55. *On the* Miocene Fossils *of* Haiti. By R. J. Lechmere Guppy, Esq., F.L.S., F.G.S., C.M.Z.S., President of the Scientific Association of Trinidad. (Read May 10, 1876.)

[Plates XXVIII. & XXIX.]

A very important memoir "On the Topography and Geology of Santo Domingo" has recently been published by Professor Gabb*. Whatever tends to elucidate the geology of the island of Haiti must of course contribute to our knowledge of West-Indian and American geology generally, and may also throw further light upon some of the problems connected therewith which have not as yet been solved.

Santo Domingo is a republic occupying two thirds of the Island of Haiti. A very large portion of the territory comprised within its boundaries has been geologically surveyed and mapped out by Prof. Gabb and his assistants. The formations examined by them are classified as Postpliocene, Miocene, and Cretaceous. Eruptive rocks are also developed to a large extent.

It is not my intention to speak of the geological part of Prof. Gabb's labours. That could only be done usefully by those acquainted with the country and conversant with its structure. My present business is with the palæontological portion of the work.

The Geological Society possesses the first regular collection of fossil Tertiary shells and corals made in Haiti, and, indeed, I might almost say, in the West Indies. This collection contains the types of the species described by Sowerby for Mr. Carrick Moore, and by Prof. Duncan. I have from time to time, when treating of the West-Indian Tertiary rocks and fossils, alluded to the fact that several of the species contained in that collection were unnamed.

Most of those species have now been described by Prof. Gabb; but it is to be regretted that his work is not accompanied by figures, so that our determinations may sometimes be open to doubts which the aid of pictorial illustration would enable us to dispel.

In the Proceedings of the Scientific Association of Trinidad for December 1873, I described several new fossils from Jamaica; and deeming it desirable that those fossils should be more widely known than they could be by means of that publication, whose circulation is very limited, I republished the descriptions and figures in the 'Geological Magazine' for September and October 1874, together with a revised list of the organic remains (exclusive of the corals and other fossils) which had been found in the Tertiary deposits of the Caribbean region. This list was a revision of one previously published by me in the Proceedings of the Scientific Association of Trinidad for 1867. The first knowledge I had of Prof. Gabb's work

* Trans. Amer. Phil. Soc. vol. xv. p. 49, with a geological map of Santo Domingo. See also, for the new genera described, Proc. Acad. Nat. Sci. Phil. 1872, p. 270.

was from the January (1875) number of the 'Journal de Conchyliologie,' which, however, I did not receive until some time after the date of its publication. In August last Prof. Gabb did me the kindness to send me a copy of his publications relating to the geology and palæontology of Haiti. I deemed the opportunity a favourable one for reexamining the Haitian fossil mollusca, which had been untouched since 1853. The present communication, which embodies the results of my reexamination, is confined for the most part to such species as I have identified in the collection of the Geological Society, or have noticed in other collections of West-Indian Tertiary fossils.

We have not escaped the tendency, almost inevitable in the case of little-known forms, to describe mere varieties, some more or less permanent, some merely individual, under distinct specific names. Prof. Gabb has done good service by uniting together some of these artificially separated forms; and in this labour he has had the advantage of large suites of specimens collected by himself in Haiti. While contributing my quota towards a reduction of our superfluous nomenclature, I may observe that it is not always a disadvantage in the beginning (particularly when the descriptions are accompanied by good figures) to distinguish the various forms which are mistaken for distinct species. Owing apparently to the great exuberance of Molluscan life in the West-Indian Miocene, much variation occurred, especially in certain genera.

In all the corrections I have ventured on in respect of Prof. Gabb's determinations, I have not acted in any spirit of derogation of his work, which I consider very valuable; and I could congratulate myself if my own had been at all times as well done.

One of the results stated by Mr. Carrick Moore has been brought out more strongly by Prof. Gabb's examination of the Haitian fossils. It is the alliance of the West-Indian Miocene fauna to that of the west coast of South America; and I think now that the conviction can hardly be resisted that during some portion of the Miocene period there was a free communication between the Pacific and the Atlantic. But other alliances point to the west coast of Africa; and there remain other alliances still more close with the Eastern and Indian Seas.

In a letter to me, dated 18th September, 1871, the late Prof. William Stimpson informed me that in the deep-sea explorations off Florida he had discovered shells either identical with or very closely allied to some species of the West-Indian Miocene. Among them he cited *Conus planiliratus*, *Pleurotoma Barretti* (=*Pl. haitensis*), *Phos elegans*, and *Corbula viminea*.

For the sake of conciseness I have, in the following remarks, used the abbreviation G. J. for the Quarterly Journal of the Geological Society.

1. Dentalium dissimile, Guppy, G. J., vol. xxii. p. 292, pl. xvii. fig. 4.

I am inclined to believe that Gabb's *D. ponderosum* is a form of

this species having thick walls. Three other species are named by Prof. Gabb; but I cannot refer the specimens in the Geological Society's collection to more than two species, one of which is named below.

2. DENTALIUM MISSISSIPENSE, Conrad.

This is very like, if not identical with, *D. Kickxii* of the Belgian Miocene.

3. BULLA PAUPERCULA, Sow. G. J. vol. vi. p. 32.

This, and *B. Vendryesiana*, may be regarded as probably marked forms of *B. striata*, Brug.

4. BULLA GRANOSA, Sow. G. J. vol. vi. p. 51, pl. x. fig. 10.

5. VOLVULA CYLINDRICA, Gabb, Trans. Amer. Phil. Soc. vol. xv. p. 246.

6. TORNATINA COIX-LACRYMA, Guppy, Geol. Mag. 1867, p. 500, fig. 3.

T. recta, Gabb, *l. c.* p. 246 (as of D'Orb.).

The same species occurs in the Miocene of Trinidad and Jamaica. *T. canaliculata*, *T. olivula* and *T. recta*, D'Orb., which may all be synonymous, are nearly related to our fossil.

7. CYLICHNA BIDENTATA, D'Orb. Moll. Cuba, pl. iv. figs. 13–16.

This is erected into a new genus, *Cylichnella*, by Gabb; but I do not concur in the necessity of that proceeding. An allied but larger species (*C. ovum-lacerti*, Guppy) is found in the Eocene of Trinidad.

