EXPLANATION OF PLATES XIX. AND XX.

PLATE XIX.

- FIG. 1. *Terebratula grandis* (Blum.), Pliocene, Monté Mario, Rome.
 2. *Terebratula ampulla* (Brocchi), Sp., after Brocchi's original figure, Piacentino.
 3. *Terebratula Regnolii* (Meneg.), Upper Miocene, Parlascio, and from a drawing by Sig. Meneghini. His collection.
 4. *Terebratula Roncioni* (Meneg.), from a drawing by Meneghini. His collection. Pliocene, Hills of Pisa.
 5. *Terebratula Lyelliana* (Sequenza), Pliocene, Sicily.
 6, 7. *Terebratula Galeottina* (Dav.), Middle Miocene, Gassino.
 8. *Terebratula rhomboidea* (Biondi), Eocene? Cape Pachino, Sicily, after Biondi.
 9, 10. *Terebratella septata* (Philippi). 9. Exterior; 10. Interior of dorsal valve, Older Pliocene, Messina.
 11, 12. *Waldheimia oranium* (Müller) = *T. euthyra* (Philippi). 11. Exterior; 12. Interior of dorsal valve, enlarged from a figure by Dr. Suess. Older Pliocene, Messina.
 13, 13a. *Waldheimia ? Davidsoniana* (Seq.). 13. Exterior; 13a. Interior of dorsal valve, enlarged after Sequenza. Upper Pliocene, Messina.
 14. *Waldheimia ? depressa* (Seq.), Older Pliocene, Messina, after Sequenza.
 15, 16. *Waldheimia septigera* (Loven) = *W. peloritana* (Seq.). 15. Exterior; 16. Interior of dorsal valve. Lower Pliocene, near Messina.
 17. *Terebratella ? Spinellii* (Meneg.), Eocene, Chiampo, collection of Sig. Meneghini.
 18. *Terebratula Vogliani* (Michelotti), Lower Miocene, Dego.
 19. *Terebratulina caput-serpentis* (Linné) Middle Miocene, Grangia, collection of Sig. Rovasenda.
 20, 20a. *Terebratulina Tauriniensis* (Seq.), Middle Miocene, Gassino, collection of Sig. Rovasenda. 20a. Enlarged.
 21, 21a. *Terebratulina striatula* (Sow ?), Eocene, Valle Organa, environs of Bassano. Mus. of Imp. School of Mines, Paris. 21a. Enlarged.
 22, 22a. *Terebratulina Michelottina* (Dav.), Eocene, Colle Berici. Mus. Imp. School of Mines, Paris. 22a, b, c. Enlarged.

PLATE XX.

- FIG. 1, 2, 3. *Rhynchonella bipartita* (Brocchi), after drawings by Sig. Meneghini. Upper Miocene, Palazzo, near Siena. His collection. 2 and 3. Var. *plicato-dentata* of Costa.
 4, 4a. *Rhynchonella Bolcensis* (Massalongo), Eocene, Bolca. Mus. Imp. School of Mines, Paris. 4a. Enlarged.
 5. *Rhynchonella complanata* (Brocchi), Middle Miocene, Gassino.
 6. *Rhynchonella sicula* (Seq.), M.S., Older Pliocene, near Messina.
 7. *Rhynchonella Meneghiniana* (Dav.), Eocene, Bolca, collection of Sig. Meneghini.
 8, 13. *Rhynchonella Buchii* (Michelotti), different forms and ages. 13. *Rhynchonella deformata* (Seq.), Middle Miocene, Hill of Turin.
 14, 19. *Rhynchonella polymorpha* (Massalongo), different varieties and ages, Eocene, Monte Spilecco, near Bolca, Zovo di Castelvecchio, etc., from different collections.

III.—ON THE TRANSITION BEDS BETWEEN THE DEVONIAN AND SILURIAN ROCKS.

By ALFRED MARSTON, Esq., Ludlow.

THE transition or passage-beds between any two large formations are always difficult to make out, and those between the Old Red Sandstone and the Silurian are no exception to the rule. Much light has recently been thrown upon the latter, yet much more

is needed before the exact order and position of their different beds can be considered as finally decided.

I include in these "transition beds" all from the top of the Upper Ludlow to some thin flaggy micaceous sandstones, which I consider the base of the Old Red. The junction of these beds with the Old Red Sandstone may be observed in the section on the Shrewsbury and Hereford Railway, near the Ludlow Tunnel, and also at the Tin Mills near Downton. The lowest of these transition beds is the Downton Sandstone, the commencement of which I would fix at the *Platyschisma* bed, which is a well defined line, and where it partakes in some measure of the Upper Ludlow character of rock. The principal fossils found in it are Lycopodiaceous seeds, *Pteraspis Banksii*, *P. truncatus*, *Eurypterus linearis*, *Pterygotus gigas*, *P. Banksii*, *Leperditia marginata*, *Beyrichia Klædeni*, *Annelids*, Carbonaceous remains, a species of *Modiolopsis*, and *Lingula cornea*. Of these fossils, *Leperditia marginata* has not been found in the Upper Ludlow, and *Eurypterus*, *Pterygotus*, and *Pteraspis* are much more abundant in the Downton Sandstone than in the underlying rock; all of which fossils reach their greatest development in the thin band occurring about 300 feet higher up, called the Olive or Tin Mill Shale. *Eurypterus linearis* has been found in the Upper Ludlow, a few feet below the Downton Sandstone, and just above occurs the Bone Bed, a stratum from 1 to 6 inches thick, composed of fragments of fish and crustacean remains.

