

DESCRIPTIONS OF TERTIARY FOSSILS FROM THE
ANTILLEAN REGION.

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SOME TIME since, the United States National Museum acquired by purchase the collection of Antillean Tertiary fossils made by the senior author of this paper, containing many types and also some new but undescribed forms. Mr. Guppy forwarded descriptions of the latter for publication in the Proceedings of the United States National Museum. Owing to the absence of named collections and works of reference in Trinidad, some changes were necessary to prepare the paper for printing, and at Mr. Guppy's request I have revised the manuscript, supervised the preparation of the figures of the new species, and added descriptions of some other new forms in the National Museum collections from the same region.

The sources of the fossils are as follows:

Pliocene.—The marls of Moen, Costa Rica, and vicinity afford many finely preserved Pliocene fossils, which have been collected and described by W. M. Gabb, and from which R. T. Hill has also obtained some material.

Miocene.—Beds in the Isthmian region, and also in Jamaica, and the Caroni beds of Trinidad have long been referred to the Miocene, from their obvious relations to the so called Miocene of Bordeaux and Dax; others of analogous age were discriminated by me from the Chesapeake Miocene of Virginia, Maryland, and Florida under the name of the Chipolan or Old Miocene. Subsequent studies have shown that all these beds, including those of Bordeaux, are referable to what is now known as the Oligocene or uppermost Eocene horizons. No strictly Miocene strata have yet been discriminated in the Antillean region,

and it is probable that the general elevation of the Antillean and Middle American lands, which is known to have taken place about the end of the Oligocene, maintained all of the present land areas above the level of the sea during the Miocene period. The strata of true Miocene in Florida are known to be extremely thin, and may probably have run out altogether a little farther south.

Upper Oligocene.—The Bowden and Clarendon marls of Jamaica, though only a few feet in thickness, are extremely rich in well-preserved fossils, many of which are common to the Chipola beds, Tampa, and Chattahoochee horizons of Florida, corresponding to the Aquitanian of France. The deposits in Jamaica have been explored by Vendryes, from whom Mr. Guppy received most of his Jamaican material; by Henderson and Simpson, for the National Museum, and by R. T. Hill, under the auspices of Dr. Alexander Agassiz. Similar beds in Santo Domingo and Haiti have been the source of specimens described by Sowerby and Gabb, and collections made by Rowell and Bland. Mr. Guppy has also described a number of species from this island. On the isthmus in the upper marls of Monkey Hill, in the Naparima beds of Trinidad, in Curaçao and elsewhere, there appear to be strata referable to the same series. Mr. Guppy recognizes the following horizons in Trinidad: Ally Creek shell bed, Naparima; Leda and Nucula beds, Naparima; Ditrupa bed, Pointapier. The last mentioned is evidently due to deposition in deeper water than the others. In all the Trinidad beds the fossils are less well preserved than in Jamaica, Haiti, and the Isthmus of Darien.

Lower Oligocene.—The Guallava sandstones of Costa Rica afforded Mr. Hill a few typical Vicksburgian species, being the southernmost point at which characteristic Vicksburg fauna has yet been recognized.

Eocene.—The Gatun beds of Conrad and Hill, the lower marls of Monkey Hill, and the Mindi Hill beds of the Panama Isthmus, are Eocene and contain a fair proportion of species common to the Claibornian of Alabama and the Upper Tejon of California. Among these may be mentioned *Lupia perovata*, Conrad, *Solarium alveatum*, Conrad, *Lunatia eminula*, Conrad, several species of Naticoids and *Cerithiopsis*, *Turritella wasana*, Conrad, and the genus *Glyptostyla*. Some of the species, like *Venus walli*, Guppy, and *Cardium haitensis*, Sowerby, appear to survive into the Oligocene. This horizon has been explored by Rowell, Conrad, Gabb, and others. The Manzanilla beds of Trinidad were probably contemporaneous.

The list of Tertiary fossils of the West Indian region, prepared by Mr. Guppy in 1874,¹ comprised some 250 species of fossil mollusks, but the fauna is much richer than this, since in one day, at the Bowden beds, Messrs. Henderson and Simpson procured over 400 species. A significant proportion of these appear to have survived little changed, or to be represented by closely analogous species in the recent fauna of

¹ Geol. Mag., Decade II, I, Nos. 9 and 10, Sept. and Oct., 1874.

the West Indies, while the corals, which are described by the late P. M. Duncan, are remarkably different from those of the existing fauna.

In the present paper those species followed by the name of Mr. Guppy were described by him, the others by the writer. Mr. Guppy notes that the new species from the Trinidad rocks, herein described, have for the most part been detected since 1890, during his reexploration of the microzoic rocks of the island. The strata are briefly described in his paper on the "Tertiary microzoic formations of Trinidad," read before the Geological Society of London in June, 1892, and published in the issue of the Journal of the society for November, 1892.

WM. H. DALL.

DESCRIPTION OF THE SPECIES.

RINGICULA, doubtful species, junior.

Oblong-ovate, turritid; whorls 5, spirally ribbed by rounded costæ with narrow (linear) interstices; aperture suboval; columella with two strongly twisted folds; spire conic; apex smooth, blunt. Length 3 mm., breadth 2 mm. [G.]

Ditrupe bed, Pointapier, Trinidad, Guppy (2270). No. 107108, U.S.N.M. Shells all incomplete and too young to name or discriminate, but useful as establishing the presence of this genus in the beds.

TORNATINA BULLATA, Kiener.

T. canaliculata, ORBIGNY, Moll. Cuba, I, p. 133, pl. IV *bis*, figs. 21-24, 1853; not of SAY.

Oligocene of Jamaica (Guppy, 2267). No. 107110, U.S.N.M.

PLEUROTOMA VENUSTA, Sowerby.

P. venusta, SOWERBY, Journ. Geol. Soc. Lond., VI, p. 50, pl. x, fig. 7, 1849.

P. jamaïcense, GUPPY, Journ. Geol. Soc. Lond., XXII, p. 290, pl. XVI, fig. 6, 1866.

Oligocene of Jamaica and Haiti; Ditrupe bed, Pointapier, Trinidad, Guppy (2118, 2255). No. 107140, U.S.N.M. Very young specimens of several other species were obtained from this locality, but they were not sufficiently matured for description.

CLATHURELLA AMICTA, Guppy, new species.

(Plate XXVII, fig. 12.)

Fusiform-ovate with longitudinal ribs crossed by revolving (spiral) ridges which rise upon them; whorls about 7, strongly keeled in the middle by one of the most prominent of the revolving ridges, sometimes the uppermost one, but in other examples the third or fourth; aperture elongate-oval; peristome broadly expanded and reflected; sinus produced. Alt., 4.6 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2273). No. 107142, U.S.N.M.

CLATHURELLA VENDRYESIANA, Dall, new species.

(Plate XXVII, fig. 1.)

Acuminate, fusiformly oblong-turritid, closely and regularly cancellate; Longitudinal sculpture boldest on upper whorls, except the first two, which are quite smooth; whorls 8, the last forming about one-half; upper angle of whorls forming a slight keel, upon which the longitudinal striae become sinuate; aperture oblong, narrow; canal and sinus broad and deep; lip much thickened. Length 14 mm., breadth 5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2284). No. 107086, U.S.N.M. This species was sent by Mr. Guppy under the manuscript name *formosa*, which is preoccupied in the genus *Clathurella* by Jeffreys, 1883.

CYTHARA GIBBA, Guppy, new species.

(Plate XXVII, fig. 9.)

Much resembling *C. biconica*, Reeve, but smaller and proportionately shorter. Alt., 3.8 mm.

Oligocene of Jamaica, Vendryes (Guppy, 2274). No. 107143-4, U.S.N.M.

CYTHARA GUPPYI, Dall, new species.

(Plate XXVII, fig. 5.)

This differs from *C. biconica*, Reeve, by its less angular shoulder, its lower, more rounded, and dehcate ribs, and smaller nucleus. Alt. 6.5 mm.

Oligocene of Jamaica, Vendryes (Guppy, 2275). No. 107145, U.S.N.M. This was sent under the preoccupied manuscript specific name of *gibberosa*, Guppy, for which I have substituted the above designation.

CYTHARA MUCRONATA, Guppy, new species.

(Plate XXVII, fig. 6.)

Fusiformly oblong, acuminate, cancellate, the longitudinal ridges being usually but not always the stoutest; whorls 5, the two apical ones large and smooth; suture marked by a prominent smooth, revolving ridge; last whorl more than one-half the shell; aperture suboval elongate; canal and sinus well developed; lip thickened. Alt. 5.5 mm., lat. 2.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2286). No. 107087, U.S.N.M.

CYTHARA OBTUSA, Guppy, new species.

(Plate XXVII, fig. 7.)

Ovate-fusiform, longitudinally ribbed by costae which are sinuate on the angle of the whorl and about the same width as their interstices, which are crossed by fine lines; whorls about 7, somewhat convex and

angulated; apex obtuse, the three apical whorls smooth; aperture narrow, produced into a moderate canal; lip thickened, notch very distinct. Length 6 mm., breadth 1.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2286). No. 107088, U.S.N.M. The preceding species of *Cythara* are on the border line between the typical *Cythara* and the small *Mangilia*, and might, with almost equal pertinency be included in either subdivision of the genus.

MANGILIA CONSENTANEA, Guppy, new species.

(Plate XXVII, fig. 4.)

Fusiform-turritid; whorls about 8, sharply angulate, spirally lirate, the strongest thread forming the angle of the whorls and rising like the other threads into knobs upon the longitudinally elongate or variciform tubercles; surface of whorl above the keel minutely lirate by fine spiral threads, aperture elongate, terminating in a moderate canal. Length 6.2 mm., breadth 2 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2289). No. 107091, U.S.N.M. This species is closely related to such species as *M. verina*, Kurtz and Stimpson, *M. limonitella*, Dall, and other recent forms which are characterized by a microscopically granular surface.

MANGILIA, doubtful species.

Oligocene of Jamaica, Guppy (2273). No. 107142, U.S.N.M. One or two indeterminable young shells, not of any of the above-mentioned species, were included in the same lot with *Clathurella amicta*.

CANCELLARIA ROWELLI, Dall, new species.

(Plate XXIX, fig. 1.)

Shell solid, acute, with seven moderately rounded whorls; suture well marked; spiral sculpture of numerous flat, little-elevated, narrow bands with narrower interspaces, the bands becoming more rounded, prominent, and somewhat alternated on the base; transverse sculpture of numerous low, narrow, flattish riblets with their posterior edges higher and sharper, crossing the spirals without interruption except on the base, and slightly nodulated by the two or three spirals in front of the suture; pillar constricted above the somewhat imbricated siphonal fasciole; aperture longer than wide, pillar with a wash of callus, and three plaits progressively less strong beginning with the posterior which crowns the fasciole; umbilicus none; body hardly callous; outer lip thickened, not reflected, obliquely receding in front, internally with sharp, distant lirations; canal short, recurved. Alt. 25, max. lat. 13 mm.

