side of the hill—or that facing the Chalk escarpment—the beds are composed almost entirely of sand and water-worn fragments from the Upper Cretaceous beds.

The cuttings between Luton and New Mill End, running parallel with Luton Hoo Park, exhibit some fine specimens of "Chalk-rock" which are interesting, as few continuous sections of this remarkable formation are visible. The first cutting, about a mile from Luton, is entirely in "Chalk-with-flints," which is here very massive. In the second cutting we have the first occurrence of the "Chalk-rock," where are exhibited in descending order:—

Chalk-with-flints, 10 feet to 15 feet.

Chalk-rock, about 2 feet.

Lower Chalk, without flints, 10 feet to 15 feet.

So excessively hard is this "rock" that it stands out in striking prominence on the sides of the excavation, it having been impracticable to level it to the same plane as the softer strata above and below. It does not occur in unbroken continuity, but is considerably dislocated at several places, and sometimes, for a few yards, two beds lie parallel to each other at a distance of several feet.

Contrary to the general character of this bed in other localities—as observed by Mr. Whitaker and others—it is here very rich in fossils; but, the matrix being so excessively hard, they are with great difficulty extracted. It has a metallic ring when struck with a hammer; it abounds in green-coated nodules, and is not uniformly compact, but in places can be very easily pulverized. Perforations are occasionally to be seen passing almost through its entire thickness, which have been subsequently filled with dark-brown clay. The Brachiopods, Echinoderms, etc., are always in good preservation, but the more delicate shells of the univalves have perished, leaving casts of their external ornamentation, and a spiral mould of their interior. The *Ammonitidæ* and *Nautili* have also experienced a similar decay, and, when broken, show the internal divisions of their *septa*. From my experience in this district I consider that the fossils from this bed have a greater resemblance to those of the Lower Chalk, than to the Upper, or Chalk-with-flints. The following are the principal genera obtained from the section:—

<i>Ventriculites.</i>	<i>Cidaris.</i>	<i>Terebratula.</i>	<i>Ammonites.</i>
<i>Cephalites.</i>	<i>Cyphosoma.</i>	<i>Rhynchonella.</i>	<i>Nautilus.</i>
<i>Parasmilia.</i>	<i>Serpula.</i>	<i>Pleurotmaria.</i>	<i>Lamna.</i>
<i>Holaster.</i>	<i>Spondylus.</i>	<i>Turbo.</i>	<i>Ptychodus.</i>

Of some of these genera there are several species which await the skill of the Palæontologist to determine.

In the third cutting the Chalk-rock occurs at a less elevation, so that a smaller section of the Lower Chalk is seen beneath it; and in the fourth cutting, immediately adjoining the village of New Mill End, it occurs at the bottom of the excavation, which in the deepest part is about ten or twelve feet. This formation also occurs in the immediate vicinity of Luton, on the opposite side of the valley of the Lea. It has been met with in two Chalk-pits now closed, in one of which, near the London Road, it was customary to sink a shaft down to this bed, and then excavate a considerable chamber beneath, the Chalk-rock forming an excellent roof to the workings.

Through the kind assistance of R. Etheridge, Esq., Palæontologist to the Geological Survey, I am enabled to add the following species, from the Totternhoe stone, to the list published in the April Number of the GEOLOGICAL MAGAZINE (p. 159):—

<i>Rhynchonella plicatula.</i>	<i>Exogyra.</i>
" <i>Cuvieri.</i>	<i>Palæastacus.</i>
" <i>octoplicata.</i>	<i>Plesiosaurus campylodon.</i>

VI.—ON THE GLACIO-MARINE DENUDATION OF CERTAIN DISTRICTS.

By MISS EYTON.

HAVING been for the last twelve months engaged in a careful study of the post-Tertiary geology of the eastern part of Shropshire, I have at length arrived at the conclusion that the denudation of the New Red Sandstone in this neighbourhood, and consequent excavation of the Tern basin, has been effected partly by glacial and partly by marine agency; the grounds upon which this conclusion is based being:—(1) An attentive consideration of the general form and outline of the basin; (2) A particular examination of the drift beds contained therein.

First, with regard to the general outline. The district drained by the river Tern, forms a basin of extensive area, but with a comparatively narrow outlet. The area is almost entirely of New Red Sandstone, chiefly the Lower Bunter beds, bounded on the east by the basaltic rock of the Wrekin range of hills, and by the long line of low Coal-measure hills extending through Ketley, Donnington Wood, and Lilleshall, in the direction of Staffordshire. In fact, as will be seen by consulting the Ordnance map, the outline of the basin is here co-extensive with the line of fault separating the Bunter Sandstone from the Coal-field. On the opposite side of the latter there occurs another great fault, dividing the Coal from the Permian beds, and by sinking a shaft through the latter, the Coal was again found on the lower side of the fault. It is extremely probable that the same experiment might be attended with similar success in the Tern basin. Indeed, there can be little doubt that, before the period of volcanic convulsion, which occasioned the faults, both the Permian and lower Bunter beds covered the whole of the Shropshire Coal-field, and it is probable that even since that period