8. TORNATELLA (ACTÆON) CUBENSIS, Gabb.

This may be identical with the shell I have described as *T. textilis* (Geol. Mag. 1874, p. 407, pl. xvi. fig. 4); but if so, it is distinct from *T. punctata*, D'Orb., as respects the surface ornamentation, which in *T. textilis* has more of a cancellate than a punctate character.

9. RINGICULA TRIDENTATA, Guppy, Geol. Mag. 1874, p. 406.

The specimens identified by Gabb as *R. semistriata*, D'Orb., may belong to this species.

10. TURBONILLA TURRIS, D'Orb. Moll. Cuba, vol. i. p. 219, pl. xvi. figs. 10–13.

A very variable species, found also in the Miocene of Jamaica and Pliocene of Trinidad. Other forms of the same have been described by D'Orbigny as *modesta*, *ornata*, and *pulchella*; and I believe that *T. dominicensis*, *angusta*, and *pertenuis* of Gabb may be placed in the same category.

11. NATICA CANRENA, Linn.

12. NATICA SULCATA, Born.

13. NATICA MAMMILLARIS, Lam.

Gabb considers *N. subclausa*, Sow., to belong to this species.

14. NATICA PHASIANELLOIDES, D'Orb.

Gabb redescribes this species under the name of *Amaura Guppyi*, but does not give his reason for disagreeing with my identification.

15. SIGARETUS EXCENTRICUS, n. sp. (Pl. XXIX. fig. 11.)

Shell globose-depressed, adorned with many regular rounded spiral ribs with much narrower threadlike interstices: spire depressed; whorls convex, the last much the largest; aperture oval, somewhat angulated posteriorly.

A more globose shell with much more convex whorls than *S. depressus*, Phil. (=*S. haliotideus*, D'Orb., =*S. Leachii*, Sow., but not the *S. haliotideus* of Linné. See Hanley, Ips. Linn. Conch. p. 390).

16. TURRITELLA TORNATA, Guppy, G. J. vol. xxii. p. 580, pl. xxvi. fig. 12.

17. TURRITELLA PLANIGYRATA, Guppy, Proc. Scient. Assoc. Trinidad, 1867, p. 169; Geol. Mag. 1874, p. 408, pl. xviii. fig. 5.

Gabb has recognized this species among the Haitian fossils; and his remarks upon it are appropriate. The figure in Geol. Mag. shows only the general shape.

18. VERMETUS PAPULOSUS, Guppy, G. J. vol. xxii. p. 292, pl. xvii. fig. 3.

Gabb regards this as the end of the tubes of *Petaloconchus*; and in this he may be right, though I do not feel completely satisfied on the point.

19. PETALOCONCHUS SCULPTURATUS, Lea; P. DOMINGENSIS, Sow. G. J. vol. vi. p. 51, pl. x. fig. 9.

20. CERITHIUM UNISERIALE, Sow. G. J. vol. vi. p. 51. (Pl. XXIX. fig. 4.)

This is a remarkable species; and Sowerby's description applies strictly to only one specimen. The species may be distinguished generally by its peculiar ovate shape, also by the ascension of the last whorl, near the aperture, halfway up to the suture, forming a canal upon the body-whorl, between the angle of the aperture and the callus of the inner lip, which terminates in a broad and blunt tooth.

21. CERITHIUM OBESUM, Gabb, Trans. Amer. Phil. Soc. vol. xv. p. 237. (Pl. XXIX. fig. 9.)

22. CERITHIUM PLEBEIUM, Sow. G. J. vol. vi. p. 51; Guppy, G. J. vol. xxii. p. 290, pl. xvi. fig. 9.

Near to *C.* (*Vertagus*) *gemmata*, Hinds, Voy. Sulph. pl. x. fig. 56.

23. SOLARIUM QUADRISERIATUM, Sow. G. J. vol. vi. p. 81, pl. x. fig. 8.

The *Torinia rotundata* of Gabb can scarcely be other than a form of this species, differing, it would seem, in the greater elevation of the spire and convexity of the whorls.

24. CANCELLARIA BARRETTI, Guppy, G. J. vol. xxii. p. 289, pl. xvii. fig. 11.

Gabb considers this identical with the recent *C. reticulata*. I am not sure whether it is distinct from the species next named, which Gabb has allowed to stand; but it is a pronounced form whose proportions are more elongate than those of *C. lævescens*.

25. CANCELLARIA LÆVESCENS, Guppy, G. J. vol. xxii. p. 289, pl. xvii. fig. 12.

26. CANCELLARIA MOOREI, Guppy, G. J. vol. xxii. p. 289, pl. xvii. fig. 7.

Gabb includes in his list the names of *C. brevis* and *C. tessellata*, Sow. I am inclined to think that the forms so named by him are young specimens of *C. Moorei* and *C. lævescens* respectively.

The following species appears to me quite distinct. It does not appear to have been mentioned by Gabb.

27. CANCELLARIA EPISTOMIFERA, n. sp. (Pl. XXVIII. fig. 9.)

Shell pyriform, scarcely rimate, adorned with stout spiral ridges having longitudinal ones crossing them and rising into points on the intersections.

Spire acuminate, having seven or eight whorls (of which the nuclear ones are smooth). Aperture oblong, canal short, outer lip sinuous, carrying a spout-like protuberance.

Judging from the sculpture alone, this might be taken for a form of *C. Barretti* or *C. lævescens*. It is, however, rather more coarsely sculptured than either of those species, in the latter of which the last whorl is smooth, or nearly so. The sinus of the outer lip is carried in a sort of spout, instead of forming a depression as in the outer lip of *C. lævescens*.

Cancellaria scalatella, Guppy (Miocene, Jamaica), does not seem to have been found in Haiti (see Geol. Mag. 1874, p. 408, pl. xvii. fig. 4).

28. ORTHAULAX INORNATA, Gabb. (Pl. XXVIII. fig. 8.)

O. inornatus, Gabb, Proc. Acad. N. S. Phil. 1872, p. 272, pl. ix. f. 3, 4; Trans. Amer. Phil. Soc. vol. xv. p. 234.

To whatever genus this shell may be assigned, I have little doubt of its near alliance to *Rostellaria macroptera*, Lam. (*Strombus amplus*, Brander), of the European Eocene (Sow. Min. Conch. vol. v. p. 177, tab. ccxcviii., ccxcix., and ccc.). The description of that shell by Sowerby might, with a few alterations, be taken for that of our species, even to the remarks as to the state of preservation of the fossil. The differences appear principally to be that in *O. inornatus* the

spire is usually more concealed, while the wing is not so much extended; the young shells of this species are also much less elongate in their proportions. There may be other differences; but the specimens in the Geological Society's collection do not enable me to speak with certainty of them, as no example is perfect. One (in fragments) attained the dimensions of at least six inches long and four wide.

