I - Adams

S. F. BAIRD.

CONTRIBUTIONS

TO

CONC HOLOGY:

CONDUCTED BY

Charles
C. B. ADAMS,

PROFESSOR OF ZOOLOGY IN AMHERST COLLEGE, MASS.

VOLUME I.

OCTOBER, 1849—NOVEMBER, 1852.

NEW YORK:

H. BAILLIÈRE, No. 290 BROADWAY;

219 REGENT ST., LONDON; AND 19 RUE HAUTEFEUILLE, PARIS.

CONTENTS OF VOL. I.

BY C. B. ADAMS.

	Page
Descriptions of forty-four new species and varieties of operculated land shells from Jamaica. September 1849. - - - - -	1-14
Catalogue of operculated land shells which inhabit Jamaica. - - -	15-16
Descriptions of supposed new species and varieties of Helicidæ from Jamaica. October 1849. - - - - -	17-38
Catalogue of species and varieties of Helicidæ which inhabit Jamaica. -	39-41
New Auriculidæ which inhabit Jamaica. Oct. 1849. - - - - -	41-42
Catalogue of Auriculidæ which inhabit Jamaica. Oct. 1849. - - -	42
Descriptions of supposed new species of freshwater shells which inhabit Jamaica. Oct. 1849. - - - - -	42-45
Catalogue of freshwater shells which inhabit Jamaica. Oct. 1849. - -	45
Remarks on the distribution of the terrestrial and freshwater Mollusca which inhabit Jamaica. Oct. 1849. - - - - -	45-50
Remarks on the weight of the shells of certain species of Colimacea. Nov. 1849. - - - - -	51-53
Description of a supposed new species of Columbella. Jan. 1850. - - -	53-54
Notes on the synonymy of certain marine shells. Jan. 1850. - - -	54-55
Descriptions of supposed new species of marine shells which inhabit Jamaica. Jan. 1850. - - - - -	56-75
Descriptions of supposed new species and varieties of terrestrial shells which inhabit Jamaica. Feb. 1850. - - - - -	76-84
Remarks on the origin of the terrestrial Molluscs of Jamaica. March 1850. - - - - -	85-87
Description of a new genus of Helicidæ from Jamaica. March 1850. -	87-88
Description of Jamaicia, a new subgenus of Cyclostoma. March 1850. -	88
Notes on certain species of the land shells of Jamaica. March 1850. -	88-90
Descriptions of supposed new species of land shells which inhabit Jamaica. March 1850. - - - - -	90-98
Synonymy of <i>Helix picturata</i> Ad. - - - - -	98-100
Description of supposed new species of land shells which inhabit Jamaica. April 1850. - - - - -	101-108
Descriptions of supposed new species of marine shells which inhabit Jamaica. April 1850. - - - - -	109-123
Descriptions of new species of Partula and Achatinella. Oct. 21st, 1850.	125-128
Descriptions of new species and varieties of shells which inhabit Jamaica. Oct. 21st, 1850. - - - - -	129-140
Analysis of the group of species of Cyclostoma, which is represented by <i>C. Jamaicense</i> Chem. - - - - -	140-148

	Page
On the genus <i>Stoastoma</i> . Oct. 21, 1850. - - - - -	148-151
Descriptions of new species and varieties of the land shells of Jamaica, with notes on some previously described species. April 1851. - -	153-174
Descriptions of new freshwater shells, which inhabit Jamaica. April 1851. - - - - -	174-175
Catalogue of the land shells which inhabit Jamaica. April 1851. - -	179-186
Catalogue of the freshwater shells which inhabit Jamaica. April 1851. -	187
On the nature and origin of the species of the terrestrial Mollusca in the Island of Jamaica. Nov. 1851. - - - - -	189-194
Notice of a reversed <i>Cyclostoma</i> . - - - - -	194
On the value of the shells of Mollusca for the purpose of distinguishing species and higher groups. Nov. 1851. - - - - -	194-203
Remarks on certain <i>Helices</i> which are described and figured in the <i>Conchologia Iconica</i> for October, 1851. Nov. 1851. - - - -	205-206
Hints on the geographical distribution of animals, with special reference to the Mollusca. Oct. 1852. - - - - -	207-215
Descriptions of new species of <i>Corbula</i> from Jamaica, &c. Oct. 1852. -	233-241
Catalogue of Species of <i>Lucina</i> , which inhabit the West Indian Seas. Nov. 1852. - - - - -	242-247

BY C. B. ADAMS AND EDWARD CHITTY.

Remarks on the habitats of certain species of land shells. April 1851. -	176-177
--	---------

BY THOMAS BLAND.

Catalogue of the terrestrial shells of St. Thomas, W. I. Oct. 1852. - -	215-224
On the <i>Clausilia</i> of America. Oct. 1852. - - - - -	224-228
Catalogue of terrestrial shells collected by T. Bland in New Grenada in 1851. Oct. 1852. - - - - -	228-230
The same, continued. - - - - -	231-233
Notice of Petit's <i>Journal de Conchyliologie</i> , &c. - - - - -	241-242
Notice of Poey's <i>Memorias sobre la Historia Natural de la Isla de Cuba</i> , &c., 1851. - - - - -	242

Contributions to Conchology
No. 1.

DESCRIPTIONS OF FORTY-FOUR SUPPOSED NEW SPECIES AND VARIETIES OF OPERCULATED LAND SHELLS FROM JAMAICA.

BY C. B. ADAMS,
Professor of Zoology, etc., in Amherst College, Massachusetts.*
SEPTEMBER, 1849.

1. *CYCLOSTOMA CHITTYI*. This species differs from *C. fimbriatum* Sowb. in the smaller and more closely set spiral carinae, of which there are three more on each whorl, — and by the scollops of the outer peritreme, which are smaller and more numerous, corresponding with the carinae.

The many individuals of *C. fimbriatum* which I have seen are quite constant in their peculiarities. Of *C. Chittyi*, however, I have but one individual. The value of the species will be more certainly established by the discovery of additional specimens.

2. *CYCLOSTOMA SPINULOSUM*. Shell short, globose-conic; dingy white, with several more or less interrupted brown spiral lines; with crowded transverse thin perpendicular lamellae, which are decussated by numerous rather strong raised spiral lines, of which three about the middle of the whorls are larger; the points resulting from the decussation are elevated into minute spines where protected in the angle of the deep suture; spire with very convex outlines; apex usually truncate with the loss of two whorls; three and one half whorls remaining, very convex; last whorl a little detached from the penult whorl near the aperture, but soldered to it by the outer peritreme; aperture exactly circular; inner peritreme much produced, striated parallel to the edge on the outside; outer peritreme moderately expanded and reflected convexly back of the plane of the aperture, finely scolloped with the ends of the spiral lines, and deeply striated parallel to the

* The writer is engaged in the preparation of a monograph of the land shells of Jamaica, and will thankfully receive any criticism or information, which may promote its completeness and correctness.

scollops; umbilicus moderately wide, extending through the truncate apex.

Mean divergence 75° ; length .55 inch; greatest breadth .55 inch; least breadth .38 inch.

The spiral lines, as usual in this group, do not appear on the first whorl, but only on the last three.

3. *CYCLOSTOMA ACULEOSUM*. Shell short, globose-conic; dingy white; with crowded transverse thin perpendicular lamellæ, which are decussated by numerous thin prominent spiral lines, with the points of intersection produced into slender spines, especially in the angle of the deep suture, the spiral lines appearing on the last three whorls; spire with very convex outlines; apex truncate with the loss of two whorls, three and one half whorls remaining, very convex; last whorl a little detached from the penult whorl near the aperture, but soldered to it by the outer peritreme; aperture exactly circular; inner peritreme well produced; outer peritreme well expanded, scolloped and striated as in the preceding; umbilicus moderately wide, extending through the truncate apex.

The spiral lamella of the operculum is extremely high and but slightly reflected outwards.

Mean divergence 77° ; length .56 inch; greatest breadth .6 inch; least breadth .38 inch.

4. *CYCLOSTOMA AMABILE*. Shell globose-conic; dingy or brownish white, with the peritreme radiated with brown; with very numerous transverse thin perpendicular lamellæ, which are decussated and aculeated by numerous spiral very delicate lines, which appear only on the last three whorls; spire with very convex outlines; apex usually truncate, with the loss of less than two whorls; three and one half whorls remaining, with a rather deep suture; last whorl not at all detached from the penult whorl; aperture exactly circular; inner peritreme well produced; outer peritreme greatly expanded, very deeply striated with the lamellæ of growth, which are pectinated parallel to the numerous scollops made by the ends of the spiral lines, perpendicular and less developed against the penult whorl, sinuate and yet more expanded above; umbilicus exhibiting all the whorls and extending through the truncate apex.

The spiral lamella of the operculum is much less elevated than in the preceding, and slopes outward much more. The sculpture of the shell is finer, the umbilicus is narrower, and the peritreme is much more expanded.

Mean divergence 75° ; length .5 inch; greatest breadth .55 inch; least breadth .35 inch.

5. *CYCLOSTOMA AMANDUM*. Shell short, globose-conic ; dingy white with three principal and often other brown more or less interrupted spiral bands ; with quite regular prominent lamellæ of growth, which are decussated and aculeated by very numerous close-set spiral lines, that appear only on the last three whorls and are most conspicuous just below the suture ; spire with very convex outlines ; apex truncate with the loss of two whorls ; three and one half remaining, very convex, with a deep suture ; last whorl a little detached from the penult whorl near the aperture, but soldered to it by the outer peritreme ; aperture exactly circular, inner peritreme much produced, regularly striated on the outside parallel to the edge ; outer peritreme finely scalloped with the termination of the spiral lines ; umbilicus extending through to the truncate apex, and exhibiting all the whorls.

Mean divergence 88° ; length .55 inch ; greatest breadth .63 inch ; least breadth .43 inch.

6. *CYCLOSTOMA BLANDIANUM*. Shell like *C. lima*, Ad. but the spiral lines are less distinct, and both the spiral and transverse lines are finer and more closely set ; the shell is shorter and the whorls are narrower ; color pale brown to white, with more or less distinct interrupted spiral brown lines ; outer peritreme very much expanded, especially on the left side, slightly crenulated, above produced into a broad sinus ; umbilicus narrow and extending through the truncate apex.

Mean divergence 60° to 62° ; length .7 inch ; greatest breadth .65 inch ; least breadth .45 inch.

7. *CYCLOSTOMA VARIABLE*. Shell moderately elongate, ovate conic ; deep blackish blue when fresh, fading by exposure into pale yellowish brown, and then developing on the upper whorls two and on the last whorl three somewhat interrupted spiral brown lines and intermediate series of small brown spots, with a series just below the suture of large square spots, with a wax-yellow lip ; with very fine spiral striæ on the last three whorls, decussated by very close-set rounded ridges of growth, most of which are gathered in the suture into minute white crenulations ; spire with very convex outlines ; apex truncate with the loss of three to three and one half whorls ; four whorls remaining, which are quite convex and very slightly angular above the middle, with the suture rather deep ; aperture circular ; outer peritreme at first rather thin smooth, and polished ; in the old, the lip is filled between its moderately produced inner and outer margins with a solid deposit concentrically striated, not scalloped ; umbilicus small, exhibiting but a part of the last whorl, extending through the truncate apex.

Mean divergence 43° ; length .53 inch ; greatest breadth .34 inch ; least breadth .26 inch.

8. *CYCLOSTOMA CONCENTRICUM*. This may be a variety of *C. variabile*; it is chiefly distinguished by having the lamellæ between the inner and outer peritremes so much produced as to appear like numerous concentric margins; by having the lip reflected farther back; by a more slender general form, the mean divergence being 33° to 35° . The lip is reddish purple, with darker rays of the same conspicuous in the more simple lip of the young, and the square sutural spots are always faint.

9. *CYCLOSTOMA SERRIFERUM*. Shell ovate-conic, moderately elongate; reddish brown, with a series of rather dark spots of the same; with very thin and sharp transverse perpendicular rather distant lamellæ, which are serrated by a few faintly impressed spiral lines: spire with convex outlines; apex truncate with the loss of about three whorls; remaining whorls four and one half, moderately convex, with a well impressed suture; last whorl scarcely detached from the penult whorl near the aperture, which is orbicular; inner peritreme not produced (?); outer peritreme shining, well expanded, except opposite to the penult whorl; umbilicus narrow, but extending through the truncate apex.

Mean divergence about 40° ; length .57 inch; greatest breadth .35 inch; least breadth .275 inch.

This may possibly be an accidental variety of *C. Grayanum* or of some other of this group. The only specimen which I have does not appear to have the lip fully developed with age.

10. *CYCLOSTOMA DECUSSATULUM*. Shell moderately elongate, ovate conic; whitish, with brown spiral bands, which are more distinct on the lower whorls; elegantly and finely decussated with numerous close-set transverse strong rounded raised lines; spire with convex outlines: apex truncate with the loss of two or two and one half whorls; four and one half to five whorls remaining, convex, with a deep suture; aperture nearly circular; inner peritreme moderately produced and reflected; outer peritreme moderately expanded, concentrically striated; umbilicus narrow, but extending through the truncate apex.

Mean divergence about 50° ; length .58 inch; greatest breadth .42 inch; least breadth .32 inch.

This species does not answer to the description and figures of *C. mirabile*, Gray, to which it must be nearly allied.

11. *CYCLOSTOMA MIRANDUM*. Shell elongate, conic; brownish white, with a series just below the suture of large distant square brown spots, and with on the upper whorls three, and on the last five narrow somewhat interrupted brown spiral lines; covered with closely-set rounded transverse raised lines; which are decussately crenulated by

numerous faint spiral striae; spire with moderately convex outlines; apex truncate with the loss of two or two and one half whorls; four or four and one half whorls remaining, convex, with a deep suture; aperture almost exactly circular; inner peritreme of old shells produced to an extraordinary degree, with a few distant lamellae girdling the outside; outer peritreme considerably produced, reflected a little back of the plane of the aperture, slightly striated, shining; umbilicus small, extending through the truncate apex.

Mean divergence 40° ; length .7 inch; greatest breadth .45 inch; least breadth .37 inch.

12. *CYCLOSTOMA MORIBUNDUM*. Shell elongate, ovate-conic; whitish, with a few pale brown spots just below the suture, and often with several much interrupted spiral series of the same color, with a deep brownish purple summit and a lip of wax-yellow; with closely set regular rounded transverse raised lines, which are decussately crenulated by numerous faint spiral striae; spire with moderately convex outlines; apex truncate with the loss of two or three whorls; four whorls remaining, with a deep suture, the last a little detached from the preceding near the aperture, which is ovate orbicular and sub-angular above; inner peritreme a little produced and reflected; outer peritreme moderately expanded, concave, and forming with the inner one a groove, striate, subulate above, narrow on the left side; umbilicus narrow, extending through the truncate apex.

Mean divergence 36° ; length .53 inch; greatest breadth .36 inch; least breadth .28 inch.

13. *CYCLOSTOMA INTERMEDIUM*. Species intermediate between *C. variabile* and *C. monstrosum*. Shell sculptured and colored like the pale varieties of *C. variabile*, with the large sutural spots less distinct; whorls of less diameter than in that species but larger than in *C. monstrosum*; apex truncate with the loss of three whorls, four remaining, quite convex, with a rather deep suture; last whorl much detached from the penult whorl; aperture larger than in *C. monstrosum*, with the peritremes similar, but the outer one is less expanded.

Mean divergence about 38° ; length .5 inch; greatest breadth .38 inch; least breadth, .27 inch.

14. *CYCLOSTOMA MONSTROSUM*. Shell moderately elongate; translucent, whitish, with unequal irregular brown spots, which are arranged for the most part in transverse bands, with the largest spots just below the suture; very finely decussated, but with the sculpture indistinct near the aperture; spire with convex outlines; apex truncate with the loss of two or three whorls; about four and one half remaining, very

convex, with a very deep suture; last fourth part of the last whorl diverging very abruptly and very far from the penult whorl; aperture small, exactly circular; inner peritreme moderately produced; outer peritreme enormously expanded, except on the inner side, convexly reflected back of the plane of the aperture, smooth and shining, with reddish brown rays; umbilicus narrow, but very plainly extending through the truncate apex.

Mean divergence about 35° ; length .56 inch; greatest breadth .38 inch; least breadth .27 inch.

15. *CYCLOSTOMA WILKINSONII*. Shell small, subcylindrical; whitish, with a few small distant pale brown spots in a spiral series; with not very closely set sharp transverse raised lines; spire with slightly convex outlines; apex truncate with the loss of three whorls, of which *the second and third are seen in the young shell to be entirely and widely detached*; four whorls remaining, very convex, with a very deep suture; last whorl widely detached from penult whorl near the aperture, acutely angular above; aperture suborbicular, quite angular above; inner peritreme moderately produced; outer peritreme rather small, concentrically striated, reflected a little back of the plane of the aperture, above produced into an angle, with two or three small brown spots; umbilicus very small, but extending through and spreading near the apex.

Mean divergence about 17° ; length .35 inch; greatest breadth .16 inch; least breadth .12 inch.

16. *CYCLOSTOMA AVENA*. Shell small, elongate; whitish, more or less tinged with brown, with numerous small distant brown dots in spiral series on the lower whorls, on the upper whorls blueish gray; with closely set transverse moderately elevated lines, some of which, in twos or rarely in threes, are more developed at the sutures into small white crenulations; spire with moderately convex outlines; apex truncate with the loss of two or three whorls; about four and one-half whorls remaining, very convex, with a deep suture; last whorl much detached from the penult whorl near the aperture; aperture suborbicular, contracted a little on the left side; inner peritreme a little produced; outer peritreme rather small, much less extended on the left than on the right side, not reflected quite back to the plane of the aperture, produced above into a concave angle; umbilicus very small.

Mean divergence 23° ; length .32 inch; greatest breadth .14 inch; least breadth .11 inch.

17. *CYCLOSTOMA MODESTUM*. Shell small, elongate; whitish; with thin raised laminae, which are more distant on the upper whorls; spire with moderately convex outlines; apex truncate with the loss of two or

three whorls; about three and one-half whorls remaining, quite convex, with a rather deep suture; last whorl a little detached from the preceding near the aperture; aperture like that of *C. Wilkinsonii*, but smaller, with the outer peritreme a little wider proportionally and without spots; umbilicus very narrow, but extending through.

Mean divergence about 25° ; length .26 inch; greatest breadth .15 inch; least breadth .11 inch.

18. *CYCLOSTOMA SOLIDUM*. Shell long, ovate-conic; whitish or brownish, with several narrow more or less interrupted sometimes nearly obsolete spiral brown lines, often with large irregular zigzag oblique spots of dark brown; with very closely set strong rounded transverse raised lines, which are a little larger in twos and threes at the summit like a minute crenulation; spire with moderately convex outlines; apex truncate with the loss of two whorls; four and one-half whorls remaining, quite convex, with a well impressed suture; aperture nearly circular; inner peritreme slightly produced and reflected; outer peritreme broad, white or pale yellow, a little concave, widest above and on the left side at the bottom of which it is subangular; umbilicus, very small.

Mean divergence 50° ; length .78 inch; greatest breadth .55 inch; least breadth .4 inch.

Var. *a*, with the outer peritreme fiery red. *C. pictum*, Humph. Mss., Sowb. resembles this species, but is smooth and has an extremely wide lip.

19. *CYCLOSTOMA AUGUSTÆ*. Shell much elongated, conic; shining, whitish or brownish, with six spiral series in three pairs of narrow dark brown spots which are either oblong or sagittate, the middle pair being more or less confluent,—with also a broad band and some more or less distinct lines of dark brown around the umbilical region; with transverse striæ very strong on the upper whorls, and feeble and distant on the last whorl, decussated by faint spiral striæ; spire with the outlines scarcely convex; apex truncate with the loss of two or three whorls; five whorls remaining, with a moderately impressed suture, which is subcrenulate by the enlargement of the upper ends of the transverse lines in twos and threes; aperture ovate-orbicular, oblique; inner peritreme a little produced and reflected; outer peritreme well expanded, white, in some yellowish, more or less concave, much produced above and inflected forming a deep pit, before the umbilicus reflected far back into a deep sinus, with an alate expansion next to the sinus; umbilicus very small.

Mean divergence 38° ; length .9 inch; greatest breadth .52 inch; least breadth .4 inch.

Var. *a*, with the outer peritreme deep red, and the spiral striae stronger; of which I have seen but two individuals.

20. *CYCLOSTOMA PROXIMUM*. Species like *C. fascia*, Gray, but the shell is much more coarsely decussated, the transverse lines being stronger and the spiral lines less numerous; the lip is less expanded and more solid, and the whole shell is thicker and smaller.

21. *CYCLOSTOMA NEWCOMBIANUM*. Shell much elongated, conic; very pale orange, elegantly decorated with several spiral series of small brown oblique spots which have white shadows, the spots being in transverse series; with numerous small but strong transverse whitish raised lines, which are mostly in groups of three to five and at the summits are developed into minute sutural crenulations; spire with slightly convex outlines; apex truncate with the loss of two or three whorls; five whorls remaining, with a well impressed suture; last whorl detached from the penult whorl near the aperture; aperture sub-orbicular, quite angular above; inner peritreme slightly produced; outer peritreme moderately expanding, shining, reflected exactly into the plane of the aperture, rather thick, nearly wanting opposite to the penult whorl, moderately produced above into a sharply angular concave wing; umbilicus very small.

Mean divergence 37° ; length .52 inch; greatest breadth .28 inch; least breadth .22 inch.

22. *CYCLOSTOMA NITENS*. Shell moderately elongated, conic; shining, brownish white with white spots, and spiral interrupted bands of pale brown, deep orange near the aperture; very finely decussate with nearly equal slightly elevated lines, but on the upper whorls the transverse lines are more prominent and the spiral lines obsolete; spire with the outlines slightly convex; apex truncate, with the loss of two or three whorls; four whorls remaining, with a well impressed suture; aperture large, ovate orbicular, moderately angulated above; inner peritreme scarcely distinct, reflected upon the outer peritreme, which is reflected nearly into the plane of the aperture, is moderately spreading, sharp, thickened, narrower and bent back opposite the umbilicus, which is small.

Mean divergence 40° ; length .56 inch; greatest breadth .36 inch; least breadth .26 inch.

23. *CYCLOSTOMA TENUSTRATUM*. Shell elongate; deeply colored with greyish and reddish slate color, with an orange lip; with numerous distinct spiral striae decussated by excessively minute and numerous transverse striae and by a few distant fine deep striae; spire with moderately convex outlines; apex truncate with the loss of two or three whorls; four and one-half rather convex whorls remaining, with a

rather deep suture ; aperture subelliptical ; lip solid ; inner peritreme scarcely produced ; outer peritreme moderately expanded, thick, striated, edge blunt ; umbilicus narrow, extending through.

