IV.—On the West Indian Tertiary Fossils.

By R. J. Lechmere Guppy, F.L.S., F.G.S., etc.

(PLATES XVI., XVII., and XVIII.[1])

§ 1. Introductory Remarks.

In the Geological Magazine (Vol. IV. p. 496) I have given some notes on West Indian Geology, with descriptions of a few new species of fossils. The notes were intended, in part, as supplementary to the papers published in the Journal of the Geological Society, and in the Geological Magazine, on the Geology and Palæontology of the West Indies, and in part to exhibit an improved classification of the Caribean upper and middle Tertiaries.

Mr. Vendryes, an ardent naturalist and zealous collector of shells and fossils in Jamaica, has kindly forwarded to me a fine set of the Miocene fossils of that island. These have been in my possession for some time: but although several novelties are contained in the collection, want of time and opportunity has hitherto prevented my working them out. The high interest attaching to these fossils has however, induced me to draw up descriptions of the new species, and to indicate those which, although previously described from other localities, are now for the first time added to the Jamaican list.

I propose now to give a list of all the organic remains hitherto found in the West Indies (as far as described) belonging to the sub-kingdoms Mollusca, Articulata, Echinodermata, and Protozoa. I do not enumerate the post-Pliocene fossils, as, for the most part, they are of existing species only. The Corals have been amply treated of by Prof. Duncan, F.R.S., in late volumes of the Journal of the Geological Society.[2] The columns of the table appended hereto are arranged in the order of the presumed antiquity of the deposits occurring in the localities named at their heads. I should remark that the observations of Mr. P. T. Cleve and others, as well as my own, lead me to substitute the term "Eocene" for the term "Lower Miocene," hitherto employed for the Manzanilla and San Fernando beds in Trinidad, and for certain deposits of similar age discovered by Mr. Cleve in St. Barts.

There are yet a considerable number of undescribed fossils known from Haiti, of which there are examples in the Museum of the Geological Society. There is little doubt that very many of the blanks in the table now given will be filled up after further search. It is probable that most of the Miocene mollusca will, sooner or later, be found in nearly all the localities where formations of that age exist in the Caribean area; though various local circumstances, such as depth and clearness of water, conditions favourable, or the reverse, for preservation of organic remains, or those of particular kinds must be allowed to have due consideration. The fossil fauna of the Eocene deposits which stands out as a group quite distinct from

[1] These three plates will appear with the concluding portion of the paper next month.—Edit. Geol. Mag.

[2] See Quart. Journ. Geol. Soc., vol. xix. p. 406 and p. 513; xx. p. 20 and p. 30; xxi. p. 1; and xxiv. p. 9.

though containing some species in common with, that of the Miocene deposits, will be found hereafter to have a very much larger number of species than we have hitherto noticed. In the San Fernando beds, whose age we now state as Eocene, are many mollusca whose condition is such that, although we may venture to assign to them their generic position, it would be unwise to describe new species from such imperfect material. As regards the Foraminifera, I believe that the differences between the faunas of the several deposits depend more upon bathymetrical conditions than upon anything else.

The determination of the geological age of the Jamaica beds and of the remarkable relations of the fossil fauna of the West Indian Miocene to that of Europe and the living fauna of the eastern seas, is strikingly supported by the new fossils now described. We have a *Murex*, an *Ovulum*, a *Cassis*, and a *Fasciolaria*, whose nearest congeners are European Miocene and Asiatic recent; a *Scalaria*, previously described indeed, but from inadequate material, whose relations are similar, and a *Naticina*, a genus almost extinct in the West Indies, but whose present distribution is along the path pointed out as that of the migration of organized beings during the Tertiary period from America to the Pacific Ocean through North Africa and South Europe.

Among the Jamaica shells there are few, e.g. *Turbo castaneus*, *Strombus pugiloides*, and *Plicatula vexillata*, which, like the *Conus fuscocingulatus* of the European Miocene, retain traces of the colouring which ornamented them while living. It is only where the strata are of such composition as to be extremely favourable to the preservation of molluscan remains, that such a circumstance could occur. In Jamaica and Haiti the Miocene formations have been remarkably suited to this end, and hence we have from them a series of organic remains scarcely surpassed in beauty even by those of Bordeaux, Dax, or Paris. In Trinidad the shells of similar age are for the most part extremely altered, and their characters more or less obliterated. It is therefore fortunate that we have those of Haiti and Jamaica upon which to found and rectify our determinations of the Trinidad rocks and fossils of like age.

§ II.—Description of the Fossils.

Hyalæa (*Diacria*) *Vendryesiana*, Pl. XVII. Figs. 2*a*, 2*b*.

Shell elongate, smooth; both valves somewhat inflated, but the superior one more so than the other: terminated on each side by two sharp mucrones, and posteriorly by a narrow curved mucro not so long as the body or main portion of the shell. Lips everted, the inferior one bordered exteriorly by a raised ridge, which towards the lateral mucrones gradually becomes confluent with the edges of the lips. Length 5 mm., of which the terminal mucro forms about 2. Breadth nearly 3 mm.

