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West Indian Tertiary Fossils.

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ORIGINAL ARTICLES.

I.—ON THE WEST INDIAN TERTIARY FOSSILS.

By R. J. LECHMERE GUPPY, F.L.S., F.G.S., etc.

(PLATES XVI., XVII., AND XVIII.¹)

(Continued from the September Number, p. 411.)

Strombus pugiloides, n. sp.

The shell for which I propose the above appellation was considered to be *Strombus pugilis* by Mr. Carrick Moore. The name was misprinted *fragilis* in his paper in the Journal of the Geological Society, vol. xix. p. 511. In my papers on the Tertiary fossils of Jamaica and the West Indies, the species was recorded under the name *Str. pugilis*. In ordinary specimens like those usually found in Jamaica, Haiti, and elsewhere, the only well-marked differences that can be noticed between the fossil shell and the recent *Strombus pugilis* are that in the former the last whorl is usually devoid of the spiniform tubercles, and that the shell is of shorter and broader figure. But some examples, supplied me by my friend Mr. Vendryes, exhibit an unexpected character. They show chevron-shaped bands of colour, about 12–15 on the last whorl. Each band takes the shape of a V, the apex of which occurs near the middle of the whorl, and forms an angle of about 30° pointing backwards or away from the aperture. These bands of colour are about two mm. wide and the spaces between them are about three mm. Numerous specimens of the recent *Str. pugilis* have passed through my hands, but I have never noticed the slightest approach to such a character. The recent shell is pale red or pink only relieved by an indistinct band of paler tint following the middle of the whorl. A less constant difference may be found in the low rounded lamellar dentition inside the outer lip which is very faint or altogether wanting in *Strombus pugilis*, but more marked in the fossil.

Murex collatus, n. sp., Pl. XVI. Fig. 8.

Ovate, rimate, slightly flattened, adorned with numerous thin slightly fimbriate or crenulate varices often doubled, especially the later ones; about seven on the last whorl; their interstices indistinctly crossed by low transverse costæ which terminate in points on the varices; the upper point large, acute and projecting, giving an angulate appearance to the shell: varices uniting below to form an irregular and contorted canal. Whorls 6–7, somewhat angulate. Spire sharp. Outer lip expanded and crenulate, obtusely dentate

¹ Plates XVI. and XVII. having been unfortunately lost *in transitu* from Trinidad, they are now being re-drawn and will appear in the November Number.—EDIT. GEOL. MAG.

within. Pillar-lip smooth. Length about 25 mm. Breadth about 15. Total length of last whorl, including canal, about 18 mm.

Very closely related to *M. calcitraba*, Lam. (Eocene, Europe). It is smoother and the whorls less angulate. These shells belong to a small group of Murices which exhibits the connexion through *Trophon*, *Rapana*, *Latiaxis*, etc., to *Purpura*. *M. collatus* would perhaps be ranked by some conchologists as a *Trophon*, as has already been done with *M. calcitraba*.

Typhis alatus, Sowerby.

Journ. Geol. Soc. 1850, vol. vi. p. 48, pl. x. f. 4.

A species almost as near to *T. tubifer* (Eocene, Europe) as *Murex collatus* is to *M. calcitraba*. The living analogues of *T. alatus* are *T. pinnatus* and *T. Sowerbyi*.

Ancillaria pinguis, n. sp., Pl. XVI. Fig. 3.

Ovate conic, spire elevated, acuminate. Suture usually visible through the enamel which covers the spire, and accompanied at a little distance by a keel, the ridge of which is threadlike. Aperture suboval, elongate. Umbilicus deep, narrow, partly hidden by the callosity of the inner lip. Columella callus strongly twisted. Central portion of last whorl without enamel.

Bears some resemblance to *Anc. lamellata*, Guppy. A near relation is perhaps *A. rubiginosa*, which has a spire of similar character.

Cassis reclusa, n. sp.

Ovate, ventricose, sulcated by about 18 narrow and shallow equidistant spiral grooves, the flattened intervening ridges being raised into knobs by somewhat obscure longitudinal costæ. Spire conic, cancellated. Apex smooth, blunt. Columella expanded into a granose callus; canal short; outer margin thickened and reflected, dentate.

Very closely related to *C. subulosa* (a Bordeaux fossil). It is chiefly to be distinguished by its larger spire and apex, generally narrower and less ventricose figure, and somewhat stouter ornamentation. Amongst recent West Indian species the nearest relation of *C. reclusa* is *C. granulata* (?=*cicatricosa*, Meusch).

Crepitacella cepula, Guppy.

Melanopsis cepula, Journ. Geol. Soc. 1866, vol. xxii. p. 580, pl. xxvi. f. 14.

Crepitacella cepula, GEOL. MAG. Vol. IV. (1867), p. 500.

This shell is related to *Cyllene pulchella*, Adams. It is not impossible that some other fossils described as *Melanopsis* really belong to the group *Crepitacella*.

Monodonta basilea, n. sp., Pl. XVI. Fig. 2.

Top-shaped, umbilicate. Apex smooth, sharp. Whorls about seven, very strongly carinate, the stout keel on the angular ridge bearing a row of rounded undulate tubercles, and having near the suture a less distinctly marked keel, between which and the keel on the angle there is a slight concavity, marked only by faint spiral ridges crossed by lines of growth. Lower half of last whorl forming the base

covered with strong spiral ridges. Mouth subcircular. Columella lip callous, produced into a broad tooth above a short broad rather effuse canal. Outer lip dentate, grooved within. Total length about 15, greatest breadth about 12 millimetres.