29. STROMBUS HAITENSIS, Sow. G. J. vol. vi. p. 48, pl. ix. fig. 7.

Gabb regards this as being *S. bituberculatus*, Sow.

30. STROMBUS PROXIMUS, Sow. G. J. vol. vi. p. 48, pl. ix. fig. 8.

Strombus pugilis, C. Moore.
—— *pugiloides*, Guppy.
—— *ambiguus*, Sow.

In his synonymy of *S. pugilis*, Gabb includes the following:—*ambiguus*, Sow.; *bifrons*, Sow.; and *pugilis* (=*pugiloides*, Guppy).

Whilst admitting much truth in Gabb's rectification, I cannot go so far as to regard *S. bifrons* as a synonym of either *S. pugilis* or *S. proximus*.

In Geol. Mag. 1874, p. 433, I have given what I consider good reasons for separating the fossils formerly regarded by Mr. Carrick Moore and myself as *S. pugilis* under a distinct name, and I proposed that of *pugiloides*. I am, however, after an examination of the types in the Geological Society's collection, prepared to agree that *S. proximus* and *S. ambiguus* are not separable from the *Strombus pugilis* of Carrick Moore and myself. One of Sowerby's names (being prior) must therefore take the place of my name *pugiloides*; and the name *proximus* may be allowed, to indicate the position of the species so near to the recent *S. pugilis*.

31. STROMBUS BIFRONS, Sow. G. J. vol. vi. p. 48, pl. ix. fig. 9.

I prefer to retain this name for the specimens which resemble *Strombus dilatatus* and *columba* more than *pugilis*.

32. MUREX DOMINGENSIS, Sow. G. J. vol. vi. p. 49, pl. x. fig. 5.

Gabb notes the relationship of the species to *M. haustellum*. To my eye its nearest kindred is *M. messorius*, Sow., a West-Indian recent species by no means very close to *M. haustellum*.

I cannot decide if *M. antillarum*, Gabb, is distinct from *M. domingensis*, Sow.

33. MUREX CORNURECTUS, n. sp. (Pl. XXVIII. fig. 4.)

Ovate-turreted, with three varices, which are nearly continuous, and stout revolving ridges accompanied by finer lines; two or occasionally three variciform tubercles between each varix; varices fringed by subtubular spines, of which the one corresponding to the keel on the angle of the whorls is much the longest. Aperture oval, the inner margin callous, the outer margin dentate, the dentations running in pairs. Canal moderately long and slightly curved.

Nearly related to *M. cornucervi*, Mart. (= *brevifrons* = *M. calcitrapa* of some authors).

34. MUREX TEXTILIS, Gabb. (Pl. XXIX. fig. 1.)

Murex textilis, Gabb, Trans. Amer. Phil. Soc. vol. xv. p. 202.

This species is a member of the group *Pteronotus*, and is allied to the following species, and more closely to the first named than either of the others:—

M. festivus, Hinds, Voy. Sulph. pl. iii. figs. 13, 14.
M. pinniger, Brod.; Wood, I. T. Suppl. *Murex* 4.
M. tripterus, Born; Reeve, C. I. *Murex* 55.
M. macropteron, Desh.; Reeve, C. I. *Murex* 123.
M. gambiensis, Reeve.
M. cyclopterus, Millet, J. Conch. 1875, p. 147.

Under *M. textilis*, Gabb, I include *M. compactus*, Gabb.

35. TROPHON DOMINICENSIS, Gabb, *l. c.* p. 202.

The description of this species seems not to be inapplicable to *Murex collatus*, Guppy (Geol. Mag. 1874, p. 433, pl. xvi. fig. 8), and may refer to the same species. There is a specimen of *Trophon* in the Society's collection upon which I cannot venture to decide, as it seems different.

36. TYPHIS ALATUS, Sow. G. J. vol. vi. p. 48, pl. x. fig. 4.

I have recorded this species from the Miocene of Jamaica and the Pliocene of Trinidad.

The form described by Gabb as *T. obesus* is represented in the Society's collection; and I have it also from Jamaica; it is not specifically distinct from *T. alatus*.

37. RANELLA CRASSA, Dillw. G. J. vol. xxii. pl. xviii. fig. 9.

38. TRITON DOMINGENSIS, Gabb, pl. B. fig. 2.

Triton domingensis, Trans. Amer. Phil. Soc. vol. xv. p. 212.

39. TRITON VARIEGATUS, Lam.

40. TRITON FEMORALIS, Linn.

41. TRITON GEMMATUS, Reeve.

42. PERSONA SIMILLIMA, Sow. G. J. vol. vi. p. 48.

Persona simillima, Guppy, G. J. vol. xxii. pl. xvii. fig. 13.

Gabb remarks on the alliance of this species with *P. constricta* of the west coast of America. It is, however, as near to the recent *Persona reticularis*, Linn., found somewhat rarely in the West Indies, and to *P. clathrata*, a closely related form from the east coast of Africa (Madagascar) and Ceylon.

43. TURBINELLUS (LATIRUS) INFUNDIBULUM, Gmel.

Gabb describes as new species four forms. I entertain doubt whether they are distinct from the above; but want of material prevents me from speaking with certainty.

44. TURBINELLUS ÆDIFICATUS, n. sp. (Pl. XXVIII. fig. 5.)

Shell solid, rimate, very shortly fusiform, spire high, composed of seven or eight whorls adorned with strong longitudinal ribs each terminating on the angle in a subtubular spine, and with numerous close spiral ridges, which are crossed by fine squamose lines of growth. Aperture narrow; inner lip covered with a thick callus bearing about four plaits.

Nearest to *T. capitellum*, Lam. (Kien. Coq. Viv. *Turbinella*, pl. 12). Indian Seas.