Potrero, Rio Amina, Santo Domingo, Rowell, in what are probably Oligocene strata. No. 113762, U.S.N.M. This species is named in honor of Rev. J. Rowell, an old collaborator of the Smithsonian Institution, and a pioneer of 1849 in California. It is perhaps most nearly

related to *C. urceolata*, Hinds, found living on the west coast of Middle America.

OLIVA PLICATA, Guppy, new species.

(Plate XXX, fig. 12.)

Cylindrical; spire conic; apex prominent; whorls 7; suture deeply channeled; columella with 10-12 strong plaits. Alt. 12.2, lat. 5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2288). No. 107090, U.S.N.M.

OLIVELLA INDIVISA, Guppy, new species.

(Plate XXX, fig. 10.)

Elongate-conic; whorls about 6, the last about three-fourths of the length of the shell. Allied to *O. oryza*, of which it may be considered a Miocene form. Alt. 6.5, lat. 1.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2287). No. 107089, U.S.N.M.

OLIVELLA, doubtful species.

Specimens of very young and indeterminable species of *Olivella* were found in some numbers in the Ditrupa bed at Pointapièr, Trinidad, by Guppy.

MARGINELLA SOLITARIA, Guppy, new species.

(Plate XXIX, fig. 14.)

Oblong; whorls about 4; spire conic; apex obtuse; aperture somewhat narrow, expanded anteriorly into a round, spout-like canal; lip thickened and strongly (4) dentate; columella twisted, with two strong folds and two teeth on the body whorl. Alt. 3, lat. 1.5 mm. [G.]

Ditrupa bed, Pointapièr, Trinidad, Guppy (2268). No. 107139, U.S.N.M.

MARGINELLA (PERSICULA) ARCUATA, Guppy, new species.

(Plate XXIX, fig. 13.)

Oval, solid, somewhat flattened; inner lip strongly dentate, outer lip sharp, dentate within; aperture curved, as long as the shell; spire very short. Alt. 4.5, lat. 3.5 mm. [G.]

Ditrupa bed, Pointapièr, Trinidad, Guppy (2253). No. 107141, U.S.N.M. The only specimen is obviously immature, but is related to *M. gravida*, Dall, and its predecessors in the Floridian Chipola beds.

MARGINELLA LATISSIMA, Dall, new species.

(Plate XXIX, fig. 11.)

Shell small, very solid and broad, externally smooth and polished, a wash of callus obscuring a very low spire of about 3 whorls; base callous; outer lip broad, thick, with a groove behind it and a low callus

on the shoulder behind the groove; aperture narrow, the outer lip smoother in front and behind, minutely denticulate near the middle; inner lip thickened; body with two transverse plaits, the posterior smaller; pillar short, with two oblique plaits, the anterior smaller. Lon. of shell 11, lat. 8.5 mm.

Pliocene clays of Moen, Costa Rica, Gabb; also from Santo Domingo, Bland. This is perhaps the shortest and widest American species.

MARGINELLA LIMONENSIS, Dall, new species.

(Plate XXIX, fig. 12.)

Shell large, thin, slender, anteriorly attenuated, of about 4 whorls; surface smooth, polished, the spire low, pointed, much obscured by enamel; aperture not quite as long as the shell, narrow, slightly wider in front and behind; outer lip thickened, incurved, smooth, on the outside, with a shallow sulcus marking off the lip from the whorl behind it; pillar lip hardly callous except near the spire; in front with four subequal oblique plaits, of which the anterior one is coincident with the border of the canal. Lon. 30, lat. 14 mm.

Pliocene clays of Limon, Costa Rica, Hill. No. 107076, U.S.N.M. This species recalls *M. antiqua*, Redfield, from the newer Miocene of Duplin County, North Carolina, but is smaller, more slender, with proportionately more prominent spire.

MARGINELLA AMINA, Dall, new species.

(Plate XXIX, fig. 15.)

Shell elongated, heavy, somewhat attenuated in front, with about 4 whorls; surface smooth, polished, spire rather more pointed and distinct than in *M. limonensis*, and with less enamel on it; aperture narrow, nearly straight, nearly as long as the shell; not widened behind; outer lip thick and heavy, profusely crenulated from end to end, on the outside with a very deep profoundly excavated sulcus, except above the shoulder, where there is a thick, callous deposit; pillar lip with a wash of callus, anteriorly with 4 plaits, the posterior pair transverse, the anterior oblique, enlarging forward; canal wide, excavated. Lon. 25, lat. 13 mm.

Potrero, Rio Amina, Santo Domingo, in Oligocene beds, Bland. This species is shorter, broader, and heavier than *M. limonensis*, from which it is further distinguished by its strongly crenulated lip and the extremely deep sulcus behind the lip.

MARGINELLA CONIFORMIS, Sowerby.

Marginella coniformis, SOWERBY, Quart. Journ. Geol. Soc. London, VI, p. 45, 1849.

Oligocene of Haiti and Santo Domingo, Sowerby and Bland, and of Jamaica, Barrett. No. 113769, U.S.N.M. The most abundant Santo Domingo *Marginella* is the *M. coniformis*, not figured by Sowerby, but

subsequently by Guppy.¹ In looking over the Guppy collection, now in the National Museum, I find a species from Cumana, labeled *M. coniformis*, but which can not be distinguished from *M. ciucta*, Kiener (No. 115599, U.S.N.M.); and another similarly named from Montserrat, Trinidad, which is a *Persicula*, closely related to *P. obesa*, Redfield.

MARGINELLA DOMINGOENSIS, Dall, new species.

Oligocene of Santo Domingo, from an island in Lake Henriquillo, and also from the Potrero, Rio Amina, Bland. Nos. 113683, 113768, U.S.N.M. This species is very close to *M. aurora*, Dall.² from the Chipola marl, but has the tip of the spire less conspicuous and the aperture quite flexuous instead of nearly straight.

PHOS METULOIDES, Dall, new species.

(Plate XXVIII, fig. 15.)

Shell small, solid, with 7 moderately rounded whorls, elegantly, evenly, reticulately sculptured by numerous subequal, flat, strap-like spirals and subflexuous transverse riblets with about equal interspaces and slightly nodulous at the intersections; aperture small, semilunate, the outer lip thickened and sharply lirate within, sharp edged, and anteriorly receding; body and pillar with little callus, and no marked constriction above the fasciole, which latter is marked by 5 spiral, flat riblets crossed by flexuous incremental lines and bounded on either side by the ordinary sculpture without any marked keel. Lon. 20, lat. 9 mm.

Ponton, Santo Domingo, Bland, in the Oligocene; also at Monkey Hill, on the Isthmus of Panama, in the Oligocene marl.

The sculpture of this species strongly recalls that of *Metula cancellata*, Gabb, from the same horizon. Fragments indicate that it reaches a much larger size than that above given.

PHOS GABBII, Dall, new species.

(Plate XXIX, fig. 4.)

Phos veraguensis, GABB, Geol. Santo Domingo, p. 212, 1873, not of HINDS.

Phos moorei and *elegans*, GABB, loc. cit., not of GUPPY.

The present species is most like *P. fasciolatus*, from which it can be instantly distinguished by its unarmed fasciole, over which the sculpture of the adjacent whorl passes without any marked interruption, much as it does in *P. metuloides*. There are 20 ribs on the last whorl against 14 in *P. fasciolatus*. There are numerous small callous ridges on the pillar, which is anteriorly keeled. The shell is 24 mm. long and 11.5 mm. wide.

¹ Geol. Journ., XXII, p. 288, pl. xvii, fig. 2, 1866.

² Trans. Wagner Free Inst. Sci., III, p. 51, pl. vi, fig. 4a.

Santo Domingo, Gabb; Potrero, Rio Amina, Bland; Jamaica, Barrett; in the Oligocene. In his paper above cited Gabb confused three different species of *Phos* under a name which belongs to none of them. *P. elegans* and *P. moorei* of Guppy are excellent species, and neither is identical with the recent Pacific Coast species of Hinds.

PHOS (STRONGYLOCERA) FASCIOLATUS, Dall, new species.

(Plate XXVIII, fig. 12.)

Shell solid, acute, with $1\frac{1}{2}$ smooth, nuclear, and 7 strongly sculptured, well rounded whorls; spiral sculpture of numerous flat spiral bands separated by narrow grooves, alternated on the earlier whorls, stronger on the base and more or less swollen on the spire when they pass over the ribs; transverse sculpture of (on the last whorl 14) numerous elevated, even, rounded, subequal ribs extending clear over the whorls and separated by wider interspaces; suture distinct; aperture subovate with a strong callus on the body and pillar, where there are a few faint tubercles, while the anterior edge of the pillar is marked by a sharp spiral keel; outer lip thickened, lirate; canal short, recurved; siphonal fasciole strong, keeled on each side, with a succession of prominent, sigmoid, elevated lamellae between the keels. Lon. 24, lat. 11.5 mm.

Oligocene at the Potrero, Rio Amina, Santo Domingo, Bland. No. 113778, U.S.N.M. This species is nearest to *P. semicostatus*, Guppy, and *P. guppyi*, Gabb, both of which are easily discriminated by the differences in sculpture.

PHOS (STRONGYLOCERA) CHIPOLANUS, Dall, new species.

Shell acute, with 2 smooth, nuclear and 7 strongly sculptured whorls, somewhat appressed at the suture; spiral sculpture much as in *P. semicostatus* of small, stout, rounded, partly alternated ridges swollen where they pass over the ribs, sparser and stronger on the base; transverse sculpture of (on the last whorl 7) strong, rounded ribs, evenly distributed and most prominent at the periphery; aperture wide, the outer lip lirate, the pillar keeled and reflected on the anterior edge: a sharp constriction and keel behind the siphonal fasciole, which is flexuously and imbricately sculptured transversely with a few small, spiral grooves; a moderate callus on the body and pillar. Lon. 25, lat. 13 mm.

Oligocene of the Chipola beds, Calhoun County, Florida, Dall. No. 114191, U.S.N.M. This species is most nearly related to *Phos solidulus* (Guppy as *Nassa*), *P. semicostatus*, Gabb, and *P. guppyi*, Gabb, all of which are well distinguished by sculpture and details of form. Among recent species *Phos uncinatus*, Say (as *Nassa*), is allied. I have already shown¹ that the last mentioned is distinguished both from *Phos* and *Nassa* by its operculum, which is lozenge-shaped, pointed in front and behind with a subcentral nucleus and concentric elements. The shell

¹ Blake Gastr., Bull. Mus. Comp. Zool., XVIII, p. 178, 1889.

is more like *Phos* than *Nassa*, and was named *Phos guadelupensis* by Petit in 1852. It is distinguished from the typical species of *Phos* by the excavation of the upper part of the whorls, and is one of the two species cited by Möreb under his undefined genus *Strongylocera*. The other species, *P. cancellatus*, Quay and Gaimard (not A. Adams), is a synonym of *P. textus* according to Tryon, and is a true *Phos*. The name *Strongylocera* may therefore, perhaps, be revived with advantage for species of the *unicincta* type, with a concentric operculum, and, among the fossils, *P. solidulus*, Guppy, *P. chipolani*, Dall, *P. fusciolatus*, Dall, *P. costatus*, Gabb, and *P. erectus*, Guppy, should be referred to it.