In general characters there is some resemblance between this shell and *Trochus cypris*, Orb. (= *Monodonta elegans*, Bast.).

Trochus decipiens, Pl. XVIII. Fig. 18.

Top-shaped, imperforate, ornamented by many spiral lines of moniliform granules; whorls rather concave above, and bearing a rather broad angular keel on their lower portion; base flattened, covered with lines of rather square granules, aperture subquadrate, wider than high, broadly angulate by the keel; columella thickened, spreading into a callus over the umbilicus.

Var. *laticarinatus*, Pl. XVIII. Fig. 19.

Keel broader and higher, whorls deeply concave above, suture deeply impressed; lines on the base squamosely granular.

Pliocene, Trinidad.

Trochus plicomphalus, Pl. XVIII. Fig. 17.

Top-shaped, deeply perforated by a small circular umbilicus, zoned with many spiral granular lines, aperture subquadrate, columella straight, thickened; base with many (10–20) moniliform rows of granules, umbilicus deep, its margins dentate.

Pliocene, Trinidad. It resembles *T. ziziphinus* in shape, but is devoid of any keel on the whorls.

Vitrinella marginata, Pl. XVIII. Fig. 21.

Orbicular, umbilicate, discoidal, few-whorled, minutely spirally striate; outer margin with about four small articulated keels not visible from above, the outer one forming the periphery; whorls somewhat convex above; spire raised, ornamented with articulated radiating striæ; aperture nearly circular, rather oblique.

Pliocene, Trinidad. A most elegant little shell.

Crucibulum piliferum.

Shell covered with numerous erect tabular spines which are small towards the apex, larger towards the base; apex small, smooth, spirally recurved.

Pliocene, Trinidad. It may be a variety of the next species, but its plicæ are smaller, whilst the spines furnish an easily-recognized character.

Crucibulum subsutum, Pl. XVIII. Fig. 4.

Strongly striate, rugose, somewhat irregularly oval; striations with a tendency to run in pairs.

Pliocene, Trinidad.

Donax fabagelloides, Pl. XVIII. Fig. 10.

Transversely oblong, somewhat triangular, subequilateral, anterior

and posterior angles rounded; zoned with broad dark bands, and finely radiately striate; margins crenate-dentate.

Pliocene, Trinidad. Remarkable for its resemblance to *D. fabagella*. It is more equilateral than that species, and not so high relatively to its length.

Venus Blandiana, n. sp., Pl. XVII. Fig. 8.

Suborbicular, subequilateral, moderately convex, adorned with numerous equidistant concentric lamellæ, between each of which there are about seven or eight concentric striæ; somewhat angulate in front and subtruncate behind; margins crenate. Lunule smooth, impressed. Posterior dorsal area not defined, striate continuously with the lamellæ of the disk. Umbones small. Cardinal teeth two under the lunule; lateral tooth one, nearly halfway down the posterior slope.

Referred to hitherto in papers on West Indian fossils as *Venus rugosa*, var., to young specimens of which species it bears a somewhat close resemblance. The Jamaican examples are smaller than those from Haiti. A specimen in the British Museum from the latter place is labelled *V. circinaria*, but it is not *Cytherea circinata*, nor even nearly allied to it.

When describing *Cytherea juncea* from Cumana, I omitted to point out the close kinship between that fossil and *C. circinata*.

Chama involuta, n. sp., Pl. XVII. Fig. 5.

Left (attached) valve deep internally, very convex externally, often spiral, completing a turn and a half, covered externally with distant large foliaceous scales more or less erect, between which are small irregular diverging granose ridges. Right valve patulous, ornamented with numerous close concentric sinuous foliaceous laminae. Umbones large, prominent, spiral. Margin and laminar cardinal tooth crenate.

Mr. Vendryes suggested that this might be a *Diceras*; but I see no ground for referring it to that genus. It is certainly a very spiral *Chama*; but otherwise its characters are in all respects those of the genus. It is apparently always attached by the umbo of the left valve, and the place of attachment is generally marked by the remains or impressions of the septa of corals. It has some resemblance to a recent species found in the West Indies, which, if I have identified it correctly, is *Ch. ruderalis*, Lam.; but besides other considerable differences, the latter is always attached by its right valve.

Plicatula vexillata, n. sp., Pl. XVII. Fig. 7.

Inequivalve, irregularly fanshaped; valves, usually with the disk almost smooth, adorned towards the margin by seven or eight stout obtuse radiating ribs, along each of which are disposed a few lines of reddish brown (probably red when alive), and between which are some distant almost foliaceous concentric striæ of growth. Longest diameter about 17 mill.

Very near to *P. ramosa*, Lam. Florida.

LIST OF THE FOSSIL MOLLUSCA, ARTICULATA, ECHINODERMATA, AND PROTOZOA HITHERTO DISCOVERED AND RECORDED FROM THE TERTIARY ROCKS OF THE CARIBBEAN AREA (EXCLUSIVE OF THE POST-PLIOCENE).

