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NEW SERIES. DECADE II. VOL. VI.

No. XI.—NOVEMBER, 1879.

ORIGINAL ARTICLES.

I.—ON THE ROCKS OF BRAZIL WOOD, CHARNWOOD FOREST.

By S. ALLPORT, F.G.S.

AN interesting discovery having just been made in consequence of the examination of a single thin slice of rock, the following communication is recommended to the attention of those geologists who, to say the least, still fail to recognize the value of the microscope in geological investigations.

A short time since, a friend in Leicester kindly sent me a specimen of the so-called gneiss from Brazil Wood; having prepared a thin section and placed it under the microscope, I immediately recognized an old acquaintance. It so closely resembled some of the altered clay-slates which surround the Land's End mass of granite,<sup>1</sup> that I could not but regard it as another illustration of contact metamorphism, and the following day was devoted to an examination of the locality in which it occurs.

Under the guidance of Mr. W. J. Harrison, of Leicester, who kindly accompanied me, a small quarry in the wood was soon found, and in a few minutes we were gratified by the discovery of a mass of granite in contact with the "gneiss." It is at present the only known junction of the granite with the old sedimentary rocks, and proves conclusively that, like the syenites of the district, the granite is also an intrusive rock. Subsequently to our visit, Mr. Harrison has discovered a bed of indurated banded slate overlying the gneiss; it has a distinct cleavage, and contains numerous small garnets. This slaty rock is interbedded with another which is rather more compact, and has a less perfect cleavage; it also contains garnets. The discovery of these slaty rocks is another point of interest, as none have been previously observed to the east of the Swithland slates. There can be no doubt that they belong to the Charnwood series, and it will be seen that their altered condition may be fully explained by their close proximity to the intrusive granite. As the locality in which these discoveries have been made has been frequently visited and described, it may afford satisfaction to previous observers to learn that the granite just found has been exposed to view by very recent quarrying of the rock.

The microscopic structure of the Mount Sorrel granite, and of

<sup>1</sup> Described by me in Quart. Journ. Geol. Soc. 1876, vol. xxxii. p. 407.

*Nöggerathiopsis prisca*, Fstm., Lower Coal-measures, Greta, New South Wales.

*Nögg. spatulata*, Dan., and *N. media*, Dan., Upper Coal-measures (Newcastle beds), New South Wales.

*Zengophyllites elongatus*, Morr.—At first described by Prof. Morris, from Tasmania, from the doubtful beds, which, however, from the evidence of *Thinnfeldia (Pecopteris) odontopteroides*, Morr., sp. (Fstm.), and *Sphenopteris elongata*, Carr., appear to be Mesozoic.

Later, also found in New South Wales (in the Upper Coal-measures, Newcastle beds).

*Cordaites australis*, M'Coy, Devonian, Iguana Creek, Victoria.

*Zamites (Podoz.) ellipticus*, M'Coy, *Zam. (Podoz.) Barklyi*, M'Coy.

*Zam. longifolius*, M'Coy, Upper Mesozoic beds in Victoria.

CONIFERÆ:—*Brachyphyllum australe*, Fstm. Upper Coal-measures (Newcastle beds), N. S. Wales.

*Cardiocarpum australe*, Carr., Upper Mesozoic, Queensland (Tivoli Mines).

The most important deductions are:

1. The doubtful strata in Tasmania (Jerusalem's Basin) are, from a palæontological point of view, equivalent with the Upper (Mesozoic) Coal-strata in Queensland, consequently also in N. S. Wales and Victoria.

2. *Phyllothea*, which in Europe and Siberia is Jurassic, appears in Australia already in Palæozoic beds, and is found still in the Upper Mesozoic beds in Victoria.

3. *Glossopteris* appears in Australia in Palæozoic beds (for the first time with Lower Carboniferous plants), is most frequent in the Upper Coal-measures (Newcastle beds), continues in India and Russia into Jurassic beds.

4. *Nöggerathiopsis* begins in Australia in Palæozoic beds, and has a closely allied representative (*Rhoptozamites*) in the Jurassic beds in Siberia.

5. The Lower Carboniferous Flora of Port Stephens and Smith's Creek (Stroud), New South Wales, is of great importance for the knowledge of the geographical distribution of the Lower Carboniferous Flora.