Genus STROMBINELLA, Dall.

Shell slender, elongated, with a presutural cingulum and a strong node behind the outer lip, near the suture, in the adult; otherwise sculptured like *Anachis*. This form appears at first sight like a small strongly sculptured *Terebra*, of the section *Aeus*, but the aperture is that of *Anachis*, to which it doubtless bears much such a relation as *Esopus* does to *Astyris*.

Type.—*Strombinella acuformis*, Dall.

STROMBINELLA ACUFORMIS, Dall, new species.

(Plate XXIX, fig. 6.)

Shell small, elongate, acute, slender, with 2 smooth nuclear and 9 or 10 sculptured whorls; spirally sculptured only on the base of the last whorl by narrow, deep grooves separated by wider, rounded threads, which become finer on the canal; transverse sculpture of (on the last whorl 12) strong, flexuous ribs extending from suture to suture, and united in front of the suture by a low, flattish, revolving ridge, which develops strong nodules at the intersections with the ribs; the last third of the last whorl is destitute of ribs, but the cingulum continues and terminates in a prominent node behind the outer lip; aperture small, semilunar, with a thin callus on the pillar, through which the spiral sculpture shows; the outer lip sharp, flexuous, somewhat expanded, with 1 to 3 coarse liræ internally; canal short, very deeply cut; pillar thin, gyrate, leaving a pervious axis. Lon. 13.5, lat. 3.5 mm.

Oligocene of the Potrero, Rio Amina, Santo Domingo. No. 113784, U.S.N.M. Two specimens of this elegant and interesting little shell were obtained from a correspondent and given to the Museum by the late Thomas Bland.

STROMBINA MIRA, Dall, new species.

(Plate XXIX, fig. 7.)

Shell small, solid, acute, with 7 whorls; the spire smooth except for a small ridge in front of the narrowly channeled suture; the last whorl finely spirally grooved below the periphery and on the pillar; aperture

long, narrow, the pillar and body with a moderate callus: pillar and canal short, hardly recurved; outer lip tumid, coarsely lirate within. Lon. 9, lat. 4.5 mm.

Oligocene of the Isthmus of Darien, near Gatun, Rowell, Hill, and others. No. 113713, U.S.N.M. This little shell has the aspect of an *Astyris*, but the aperture of a *Strombina*. It may be mentioned here that the *Planaxis crassilabrum* of Guppy, from the Tertiary of Trinidad, is founded, according to the types, on defective specimens of a *Strombina*, which is probably *S. haitensis*, Gabb.

TYPHIS, doubtful species.

Ditrupa bed, Pointapier, Trinidad, Guppy (2136). No. 107136, U.S.N.M. This species, represented by an extremely small immature specimen, was referred by Mr. Guppy to *T. alatus*, Sowerby, but a careful examination of it shows that it is more nearly related to *T. linguiferus*, Dall, of the Chipola, Florida, Oligocene and to *T. recurvirostratus*. Until a more mature specimen is obtained it would be inadvisable to apply a specific name to this species.

TYPHIS OBESUS, Gabb.

Typhis obesus, GABB, Geol. Santo Domingo, 1873, p. 203.

Oligocene of Santo Domingo, Gabb; of Jamaica, Vendryes and Hill; of the Chipola marl, Calhoun County, Florida, Dall and Burns. Nos. 115494, 112182, and 107455, U.S.N.M. This species was collected in Jamaica by Vendryes and named *T. alatus* in the Guppy collection, but it appears to be a sufficiently distinct species from Sowerby's shell and much more common. It is also found, rarely, in the Chipola marl.

A third species of *Typhis* from Jamaica is represented in the collection of the National Museum by a single, not very well preserved, specimen. It is closely related to, if not identical with, *T. floridanus*, Dall, of the Chipola marl.

In this connection the following notes on species cited in Mr. Guppy's catalogue of West Indian Tertiary fossils may not be out of place: *Trophon dominicensis*, Gabb, is a well-marked species of *Murex*, from which *Murex collatus*, Guppy, is perfectly distinct. *Purpura miocenica*, Guppy, is a *Coralliophila*, probably identical with a species now existing and commonly known as *C. galea*, Chemnitz. *Fasciolaria tarbelliana*, Grateloup, is a species of *Latirus*.

ACLIS ACUMINATA, Guppy, new species.

(Plate XXVIII, fig. 9.)

Elongate-turritid, smooth, shining; whorls about 9, slightly convex; suture well marked, overhung by the whorl above; aperture subquadrate; columella lip reflected. Alt. 3, lat. 0.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2279). No. 107081, U.S.N.M. This curious little shell appears to be an *Aclis*, but might possibly be the young of a smooth *Turbonilla*.

Subgenus **AMBLYSPIRA**, Dall.

ACLIS ? (AMBLYSPIRA) TERES, Guppy, new species.

(Plate XXVIII, fig. 6.)

Elongate-turriculate, somewhat arcuate, ivory-shining, covered with enamel-like deposit; whorls about 7, flattened, except the earlier ones, which are sometimes more or less rounded; suture scarcely distinct except between the earlier whorls; aperture elongate. Alt. 2, lat. 0.5 mm. [G.]

Ditrupe bed, Pointapier, Trinidad, Guppy (2252). No. 107073, U.S.N.M. This and the following species belong to a group of minute shells between *Aclis* and *Eulima* conchologically, characterized by their blunt apex and short base with subcylindric form, which may, however, be varied by the overhang of the whorls. They are rather characteristic of deep water, and a number of undescribed recent species have been obtained from 400 or 500 fathoms off the coast of Florida. The apex resembles that of *Eulima* externally, but the shell has more the aspect of some of the *Aclides*. *A. teres* may be taken as the type, for which I propose the subgeneric name *Amblyspira*.

ACLIS ? (AMBLYSPIRA) PROMINENS, Guppy, new species.

(Plate XXVII, fig. 11.)

Subimate, conic turritid; whorls about 9, strongly carinate; the keel overhanging the suture, thereby causing the latter to be deeply sunk, especially on the later whorls; aperture somewhat angulate and forming an obsolete canal above. Alt. 4, lat. 1.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2271). No. 107072, U.S.N.M.

ACLIS ? (AMBLYSPIRA), doubtful species.

Subimate, turritid-cylindric; whorls 4-5, smooth, slightly convex, carinate at the line of suture; aperture simple, suboval; columellar margin slightly reflected. Alt. 2, lat. 0.5 mm. [G.]

Ditrupe bed, Pointapier, Trinidad, Guppy (2272). No. 107112, U.S.N.M. These specimens are evidently immature, and do not afford material for a complete specific diagnosis.

EULIMA EGREGIA, Guppy, new species.

(Plate XXVIII, fig. 11.)

Turritid, smooth; whorls about 14, slightly convex; suture well marked, simple, linear; aperture suboval; columella callus reflected over the body whorl. Alt. 29, lat. 10 mm. [G.]

Tertiary beds of Monserrat, Trinidad, Guppy (2282). No. 107082, U.S.N.M. A remarkably fine large species with exceptionally conspicuous sutures.

EULIMA (LIOSTRACA) NOBILIS, Guppy, new species.

(Plate XXX, fig. 9.)

Very elongate, subulate; whorls 10 or more; spire sharp (imperfect in our specimens); suture not visible; aperture oblong, narrow, widening anteriorly; body with a callus extending to the slightly reflected but sharp pillar lip. Alt. 7, lat. 2 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2132). No. 107071 U.S.N.M.

EULIMA, doubtful species.

Elongate, subulate; whorls 8 or 9; spire sharp; suture masked by enamel; aperture elongate, with a callus on the body. Alt. 4, lat. 1 mm. [G.]

Ditrupa bed, Pointapier, Trinidad, Guppy (2133). No. 107111, U.S.N.M. Probably young specimens of *E. nobilis*, but if not, too imperfect for description.

PYRAMIDELLA (LONGCHÆUS) JAMAICENSIS, Dall, new species.

(Plate XXIX, . 10.)

Shell small, subcylindrical, with 7 or 8 whorls, smooth, polished, with a deep, square-cut channel at the periphery, the bottom of which is crossed by transverse, elevated lines in harmony with the lines of growth; the suture is wound about the shell a little in advance of the periphery near but not at the groove, giving the effect of duplication; base rounded, smooth; a strong plait encircles the pillar and emerges some distance from the aperture, a minor fold is seen on the anterior part of the pillar, but does not emerge; aperture at the base of the pillar angular, almost channeled; outer lip sharp, not lirate inside. Lon. 3.25, lat. 1 mm.

Oligocene of Jamaica, Bowden marl. No. 115642, U.S.N.M. This species is smaller than any of the others from the same region and has a much stronger peripheral groove in proportion to its size.

PYRAMIDELLA (LONGCHÆUS) FORULATA, Guppy, new species.

(Plate XXVIII, fig. 13.)

Elongate, ovate-conic, smooth; whorls about 7, with a single square groove along the line of suture; aperture suboval; columella strongly twisted with three folds or plaits; a square, spiral groove runs along above the suture just where it is joined to the succeeding whorl, producing the appearance of a squarely sunk suture. Alt. 5, lat. 2 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2259). No. 107118, U.S.N.M. Allied to *O. cinctus* and *O. hastatus*, Adams.

PYRAMIDELLA (LONGCHÆUS), doubtful species.

Ditrupe bed, Pointapier, Trinidad, Guppy (2260). No. 107119, U.S.N.M. These fragments are obviously the young of a larger species, perhaps the preceding. They do not offer satisfactory characters for a specific description.

TURBONILLA PLASTICA, Guppy, new species.

(Plate XXVIII, fig. 4.)

Elongate turritid, longitudinally ribbed, the ribs narrower than their spirally-striate interstices; whorls about 7, exclusive of the apex, which is large, sinistral, smooth, and composed of about 3 turns set on in a plane continuous with the axis of the shell and at right angles to the plane of the succeeding whorls; aperture simple, ovate; columella reflected. Alt. 3.5, lat. 1 mm. [G.]

Ditrupe bed, Pointapier, Trinidad, Guppy (2123). No. 107113, U.S.N.M. Distinguished by its larger nucleus from *T. turris*, Orbigny, and the following species:

TURBONILLA TURRITISSIMA, Guppy, new species.

(Plate XXVIII, fig. 5.)