SUB-KINGDOM MOLLUSCA. CLASS GASTEROPODA.	Recent.	Pliocene Trinidad.	MIOCENE.						EOCENE.		Additional Tertiary Localities.
			Cumana.	Barbuda.	Trinidad (Caroni Series).	Jamaica.	Haiti.	Angulla.	Trinidad (Manzanilla).	Trinidad (San Fernando).	
<i>Physa</i> , Draparnaud.											
<i>rivalis</i> , Mat. & Rack.	x	x									
<i>Planorbis</i> , Geoffroy.											
<i>terverianus</i> , Orb.	x	x									
<i>Gundlachia</i> , Pfeiff.											
<i>ancyliformis</i> , Pf.	x	x									
<i>Bulla</i> , Klein.											
<i>striata</i> , Brug.	x	x	x	x			x	x			Europe.
<i>Vendryesiana</i> , Guppy							x				
<i>paupercula</i> , Sow.								x			
<i>granosa</i> , Sow.								x			
<i>Tornatina</i> , Adams.											
<i>coixlacryma</i> , Guppy							x				
<i>canaliculata</i> , Orb. ...	x	x									
<i>Tornatella</i> , Lamarck.											
<i>textilis</i> , Guppy							x				
<i>Cylichna</i> , Loven.											
<i>ovumlacerti</i> , Guppy ...									x		
<i>Scalaria</i> , Lamarck.											
<i>clathrus</i> , Lam.	x	x									
<i>Leroyi</i> , Guppy					x		x				
<i>Ehrenbergi</i> , Forbes ...											Barbados.
<i>Turbonilla</i> , Risso.											
<i>turris</i> , Orb.	x	x									
<i>subcarinata</i> , Orb. ...	x	x									
<i>Leiostraca</i> , Adams.											
<i>clavata</i> , Guppy			x								
<i>Odostomia</i> , Fleming.											
<i>lavigata</i> , Orb.	x	x									
<i>cancellata</i> , Orb.	x	x									
<i>Aclis</i> , Lovén.											
<i>helecteroides</i> , Guppy ...		x									
<i>Natica</i> , Adanson.											
<i>canrena</i> , Linn.	x	x									
<i>sulcata</i> , Born	x		x				x	x			Panama.
<i>phasianelloides</i> , Orb.							x	x	x		Cuba.
<i>subclausa</i> , Sow.							x	x			Panama.
<i>Naticina</i> , Gray.											
<i>regia</i> , Guppy							x				
<i>Sigaretus</i> , Lamarck.											
<i>depressus</i> , Phil.	x	x									
<i>Ringicula</i> , Deshayes											
<i>tridentata</i> , Guppy ...							x				
<i>Turritella</i> , Lamarck.											
<i>imbricata</i> , Linn.	x	x									
<i>tornata</i> , Guppy			x				x	x		x	
<i>planigyrate</i> , Guppy ...					x						
<i>Vermetus</i> , Adanson.											
<i>papulosus</i> , Guppy.							x	x			
<i>lumbricalis</i> , Linn. ...	x	x									
<i>trilineatus</i> , Guppy	x										

SUB-KINGDOM MOLLUSCA. CLASS GASTEROPODA.	Recent.	MIOCENE.							EOCENE.		Additional Tertiary Localities.
		Pliocene Trinidad.	Cumana.	Barbuda.	Trinidad (Caroni Series).	Jamaica.	Haiti.	Anguilla.	Trinidad (Manzanilla).	Trinidad (San Fernando).	
<i>Peta oconchus</i> , Lea.					x		x				U. States.
<i>sculpturatus</i> , Lea.....											
<i>Siphonium</i> , Browne.											
<i>decussatum</i> , Gmel.....	x	x									
<i>Narica</i> , Recluz.											
<i>sulcata</i> , Orb.	x	x									
<i>Triforis</i> , Deshayes.											
<i>guttata</i> , Guppy.....		x									
<i>Cerithiopsis</i> , Forbes.											
<i>punctatum</i> , Linn.....	x	x									
<i>Cerithium</i> , Bruguières.											
<i>plebeium</i> , Sow.....			x			x	x	x			
<i>uniseriale</i> , Sow.			x				x				
<i>Solarium</i> , Lamarck.											
<i>semidecussatum</i> , G. ...		x									
<i>quadriseriatum</i> , Sow.					x	x	x	x			
<i>Monodonta</i> , Lamarck.											
<i>basilea</i> , Guppy						x					
<i>Cancellaria</i> , Lamarck.											
<i>Barretti</i> , Guppy						x	x				
<i>laevescens</i> , Guppy						x	x	x			
<i>Moorei</i> , Guppy.....			x			x	x				
<i>scalatella</i> , Guppy					x						
<i>Strombus</i> , Linné.											
<i>pugiloides</i> , Guppy.....						x	x	x			Cuba.
<i>bifrons</i> , Sow.						x	x				Panama.
<i>ambiguus</i> , Sow.							x				
<i>Haitensis</i> , Sow.....							x				
<i>proximus</i> , Sow.							x				
<i>Murex</i> , Linn.											
<i>Domingensis</i> , Sow. ...			x				x	x			Panama.
<i>collatus</i> , Guppy							x				
<i>Typhis</i> , Montfort.											
<i>alatus</i> , Sow.		x					x	x			
<i>Ranella</i> , Lamarck.											
<i>crassa</i> , Dillw.	x						x				
<i>Triton</i> , Montfort.											
<i>variegatus</i> , Lam.	x							x			
<i>femorialis</i> , Linn.	x							x			
<i>gemmatus</i> , Reeve.....	x							x			
<i>Latirus</i> , Montfort.											
<i>infundibulum</i> , Gm....	x				x		x				U. States.
<i>Turbinellus</i> , Lam.											
<i>ovoides</i> , Kien.....	x				x			x			
<i>validus</i> , Sow.					x			x			
<i>Haitensis</i> , Sow.....								x			
<i>Fasciolaria</i> , Lam.											
<i>textilis</i> , Guppy						x					
<i>semistriata</i> , Sow.						x	x				
<i>intermedia</i> , Sow.						x	x				
<i>Tarbelliana</i> , Grat. ...			x								[rope. Chile, Eu-
<i>Pyrula</i> , Lamarck.											
<i>melongena</i> , Linn.....	x	x				x	x		x		Europe.