Related to *H. inflexa* and *labiata* of D'Orbigny.—It differs chiefly in being more inflated, especially the inferior valve, and in being narrower behind the lateral mucrones—a character, it would seem, of some importance in this genus.

suture much more deeply sunk in *C. scalatella*, whilst the longitudinal ridges project upon the angle of the whorls so as to give a coronate appearance.

The three *Cancellaria* hitherto described from the Jamaican Miocene are all akin to European fossils of the same date; but two of them belong to the type of the recent *C. reticulata*. The present is of more decidedly Miocene aspect than either of the three previously described.

Ovulum immunitum, n. sp., Pl. XVI. Fig. 7.

Fusiform-elongate, pointed at both extremities. Outer lip thickened, extending in a nearly regular slight curve from the posterior to the anterior canal; slightly dilated anteriorly. Inner lip with two strong folds at the anterior end. Aperture as long as the shell; narrow posteriorly, growing wider gradually until near the middle of the whorl, then increasing in width by the expansion of the outer lip and the recession of the whorl to form the slightly twisted pillar-lip. Length about 20, breadth about seven mm.

Allied to *Ov. Leathesi*. Wood, of the English Crag. It is nearly of the same size, but is more slender in its proportions, and in some particulars is more close to *Ov. spelta*, including under that term both the fossil and recent species so called.

Conus recognitus, Guppy.

C. solidus, Sowerby, Journ. Geol. Soc., vol. vi. p. 45.

C. recognitus, Guppy, Proc. Scient. Assoc. 1867, p. 171.

The name *solidus* having been used for another Cone, I proposed in 1867 the name of *recognitus* for this species.

Conus consobrinus, Sow., Pl. XVII. Fig. 4.

Sowerby, Journ. Geol. Soc., vol. vi. p. 45.

I have referred this shell to Sowerby's species; but if my determination be correct, Sowerby's description is in need of amendment. The zones, or rather spiral ribs, can scarcely be called granose, although they exhibit a tendency to become so towards the completion of the last whorl, which is usually devoid of the tubercular crowning of the previous whorls.

This species was hitherto only known from Haiti, but it is now added to the Jamaican list.

Conus prototypus, Pl. XVIII. Fig. 1, and Pl. XVII. Fig. 9.

Somewhat pyriform, finely striate anteriorly, becoming quite smooth on the angle of the whorls, which bear a rather indistinct keel; spire mucronate, rather elevated; aperture somewhat widened towards the anterior canal.

Miocene, Trinidad. A cone which departs very considerably from the usual type in its swelling outlines and the consequent direction and shape of the aperture. It is more of the shape of *C. bulbus* than of any other species I know. It is, however, probably a young specimen.

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ORIGINAL ARTICLES.

I.—Notes on Certain Fossil Orthoptera claiming affinity with the genus *Gryllacris*.

By A. H. Swinton, Esq.

(PLATE XIV.)

...ne Tertiary ...	1. *Gryllacris Ungeri*, Heer. Figured and described by Heer in his Insectenfauna, 1849, s. 8, t. i. 2. *Gryllacris Charpentieri*, Heer, op. cit. s. 12, t. i.
...l Formation ...	3. *Gryllacris lithanthraca*, 2 species. Figured and described in Palæontographica, bd. iv. p. 25 and 28, t. iv. 1–2. 4. *Corydalis Brongniarti*, Aud. Buckland, vol. ii. p. 77.

The above five insect remains, claiming affinity with the modern ...us *Gryllacris*, of the order Orthoptera, retain for the investigator ...haracters in common, but such as may be afforded by the central ...tion of the principal disk or internomediate field of the elytron, ...by the lesser marginal field. From comparison of these areas ...the specimens from the Coal-measures, as regards configuration ...venation, a certain similarity of design is observed, and a general ...respondence detected. By taking Heer's descriptions and figures ...data, this character is seen to be reproduced—less markedly dis...t from the type observable in certain species of the modern genus ...Burmeister—both in the profile of *G. Ungeri* and in other frag...nts preserved to us in the Eocene strata of the Continent. Com...e identification of these species must be the reward of future ...stigators.

The most perfectly preserved venation is presented by the frag...t of *C. Brongniarti*, hitherto reputed a Neuropterous insect, ...ly allied to the living *Corydalis* of Carolina, and exhibited as ...by Audouin at the meeting of the Naturforscher at Bonn in the ...th of September, 1835, but which Heer seems rather to indicate ...belonging to the Orthoptera; and this latter view, it will I ...k be seen, is quite agreeable to the venation and peculiarities of ...tructure exhibited in its wing, an object of undoubted beauty, ...aled by the fortuitous fracture of a nodule of Clay-ironstone, ...now preserved in the British Museum. The history of this ...men is somewhat wrapt in obscurity. It was purchased by ...ell at the sale of Parkinson's collection, the latter, there is ...n to suppose, having obtained it from the neighbourhood of ...rook-dale. It was subsequently transmitted to M. Brongniart, ...has been described by Audouin (Buckland, Geology and Mine...y, vol. ii. p. 77). In the Museum specimen of *G. Ungeri* the