Subulate-turritid, many-whorled, longitudinally ribbed, the interstices between the ribs cancellated by less-pronounced spiral lines. Whorls (? 15) slightly rounded; aperture suboval, with a slightly twisted columella. Length of a large imperfect example 8, breadth 2 mm. Length of a small perfect example 5, breadth 1.5 mm. A large example has 10 whorls, but the spire is broken. A smaller example has 9 to 10 whorls. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2258). No. 107114, U.S.N.M. The following forms are as distinct as species usually recognized in this group, but believing the range of variation to be much greater than usually allowed for, I am inclined to think they may eventually prove varieties of the preceding species. [G.]

TURBONILLA ANGULATA, Guppy, new species?.

(Plate XXVIII, fig. 10.)

A form with strongly angulate whorls giving a step-like appearance. In this the spiral striae between the longitudinal ribs are fine and thread-like. Alt., 3.5 mm.

Oligocene of Jamaica, Vendryes, (Guppy, 2258a). No. 107115, U.S.N.M.

TURBONILLA SIMPLICIOR, Guppy, new species?.

(Plate XXVIII, fig. 1.)

This has a stouter appearance. A specimen of it with 15 whorls has a tendency to a subquadrate shape of aperture. It has no spiral lines between the longitudinal riblets. Alt., 7.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2258b). No. 107116, U.S.N.M.

TURBONILLA TENUILINEATA, Guppy, new species?.

(Plate XXVIII, fig. 8.)

In this form, which would generally be regarded as a distinct species, the ornamentation is reduced to 4 or 5 very fine spiral lines. The aperture is subquadrate in our specimens, but this feature may vary to some extent. Alt., 5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2258c). No. 107117, U.S.N.M.

TURBONILLA (STYLOPSIS) OCTONA, Guppy, new species.

(Plate XXVII, fig. 8.)

Turritid, somewhat fusiformly cylindrical; smooth or only striate longitudinally by lines of growth; whorls about 4-5 (in addition to the discoid sinistral apex of about 3 turns set on at an angle), angulated above, and separated by a deep suture; aperture suboval, angulate above and somewhat produced anteriorly; columella reflected, the callus spread over the pillar lip. Alt. 1.25, lat. 0.3 mm. [G.]

Ditrupe bed, Pontapier, Trinidad, Guppy (2129). No. 107078, U.S.N.M. This may be compared with *Acelis similima*, Smith, from St. Helena, and *Eulina subcylindrata*, Dunker.

OSCILLA INDISCRETA, Guppy, new species.

(Plate XXVIII, fig. 14.)

Subulate-turritid; whorls about 9, flat, adorned with three strong squarish spiral ribs or keels, narrower than their deep interstices; the upper rib on a whorl in contact with the lower one on the preceding whorl, thus almost masking the suture; these two ribs sometimes nodulous; aperture suboval; base with a spiral rib dividing the space between the keel on the angle of the whorl from the plaited and twisted columella. Near the apex the lower and upper keels are more nodulous and are fused together so as to form apparently only one keel. Alt. 6, lat. 2 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2148). No. 107074, U.S.N.M. This may be compared with the recent *O. (Triptychus) nivea* of Mörch, from which it differs in details of sculpture, as also from the synonymous *O. biseriata*, Gabb, of the Costa Rica Pliocene.

ULTIMUS PRECURSOR, Dall, new species.

(Plate XXIX, figs. 2, 3.)

Shell solid, polished, with a strong, transverse, rounded dorsal keel, the enamel of the back leaving a considerable area uncovered; ends blunt; aperture wide; the outer lip very feebly cross-striated. Lon. 24.5, lat. 15 mm.

Pliocene clays of Limon, Costa Rica. No. 107456, U.S.N.M. This form differs from the recent *U. gibbosa* by the greater excavation of the slope from the dorsal keel forward, by the greater prominence of the keel, which is rather more posteriorly situated, by the more abrupt truncation of the posterior end, and by the somewhat greater proportional breadth. A larger area of the back is left without enamel in the adult than in *U. gibbosa*.

CARINARIA CAPERATA, Guppy, new species.

(Plate XXVII, fig. 11.)

Cornucopiaeform, carinated, compressed, with 7 or 8 transverse ridges in harmony with the wavy incremental lines; keel somewhat plicate, spire short, the apex wanting in the specimens. Lon., 7 mm. [G.]

Shell bed of Ally Creek, Naparima, Trinidad, Guppy (2138). No. 107138, U.S.N.M. The shell itself being extremely fragile, can not be extracted, but the casts give a fairly accurate idea of its form. It is nearest to *C. paretoi*, Mayer, from the Langhian (Miocene) of Senavalle di Scrivia, Italy. That species is, however, much more numerous and evenly sculptured with rounded riblets, and attains a length of 19 mm.

TRIFORIS, doubtful species.

Sinistral, ovate-turritid; whorls 4-6, cancellated by 4 or 5 stout revolving ridges, crossed by finer costellæ, dividing the surface into rather square pits; base smooth, imperforate; aperture oval; columella twisted, continued into a spout-like canal. Alt. 1, lat. 0.5 mm. [G.]

Ditrupe bed, Pointapier, Trinidad, Guppy (2140). No. 107122, U.S.N.M. While sufficient to determine the presence of the genus *Triforis*, these minute and immature fragments are not capable of affording data for a specific description.

BITTIUM (STYLIFERINA) CERITHIDIOIDE, Dall.

Oligocene of Jamaica, Guppy (264). No. 107123, U.S.N.M. This widespread little shell extends from the Oligocene to the recent fauna of the Antilles with great uniformity of character.

BITTIUM (STYLIFERINA) PRÆFORMATUM, Guppy, new species.

(Plate XXVIII, fig. 2.)

Turritid, subulate, or rather fusiformly cylindrical, varicose, spirally lirate, and granulose; whorls about 12, slowly increasing, the last

scarcely exceeding the previous ones in diameter; canal short. Alt. 5.5, lat. 1.6 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2144). No. 107124, U.S.N.M. This form is very slightly removed from *B. adamsi*, Dall, but is somewhat more slender, with slight differences of sculpture.

PYRAZISINUS? HAITENSIS, Dall, new species.

(Plate XXIX, fig. 8.)

Shell large, heavy, of more than 7 whorls; surface smooth or faintly spirally striated on the early whorls; the base flattish, disk-like, with strong spiral threads and flexuous incremental lines; transverse sculpture of 7 or 8 short, very high, compressed ribs, which do not reach the sutures; whorls moderately convex, appressed at the suture. Lon. of 4 whorls 40, lat. 25 mm.

Oligocene of the island of Haiti, from an island in Lake Henriquillo, Rowell. No. 113681, U.S.N.M. Two broken specimens, wanting both the aperture and the apex, are obviously of some Cerite. The peculiar sculpture recalls that of *Pyrazisinus cornutus* of the Oligocene of Florida, and what is left of the aperture is not inconsistent with the supposition that the shell was a species of that genus, to which it is provisionally referred.

Genus MODULUS, Gray.

Monodonta (sp.), GUPPY.

Pseudotrochus, HELPRIN.

MODULUS MODULUS L. var. BASILEUS, Guppy.

Monodonta basilea, GUPPY, Geol. Mag., Dec. II, I, p. 442, Pl. XVI, fig. 2, 1874.

Oligocene of Jamaica, Vendryes. No. 107137, U.S.N.M. The young specimens forwarded are not distinguishable from some of the varieties of the recent *M. modulus* of the same age. The full grown *M. basileus* is somewhat characteristic, judging from the single type specimen, and may rank as a variety or subspecies.

CÆCUM, doubtful species.

Ditrupe bed, Pointapier, Trinidad, Guppy (2266). No. 107150, U.S.N.M. This species for which Mr. Guppy assigned the name of *C. annulatum*, Brown, var. *curtum*, is more nearly related to *C. instructum*, de Folin, of the Antillean recent fauna, but differs by its slightly smaller size and less prominent micro.

TURRITELLA ARATA, Guppy, new species.

(Plate XXVIII, fig. 3.)

Elongate, conic-cylindric, many-whorled; whorls without any convexity, doubly keeled, the interstices between the spiral ridges occupying the middle of the whorl and carrying one or two scarcely visible

threads; aperture quadrate; suture fine, linear; base smooth. Alt. 10.3, lat. 1.5 mm. [G.]

Oligocene of Haiti, Guppy (2280). No. 107085, U.S.N.M.

TURRITELLA, doubtful species.

Shell bed, Ally Creek, Naparima, Trinidad, Guppy (2119). No. 107121, U.S.N.M. A specimen of *Turritella* or immature *Vermicularia* too imperfect to define specifically was obtained as above. Lon. 6, lat. 3 mm. It wants both apex and base, but is furnished with sharp, revolving ridges, of which two very prominent ones divide each whorl into three parts, of which the deep one next below the scarcely visible suture contains three fine spiral lines, and the narrower one on the middle of the whorls between the two prominent keels contains one fine spiral line.

MATHILDA PLEXITA, Dall, new species.

(Plate XXIX, fig. 5.)

Shell small, elongated, turritid, with deep sutures and 13 strongly rounded whorls; sculpture reticulate; spiral sculpture of 4 to 6 rounded prominent threads alternated with much finer threads; there are also 3 of intermediate size on the base; these are crossed by regularly spaced, very narrow laminar transverse ridges, which are slightly nodulous at the intersections; top and base of the whorls flattened, with a minute umbilical chink; aperture subovate, entire, with sharp margin, a little modified by the sculpture on the outer lip; throat not lirate, but the external sculpture indicated by shallow sulci. Lon. 18.3, lat. 6 mm.

Oligocene of Jamaica, Henderson and Simpson. No. 115436, U.S.N.M. (figured). Ditrupa bed, Pointapier, Trinidad, Guppy (2115). No. 107120, U.S.N.M.; fragment. This fine species has somewhat the aspect of a reticulated *Scala* of the subgenus *Aerilla*, under which name it was sent in. Beside the fragment sent by Mr. Guppy from Trinidad, it has also been noticed in the Oligocene beds of the Isthmus of Darien at Monkey Hill.

FOSSARUS (GOTTOINA) MUNDULUS, Guppy, new species.

(Plate XXVII, fig. 16.)

Turbinata, rimate; whorls 4-5, with spiral sculpture of subequal regular ridges, of which three are visible on the upper whorls, and these are simple, while on the last whorl the spiral sculpture is reticulated by transverse, elevated, incremental lines; suture deep and well marked; base with similar spiral sculpture and an extremely narrow umbilical chink; aperture circular, thickened, and slightly dentate or lirate. Alt. 3, lat. 2.75 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2291). Nos. 107093 and 107094, U.S.N.M. This species is not unlike some larger recent forms found in deep water off the southeastern coast of the United States.

ALABA TURRITA, Guppy, new species.

(Plate XXVIII, fig. 7.)

Shell elongate-turritid; whorls about 9, spirally lirate by somewhat obsolescent ridges; two rather broad varices on each whorl; not continuous on successive whorls; spire pointed; aperture suboval, slightly notched; peristome subcontinuous; columella expanded. Alt. 5, lat. 2.25 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2137). No. 107128, U.S.N.M.