	Recent.	MIOCENE.						EOCENE.		Additional Tertiary Localities.
		Pliocene Trinidad.	Cumana.	Barbuda.	Trinidad (Caroni Series).	Jamaica.	Haiti.	Anguilla.	Trinidad (Manzanilla).	
SUB-KINGDOM MOLLUSCA.										
CLASS GASTEROPODA.										
<i>Fusus</i> , Humphreys.										
<i>Henekeni</i> , Sow.								x		
<i>Haitensis</i> , Sow.....								x		
<i>Phos</i> , Montfort.										
<i>Moorei</i> , Guppy.....							x	x		Panama.
<i>erectus</i> , Guppy							x			
<i>elegans</i> , Guppy			x				x	x		
<i>solidulus</i> , Guppy			x	x			x			
<i>Nassa</i> , Lamarck.										
<i>incrassata</i> , Müll.	x	x	x				x	x		Europe.
<i>Planaxis</i> , Lamarck.										
<i>crassilabrum</i> , Guppy		x								
<i>Purpura</i> , Lamarck.										
<i>Miocenica</i> , Guppy ...							x			
<i>Terebra</i> , Lamarck.										
<i>inaequalis</i> , Sow.			x				x	x		
<i>bipartita</i> , Sow.....							x	x		
<i>flammea</i> , Linn.....	x						x	x		
<i>sulcifera</i> , Sow.....							x	x		
<i>Cassis</i> , Browne.										
<i>reclusa</i> , Guppy.....							x			
<i>sulcifera</i> , Sow.							x	x		
<i>monilifera</i> , Guppy ...							x			
<i>Cassidaria</i> , Lamarck.										
<i>laevigata</i> , Sow.								x		
<i>sublaevigata</i> , Guppy ...							x			
<i>Oniscia</i> , Sowerby.....										
<i>Domingensis</i> , Sow. ...								x		
<i>Malea</i> , Valenciennes.										
<i>camura</i> , Guppy							x	x		Panama.
<i>Ficula</i> , Swainson.										
<i>carbacea</i> , Guppy					x		x		x	
<i>Persona</i> , Montfort.										
<i>similima</i> , Sow.....			x				x	x		
<i>Crepidacella</i> , Guppy.										
<i>cepula</i> , Guppy			x				x			
<i>Columbella</i> , Lam.										
<i>Duclosiana</i> , Orb.	x	x								
<i>pulchella</i> , Kien.	x	x								
<i>peculiaris</i> , Guppy.....		x								
<i>Haitensis</i> , Sow.....								x		
<i>venusta</i> , Sow.			x					x		
<i>gradata</i> , Guppy			x				x			
<i>ambigua</i> , Guppy							x			
<i>Oliva</i> , Lamarck.										
<i>reticularis</i> , Lam.	x						x			Panama.
<i>hispidula</i> , Lam.	x		x					x		
<i>cylindrica</i> , Sow.			x	x	x			x		Panama.
<i>oryza</i> , Lam.	x	x								
<i>Ancillaria</i> , Lam.										
<i>pinguis</i> , Guppy.....							x			
<i>lamellata</i> , Guppy....								x		
<i>glandiformis</i> , Lam. ...							x	x		Europe.