Mean divergence 37° ; length .5 inch ; greatest breadth .3 inch ; least breadth .23 inch.

Cyclostoma xanthostoma, Sowb., is more coarsely sculptured with less numerous spiral grooves, has sometimes the coloring of the above, but is more frequently horn colored.

24. *CYCLOSTOMA IGNILABRE*. Shell elongate ; varying in different individuals from a pale dingy brown to dark blueish slate color, but in all is deeply colored at the extremities, with a fiery red lip ; with closely set strong transverse raised lines, which are decussated by many very faint striæ ; spire with moderately convex outlines ; apex truncate with the loss of three whorls ; four and one-half quite convex whorls remaining, with a deep suture ; aperture and peritremes as in the preceding ; umbilicus narrow, extending through.

Mean divergence 35° ; length .5 inch ; greatest breadth .27 inch ; least breadth .2 inch.

Var. *a*, with a white lip, and shell always pale dingy brown.

25. *CYCLOSTOMA PISUM*. Shell short, ovate conic ; dark slate colored, with a red lip ; with closely set strong transverse raised lines decussated by very faint spiral lines, which are obsolete on the upper whorls ; spire with quite convex outlines ; apex truncate with the loss of two and one-half whorls ; three very convex whorls remaining, with a very deep suture ; aperture circular ; inner peritreme a little produced and reflected ; outer peritreme much expanded, a little concave and faintly striate ; umbilicus rather wide, extending through.

Divergence about 56° ; length .33 inch ; greatest breadth .315 inch ; least breadth .215 inch.

26. *CYCLOSTOMA HYACINTHINUM*. Shell ovate conic ; deep greyish blue, often in the progress of growth becoming pale brown and then orange, always deep orange at the lip ; with rather strong but not very prominent often whitish transverse raised lines, which are mostly in groups of three or four, and are traversed by numerous spiral series of short rectangular obliquely situated indentations, which are of a dark brown in brownish parts of the shell,—with very unequal and inequidistant small crenulations in the suture ; spire with rather convex outlines ; apex truncate with the loss of two whorls ; four quite convex whorls remaining, with a deep suture ; aperture orbicular, slightly angulated above ; inner peritreme slightly produced ; outer peritreme narrow, concave, deeply striated, sharp-edged, wanting at the contact with the penultimate whorl, auriculate above ; umbilicus extending through.

Mean divergence 58° ; length .58 inch; greatest breadth .45 inch; least breadth .35 inch.

Probably this is a variety of *C. Banksianum*, which is more coarsely and conspicuously crenulated; but without authentic specimens of *C. Banksianum*, I am unable to decide from the description and figures in the Thesaurus.

27. *CYCLOSTOMA REDFIELDIANUM*. Shell ovate-conic; pale blueish gray or dingy white, with a few spiral interrupted lines of dark brown; strongly striated transversely, without spiral striæ; spire with rather convex outlines; apex truncate with the loss of two whorls; three and one-half quite convex whorls remaining, with a deep suture, which has a few strong unequal inequidistant crenulations; aperture large, nearly orbicular; inner peritreme a little produced and reflected; outer peritreme wanting on the upper part of the left side, much expanded on the remaining part of this side, moderately spread on the outer side, concave, sharp-edged, above often inflected so as to form a cell; umbilicus small.

Mean divergence 55° ; length .66 inch; greatest breadth .5 inch; least breadth .4 inch.

28. *CYCLOSTOMA TECTILABRE*. Shell ovate-conic; blueish horn colored, with several interrupted spiral brown lines; with rather closely set sharp elevated transverse lamellæ, without spiral striæ; spire with quite convex outlines; apex truncate with the loss of two and one-half very small whorls; nearly four very convex whorls remaining, with a deep suture, aperture a little detached from the penult whorl, nearly orbicular, slightly angulated above; inner peritreme very slightly spread, but covering the outer one, which is extremely small; umbilicus small.

Operculum much larger than the aperture, with its margin reflected abruptly far behind the margin of the aperture!

Mean divergence 45° ; length .53 inch; greatest breadth .4 inch; least breadth .3 inch.

29. *CYCLOSTOMA ARMATUM*. Shell much elongated; brown, with a reddish and cinereous tinge, usually darker at the summit, rarely with a spiral series of dark brown spots; with very closely set strong transverse raised lines (the whitish color of which gives the ashy tinge to the general aspect), which at the upper extremity are enlarged, mostly in fours with one unenlarged line between, into a closely set series of strong sutural crenulations,—without spiral striæ; spire with outlines scarcely convex; apex truncate with the loss of two and one-half whorls; five moderately convex whorls remaining, with a well impressed suture; last whorl near the end a little detached from the pre-

ceding; aperture ovate-orbicular, well angulated above, white within next the lip, with the fauces yellowish brown; lips single, slightly spread and reflected into the plane of the aperture, a little alate at the angle; umbilicus very small.

Mean divergence 30° ; length .64 inch; greatest breadth .35 inch; least breadth .26 inch.

30. *CYCLOSTOMA MUTICUM*. Species like *C. armatum*, but the shell is more slender; and more delicately striated transversely; the outlines of the spire are more convex; there are no sutural crenulations; the aperture is smaller, less regularly ovate, and more angulated above.

Mean divergence 28° ; length .57 inch; greatest breadth .27 inch; least breadth .23 inch.

31. *CYCLOSTOMA FECUNDUM*. Shell much elongated, conic; brownish or reddish brown, sometimes with darker more or less transverse clouds, with numerous elegant spiral series of small dark brown spots, which are arranged at unequal distances in transverse lines, and are most conspicuous in the young shell, disappearing with age; with transverse striæ like *C. armatum*, and spiral faintly impressed lines on the upper whorls; spire with scarcely convex outlines; apex truncate with the loss of three whorls; five rather convex whorls remaining, with a moderately impressed suture; aperture large and spreading, less oblique than in the two preceding species, ovate, much angulated and extended into a sinus above; lip single, rather thin, a little spreading, scarcely reflected back to the plane of the aperture; umbilicus small, with rather strong spiral striæ.

Mean divergence 33° ; length .72 inch; greatest breadth .37 inch; least breadth .3 inch.

Var. *distinctum*, with the aperture a little detached from the last whorl.

32. *CYCLOSTOMA AURORA*. Shell much elongated, ovate-conic; very pale orange, sometimes with very faint spiral darker lines, white next the aperture; with very strong not closely set whitish transverse raised lines, and two or three very faintly impressed spiral striæ on the upper part of the whorls; spire with slightly convex outlines; apex truncate with the loss of three whorls; four and one-half whorls remaining, moderately convex, with a well impressed suture; aperture ovate, moderately spreading, appressed a little to the penult whorl below the angle above, which is detached; lip rather thin, scarcely spreading and but little reflected, umbilicus very small, with strong spiral striæ.

Mean divergence 30° ; length .65 inch; greatest breadth .31 inch; least breadth .26 inch.

Given to me in Jamaica as a native species.

33. *CYCLOSTOMA MORDAX*. Shell much elongated; pale brown, often at the summit deep reddish brown, with several spiral series of very small deep brown spots, of which those next below the suture are the larger, and a somewhat interrupted band of the same around the anterior extremity; with closely set much elevated sharp transverse lamellæ, which are slightly crenulated by numerous spiral impressed lines, of which one next below the suture is more deeply impressed; spire with scarcely convex outlines; apex truncate with the loss of nearly three whorls; nearly five quite convex whorls remaining, with a well impressed suture; last whorl a little detached from the penult whorl next the aperture; aperture ovate-orbicular; lip simple, slightly spread, reflected nearly into the plane of the aperture, more developed at the angle above, and more advanced in the middle of the right side; umbilicus very small.

Mean divergence 28° ; length .58 inch; greatest breadth .32 inch; least breadth .25.

34. *CYCLOSTOMA QUINQUE-FASCIATUM*. Shell much elongated; whitish with a faint tinge of brown, with—on the upper whorls three, and on the last whorl five spiral series of very dark brown spots which have pale brown shadows, the spots being also in inequidistant transverse lines; with rather distant smooth transverse ridges; spire with scarcely convex outlines; apex truncate with the loss of nearly four whorls; five whorls remaining, with a moderately impressed suture; aperture ovate, subangulated at each end; inner peritreme thickened, white, appressed to the outer one, which is moderately expanded, sinuate, reflected nearly to the plane of the aperture, much expanded and concave above and also below on the left side, wanting opposite the penult whorl; umbilicus very small, nearly concealed by the lip.

Mean divergence 33° ; length .77 inch; greatest breadth .39; least breadth .3 inch.

35. *CYCLOSTOMA CRENULOSUM*. Shell much elongated, conic; brownish, sometimes with transverse darker clouds and slender zigzag spots, with a band of the same around the anterior part; very coarsely striated transversely, the upper ends of the raised lines being developed into very numerous sutural crenulations, spiral lines wanting; spire with nearly rectilinear outlines; apex truncate with the loss of three whorls; five whorls remaining, with a moderately impressed suture, which is nearly concealed by the crenulations; aperture ovate-orbicular; inner peritreme orange red, on the right side coalescing with the outer peritreme, which is white, moderately expanded, sharp, concave, more produced and inflected above and at the lower end of the left side; umbilicus very small.

Mean divergence 35° ; length .83 inch; greatest breadth .45 inch; least breadth .35 inch.

36. *CYCLOSTOMA PAUPERATUM*. Shell very elongate and slender, conic; color — ?; very coarsely striated transversely, not crenulated in the suture, spiral lines wanting; spire with nearly rectilinear outlines; apex truncate with the loss of three (?) whorls; five whorls remaining, with a moderately impressed suture; aperture ovate-orbicular; inner peritreme on the right side less elevated above the outer one, which is moderately expanded, concave, sharp, produced into an angle and inflected at each extremity of the left side; umbilicus very small, concealed by the lip.

Mean divergence 28° ; length .58 inch; greatest breadth .26 inch; least breadth .2 inch.

37. *HELICINA PALLIATA*. Species similar to *H. Brownii*, Gray, but the shell is larger, thicker, less globose, with the incision as deep but much narrower and linear; the produced columella is grooved with a broad shallow furrow, while in *H. Brownii* it has a deeply impressed line.

The characters of the incision and produced columella in this group of *Helicinae* appear to be very constant. It is chiefly for this reason that I regard this as a good species. The form and size are intermediate between *H. maxima* and *H. Brownii*.

Mean divergence 110° ; length .43 inch; greatest breadth .69 inch; least breadth .55 inch.

38. *HELICINA HOLLANDI*. Species similar to *H. Brownii*, but the shell is much smaller and thinner; it is chiefly distinguished by the incision being only half as deep, and by the produced columella, which has no impressed line nor groove, although slightly raised at the margins.

Mean divergence 105° ; length .23 inch; greatest breadth .41 inch; least breadth .32 inch.

39. *HELICINA MACILENTA*. Shell rather small and thin, subdiscoidal, flattened beneath; pale brown; epidermis extremely thin, microscopically hirsute or chagrined; spire a little elevated and convex; whorls nearly four and one-half, scarcely convex; aperture large; labrum thin, sharp, moderately expanded and reflected, with a deep curved incision below the columella similar to that of *H. palliata*; the produced columella is strongly margined on the inner side.

Mean divergence about 135° ; length .16 inch; greatest breadth .29 inch; least breadth .23 inch.

40. *HELICINA ALBOLABRIS*. Shell with a notch like that of *H. maxima*, but the notch is rather large proportionally; in other respects

similar to *H. Brownii*, but the whorls are less convex, and the last one much depressed, and the shell more solid, with a greater divergence.

Mean divergence 110° ; length .39 inch; greatest breadth .64 inch; least breadth .5 inch.

41. *HELICINA CITRINO-LABRIS*. Shell brown or lemon yellow, very solid, outer lip very thick and always lemon yellow; in other characters like *H. albolabris*, of which it may possibly be a variety with a greater divergence. The epidermis is very finely but not densely hirsute.

Mean divergence 123° ; length .39 inch; greatest breadth .67 inch, least breadth .53 inch.

42. *HELICINA MEGASTOMA*. Shell globose conic, smooth and shining, rather thick, yellowish brown; spire with very convex outlines; whorls four and one-half, a little flattened; last whorl very large and high, with corresponding size of the aperture, which is quite exactly semicircular; labrum moderately reflected and thickened; columella and adjacent part of the last whorl bent into the plane of the aperture; the columella is produced into a very minute tubercle.

Mean divergence 108° ; length .2 inch; greatest breadth .33 inch; least breadth .25 inch.

43. *HELICINA JOSEPHINÆ*. Shell conic above, much flattened beneath, with the periphery very acute and scalloped or imbricate; above irregularly mottled with yellow, green, and white; beneath copper red, with the centre pale green; spirally ribbed above, with very fine close spiral striæ beneath; spire with the outlines concave near the apex, rectilinear in the rest; apex acute; whorls six, flat or slightly concave; aperture a spherical triangle; labrum moderately thickened and reflected, much advanced above; deposit of the base thin.

Mean divergence 100° ; at the apex 80° ; length .27 inch; greatest breadth .43 inch; least breadth .36 inch.

This species belongs to Trochatella.

44. *HELICINA TENUIS*. Shell small, thin, conic, pale brown, with distant slender raised spiral lines, decussated on the spire by inequidistant lines of growth; whorls four and one-half, more inflated and subangular below the middle; aperture elliptical; labrum sharp, not reflected; labrum with a very thin deposit, columella slightly pointed.

Mean divergence 90° ; length .08 inch; greatest breadth .09 inch; least breadth .08 inch.

This also is a Trochatella.

CATALOGUE

OF

OPERCULATED LAND SHELLS WHICH INHABIT JAMAICA.

CYCLOSTOMA.

SECTION I.

1. *C. pulchrum*. Wood.
2. *C. fimbriatulum*. Sowb.
3. *C. Chittyi*. Ad.
4. *C. aculeosum*. Ad.
5. *C. spinulosum*. Ad.
6. *C. amandum*. Ad.
7. *C. Hillianum*. Ad.
8. *C. amabile*. Ad.
9. *C. scabriculum*.* Sowb.
10. *C. lincinum*. Linn.
11. *C. lima*. Ad.
12. *C. Blandianum*. Ad.
13. *C. lincinellum** Lam.

SECTION II.

14. *C. variabile*. Ad.
15. *C. concentricum*. Ad.
16. *C. Grayanum*.† Ad.
17. *C. serriferum*. Ad.
18. *C. pulchrius*. Ad.
19. *C. articulatum*. Sowb.
20. *C. decussatulum*. Ad.
21. *C. mirandum*. Ad.
22. *C. moribundum*. Ad.
23. *C. intermedium*. Ad.
24. *C. monstrosum*. Ad.

SECTION III.

25. *C. Wilkinsonii*. Ad.
26. *C. avena*. Ad.
27. *C. modestum*. Ad.

SECTION IV.

28. *C. ambiguum*. Lam.
29. *C. thysanoraphe*. Sowb.
30. *C. pictum*. Humph.
31. *C. solidum*. Ad.
32. *C. labeo** Lam.
33. *C. Augustæ*. Ad.
34. *C. fascia*. Gray.
35. *C. proximump*. Ad.
36. *C. Newcombianum*. Ad.
37. *C. nitens*. Ad.
38. *C. xanthostoma*. Sowb.
39. *C. tenuistriatum*. Ad.
40. *C. ignilabre*. Ad.
41. *C. pisum*. Ad.

SECTION V.

- { 42. *C. Bronnii*. Ad.
- { 43. *C. fuscolineatum*. Ad.
44. *C. album*. Lam.
- { 45. *C. hyacinthinum*. Ad.
- { 46. *C. Banksianum** Sowb.
47. *C. Redfieldianum*. Ad.

SECTION VI.

48. *C. tectilabre*. Ad.

SECTION VII.

49. *C. pauperatum*. Ad.
50. *C. crenulosum*. Ad.
51. *C. quinquefasciatum*. Ad.

* Not in the Zoological Museum of Amherst College.

† *C. Grayanum*, Ad. Jan. 1847, Catalogue Shells.

" " Pfr. July 1847, Zeitschrift, &c.

Syn. *C. obscurum*. Gray.

~~52. C. Sauliae. Sowb.~~

53. C. mordax. Ad.

54. C. maritimum. Ad.

55. C. aurora. Ad.

56. C. fecundum. Ad.

57. C. Adamsi. Pfr.

58. C. muticum. Ad.

59. C. armatum. Ad.

SECTION VIII.

60. C. Duffianum. Ad.

61. C. corrugatum. Sowb.

62. C. Jamaicense. Sowb.

63. C. asperulum.* Sowb.

HELICINA.

SECTION I.

64. H. palliata. Ad.

65. H. Brownii. Gray.

66. H. Hollandi. Ad.

67. H. macilenta. Ad.

SECTION II.

68. H. maxima. Sowb.

69. H. albolabris. Ad.

70. H. citrino-labris. Ad.

71. H. solitaria. Ad.

72. H. affinis. Ad.

73. H. megastoma. Ad.

H. Gossei, Pfr #

SECTION III.

74. H. Adamsiana. Pfr.

75. H. depressa. Gray.

76. H. lineata. Ad.

SECTION IV.

77. H. neritella. Lam.

{ 78. H. aurantia. Gray.

{ 79. H. Jamaicensis. Sowb.

SECTION V.

80. H. costata. Sowb.

TROCHATELLA.

81. T. Tankervillei. Gray.

82. T. pulchella. Gray.

83. T. Grayana.* Pfr.

84. T. Josephinæ. Ad.

85. T. tenuis. Ad.

LUCIDELLA.

86. L. aureola. Gray.

STOASTOMA.

87. S. Gouldianum. Ad.

88. S. Blandianum. Ad.

89. S. Fadyenianum. Ad.

90. S. Pfeifferianum. Ad.

91. S. Cumingianum. Ad.

92. S. Chittyanum. Ad.

93. S. pisum. Ad.

94. S. Lindsleyanum. Ad.

95. S. Redfieldianum. Ad.

96. S. Jayanum. Ad.

97. S. Leanum. Ad.

TRUNOATELLA.

98. T. costata. Pfr.

99. T. Adamsi. Pfr.

100. T. succinea. Ad.

NOTE. The shells collected in my last expedition to Jamaica belong to the Zoological Museum of Amherst College. The Trustees of the College have directed the sale of a part of the collections. A few suites of 15 specimens of 7 species of *Stoastoma* will be sold for \$2.00, or one suite of 20 specimens of 10 species for \$5.00; or 100 specimens of 50 other species of the operculated *Colimacea* of Jamaica, for \$15.00; or of 300 specimens of 150 species of the Jamaica *Colimacea* generally, for \$45.00. The number of specimens in any one species will not exceed 3.

CONTRIBUTIONS TO CONCHOLOGY.

NO 2.

Descriptions of supposed new species and varieties of HELICIDAE from Jamaica, by C. B. Adams, Professor &c. in Amherst College, Massachusetts. Oct. 1849.

GEOMELANIA. Pfr. To the single species which Dr. Pfeiffer made the type of this new genus, we have the pleasure of adding two or three, all of which are of much less size. They have the same general facies, in respect of form, truncation, and sculpture, except in the spiral striæ of *G. elegans*, as well as the most essential generic characters of *G. Jamaicensis*, Pfr. None of the new species however exceed Dr. Pfeiffer's species in the development of the generic characters, and his species remains therefore the most appropriate type, as which its superior size gives it a practical advantage.

It is a matter of profound regret, that the question of the existence of an operculum is not yet definitively settled. Of *G. minor* a multitude of individuals were seen in various stages of decay and many in a fresh state, but without the animal. No operculum was seen in any specimens, nor were there occurring loose with the shells any opercula, which could have belonged to them. So far as an opinion can be formed without a living individual, it seems very probable that the genus is not operculated. Indeed its affinities with *Cylindrella* are such, that we were at first disposed to regard these shells as an aberrant group of that genus. They resemble it in the great degree of truncation, in the general form, in the sculpture, and even in the aperture, for some *Cylindrellæ* are slightly effuse. It is not to be forgotten however, that the shells of *Geomelania* also closely resemble those of *Truncatella*. But the inland habits of the species render it very probable that the animals have little affinity with a maritime genus.

Since this genus is little known, we commence with a description of the typical species, from a specimen in the Cumingian Collection, for the loan of which and of several other rare or unique specimens of

Jamaica land shells, I have been indebted to the liberality of Mr. Cuming.

GEOMELANIA JAMAICENSIS, Pfr. Shell conic-cylindrical; whitish; densely sculptured with strong transverse* somewhat angular ribs, which become obsolete only on the anterior extremity of the last whorl; spire with rectilinear outlines; apex truncate with the loss of — whorls; nearly seven whorls remaining, rather convex, with a well impressed suture; aperture ovate, widely and deeply effuse; labrum much thickened, reflected, very much produced in the lower part; labium rather thick, separated by a slight groove from the penultimate whorl, separated above from the labrum by a small sinus.

Mean divergence 16° ; length .66 inch; greatest breadth .2 inch; least breadth .16 inch.

GEOMELANIA MINOR. This may be only a variety of the preceding, but the dimensions given below are those of the largest, among several hundreds, which we have seen. The most essential difference is in the aperture, which is but slightly effuse; the labrum is throughout much expanded convexly, and is by no means so disproportionately produced in the lower part. The apex is truncate with the loss of 6 or 7 whorls.

Mean divergence 14° to 15° ; length .41 inch; greatest breadth .13 inch; least breadth .14 inch.

GEOMELANIA EXPANSA. Shell much elongate, conic; whitish; rather densely sculptured with strong transverse somewhat arcuate ribs, which are flattened on the forward side, are less regular than in *G. minor*, and are obsolete on the anterior half of the last whorl; spire with rectilinear outlines; apex truncate with the loss of — whorls; nearly seven whorls remaining, moderately convex, with a well impressed suture; aperture ovate, much expanded laterally, widely and rather deeply effuse anteriorly; labrum but little thickened, slightly reflected above, more reflected and widely spread below; labium rather thin, a little reflected into the concavity of the central region of the penult whorl, to which it is appressed.

Mean divergence 18° ; length .53 inch; greatest breadth .185 inch; least breadth .15 inch.

GEOMELANIA ELEGANS. Shell cylindrical; whitish; elegantly

*In these papers the word *transverse* is used in reference to the direction of growth, in distinction from *spiral*, and of course without any reference to the axis of the shell.

sculptured with distant prominent very slender ribs, which are not impressed by the very numerous microscopic spiral striae, of which about twenty are visible on the whorls of the spire: spire with nearly rectilinear outlines; apex truncate with the loss of — whorls; seven whorls remaining, quite convex, with a very deep suture; aperture ovate, moderately effuse; labrum moderately thickened and reflected, and but little produced at the lower part; labium prominent, rather thick, slightly detached from the penult whorl at the very small sinus above which it unites with the labrum.