SOLARIUM, doubtful species.

Orbicular, discoidal, depressed, widely umbilicate; surface corrugated by undulate rather flattened radiating ridges, narrower than their interstices and rising into tubercles on the angle of the whorl; crossed by revolving or spiral furrows, dividing the surface into somewhat square tesserae; first 2 or $2\frac{1}{2}$ whorls quite smooth; apex depressed; umbilicus encircled by rows (3) of strong rounded tubercles formed by a continuation of the sculpture on the flattened upper surface of the whorls. Alt. 1, lat. 3 mm. [G.]

Ditrapa bed, Pointapier, Trinidad, Guppy (2254). No. 107126, U.S.N.M. The presence of this very young specimen, which shows only enough of the adult characters to determine its place in the group of *S. elaboratum*, Conrad, suffices to establish the presence of the group in the fauna, though not to characterize the species.

RISSOA (ALVANIA) PARIANA, Guppy, new species.

(Plate XXIX, fig. 9.)

Shell conic-oblong, turritid; whorls about 6, decorated by about 4 spiral ribs narrower than their interstices, upon which rise into points somewhat stout longitudinal costae forming subquadrate or oblong pits, in which some faint striae may be observed; apex smooth; base with about 4 spiral ribs; lip stout, expanded. Alt. 2.3, lat. 1.5 mm. [G.]

Ditrapa bed, Pointapier, Trinidad, Guppy (2257). No. 107127, U.S.N.M.

BENTHONELLA TURBINATA, Guppy, new species.

(Plate XXVII, fig. 10.)

Turbinate subrimate, longitudinally sinuate-costate; whorls about 5, the apical ones (about 2) quite smooth, the others strongly ribbed by sinuate costae, their wider interstices crossed by minute spiral striae which are not visible on the ribs; aperture ovate; columella reflected. Alt. 1, lat. 0.78 mm. [G.]

Ditrapa bed, Pointapier, Trinidad, Guppy (2139). No. 107077, U.S.N.M. The presence of this genus (*Helca* of Jeffreys) in these beds is almost conclusive evidence of their deep water or archibenthal character.

RISSOINA BROWNIANA, Orbigny.

R. browniana, ORBIGNY, Moll. Cuba, II, p. 28, pl. XII, figs. 35, 31, 1853.

Oligocene of Jamaica, Vendryes (Guppy, 2261), Nos. 107129 and 107130, U.S.N.M.

RISSOINA SAGRAIANA, Orbigny.

R. sagraiana, ORBIGNY, Moll. Cuba, II, p. 25, pl. XII, figs. 4, 5, 1853.

Oligocène of Jamaica, Vendryes (Guppy, 2263). Nos. 107131 and 107132, U.S.N.M. This is *R. sagra* on the explanation of the plate and *sagraiana* in the text.

RISSOINA ELEGANTISSIMA, Orbigny.

R. elegantissima, ORBIGNY, Moll. Cuba, II, p. 26, pl. XII, figs. 27, 28, 1853.

Oligocene of Jamaica, Vendryes (Guppy, 2264). No. 107133, U.S.N.M.

RISSOINA STRIATICOSTATA, Orbigny.

R. striaticostata, ORBIGNY, Moll. Cuba, II, p. 27, pl. XII, figs. 30, 31, 1853.

Oligocene of Jamaica, Vendryes (Guppy, 2265). No. 107134, U.S.N.M.

HIPPONYX TORTILIS, Guppy, new species.

(Plate XXVII, fig. 15.)

Subovate, obliquely conic, with imbricating lamella, which are closely covered with radiating striae; margin expanded. Lon., 6.5 mm. [G.]
Oligocene of Jamaica, Vendryes (Guppy, 2276). No. 107147, U.S.N.M.

HIPPONYX SUBRUFUS, Carpenter.

Oligocene of Jamaica, Vendryes (Guppy, 2283). No. 107084, U.S.N.M.
Exactly like recent specimens.

NATICA PERLINEATA, Dall.

N. perlineata, DALL, Blake Gastr., p. 294, 1889.

Recent in the Antilles, 70 to 229 fathoms. Fossil in the Tertiary beds of Monserrat, Trinidad, Guppy (2281). No. 107083, U.S.N.M. In this connection it may be stated that *Stomatia idolon*, Guppy, from San Fernando, Trinidad, proves on more close study to be the operculum of a naticoid shell.

PHASIANELLA, doubtful species.

Ovate-conoidal, rimate, with about 5 whorls slightly convex, the last angulate on the periphery and comprising more than two-thirds of the whole shell; apex pointed; aperture suboval; a callus on the pillar, reflected over the umbilical chink. Alt. 4, lat. 3 mm. [G.]

Ditrupea bed, Pointapier, Trinidad, Guppy (2256). No. 107148, U.S.N.M. This is almost certainly identical with one of the small recent species, but the material is too meager for a positive decision on that point.

MICROGAZA ROTELLA, Dall.

M. rotella, DALL, Blake Gastr. Bull. Mus. Comp. Zool., XVIII, p. 357, pl. xxii, figs. 5, 5a (1881), 1889.

Recent in 70 to 805 fathoms in the Antilles. Fossil in the Oligocene of Bowden, Jamaica, Henderson and Simpson. Nos. 94994 and 107457, U.S.N.M.

This elegant and curious little shell is common in the Bowden marl and exactly agrees with the recent specimens with which it was compared. The variety *inornata*, Dall, was found with the typical form in the marl as in the sea.

DILLWYNELLA ERRATA, Guppy, new species.

(Plate XXVII, fig. 2.)

Subglobose turbinate, shining, smooth, or marked by obsolescent undulate lines of growth; whorls 3-4, rapidly increasing, somewhat compressed or flattened superiorly; aperture circular, effused below into a sort of expanded and channeled columellar lip; spire little elevated. Alt. 1.5, lat. 1.8 mm. [G.]

Ditrupea bed, Pointapier, Trinidad, Guppy (2126). No. 107135, U.S.N.M. This genus is now known to extend from the Claibornian Eocene to the recent fauna.

SOLARIORBIS CLYPEATUS, Guppy, new species.

(Plate XXVII, fig. 3.)

Depressed, scarcely conoidal; whorls about 3, flattened, lineated by fine spiral ribs, which are crossed by fine radiating lines of growth; margin of whorls strongly but somewhat sharply carinated, the keel being a round rib marked off from the whorl by a line; umbilicus small; base covered with revolving and radiating lines like those of the upper surface, but finer; apex smooth. Alt. 1.75, lat. 3 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2134). No. 107075, U.S.N.M.

CALLIOSTOMA ASPERRIMUM, Dall.

C. asperrimum, DALL, Bull. Mus. Comp. Zool., XVIII, p. 373 (1881), 1889.

Recent in the Antilles, 100 to 220 fathoms, Blake expedition. Oligocene of Jamaica, Vendryes (Guppy, 2293a). No. 107097, U.S.N.M.

CALLIOSTOMA PULCHER, C. B. Adams.

C. pulcher, ADAMS, Contr. Conch., p. 69, 1850, not of A. ADAMS, 1851.

Recent in the Antilles. Oligocene of Jamaica, Vendryes (Guppy, 2293b). No. 107096, U.S.N.M.

CALLIOSTOMA ROSEOLUM, Dall.

C. roseolum, DALL, Bull. Mus. Comp. Zool., XVIII, p. 366, pl. XXIV, figs. 6, 6a, 1889.

Recent in the Antilles, 15 to 200 fathoms. Fossil in the Oligocene of Jamaica with the preceding species (Guppy, 2293c).

CALLIOSTOMA CORBIS, Dall.

C. corbis, DALL, Bull. Mus. Comp. Zool., XVIII, p. 365, pl. XXXIII, fig. 1, 1889.

Recent in the Antilles, 220 to 450 fathoms. Fossil in the Oligocene of Jamaica, Vendryes (Guppy, 2294). No. 107098, U.S.N.M. This is perhaps the most common species of *Calliostoma* in the Bowden marl.

SOLARIELLA ALTIUSCULA, Guppy, new species.

(Plate XXVII, fig. 17.)

Somewhat turritid; whorls 5-6, adorned with sharp spiral ridges, of which only about 2 are visible on the upper whorls, 4 on the last whorl but one, and about 10 on the last whorl; three apical whorls smooth; umbilicus open, deep, with about 4 granular or tubercular ridges on the last whorl; base encircled with a strong sharp ridge; aperture subquadrate, almost circular. Alt. 6.3, lat. 7 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2269). No. 107125, U.S.N.M.

LIOTIA SIDEREA, Guppy, new species.

(Plate XXVII, fig. 18.)

Turribate, rimate; whorls 5-6, covered with a fine, scaly ornamentation; two keels, one on the angle of the whorls and one halfway between that and the suture; suture deep, bordered by a dentate ridge; base ornamented with 6 to 7 rows of rather square granules, largest near a wrinkled and dentate callus surrounding the imperfect umbilicus; aperture circular; lip expanded anteriorly, continued over the body whorl by a callus; columella reflected. Alt. 3.5, lat. 3.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2292). No. 107095, U.S.N.M.

LIOTIA VERESIMILIS, Guppy, new species.

(Plate XXVII, fig. 13.)

Conic-pyramidal, umbilicate; whorls 5, spirally lirate by a few thread-like ridges, of which two are visible on the upper whorls, crossed by equally fine radiating threads which divide the surface into square areolæ; suture linear; aperture circular; lip continuous. Alt. 1.5, lat. 1.5 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2290). No. 107092, U.S.N.M.

? DENTALIUM HAITENSE, Gabb.

D. haitense, GABB, Geol. Santo Domingo, 1873, p. 244.

Oligocene of Jamaica, Vendryes (Guppy, 2278). No. 107080, U.S.N.M. Two very slender specimens appear to belong to this species. [G.]

DENTALIUM GOULDII, Dall.

D. Gouldii, DALL, Bull. Mus. Comp. Zool., XVIII, p. 424, pl. XXVI, fig. 4, 1889.

Recent in the Antilles (as *D. hexagonum*, Sowerby, not Gould), 12 to 150 fathoms. Fossil in the later Tertiaries of this region and in the Neula beds (Eocene), Naparima, Trinidad, Guppy (190). No. 107149, U.S.N.M. Mr. Guppy compares the fragments found with *D. striatum*, Sowerby, of the English Eocene.

CADULUS PARIANUS, Guppy, new species.

(Plate XXX, fig. 7.)

Tube round, tapering, suddenly constricted near the broader end. Lon. 3, diam. 0.75 mm. [G.]

Ditrupa bed, Pointapier, Trinidad, Guppy (2277). No. 107155, U.S.N.M.

The name *Ditrupa*, which has been applied to this genus by Mr. Guppy, is now generally used for an annelid. These shells, though very similar to those of *Ditrupa*, are unquestionably molluscan and belong to the genus *Cadulus* of Philippi. It is stated by Mr. Guppy that the nearest relative of this species is the *C. dentalina* of the Jamaican Oligocene.