	Recent.	Eocene Trinidad.	MIOCENE.						EOCENE.		Additional Tertiary Localities.
			Cumana.	Barbada.	Trinidad (Caroni Series).	Jamaica.	Haiti.	Anguilla.	Trinidad (Manzanilla).	Trinidad (San Fernando).	
SUB-KINGDOM MOLLUSCA.											
CLASS GASTEROPODA.											
<i>Pleurotoma</i> , Lam.											
<i>consors</i> , Sow.							x	x			
<i>venustum</i> , Sow.							x	x			
<i>Barretti</i> , Guppy			x				x	x			
<i>Jamaicense</i> , Guppy ...							x				
<i>Henekeni</i> , Sow.							x	x			
<i>Haitense</i> , Sow.			x				x	x			
<i>Jaguense</i> , Sow.								x			
<i>elator</i> , Orb.	x	x									
<i>luctuosa</i> , Orb.	x	x									
<i>Conus</i> , Linné.											
<i>recognitus</i> , Guppy ...							x	x			
<i>planiliratus</i> , Sow.					x		x	x			
<i>stenotomus</i> , Sow.							x	x			
<i>granozonatus</i> , Guppy							x	x			
<i>interstinctus</i> , Guppy...							x	x			
<i>gracilissimus</i> , Guppy			x				x	x	x		
<i>Haitensis</i> , Sow.								x			
<i>symmetricus</i> , Sow. ...			x					x			
<i>marginatus</i> , Sow.								x			
<i>Domingensis</i> , Sow. ...								x			
<i>catenatus</i> , Sow.								x			
<i>consobrinus</i> , Sow. ...							x	x			
<i>prototypus</i> , Guppy ...					x			x			
<i>pusio</i> , Brug.	x	x									
<i>Mangelia</i> , Leach.											
<i>micropleura</i> , Guppy...		x									
<i>Mitra</i> , Lamarck.											
<i>Henekeni</i> , Sow.					x		x	x			
<i>varicosa</i> , Sow.								x			
<i>Voluta</i> , Linné.											
<i>soror</i> , Sow.								x			
<i>pulchella</i> , Sow.								x			
<i>Ovulum</i> , Bruguières.											
<i>immunitum</i> , Guppy...							x				
<i>Marginella</i> , Lamarck.											
<i>coniformis</i> , Sow.			x		x		x	x			
<i>interrupta</i> , Lam.	x		x								
<i>cærulescens</i> , Lam.	x	x									
<i>Volvarina</i> , Hinds.											
<i>pallida</i> , Lam.	x	x									
<i>catenata</i> , Montf.	x	x									
<i>Erato</i> , Risso.											
<i>maugera</i> , Gray	x	x									
<i>Cypræa</i> , Linné.											
<i>pustulata</i> , Lam.	x							x			
<i>Henekeni</i> , Sow.								x			
<i>Dentalium</i> , Linné.											
<i>Mississippiense</i> , Conr. ...								x		U. States.	
<i>dissimile</i> , Guppy							x				
<i>disparile</i> , Orb.	x	x									
<i>Antillarum</i> , Orb.	x	x									
<i>Trochita</i> , Schumacher.											
<i>Candeana</i> , Orb.	x	x									

	Recent.	Pliocene Trinidad.	MIOCENE.						EOCENE.		Additional Tertiary Localities.
			Cumana.	Barbuda.	Trinidad (Caroni Series.)	Jamaica.	Haiti.	Anguilla.	Trinidad (Manzanilla).	Trinidad (San Fernando).	
SUB-KINGDOM MOLLUSCA.											
CLASS GASTEROPODA.											
<i>Crucibulum</i> , Schum.											
<i>pilsiferum</i> , Guppy.....		x									
<i>subsutum</i> , Guppy.....		x									
<i>Crepidula</i> , Lamarck											
<i>aculeata</i> , Lam.....	x	x									
<i>Gadina</i> , Gray.											
<i>afra</i> , Gray.....	x	x									
<i>Fissurella</i> , Lamarck.											
<i>Cayennensis</i> , Lam. ...	x	x									
<i>Stomatia</i> , Browne.											
<i>eidolon</i> , Guppy.....										x	
<i>Neritina</i> , Lamarck.											
<i>Woodwardi</i> , Guppy...							x				
<i>Trochus</i> , Linné.											
<i>deceptens</i> , Guppy		x					x				
<i>plicomphalus</i> , Guppy		x									
<i>Turbo</i> , Linné.											
<i>castaneus</i> , Chemn.....	x		x				x				
<i>Cyclostrema</i> , Marryat.											
<i>bicarinatum</i> , Guppy							x				
<i>Vitrinella</i> , Adams.											
<i>marginata</i> , Guppy ...		x									
CLASS PTEROPODA.											
<i>Hyalaea</i> , Lamarck.											
<i>Vendryesiana</i> , Guppy							x				
CLASS CONCHIFERA.											
<i>Martesia</i> , Leach.											
<i>striata</i> , Linn.	x	x									
<i>Teredo</i> , Linné.											
<i>fistula</i> , Lea					x			x			
<i>Gastrochaena</i> , Spengler.											
<i>cuneiformis</i> , Lam. ...	x	x									
<i>Corbula</i> , Bruguières.											
<i>viminea</i> , Guppy							x	x			
<i>vieta</i> , Guppy.....		x					x	x	x		
<i>Cubaniana</i> , Orb.....	x	x									
<i>Caribea</i> , Orb.....	x	x									
<i>Nezra</i> , Gray.											
<i>costellata</i> , Desh.	x						x				
<i>Cercomya</i> , Agassiz.											
<i>ledaeiformis</i> , Guppy ...									x		
<i>Mactra</i> , Linné.											
<i>turgida</i> , Gmel.....	x	x									
<i>subovalina</i> , Guppy ...											x
<i>Mactrimula</i> , Gray.											
<i>macescens</i> , Guppy ...									x		
<i>Tellina</i> , Linné.											
<i>biplicata</i> , Conr. ...				x	x						
<i>Strigilla</i> , Turton.								x			
<i>carnaria</i> , Linn.	x	x									
<i>Semele</i> , Schumacher.											
<i>variegata</i> , Lam.	x	x									

Cuba; U.S.

