

M. pusilla by the shorter spire, the more depressed apex, and the condition of the folds on the columella. It is besides a broader and smaller shell.

Size: Axis, 3-24ths of an inch; diameter, 2-24ths.

Localities: Headon Hill, Lyndhurst, and Roydon in the New Forest (Mus. Edw.).

EXPLANATION OF PLATE XIV.

- Fig. 1. *Cypræa cavata* (F. E. Edw.).
 a. Back view of immature shell from Hunting Bridge.
 b. Front view of do. do.
 c. Back view of adult shell from Bramshaw.
 d. Front view of do. do.
 2. *Cypræa orthocheila* (F. E. Edw.).
 a. Back view of adult shell from Brook.
 b. Front view of do. do.
 3. *Cypræa attenuata* (F. E. Edw.).
 a. Back view of adult shell from Bramshaw.
 b. Front view of do. do.
 4. *Cypræa alata* (F. E. Edw.).
 a. Back view of adult (?) shell from Highgate.
 b. Front view of do. do.
 5. *Cypræa tumescens* (F. E. Edw.).
 a. Back view of adult shell from Brook.
 b. Front view of do. do.
 c. Fragment showing the condition of the outer lip and the anterior canal.
 6. *Cypræa cancellata* (F. E. Edw.).
 a. Enlarged view of portion of the whorl, showing the cancellation.
 b. Back view of adult shell from Bramshaw.
 c. Front view of do. do.
 7. *Marginella æstuarina* (F. E. Edw.).
 a. Shell natural size, from Roydon.
 b. Enlarged back view.
 c. Enlarged front view.

IV.—ON CERTAIN TRACKS IN THE MANX SLATES.*

By THOMAS GRINDLEY, Esq.

IN 1862 Mr. John E. Taylor (of Norwich), while surveying a newly-opened slate quarry at Dalby, on the western side of the Isle of Man, discovered three impressions of an oval form about nine inches long, and described them † as resembling the tracks of *Protichnites*, figured in Owen's Palæontology‡; the quarrymen told him that they were of frequent occurrence.

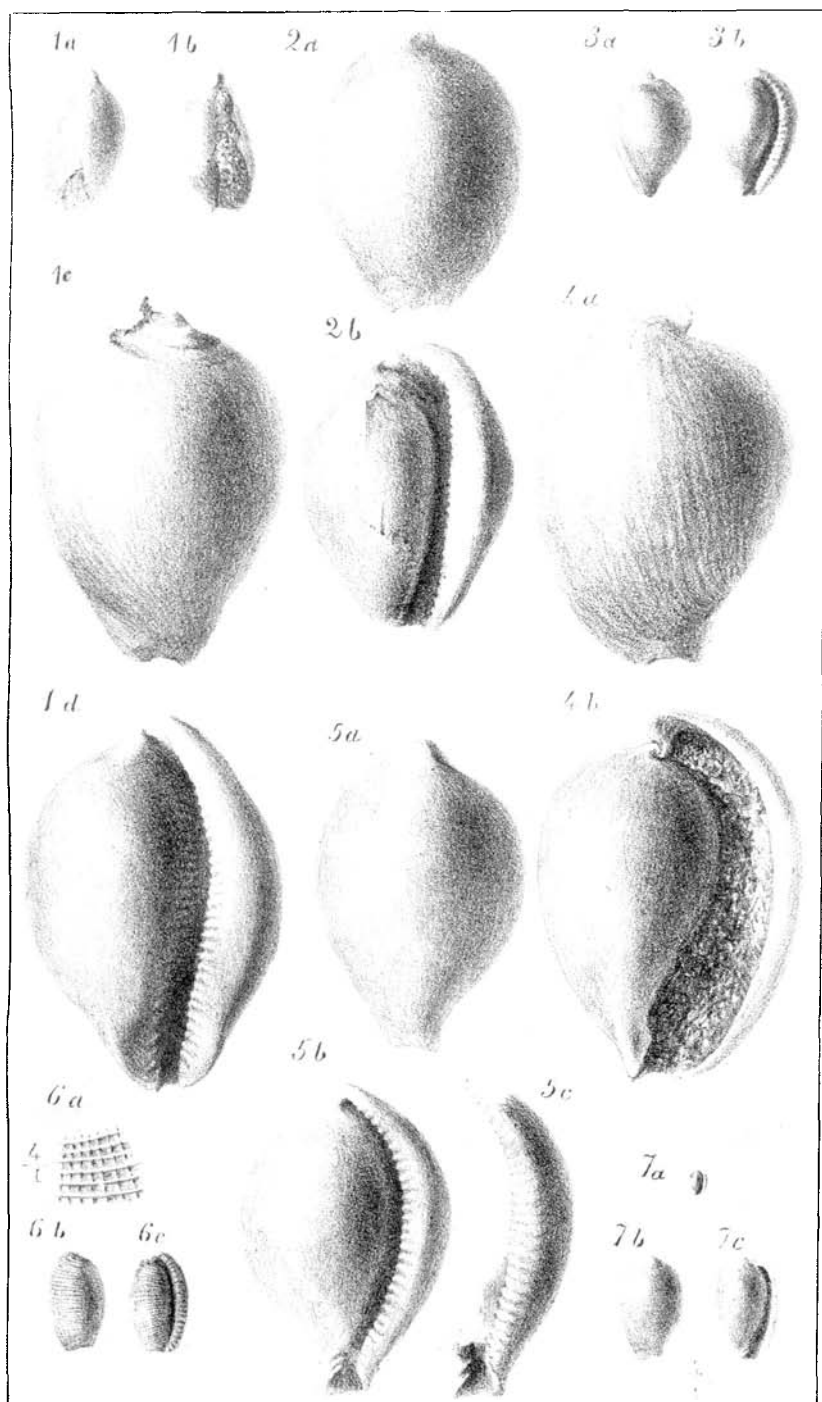
In 1863 Mr. Grindley noticed similar markings in great abundance upon a series of beautifully rippled slates of Cambrian age at Laxey, on the eastern side of the island.