Mean divergence 13° to 14° ; length .3 inch; greatest breadth .08 inch; least breadth .07 inch.

CYLINDRELLA BEARDSLEANA. Shell quite regularly conic, but much elongated; whitish; with closely set small obtuse ribs which are not oblique, not carinated anteriorly; spire with rectilinear outlines; apex truncate with the loss of six whorls; eight whorls remaining, quite convex, with a deep suture; last whorl a little detached, angular above; lip sharp, reflected opposite to the penult whorl, otherwise scarcely reflected.

Length .3 inch; breadth .07 inch.

C. pgymaea Ad. Jan. 1. 1845, is similar, but its aperture is wider, the whorls more convex with a deeper suture, and the shell is much smaller.

CYLINDRELLA AGNESIANA. Shell sinistrorsal, very long, cylindrical in the lower two-thirds, moderately tapering above; white; with very oblique very closely set fine rather sharp striae which are more oblique in their upper part, — anteriorly with an extremely prominent and acute carina, on the left side of the last whorl with a carina scarcely less prominent and acute, on the upper side with a third carina quite acute and prominent, on the right side subangular; spire with outlines mostly rectilinear, with a waved axis at the tip; apex broadly truncate with the loss of twelve whorls; eighteen to twenty-two whorls remaining, the usual total number being *thirty*; (a short entire specimen has twenty-eight;) whorls flattened or scarcely convex, with a moderately impressed suture; last whorl very much produced obliquely; aperture angulated in proportion to the sharpness of the carinae, trapezoidal, the upper left side being the longer; with one diameter parallel and the other nearly perpendicu-

lar to the axis of the shell ; tip reflected nearly into the plane of the aperture sharp, rather wide.

Common full size, 1.45 inch long, .17 inch wide : of a large shell, length 1.68 inch ; breadth .175 inch ; of a small shell, length 1.07 inch ; breadth .16 inch : of a small entire shell, length 1.65.

This species probably excels all other shells in the number of whorls.

CYLINDRELLA ALBA. Shell subfusiform, widest above the middle ; pure white ; striae scarcely visible under a common magnifier except on the last two whorls ; the last whorl is sharply carinate anteriorly, rather obtusely carinate just above the middle ; spire with rectilinear outlines ; apex truncate with the loss of thirteen or fourteen whorls, the upper part of the spire before truncation being very long and slender ; thirteen or fourteen whorls remaining, slightly convex, with a well impressed suture ; last whorl much produced obliquely ; aperture sharply angular anteriorly, obtusely so on the right, in the rest well rounded ; lip moderately thickened, reflected nearly into the plane of the aperture, shining, sharp, rather narrow.

Length .4 inch ; breadth .083 inch.

Var. *striatula* ; striae very distinct under a common magnifier ; length .52 inch ; breadth .11 inch.

CYLINDRELLA COSTULATA. Shell subovate, but elongated ; whitish ; with thin very prominent very distant moderately oblique ribs, of which there are about ten on the penult whorl, and which, as usual in this genus, are more crowded on the last whorl,—anteriorly with a prominent but not sharp carina ; spire with convex outlines along the middle ; apex truncate with the loss of five or six whorls ; nine or ten whorls remaining, rather flattened, but with a deep suture ; last whorl much detached and produced & angulated on the right ; aperture much dilated on the right, anteriorly a little angular, the rest rounded ; lip somewhat thickened, rather narrow and sharp, reflected into the plane of the aperture.

Length .25 inch ; breadth .075 inch ; length of an entire specimen .325 inch.

CYLINDRELLA MONTANA. Shell subcylindrical, tapering above ; pale red, rarely white ; with closely set extremely fine oblique striae, which are most arcuate above the middle, with a very small rather prominent carina anteriorly, slightly angulated just above the middle of the last whorl ; spire with convex outlines in the upper third, in the rest rectilinear, above the place of truncation rectilinear up to

the third and fourth whorls, and there slightly concave; apex broadly truncate with the loss of ten or eleven whorls; nine or ten remaining, scarcely convex, with a lightly impressed slightly marginate suture; last whorl produced perpendicularly to the axis of the spire; aperture a little dilated on the right, otherwise orbicular, a little spreading; lip well reflected only at the extreme margin.

Length .58 inch; breadth .163 inch.

CYLINDRELLA GRAVESII. Shell ovate-cylindrical moderately elongated, with the last whorl a little quadrangular; white; with very dense very fine slightly arcuate very oblique striae, with the carinae of the last whorl obsolete; spire with rather convex outlines; apex truncate with the loss of — whorls; nine to eleven whorls remaining, scarcely convex, with a lightly impressed margined suture; last whorl moderately produced at right angles to the axis of the spire; aperture somewhat quadrangular, lip rather wide, reflected into the plane of the aperture.

Var. *a*, with a small prominent anterior carina.

Dimensions rather variable, as follows in three individuals before me. No. 1; length .72 inch; breadth .178 inch. No. 2; length .66 inch; breadth .2 inch. No. 3; length .55 inch; breadth .19 inch.

CYLINDRELLA AMBIGUA differs from *C. rosea*, Pfr., in having the outlines more convex, the whorls very deep. If not a monstrosity, it is probably a good species; but from a single specimen I am unable to decide.

Cylindrella rosea, Pfr. var. *magna*, Ad. Length 1 inch; breadth .34 inch.

Cylindrella rosea. Pfr. var. *major*, Ad. Length 1.3 inch; breadth .45 inch.

The dimensions of the type are the following: length .73 inch; breadth .26 inch.

CYLINDRELLA ASPERA. Shell ovate-cylindrical, moderately elongated; red mostly, with white anteriorly, or sometimes white in half of the shell; with very coarse oblique striae, which are most arcuate at or below the middle, with the intervening raised lines acute-edged, with a nearly obsolete carina anteriorly, and another more prominent midway between this and the middle of the last whorl; spire with quite convex outlines; apex truncate with the loss of — whorls; nine or ten whorls remaining, quite convex, with a well impressed suture; last whorl moderately produced, subangular on the right side; aperture large, spreading, subrectilinear above, in the rest orbicular,

slightly effuse anteriorly; lip rather wide, not very sharp, reflected nearly into the plane of the aperture.

Length .94 inch; breadth .3 inch.

In Jan. 1845 I described *C. obesa*, and as its variety *C. densestriata*. The former differs from *C. brevis* Pfr. invariably, in the multitude of individuals which I have seen, in having the raised lines comparatively very distant. It is limited to a small district, on both sides of which *C. brevis* is widely distributed. If not a good species, it may retain the name, *C. obesa*, as a variety. But *C. densestriata* is specifically identical with *C. brevis*, yet it is not an inappropriate name for a very shining variety in which the striae are excessively fine.

CYLINDRELLA COLUMNA is perhaps a variety of *C. brevis* Pfr. But the spire has rectilinear and almost exactly parallel outlines in its lower two-thirds or three-fourths; the shell is longer; the whorls are wholly flattened; the lip is more widely spread; and the striae are as small as in the more finely striated varieties of *C. brevis*.

Length .72 inch; breadth .22 inch; of another, length .575 inch; breadth .18 inch.

Variety INTERMEDIA more resembles *C. brevis* in having the whorls a little convex; but the shell is longer than the type of *C. columna*, and the aperture a little larger.

Length .78 inch; breadth .22 inch.

C. rosea, Ad. Proc. Bost. Soc. Nat. Hist. Feb. 18, 1846, received the name of *C. CARNEA* in my printed catalogue of shells Jan. 1, 1847.

C. carnea var. *cerina* differs from the type chiefly in its wax color and in being a little more slender.

CYLINDRELLA INORNATA. Shell subovate or fusiform, but elongated; whitish; with fine oblique arcuate sharp prominent but not very closely set raised lines, anteriorly with two carinae which are not prominent; spire with the outlines moderately convex in the middle and lower whorls; apex truncate with the loss of — whorls; eight or nine whorls remaining, quite convex, with a deep suture; last whorl well detached and produced; aperture subangular on the right side, in the rest rounded; lip a little thickened, narrow, moderately reflected.

Length .38 inch; breadth .11 inch.

CYLINDRELLA SIMPLEX. Shell subovate, or fusiform, moderately elongated; whitish; with very oblique straight faint striae, with one moderately sharp carina at the anterior extremity, and another which

is slight and obtuse a little above the middle of the last whorl; spire with the outlines quite convex throughout most of the shell; apex truncate with the loss of — whorls; ten and one-half whorls remaining, quite convex, with a deep suture; last whorl slightly produced; aperture angular at the anterior extremity and on the middle of the right side; lip thin, sharp, narrow, and moderately reflected.

Length .315 inch; breadth .1 inch.

CYLINDRELLA HYDEANA. Syn. *Bulimus Gossei*, Pfr. If this species be removed from *Bulimus* to *Cylindrella*, it will require a new name. It appears to belong to Dr. Pfeiffer's section 6 of *Cylindrella* with a persistent apex, and strongly resembles several of the species of that section in its general form, and in the position and form of the aperture. It has the type of sculpture usual in *Cylindrella*, and like most of this genus, but unlike any species of *Bulimus*, in *Jamacia*, it occurs in great profusion among limestone rocks. It is most closely allied to *C. pontifica*, Gould, Mss.

C. cylindrus, Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1849, received the name of *C. RUBRA* in my printed Catalogue of shells Jan. 1847. It is perhaps a variety of *C. Dunkeri*, Pfr., but differs in having the greatest diameter at or above the middle of the shell, while in the latter it is in the lower third, above which the shell tapers regularly, *C. rubra* is larger, has coarser striæ, and is always deep red. *C. Dunkeri* is always brown. The last loses eight or nine whorls by truncation, and has twelve remaining.

CYLINDRELLA SIMILIS is perhaps another variety of *C. Dunkeri*, Pfr. but is much smaller, has the aperture less angulated anteriorly, angulated at the left end of the upper side, and the lip is much more arched above: the striation is finer in proportion to the size: nine or ten whorls are lost by truncation, and twelve remain.

Length .475 inch; breadth .09 inch.

CYLINDRELLA TENELLA is much more slender than *C. Dunkeri*, has thirteen whorls, and the striation is microscopically minute: the aperture is like that of *C. Dunkeri*, and, like *C. rubra*, it tapers from above the middle down to the anterior extremity.

Length .5 inch breadth .077 inch.

CYLINDRELLA TENERA also resembles *C. Dunkeri* in color and *C. rubra* in form. It is very small, has the aperture orbicular, and the striation microscopic; it loses six whorls by truncation, and has ten remaining.

Length .28 inch; breadth .055 inch.

Synopsis of classification of species and varieties of *Cylindrella* inhabiting Jamaica.

The scheme is modified from Dr. Pfeiffer's.

- Geomelaniform; 5—6.*
 - Clausiliaform; 7—18;
 - sinistrorsal; 7—9;
 - dextrorsal; 10—18;
 - smooth; 10;
 - costulate; 11—12;
 - striate; 13—18.
 - Pupaeform; 19—29;
 - aperture produced, cylindrical; 19—22;
 - “ “ , spreading; 23—26;
 - aperture not produced; 27—29.
 - Fusiform; 30—32;
 - polished; 30;
 - not polished; 31—32.
 - Bulimiform; 33.
 - Columnar; 34—38.
-

ACHATINA PROCERA. Shell conic, much elongated; white, more or less tinged with brown, with rather broad dark brown somewhat oblique stripes, which are waved on the posterior margin, interrupted at the middle of the last whorl, and of which there are four or five on each whorl, except on the first three or four which are colorless; varicose coincidently with the brown stripes on the last whorl, like *A. leucozonias* with closely set very coarse transverse striae or ribs; spire with the outlines nearly rectilinear; apex rather obtuse; whorls about ten, rather convex, with a slightly channeled suture; aperture rather narrow, quite acute above; labrum rather sharp, produced to an extraordinary degree in the middle, and then abruptly retreating in a deep well rounded sinus, which reaches to the twisted and much arcuated columella.

Mean divergence 27° ; length 1.375 inch; breadth .4 inch; length of aperture .52 inch. Of another individual, mean divergence 31° ; length 1.08 inch; breadth .395 inch; length of aperture .44 inch.

* These numbers refer to a catalogue of the Jamaica Helicidae, which will follow the descriptions of species.

ACHATINA ELEGANS may be a variety of *A. Phillipiana* Pfr., but it has the striae extremely fine, and the dark brown stripes are much narrower. Dr. Pfeiffer's species has the striae very coarse and the stripes very wide.

ACHATINA NEMORENSIS. Shell subfusiform; pale brown or pale reddish brown, with dark brown transverse stripes, which are not very wide, reaching nearly to the anterior extremity, about four on each whorl except on the first three, which have none; with very dense rather small striae; spire with the outlines quite convex; whorls eight, moderately convex, with a well impressed suture; aperture long, narrow in the upper half, and very acute above; labrum sharp, produced along the middle, a little angulated below the middle; columella nearly straight, rather slender, and pointed.

Mean divergence 30° ; length .83 inch; breadth .25 inch; length of aperture .35 inch.

Var. *a*, with very few brown stripes.

ACHATINA LIGATA. Shell elongate, subconic, with a broad deep constriction around the middle of the last whorl; pale brown, with dark brown narrow transverse stripes, which are sometimes nearly obsolete, of which there are about three on each whorl, except on the first three or four, which have none; varicate at the last one or two brown stripes, with rather fine crowded transverse striae; spire with the outlines moderately convex; apex small; whorls about seven and one half, a little convex, with a well impressed suture; aperture long, much modified by the intrusion of the labrum at the constriction of the last whorl; labrum thickened at the constriction; columella a little twisted and arcuated.

Mean divergence 24° ; length .68 inch; breadth .195 inch; length of aperture .26 inch.

ACHATINA ANGIOSTOMA. Shell fusiform; pale reddish, with transverse rather narrow dark brown stripes, of which there are about four on each whorl except on the first three; with extremely fine crowded transverse striae; spire with moderately convex outlines; apex rather small; whorls seven, moderately convex, with a well impressed suture; aperture very long and narrow; labrum very thin and sharp; columella produced to an extraordinary degree, straight, a little twisted.

Mean divergence 34° ; length .72 inch; breadth .22 inch; length of aperture .36 inch.

ACHATINA INGALLSIANA. Shell fusiform; pale brownish, with but

four or five dark brown transverse stripes ; with very minute rather numerous but not crowded transverse striae ; spire with moderately convex outlines ; apex rather small ; whorls seven, moderately convex, with a well impressed finely corded suture ; aperture very long, rather narrow ; lip thin, with the edge sharp and curved forwards ; columella moderately produced and arcuate.

Mean divergence 36° ; length .75 inch ; breadth .25 inch ; length of aperture .35 inch.

ACHATINA UNICOLOR. Species similar to the preceeding, but the shell is uniformly light brown, without any dark stripes ; the striae are rather more strongly impressed ; the columella is not arcuate ; and the form is rather more slender.

Mean divergence 33° ; length .7 inch ; breadth .21 inch ; length of aperture .33 inch.

ACHATINA LEVIS. Shell much elongated, conic ; very pale brown, shining ; very thin, smooth, with microscopic transverse striae, which are quite numerous on the upper whorls ; spire with rectilinear outlines ; apex not very small ; whorls seven, a little convex, with a moderately impressed suture ; aperture ovate, acute above ; labrum thin and sharp ; columella slightly arcuate.

Mean divergence 14° or 15° ; length .42 inch ; breadth .1 inch ; length of aperture .13 inch.

This may be a variety of *A. pellucens* ; but that shell has more numerous striae, a constant difference in the individuals which I have seen.

ACHATINA MICANS. Species similar to *A. levis*, but the shell is less elongated, the outlines of the spire are more convex, the aperture is shorter, and the columella is more twisted and not arcuate.

Mean divergence 17° ; length .41 inch ; breadth .115 inch ; length of aperture .12 inch.

ACHATINA STRIOSA. Shell elongated, conic ; white, with a horn colored epidermis, which is much striated transversely ; the shell is smooth ; spire with nearly rectilinear outlines ; apex not very small ; whorls eight, short, moderately convex, with a deep suture ; aperture short, ovate, moderately acute above ; labrum thin, sharp, not produced along the middle ; columella short, broadly truncated, much arcuated.

Mean divergence 17° ; length .28 inch ; breadth .085 inch ; length of aperture .08.

ACHATINA INUSITATA. Shell elongated, gradually tapering in the

upper half, cylindrical in the lower half, wide and blunt anteriorly, with a broad very deep constriction about the middle of the last whorl; dingy white; with very distant lamelliform transverse ribs, about ten on each whorl, with strong irregular intervening striae; spire with convex outlines; apex small; whorls nine, very convex, with a deeply impressed, and near the apex a channelled, suture; last whorl small and very short; aperture ovate, acute above, much modified by the constriction of the last whorl, which constriction bends the sharp labrum into two large arcs of small circles; columella remarkably twisted and arcuate.

Length .16 inch; breadth .05 inch; length of aperture .033 inch.

This species approaches *Cylindrella* in general form, (so as to render useless the character of divergence,) and resembles *C. costulata* in sculpture.

BULIMUS. The first two or three following species with some described above belong to a group of small shells, which are intermediate between *Bulimus* and *Achatina*. Those which approximate most to *Achatina* have been referred to that genus, and the following two or three conform more to the type of *Bulimus*. Among these shells, the distinction between these two genera loses its value.

Mr. Reeve has described a species of this group, of which some individuals have, and some have not a truncated columella.

BULIMUS NITIDIUSCULUS. Shell long ovate conic; dingy white; smooth and shining, with a few very distant excessively minute transverse striae; spire with nearly rectilinear outlines; apex rather obtuse; whorls nearly six, rather convex, with a well impressed suture last whorl long; aperture long ovate, quite acute above; labrum very thin and sharp; columella somewhat twisted.

Mean divergence 24° ; length .21 inch; breadth .1 inch; length of aperture .1 inch.

BULIMUS PAUPERCULUS. Shell much elongated, regularly tapering to the summit; white, with a thin horn colored epidermis; with numerous broad lightly impressed arcuate transverse striae; spire with rectilinear outlines; apex rather obtuse; whorls seven, rather convex, with a well impressed suture; aperture long ovate, quite acute above; labrum thin and sharp; columella well thickened.

Mean divergence 18° ; length .25 inch; breadth .25 inch; length of aperture .075 inch.

BULIMUS TEREbella. Shell very much elongated, regularly tapering to the summit; dingy white; with numerous transverse lightly impressed striae; spire with rectilinear outlines; apex rather obtuse; whorls nine and one-half, short, quite convex, with a deep suture; aperture subovate, moderately acute above; labrum thin and sharp.

Mean divergence 12° ; length .3 inch; breadth .07 inch; length of aperture .052 inch.

BULIMUS ANOMALUS. Shell with the general form and sculpture of *Truncatella*, cylindrical; whitish; with very numerous strong transverse ribs, which are continued quite into the suture; spire with rectilinear outlines; apex — ? (the apex in the only specimen before me is broadly truncate,) six whorls remaining, which are moderately convex, somewhat shouldered, with a well impressed suture; last whorl rather long, with a slight constriction around the middle, which also modifies the aperture, which is rather long, slightly acute above, well rounded below; labrum thin and sharp; columella stout, very prominent, arcuated or twisted in a loose spiral to an extraordinary degree.

Mean divergence 12° ; length .23 inch; breadth .075 inch; length of aperture .07 inch.

BULIMUS MINIMUS. Shell very much elongated, cylindrical; translucent, white; elegantly sculptured with very numerous flat slightly prominent arcuate ribs, about twenty-five on each whorl, — and numerous microscopic spiral striae; spire with rectilinear outlines; apex very obtuse; whorls seven, long, very convex, with a very deep suture; last whorl very long and narrow; aperture short, moderately acute above, well rounded below; labrum sharp; columella not perceptibly thickened.

Mean divergence 8° or 9° ; length .1 inch; breadth .026 inch; length of aperture .024 inch.

BULIMUS MONODON. Shell ovate-conic; dingy white; with some slight striae of growth; spire with the outlines somewhat convex; apex subacute; whorls nearly five and one-half, a little convex and shouldered, with a well impressed suture; last whorl large and wide, sometimes a little constricted near the aperture, which is rather wide, ovate, moderately acute above; labrum thin and sharp; columella straight, with an oblique tooth near its extremity; umbilicus very small.

Mean divergence 45° ; length .25 inch; breadth .15 inch; length of aperture .13 inch.

BULIMUS MIRABILIS. Shell rather long and conic, with two-thirds of each whorl enormously inflated, gradually more abruptly with the progress of growth, so as to give to the shell the form of a screw; subtransparent, whitish; with numerous microscopic spiral striae, and very distant transverse erect lamellar ribs, which have smooth rounded edges, and are most elevated at the summit of the convexity of the whorls, and diminish much over the anterior extremity of the shell; spire with rather convex outlines; apex with the inflation proportionally much longer and the ribs but slightly elevated; whorls about seven, with an indistinct suture; aperture modified by the form of the last whorl at its termination, and by the remarkably prominent and much twisted columella, nearly into the form of the figure 8.

Length .1 inch; breadth .062 inch.

This most extraordinary of all the land shells which I have seen, strikes the beholder with amazement, and its novelty renders description difficult.

HELIX PATINA may be a variety of *H. acutissima*, Lam., but it is concave on both sides of the periphery, like *H. soror*, while Lamarck's shell is always convex below and usually also above the periphery: the surface of *H. patina* is smooth throughout, except a slight granulation near the end of the last whorl, and is rather irregularly impressed with scattered lines, which are mostly perpendicular to the striae of growth.

Greatest breadth 2.2 inches; least breadth 2 inches; height 1 inch.

HELIX FLUCTUATA resembles the preceding, but the surface is more uniformly and regularly granulated even than in *H. acutissima*: the outline of the last whorl is an oval considerably elongated; on the first half of this whorl, the shell is concave on both sides of the periphery, which next rather suddenly becomes obtuse: the lower side is very convex through the central region, and the upper surface is obliquely waved or wrinkled.

Greatest breadth 2.2 inches; least breadth 1.7 inch; height 1 inch.*

HELIX CARA. Shell convex above, more convex beneath, with a

*The largest *Helix acutissima* which I have seen is 2.3 by 2.03 inches, and the smallest mature individual is 1.1 by .95 inch.

very acute periphery; brown, with a white lip; surface smooth, or almost microscopically granulated and punctulated, with a smooth shining epidermis; spire moderately and somewhat convexly elevated; whorls fine, scarcely convex, with a suture not impressed; aperture subtriangular, with a very thick, strong lip, which has along the lower side within three teeth, of which the outer is larger, and is double at the extremity when mature, or nearly to the base when first formed; the inner tooth is small and very near the columella; the two outer teeth have exterior pits proportionate to their size; umbilicus small, entirely concealed in the old shells.

