Rock and Oxford Clay into the Lower Corallian Limestones. The larger specimens have a considerable resemblance to *Pl. Münsteri* from the "Lower Coral Rag" of Heersum, which is on the horizon of the Wydale Beds. In *Pl. Münsteri* the spiral angle is wider, the whorls more angular, and the ornamentation probably more "reticulate" (mainly a question of *status*). The closest representatives of *Pl. Münsteri* occur in the Main Limestones of Osmington. But in the Elsworth rock, which is Upper Oxfordian, are specimens of *Pleuronomaria* the very fac-simile of the larger specimens from the Scarborough Cornbrash. These Elsworth rock specimens were identified by Blake and Hudleston (Corallian Rocks of England, Q.J.G.S. 1877. p. 313) with Roemer's Heersumer species.

The specimen from the Lower Corallian Limestones of Wydale is in excellent preservation, and may be compared even with such an one as is figured (Plate III. Fig. 8). Although a smaller fossil, the granulations are slightly larger, and in this respect it more nearly approaches *Pl. granulata*, Sow. I doubt not that each horizon and locality will present some slight differences, but the broad fact remains that one of the most abundant fossils in the Yorkshire Cornbrash may be traced sparingly through all the Oxfordian beds of Yorkshire, including the Lower Corallian Limestone, whilst its nearest relatives, and in some cases absolute representatives, are characteristic Oxfordian fossils in other places.

EXPLANATION OF PLATE III.

- FIG. 1, 1a, 1b. *Trochus monilitectus*, Phillips. Scarborough Limestone. British Museum. Back, front, and basal views. $\times 1\frac{1}{2}$.
 ,, 2, 2a. *Trochus Scarburgensis*, sp.n. Cornbrash, Scarborough. Leckenby Collection. Back and front views. $\times 1\frac{1}{2}$.
 ,, 3, 3a. *Trochus strigosus*, Lycett. Cornbrash, Scarborough. Leckenby Collection. TYPE REFIGURED. Back and front views: nat. size.
 ,, 4. *Ib.* Same formation, locality, and Collection. Back view; nat. size.
 ,, 5. *Trochus ? Scarburgensis*, var. Cornbrash or Kelloway Rock. British Museum. Back view; nat. size.
 ,, 6, 6a. *Trochus subglaber*, sp.n. Cornbrash, Scarborough. Leckenby Collection. Back view. $\times 1\frac{1}{2}$, and whorl further enlarged.
 ,, 7. *Trochus Leckenbyi*, Morris and Lycett. Scarborough Limestone, ? Claughton. Leckenby Collection. TYPE REFIGURED. Back view. $\times 1\frac{1}{2}$.
 ,, 8, 8a, 8b. *Pleuronomaria granulata*, Lycett, non Sowerby. Cornbrash, Scarborough. Leckenby Collection. Back and front views; nat. size, and portion magnified.
 ,, 9. *Ib.* Kelloway Rock, Scarborough. Leckenby Collection. Back view; nat. size.
 ,, 10. *Ib.* Oxford Clay, Scarborough. York Museum. Back view; nat. size.

IV.—ON THE RECENT DISCOVERY OF THE WING OF A COCKROACH AND TWO SCORPIONS IN ROCKS OF SILURIAN AGE.

By HERBERT GOSS, F.L.S., F.G.S., etc.

UP to December last the most ancient fossil insects known were the six fragments of *Neuroptera*, obtained by Mr. C. F. Hartt, from the Devonian rocks of New Brunswick, which were described by Mr. Scudder in Vol. V. of this MAGAZINE.¹ Although these six

1868, pp. 172-177, and 216-222.

fossils were the oldest *known* insects, it seemed unlikely that they, or even the families or genera to which they belonged, were the most ancient representatives of their class. The first appearance of insects on the Earth was probably contemporaneous with that of land plants, and as remains of this division of the Vegetable Kingdom had been discovered in Silurian rocks, it seemed not unreasonable to assume that insects might have existed at an earlier period than the Devonian. The recent discovery of the wing of a cockroach in rocks of Silurian age at Jurques, Calvados, France, no longer leaves the question of the occurrence of insects at an earlier period than the Devonian a matter of speculation.

In a note, recently communicated by M. Milne-Edwards to the Académie des Sciences of Paris,¹ M. Charles Brongniart describes the wing of a species of *Blatta* from the Middle Silurian formation of Jurques. The piece of rock containing this fossil was received from M. Douvillé, Professor in the Paris School of Mines, in whose honour this the *oldest known insect* has been named *Palæoblattina Douvillei*.