This species seems very different from any noticed hitherto. I have endeavoured to identify it with one of Gabb's descriptions, but without success, and therefore assign it provisionally a new name. I am not, however, without a suspicion that the specimens called *Vasum haitense* by Gabb belong to this species, while his *V. tuberculatum* is really the *T. haitensis* of Sowerby.

45. TURBINELLUS VALIDUS, Sow. G. J. vol. vi. p. 50.

Allied to *T. scolymus*.

46. TURBINELLUS OVOIDEUS, Kiener.

47. TURBINELLUS HAITENSIS, Sow. (Pl. XXIX. fig. 3.)

Turbinellus haitensis, Sow. G. J. vol. vi. p. 50.

I think *Vasum tuberculatum*, Gabb, may be referable to this species.

48. FASCIOLARIA SEMISTRIATA, Sow. G. J. vol. vi. p. 49.

Fasciolaria semistriata, Guppy, G. J. vol. xxii. pl. xvi. fig. 12.

I can detect no difference between *F. intermedia* and *F. semistriata*. The papillary apex noticed by Sowerby as a character of the former is, as Gabb remarks, simply the single nuclear whorl. It may have originally existed in the specimens assigned to *F. semistriata*. This species (including *F. intermedia*) is allied to *F. tulipa*. *F. textilis*, Guppy (Geol. Mag. 1874, p. 410, pl. xvi. fig. 5) is nearer to *F. filamentosa*, but is more ovoid in shape, and is, indeed, almost intermediate between the groups designated as *Turbinellus* and *Fasciolaria*, which, together with *Pyrula* (= *Cassidulus* of some authors, but excluding *Ficula*), may in a large sense be considered as subgenera of *Fusus*. Another species of *Fasciolaria* found in the West-Indian Miocene, but not yet recorded from Haiti, is *F. Tarbelliana*, Grat.

49. PYRULA MELONGENA, Linn.

P. consors, Sow. G. J. vol. vi. p. 49.

Gabb considers that *P. patula* is conspecific. I have doubts

whether they ought to be so regarded, though unquestionably nearly allied. A reexamination of the Haitian fossil revealed to me some difference in the surface characters of the Miocene and recent shells.

50. Fusus henekeni, Sow. (Pl. XXVIII. figs. 2 & 6.)

Fusus henekeni, Sow. G. J. vol. vi. p. 49.

An examination of Sowerby's *F. haitensis* proves that it is only an individual form of *F. henekeni*. Similar variations occur in the recent analogue of the species, *F. distans*, Lam.

51. Cuma tectum, Kiener.

This shell is well represented in the Geological Society's collection.

52. Phos Guppyi, Gabb, *l. c.* p. 212.

Phos erectus, Guppy, Geol. Mag. 1874, p. 410, pl. xvi. fig. 1.

53. Phos elegans, Guppy, G. J. vol. xxii. p. 290, pl. xvi. fig. 13.

Gabb makes this a synonym of *P. veraguensis*, Hinds, which I am not prepared at present to indorse; but I concur with him in regarding *P. Moorei* as a form of *P. elegans*. I should go a step further and unite, under the name of *P. elegans*, the forms described by Gabb as *P. costatus* and *P. semicostatus*. The *Nassa solidula* of the West-Indian Miocene appears to be distinct; but it is not recorded from Haiti.

54. Nassa incrassata, Müll.

55. Clea truncata, Gabb. (Pl. XXIX. fig. 6.)

Ectracheliza truncata, Gabb, Proc. Acad. N. S. Phil. 1872, p. 271, pl. ix. fig. 2; Trans. Amer. Phil. Soc. vol. xv. p. 213.

The new genus *Ectracheliza*, described by Gabb, appears to me identical with *Clea*, Adams, of which the type *Clea nigricans*, Adams, was figured in Gen. Moll. vol. ii. p. 625, pl. cxxxvii. fig. 8. The two species agree in general form, in the truncation of the apex, and even in the presence of an impressed more or less double spiral line below the suture. The fossil *C. truncata* appears to differ from the recent *C. nigricans* chiefly in the following respects:—The latter has a more vertical aperture, the outer lip not being so prominent anteriorly; and its columella is rather more strongly twisted.

The genus is with little doubt closely related to *Planaxis*, forming one of the links of connexion between *Oliva* and the other members of the Buccinidæ. Another species which may be compared with *Clea truncata* is the *Quoyia decollata* of Gray (Reeve, El. Conch. vol. i. p. 63, pl. iii. fig. 18), which, besides other differences, has a considerably higher spire.

56. Crepitacella cepula, Guppy.

Melanopsis cepula, Guppy, G. J. vol. xxii. p. 580, pl. xxvi. fig. 14.

Crepitacella cepula, Guppy, Geol. Mag. 1867, p. 500.

Dolophanes melanoides, Gabb, Proc. Acad. N. S. Phil. 1872, p. 273, pl. xi. fig. 7; Trans. Amer. Phil. Soc. vol. xv. p. 234.

After a careful examination no doubt remains on my mind of the correctness of the above synonymy, which is suggested by Prof. Gabb himself. The points of difference which he notices are not constant, as I have ascertained by the inspection of a series of specimens from Jamaica.

57. TEREBRA SULCIFERA, Sow. G. J. vol. vi. p. 47. (Pl. XXIX. fig. 8.)

T. bipartita, Sow.

T. inæqualis, Sow.

Gabb considers *T. sulcifera* to be identical with *T. robusta*, Hinds. After an examination of the numerous specimens in the Society's collection, I can establish no constant differences between the individuals described under the three above-quoted names by Sowerby.

T. flammea is included by error in our list of West-Indian Miocene fossils.

58. CASSIS SULCIFERA, Sow. G. J. vol. vi. p. 47, pl. x. fig. 1.

59. CASSIS MONILIFERA, Guppy, G. J. vol. xxii. p. 287, pl. xvii. fig. 8.

C. reclusa, Guppy, Geol. Mag. 1874, p. 434.

Gabb identifies this species with *C. granulosa*; and I find a very close resemblance between them. But *C. monilifera* is distinguished by its varices, which, however, are wanting in the form I have called *C. reclusa*; and the latter is moreover devoid of the row of tubercles on the angle. The species is as near to *C. subulosa* (Miocene of Europe) as to *C. granulosa*.

60. CASSIDARIA LÆVIGATA, Sow. G. J. vol. vi. p. 47, pl. x. fig. 2.

Cassidaria sublævigata, Guppy, G. J. vol. xxii. p. 287, pl. xvii. fig. 10.