The Downton Sandstone is composed of fine yellow-coloured sandstone, deposited in a tranquil sea, the currents of which for long periods carried the same materials; it had, therefore, everything favourable for the preservation of its organic life. Between this rock and the next to be described occurs a series of different coloured bands of sandstone, showing great irregularity in their formation, which is not favourable to the preservation of their fossil contents, and consequently in these beds we find a scarcity of organic remains; I only know of one organism obtained from them, the small *Beyrichia*. The next bed is a greenish-grey sandstone, strongly micaceous; the only fossils that have yet been found in it being *Cephalaspis Murchisoni*, *Lingula cornea*, and a few Carbonaceous remains. This bed may be observed in position in the lane leading from Onibury to Norton, and at the Tin Mills near Downton.

We next come to the Olive shales, which are thin light-brown argillaceous beds, very brittle and full of fossils, and these latter generally occurring in thick masses. About the centre of these beds is the Upper Bone Bed, from whence very fine spines of *Onchus Murchisoni*, *Onchus tenuistriatus* have been procured, also fragmentary remains of *Cephalaspis Murchisoni*, *C. ornatus*, *Auchenaspis Salteri*, etc. From the Olive or Tin Mill Shale has been procured *Pterygotus Banksii*, *Eurypterus pygmaeus*, *E. megalops*, and *E. acuminatus*; *Leperditia marginata*, *Beyrichia* sp. remains of plants, a species of *Actinophyllum*, a new *Modiolopsis* and *Lingula cornea*. The best sections at present known may be seen on the Shrewsbury and Hereford Railway, at the Tin Mills, and near Onibury.

Immediately above the Olive Shale is a hard band of purple micaceous grit, full of large specimens of *Lingula cornea*, this bed is well exposed at the Tin Mills. Lying above these purple beds is a bed of grey sandstone, very barren, the only remains yet brought to light being *Lingula cornea* and carbonaceous markings, and these very scarce and imperfect. This bed may be best examined near Onibury. Immediately above this last rock are the thin, flaggy, micaceous sandstones, the base of the Old Red, in which beds not a single trace of organic life has yet been observed; yet I have no doubt that further search will be rewarded by the discovery of traces of *Pterygotus*, *Pteraspis*, and *Cephalaspis*, as they are found both below and above them, and consequently must have lived not very far off during the period of their deposition.

IV.—ON A NEW LARGE *TEREBRATULA* OCCURRING IN EAST ANGLIA.

By E. RAY LANKESTER, B.A., Countess Geological Scholar, Oxford.

(With a Wood Engraving.)

THE forms which Mr. Davidson in his invaluable Monograph has included under *T. ovoides*, are so various that it would be possible to refer the shells figured in the plate to that species, but since *T. trilineata*, from the Inferior Oolite, and *T. lata* and *T. ovoides*, from drift-blocks—which I shall endeavour to show are of the very latest Jurassic horizon—are very different in many respects, I prefer to give a new name to this form, which may find its place near *T. ovoides* and *T. simplex*. The specimen drawn, Fig. 1 and 1a, is from the collection of Mr. Roper of Lowestoft, who obtained it, with another specimen, from a gravel-pit at Thorpe in Suffolk. It has the general simple form of *T. ovoides*, but is remarkable for its great size. The imperforate valve is flattened in the mesial line, whilst the perforate valve is deep and raised into a well-pronounced keel in the mesial line extending from the beak; the foramen is small. The specimen figured is longer than the other in Mr. Roper's collection, which has the shorter, squarer form of Fig. 2, resembling *T. simplex*. This fine *Terebratula* may be known as *T. rex*.

In the British Museum and in the Ipswich Museum are portions of a block crowded with a *Terebratula*. The block was found by Mr. Charlesworth in a gravel-pit near Snape in Suffolk. The specimens in the fragment in the British Museum present a family likeness to *T. rex*, but they are shorter, squarer, and fuller, the imperforate valve being slightly convex. The block which contains them is evidently the same matrix as that which embedded Mr. Roper's *T. rex*, whilst Mr. Roper's specimens are like unwieldy examples of Sowerby's *T. ovoides*—bearing the same relation to the well-marked specimens, such as Mr. Rose's from Stow-Bardolph, No. 44,503 in the British Museum as do the irregular gigantic specimens of *T. depressa* from Upware to the beautiful and really elegant *T. nerviensis* of Belgium. It is difficult to look upon the specimens from Snape in this way, and the late Dr. Woodward had, we find, indicated *T. homologaster* (a Brown Jura species from Würtemberg