Greatest breadth 1.4 inch; least breadth 1.2 inch; height .55 inch.

HELIX CHITTYANA. Shell convex above, more convex beneath and more widely so than the preceding, next to the acute periphery a little concave above and very convex below; brownish white, with a zone of deep brown on both sides of the whitish periphery, with a brown lip; surface slightly striated, shining, with a smooth shining brown epidermis, which is deciduous in narrow irregularly zigzag portions; spire convex, moderately elevated; whorls four and one-half, nearly flat, with a suture not impressed; aperture subtriangular but much modified by the convexity of the last whorl, with four teeth, of which the outer two stand over one exterior pit, and of which the inner one is small, very near the columella, and without any exterior pit.

Greatest breadth 1 inch; least breadth .95 inch; height 5 inch.

HELIX PICTURATA. Species like *H. sinuata*, Müll., but the shell is usually smaller, the whorls are always much shorter, the spire more depressed, and the shell less convex beneath: it is remarkable for having portions of the epidermis hydrophanous, which are mostly in zigzag or radiating pale brown stripes: the aperture is much more expanded laterally than *H. sinuata*: umbilicus small, partly covered by the reflected lip.

Greatest breadth .9 inch; least breadth .73 inch; height .38 inch.

Variety *a*, without umbilicus and the spire rather more elevated.

HELIX STRANGULATA. Shell depressed-globular, moderately, regularly, and nearly equally convex above and below: reddish brown, paler beneath; with very fine granulated wrinkles; spire moderately convex, with a rather deep suture, last whorl very high; aperture small, subovate, very much constricted by two long narrow and deep exterior pits, which nearly meet under the lips, and which within project as two teeth connected at base, as in *H. Brownii*, Pfr., but are

not parallel; next is a large tooth, which terminates at the outer margin of the lip, and next a fourth on the collumella, which enters a large deep indentation in the central region of the shell; lip broadly reflected, but rather sharp, columellar part very wide and concavely flattened; umbilicus wanting.

Greatest breadth .95 inch; least breadth .8 inch; height .58 inch.

HELIX TORREFACTA. Shell conoid, with a very thin transparent epidermis, on the upper whorls, which is a little thicker and straw-colored on the lower whorls; smooth or with almost imperceptible striae of growth; spire like that of *H. Cookiana*, Fer., but a little more elevated; whorls eight, short, moderately convex, with a well impressed suture; last whorl with the base, (intermediate between that of *H. Cookiana* and *H. epistylium*, Müll.) having its central region rather deeply but not very widely indented; aperture lunate; labrum sharp; columella somewhat twisted and produced rather obliquely; around the base of the last whorl within is a lamella, which slopes inwardly as it rises.

Dimensions of two varieties: No. 1: greatest breadth .7 inch; least breadth .63 inch; height .7 inch. No. 2: greatest breadth .6 inch; least breadth .55 inch; height .7 inch.

HELIX EPISTYLIUM. Shell conoid; white; with microscopic striae of growth; spire with very convex outlines; apex very obtuse; whorls six and one-half, a little convex, with a well impressed suture; last whorl with a subangular periphery; aperture lunate, without any internal lamella; lip sharp; umbilicus very narrow, rather deep.

Greatest breadth .175 inch; least breadth .16 inch; height .17 inch.

Except in its minute size this species much resembles *H. epistylium*, and still more closely *H. Cookiana*.

HELIX PILA. Shell very globular; white, translucent; with excessively fine striae of growth and microscopic spiral lines; spire with very convex outlines; apex very obtuse; whorls more than six, quite convex, with a well impressed suture; aperture lunate, except as interrupted by the intrusion obliquely of a large uneven abruptly terminating columella; lip very thin and sharp; within, nearly half way up the outer side, is a high lamella, which after entering half the length of the last whorl suddenly diminishes to a line; umbilicus wanting.

Greatest breadth .6 inch; height .53 inch.

HELIX LAMELLIFERA. Shell hemispherical; brownish horn color;

epidermis with sharp but microscopic projecting lamelliform points, which are frequently worn off; with rather coarse and distant striae of growth; spire convex, moderately elevated; apex subacute; whorls five and one-half, a little convex, with a well impressed suture; aperture lunate; on the inside of the periphery of the last whorl, a little within the labrum, commences a slightly elevated lamella, which extends from 100° to 120° farther in; labrum very thin and sharp; columella somewhat thickened, very oblique; columellar region moderately indented.

Greatest breadth .39 inch; least breadth .35 inch; height .27 inch.

HELIX GRAMINICOLA. Shell depressed globular; brown, with a white zone next below the suture, and another on the periphery of the last whorl, which last zone is margined above with a blackish brown zone: with striae of growth which are fine beneath and coarse above; spire convex, moderately elevated; apex rather obtuse; whorls more than five, rather convex, with a well impressed suture; aperture more than a semicircle, much modified by the penult whorl; labrum rather sharp and thin; thickened a little within by a purple deposit, slightly reflected over the small umbilicus.

HELIX MACMURRAYI. Shell globular; white, with a very thin brown epidermis; with very fine striae of growth, and very lightly impressed unequal spiral lines; spire with the outlines quite convex; apex very obtuse; whorls nearly six, quite convex, a little concave at the upper part, with a lightly impressed suture; aperture suborbicular, a little modified by the intrusion of the last whorl; labrum not reflected, rather sharp, but in the old shells not thin; umbilicus wanting.

Greatest breadth 1.9 inch; least breadth 1.6 inch; height 1.5 inch.

HELIX MUNDA. Shell depressed globular; with a rather thick epidermis, which is horn colored on the upper whorls, and greenish brown on the rest; with excessively fine striae of growth; spire convex, moderately elevated; apex very obtuse; whorls fine, moderately convex, with a well impressed suture; last whorl large, somewhat depressed; aperture suborbicular, angular at the end of the oblique white columella, and modified considerably by the penult whorl; lip excessively thin and sharp; umbilicus wanting.

This shell resembles the young of the preceding, which when young is much flattened on the spire, has the aperture much larger, and the columella is straight.

Greatest breadth .6 inch; least breadth .5 inch; height .4 inch.

CONTRIBUTIONS TO CONCHOLOGY.

No. 3.

DESCRIPTIONS OF SUPPOSED NEW HELICIDÆ FROM JAMAICA.

Continued from p. 32.

HELIX TUNICATA. Shell globose-conic; white beneath a thick epidermis, which is yellowish brown on the spire, and dark brown on the last whorl, and peels off in flakes in the early stages of decay; with fine striæ of growth and very lightly impressed spiral lines; spire conic, well elevated, with the outlines a little convex; apex acute; whorls five and one-half, rather convex, with a well impressed suture; aperture subquadrate, with the outer angle rounded off; labrum thin and sharp; columella pure white, dilated, somewhat spiral; umbilicus none.

Mean divergence 110° ; greatest breadth 1.05 inch; least breadth .85 inch; height 1 inch.

This species differs from *H. munda* in the conical and more elevated spire, greater size, stouter and subspiral columella, &c.

HELIX SULPHUREA. Shell sub-globose, conic above, and a little tapering below; yellow, nearly transparent; smooth and shining; spire with the outlines a little convex, well elevated, conic; apex very small and acute; whorls four, a little convex, with a well impressed finely margined suture; last whorl very long; aperture sub-subovate; labrum very thin and sharp; columella much produced, nearly straight; umbilicus none.

Mean divergence 90° ; greatest breadth .175 inch; least breadth .13 inch; height .16 inch.

Perhaps this is a young shell, but probably not of any described species.

HELIX VIRGINEA. Shell conic; pale brown, with the upper whorls and a zone on the periphery horn colored, with narrow portions of epidermis scattered somewhat in zigzag, which are white

and hydrophanous; with fine striae of growth; spire elevated with the outlines almost rectilinear; apex rather obtuse; whorls nearly six, a little convex, with the suture but little impressed; last whorl much advanced above over the aperture, which is suborbicular; lip very thin and sharp, except the columellar portion, which is much thickened and expanded, of a pink color, coalescing with the outer lip in a curve; umbilicus wanting.

Mean divergence 80° ; greatest breadth .78 inch; least breadth .67 inch; height .73 inch.

HELIX FUSCOCINCTA. Shell conic; white beneath a very thick epidermis, which has a narrow well defined blackish zone next below the suture, and next below is pale brown, gradually becoming darker in crossing the whorls to a narrow and well defined very pale yellowish brown zone, which runs next above the suture and along the periphery of the last whorl, the base of which is wholly of a dark brown,—often with numerous hydrophanous white spots: with striae of growth, which are fine in some and coarse in other individuals; spire with nearly rectilinear outlines, more or less elevated; apex a little obtuse; whorls six, a little convex, with a well impressed suture; aperture somewhat depressed orbicular; lip rather thin and sharp, with the columellar portion moderately dilated and thickened; umbilicus wanting.

The proportions are quite variable, as in the four following examples; the first being a young shell.

No. 1. Mean divergence 70° ; greatest breadth .6 inch; least breadth .52 inch; height .65 inch.

No. 2. Mean divergence 82° ; greatest breadth .83 inch; least breadth .7 inch; height .79 inch.

No. 3. Mean divergence 95° ; greatest breadth .725 inch; least breadth .58 inch; height .57 inch.

No. 4. Mean divergence 106° ; greatest breadth .81 inch; least breadth .63 inch; height .57 inch.

HELIX SIMILIS. Species similar to *H. arborcoides* Ad.; but the shell is larger, the whorls are much higher, and there is an umbilicus about .04 inch in diameter extending through to the apex. The young of *H. epistylum* Mull., also resemble this species, but have no umbilicus, a much more convex base, and an angular periphery, while the periphery of this is very broadly rounded.

Greatest breadth .6 inch; least breadth .55 inch; height .36 inch.

HELIX HOLLANDI. Species similar to *H. arborcoides* Ad.; but

the whorls are lower; there is an umbilicus about .03 inch in diameter extending to the apex; the aperture is smaller, and the last whorl is much flattened beneath.

Greatest breadth .49 inch; least breadth .42 inch; height .25 inch.

HELIX AMBIGUA. A single individual occurs, which is like *H. similis*, but smaller; with the spire more elevated, the columella less oblique, and the anterior part of the lip more directly transverse, with a smaller umbilicus. The suture is deeper than in *H. similis* or in *H. arboreoides*, between which this shell is in most characters intermediate. Having but one specimen, I do not regard the species as fully established.

Greatest breadth .46 inch; least breadth .42 inch; height .25 inch.

HELIX ANTHONIANA. Shell conic; whitish; with a thin pale brown epidermis; with excessively fine striæ of growth; spire with rather convex outlines, well elevated; apex subacute; whorls seven, quite convex, with a deep suture; aperture sublunate; lip sharp, a little reflected in the columellar portion; umbilicus narrow.

Mean divergence 9° ; greatest breadth .42 inch; least breadth .375 inch; height .35 inch.

HELIX BREVIS. Shell subdiscoidal; whitish; smooth and shining; spire convex, but little elevated; apex obtuse; whorls more than four, slightly convex, short, with a moderately impressed suture; last whorl a little flattened beneath; aperture lunate; lip thin and sharp; umbilicus rather small.

Greatest breadth .45 inch; least breadth .13 inch; height .04 inch.

HELIX SIMULANS. Species like *H. fulva* Mull., (*H. chersina* Say.) and formerly supposed to be identical with that species. It is chiefly distinguished by numerous microscopic impressed spiral lines; the whorls are less by one, viz. four and two-thirds, and the spire is less elevated, with 10° more divergence. It is of a glossy brown, deeper than in *H. fulva*.

Mean divergence 92° ; greatest breadth .11 inch; least breadth .09 inch; height .08 inch.

HELIX FUSCULA. Shell subconic; brown; with fine striæ of growth; spire well elevated convexly; apex subacute; whorls four, quite convex, with a deep suture; aperture sublunate; lip sharp and thin; last whorl very convex around the small umbilicus.

Mean divergence 30° ; greatest breadth .1 inch; least breadth .09 inch; height .072 inch.

HELIX DIMINUTA. Shell discoidal; greenish or pale corneous, with distant transverse raised lamellæ; spire slightly elevated convexly; apex obtuse; whorls four and one-half, rather convex, with a rather deep suture; aperture orbicular, except as a little modified by the penult whorl; lip sharp and thin; umbilicus very wide.

Greatest breadth .12 inch; least breadth .103 inch; height .05 inch.

HELIX APEX. Shell discoidal; whitish; with microscopic spiral striæ; spire scarcely elevated, convex; apex very obtuse; whorls four, cylindrical, with a deep suture; aperture nearly circular; lip thin and sharp; umbilicus very wide.

Greatest breadth .073 inch; least breadth .065 inch; height .02 inch.

HELIX IMMUNDA. Shell depressed conic; dingy white, sometimes greenish and brownish, translucent; very thin, with very unequal striæ of growth; spire convex, moderately elevated; apex very obtuse; whorls five, quite convex, with a deep suture; aperture transversely oval; lip extremely thin and sharp, reflected in the columellar portion; umbilicus not very wide, extending to the apex.

Greatest breadth .52 inch; least breadth .44 inch; height .27 inch.

HELIX PERDEPRESSA. Shell discoidal; whitish or pale horn colored; with very fine transverse striæ; spire concave or plane, with the last whorl often descending below the plane of the preceding; apex always depressed into the plane of the spire; whorls five, angular, on the upper side sloping a little below the plane of the spire, with a well impressed suture; aperture elliptical, a little modified by the penult whorl; lip thin and sharp; umbilicus as wide as the last whorl, regularly concave and exhibiting all the whorls. The following are the dimensions of a large specimen.

Greatest breadth .25 inch; least breadth .215 inch; height .105 inch.

HELIX ANGUSTISPIRA. Shell somewhat hemispherical; pale horn colored; very finely striated transversely; spire depressed conic, with rectilinear outlines; apex very small and acute; whorls five and one half, quite convex, narrow, high, with a rather deep suture; aperture lunate, obliquely very long and narrow; umbilicus rather small.

Mean divergence about 123° : greatest breadth .125 inch; least breadth .115 inch; height .98 inch.

HELIX INCONSPICUA. Shell subdiscoidal; whitish or pale horn color; with very fine striae of growth; spire scarcely elevated convexly; apex obtuse; whorls nearly five, rather convex, narrow, rather high, with a well impressed suture; periphery of the last whorl nearly in the plane of the spire, subangular; aperture narrow and lunate: umbilicus more than half as wide as the penult whorl, subconcave. This species is intermediate between *H. peraffinis* and *H. depressa*.

Greatest breadth .175 inch; least breadth .15 inch; height .98 inch.

PUPA JAMAICENSIS. Shell cylindrical; pale brownish horn color; with fine oblique striae of growth; spire tapering only near the summit, into an obtuse apex: whorls five, quite convex, with a deep suture: aperture semioval, with the right side longer, and shouldered above, and the transverse side a little oblique: to the right of the middle of the latter is a very prominent stout tooth; on the middle of the columella is another equally stout, but less prominent: on the right side is another prominent tooth directed between the two above-mentioned, and on each side of it a rather smaller tooth; lip moderatley reflected; with a very small umbilicus.

This species is more exactly cylindrical than *P. servilis*, Gould, *P. procera*, Gould, &c. which have a similar aperture; the upper and lower teeth of the right side are more conspicuous, and the shell is much smaller.

Length .07 inch; breadth .025 inch.

PUPA LATA. Shell very short, subcylindrical, truncated anteriorly; pale brown or horn color; with very regular rather distant microscopic transverse lines, which are more distinct on the upper whorls: spire cylindrical; apex conoid; whorls five, very convex, with a deep suture: last whorl making nearly a right angle between its lateral and anterior surfaces: aperture about two-thirds of a circle, without teeth; lip not reflected, with a smooth blunt margin; without umbilicus.

Length .075 inch; breadth .055 inch.

PUPA HEXODON. Shell ovate; brown; smooth and shining; spire with convex outlines: whorls five, rather convex, with a well impressed suture; aperture semioval, with the transverse lip rather

oblique, constantly with six teeth, of which two are on the transverse lip, the inner one being a little larger; two teeth are on the columella, the upper one being a little larger; and on the outer side are two, of which the lower one is a little larger; umbilicus very small. This species resembles *P. ovata* Say. See the excellent monograph by Dr. Gould of the Pupæ of the United States in the Bost. Journ. Nat. Hist. Vols. III. and IV.

Length .085 inch; breadth .055 inch.

PUPA EXILIS. Shell tapering and much elongated; white; smooth; spire slender, with scarcely convex outlines; apex obtuse; whorls nearly six, rather convex, with a well impressed suture; aperture oblique, long, contracted at both extremities, rather angular anteriorly; lip well reflected and thickened; on the left side of the aperture is a strong transverse tooth, and there is a smaller oblique tooth at the end of the columella; umbilicus very small. This species much resembles *P. exigua* Say, but tapers regularly from the middle of the last whorl, and is more slender.

Length .08 inch; greatest breadth .028 inch; least breadth .025 inch.

SUCCINEA LATIOR. Shell obliquely elliptical; pale amber color; extremely thin, with rather coarse unequal striæ of growth; spire small; apex acute; whorls three and one-third; quite convex, with a well impressed suture; aperture oval, acutely angular above, not oblique. This species is intermediate, in the form of the last whorl and in its proportion to the spire, between *S. campestris* Say, and *S. obliqua* Say, but is much thinner than either of those species. *S. Sagra* (!) Orb., the allied species of Jamaica, is narrower and smoother.

Length .53 inch; breadth .34 inch; length of aperture .43 inch; breadth .27 inch. Of another individual, length .43 inch; breadth .27 inch.

SUCCINEA ANGUSTIOR. Shell very long ovate; brownish horn colored; well covered with striæ of growth, not shining; spire long; apex acute; whorls three and one-half, long, rather convex, with a well impressed suture; aperture oval, rather small, not oblique. A large specimen is .3 inch long and .16 inch broad; length of aperture .2 inch; breadth .12 inch.

CATALOGUE OF SPECIES AND VARIETIES OF HELICIDÆ
WHICH INHABIT JAMAICA.*

GEOMELANIA.

1. <i>G. Jamaicensis</i> Pfr.	3. <i>G. expansa</i> Ad.
2. <i>G. minor</i> Ad.	4. <i>G. elegans</i> Ad.

CYLINDRELLA.

5. <i>C. pygmaea</i> Ad.	{ 21. <i>C. cylindrus</i> Chem	
6. <i>C. Beardsleana</i> Ad.		22. <i>C. rubella</i> Ad.
7. <i>C. gracilis</i> Wood.		23. <i>C. aspera</i> Ad.
8. <i>C. elongata</i> Chem.		24. <i>C. obesa</i> Ad.
9. <i>C. Agnesiana</i> Ad.		25. <i>C. brevis</i> Pfr.
10. <i>C. alba</i> Ad.	26. <i>C. columna</i> Ad.	
10. bis. <i>C. Gossei</i> Pfr.	26.a. " " var. <i>intermedia</i> Ad.	
11. <i>C. seminuda</i> Ad.	27. <i>C. nobilior</i> Ad.	
12. <i>C. costulata</i> Ad.	28. <i>C. carnea</i> Ad.	
	28.a. " " var. <i>cerina</i> Ad.	
	29. <i>C. sanguinea</i> Pfr.	
13. <i>C. subula</i> Fer.*	30. <i>C. Maugeri</i> Wood.	
14. <i>C. alabastrina</i> Pfr.*	31. <i>C. inornata</i> Ad.	
15. <i>C. Humboldtiana</i> , var. β Pfr.*	32. <i>C. simplex</i> Ad.	
16. <i>C. variegata</i> , var. γ Pfr.*		
17. <i>C. montana</i> Ad.	33. <i>C. Hydeana</i> Ad.	
18. <i>C. Gravesii</i> Ad.		
19. <i>C. rosea</i> Pfr.	34. <i>C. rubra</i> Ad.	
19.a. " " var. <i>magna</i> Ad.	35. <i>C. Dunkeri</i> Pfr.	
19.b. " " " <i>major</i> Ad.	36. <i>C. similis</i> Ad.	
20. <i>C. ambigua</i> Ad.	37. <i>C. tenella</i> Ad.	
	38. <i>C. tenera</i> Ad.	

ACHATINA.

39. <i>A. ligata</i> Ad.	47. <i>A. Dominicensis</i> Gm.
40. <i>A. Jamaicensis</i> Pfr.	48. <i>A. curvilabris</i> Pfr.
41. <i>A. procera</i> Ad.	49. <i>A. anglostoma</i> Ad.
42. <i>A. Griffithii</i> Ad.	50. <i>A. Ingallsiana</i> Ad.
43. <i>A. Phillipiana</i> Pfr.	51. <i>A. unicolor</i> Ad.
44. <i>A. elegans</i> Ad.	52. <i>A. nemorensis</i> Ad.
45. <i>A. venusta</i> Pfr.	53. <i>A. Phillipsii</i> Ad.
46. <i>A. leucozonias</i> Walch.	54. <i>A. arcuata</i> Pfr.

* The species which are thus designated are not in the collection of Amherst College.

55. <i>A. vicina</i> Ad.	62. <i>A. micans</i> Ad.
56. <i>A. propinqua</i> Ad.	63. <i>A. iota</i> Ad.
57. <i>A. Gossei</i> Pfr.	64. <i>A. octona</i> Chem.
58. <i>A. costulata</i> Ad.	65. <i>A. striosa</i> Ad.
59. <i>A. aberrans</i> Pfr.	66. <i>A. inusitata</i> Ad.
{ 60. <i>A. pellucens</i> Ad.	
{ 61. <i>A. levis</i> Ad.	

BULIMUS.

67. <i>B. minimus</i> Ad.	75. <i>B. laeviusculus</i> Ad.
68. <i>B. striatellus</i> Ad.	
69. <i>B. terebella</i> Ad.	76. <i>B. rufescens</i> Gray.*
70. <i>B. pauperculus</i> Ad.	77. <i>B. erubescens</i> Pfr.
71. <i>B. octonoides</i> Ad.	78. <i>B. immaculatus</i> Ad.
72. <i>B. pallidus</i> Ad.	79. <i>B. zebra</i> Mull.
73. <i>B. monodon</i> Ad.	
74. <i>B. nitidiusculus</i> Ad.	80. <i>B. anomalus</i> Ad.
	81. <i>B. mirabilis</i> Ad.

PUPA.