LIMOPSIS SUBANGULARIS, Guppy, new species.

(Plate XXX, fig. 2.)

Suborbicular, equivalve, subequilateral, closed; radiately and concentrically striate, with a slight angle at the hinder margin of the almost straight hinge line; radiating riblets regular, somewhat stronger on the slopes, narrower than the interstices; concentric ribs low and rounded, scarcely rising upon the radiating riblets; hinge teeth stout, scarcely curved, about 3 before and 3 behind the small cartilage pit. Height of valve, 6.75 mm. [G.]

Ditrupa bed, Pointapier, Trinidad, Guppy (2117). No. 107152, U.S.N.M. The specimens are very young, and perhaps have not fully assumed their adult characteristics.

ANOMIA UMBONATA, Guppy, new species.

(Plate XXX, fig. 6.)

Angularly and rather irregularly suboval; minutely shagreened, especially on the prominent umbonal region; umbo terminating in a sharp point. Breadth, 6 mm. [G.]

Shell bed, Ally Creek, Naparima, Trinidad, Guppy (2116). No. 107154, U.S.N.M. The imperfect state of the specimens precludes a more complete description.

ANOMIA SIMPLEX, Orbigny.

A. simplex, ORBIGNY, Moll. Cuba, II, p. 367, pl. XXVIII, figs. 31-33, 1853.

Recent from Cape Cod to Rio Janeiro, Brazil. Oligocene of Jamaica, Vendryes (Guppy, 2303). No. 107107, U.S.N.M.

Genus CRASSATELLITES, Kruger.

Subgenus CRASSINELLA, Guppy.

Crassinella, GUPPY, Geol. Mag., Decade II, Vol. II, Jan., 1875, not of BAYLE, 1879.

Gouldia, auct. var., not of C. B. ADAMS, 1817, nor of BONAPARTE (Aves), 1850.

Eriphyla, DALL, Proc. Zool. Soc. 1879, p. 132, not of GABB.

Pseuderiophyla, FISCHER, Man. Conch., p. 1022, 1887.

Having failed so far to find the place where the supposed genus *Crassinella* of Conrad is printed, it becomes probable that it is a manuscript name. At all events, unless somebody can find it, it should not be allowed to stop the way. Gabb's *Eriphyla* proves to have an external ligament like Meek's *Eriphylopsis*. Therefore, unless *Crassinella*, Conrad, can be located, Mr. Guppy's name for this little group of diminutive Crassatellas should take precedence, the name of Fischer having been suggested in the belief that Conrad's name had been published and was prior.

CRASSATELLITES (CRASSINELLA) GUPPYI, Dall, new species.

(Plate XXX, fig. 5.)

Rounded trigonal, flattish, concentrically costate, with 10 to 12 lamellar ribs, much narrower than the interstices. Alt. 4.6, lon. 4.6 mm.

Oligocene of Jamaica, Vendryes, and others (Guppy, 191). No. 107151, U.S.N.M. This species is related to the Recent and Neocene *C. martiniensis* and *guadelupensis* of Orbigny, but is constantly smaller. It was sent by Mr. Guppy under the manuscript name of *C. miocenica*, but as we now know that the horizon is Oligocene, I have taken the liberty of substituting Mr. Guppy's name for the name he proposed.

LUCINA PAUPERATA, Guppy, new species.

(Plate XXX, fig. 3.)

Suborbicular, not very convex, with faint, broad, radiating (ray-like) grooves and sublamellar concentric ridges. Diameter, 11.5 mm. The radiating ornament looks like color, but it is really faint, shallow flutings. Near to *L. squamosa*, Lam. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2297). No. 107101, U.S.N.M.

LUCINA TEXTILIS, Guppy, new species.

(Plate XXX, fig. 1.)

Orbicular, occasionally a little irregular in outline; decussate by somewhat irregular fine radiating and concentric lines; margins dentate. Diameter, 11 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2298). No. 107103, U.S.N.M. Resembles a small form of *L. costata*, Conrad.

DIVARICELLA PREVARICATA, Guppy, new species.

(Plate XXX, fig. 4.)

Suborbicular, inflated, margins minutely denticulate, surface divaricately sculptured. Length of shell, 8 mm. [G.]

Oligocene of Jamaica, Vendryes (Guppy, 2299). No. 107102, U.S.N.M. Resembles *D. americana*, C. B. Adams (= *quadrisulcata*, Orbigny), but is constantly smaller and weaker.

CARDIUM SERRATUM, Linnæus.

Oligocene of Jamaica, Vendryes (Guppy, 2300). No. 107104, U.S.N.M. This small form is identical with the dwarfed form from deep water (100 fathoms), which I named variety *sybariticum*.¹ The larger form is also found in the Bowden beds.

CLEMENTIA ? TÆNIOSA, Guppy, new species.

(Plate XXX, fig. 8.)

Subtriangularly suborbicular, scarcely ventricose, concentrically ribbed, the ribs rounded with concave sulci between them. Alt. 43, lon. 47 mm. [G.]

Tertiary beds of Savaneta, Trinidad (Guppy, 2302). No. 107106, U.S.N.M. The specimen is an internal cast, with the hinge line defective.

SANGUINOLARIA UNIOIDES, Guppy, new species.

(Plate XXX, fig. 11.)

Ovate oblong, slightly ventricose, smooth, with shallow, concentric sulci and fine radiating striae. Length 63, height 44 mm. [G.]

Tertiary beds, Savana Grande, Trinidad, Guppy (2302). No. 107106, U.S.N.M. A somewhat Unio-like shell of uncertain affinities. The beds from which it came have yielded some other large bivalves whose affinities have not been ascertained, partly on account of their imperfect condition. [G.]

CORBULA DISPARILIS, Orbigny.

Corbula disparilis, ORBIGNY, Moll. Cuba, II, 283, pl. xxvii, figs. 1-4, 1846.

C. philippii, E. A. SMITH, Chall. Rep., p. 33, pl. vii, fig. 4, 1885.

C. operculata, PHILIPPI, Zeitschr. Mal., V, p. 13, 1849.

Oligocene of Jamaica (Guppy, 2295), and also recent in the Antilles.

TEREDINA ?, doubtful species.

Almost globular, anterior area finely closely laminose, posterior area subequal, nearly smooth, the medial groove feebly marked; callum

¹ Bull. Mus. Comp. Zool., XII, p. 271, 1886.

apparently complete, siphonal end slightly gaping, truncate, the margins thickened and reflected, the dorsal plates wanting, probably lost. Alt., 6 mm.

Oligocene of Jamaica, Vendryes (Guppy, 2296). No. 107160, U.S.N.M. This very singular little pholad is unfortunately imperfect, rendering it advisable to await more material before describing it. It was received with the manuscript name of *Martesia sphaeroidalis*, but it is not a *Martesia* and perhaps may prove a *Teredina*.

DIMYA GRANDIS, Dall, new species.

Shell large for the genus, ostreiform, attached by the right valve; externally smooth or (in the variety *diraricata*) rather strongly sculptured with close-set dichotomous radiating ribs; internally smooth and nacreous near the edges; the visceral area with a porcellanous, finely granulated coat, posterior adductor leaving a duplex scar, as in *D. argentea*, Dall; anterior scar single, small, close to the pallial border and high up in the valve; pallial area bordered by a line of minute, fringe-like, short grooves; cardinal crura raised on each side of the small, subtriangular socket for the resilium, behind which they join, forming in the right valve a keystone-shaped projection which fits inside the pair on the left valve. Alt. 32, lat. 30 mm.

Oligocene of the Potrero, Rio Amina, Santo Domingo, Bland. No. 113799, U.S.N.M.

The genus *Dimyodon*, Munier Chalmas, is characterized chiefly by its undivided posterior adductor scar, the tooth-like crura being present though feeble in the typical *Dimya*. The present form has the scars of *Dimya* and well-developed crura. From the recent *D. argentea* it is distinguished by sculpture, size, and hinge.

The differences of sculpture do not appear to be due to the object upon which the shell attaches itself, as this attachment is only by a very small portion of the surface.

Mr. Guppy's work was done largely without the advantages of books and specimens for reference, hence it naturally followed that his names in some cases require revision. With his types for comparison I have been able to correct some of these misidentifications, and the present occasion seems a proper one for putting the corrections on record, with notes on some other species:

Columbella ambigua and *C. gradata*, Guppy, are referable to the genus *Strombina*.

Columbella peculiaris, Guppy, is an *Esopus*, nearly related to *E. stearnsii*, Tryon.

Scala (Acrilla) leroyi, Guppy, has also been collected on the Isthmus, near Gatun.

Clea truncata, Guppy, is a *Planaxis* which Mr. Guppy wrongly identified with *Etracheliza truncata*, Gabb. Although Mr. Guppy¹ figures the genuine shell, his specimens are quite different.

¹Journ. Geol. Soc., XXXII, pl. xxix, fig. 6.

Dolophanes melanooides, Gabb, is identical with *Crepitacella cepula* as claimed by Mr. Guppy, and the latter name has priority.

Iopsis, Gabb, was founded on an immature *Rissoina*, as his type specimen shows.

Acteonidea, Gabb, is synonymous with *Rictaxis*, Dall, which has two or three years priority.

I have discussed *Orthaulax*, Gabb, in the Transactions of the Wagner Free Institute of Science, Vol. III. The *Petalocoehus* of Mr. Guppy's list is not *P. sculpturatus*, Lea, and should retain Sowerby's name of *domingensis*.

Turbonilla subcarinata, Orbigny, of Guppy's list, is an immature *Rissoina*, from Matura, Trinidad.

Amauropsis ocalanus, Dall, from the Lower Oligocene of Florida, has also been detected in Santo Domingo on the Rio Amina.

Gryphaea athyroides, Guppy, has the aspect of an *Ostrca*, but the hinge is inaccessible.

Cercomya ledaformis, Guppy, is a *Leda* and, under the circumstances, may better be renamed *Leda guppyi*.

Crassatella, labeled *marylandica*, Conrad, from the Oligocene of Jamaica, is not that species, nor *C. floridana*, Dall, but probably an undescribed species.

Dosinia cyclica, Guppy, is a *Lucinopsis*.

Corbula rieta, Guppy, was founded on the sculptured valves of *C. disparilis*, Orbigny; *Erycina tensa*, Guppy, upon the smooth valves of the same species.

Tellina, identified with *T. buplicata*, Conrad, appears distinct, and should retain d'Orbigny's specific name of *sagrae*. It belongs to the subgenus *Metis*, H. and A. Adams.

The following Polyzoa were included from the Jamaican Oligocene and identified by Mr. Guppy:

CUPULARIA OWENI, Lamarck.

MEMBRANIPORA SAVARTI, Audouin.

There are several undetermined species of Polyzoa in the Ditrupa beds of Pointapièr, Trinidad.