### III.—FURTHER NOTES ON A COLLECTION OF FOSSIL SHELLS, ETC., FROM SUMATRA (OBTAINED BY M. VERBEEK, DIRECTOR OF THE GEOLOGICAL SURVEY OF THE WEST COAST, SUMATRA). PART III.

By HENRY WOODWARD, LL.D., F.R.S., etc.;  
of the British Museum.

(PLATES XII. AND XIII.)

28. *Conus*, sp. (cast). Pl. XII. Fig. 1.

This cast indicates a subfusiform shell with a somewhat elongated conical spire, but the apex is imperfect: volutions contiguous and convex; the body-whorl gradually tapering to a somewhat acute base.

<sup>1</sup> Continued from the October Number, p. 444.

*Dimensions*:—Length about  $3\frac{1}{2}$  inches; width of broadest part nearly  $1\frac{3}{8}$  inch. Number of whorls 6–8.

This cone in its general form is evidently near to the *Conus Noe* of Brocchi (*Conchiologia Fossile Subapennina*, 1814, tom. ii. p. 293, tab. iii. fig. 3); but as it is only preserved to us in the form of a cast, it is impossible to do more than point out approximately its specific relations.

*Formation*:—Obtained by M. Verbeek from the bed marked (5), consisting of Tertiary Coral limestone, including internal casts of Gasteropods and Conchifers, etc. (Verbeek, *GEOL. MAG.* 1877, p. 444).

*Locality*:—Government of the West Coast of Sumatra.

29. *Conus substriatellus* (cast), H. Woodw. Pl. XII. Fig. 2.

This cast—which approaches most nearly to *Conus striatellus* of H. M. Jenkins (*Quart. Journ. Geol. Soc.* 1863, vol. xx. p. 54, pl. vii. figs. 3a, 3b) from Java, and particularly with the figures of a cone referred to that species by Dr. K. Martin, in his work “*Die Tertiärschichten auf Java*” (*Univalves*), Leyden, 1879, p. 9, tab. i. figs. 2 and 2a—represents a conical ventricose shell; the axis being short in proportion to its breadth; the whorls narrow, volutions 7–8 in number, apex depressed, aperture narrow, slightly dilated at the base.

*Dimensions*:—Height of shell 40 mm.; breadth of shell at widest part 28 mm.

The figure given by Mr. Jenkins is evidently that of a young individual, whereas our cast is that of an adult shell; Dr. Martin's figures represent three stages of growth, and his Fig. 2 most nearly corresponds with M. Verbeek's specimen.

It must, however, be borne in mind that the Javan fossils are represented by specimens having the shell preserved, whereas the Sumatran fossil is only a cast. I have therefore preferred to name it *C. substriatellus*.

*Formation and Locality*:—From the bed marked (5), found with the preceding species.

30. *Cypræa subelongata*, H. Woodw. Pl. XII. Fig. 3.

This species is represented by four examples, two of which have the shell partially preserved, which was tolerably thick; in general form it is somewhat amygdaloidal or ovato-elongate; the spire is slightly visible, but depressed; the aperture is narrow at the upper part, and somewhat dilated from the middle towards the base; there are well-marked indications of crenulations on the inner lip.

*Dimensions*:—Length of figured specimen 33 millimètres; breadth of shell  $21\frac{1}{2}$  mm. The three other specimens referred to this species are somewhat smaller.

This shell closely resembles, in general form, the so-called *Ovula elongata* of D'Archiac (*Descrip. des Animaux Fossiles de l'Inde*, 1854, p. 331, pl. xxxiii. fig. 9 and 9a) from the Hala Chain; but as the Sumatran fossil affords distinct evidence of crenulations on the body-whorl, as above stated (although, unfortunately, our artist has omitted to indicate them in Fig. 3), we have not ventured to refer it to that species. Possibly—as the Indian shell is so like a *Cypræa* in general form—the artist of M. D'Archiac's plate may

nearly obsolete. The form I figured as *Prenaster excentricus* resembles the diagram-sketch on your Plate more than any other species that occurs to me now, so that your Sumatran Echinoderm may be an allied form belonging to the genus *Prenaster*. More than this I cannot say."

37. *Conus Niasensis*, H. Woodw. Pl. XIII. Fig. 1.

Shell conical-elongate, concentrically-striated, striae wider apart towards the base of shell and rather more strongly accentuated; spire conical, apex obtuse, showing about seven volutions, concentrically striated and crenulated, the outer margins ornamented with a series of flattened tubercles; aperture narrow.