82. <i>P. fallax</i> (?) Say.	87. <i>P. servilis</i> Gould.
83. <i>P. lata</i> Ad.	88. <i>P. Jamaicensis</i> Ad.
84. <i>P. contracta</i> (?) Say.	89. <i>P. exilis</i> Ad.
85. <i>P. tenuidens</i> Ad.	
86. <i>P. hexodon</i> Ad.	90. <i>P. striatella</i> (?) Fer.

SUCCINEA.

91. <i>S. angustior</i> Ad.	93. <i>S. latior</i> Ad.
92. <i>S. Sagra</i> Orb.	94. <i>S. contorta</i> Ad.

HELIX.

95. <i>H. Martiniana</i> Pfr.*	107. <i>H. tridentina</i> Fer.
96. <i>H. peracutissima</i> Ad.	108. <i>H. Bronnii</i> Pfr.
97. <i>H. soror</i> Fer.	109. <i>H. picturata</i> Ad.
98. <i>H. cara</i> Ad.	110. <i>H. sinuata</i> Mull.
99. <i>H. Chittyana</i> Ad.	111. <i>H. strangulata</i> Ad.
100. <i>H. patina</i> Ad.	112. <i>H. anomala</i> Pfr.
101. <i>H. fluctuata</i> Ad.	
102. <i>H. acutissima</i> Lam.	113. <i>H. aspera</i> Fer.
103. <i>H. Bainbridgii</i> Pfr.	114. <i>H. Jamaicensis</i> Chem.
104. <i>H. Spengleri</i> Hinds.*	
105. <i>H. lucerna</i> Mull.	115. <i>H. angustata</i> Fer.*
106. <i>H. Okeniana</i> Pfr.*	116. <i>H. Cubensis</i> , var. ♂ Pfr.*

117. <i>H. tunicata</i> Ad.	136. <i>H. inconspicua</i> Ad.
118. <i>H. sulphurea</i> Ad.	137. <i>H. peraffinis</i> Ad.
119. <i>H. MacMurrayi</i> Ad.	138. <i>H. Boothiana</i> Pfr.
120. <i>H. munda</i> Ad.	139. <i>H. turbiniformis</i> Pfr.
121. <i>H. tenerrima</i> Ad.	140. <i>H. Anthoniai</i> Ad.
122. <i>H. graminicola</i> Ad.	141. <i>H. angustispira</i> Ad.
123. <i>H. nemoraloides</i> Ad.	142. <i>H. ambigua</i> Ad.
124. <i>H. Gossei</i> Pfr.	143. <i>H. brevis</i> Ad.
125. <i>H. subconica</i> Ad.	144. <i>H. Hollandi</i> Ad.
126. <i>H. fuscocincta</i> Ad.	145. <i>H. arboreoides</i> Ad.
127. <i>H. virginea</i> Ad.	146. <i>H. similis</i> Ad.
128. <i>H. fuscula</i> Ad.	
129. <i>H. immunda</i> Ad.	147. <i>H. lamellifera</i> Ad.
130. <i>H. ptychodes</i> Pfr.	148. <i>H. pila</i> Ad.
131. <i>H. perdepressa</i> Ad.	149. <i>H. Cookiana</i> Gm.
132. <i>H. depressa</i> Ad.	150. <i>H. torrefacta</i> Ad.
133. <i>H. sincera</i> Ad.	151. <i>H. epistylium</i> Ad.
134. <i>H. diminuta</i> Ad.	152. <i>H. epistylum</i> Mull.
135. <i>H. apex</i> Ad.	153. <i>H. epistylioides</i> Fer.
	154. <i>H. simulans</i> Ad.
	155. <i>H. dioscoricola</i> Ad.

PROSERPINA.

156. <i>P. nitida</i> Sowb.	157. <i>P. opalina</i> Ad.

NEW AURICULIDÆ which inhabit Jamaica. By C. B. ADAMS. Oct. 1849.

MELAMPUS CORONATUS. Shell obconic; reddish purple; with several spiral punctate striae and distant transverse striae, and a deciduous epidermis, which is produced into a small spine at each of the principal transverse striae on the spire; spire rather short, with outlines slightly concave; apex very acute; whorls about seven, slightly shouldered, with a moderately impressed suture; aperture with a large solid spiral prominent callus or tooth on the columella. The two specimens before me may be young shells, but probably belong to a new species.

Length .11 inch; breadth .07 inch.

PEDIPES OVALIS may be a variety of *P. quadridens* Pfr.; but when full grown it is oval: the spiral ribs on the last whorl are broad and approximate, and on the whole shell they are smooth, without the irregular microscopic granulations of *P. quadridens*:

the color is yellowish brown or waxen : the aperture is similar to that of Dr. Pfeiffer's species, but the tooth of the right side is less conspicuous.

Length .12 inch ; breadth .09 inch : of *P. quadridens*, length .16 inch ; breadth .135 inch.

Catalogue of **AURICULIDÆ** which inhabit Jamaica. Oct. 1849

MELAMPUS.

1. *M. coniformis* Brug.
2. *M. flavus* Gm. Syn. *Auricula monile* Lam.
3. *M. pusillus* Gm. Syn. *Auricula nitens* Lam.
4. *M. coronatus* Ad.
5. *M. cingulatus* Pfr.

PEDIPES.

6. <i>P. quadridens</i> Pfr.	7. <i>P. ovalis</i> Ad.

Descriptions of supposed new species of **FRESH WATER SHELLS**
which inhabit Jamaica. By C. B. ADAMS. Oct. 1849.

PALUDINA JAMAICENSIS. Shell ovate-conic ; translucent or sub-transparent ; green, sometimes with a tinge of brown ; very smooth ; spire with the outlines nearly rectilinear ; apex acute, persistent ; whorls six, quite convex, very regularly rounded ; aperture ovate, acute above ; with an umbilical groove between the left side of the lip and the last whorl.

Mean divergence about 60° ; length .15 inch ; greatest breadth .1 inch ; least breadth .08 inch.

VALVATA PYGMÆA. Shell convex above ; concave below ; color*
——? with fine striæ of growth ; spire convex, moderately elevated ; apex subacute ; whorls three and one-half, with a very deep suture, very accurately rounded and rather rapidly increasing in diameter, so that the shell resembles an elongated cone wound in a spiral manner : aperture large, with the upper end of the labrum advanced

* I have not yet obtained any fresh or living specimens.

far beyond the lower extremity: umbilicus as wide as the penult whorl. The following are the dimensions of a large specimen.

Greatest breadth .075 inch; least breadth .06 inch; height .03 inch.

PLANORBIS MACNABIANUS. Shell discoidal and excessively flattened, like *P. vortex*; brownish horn color; with microscopic crowded transverse striae of growth; spire a little more concave on the right than on the left side; apex conspicuous on both sides; whorls six, with a well impressed suture on both sides, planulate on the left side and a little convex on the right side; last whorl with an angular periphery in the plane of the left side; aperture very oblique, the right half of the labrum being advanced very far and abruptly beyond the left half, especially in old shells, in which the advance is equal to twice the diameter of the aperture.

Greatest breadth .27 inch; least breadth .25 inch; height of the last whorl .04 inch.

PLANORBIS REDFIELDI. Shell discoidal; horn color; smooth, with a few microscopic interrupted spiral striae; spire more widely and deeply concave on the left than on the right side; apex visible on both sides; whorls nearly four, wider on the left side, with a well impressed and margined suture on both sides, subplanulate on the left, convex on the right; last whorl spreading much through a regular curve from the right to the left side, where it has a subangular periphery, narrow on the left side; labrum with its right half advanced beyond its left by a space equal to the diameter of the aperture.

Greatest breadth .185 inch; least breadth .16 inch; height of last whorl .065 inch.

PLANORBIS HALBEMANNI. Shell subdiscoidal; brownish horn color; with very fine striae of growth, and several spiral series of microscopic punctures; spire very narrow; apex deeply sunk on both sides; whorls five, rather convex, more convex on the right side, with a well impressed suture margined on the right side; last whorl very wide on both sides and high, with a slightly angular periphery on the left side; aperture lunate, with the labrum most advanced at one third of its length from the right extremity.

Greatest breadth .14 inch; least breadth .125 inch; height of last whorl .07 inch.

PLANORBIS DECIPIENS. Shell discoidal; pale horn color; with fine striae of growth and finer microscopic spiral striae; spire wide,

a little concave on both sides; apex moderately depressed, more so on the right side; whorls five, rather convex on the right side, subangular on the left, with a well impressed suture; last whorl not large, with the subangular periphery nearer to the right side; aperture semioval; much advanced at the right extremity. This species resembles *P. pallidus* Ad., which has a less number of whorls, of which the last is much wider; that shell is also higher.

Greatest breadth .365 inch; least breadth .32 inch; height of the last whorl .09.

PLANORBIS AFFINIS. Shell discoidal; horn color; with coarse striæ of growth; spire wide and moderately concave on both sides; apex very deeply depressed into a minute pit and invisible on the right side, conspicuous on the left side; whorls about five and one-third, convex with a deep suture on the right side, on the left side angular, with the suture at first on the angle for nearly three whorls and then descending into an acute angular channel; last whorl rather large, moderately turned to the left; aperture semioval; labrum moderately advanced on the right side. This shell is very similar to *P. lentus* Say, of which it may possibly be a variety. Its altitude is less, and the right side is more uniformly concave. Perhaps this is a case of specific identity with plural origin.

Greatest breadth .68 inch; least breadth .535 inch; height of last whorl .21 inch.

Var. *a*; brownish red, with coarser striæ of growth, the outer whorl more sharply angulated, and higher.

Greatest breadth .57 inch; least breadth .455 inch; height of last whorl .22 inch.

CYCLAS VEATLEYI. Shell oval; horn color with a tinge of brown; extremely thin, with fine striæ of growth; valves very inequilateral, with a moderately convex disk; anteriorly both short and low, with a well rounded margin; posteriorly very high and subtruncated; beaks small but prominent; cardinal teeth small; lateral teeth moderately developed, somewhat remote. Very rare.

Length .21 inch; height up the middle of the posterior side .15 inch; breadth .105 inch.

CYCLAS PYGMEA. Shell oval; color* —?; not very thin proportionately to its size, with microscopic striæ of growth; valves somewhat inequilateral, with a very convex disk; anteriorly short

* I was unable to find any living or fresh specimens.

but high and scarcely truncate; posteriorly long but much lower, somewhat tapering to a well rounded extremity; beaks wide, not prominent: cardinal teeth small and lamellar; lateral teeth moderately developed, not remote.

Length .083 inch; height .075 inch; breadth .05 inch.

Catalogue of FRESH WATER SHELLS, which inhabit Jamaica.
By C. B. ADAMS. October, 1849.

1. **MELANOPSIS** lineolata Gray.
 2. **MELANIA** spinifera Ad.
 3. **VALVATA** pygmæa Ad.
 4. **PALUDINA** rivularis Ad.
 5. " Jamaicensis Ad.
 6. **AMPULARIA** fasciata (?) Lam.
 7. **PLANORBIS** MacNabianus Ad.
 8. " Redfieldi Ad.
 9. " Haldemani Ad.
 10. " dentiferus Ad.
 11. " pallidus Ad.
 12. " decipiens Ad.
 13. " affinis Ad.
 14. **ANCYLUS** obscurus (?) Hald.
 15. **PHYSA** Soverbyana Orb.
 16. **LIMNÆA** umbilicata Ad.
 17. **CYCLAS** pygmæa Ad.
 18. " Veatleyi Ad.
-

Remarks on the distribution of the TERRESTRIAL AND FRESH-WATER MOLLUSCA which inhabit Jamaica. By C. B. ADAMS. October, 1849. Read before the American Association for the Promotion of Science, August 16, 1849.

In the following statements perfect accuracy in the details is not attempted. Subsequent explorations will enlarge the total number of known species, and modify our views of the distribution of species, both by the discovery of new species whose distribution is very

limited, and by ascertaining a wider distribution of some which are now known. The validity also of several of the species which have been enumerated in the preceding catalogues is even more than doubtful, as intimated in the captions of the articles. Additional specimens and the suggestions of experienced zoologists will enable us, we hope, at some future time to determine more satisfactorily many of these difficult and doubtful cases. With some confidence, however, in the general correctness of the following views, we think it unnecessary any longer to withhold them.

A fact, which affects the visiter from a northern climate with astonishment, is the great profusion of the terrestrial species, and their accumulation in certain districts. In the parish of Manchester, a region four miles long and one mile wide contains one hundred species,—as many as the whole number native in North America east of the Mississippi river. After becoming acquainted with their stations and localities, a collector might easily obtain eighty or ninety species in one day, for most of them are sufficiently numerous in individuals to render his success certain with ordinary skill. Of the 265 terrestrial species which have been enumerated, more than two hundred were collected by the writer in person in a hasty exploration of one-tenth of the surface of Jamaica. From the very limited distribution of most of these species, we may reasonably expect that this island, 6400 square miles in extent, will furnish from 350 to 400 good species. Long might a collector continue his explorations, and make good his maxim—*nulla dies sine specie*.

It should not, however, be supposed that the species have been distributed, in such profusion, over all parts of the island indiscriminately. The trappean, syenitic, and sandstone districts are as destitute of land shells, both of species and of individuals, as the barren surface of New England. In the limestone districts, but few species will be found on the Newer Pleiocene (?) or rubble limestone. They abound on the more perfectly consolidated limestone of Miocene (?) age. Here the numerous and violent dislocations of the earth's crust by earthquakes, for a long succession of ages, have broken the surface into innumerable cavities and labyrinthine passages. These have been only partially filled with soil, since the mechanical decay of the well consolidated limestone is slight, and no glacial agency has ever smoothed down the asperities of the surface. Extensive districts occur where tropical rains leave no

standing water, and where no rivers flow, or where the rivers without obstruction and with no material change of course run through the base of lofty mountains. In the dense and varied tropical vegetation above, and in the innumerable places of retreat beneath the surface, we find the paradise of snails. They, with a variety of articulated animals, form a guano soil, which renders the almost naked rocks the most fertile spots and sustains a thorny and impenetrable vegetation.

The difference in the extent of the marine and of the terrestrial species is remarkable. A few of the marine species of Jamaica occur also in the New England States: and many are found in the Southern States. Several occur in West Africa, and in the Mediterranean, and a large majority are already known to occur through the other islands. Perhaps we may safely conjecture that not more than ten or fifteen per cent. of the marine species are peculiar to the island. The same law governs those genera of Colimacea which are maritime in their habits, viz. *Truncatella*, *Pedipes*, and *Melampus*.

With the species of Mollusca, which are strictly terrestrial, the law of distribution is reversed. Probably not more than six to nine per cent. of the species are common to any other islands. In the *Thesaurus Conchyliorum* of G. B. Sowerby, Jr., *Cyclostoma articulatum* is said to have come from Demerara and the Antilles; and the habitat of *Helicina picta* Fer. is said to be Martinique and Jamaica. The habitat of *H. hannastoma* Moric. and of *C. Adamsi* Pfr. (*C. crenulatum* Gray) is 'the Antilles,' and yet more generally, *C. fascia* Gray and *H. neritella* Lam. are said to come from the West Indies.* Thus of the 97 operculated species, two only (with a third which we have not enumerated as a Jamaica shell) are affirmed to occur in other islands.

Of the HELICIDÆ† of Jamaica, the genus *Geomelania* has been found only in Jamaica. Of *Cylindrella*, *C. brevis* is said, by Dr. L. Pfeiffer on the authority of Petit, to occur in Martinique, and Cuba is doubtfully mentioned as its habitat. Variety γ of *C. Humboldtiana*, and variety γ of *C. variegata*, both Cuban species, are said by Dr. Pfeiffer to occur also in Jamaica. *C. Maugeri*, a Jamaica species, is said by Dr. P. on the authority of Dr. Hornbeck, to occur also in St. Thomas. The remaining thirty species are peculiar to Jamaica.

* *Cyclostoma Sauliæ* was introduced erroneously into the Catalogue on page 16, No. 1.

† See catalogue of species, page 39.

Of *Achatina*, *A. octona* is very widely distributed through the West Indies, and is said by Mr. Reeve to occur in the Polynesian islands. It has probably been distributed more or less by human agency. In Jamaica, it occurred only in Kingston, in a small garden near the shipping. *A. leucozonias* is said by Ferussac to occur in Martinique. It has twice been given to me in Jamaica as a native species, although I have not found it in place. *A. Dominiensis* is said to occur in Hayti. I have found it in the eastern part of Jamaica. According to Dr. Pfeiffer, his variety of γ of *A. venusta* occurs in Demerara. The remaining twenty-four species are known only as natives of Jamaica.

Fifteen species of *Bulinus* have been found in Jamaica, of which one only, *B. zebra*, is known to inhabit other islands. The habits of this species, which lives on cultivated and other shrubs, lattice fences, &c. near human habitations, and its very local distribution in such situations, suggest that it may have been introduced.

Of the more general distribution of the small species, we have a remarkable example in the genus *Pupa*. Of the nine species known to me, one appears to be identical with *P. contracta*, which is well known to occur over a large part of the United States. As far north as 44° lat., I have frequently found it in Vermont. In certain localities the Jamaica shells of this species are very abundant. Another species, which I have found in Jamaica and received from Cuba, is not distinguishable specifically from *P. fallax*, which has a similar distribution in the United States. The West Indian variety however is thinner both in the lip and in the walls of the shell; and, if a slight difference, especially when constant, should have more weight in distinguishing species where plurality of origin is probable, perhaps this variety is entitled to specific rank. *P. servilis* was found by Dr. R. E. Griffith in Santa Cruz. *P. striatella*, of which one specimen was given to me in Jamaica as native, is said to occur in Hayti, Porto Rico, &c. But this species belongs to the group of large and solid Pupæ, which are more maritime in their habits.

[TO BE CONTINUED.]

ERRATA.—On p. 18, line 8th from the bottom, for tip read lip.

“ 40, after 75 *B. læviuseculus* Ad. insert 75 bis. *B. subula* Pfr.

NOTE.—Ten of the fresh water species will be sold at the same rate as the 150 species of land shells. See Note p. 15. Some additional rare species in all these families can be had at 50 cts. each, with one or two specimens of each.

CONTRIBUTIONS TO CONCHOLOGY.

No. 4.

REMARKS ON THE DISTRIBUTION OF THE TERRESTRIAL AND FRESH-WATER MOLLUSCA, WHICH INHABIT JAMAICA. — Continued from p. 48.

FOUR species of *Succinea* inhabit Jamaica, one of which is probably identical with a Cuban species, *S. Sagra*. In this genus the paucity of specific characters is such, that plurality of origin may often be undistinguished by well marked specific differences. Specific identity in such genera is by no means indicative of unity of origin.

Sixty-one species of *Helix* inhabit Jamaica. *H. Cubensis* is a Cuban species, of which variety σ is said by Dr. Pfeiffer to come from Jamaica. *H. turbiniformis* is said by the same authority to occur rarely in a province of Cuba; it is common in certain parts of Jamaica. *H. Boothiana* is also common to Cuba and Jamaica. *H. angustata* is said to occur in Hayti and Jamaica. *H. Bainbridgei*, the heaviest species of land shells in Jamaica, which occurs in the central parts of the parish of Manchester, is said by Dr. Pfeiffer, on the authority of Mr. Bainbridge, to have come from Demerara. Dr. R. E. Griffith found *H. sincera* in Santa Cruz. The remaining fifty-five species have not yet been found out of Jamaica. The two species of *Proserpina* are not known to inhabit any other island.

Thus of the two hundred and fifty-seven species which are strictly terrestrial, twenty-two may have been found out of Jamaica. If it should be thought that the further exploration of other islands and of the mainland should add to this latter number, it is equally probable that the number would be much reduced by requiring absolute certainty in the testimony on which Jamaica species have been referred to other habitats.

Only nineteen fresh-water species of Mollusca in Jamaica are known to me, all of which I have collected in person. The number of genera is remarkable. Although *Planorbis* has seven species, the remaining twelve species belong to ten genera.

There are no *Naiadæ*, and there are but two very rare species of

Cyclas. The *Limnæa* is not distinguishable from a Cuban species, nor from *L. umbilicata* of Massachusetts. The *Physa* is probably *P. Soverbyana*, of Cuba also. The *Ancylus* is not distinguishable from *A. obscurus* of Pennsylvania. *Ampullaria fasciata* is said to occur in several other parts of tropical America. But these four are genera in which there is a great paucity of specific characters. The remaining species have not been identified with those of other places, unless *Planorbis affinis* be identical with *P. lentus*. In some localities, several of the fresh-water species occur abundantly; but these favorable stations are not numerous. Streams are very frequent in many parts of Jamaica, but they are mostly mountain torrents, which rarely present favorable stations for Mollusca.

It has been observed by naturalists, that in tropical Zoology, while the number of species is much greater than in northern regions, the number of individuals is much less. This is eminently true of birds and fishes, and of some other classes. Perhaps this generalization does not hold true of any entire class of Mollusca, and if it be applied to the terrestrial Mollusca of the Western Hemisphere, the reverse is remarkably evident. In Jamaica, many of the terrestrial species exist in a profusion to which there is no parallel in the temperate and northern regions of North America.

A comparison of the number and of the distribution of the marine and of the terrestrial species, suggests an interesting conclusion. If the same general fact is true in all the larger islands, viz.: that the number of terrestrial species in each island is from one third to one half the number of the marine species, while 5 per cent. of the former and 75 or 80 per cent. of the latter are common to two or more islands,—it follows that the total number of terrestrial species in the Antilles must exceed that of the marine species.

With this extremely local distribution of the terrestrial Mollusca in the West Indies may be associated the great fact of their geological history,—that these islands have, since the later Tertiary periods, been in the process of elevation,—that they are the harbingers of a future continent, unlike the groups in the Pacific, which are the remains of ancient continents. Coincident with these two general facts the West Indies is also a third,—that their coral reefs are all fringing, and that coral lagoon islands are wanting.

The name *Cyclostoma solidum* is pre-occupied by Menke. The species, which was described under this name on page 7, may therefore receive the name of *C. JAYANUM* Ad.

REMARKS ON THE WEIGHT OF THE SHELLS OF CERTAIN SPECIES OF
COLIMACEA. By C. B. ADAMS. Nov. 1849.

THE average weight of the full grown shells of a given species of the Mollusca is an interesting item in its history. The ratio between their size and weight varies so much in different species, that the usual precise statements of the former convey no information of any value respecting the latter character. We give therefore a few examples, which include the most minute terrestrial species that exist in the collection of Amherst College, and which are probably among the most minute that have been hitherto discovered. Several specimens were weighed together, both for the purpose of dividing any error in the process, and of obtaining an average result. Using the balance of analytical chemistry, and taking ten or more individuals of the minute species, we obtain quite exact results. The principal sources of error in the comparison of species arise from the difference in the mode of preservation of the shells. In the very small species, the animals are usually dried up in the shells; but if not taken alive, they may have lost more or less of the solid matter in the animal. But the difference of weight resulting from this cause cannot be considerable as compared with the entire weight of the shell, for the total solid matter in the soft parts is small. In many operculated species, the operculum is unknown, and we have therefore excluded this part in all the examples of such species.