While agreeing with Gabb that *C. sublævigata*, Guppy, is only a variety, I may mention that it is a distinguishable form. Examples of it were separated in the Geological Society's collection by Mr. Carrick Moore as *C. lævigata*, var.

61. ONISCIA DOMINGENSIS, Sow. G. J. vol. vi. p. 47, pl. x. fig. 3.

62. MALEA CAMURA, Guppy, G. J. vol. xxii. p. 287, pl. xvii. fig. 9.

Gabb regards this as identical with *M. ringens*, Swains. (*latilabris*, Val.).

63. FICULA MISSISSIPIENSIS, Conr. Journ. Phil. Acad. 2nd ser. vol. i. p. 117.

F. carbasea, Guppy, G. J. vol. xxii. p. 580, pl. xxvi. fig. 7.

Found also in the Miocene of Jamaica and Trinidad.

64. COLUMBELLA VENUSTA, Sow. G. J. vol. vi. p. 46, pl. ix. f. 6.

For this species Gabb creates a new genus *Metulella*, in which he includes another shell found by him in the Haitian Miocene and described as *Metulella fusiformis*, Gabb, a figure of which is given by him in Journ. Acad. N. S. Phil. 1872, pl. xi. f. 3.

65. COLUMBELLA GRADATA, Guppy, G. J. vol. xxii. p. 288, pl. xvi. f. 10.

I am inclined, upon a reexamination of the fossils, to consider *C. ambigua*, Guppy, as only a marked variety of *C. gradata*; and I should include under the same name the *Strombina caribœa* of Gabb. The Cumana specimens of *C. gradata* exhibit all the characters ascribed by Gabb to his *S. caribœa*, including the *Ranella*-like flattening, which is less pronounced in the Jamaican examples, and not found at all in the form called *C. ambigua*. I further doubt if *C. inflata*, Gabb, is separable from *C. gradata*.

66. COLUMBELLA HAITENSIS, Sow. G. J. vol. vi. p. 46.

From the description I should suppose that *C. exilis*, Gabb, may be comprised under this name.

67. OLIVA CYLINDRICA, Sow. G. J. vol. vi. p. 45.

I cannot find any sufficient characters upon which to base a separation into distinct species of the Olives found in the West-Indian Miocene. Some of them approach more or less closely to *O. reticularis*; but I am not sure of their specific identity. One of my specimens of *O. cylindrica* from Jamaica is more than $3\frac{1}{2}$ inches long, and has lost about $\frac{1}{2}$ inch of its spire. Gabb names five other species; but I can give no certain opinion as to their validity.

Gabb describes under the name of *Plochelœa crassilabrum* (Proc. Acad. N. S. Phil. 1872, p. 971, pl. xi. f. 5) a form of Olive which I have not met with.

68. ANCILLARIA GLANDIFORMIS, Lam.

I am not certain of the distinctness of my *A. pinguis* (Jamaica) from this species.

69. PLEUROTOMA HAITENSIS, Sow. G. J. vol. vi. p. 50.

P. Barretti, Guppy, G. J. vol. xxii. p. 290, pl. xvii. f. 6.

Gabb considers *P. haitensis* to be the same as *P. virgo*, and includes in the synonymy (besides *P. Barretti*) *P. Jelskii*, Crosse, and *P. antillarum*, Crosse.

70. PLEUROTOMA HENEKENI, Sow. G. J. vol. vi. p. 50, pl. x. f. 6.

P. jaquense, Sow. *l. c.* p. 51.

I concur with Gabb in the fusion of the above two specific names; and I would add his *P. longicaudata* and *P. humerosa* to the synonymy.

71. PLEUROTOMA VENUSTA, Sow. G. J. vol. vi. p. 50, pl. x. f. 7.

My *P. jamaicensis* may possibly be referred to this species as a small and marked variety. The living analogue of this species appears to be *P. gibbosa*, Chemn.

72. PLEUROTOMA CONSORS, Sow. G. J. vol. vi. p. 50. (Pl. XXVIII. fig. 7.)

I cannot undertake to say that this is identical with *P. militaris*, Hinds, though Gabb considers it so. The likeness was remarked by Sowerby.

73. PLEUROTOMA SQUAMOSA, Gabb, Trans. Amer. Phil. Soc. vol. xv. p. 208. (Pl. XXIX. fig. 7.)

There is one example of this species in the Geological Society's collection. The sculpture is very remarkable. Several other forms of *Pleurotoma* are named by Gabb; but I have seen none which may not be referred to one or other of the above five species, which are well marked and decidedly distinct.

74. CLAVATULA LABIATA, Gabb, Trans. Amer. Phil. Soc. vol. xv. p. 209. (Pl. XXVIII. fig. 3.)

Near to *C. imperialis*, Lam. West Africa.

75. CONUS RECOGNITUS, Guppy.

C. solidus, Sow. G. J. vol. vi. p. 45; Guppy, G. J. vol. xxii. pl. xvi. fig. 1.

Gabb identifies this with *C. pyriformis*, Reeve. The *C. solidus* of Sowerby (Thes. Conch. 580, = *C. retifer*, Menke) is a different species, very unlike the Haitian shell.

76. CONUS CONSOBRINUS, Sow. G. J. vol. vi. p. 45; Guppy, Geol. Mag. 1874, pl. xvii. f. 3.

C. granozonatus, Guppy, G. J. vol. xxii. p. 287, pl. xvi. f. 5.

Prof. Gabb has so conscientiously worked out the Haitian Cones that I accept this rectification, which otherwise would have appeared to me difficult. The figure given by me in the Geological Magazine is fairly representative of the usual form.

77. CONUS CATENATUS, Sow. G. J. vol. vi. p. 45, pl. ix. f. 2.

C. interstinctus, Guppy, G. J. vol. xxii. p. 288, pl. xvi. f. 3.

C. stenostoma, Sow. G. J. vol. vi. p. 44; Guppy, G. J. vol. xxii. p. 287, pl. xvi. f. 2.

Gabb records *C. stenostomus* as distinct from *C. catenatus*; but I find great difficulty, on comparison of many specimens, in drawing the line of demarcation.