SUB-KINGDOM MOLLUSCA. CLASS CONCHIFERA.	Recent.	Pliocene Trinidad.	MIOCENE.					EOCENE.		Additional Tertiary Localities.
			Cumana.	Barbuda.	Trinidad (Caroni Series).	Jaimaca.	Haiti.	Anguilla.	Trinidad (Manzanilla).	
<i>Donax</i> , Linné.										
<i>striata</i> , Linn.	x	x								
<i>fabagelloides</i> , Guppy...		x								
<i>Lucina</i> , Bruguières.										[Europe.
<i>tigrina</i> , Linn.	x		x				x			Egypt ;
<i>Pennsylvanica</i> , Linn.	x		x				x	x		Piedmont ;
<i>muricata</i> , Chemn. ...	x	x								[U.States.
<i>Crassinella</i> , Guppy										
<i>Martinicensis</i> , Orb. ...	x	x								
<i>Trigona</i> , Megerle										
<i>mactroides</i> , Born.	x	x								
<i>Cytherea</i> , Lamarck.										
<i>planivola</i> , Guppy. ...							x			
<i>carbacea</i> , Guppy							x			
<i>juncea</i> , Guppy			x							
<i>convexa</i> , Say.....	x		x							
<i>circinata</i> , Born.....	x	x								
<i>Venus</i> , Linné.										
<i>Blandiana</i> , Guppy....							x			
<i>paphia</i> , Linn.	x		x				x	x		Vienna.
<i>rugosa</i> , Chemn.....	x						x	x		
<i>puerpera</i> , Linn.....	x							x		
<i>flexuosa</i> , Linn.	x	x								
<i>cancellata</i> , Gron.	x	x	x					x		
<i>crenulata</i> , Chemn. ...	x	x								
<i>Walli</i> , Guppy								x		
<i>Woodwardi</i> , Guppy...										
<i>Dosinia</i> , Scopoli										
<i>acetabulum</i> , Conr. ...	x			x						U. States.
<i>cyclica</i> , Guppy								x		
<i>Cardium</i> , Linné.										
<i>muricatum</i> , L.	x	x								
<i>Haitense</i> , Sow.....	x	x	x				x	x		
<i>lingualeonis</i> , Guppy...							x			
<i>inconspicuum</i> , Guppy							x			
<i>castum</i> , Guppy.....								x		
<i>Cardia</i> , Bruguières.										
<i>minima</i> , Sow.	x	x								
<i>scabricostata</i> , Guppy..							x	x		
<i>Chama</i> , Bruguières.										
<i>arcinella</i> , Lam.	x						x	x		U. States.
<i>involuta</i> , Guppy ..							x			
<i>ruderalis</i> , Lam.....	x	x								
<i>Erycina</i> , Lamarck.										
<i>tena</i> , Guppy										
<i>Leda</i> , Schumacher										
<i>bisulcata</i> , Guppy							x			
<i>incognita</i> , Guppy									x	
<i>clara</i> , Guppy							x			
<i>Packeri</i> , Forbes										Barbadoes.
<i>perlepidia</i> , Guppy		x								
<i>illecta</i> , Guppy								x		
<i>Nucula</i> , Lamarck										
<i>Schomburgki</i> , Forbes.									x	Barbadoes.

	Recent.	Pliocene Trinidad.	MIOCENE.						EOCENE.		Additional Tertiary Localities.
			Cumana.	Barbuda.	Trinidad (Caroni Series).	Jamaica.	Haiti.	Anguilla.	Trinidad (Manzanilla).	Trinidad (San Fernando).	
SUB-KINGDOM. MOLLUSCA.											
CLASS CONCHIFERA.											
<i>N. baccata</i> , Guppy		x									
<i>vieta</i> , Guppy.....		x									
<i>Arca</i> , Linné.											
<i>occidentalis</i> , Phil.	x	x				x	x				
<i>incongrua</i> , Say.....	x										
<i>consobrina</i> , Sow.			x			x	x				
<i>inequilateralis</i> , Guppy						x					
<i>patricia</i> , Sow.					x		x				
<i>trinitaria</i> , Guppy.....											
<i>filicata</i> , Guppy.....								x			
<i>centrota</i> , Guppy	x	x						x			
<i>Adamsi</i> , Shuttl.....	x	x									
<i>squamosa</i> , Lam.	x	x									
<i>pexata</i> , Say	x	x	x				x				U. States.
<i>Pectunculus</i> , Lamarck.											
<i>decussatus</i> , Linn.....	x		x			x					
<i>acuticostatus</i> , Sow. ...			x			x	x				
<i>Pecten</i> , Bruguières.											
<i>exasperatus</i> , Sow.....	x					x					
<i>inequalis</i> , Sow.						x	x				
<i>thetidis</i> , Sow.							x				
<i>nucleus</i> , Born	x	x									
<i>oxygonus</i> , Sow.							x				
<i>comparilis</i> , Tuomey...					x						U. States.
<i>Anguillensis</i> , Guppy...								x			
<i>Mortoni</i> , Ravenel.....								x			U. States.
<i>Plicatula</i> , Lamarck.											
<i>vexillata</i> , Guppy						x					
<i>Spondylus</i> , Lamarck											
<i>bostrychites</i> , Guppy ...						x	x	x			
<i>Ostrea</i> , Linné.											
<i>virginica</i> , Gmel.	x				x		x	x			[U. States. Europe ;
<i>cucullata</i> , Born.	*x	x									
<i>Gryphaea</i> , Lamarck											
<i>athyroides</i> , Guppy ...									x		
CLASS											
BRACHIOPODA.											
<i>Terebratula</i> , Lhwyd.											
<i>lecta</i> , Guppy									x		
<i>trinitatensis</i> , Guppy...									x		
<i>carneoides</i> , Guppy ...									x		St. Barts.
<i>Argiope</i> , Deslongch.											
<i>Clevei</i> , Davidson											St. Barts,
CLASS POLYZOA.											
<i>Cupularia</i> , Orbigny.											
<i>pyriforme</i>	x	x	x			x	x				
<i>calyxglandis</i> , Guppy..								x			
<i>Cellaria</i> , Lamarck.											
<i>salicornia</i> , Pallas. ...	x	x									
SUB-KINGDOM											
ARTICULATA.											
<i>Ranina</i> , Lamarck.											
<i>porifera</i> , Woodward..									x		St. Barts.