In the following table, the first column of figures contains the number of specimens which were weighed together, and the second column—their aggregate weight, and the third—their average weight, in decimal parts of a grain.

1.	<i>Cyclostoma avena</i>	Ad.	Jamaica.	20	4.025	.2012
2.	<i>Helicina lineata</i>	Ad.	"	10	.28	.028
3.	" <i>depressa</i>	Gray.	"	10	2.14	.214
4.	" <i>affinis</i>	Ad.	"	10	2.916	.2916
5.	" <i>Adamsiana</i>	Pfr.	"	10	4.85	.485
6.	" <i>solitaria</i>	Ad.	"	10	8.21	.821
7.	" <i>megastoma</i>	Ad.	"	2	1.82	.91
8.	" <i>costata</i>	Sowb.	"	10	10.92	1.092
9.	" <i>hæmastoma</i>	Moric.	"	1	1.928	1.928
10.	" <i>Jamaicensis</i>	Sowb.	"	10	21.21	2.121

11.	"	neritella	Lam.	Jamaica	10	26.585	2.6585
12.	"	albolabris	Ad.	"	5	22.11	4.422
13.	"	maxima	Sowb.	"	4	71.43	17.856
14.	Trochatella	tenuis	Ad.	"	10	.173	.0173
15.	"	Josephinæ	Ad.	"	10	9.83	.983
16.	"	pulchella	Gray.	"	5	8.51	1.703
17.	"	Tankervillei	Sowb.	"	5	42.08	8.416
18.	Lucidella	aureola	Gray.	"	10	6.97	.697
19.	Stoastoma	Blandianum	Ad.	"	20	.08	.004
20.	"	Redfieldianum	Ad.	"	50	.39	.0078
21.	"	Leanum	Ad.	"	50	.6	.012
22.	"	Jayanum	Ad.	"	50	.8	.016
23.	"	Fadyenianum	Ad.	"	15	.29	.01933
24.	"	Gouldianum	Ad.	"	30	.59	.0197
25.	"	Cumingianum	Ad.	"	1	.025	.025
26.	"	Pfeifferianum	Ad.	"	5	.303	.0606
27.	"	pisum	Ad.	"	10	1.75	.175
28.	Truncatella	fusca	Phil.	Naples.	9	.06	.00667
29.	"	Adamsi	Pfr.	Jamaica.	10	.63	.063
30.	"	scalaris	Mich.	"	10	1.35	.135
31.	"	costellaris (?)	Risso.	Fiji Is's.	10	5.17	.517
32.	"	succinea	Ad.	Jamaica.	11	7.59	.69
33.	Pedipes	quadridens	Pfr.	"	20	7.89	.3945
34.	Geomelania	minor	Ad.	"	20	5.3	.265
35.	Cylindrella	pygmea	Ad.	"	100	1.17	.0117
36.	"	tenera	Ad.	"	1	.06	.06
37.	"	Beardsleana	Ad.	"	20	1.41	.0705
38.	Achatina	iota	Ad.	"	12	.03	.0025
39.	"	aberrans	Pfr.	"	50	1.45	.029
40.	Bulimus	minimus	Ad.	"	4	.016	.004
41.	Helix	apex	Ad.	"	20	.078	.0039
42.	"	minuscule	Binney.	Vermont.	8	.11	.01375
43.	"	pulchella	Mull.	"	100	2.3	.023
44.	Pupa	Jamaicensis	Ad.	Jamaica.	100	.3	.003
45.	"	miliun	Gould.	Vermont.	4	.016	.004
46.	"	minutissima	Hartm.	Bavaria.	15	.07	.00467

Pupa minutissima (No. 46) is the least of the European land shells with which we are acquainted. Pupa miliun (No. 45) is the least of the species which inhabit the United States. Three of the species

of the land shells which inhabit Jamaica are of less size than either of these ; viz. *Helix apex* (No. 41,) *Pupa Jamaicensis* (No. 44,) and *Achatina iota* (No. 38.) The latter is probably the least of all the known species of terrestrial molluscs. Two others (Nos. 19 and 40) are of the same size as *Pupa milium*.

It follows that the least of all known terrestrial shells exist in tropical regions. A subsequent investigation of the size of the marine species, which we have collected in Jamaica, will also show a large number of extremely minute shells. From the well known fact that the larger species occur only in tropical regions, it has by many been too hastily inferred that only temperate regions contain a large proportion of very small species. The difference of zones is not that one extreme of size is found in the tropics and the other in temperate climates, but that, while both appear in tropical countries, one extreme is deficient in temperate regions.

Within the tropics, however, there appears to be a great difference in the average size of the land shells of different regions. In the West Indies and in the Polynesian Islands, there is a great proportion of small species. But in Brazil and in the Philippine Islands, there are very few small land shells. It is remarkable that this purely geographical difference greatly exceeds the average difference in the species of different zones. The cause of this prominent fact in the plan of creation it may not be easy to discover.

Description of a supposed new species of *COLUMBELLA*. By C. B. Adams, Jan. 1850.

COLUMPELLA OVULOIDES. Shell long obovate : yellowish brown, rarely blackish brown, irregularly mottled with large angular spots of white, often with a band of white around the middle of the last whorl, with the apex white : with numerous fine spiral striae, of which those that are on the upper part of the whorls and at the anterior extremity of the shell are coarser ; with excessively minute unequal striae of growth : apex acute : spire with very concave outlines : whorls nine, the penult whorl only being very convex, with a well impressed suture, which near the end is rapidly curved upwards towards the apex : aperture very long and linear : labrum much produced in a broad

curve along the middle, incurved, rather sharp but stout, denticulate; within: labium with a deposit of moderate thickness: columella somewhat produced.

Mean divergence of the spire 50° ; length of the spire .22 inch total length .7 inch; breadth .26 inch.

HABITAT—Bahamas. Fine specimens were collected on Turks Is. by Dr. A. Barrett of Pittsfield, Mass. This beautiful shell is well known in our collections, but I cannot learn that it has been described.

Notes on the SYNONYMY of certain marine shells. By C. B. Adams, Jan. 1850.

Pleurotoma plicata Ad. Bost. Journ. Nat. Hist. III. p. 318. pl. 3. f. 6. This name having been pre-occupied by Lamarck for a fossil shell, my species may take the name of *PLEUROTOMA PLICOSA*.

Pleurotoma decussata Macgillivray Moll. Scot. p. 172. This species, although perhaps figured in Brown's Illust. in 1827 with the name *Fusus decussatus*, was first described in 1844, by the industrious and learned author of one of the most complete local Fauna Molluscorum which has ever appeared. This name was therefore anticipated by Mr. Couthuoy for a Massachusetts shell in Feb. 1839. The Scottish species may therefore take the name *P. MACGILLIVRAYI*.

Pleurotoma violacea Hinds. Proc. Zool. Soc. Lond. March 28, 1843. The name of this species was anticipated by me in January 1842, for a species which inhabits Maine. Mr. Hinds' species may therefore take the name of *P. REEVII*.

Pleurotoma nigrescens Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845, appears to be identical with *P. nigrescens* Gray (Ad.?) Mss. in Reeve Conch. Icon. pl. XXVI, No. 235, Nov. 1845. This species, with *P. minor* Ad. and *P. fuscolineata* Ad., was sent by me in January 1845, to the British Museum, where they were seen by Sir Robert Schomburgk. See his catalogue of West Indian shells in Hist. Barbadoes, pp. 659—664.

Pleurotoma fuscolineata Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1 1845, very closely resembles, and perhaps is identical with *P. sculpta* Reeve Proc. Zool. Soc. Lond. Jan. 27, 1846; but all my specimens

are "minutely reticulated," never smooth. This species was described by Mr. Sowerby in Proc. Zool. Soc. Lond. March 12, 1844, as *Columbella monilifera*, and was also described and figured in the Thes. Conch. Columb. p. 144, pl. 40, fig. 177. The figure faithfully exhibits the sinus, which is not mentioned in the text. The name of the species will be *Pleurotoma monilifera* (Columbella) Sowb.

Pleurotoma albobittata Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845, appears to be identical with *P. luteo-fasciata* Reeve Proc. Zool. Soc. Lond. Oct. 28, 1845.

Pleurotoma trilineata Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845, appears to be identical with *P. trifasciata* Gray Mss. in Reeve Conch. Icon. XXXIII, No. 297, Dec. 1845. It is probably a *Mangelia*.

The following species were described as *Pleurotomae* in Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845, but may be referred to *Mangelia* of Leach, as characterized by Mr. Hinds in Proc. Zool. Soc. Lond. 1843, p. 45.

Mangelia albobittata (*Pleurotoma*) Ad.

"	<i>fusca</i>	"	"
"	<i>dubia</i>	"	"
"	<i>multilincata</i>	"	"
"	<i>trilineata</i>	"	"
"	<i>candidissima</i>	"	"

Buccinum concinnum Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845, is a *Columbella*, and may take the name of *C. DECIPIENS*.

Columbella purpurascens Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845, appears to be identical with *C. dormitor* Sowb. Proc. Zool. Soc. Lond. March 12, 1844, and in Thes. Conch. Columb. p. 143, pl. 40, fig. 173. This figure is colored like a faded specimen.

Buccinum obscurum Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845, is a *Columbella*, and may take the name of *C. OBESA*. The color is more frequently pale yellowish brown, with a very dark spiral band of the same color on the lower part of the whorls of the spire and on the summit of the convexity of the last whorl, with another similar band anteriorly. This species is very closely allied to *C. atomella* Ducl.

Note on *Geomelania Jamaicensis* Pfr. While No. 3 was in press, I received from Jamaica a fine specimen of this shell, precisely like the Cuningian specimen. That the differences between this shell and *G. minor* are of specific value, we are therefore more confident.

My friend, Hon. Edward Chitty, informs me that he has detected an operculum in *Geomelania*, and that he has some additional species.

Descriptions of supposed new species of MARINE SHELLS, which inhabit Jamaica. By C. B. Adams, Jan. 1850.

MARGINELLA NIVEA. Shell obovate, white, translucent, with numerous spots of opaque white: smooth and shining: apex acute: spire small, short, vitreous, wholly opaque white: whorls about three and one-half: aperture long, effuse above: varix stout, produced to the apex: columella with four prominent plaits.

Mean divergence about 100° ; length of spire .06 inch; total length .37 inch; breadth .22 inch.

This species resembles *M. pruinosa* Hinds, but is much smaller, more regularly obovate, the spire is shorter, and the coloration is different except in the opaque white spots.

MARGINELLA ALBA. Shell obovate, wide: pure opaque white: smooth and shining: spire concealed, with a shallow pit in its place: labrum well excurved in its upper part, produced to the summit, rather sharp edged, thick, smooth within: columella with four or five plaits, of which the upper one or two are inconspicuous.

Length .205 inch; breadth .13 inch.

MARGINELLA ABBREVIATA. Shell oblong, but much contracted anteriorly: white: smooth and shining: spire very short: apex rather obtuse: whorls about three and one-third: labrum incurved and contracting the aperture: varix produced a little way on the spire: columella with four plaits of which the upper one is small.

Mean divergence about 90° ; length of spire about .04 inch; total length .22 inch; breadth .11 inch.

This shell resembles *M. lactea* Kr., but is much shorter, and is broader at the top of the last whorl; in *M. lactea* the varix extends farther on the apex.

MARGINELLA FLUCTUATA. Shell obovate: whitish, with very narrow longitudinal strongly waved lines of brown, which extend from the summit to the anterior extremity, and which, being more conspicuous at the summit and at intervals, form spiral series, a little above and a little below the greatest convexity of the shell: spire entirely

concealed by the last whorl, with a callus reaching from the lip over the summit: labrum rather sharp, finely denticulate within: columella with five plaits, the anterior of which are larger. This species resembles *M. frumentum* Sowb.

Length .17 inch; breath .11 inch.

MITRA MONILIFERA. Shell between a fusiform and rhomboidal shape: brownish black, with a white spiral band which is a little above the suture, and which is small and indistinct on the upper whorls and increases with the progress of growth, and which is dilated into spots on the ribs; with rather acute longitudinal ribs, about fourteen on each whorl, and numerous excessively minute unequal raised spiral lines, which are larger at the anterior extremity, and more nodulous on the ribs; anteriorly with a broad well impressed groove, which commences in the aperture above the plaits, and contracts the general form: apex acute: spire with nearly rectilinear outlines: whorls eight or nine, rather convex, with a rather deep suture: columella with four plaits.

Mean divergence 45° ; length of spire .38 inch; total length .74 inch; breadth .36 inch.

This species resembles *M. microzonias* Lam. in which the ribs are obtuse, the outlines of the spire are more convex, and the general form is narrower. It also resembles *M. leucodesma* Reeve.

MITRA ALBICOSTATA. Shell fusiform: dark brown or reddish brown, with whitish ribs, with a spiral band of a darker shade of the same, which is scarcely interrupted on the ribs, and a spiral white band which commences on the last whorl near the summit of the aperture: with obtuse longitudinal ribs, about 16 on each whorl, which are nearly obsolete in a broad shallow groove near the anterior extremity; with spiral striae in the intercostal spaces, and a few spiral raised nodulous lines anteriorly, of which the larger is continuous with the upper columellar plait: apex obtuse: spire with the outlines quite convex: whorls six, moderately convex, with a well impressed suture: aperture narrow: columella with four plaits, of which the two lower are small and approximate, and the two upper are large and distant. This species resembles *M. cavea* Reeve.

Mean divergence 40° . Length of spire .35 inch; total length .59 inch; breadth .31 inch.

COLUMBELLA* FENESTRATA. Shell much elongated, ovate conic, sub-angular on the middle of the last whorl: opaque white around the aperture, with, at the summit of the whorls, a spiral opaque white band, which is interrupted by the angles of an approximate series of

brown spots, which have the form of the summits of Gothic windows, and in which the deep brown of the summit fades in descending to the middle of the whorls, where the shell is transparent; with three linear spiral series of alternating white and brown on the middle and anterior part of the last whorl: with spiral striæ anteriorly, otherwise smooth: apex acute: spire with the outlines nearly rectilinear: whorls eight, nearly plane, with a lightly impressed suture: aperture in the form of a $\circ$ but rather wider: labrum thickened and well ex-curved, smooth within, sinuate above.

Mean divergence 30° ; length of spire .16 inch; total length .25 inch; breadth .08 inch.

COLUMBELLA COSTULATA. Shell moderately elongated, ovate: whitish, with an ill-defined spiral band of very pale yellowish brown on the middle of the whorls, with the same color anteriorly; with a series of large deep brown spots at the summit of the whorls and also before the middle of the last whorl: with obtuse longitudinal ribs, about twelve on each whorl, and unequal spiral striæ: apex subacute: spire with moderately convex outlines: whorls about five and one-half, a little convex, with a well impressed suture: aperture small: labrum with a broad highly polished varix, denticulate within, sinuate above.

Mean divergence 40° ; length of spire .12 inch; total length .19 inch; breadth .09 inch.

This species was described in Mss. five years since, but being informed that it was identical with *C. pygmaea* Sowb just published, I suppressed the description and distributed the shell as *C. pygmaea*. It proves to be quite distinct.

TEREBRA JAMAICENSIS. Shell not very slender, regularly tapering above the last whorl: slate colored, with a series of darker spots on a white spiral stripe next below the suture; with a white spiral line emerging from the top of the aperture, and a brown one from the middle of the same; white between the brown stripe and the columella: with longitudinal unequal wrinkles, which extend from the suture nearly to the middle of the whorls; with excessively minute lightly impressed spiral striæ: apex acute: spire with the outlines almost rectilinear: whorls twelve or thirteen, nearly plane: aperture long ovate: notch wide: columella slightly twisted. This species closely resembles the more slender *T. stylata* Hinds of the Philippine Islands.

Mean divergence 16° ; length 1.9 inch; breadth .43 inch.

PURPURA ABERRANS. Shell ovate or subfusiform: white: longitudinally plicately ribbed; with close-set, well elevated spiral ridges which are continuous over the longitudinal folds, and are closely and

finely but strongly imbricated, and of which the alternate ones are often much smaller: apex acute: spire with the outlines almost rectilinear: whorls about seven, quite convex, with a rather deep suture: aperture obovate: lip rather sharp, serrated by the sculpture; labium with a moderate deposit: umbilicus slight. An old shell is subcanaliculate.

Mean divergence 55° ; length of spire .26 inch; total length .47 inch; breadth .27 inch. Of another specimen, mean divergence 65° ; length .46 inch; breadth .3 inch.

This species resembles *Murex costellaris* Lam., the *Purpura costellaris* of Reeve.

CONUS ARMILLATUS. Shell obovate-conic; attenuated anteriorly: white, with small orange brown square spots, which are more or less confluent transversely, anteriorly and within the aperture of a pale purple color, which is interrupted within by a white fascia below the middle of the shell: solid, with fine revolving striæ on the spire, and on the last whorl with very regular spiral rather distant minute granulous elevated lines, which, from the angle above nearly to the anterior extremity, resemble fine strings of beads, but anteriorly are crowded, smaller, and are irregularly and feebly granulous: apex acute: spire with the outlines a little concave: whorls nearly seven, not coronated: aperture rather open.

Mean divergence 90° ; length of spire .2 inch; total length .59 inch; breadth .32 inch.

TRITON PARVUS. Shell elongate, subfusiform: dingy white on the spire with irregular pale brown stains, on the last whorl pale brown, with two revolving whitish stripes of which the upper one is linear; sometimes the shell is wholly brown except the lower fascia: with longitudinal narrow rounded ribs, of which there are 10 or 12 on each whorl including the varices, which are not easily distinguished from the ribs, and which are distant a little more than a semi-revolution; with numerous spiral unequal elevated lines, which are continuous over the ribs, and of which the anterior ones are larger and granose: apex acute: spire with slightly convex outlines: whorls seven, convex, slightly more inflated above the middle, with a well impressed suture: aperture subelliptical, with a small well defined gutter posteriorly: labrum crenulate within: labium a little thickened: canal short, wide, a little recurved: with an umbilical indentation.

Mean divergence 35° ; length of spire .25 inch; total length .47 inch; breadth .21 inch.

This species was described in Mss. five years since, but being in-

formed that it was identical with *T. angulatus* Reeve, I suppressed the description. It proves to be quite different.

TRITON PULCHELLUS. Shell fusiform: reddish at the apex, pale yellow, with spiral unequal bands of gray, of which there are two on the whorls of the spire and two more on the last whorl: with the aperture more or less orange red: decussate with many small unequal longitudinal and spiral ridges, with unequal nodulous intersections; varices five, last one very large: apex acute: spire with the outlines nearly rectilinear between the varices: whorls eight, rather convex, subangular at or a little above the middle, with a well impressed suture: aperture subelliptical, somewhat acuminate at both extremities: labrum grooved within under the last varix, denticulate on both sides of the groove: labium transversely wrinkled: canal moderately bent to the left and upwards.

Mean divergence 45° ; length of spire .33 inch: total length .72 inch; breadth .36 inch.

This shell resembles a small and slender *T. chrysostoma*.

MUREX INTERMEDITUS. Shell elongated, ovate fusiform: whitish, with dingy brown spots behind the varices, and a few dark brown spiral lines within the aperture, and spots of the same on the labrum: with six varices on each whorl; with imbricate spiral striæ; with strongly crenulated spiral very prominent ridges, which are slightly fringed in crossing the varices, and of which the upper two are approximate, and the next lower one is small: apex acute: spire with moderately convex outlines: whorls eight, very angular above the middle, and concave above the angle, with a deep suture; last whorl with a broad deep groove anteriorly, which is divided into pits by the varices: aperture obovate: canal rather short but white.

Mean divergence 43° ; length of spire .46 inch; total length .85 inch; breadth .4 inch.

This species is similar to *M. erosus* Brod. and *M. alveatus* Kr.

MUREX PAUPERCULUS. Shell elongated, obliquely subfusiform: whitish, within the aperture yellowish: with three not very stout varices on each whorl, and slender intermediary varicoid ridges; with a few distant spiral ridges, the intersections being nodulous: apex subacute: spire with the outlines a little convex: whorls six, quite convex, with a deep suture: aperture elliptical: canal short, rather wide and recurved.

Mean divergence 42° ; length of spire .33 inch; total length .71 inch; breadth .3 inch.

FUSUS NITENS. Shell ovate fusiform: white, with a spiral series,

of more or less waved transversely much elongated spots of brown; on the last whorl are two more series of shorter spots of the same color: with a varicoid rib a little behind the labrum; with rather coarse revolving striae anteriorly; otherwise smooth and shining; apex acute: spire with the outlines slightly convex: whorls eight or nine, moderately convex: aperture rather long, subelliptical, acute above: labrum sharp: canal very short, and very wide.

Mean divergence 38° ; length of spire .29 inch; total length .57 inch; breadth .24 inch.

PLEUROTOMA AUGUSTE. Shell long ovate-fusiform: bright red, whitish on the folds and anteriorly, with a wide or sometimes a linear spiral band of brown, which is interrupted by the ribs: with nine broad longitudinal ribs on each whorl: apex obtuse: spire with the outlines nearly rectilinear: whorls six and one-half, a little convex, with a lightly impressed suture: aperture obovate: sinus shallow: canal very short, wide, and strong.

Mean divergence 30° ; length of spire .48 inch; total length .74 inch; breadth .27 inch.

PLEUROTOMA JAYANA. Shell clavate-pyramidal: black, with a broad spiral pale yellowish nodiferous band, and another of the same color anteriorly: with a series of broad close-set smooth not prominent nodules on the lower half of the whorls of the spire; anteriorly with four or five distant raised revolving lines, which are sometimes granulous, the granules being white: apex acute: spire with the outlines nearly rectilinear: whorls eight, planulate above the series of nodules, with a lightly impressed suture; last whorl subangular: aperture small: sinus a little below the extremity of the labrum: canal very short.

Mean divergence 30° ; length of spire .31 inch; total length .5 inch; breadth .24 inch.

This species resembles *P. zebra* Kr., for which it was for some time mistaken.