It may not be amiss to remark that *Orbitoides mantelli* has been repeatedly and persistently reported from the Tertiaries of the West Indies; but in no case which I have been able to examine has the West Indian species proved to be the true *O. mantelli*. The most southern locality for the genuine *O. mantelli* is in the Guallava sandstones of Costa Rica, though the species doubtless occurs on the north-western shores of Cuba. The West Indian form sent under the name of *O. mantelli* has been identified as *O. forbesii*, a much thicker, more globose, and smaller species.

EXPLANATION OF THE PLATES.¹

PLATE XXVII.

- FIG. 1. *Clathurella vendryesiana*, Dall; alt., 14 mm.; p. 306.
 2. *Diltheyella errata*, Guppy; alt., 1.5 mm.; p. 323.
 3. *Solariorbis clypeatus*, Guppy; lat., 3 mm.; p. 323.
 4. *Mungilia consentanea*, Guppy; alt., 6.2 mm.; p. 307.
 5. *Cythara guppyi*, Dall; alt., 6.5 mm.; p. 306.
 6. *Cythara mucronata*, Guppy; alt., 5.5 mm.; p. 306.
 7. *Cythara obtusa*, Guppy; alt., 5.7 mm.; p. 306.
 8. *Stylopsis octona*, Guppy; alt., 1.25 mm.; p. 317.
 9. *Cythara gibba*, Guppy; alt., 3.8 mm.; p. 306.
 10. *Benthonella turbinata*, Guppy; alt., 1 mm.; p. 321.
 11. *Aclis (Amblyspira) prominens*, Guppy; alt., 4 mm.; p. 314.
 12. *Clathurella amicta*, Guppy; alt., 4.6 mm.; p. 305.
 13. *Liotia veresimilis*, Guppy; alt., 1.5 mm.; p. 324.
 14. *Carinaria caperata*, Guppy; 7 mm.; p. 318.
 15. *Hipponyx tortilis*, Guppy; lon., 6.5 mm.; p. 322.
 16. *Fossarus (Gottoina) mundulus*, Guppy; alt., 3 mm.; p. 320.
 17. *Solaricella altiuscula*, Guppy; lat., 7 mm.; p. 324.
 18. *Liotia siderea*, Guppy; alt., 3.5 mm.; p. 324.

PLATE XXVIII.

- FIG. 1. *Turbonilla simplicior*, Guppy; alt., 7.5 mm.; p. 317.
 2. *Bittium (Styliferina) praeformatum*, Guppy; alt., 5.5 mm.; p. 318.
 3. *Turritella arata*, Guppy; alt., 10.3 mm.; p. 319.
 4. *Turbonilla plastica*, Guppy; alt., 3.5 mm.; p. 316.
 5. *Turbonilla turritissima*, Guppy; alt., 6.75 mm.; p. 316.
 6. *Aclis (Amblyspira) teres*, Guppy; alt., 2 mm.; p. 314.
 7. *Staba turrita*, Guppy; alt., 5 mm.; p. 321.
 8. *Turbonilla tenuilineata*, Guppy; alt., 5 mm.; p. 317.
 9. *Aclis acuminata*, Guppy; alt., 3 mm.; p. 313.
 10. *Turbonilla angulata*, Guppy; alt., 3.5 mm.; p. 316.
 11. *Eulima egregia*, Guppy; alt., 29 mm.; p. 314.
 12. *Phos (Strongylocera) fasciolatus*, Dall; alt., 24 mm.; p. 311.
 13. *Pyramidella (Longchæus) forulata*, Guppy; alt., 5 mm.; p. 315.
 14. *Oscilla indiscreta*, Guppy; alt., 6 mm.; p. 317.
 15. *Phos metuloides*, Dall; alt., 20 mm.; p. 310.

PLATE XXIX.

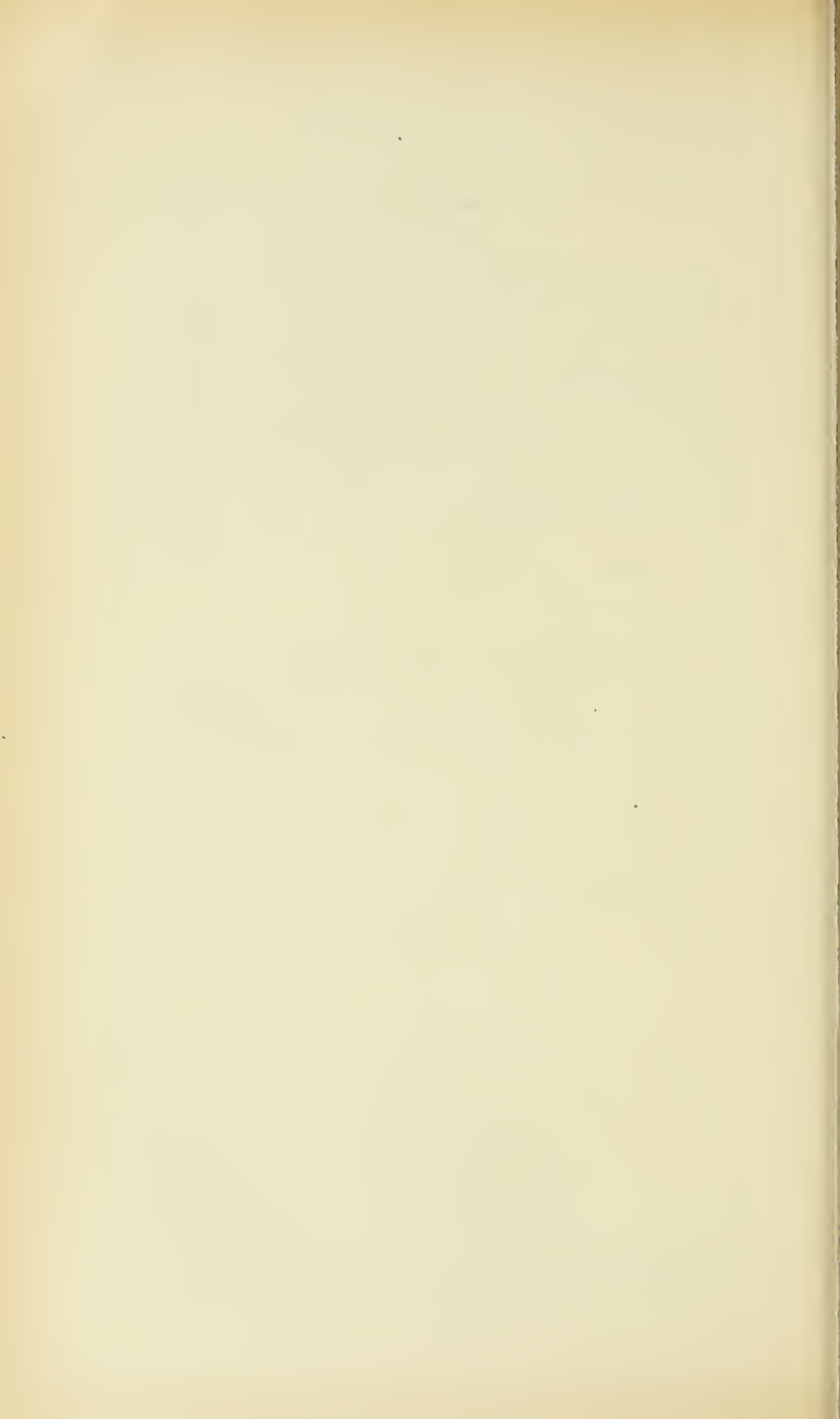
- FIG. 1. *Cancellaria rowelli*, Dall; alt., 25 mm.; p. 307.
 2. *Ultimus precursor*, Dall; lon., 24.5 mm.; p. 318.
 3. The same in profile.
 4. *Phos gabbii*, Dall; alt., 24 mm.; p. 310.
 5. *Mathilda plexita*, Dall; alt., 18.3 mm.; p. 320.
 6. *Strombinella acufornis*, Dall; alt., 13.5 mm.; p. 312.
 7. *Strombina mira*, Dall; alt., 9 mm.; p. 312.
 8. ? *Pyrazisinus haitensis*, Dall; alt., 35 mm.; p. 319.
 9. *Rissoa pariana*, Guppy; alt., 2.3 mm.; p. 321.
 10. *Pyramidella (Longchæus) jamaicensis*, Dall; alt., 3.25 mm.; p. 315.

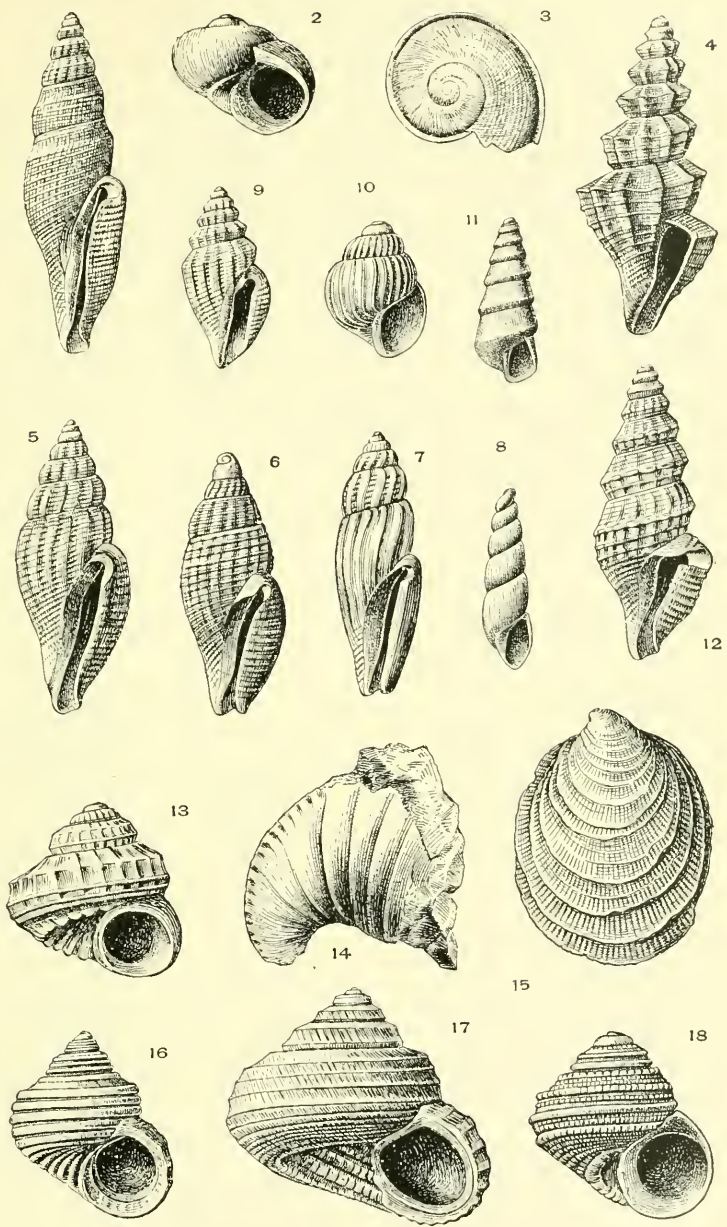
¹As the figures are not drawn to a uniform scale, the greatest length, altitude, or breadth of the specimen in millimeters follows the reference in each case.