	Recent.	Pliocene Trinidad.	MIOCENE.						EOCENE.		Additional Tertiary Localities.
			Cumana.	Barbuda.	Trinidad (Caroni Series).	Jamaica.	Haiti.	Anguilla.	Trinidad (Manzanilla).	Trinidad (San Fernando).	
SUB-KINGDOM ARTICULATA.											
<i>Spirorbis</i> , Lamarck											
<i>clymenoides</i> , Guppy ..										x	
<i>Ditrupe</i> , Berkeley.											
<i>dentalina</i> , Guppy.....							x				
SUB-KINGDOM ECHINODERMATA.											
<i>Cidaris</i> , Lamarck.											
<i>melitensis</i> , Wright									x		Europe.
<i>metularia</i> , Lam.	x										Guadeloupe
<i>Tripneustes</i> , Agassiz											
<i>ventricosus</i> , Ag.	x										Ditto.
<i>Echinus</i> , Linné.											
<i>cameleo</i> , Mich.	x										Ditto.
<i>Echinometra</i> , Klein.											
<i>lobata</i> , Blainv.	x										Ditto.
<i>acufera</i> , Blainv.	x								x		
<i>Clypeaster</i> , Lamarck.											
<i>Duchassaingi</i> , Mich....											Ditto.
<i>parvus</i> , Duch.											Ditto.
<i>crustulum</i> , Mich.....											Ditto.
<i>ellipticus</i> , Mich.									x		Ditto.
<i>Scutella</i> , Lamarck.											
<i>Michelini</i> , Duch.											Ditto.
<i>Encope</i> , Agassiz.											
<i>Desmoulini</i> , Duch....	x										Ditto.
<i>Echinoneus</i> , Phelsum.											
<i>cyclostomus</i> , Leske ...	x								x		Antilles.
<i>orbicularis</i> , Desor. ...											Cuba.
<i>Caratomus</i> , Agassiz.											
<i>pisiformis</i> , M. & D.											Guadeloupe
<i>Cassidulus</i> , Lamarck.											
<i>Guadelupensis</i> , M. & D.											Ditto.
<i>Echinolampas</i> , Gray.											
<i>seniorbis</i> , Guppy									x		
<i>lycopersicus</i> , Guppy ...									x		
<i>ovumserpentis</i> , Guppy										x	St. Barts.
<i>Pygorhynchus</i> , Agassiz											
<i>Jamaicensis</i> , Mich. ...							x				
<i>Amblypygus</i> , Agassiz.											
<i>Americanus</i> , Mich. ...							x				
<i>Hemaster</i> , Desor.											[Guadeloupe
<i>Michelottii</i> , Mich.....											Cuba ;
<i>Schizaster</i> , Agassiz											
<i>Cubensis</i> , Orb.											Ditto, do.
<i>Scille</i> , Desm.									x		Europe.
<i>Brissus</i> , Klein.											
<i>dimidiatus</i> , Agassiz ...	x								x		Cuba.
<i>Pentacrinus</i> , Miller.											
<i>rotularis</i> , Guppy										x	
<i>obtusus</i> , Guppy.....										x	
INCERTÆ SEDIS.											
<i>Cisseis</i> , Guppy.											
<i>asterisca</i> , Guppy										x	

	MIOCENE.					Eocene.	
	Cumana.	Antigua.	Jamaica.	Haiti.	Anguilla.	Trinidad.	
SUB-KINGDOM PROTOZOA. CLASS RHIZOPODA.							
<i>Nummulina Ramondi</i>	x	x	x	x	x	x	
<i>Orbitoides Mantelli</i>	x	x	x	x	x	x	
<i>dispersus</i>		x	x				
" <i>media</i>			x				
" <i>papyracea</i>			x				
" <i>Forbesi</i>			x				
<i>Orbitolites complanatum</i>					x		
<i>Amphistegina vulgaris</i>			x			x	
<i>Heterostegina depressa</i>			x				
<i>Operculina complanata</i>			x				
<i>Miliola seminulum</i>					x		
<i>Robulina cultrata</i>				x			
<i>Rosalina Beccarii</i>				x			
<i>Orbulina universa</i>						x	
<i>Globigerina bulloides</i>			x			x	
<i>Nodosaria glabra</i>						x	
" <i>hispida</i>						x	
" <i>raphanus</i>			x			x	
" <i>raphanistrum</i>			x	x		x	
" <i>ovicula</i>						x	
" <i>pyrula</i>						x	
" <i>affinis</i>				x			
<i>Spiroloculina nitida</i>						x	
<i>Glandulina laevigata</i>						x	
<i>Dentalina elegans</i>						x	
" <i>filiformis</i>						x	
" <i>communis</i>						x	
" <i>acicula</i>			x				
<i>Polymorphina gibba</i>						x	
<i>Orbitolina vesicularis</i>			x				
<i>Rotalia orbicularis</i>						x	
" <i>corallinarum</i>						x	
<i>Vaginulina striata</i>			x				
" <i>legumen</i>			x				
<i>Frondicularia complanata</i>			x				
<i>Textularia Barretti</i>			x				
<i>Bulimina ovata</i>			x				
<i>Lituola Soldanii</i>			x				
<i>Vertebralina striata</i>			x				
<i>Cuneolina pavonia</i>			x				
<i>Cristellaria calcar</i>			x				
" <i>cultrata</i>			x				
" <i>rotulata</i>			x				
" <i>Italica</i>			x				

EXPLANATION OF PLATES.