*Dimensions*:—Height 15 millimètres; breadth at widest part of shell  $6\frac{1}{2}$  mm.

The ornamentation of the upper portion of the whorls around the apex presents a close agreement with *Conus acutangulus*, Chemn., as figured by K. Martin from Java (Die Tertiärschichten auf Java, p. 11, tab. ii. fig. 2); but the apex of this species is more regularly conical and the shell itself is more robust.

Dr. Böttger also figures a cone under the name of *Conus gracilispira*, Böttg., from Pengaron, Borneo (p. 18, taf. ii. fig. 13, 14 a, and b, Palaeontographica, 1875); but the apex is too truncated, and the specimen, being a cast, cannot be compared certainly with our fossil.

*Formation*:—Tertiary Grey Marl.

*Locality*:—Hiligara, Island of Nias, Government of the West Coast of Sumatra.

38. *Oliva mustelina*? Lamarck. Pl. XIII. Fig. 2 a, b.

The specimen figured consists only of the body-whorl, the apex being wanting; the shell is much eroded, and it would be difficult of identification, but it presents a great similarity to the *Oliva mustelina*, Lamarck, which is commonly met with on the coast of Japan, the Philippines, and Singapore.

The following is the description of *Oliva mustelina* (from Sowerby's *Thesaurus Conchyliorum* (1871), part xxx. p. 22).

"Shell oblong-cylindrical, subtruncated at both ends, thick; colour greyish yellow, marked with obliquely-longitudinal undulating lines; spire short, broad, suture acute, punctated; columella plicated throughout, terminating posteriorly in a thick elevated callus, having a few very strongly-oblique plicæ in front; aperture violet within; lip thick, elevated behind, interior and exterior smooth."

*Formation*:—(Sub-fossil?)

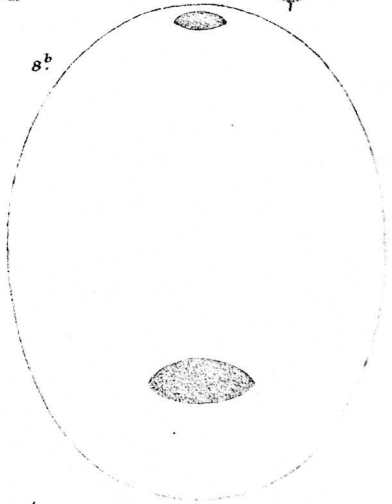
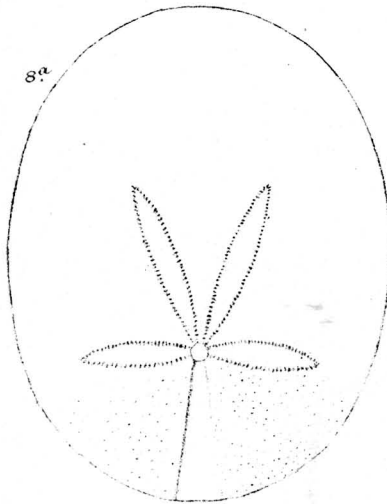
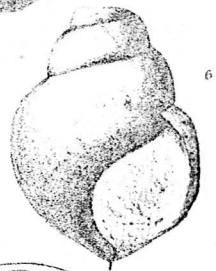
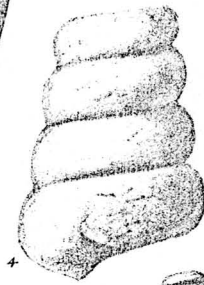
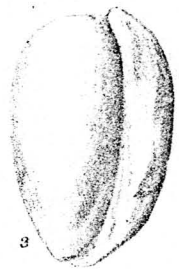
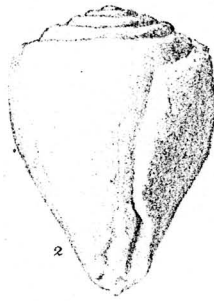
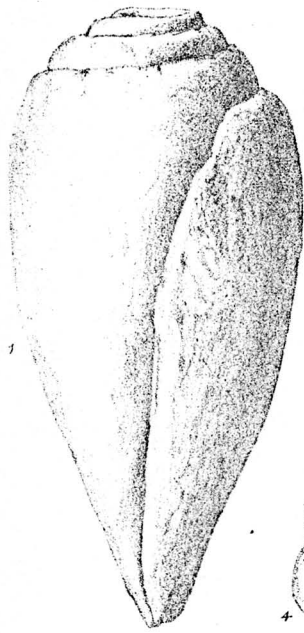
*Locality*:—Government of the West Coast of Sumatra.