78. CONUS GRACILISSIMUS, Guppy, Geol. Journ. vol. xxii. p. 288, pl. xvi. f. 4.

Gabb refers this to *C. Orbignyi*, Audouin (*C. planicostatus*, Sow.).

It bears much likeness to a shell recently described by Sowerby as *C. gracilis* (Zool. Proc. 1875, p. 125, pl. xxiv. f. 6).

79. CONUS MARGINATUS, Sow. G. J. vol. vi. p. 44. (Pl. XXIX. fig. 5.)

I believe the specimens from Cumana, which I formerly attributed to *C. haitensis*, really belong to *C. marginatus*—a mistake due to want of figures.

80. CONUS PLANILIRATUS, Sow. G. J. vol. vi. p. 44.

C. planiliratus, Guppy, G. J. vol. xxii. p. 287, pl. xvi. f. 7.
Gabb identifies this with *C. Stearnsi*, Conrad, Florida.

81. CONUS HAITENSIS, Sow. G. J. vol. vi. p. 44.

C. symmetricus, Sow. *l. c.* p. 44, pl. ix. f. 1.
C. domingensis, Sow. *l. c.* p. 45.

I adopt the above synonymy from Prof. Gabb. The shell described by me as *C. prototypus* may possibly be the same as *C. strombiformis*, Gabb.

Of the other species of *Conus* enumerated by Prof. Gabb I have no knowledge. All the West-Indian Miocene forms I have seen may be assigned to one or other of the species named above—though, owing to the great range of variation, some difficulty is sure to be felt until the student has obtained a closer acquaintance with these fossils.

82. MITRA HENEKENI, Sow. G. J. vol. vi. p. 46, pl. ix. f. 5.

I have recognized no other Mitre than this in the West-Indian Miocene; and I should be inclined to place under it most, if not all, of the forms described by Gabb under different specific names—the only exception being *M. tortuosa*, which Prof. Gabb states to belong to the group *Costellaria*, Swains., and to be akin to *M. semifasciata*, Lam. The *M. varicosa* of Sowerby has not been identified either by Prof. Gabb or myself. It is possible that *M. titan*, Gabb, may be a valid species.

83. VOLUTA PULCHELLA, Sow. G. J. vol. vi. p. 46, pl. 9. f. 4.

Gabb is right in considering *V. soror*, Sow., to belong to this species. It has no characters by which even to separate it as a variety.

I have not met with *Scapha striata*, Gabb.

84. MARGINELLA CONIFORMIS, Sow. G. J. vol. vi. p. 45; Guppy, G. J. vol. xxii. p. 288, pl. xvii. f. 2.

85. MARGINELLA SOWERBYI, Gabb, Trans. Amer. Phil. Soc. vol. xv. p. 221. (Pl. XXVIII. fig. 1.)

86. CYPRÆA HENEKENI, Sow. G. J. vol. vi. p. 45, pl. ix. fig. 3.

87. CYPRÆA GABBIANA, n. sp. (Plate XXIX. fig. 10.)

The cowry for which I propose the above name has hitherto been considered by me to be *C. pustulata*, and has been identified by

Gabb as *C. nucleus*. I think it may be regarded as intermediate between those two species; and it presents, I think, some characters which, combined with its distance in time and space from its nearest congeners, may warrant a provisional specific name:—

Oval-elongate, rostrated at both ends, superiorly covered with large shining tubercles, which are almost circular upon the back, but become elongate and have a tendency to run into ribs near the thickened and regularly grooved lip, whose dentations are continuous with the ribs on the outside. A dorsal groove separates the back into two nearly equal halves.

The tubercles are larger than those of *C. nucleus*.

88. Calliostoma conicum, Gabb, *l. c.* p. 243.

I possess a shell from the Miocene of Jamaica which may belong to this species. It differs from Gabb's description in having beaded ribs, of which the one on the angle of the whorls is largest. The shells described by me from the Pliocene of Trinidad under the names *Trochus decipiens* and *plicomphalus* are nearly allied.

A critical examination of the species of this section of *Trochus* found in the West-Indian area is much needed. They are very rare; but a few are occasionally found. The present shell resembles some of the European Miocene forms, e. g. *T. laureatus*, Mayer, and *T. Paulucciæ*, Mayer.

I do not recognize the *Margarita tricarinata* nor the *Adeorbis carinata* among the Haitian fossils. It has occurred to me that one or both of them belong to the species described by me as *Cyclostrema bicarinatum*; but I can speak with no certainty on this point.

89. Phorus delectus, n. sp. (Plate XXVIII. fig. 10.)

Shell conical, umbilicate, whorls sharply angulated below, forming a very concave base, and bearing on the periphery a keel carrying obtuse tubercles. Upper surface covered with close undulated ridges, occasionally dichotomous or anastomosing, and running in a more or less spiral direction, but directed rather towards the outer margin. Base concave, covered with spiral rows of small grains.

I do not feel sure that this is the shell indicated by Prof. Gabb under the name of *Phorus agglutinans*, Lam. It is certainly very different from the Eocene *P. agglutinans*, and it is apparently sufficiently distinct from the living *Phorus* of the West Indies (whose name is properly *P. conchyliophorus*) to deserve a specific appellation.

90. Teredo fistula, Lea, ?=Kuphus incrassatus, Gabb.

91. Corbula viminea, Guppy, G. J. vol. xxii. p. 293, pl. xviii. fig. 11.

Bothrocorbula viminea, Gabb, Proc. Acad. N. S. Phil. 1872, p. 274, pl. x. fig. 3.

The new genus *Bothrocorbula* of Gabb is founded upon this species, and may possibly pass as a subgenus or section.

92. CORBULA VIETA, Guppy, G. J. vol. xxii. p. 580, pl. xxvi. fig. 8.

According to Gabb this is *C. disparilis* of D'Orbigny. I am not prepared to assert the specific identity of the recent with the fossil shell, although the latter is found in the Eocene, Miocene, and Pliocene of the West Indies.

Gabb records three other species of *Corbula*, of which one is described as new.

93. NEÆRA ORNATISSIMA, D'Orb.

It is possible that to this species may be referred the shell formerly regarded by me as *N. costellata*, Desh. Gabb (I think, rightly) regards as synonymous the *N. alternata* of D'Orbigny.