The outline of the markings is an irregular oval. Their dimensions vary considerably in different examples, the average size being

* This communication was received some time since, but from want of space we have been unwillingly compelled to postpone it, and even now cannot give it in full.—EDW.

† Geologist, vol. v. 1862, p. 322.

‡ 2nd edition, 1861, p. 183.



E. Fielding del.

Recherch. Geol.

MODERN SPECIES OF CYPRÆA & MARGINELLA.

eight or nine inches long, five or six inches wide, and two inches deep: in one instance the length was two feet, but only eight or nine inches broad; and from a crack running obliquely across the east near its centre, Mr. Grindley concluded that it was not one cast but two, one partly overlying the other. The shape of the casts is always the same, independently of their being of different sizes; their mineralogical composition, though identical, or very nearly so, with the matrix, is generally much softer, and they are often washed out of the rocks that lie between high and low water. The casts are strongly coloured with iron, and frequently studded with small crystals of Blende (the neighbouring rocks contain this mineral in great abundance), which, when these crystals happen to fall out, present a very curious pitted appearance. The impressions, as a rule, occur in pairs, but a single one is often found by itself: when however they are in odd numbers, the missing one may be presumed to have been covered up by the neighbouring overlying rock, or else lost through a break in the continuity of the marked surface. They are generally of very unequal size; and the distance between the impressions is not always the same, but this is not to be expected when the great difference in the size of the pairs is considered. In some cases they touch each other; in others they are separated by an interval of several inches. The smallest impressions are usually closest together; occasionally the groups are clustered in great numbers, at other times scattered over the rocks very sparingly.

The larger axes of the impressions all point in the same direction, which is generally speaking, parallel to the line of strike, also to the ripple-marks on the rock-surfaces, and consequently more or less to the ancient sea-margin.

Supposing these impressions to be footmarks of some huge Cambrian or Lower Silurian reptile, Mr. Grindley discusses the habits which the various situations and positions of the traces indicate, and which tend to prove that the creature resorted to the shore in search of food.

This paper, the author states, is rather to draw the attention of scientific men to the subject afresh, than to record his own notions and observations. He reviews the different opinions expressed by geologists as to their real nature; some have strongly asserted their organic origin, while others have as positively denied it. With respect to the latter, some have regarded the casts as mere concretions, others as simply pebbles enclosed in the rock: but the casts show no signs of concretion or crystallization, which would be inconsistent with the first supposition, and their regularity of order would dispose of the second. Others have regarded them as double worm-burrows, but there is not the slightest connexion between the casts, and they are not deep enough for such to be the case. Among those who admit their organic origin, some suggest gigantic mollusks, but this appears to be inadequate to explain the fact when their arrangement in pairs, their marked position, and their occurrence in rippled slates, an indication of a littoral deposit,

is considered, and an examination of the casts themselves affords no support whatever to this conclusion. Again, they have been regarded as the trail of a crustacean, but the absence of a central track, and the varying relations of the different groups, seem to preclude this explanation, though the fact that a great proportion of the casts are sunk in the matrix obliquely to the plane of the rock, appears in favour of it. But the hypothesis, that they are footprints of some unknown reptile, although it has found but little favour amongst geologists, harmonises in Mr. Grindley's opinion with the facts of the case better than any other yet proposed, and he thinks no sound objection has as yet been advanced against it. The idea of a creature of vast size prowling along the margin of the shore in search of food agrees in every respect with the trails, the difference in the size of the two pairs of casts composing the group of four, may be the result of a difference in the size of the hind and fore feet. The variation in the impressions would indicate a troop of animals of different ages and sizes.

In conclusion, the author stated that, though he was certainly of opinion that the markings were of reptilian origin, yet he was by no means unwilling to adopt any more reasonable explanation.

ABSTRACTS OF FOREIGN MEMOIRS.

I. ON CALAMITE-FRUIT FROM THE SPATHIC IRON-ORE NEAR HATTIGEN ON THE RUHR. BY RUDOLPH LUDWIG,

(CALAMITEN-FRÜCHTE AUS DEM SPATHEISENSTEIN BEI HATTIGEN AN DEM RUHR. VON RUDOLPH LUDWIG. *Palæontographica*, vol. x. pp. 11-16. Pl. 2.)

THE fossil which formed the subject of this memoir was obtained from a bed of spathic iron-ore occurring near Hattigen on the Ruhr, and had already been referred by Dr. Lottner* (who sent it to the author for examination) to the genus *Cyathocrinus*. Dr. Ludwig, however, determined that it was referable to the vegetable kingdom, and consisted of the fructifying spikes of a species of Calamite; he gives the following description of it:—the fossil consists of shortly stalked fruit-spikes lying in a whorl round the stem, having a cylindrical form, contracted above and below. The spikes are about seven centimètres in length and one in thickness; they consist of a number of closely packed, broad, short, and sharply pointed bracts arranged in a coronal manner upon circular, radially ribbed discs, attached to the hollow jointed stalk, so that as many as fifteen bracts form together a crown-like body, whose teeth exactly touch the middle rib of the bracts above. In this manner as many as from 20 to 25 cylindrical chambers, superimposed on one another are formed along the central column; they are imperfectly closed at the exterior margin, and each one contains five bunches of spore-capsules attached to the central stalk. The arrangement and

* Geognost. Skizze des Westphälischen Steinkohlengebirges. 1859, p. 154.