39. *Oliva pseudoaustralis*, H. Woodw. Pl. XIII. Fig. 3.

This is a smooth ovate shell with a conical spire, and having a strongly ribbed columella which is thickened towards the base. It appears to be allied to the *Oliva australis* of Duclos, but it is rather shorter, and has a more conical spire.

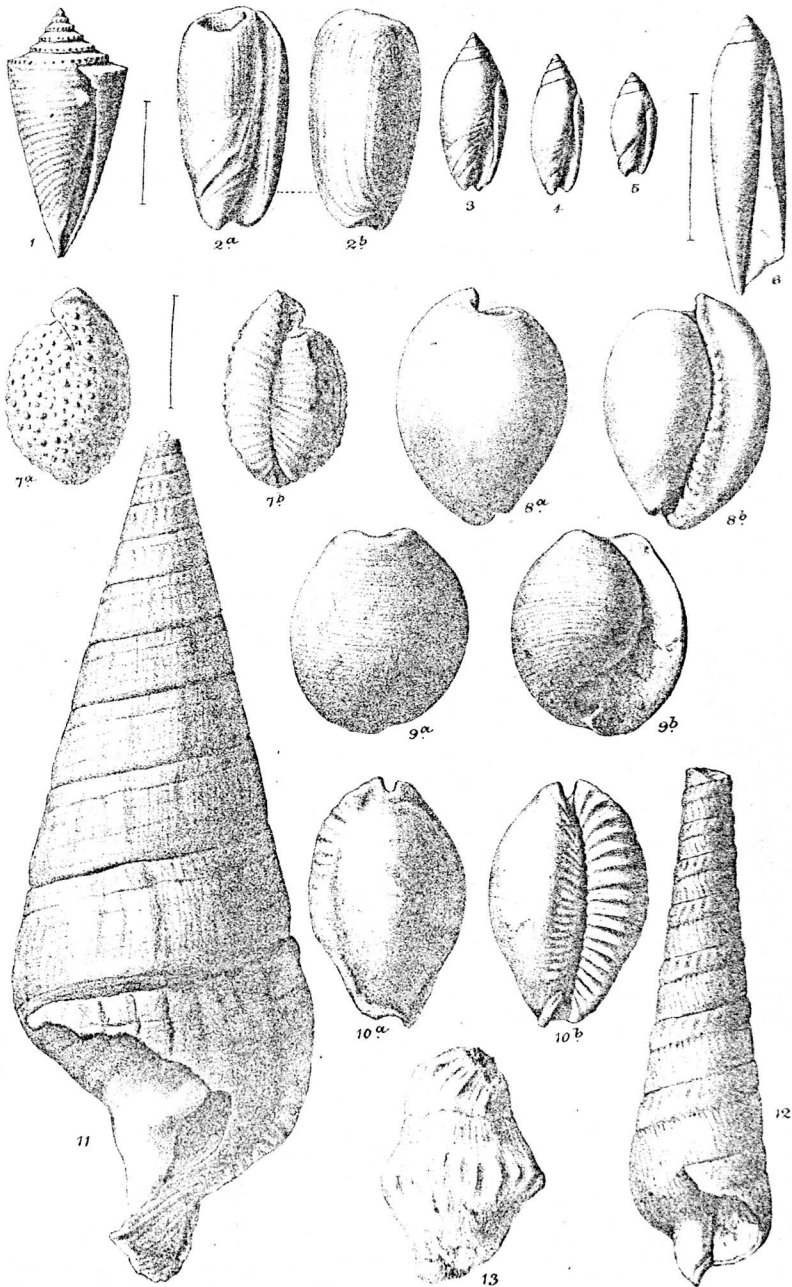
This species may also be compared with the *Oliva Javana*, K. Martin, (*op. cit.*) tab. iii. fig. 8 and 8a, but the spire of this latter species is more acute.





C. L. Grisebach del. et lith.

West, Newman & Co. sculp.



C. L. Griesbach del. et lith.

West, Newman & Co. imp.