94. TELLINA BIPLICATA, Conrad, Tertiary Fossils, p. 36, pl. xix. fig. 4.

T. Sagræ, D'Orb. Pal. Cuba.

Allied to *T. interstrialis*, *T. sobralensis*, and *T. ephippium*.

I have not identified with certainty any of the other *Tellinæ* recorded by Gabb. This one is not mentioned by him.

95. TELLIDORA CRYSTALLINA, Chemn.

This is recorded by Gabb, who identifies a Haitian fossil with the west-coast species of the above name. I mention it only to observe that I have found a shell in the West Indies which is nearly allied, if not identical, presenting some slight though constant differences.

96. LUCINA TIGRINA, Linn.

97. LUCINA PENNSYLVANICA, Linn.

98. CRASSINELLA MARTINICENSIS, D'Orb.

Crassatella martinicensis, D'Orb. Moll. Cuba, vol. ii. p. 288, pl. xxvii. figs. 21–23.

C. guadelupensis, D'Orb., ib. p. 289, pl. xxvii. figs. 24–26.

This species occurs throughout the Miocene and Pliocene beds of the West Indies. I have no doubt of the two forms named by D'Orbigny being referable to one species, which belongs to the genus *Gouldia* of C. B. Adams. The name *Gouldia* having been used for a genus of birds, I proposed in 1874 the name *Crassinella* to replace it for these shells.

99. VENUS PAPHIA, Linn.

100. VENUS BLANDIANA, Guppy, Geol. Mag. 1874, p. 436, pl. xvii. fig. 8.

Allied to *V. rugosa*.

101. VENUS WOODWARDI, Guppy, G. J. vol. xxii. p. 292, pl. xviii. fig. 1.

I think it not improbable that *Chione Guppyana*, Gabb, belongs to this species.

Gabb also records *V. magnifica*, Hanley, the recent analogue of which is an inhabitant of the Philippine Islands.

102. CYTHEREA JUNCEA, Guppy, G. J. vol. xxii. p. 582, pl. xxvi. fig. 13.

Closely related to *C. circinata*, with which Gabb considers it identical—a view which I am not prepared to controvert. But should we not add *C. acuticostata* and *Tryoniana* of Gabb, although placed in a different section?

103. CYTHEREA CARBASEA, Guppy, G. J. vol. xxii. p. 292, pl. xviii. fig. 13.

104. CYTHEREA PLANIVIETA, Guppy, G. J. vol. xxii. p. 292, pl. xviii. fig. 3.

The figure cited is taken from a slightly distorted specimen.

105. CARDIUM HAITENSE, Sow. G. J. vol. vi. p. 52, pl. x. fig. 11.

106. CARDIUM LINGUALEONIS, Guppy, G. J. vol. xxii. p. 292, pl. xviii. fig. 7.

Gabb regards this as identical with *C. subelongatum*, Sow.

107. CARDIUM INCONSPICUUM, Guppy, G. J. vol. xxii. p. 293, pl. xviii. fig. 12.

Gabb describes another species under the name *C. dominicense*; but although he gives it nearly 60 ribs, I am not sure that it is different from *C. inconspicuum*.

108. ERYCINA TENSA, Guppy, G. J. vol. xxii. p. 582, pl. xxvi. fig. 6.

This shell was described by me from beds which are now regarded as Eocene. Gabb records it from Haiti.

109. CARDITA SCABRICOSTATA, Guppy, G. J. vol. xxii. p. 293, pl. xviii. fig. 10.

110. CHAMA ARCINELLA, Lam.

111. CHAMA INVOLUTA, Guppy, Geol. Mag. 1874, p. 436, pl. xvii. figs. 5 *a*, *b*, *c*.

Some enormously thickened and heavy examples of *Chama* in the collection appear to me to be very old specimens of this species.

112. ARCA PATRICIA, Sow. G. J. vol. vi. p. 52.

Undoubtedly near to *A. grandis*, with which Gabb identifies it.

113. ARCA CONSOBRINA, Sow. G. J. vol. vi. p. 52, pl. x. fig. 12.

Gabb states that *A. floridana*, Conr., is a synonym.

114. ARCA OCCIDENTALIS, Phil.

A. noæ, Guppy, G. J. vol. xxii. p. 293.

I am not sure that I have the right name of this shell, which is determined by Gabb to be *A. imbricata*, Brug.

Gabb describes three other Arks; and we have also *A. pexata* recorded from the Haitian Miocene.

115. PECTUNCULUS DECUSSATUS, Linn.

This appears to be the prior name of the species formerly recorded by me as *P. pennaceus*, Lam. (Hanley, Ips. Linn. Conch. p. 96).

116. PECTUNCULUS ACUTICOSTATUS, Sow. G. J. vol. vi. p. 53, pl. x. fig. 3.

Of *Leda* and *Nucula* we have several species recorded from the West-Indian Miocene; but I have not recognized any of them among the Haitian fossils.

117. PECTEN THETIDIS, Sow. G. J. vol. vi. p. 52.

118. PECTEN OXYGONUS, Sow. G. J. vol. vi. p. 52.

P. exasperatus, Guppy, G. J. vol. xxii. p. 294.
I agree with Gabb in the above rectification.

119. PECTEN INÆQUALIS, Sow. G. J. vol. vi. p. 52.

Pecten inæqualis, Guppy, G. J. vol. xxii. p. 294, pl. xviii. fig. 6.

120. OSTREA VIRGINICA, Gmel.

121. OSTREA HAITENSIS, Sow. G. J. vol. vi. p. 53.

Gabb has corrected the error into which I fell in regarding this as identical with the preceding.