M. Brongniart states that the neuration of two species of *Blattidæ*² of the Carboniferous Period—*Progonoblattina Fritschii* (Heer) and *Gerablattina fascigera* (Scudder)—recalls, in a slight degree, that of this Silurian wing which he describes as follows:—

“Cette aile qui mesure 0^m.035 de long a appartenu à un *Blattide*; le champ huméral est large; on y voit la veine humérale supérieure, la veine humérale inférieure qui se bifurque à son extrémité; la veine vitrée ou médiane également divisée en deux rameaux; les veines discoïdales supérieure et inférieure et leurs divisions très obliques qui se rejoignent à leur extrémité, ainsi que cela se voit encore chez certaines Blattes de notre époque; on peut suivre la veine anale qui est assez droite et s'étend presque jusqu'au bout de l'aile, puis les veines axillaires qui lui sont parallèles. Ce qui est fort remarquable et ce qui distingue cette empreinte de toutes les ailes de Blattes vivantes et fossiles c'est la longueur de la nervure anale, et le peu de largeur du champ axillaire.”

Although the fossil wing above described is the only fragment of an insect as yet obtained from rocks of Silurian age, the recent discovery of insectivorous animals—two scorpions—in Silurian rocks furnishes additional evidence of the existence of insects at this early period.

One of the Scorpions was obtained by Dr. Hunter, of Carlisle, from the Ludlow beds (Upper Silurian) of Lesmahagow, Lanarkshire; and a preliminary description of it by Mr. B. N. Peach has appeared in a recent number of “Nature.”³

The second Scorpion was obtained from the Upper Silurian of the Isle of Gotland, and has been named by Dr. Lindström *Palæophonus nuncius*, and described by him in a letter to M. Milne-Edwards,⁴

¹ Comptes rendus des Séances de l'Académie des Sciences de Paris, No. 26, 29th December, 1884.

² These *Blattidæ* are referred to in my paper on “The Insecta of the Carboniferous Period,” pp. 169–173, of vol. xv. of the Entomologists' Monthly Magazine, 1878, and “The Insect Fauna of the Primary or Palæozoic Period,” Proc. Geol. Assoc. vol. vi. No. 6, 1879.

³ No. 796, January 29, 1885.

⁴ Extract from a letter from Prof. Lindström to M. Milne-Edwards, Comptes Rendus of the Académie des Sciences of Paris, No. 22, 1 Dec. 1884, pp. 984–985. Dr. Lindström states that a detailed account of this Scorpion by Prof. Thorell and himself will shortly appear.

which the latter has communicated to the French Academy of Sciences. Dr. Lindström states that this Scorpion is in a good state of preservation, and that one of the stigmata is visible on the right side, clearly proving that the animal respired air. He further remarks that in the construction of this Scorpion a feature of great importance is observable, viz. the presence of four pairs of thoracic legs which are stout and pointed like those of the embryos of many *Tracheata* and of forms like *Campodea*. This form of the leg no longer exists in the fossil Scorpions of the Carboniferous formations, in which fossils these appendages resemble those of existing species.

It will be noticed that both these Scorpions were obtained from the *Upper* Silurian, whereas the wing of the Cockroach was, as before stated, obtained from the *Middle* Silurian (Silurien Moyen). This wing is therefore of even greater antiquity than the Scorpions, and consequently represents not only the oldest known *insect*, but the oldest known *terrestrial* animal.

The discovery of air-breathing land animals in the Silurian rocks is of course of importance to geologists from the evidence thus afforded of the terrestrial and atmospheric conditions of the period; and the fact that the ancestors of the ubiquitous Cockroach were the most ancient representatives of the class *Insecta*, and of all land animals, cannot but be interesting to zoologists.

V.—NOTE ON AN APPARENTLY NEW SPECIES OF *HYOPOTAMUS* (*H. PICTETI*, NOBIS).

By R. LYDEKKER, B.A., F.G.S., etc.

SINCE describing the skull of *Anthracotherium Gresslyi* (= *Hyopotamus Gresslyi*, Rüt.) in the last Number of the Magazine (p. 63), I have observed that the right maxilla of a small anthracotheroid from the Upper Eocene "Bohnerz" of Canton Vaud, Switzerland, has been figured by Pictet in his "Matériaux pour la Paléontologie Suisse—Vertèbres de la Faune Eocène, Supplement, pl. xxiv. fig. 5," under the name of *H. Gresslyi*. The British Museum has recently acquired some upper true molars from the same formation agreeing precisely with those of Pictet's specimen; and a comparison of these teeth with those of the Brit. Museum specimen of *A. Gresslyi* (figured in my memoir already quoted) shows that they are quite different;—being distinguished by their slightly inferior size, the more inward inclination of the outer surfaces of the external columns, as well as the more distinct loop connecting these columns. These teeth agree, in fact, with those of brachydont species of *Hyopotamus*, like *H. porcinus*. Pictet's figure also shows that his specimen differs from *Anthracotherium Gresslyi* in having an elongated, instead of a triangular pm. 3.

There is no question of the distinctness of the form under consideration from the last-named species, and as its molar teeth are precisely similar in structure to those of the much larger *Hyopotamus porcinus*, it may be at least provisionally referred to the same genus. As I am unable to identify it with any named form, it may receive a new specific name, and I accordingly propose that of *H. Picteti*.