PLEUROTOMA SOLIDA. Shell clavate pyramidal: very dark brown or nearly black, with the intercostal spaces pale brown: with a very slight keel on the upper part of the whorls, and a smooth space below it, and somewhat oblique transverse ribs abruptly commencing above the middle of the whorls, and spiral striae in the intercostal spaces; anteriorly with prominent raised revolving lines decussating the transverse ribs: apex subacute: spire with the outlines nearly rectilinear: whorls eight, a little convex, with a moderately impres-

sed suture, which is crenulated by the entrance of the ribs from above: aperture rather small: labrum produced along the middle and in dead shells usually broken off: sinus deep, a little below the extremity of the labrum: canal very short. This species is allied to *P. unicolor* Sowb., *P. rustica* Sowb., and *P. fuscescens* Gray.

Mean divergence 27° ; length of spire .45 inch; total length .68 inch; breadth .28 inch.

PLEUROTOMA FUSCOCINCTA. Shell clavate pyramidal: pale yellowish white, with a sutural line of brown, anteriorly wax yellow with revolving lines of yellowish white: with a spiral series of large smooth well rounded nodules, on slightly elevated wide ridges on the lower half of the whorls; anteriorly with a few spiral raised lines: apex acute: spire with the outlines rectilinear: whorls seven or eight, not convex, with the suture not impressed: aperture rather wide: canal very short.

Mean divergence 33° ; length of spire .17 inch; total length .27 inch; breadth .13 inch.

PLEUROTOMA MACULATA. Shell ovate-fusiform: white with a spiral series of large distant yellowish brown spots on the upper part of the whorls; anteriorly with a spiral band of very pale yellowish brown terminating often in a deeper spot on the labrum: with eleven or twelve transverse ridges on each whorl, which are decussated by several spiral prominent lines: apex acute: spire with the outlines moderately convex: whorls seven, angular, with a well impressed suture: aperture small, nearly in the form of a δ : labrum well ex-curved, denticulate within: sinus not very small, near the upper extremity of the labrum: canal short, turning to the left.

Mean divergence 31° ; length of spire .1 inch; total length .17 inch; breadth .08 inch.

This species has some resemblance to *P. quadrata* Rv.

Pleurotoma quadrata (?) Rv. The figure of this species in Reeve's Conch. Icon. represents quite accurately a species, which inhabits Jamaica, but the figure is three times the linear dimensions of our shell, although it is not said to be magnified. If our specimens belong to a distinct species, it may receive the name of *P. DIMINUTA*.

PLEUROTOMA DECORATA. Shell ovate-fusiform: covered, on a whitish ground, with a net work of bright brown irregular spots and lines, which on the upper whorls are less numerous, somewhat regular and darker: with, on the upper whorls, strong transverse ridges which become smaller and at length disappear on the penult whorl;

with very close-set rather coarse spiral striae, which are elegantly de-gussated on the lower whorls by excessively minute lines of growth: apex acute: spire with moderately convex outlines: whorls seven or eight, rather convex, with a well impressed suture: aperture large: labrum well excurved and produced in its lower half: sinus rather deep at the upper extremity of the labrum: canal short and very wide.

Mean divergence 32° ; length of spire .27 inch; total length .55 inch; breadth .2 inch.

This species much resembles *P. lynceiformis* *Re.*, for which it has been mistaken. It also closely resembles in form, but not in sculpture, *P. patula* *Re.*

PLEUROTOMA ALPELLA. Shell long ovate-fusiform: opaque snow white in the intercostal spaces, otherwise of a chalcedonic white: with strong wide transverse ribs, about thirteen on each whorl, nearly in continuous lines from the summit to the last whorl, and becoming obsolete anteriorly: with one or two raised spiral lines, at the base of each whorl and numerous well rounded revolving ridges on the anterior half of the last whorl: apex acute: spire with slightly convex outlines, long and regularly conic: whorls seven, slightly convex, with a moderately impressed suture: aperture nearly in the form of a $\S$; labrum denticulate within; sinus rather wide and shallow near the upper end of the labrum: canal very short.

Mean divergence about 30° ; length of spire .12 inch; total length .2 inch; breadth .07 inch.

PLEUROTOMA PYGMÆA. Shell ovate-fusiform, much elongated: with a broad irregular band of yellowish brown along the upper part of the whorls and below the middle of the last whorl: with small transverse approximate ribs, about fifteen on each whorl, and rather distant spiral elevated lines, the intersections being developed into large nodules: nucleus smooth and opaque white: apex subacute: spire with convex outlines: whorls about six, moderately convex, with a lightly impressed suture: aperture rather narrow: sinus rather large and deep, near the upper end of the labrum: canal very short.

Mean divergence about 30° ; length of spire .075 inch; total length .13 inch; breadth .055 inch.

PLEUROTOMA FLAVOCINCTA. Shell ovate-conic, much elongated: white, with a spiral band of yellowish brown on the upper and on the lower parts of the whorls, with spots of the same descending from the upper band into the intercostal spaces; with linear bands of the same

below the middle of the last whorl: plicately and transversely ribbed on the middle of the whorls; with a very broad moderately elevated spiral ridge along the middle of the whorls; with a slight linear spiral ridge at the summit of the whorls, and a third spiral ridge of intermediate size at the lower part of the whorls: apex subacate: spire with the outlines nearly rectilinear: whorls about seven, scarcely convex, with an indistinct suture: aperture small, but rather wide: sinus moderate, near the upper end of the labrum: canal very short.

Mean divergence about 28° ; length of spire .11 inch; total length .19 inch; breadth .07 inch.

PLEUROTOMA NODATA. Shell fusiform, elongated: brown, with white tubercles: with a spiral series of large obtuse undivided scarcely elongated tubercles, which are connected by a small elevated spiral line; whorls slightly shouldered; anteriorly with a few distant elevated spiral lines: apex acute: spire with the outlines nearly rectilinear: whorls seven, a little convex, with a moderately impressed suture: aperture rather narrow: sinus rather shallow: canal not very short. This species resembles *P. albinodata* Rv., which has the tubercles divided by a deeply impressed spiral line.

Mean divergence 33° ; length of spire .2 inch; total length .31 inch; breadth .1 inch.

PLEUROTOMA QUADRILINEATA. Shell clavate-pyramidal: white, with one or two fine spiral lines of brown along the suture, and four similar lines just below the periphery of the last whorl, all of which lines are interrupted by the ribs, and with similar but paler lines at the upper part of the whorls and anteriorly: with obtuse moderately elevated transverse ribs, about eleven on each whorl; with many excessively minute finely granose spiral elevated lines, which are more conspicuous where colored as above described, and which are obsolete at the summit of the ribs: apex acute: spire with the outlines nearly rectilinear; whorls seven, subangular above the middle, with a well impressed suture: aperture long-obovate, subacuminate at both extremities: labrum well excurved: sinus shallow: canal short.

Mean divergence about 30° ; length of spire .12 inch; total length .21 inch; breadth .08 inch.

PLEUROTOMA FUSIFORMIS. Shell fusiform: white, with a tinge of brown along the suture and in the intercostal spaces: with large obtuse pliciform ribs, about nine on each whorl, and numerous unequal inequidistant spiral raised lines, of which one a little above the pe-

riphery of the whorls is much larger, giving a subangular aspect to the whorls: apex acute: spire with the outlines nearly rectilinear: whorls five or six, rather convex, with a well impressed suture: aperture long obovate: sinus small: canal wide and short.

Mean divergence 40° . Length of spire .1 inch; total length .18 inch; breadth .085 inch.

MANGELIA DENSESTRIATA. Shell fusiform: white: with narrow prominent ribs, ten or eleven on each whorl, and crowded regular excessively fine deep spiral striae, which cover the entire surface and are not interrupted in crossing the ribs: apex acute: spire with rather convex outlines: whorls seven, subangular near the summit, with a rather deep suture: last whorl long, and gradually attenuated into a wide canal.

Mean divergence 40° ; length of spire .13 inch; total length .28 inch; breadth .11 inch.

MANGELIA MURICOIDES. Shell fusiform and slender: pure white: with six narrow subacute prominent ribs on each whorl, which are sinuated posteriorly on the right side, and which are continuous along the spire like a *Murex*; with very numerous microscopic spiral striae in the intercostal spaces: apex acute: spire with the outlines nearly rectilinear: whorls six, slightly convex, with a lightly impressed suture: last whorl gradually attenuated below into a wide canal.

Mean divergence 32° ; length of spire .09 inch; total length .18 inch; breadth .07 inch.

MANGELIA BICONICA. Shell biconic: whitish, with a narrow spiral band of brown at the summit of the whorls, which is darker between the ribs, and a similar wider band a little anterior to the periphery of the last whorl; (or some specimens may be described as pale brown, with a spiral band of white on the periphery of the whorls, and as white anteriorly): with strong transverse rounded ribs, about nine on each whorl, and excessively fine spiral rather distant raised lines, which are obsolete on the summits of the ribs: apex acute: spire with the outlines nearly rectilinear: whorls six, subangular, with a moderately impressed suture: aperture narrow: labrum often much thickened by the last rib: sinus near the upper extremity of the labrum, rather large in old shells: canal short.

Mean divergence 45° ; length of spire .08 inch; total length .18 inch; breadth .09 inch.

Var. alba, entirely of a pure white color.

This species resembles *P. symmetrica* *Re.* and *Mangelia Dysoni* *Re.*

MANGELIA LANCEOLATA. Shell very long, lanceolate: brownish, more or less tinged with purple, with fine spiral lines of white and of dark brown, which are more conspicuous on the ribs; with a darker and wider brown line along the suture: with six very prominent acute transverse ribs on each whorl, which are nearly or quite continuous on the successive whorls; with a spiral elevated line, on the middle of the whorls, which is obsolete in the intercostal spaces and has nodulous intersections with the ribs: apex acute: spire with rectilinear outlines: whorls eight, scarcely convex, with a lightly impressed suture: labrum finely denticulate within: sinus shallow: canal not very short.

Mean divergence 23° ; length of spire .26 inch; total length .44 inch; breadth .14 inch.

MANGELIA CRASSICOSTATA. Shell subfusiform: dark reddish brown, paler about the apex: with very strong and very prominent transverse ribs, smooth on the summits, about ten on each whorl, with the transverse sections of the intercostal spaces almost regularly concave; with a few distant elevated spiral lines, of which one is on the middle of each whorl, and one is on the lower half, and the rest are anterior: apex acute: spire with quite convex outlines: whorls about seven, rather convex, with a well impressed suture: aperture narrow: labrum much thickened by the last rib: sinus rather large and deep: canal very short.

Mean divergence 42° ; length of spire .13 inch; total length .22 inch; breadth .1 inch.

This species resembles *Mangelia badia* Re., but that shell is represented with a smaller spire and more slender ribs. It may possibly be a variety of *M. fusca* Ad.

MANGELIA BREVIS. Shell short, fusiform, orange or wax yellow, white along the upper part of the whorls and anteriorly: with very strong transverse ribs, about nine on each whorl, smooth on the summits, with unequal microscopic spiral elevated lines: apex subacute: spire with very convex outlines: whorls about six, moderately convex or subangular, with a lightly impressed suture: aperture quite narrow: labrum much thickened by the last rib: sinus rather large: canal very short.

Mean divergence about 45° ; length of spire .065 inch; total length .135 inch; breadth .07 inch.

MANGELIA VICINA. Shell fusiform, moderately elongated: dull brownish red, white along the upper part of the whorls and anteriorly:

with strong transverse ribs, smooth on the summits, about ten on each whorl; with unequal spiral microscopic striæ: apex acute: spire with rather convex outlines: whorls about six, moderately convex, with a distinct suture: aperture rather narrow: labrum well thickened by the last rib: sinus rather large: canal very short. Similar to *M. brevis*.

Mean divergence about 40° ; length of spire .1 inch; total length .17 inch; breadth .08 inch.

SCALARIA LIGATA. Shell rather short, conic: white: varices thirteen on each whorl, rather strong, well elevated, continuous across the suture and but slightly depressed by it: whorls five or six, scarcely contiguous: aperture very slightly elongated obliquely: umbilical region with a small ridge parallel with the labium.

Mean divergence nearly 50° ; length of spire .15 inch; total length .25 inch; breadth .14 inch.

PHASIANELLA AFFINIS. Shell ovate: with waving or zigzag transverse flames of brown or red; and very numerous minute well defined dots of red or brown, with white shadows on their right side, somewhat in irregular waving or zigzag series, on a whitish ground: apex acute: spire with moderately convex outlines: whorls nearly five, moderately convex, a little flattened along the middle, with a moderately impressed suture: aperture elliptical: with a small umbilicus and groove issuing from it, which are sometimes concealed by the labial deposit. This species was at first mistaken for *P. pulla*.

Mean divergence about 60° ; length of spire .16 inch; total length .31 inch; breadth .19 inch.

PHASIANELLA BREVIS. Shell subglobose: with a whitish ground and large spots of red on the upper part of the whorls; pale red on the anterior and middle of the last whorl; with well defined spots of dark red sprinkled over the whole surface: with microscopic spiral striæ on the upper whorls, otherwise smooth: apex rather obtuse: spire with very convex outlines: whorls about four, very convex, with a rather deep suture: aperture large, ovate-orbicular: umbilicus wanting.

Mean divergence about 80° ; length of spire .04 inch; total length .1 inch; breadth .085 inch.

PHASIANELLA TESSELATA. Shell ovate conic: with fine rather distant parallel spiral lines of brown, which descend more rapidly than the whorls; with transverse irregular flames of olive brown or red, which have white shadows on the left side, and which form with

the spiral lines a rather irregularly tessellated arrangement of colors : surface very glossy : apex subacute : spire with slightly convex outlines whorls four, moderately convex, with a well impressed suture ; last whorl abruptly rounded or subangular : aperture ovate-elliptical : with a small umbilicus. A variety from some other West Indian island is of a nearly olive brown, but without any difference in the spiral lines of dark brown, which do not appear to be subject to the variability of coloring which is so common in this genus.

Mean divergence about 68° ; length of spire .11 inch ; total length .2 inch ; breadth .15 inch.

PHASIANELLA CONCOLOR. Shell rather long ovate-conic : of a uniform glossy brown, rarely with a sutural band of a deeper shade of the same : surface highly polished : apex rather obtuse : spire with the outlines nearly rectilinear : whorls five, rather convex, with a well impressed suture ; last whorl subangular : aperture ovate : labium with a thick deposit : with an umbilical indentation.

Mean divergence about 55° ; length of spire .05 inch ; total length .1 inch ; breadth .06 inch.

[TO BE CONTINUED.]

" CONTRIBUTIONS TO CONCHOLOGY " are issued by the subscriber, at irregular intervals of time, in numbers of 16 or 20 pp. each.

They are devoted chiefly to a description of new species of the shells of Jamaica, preliminary to a monograph of the shells of that island : but any additions to conchology or malacology come within their plan.

Copies will hereafter be furnished only to subscribers, at one dollar for five numbers, or in return for books, pamphlets, or specimens presented to the Zoological department in Amherst College, or to public institutions which have once acknowledged the receipt of a copy.

The shells, which were collected in my last expedition to Jamaica, belong to the Zoological Museum of Amherst College. The Trustees of the College have directed the sale of a part of the duplicates. Suites, either of all or of one or more genera of the land and fresh-water shells, will be furnished at 30 cents per species : or selections may be made at a fixed price for each species, and the remainder returned. The marine shells will be furnished at 25 cents per species, without distinction except, in favor of priority of application. A catalogue of all the marine species will soon be published.

25 cents per species will also be paid for any number of authentically named shells, which are not in the Zool. Mus. of this college.

The species of Jamaica shells may also be had *on exchange*, provided that a list of the species, which can be furnished by any correspondent, shall be first communicated to the subscriber for selection of desiderata, for which only will a return be made. Parcels sent without regard to this rule will be considered as donations to the Museum, and may be sent, if through New York City, to care of J. H. Redfield, Esq., 82 Courtland Street, New York. If not through New York, they may come by express, via Northampton, Mass.

C. B. ADAMS, AMHERST, MASS.

CONTRIBUTIONS TO CONCHIOLOGY.

NO 5.

Descriptions of supposed new species of MARINE SHELLS, which inhabit Jamaica. By C. B. Adams, 1850. Continued from p. 68.

PHASIANELLA CONCINNA. Shell broad ovate, or ovate conic: with numerous well defined dots of opaque reddish brown on a sub-transparent ground of very pale red or brown, the dots being less numerous and less uniformly sprinkled on the upper part of the whorls: surface well polished: apex rather obtuse: spire with quite convex outlines: whorls four, quite convex, with a well impressed suture: aperture ovate-orbicular, with its plane very oblique to the axis of the shell: labrum much curved: with an umbilical groove parallel to the labrum.

Mean divergence about 60° ; length of spire .07 inch; total length .14 inch; breadth .1 inch.

TROCHUS PULCHER. Shell conical, much elevated: pale claret color, with a dark brown apex, and large ill defined spots of white; with spiral series of minute dark red oblong spots, which are proportioned to the size of the spiral ridges on which they are placed; the ridges of least size are not spotted: solid, with ten or twelve minute spiral ridges, of which one near the base of the whorls is larger, and three are of an intermediate size, viz., one on each side of the suture and one on the middle of the whorls; on the lower side of the last whorl are sixteen or eighteen other minute revolving ridges, of which every second or third is spotted: apex acute: spire with the outlines nearly rectilinear: whorls seven and one-half, a little concave, acutely prominent in the lower part; last whorl subangular, moderately convex beneath: aperture subquadrate, iridescent within: columella subtruncate: umbilicus wanting. The whorls in this shell have the same form as in *T. jujubinus*, and the general form of the shell is like that of *T. pyramidatus*.

Mean divergence 48° ; length of spire .26 inch; total length .38 inch; breadth .27 inch.

CINGULA (?) *CONCINNA*. Shell broadly ovate-conic: subtransparent, wax brown, darker at the sutural ridge: smooth and shining; at the summit of the whorls with a narrow ridge scarcely elevated, but separated by an impressed line: apex rather obtuse: spire with the outlines moderately convex: whorls five, quite convex, with a well impressed suture; last whorl large: aperture acute above, in the rest regularly ovate: lip a little reflected on the left side: umbilical region slightly indented.

Mean divergence 53° ; length of spire .03 inch; total length .075 inch; breadth .055 inch.

CINGULA (?) *SOLIDA*. Shell subconic, well elevated: dark brown, with the lip and apex white: with a few distant subgranular elevated spiral lines, of which the alternate ones are much more minute; anteriorly smooth: apex obtuse: spire with the outlines nearly rectilinear: whorls five, slightly shouldered above, scarcely convex, with a well impressed suture: aperture orbicular, parallel with the axis of the spire: lip reflected on the left side and on the adjacent part of the anterior side: umbilical region moderately indented.

Mean divergence about 32° ; length of spire .05 inch; total length .085 inch; breadth .045 inch.

CINGULA (?) *CONICA*. Shell elongated, conic: whitish, with large irregular spots of wax color, and a wax-colored summit: solid, with three or four slightly elevated obtuse spiral ridges, and about the periphery of the last whorl two or three more, all of which are slightly striated across; on the lower whorls with nearly obsolete broad ridges; anteriorly smooth: apex acute: spire with rectilinear outlines: whorls six and one-half, flat, with a lightly impressed suture; last whorl with a moderately acute periphery: aperture between quadrate and orbicular, nearly parallel with the axis of the spire: lip reflected on the left side and on the adjacent part of the anterior side: umbilical region moderately indented.

Mean divergence about 32° ; length of spire .065 inch; total length .105 inch; breadth .06 inch.

These last three species we have referred, with some doubt, to *Cingula* of Fleming, restricting this genus to the section in which the labrum is not thickened and the aperture is Turbinoid, and excluding *Rissoa* in which the aperture is Melanoid and the labrum thickened. *C. concinna* however is with difficulty referred to the same generic type with *C. solida* and *C. conica*, being eminently distinguished by its smoothness and translucency, (in this respect resembling, as also

in color, Pupa ovata, *P. milium*, &c.) and its broadly ovate form elegantly rounded below and acute above, with the same beautiful outline repeated in the aperture, as in some Phasianellae. The last two species have a striking coincidence in the general plan of sculpture, reflection of the left side of the lip, &c., and evidently belong to a restricted natural group, which perhaps should be separated from *Cingula*. We have been unable to obtain more than one specimen of each of these species.

LITIOPA EFFUSA. Shell elongated, ovate: of a uniform brown wax color, subtransparent: apex obtuse: spire with the outlines very convex above, nearly rectilinear in the rest: whorls six, quite convex, with a well impressed suture: aperture ovate, anteriorly produced so as to resemble a very broad short canal: labrum thin, not very sharp, somewhat reflected: columella slightly twisted.

Mean divergence about 35° ; length of spire .06 inch; total length .11 inch; breadth .06 inch.

LITIOPA OBESA. Shell ovate: of a uniform brown wax color, subtransparent: smooth: apex obtuse: spire with the outlines moderately convex: whorls five, rather convex, with a distinct suture; last whorl large: aperture large, obliquely subrhomboidal, effuse, but scarcely produced anteriorly: labrum very thin, retreating above, scarcely reflected: columella slightly arcuate.

Mean divergence about 55° ; length of spire .08 inch; total length .185 inch; breadth .11 inch.

LITTORINA JAMAICENSIS. Shell oblong conic: with transverse somewhat oblique flames of rusty brown or slate color or black, on a white ground, which are interrupted on the middle of the whorls by a spiral slate-colored or black band, which is of unequal width in different shells and in different parts of the same shell, but is itself sometimes interrupted by the continuity of the transverse flames of white and slate color: brown on the columella; brownish black within, with a spiral band of white near the anterior extremity: solid, with very deep rather distant spiral striae, of which there are about eight on the penult whorl, and which are more crowded anteriorly: apex very acute: spire with the outlines nearly rectilinear: whorls seven, convex, with a lightly impressed suture; last whorl with an angular and subcarinated periphery: aperture rather broadly ovate: columella arcuate and flattened. The sculpture of this shell is like that of *L. carinata* Orb. and the form is like that of *L. lineata* Orb. (*L. ziczac* Desh. et al.) but is rather more robust, and the shell is more

solid. A variety of coloring has all the shell black except on the upper third of the whorls and on the anterior part. A variety of sculpture and coloring has the striae enlarged nearly to the width of the intervening ridges, and is mostly black with spirally elongated spots of white on the ridges.

Mean divergence 58° ; length of spire .36 inch; total length .72 inch; breadth .44 inch.

CHEMNITZIA LATIOR. Shell moderately elongated: white: with about twenty to twenty-four prominent transverse ribs, the ends of which mostly alternate at the suture, and which are produced on the last whorl into the umbilical indentation: with numerous crowded spiral striae, which ascend the sides of the ribs without being produced over their summits: nucleus consisting of about one smooth globular whorl, with its axis nearly at right angles to the axis of the shell: spire with the outlines a little convex: whorls about nine after the loss of the nucleus, slightly convex, with a distinct suture: aperture obliquely ovate, acuminate above: labium much thickened: umbilical region moderately indented.