122. DITRUPA DENTALINUM, Guppy, Geol. Mag. 1874, pl. xvi. fig. 11, and 1875, p. 41.

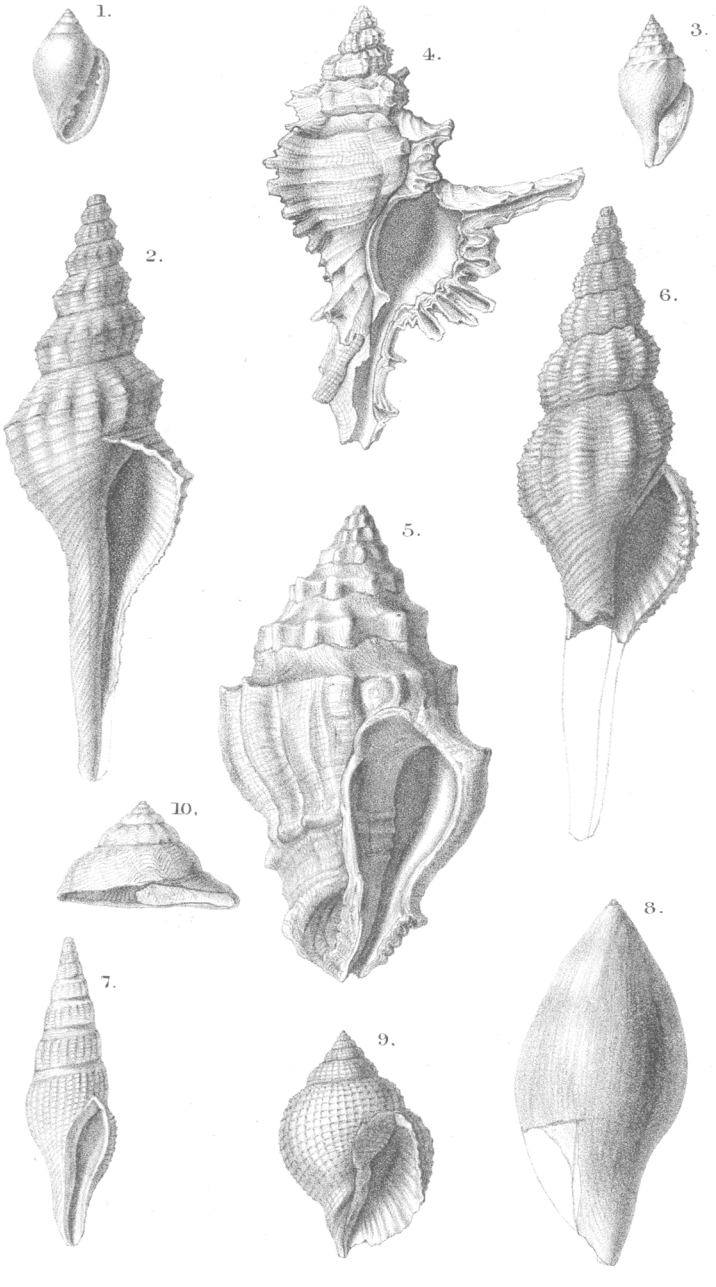
EXPLANATION OF THE PLATES.

PLATE XXVIII.

Fig. 1. Marginella Sowerbyi.
2. Fusus Henekeni, var. haitensis.
3. Clavatula labiata.
4. Murex cornurectus.
5. Turbinellus ædificatus.
6. Fusus Henekeni, type.
7. Pleurotoma consors.
8. Orthaulax inornata.
9. Cancellaria epistomifera.
10. Phorus delectus.

PLATE XXIX.

Fig. 1. Murex textilis.
2. Triton domingensis.
3. Turbinellus haitensis.
4. Cerithium uniseriale.
5. Conus marginatus.
6. Clea truncata.
7. Pleurotoma squamosa.
8. Terebra sulcifera.
9. Cerithium obesum.
10. Cypræa Gabbiana.
11. Sigaretus excentricus.



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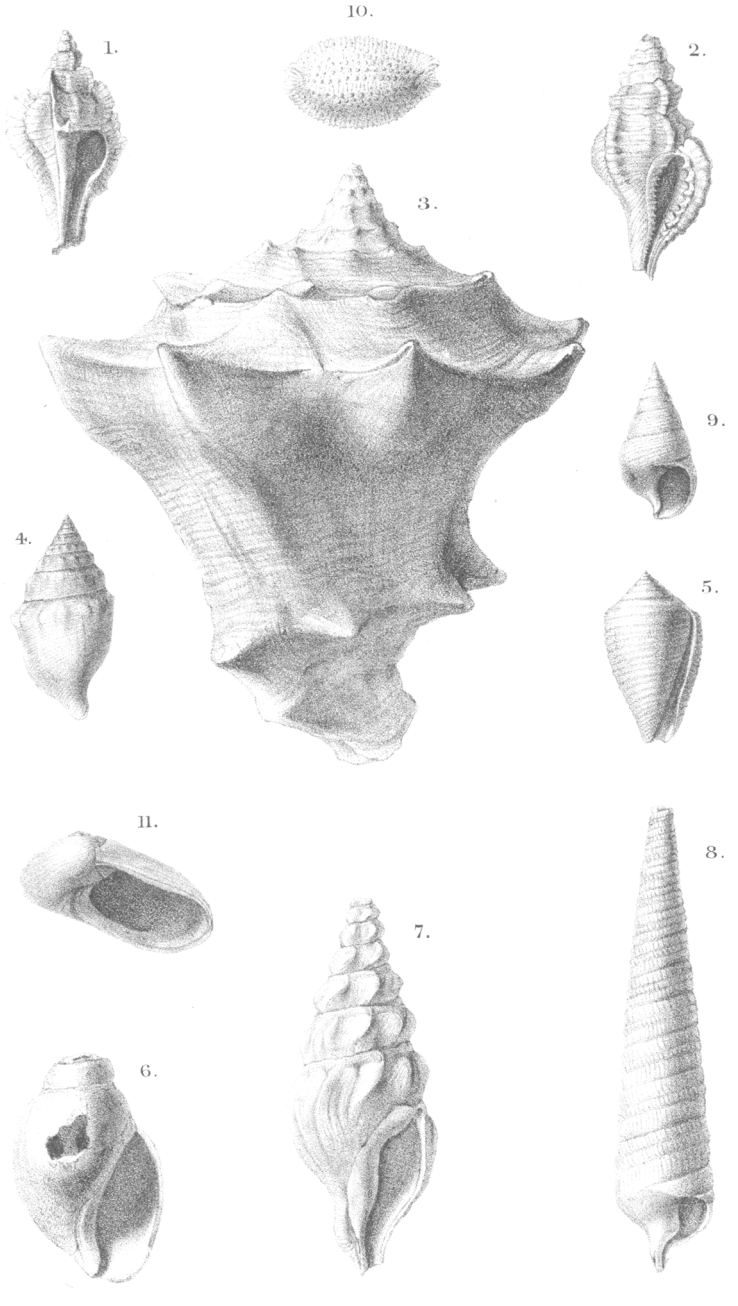

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