- FIG. 11. *Marginella latissima*, Dall; alt., 11 mm.; p. 308.
12. *Marginella limouensis*, Dall; alt., 30 mm.; p. 309.
13. *Marginella arcuata*, Guppy; alt., 4.5 mm.; p. 308.
14. *Marginella solitaria*, Guppy; alt., 3 mm.; p. 308.
15. *Marginella amina*, Dall; alt., 25 mm.; p. 309.

PLATE XXX.

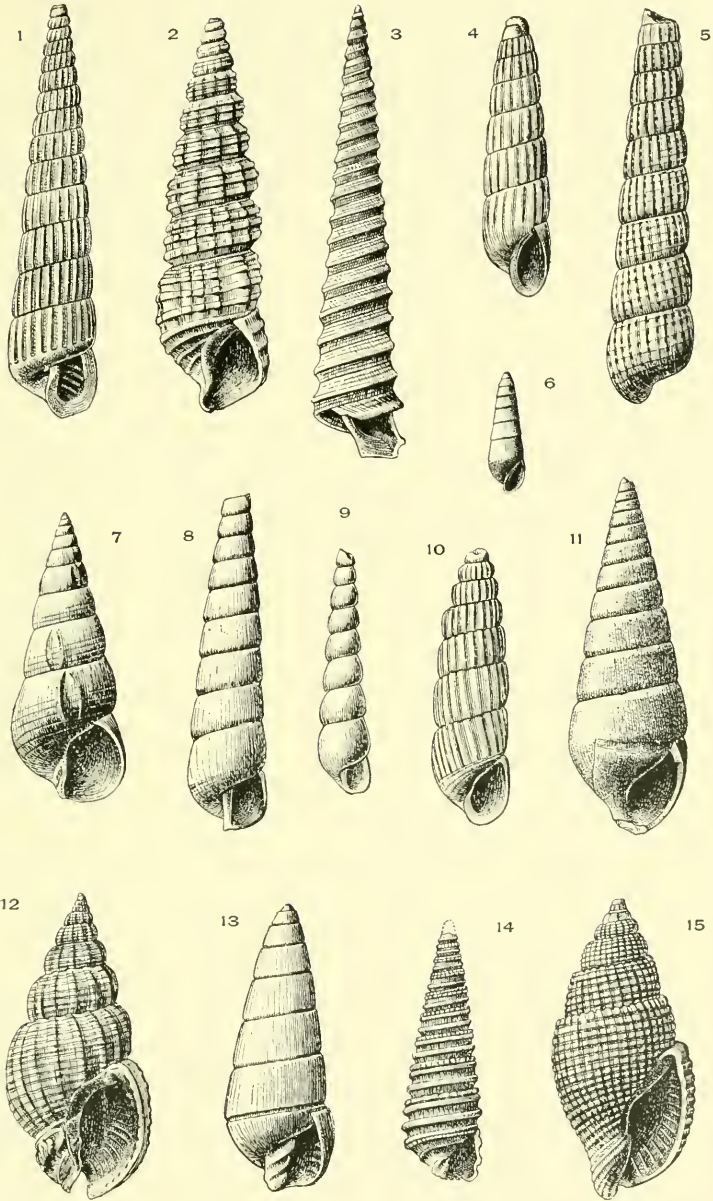
- FIG. 1. *Lucina textilis*, Guppy; lon., 11 mm.; p. 326.
2. *Limopsis subangularis*, Guppy; lon., 6.75 mm.; p. 325.
3. *Lucina pauperata*, Guppy; lon., 11.5 mm.; p. 326.
4. *Diraricella preraricata*, Guppy; lon., 8 mm.; p. 327.
5. *Crassinella guppyi*, Dall; lon., 4.6 mm.; p. 326.
6. *Anomia umbonata*, Guppy; lon., 6 mm.; p. 325.
7. *Cadulus parianus*, Guppy; lon., 3 mm.; p. 325.
8. ? *Clementia taniosa*, Guppy; lon., 47 mm.; p. 327.
9. *Eulima (Liostraca) nobilis*, Guppy; alt., 7 mm.; p. 315.
10. *Olivella indivisa*, Guppy; alt., 6.5 mm.; p. 308.
11. *Sanguinolaria unioides*, Guppy; lon., 63 mm.; p. 327.
12. *Olivella plicata*, Guppy; alt., 12.2 mm.; p. 308.





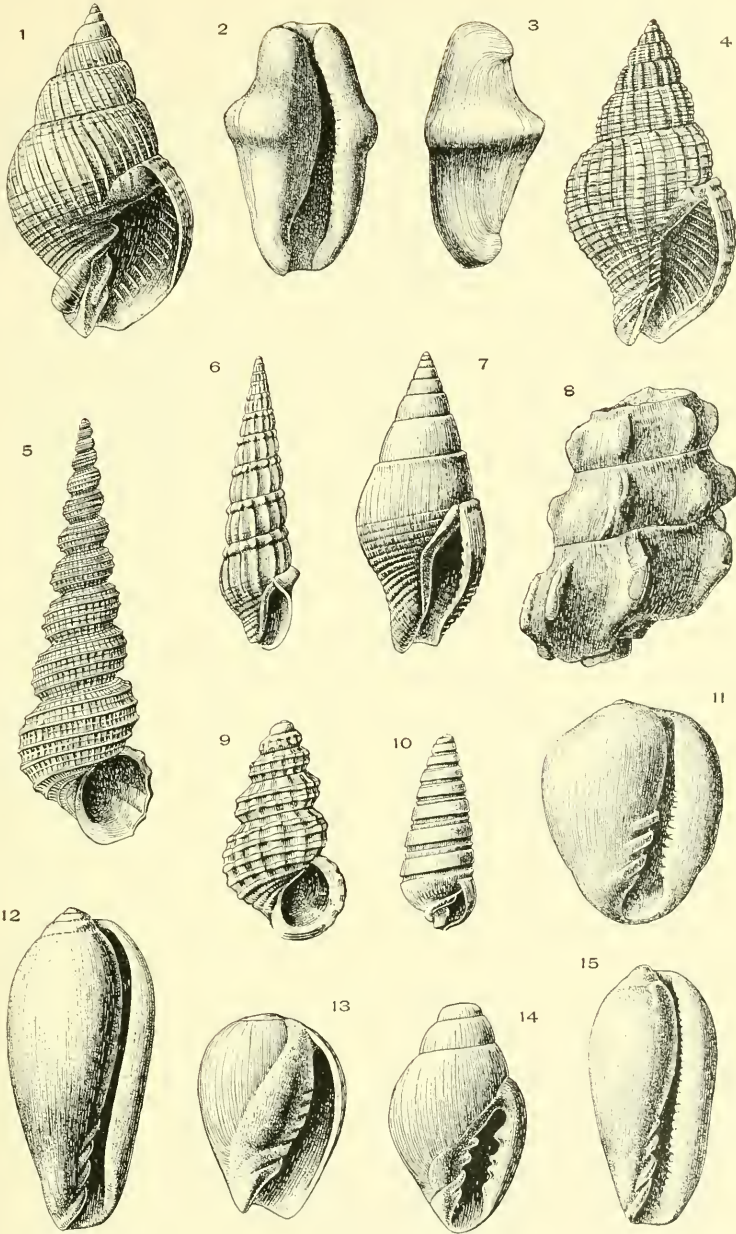
ANTILLEAN TERTIARY FOSSILS.
FOR EXPLANATION OF PLATE SEE PAGE 330





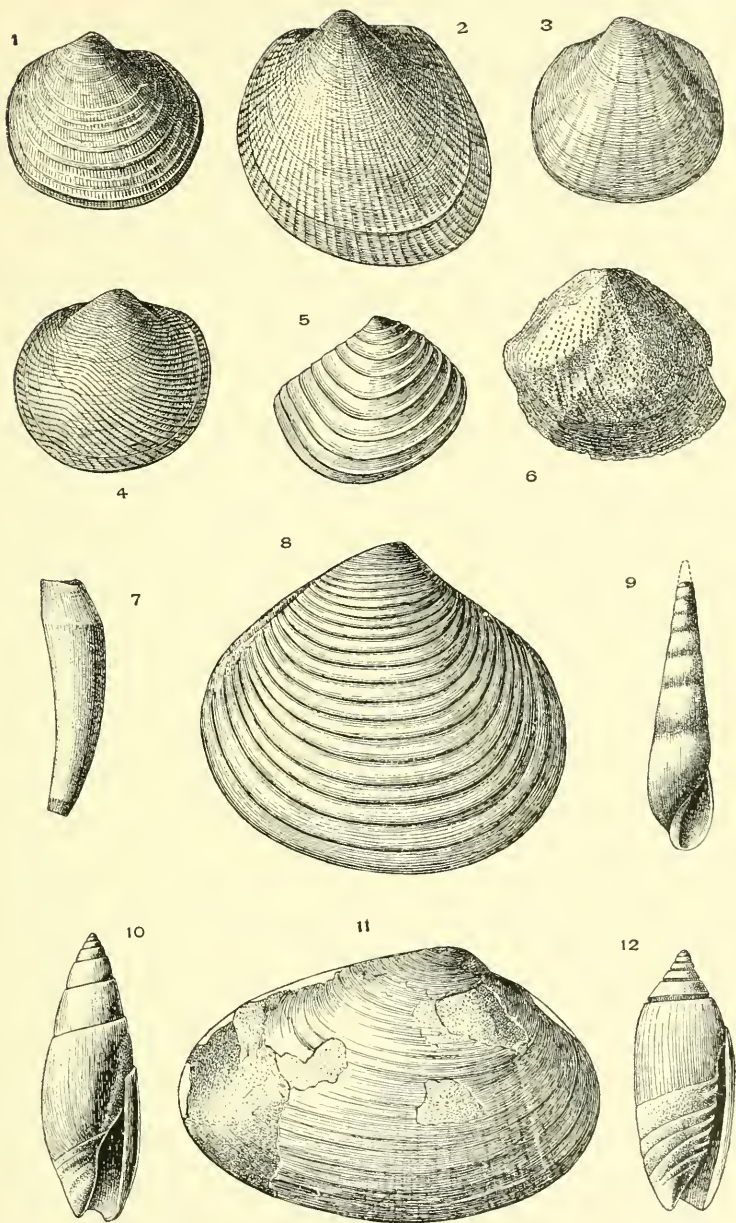
ANTILLEAN TERTIARY FOSSILS.
FOR EXPLANATION OF PLATE SEE PAGE 330.





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