ALL THE FIGURES ARE OF THE NATURAL SIZE.

PLATE XVI.

- FIG 1. *Phos erectus*.
- " 2. *Monodonta basilea*.
- " 3. *Ancillaria pinguis*.
- " 4. *Tornatella textilis*.
- " 5. *Fasciolaria textilis*
- " 6. *Bulla Vendryesiana*.

- FIG. 7. *Ovulum immunitum*.
- " 8. *Murex collatus*.
- " 9. *Purpura Miocenica*.
- " 10. *Scalaria Leroyi*.
- " 11. *Ditrupea dentalina*.

PLATE XVII.

- | | | | |
|--------------|--------------------------------|---------|-----------------------------|
| FIG. 1, 1a. | <i>Leda clara.</i> | FIG. 6. | <i>Naticina regia.</i> |
| ,, 2a, 2b. | <i>Hyalæa Vendryesiana.</i> | ,, 7. | <i>Plicatula vexillata.</i> |
| ,, 3. | <i>Conus consobrinus.</i> | ,, 8. | <i>Venus Blandiana.</i> |
| ,, 4. | <i>Cancellaria scalatella.</i> | ,, 9. | <i>Conus prototypus.</i> |
| ,, 5a, b, c. | <i>Chama involuta.</i> | | |
| | 5a. exterior of left valve. | | |
| | 5b. interior of left valve. | | |
| | 5c. exterior of right valve. | | |

PLATE XVIII.

- | | | |
|---------|--------------------------------|--------------------|
| FIG. 1. | <i>Conus prototypus</i> | Miocene, Trinidad. |
| ,, 2. | <i>Scalaria Leroyi</i> | ,, ,, |
| ,, 3. | <i>Cupularia calyxglandis</i> | Eocene Trinidad. |
| ,, 4. | <i>Crucibulum subutum</i> | Pliocene, ,, |
| ,, 5. | <i>Turritella planigyrate</i> | Miocene, ,, |
| ,, 6. | <i>Mangelia micropleura</i> | Pliocene, ,, |
| ,, 7. | <i>Nucula baccata</i> | ,, ,, |
| ,, 8. | ———— <i>victa</i> | ,, ,, |
| ,, 9. | <i>Leda perlepada</i> | ,, ,, |
| ,, 10. | <i>Donax fabagelloides</i> | ,, ,, |
| ,, 11. | <i>Aclis helecteroides</i> | ,, ,, |
| ,, 12. | <i>Vermetus trilineatus</i> | ,, ,, |
| ,, 13. | <i>Planaxis crassilabrum</i> | ,, ,, |
| ,, 14. | <i>Solarium semidecussatum</i> | ,, ,, |
| ,, 15. | <i>Turbonilla turris</i> | ,, ,, |
| ,, 16. | <i>Liostraca clavata</i> | ,, ,, |
| ,, 17. | <i>Trochus plicomphalus</i> | ,, ,, |
| ,, 18. | ———— <i>deciptis</i> | ,, ,, |
| ,, 19. | ———— var. <i>laticarinatus</i> | ,, ,, |
| ,, 20. | <i>Columbella peculiaris</i> | ,, ,, |
| ,, 21. | <i>Vitrinella marginata</i> | ,, ,, |
| ,, 22. | <i>Cylichna ovumlacerti</i> | Eocene, ,, |
| ,, 23. | <i>Area centrota</i> | Pliocene, ,, |
| ,, 24. | <i>Pecten Anguillensis</i> | Miocene, Anguilla. |
| ,, 25. | <i>Pentacrinus rotularis</i> | Eocene, Trinidad. |
| ,, 26. | ———— <i>obtus</i> | ,, ,, |
| ,, 27. | <i>Triforis guttata</i> | Pliocene, ,, |

II.—NOTES ON THE IMPRESSION OF *PALEONTINA OOLITICA* IN THE JERMYN STREET MUSEUM.

By A. G. BUTLER, F.L.S., F.Z.S., etc.
of the British Museum.

(PLATE XIX.)

IT will be remembered that, in the GEOLOGICAL MAGAZINE for 1873, Vol. X. p. 2, Pl. I. Figs. 1, 2, I described a fossil Butterfly from the Stonesfield Slate under the name of *Palæontina oolitica*; the type was in the possession of Mr. E. Charlesworth, who subsequently discovered that the twin impression had been obtained by Mr. J. W. Judd, F.G.S., who presented it to the Museum of Practical Geology, Jermyn Street.

Soon after the publication of my paper, my friend Mr. Samuel Scudder, of Boston, U.S. (who has long taken great interest in fossil insects, especially *Lepidoptera*), wrote me a letter, from which I subjoin an extract:—

“While in England, I studied the original of your fossil butterfly, and also of its *reverse* in the Museum of the School of Mines. I