Mean divergence 22° ; length of spire .165 inch; total length .215 inch; breadth .065 inch.

CHEMNITZIA PUNCTA. Shell much elongated: white: with about twenty-six to thirty rather prominent transverse ribs, which are not produced below the convexity of the last whorl; with numerous crowded spiral striae in the intercostal spaces, one of which striae, a little above the middle of the whorls, and another along the suture are wide and deep, resembling spiral series of punctures; intercostal spaces depressed anteriorly below the adjacent anterior surface: spire with the outlines rectilinear: whorls ten or eleven, after the loss of the nucleus, scarcely convex, with a distinct suture: aperture ovate-rhombic: labium scarcely thickened: umbilical region scarcely indented.

Mean divergence about 16° ; length of spire .185 inch; total length .22 inch; breadth .05 inch.

CHEMNITZIA OBELISCUS. Shell much elongated: white: with twenty-six to thirty transverse prominent ribs, which are not produced below the convexity of the last whorl; with numerous crowded spiral striae in the intercostal spaces, and a little above the middle of the whorls a broad smooth depressed spiral line, and similar lines on the middle and anterior of the last whorl: spire with the outlines rectilinear: whorls eleven after the loss of the nucleus, planulate,

with a very distinct suture: aperture ovate-rhomboidal: labium slightly thickened: umbilical region not indented.

Mean divergence about 10° ; length of spire .21 inch; total length .25 inch; breadth .05 inch,

CHEMNITZIA SUBULATA. Shell much elongated, subulate: white, or pale brownish white with two spiral bands of pale wax color, and a third of the same color anteriorly: with about twenty-eight to thirty rather prominent slender transverse ribs, which are not quite obsolete below the convexity of the last whorl; in the intercostal spaces and anteriorly with numerous excessively fine crowded spiral striæ, of which one next below the suture is larger: nucleus consisting of about one and one-half whorls, moderately oblique: spire with a slightly curved axis, with the outlines scarcely convex: whorls ten after the loss of the nucleus, rather convex, with a well impressed suture: aperture ovate, acute above: labium slightly thickened: umbilical region slightly indented.

Mean divergence about 11° ; length of spire .13 inch; total length .17 inch; breadth .045 inch.

CHEMNITZIA LEVIS. Shell much elongated: white: with about twenty-eight to thirty transverse rather stout ribs, which are not produced below the convexity of the last whorl; without spiral striæ; with the intercostal spaces of the last whorl anteriorly depressed below the surface of the anterior region: with scarcely perceptible lines of growth anteriorly: nucleus consisting of about one and one-third smooth whorls, quite oblique: spire with the outlines nearly rectilinear: whorls nine or ten, scarcely convex, a little constricted above: aperture rhombic ovate: labium scarcely thickened: umbilical region not indented.

Mean divergence about 10° ; length of spire .12 inch: total length .165 inch; breadth .04 inch.

CHEMNITZIA SUBSTRIATA. Shell moderately elongated: white, with a slight tinge of wax color next above the suture: with about twenty-two to twenty-four transverse rather stout ribs; in the intercostal spaces and anteriorly with very numerous crowded excessively minute spiral striæ, which are scarcely perceptible under a common magnifier; on the middle of the whorls is a spiral series of shallow pits in the intercostal spaces; on the last whorl, with the anterior extremities of the intercostal spaces moderately depressed below the surface of the anterior region: spire with rectilinear outlines: whorls about eight, planulate, with a distinct suture: aperture rhombic-ovate: labium scarcely thickened: umbilical region scarcely indented.

Mean divergence about 12° ; length of spire .09 inch; total length .115 inch; breadth .04 inch.

CHEMNITZIA EXILIS. Shell very slender: white: with about fifteen to eighteen stout transverse ribs, which terminate just below the convexity of the last whorl; with numerous spiral striae in the intercostal spaces, but not anteriorly; with the intercostal spaces on the last whorl anteriorly depressed below the adjacent surface of the anterior region: nucleus with about one and one-half smooth whorls, nearly at right angles to the rest of the shell: spire with rectilinear outlines: whorls ten besides the nucleus, planulate, with a moderately impressed suture: aperture rather short, subelliptical: labium scarcely thickened: umbilical region scarcely indented.

Mean divergence about 10° ; length of spire .145 inch; total length .165 inch; breadth .037 inch.

CHEMNITZIA PUSILLA. Shell very slender: white: with about twelve rather stout transverse ribs, which are not produced below the convexity of the last whorl; without spiral striae; with the intercostal spaces on the last whorl depressed anteriorly below the adjacent surface of the anterior region, which is smooth: nucleus consisting of about one and one-half smooth whorls, very oblique: spire with rectilinear outlines: whorls ten or eleven besides the nucleus, moderately convex, with a well impressed suture: aperture ovate: labium not perceptibly thickened: umbilical region scarcely indented. This species resemble *C. levis*.

Mean divergence about 8° ; length of spire .11 inch; total length .135 inch; breadth .03 inch.

CHEMNITZIA FLAVOCINCTA. Shell moderately elongated: white, with a broad spiral band of yellowish brown along the suture: with about twenty-eight transverse well rounded rather slender ribs, which become obsolete on the anterior surface; with excessively minute spiral striae, in the intercostal spaces, coarser and traversing the ribs on the anterior region: nucleus consisting of about one and one-half smooth whorls, very oblique: whorls eight or nine besides the nucleus, slightly convex below the middle, slightly shouldered, with a distinct suture: aperture rather small, elliptical: labium moderately thickened: umbilical region scarcely indented.

Mean divergence about 12° ; length of spire .11 inch; total length .145 inch; breadth .04 inch.

CHEMNITZIA MULTICOSTATA. Shell moderately elongated: white, or tinged with yellowish brown: with about thirty-four to thirty-eight

slender transverse ribs, which become obsolete on the anterior surface; in the intercostal spaces, with rather coarse distant spiral raised lines, which traverse the ribs only at their anterior extremities on the last whorl: nucleus consisting of little more than one smooth whorl, very oblique: spire with the outlines slightly convex: whorls nine besides the nucleus, scarcely convex, with a well impressed suture: aperture ovate, subacute above: labium slightly thickened: umbilical region scarcely indented.

Mean divergence about 12° ; length of spire .125 inch; total length .165 inch: breadth .045 inch.

CHEMNITZIA RETICULATA. Shell moderately elongated: white: with about twenty-six to thirty rather strong transverse ribs, which become obsolete on the anterior surface; with very coarse distant spiral raised lines, decussating the ribs: nucleus consisting of a little more than one smooth whorl, very oblique: spire with the outlines a little convex; whorls about seven besides the nucleus, slightly convex, with a well impressed suture: aperture ovate, acute above: labium scarcely thickened: umbilical region not indented.

Mean divergence about 12° ; length of spire .09 inch; total length .125 inch; breadth .04 inch.

Note on *Pholus corticaria* Sowb. By C. B. Adams, Feb. 1850.

This species was discovered by me in the bark of a log, on the shore of the Bay of Port Royal, near Kingston, Jamaica, in March, 1844. Specimens were distributed with the Mss. name of *P. rosea*, subsequently altered to *P. corticaria*. Some were sent to the British Museum and to Mr. Cuming's collection, where they were seen by Mr. Hanley, who affirmed them to be not distinct from a variety of *P. pusilla* Linn. In deference to his opinion, the description was suppressed from my 'Synopsis' of new species from Jamaica. In Part X of Sowb. Thes. Conch. (Dec.?) 1849, a description of this species is published for the first time, with the name of '*P. corticaria* Gray, Mss.,' as being in the British Museum, without indication of habitat. It is said that 'the specimens, having bored in floating mahogany, have taken a reddish color.' This color was derived from the bark of the tree. The shells did not penetrate the wood, and where they were in contact with it, they were distorted, as if unable to penetrate it.

Miss. names are not quotable as having the value conferred by authorship, and the name must stand as above. It is unfortunate that the descriptions of several of the new marine species of shells from Jamaica should have been suppressed, in deference to the eminent authority above mentioned, and distributed with erroneous names.

Descriptions of supposed new species and varieties of TERRESTRIAL SHELLS, which inhabit Jamaica. By C. B. Adams, Feb. 1850.

Most of the following species have been received from the Hon. Edward Chitty, to whom, on this and on former occasions, I have been greatly indebted for several new species, and especially for information respecting the distribution of the species over this island. For similar favors I am also indebted to the Rev. F. R. Holland and Mrs. Holland, to Miss Agnes Hines, Dr. J. S. Hyde, and to James MacMurray, Esq. The details of such acknowledgements, the facts communicated, my own observations on the varieties, distribution, habits, &c. of the species, as well as their synonymy and the correction of errors, are mostly reserved for the monograph to which these papers are preliminary. It is proper to make this statement here, lest I should appear forgetful of the kindness of many friends, who in various ways are aiding me in this work.

HELIX INGENS. Shell transversely ovate, convex above, more convex beneath, concave next the periphery below, and also above except in the last half of the last whorl: with a very acute periphery: above reddish brown of shades varying in different individuals and in different parts of the same shell, usually paler on the last whorl; beneath dark reddish or blackish brown next the periphery, whitish in the rest; lip reddish brown: surface strongly granulated beneath, except at the margin of the umbilicus; above more feebly granulated, smooth on the upper whorls and on the upper part of the lower whorls: spire convex, moderately elevated: whorls a little more than five, convex next below and concave next above the suture, with a very uneven surface: aperture subtriangular: labrum reflected and thickened; on the middle of the lower side with (usually?) two rather distant stout teeth, the inner of which is (frequently?) accompanied by a contiguous small tooth: umbilicus large and deep, scarcely contracted except quite near the apex, where it consequently termi-

mates very obtusely; mostly covered by the expansion and thickening of the lip.

Greatest breadth 2.98 inches; least breadth 2.45 inches; height 1.2 inches.

This largest of all the terrestrial shells of Jamaica is as remarkable for the character of its umbilicus, as for its magnitude. This species is intermediate between *II. patina*, *II. acuta*, and *H. fluctuata*.

HELIX VALIDA. Shell hemispherical above, moderately convex beneath, with a very slight sharp carina on the periphery, which is otherwise well rounded: above dark reddish brown, often blackish along the suture, paler at the apex, often paler beneath; with a narrow pale band at the periphery; lip brown: surface rather finely but strongly and densely granulated, except near the apex: spire very convex and much elevated: whorls five and one-half, quite convex, with a rather deep suture: aperture much expanded above and laterally, transversely auriform; with the lip well reflected and thickened; with four teeth, which are similar to those of *II. Bronnii*: umbilicus wanting. This shell resembles *H. sinuata* in its sculpture and in the white line and delicate keel along the periphery: in respect of the teeth it resembles *II. Bronnii*. Last summer a specimen was loaned to me by Mr. Cuming as *H. Bronnii*. This species differs from both of the above in the much dilated aperture.

Greatest breadth 1.4 inch; least breadth 1.1 inch; height .8 inch: of a small variety, greatest breadth 1.17 inch; least breadth .97 inch; height .73 inch.

HELIX FORTIS. Shell depressed, suborbicular, subconic, moderately convex beneath, with a slight sharp keel along the periphery: (reddish brown?): surface rather strongly granulated except on the upper whorls: spire between convex and conic, but little elevated: whorls nearly five and one-half, convex next below the suture, and next above it very concave, forming a shallow spiral furrow; with the suture lightly impressed: aperture with the same form and character of lip as in *II. sinuata*; with three robust teeth on the lower side, of which the two on the right have, externally, corresponding furrows, which are long and deep: umbilicus wanting.

Greatest breadth 1.44 inch; least breadth 1.19 inch; height .75 inch.

Many groups in all the principal genera of land shells in Jamaica present phenomena precisely similar to the following example, which is now briefly stated, as an apology for both occasional ex-

cess and deficiency in describing new species. We hope eventually to describe all the kindred facts, which we have observed, since they have important relations to the general questions of the limits, origin, and permanency of species. Similar observations by Mr. Chitty coincide with my own, and are more numerous than my opportunities have permitted me to make.

Almost every one of the numerous districts in Jamaica, which are favorable for the terrestrial Mollusca, has one or more peculiar modifications of the type of that group of Helices, which is represented by *Helix sinuata*. In some instances, these subordinate local types are accompanied by a type which has a more general distribution. In other cases a local type exists alone.

Some of these local types are so *widely* distinguished from the general type, that no one hesitates to regard them as good species. Such are *H. anomala*, *H. strangulata*, and *H. tridentina*. Less different from the typical species are *H. Schroeteri*, *H. Bronnii*, *H. valida*, and *H. picturata*. Other local types present an inferior quantity, but an almost equal constancy, of difference from the typical species. In the latter case, he who is not acquainted with their distribution and has not the means of observing their constancy, may be confident that such forms are mere varieties. On the other hand, an observer, whose attention should be wholly occupied with these phenomena, would be likely to make almost as many species as there are localities.

In some instances the peculiarities of a local type, which differs but slightly from the typical species, are quite constant at the given place, but vary geographically, that is are gradually lost in the more and more distant individuals. I am not aware that these examples are numerous.

Not only does the amount of difference between the local types vary from that of well marked species to that of scarcely distinguishable varieties, but the individuals of a given locality, while preserving the peculiarities of the type, sometimes differ from each other in characters which appear to be as important, except in the want of constancy, as those which distinguish the local group.

Similar to the above is the case of the Naiadæ of the United States, and to a greater or less extent of many tribes of Mollusca in in other widely extended regions. These remarks might be extended to many classes in other divisions of the animal kingdom; but our object, at present, is merely to notice an example of a class of phe-

nomena, which are remarkable for being concentrated in great numbers within the narrow limits of Jamaica, instead of being spread over a continent or a zone.

Naturalists are well aware of the perplexities, which arise from facts, such as we have now alluded to, in attempting to ascertain the limits of species. The question—what is a species—is easily answered in theory. But in many classes of the animal kingdom, this question is extremely perplexing in practice. It is only the laws of nature which are simple; the resultant effects present a tangled mass of phenomena, which only Infinite Intelligence can fully comprehend. Many of the descriptive generalizations of organic nature, like that of linear gradation, which have so much of beautiful simplicity, have already passed away, because they originated in the human mind, and formed no part of the Divine plan. Others, like those of the unity of place and parentage in the origin of species, are fast disappearing. Perhaps the theory of distinct limits of species may fail in some of the lower classes of animals.

We shall now be understood, when we describe the three following types in the group of *Helices* above mentioned, without attempting to decide whether the degree of difference should elevate them to specific rank, or reduce them to varieties of *Helix sinuata*. Unable now to ascertain, with absolute certainty, which form was the type of the original description by Müller, we have assumed it to be that which is most generally distributed through the island.

HELIx INVALIDA. Shell very convex above, somewhat flattened below, with a very slight sharp carina on the periphery: dark reddish or blackish brown, paler at the apex (and after exposure, as usual in the group), with a white lip, and a white line along the periphery: surface finely granulated, except on the upper whorls of the spire and around the umbilical region: spire much elevated: whorls five, moderately convex, with a lightly impressed suture: aperture like that of *H. sinuata*, but rather smaller, with the lip and teeth less robust, the right pair of teeth a little more connected at base, and their exterior indentations shorter: umbilicus wanting. This shell is much smaller than the common type of *H. sinuata*.

Greatest breadth .78 inch; least breadth .66 inch; height .46 inch.

HELIx PROPENUDA. Shell like *H. sinuata*, but the color is very pale, almost white except on the upper whorls: the aperture more contracted; the exterior furrows are very short, and the right pair of teeth a little joined at base: the epidermis consists of small distant

obliquely transverse thin brownish green patches : umbilicus wanting.

Greatest breadth .885 inch ; least breadth .765 inch ; height .5 inch.

HELIX CANDESCENS. Shell like *H. invalida*, but white or yellowish white, with a line of clearer white along the periphery : spire much less elevated, and more regularly convex : surface smooth, or granulated on the last whorl, rarely granulated on the penult whorl : suture well impressed : aperture as in *H. invalida*, but the lip and teeth are more robust, and their external furrows are very long and deep : umbilicus wanting.

Greatest breadth .84 inch ; least breadth .74 inch ; height .43 inch.

HELIX FOREMANIANA. Shell ovoid, with a scarcely perceptible obtuse angle on the periphery : white, with a very pale horn-colored epidermis : with fine irregular striæ of growth, and sometimes on the lower side of the last whorl with inequidistant unequal concentric striæ : spire very much elevated, with very convex outlines : whorls seven and one-half, quite convex, with a well impressed suture ; last whorl very convex beneath to the centre, without any indentation in the umbilical region : aperture obliquely lunate, wider below than above ; within, a little below the middle of the right side, is a long lamellar tooth, commencing abruptly in the bottom of the aperture, and gradually diminishing in height to its termination a little within the margin ; with a wide irregular tooth on the end of the columella : labrum sharp : umbilicus wanting. This species is dedicated to my friend Dr. E. Foreman, of Washington, who is well known for many years to have rendered valuable services to Conchology.

Greatest breadth .78 inch ; least breadth .73 inch ; height .9 inch.

HELIX ALVEUS. Shell semioval, scarcely subangular on the periphery : whitish, translucent ; with excessively fine unequal striæ of growth : spire extremely convex, with a very deep suture ; last whorl rather small : aperture small, subquadrangular : labrum sharp and thin : labium with a distinct but not a thick deposit : umbilicus about half as wide as the last whorl, scarcely contracted except quite near the apex, where it consequently terminates very obtusely.

Greatest breadth .3 inch ; least breadth .28 inch ; height .18 inch.

HELIX COLUMELLATA. Shell convex-conic above, moderately convex beneath : white under a yellowish or greenish brown epidermis : with fine irregular striæ of growth ; sometimes with numerous microscopic punctures : apex subacute : spire very much elevated, nearly conic : whorls nearly six, moderately convex, obtusely a little shoulder-

ed, with a deep suture; last whorl slightly flattened above the middle: aperture in the form of a spherical triangle: labrum sharp: columella much and very obliquely produced, curved, very thick, abruptly terminating, opaque white: umbilical region not indented.—This species has been confounded with *H. tenerrima*, and distributed as such.

Greatest breadth .63 inch; least breadth .56 inch; height .47 inch.

PROSERPINA DISCOIDEA. Shell nearly discoidal: pale yellowish or greenish brown; subtransparent, shining: with excessively fine striae of growth, and an impressed spiral line next below the suture: spire convex, slightly elevated: whorls four and one-half, moderately convex, with a well impressed suture; last whorl a little flattened beneath: aperture much dilated laterally, transversely ovate, but much modified by the penult whorl, without teeth: labrum thin and sharp: central callus occupying the region of the umbilical indentation: umbilicus narrow and deep.—This species is nearly allied to *P. opalina*. Being a genuine *Proserpina* without teeth, it suggests the propriety of omitting the phrase “apertura intus dentata” from the description of the genus.

Greatest breadth .275 inch; least breadth .23 inch; height .09 inch.

PROSERPINA PULCHRA. Shell similar to *P. nitida*, but much smaller and less discoidal, the spire being more elevated and the last whorl higher: the color of the upper whorls, (the last and usually a small part only of the penult whorl being excepted), varies from a deep crimson to a bright orange red, with an opaque white line along the suture. In all other characters this shell so closely resembles *P. nitida*, that I have long hesitated whether I should propose it as a distinct species. The peculiarity of form appears to be absolutely constant in the individuals (about 30), that I have seen: that of color fails partially only in a very few, which appear to have been bleached by exposure.

Greatest breadth .2 inch; least breadth .18 inch; height .12 inch.

PROSERPINA BIDENTATA. This shell is also very similar to *P. nitida*, but is much smaller: besides the deep spiral line which accompanies the suture, there are several other very feebly impressed spiral lines; the surface is not so smooth although equally brilliant: the color is yellowish green: the aperture has only two teeth, one near the base of columella, and another a little above it. Specimens

of *P. pulchra*, of the same size, have five teeth well developed, as have also the least of our specimens of *P. nitida*.

Greatest breadth .21 inch ; least breadth .13 inch ; height .08 inch.

CYLINDRELLA GREYANA. Shell much elongated, tapering quite uniformly to the apex : dingy white : with excessively elevated lamellar transverse ribs, of which there are six on each whorl ; with the intercostal spaces densely covered with microscopic spiral striae : spire with the outlines nearly rectilinear : apex broadly truncate with the loss of five whorls, of which the first one and one-half are smooth, the next one is closely covered with microscopic transverse raised lines, and the rest have twelve to fourteen lamellar transverse ribs, which are moderately elevated, but which increase in size and diminish in number down the spire to a little below the place of truncation : remaining whorls about seven, somewhat flattened, with a very deep suture ; last whorl small, scarcely produced from its last point of contact with the penult whorl : aperture obliquely ovate, a little modified by the penult whorl : labrum near the last rib, very thin and sharp, not reflected.

Length .31 inch ; breadth .14 inch.

This extraordinary shell is dedicated to His Excellency, Sir Charles Grey, the present Governor General of Jamaica, as a tribute of respect for those attainments in Natural Science, which adorn a high official station. We thus also commemorate the administration, during which a very large portion of the land and fresh-water shells of Jamaica have been discovered.

CYLINDRELLA LATA. Shell very robust, cylindrical in the lower three-fourths, rapidly tapering above : wax color, with a dark brown line next below the suture : with excessively minute crowded transverse striae ; anterior spiral keel very prominent : apex not very broadly truncate, with the loss of ——— whorls : whorls remaining eight and one-third, very narrow, slightly convex, with a lightly impressed suture : aperture considerably produced beyond the penult whorl, transversely elliptical : lip broadly reflected. This species in several respects combines the characters of *C. sanguinea* and *C. rosea*.

Length .86 inch ; breadth .33 inch.

CYLINDRELLA HOLLANDI. Shell rather slender, cylindrical in the lower three fourths, slowly tapering above : wax color : with very minute crowded transverse striae, and the anterior spiral keel not very prominent : apex rather broadly truncate, with the loss of ———

whorls: whorls remaining ten, subplanulate, with a well impressed suture: aperture considerably produced beyond the penult whorl, between orbicular and trapezoidal, slightly effuse by the canal within the anterior keel; lip well expanded, moderately reflected.

Length .82 inch; breadth .18 inch.

CYLINDRELLA AUGUSTÆ. Shell not very slender, cylindrical in the lower three-fourths, slightly tapering above: pale wax color: with very minute crowded transverse striæ; anterior spiral keel not very prominent: apex broadly truncate, with the loss of — whorls; whorls remaining nine, a little convex, with a well impressed suture: aperture moderately produced beyond the penult whorl, suborbicular, a little dilated at the left of the upper side: lip well expanded, moderately reflected. This species is allied to the preceding and to *C. montana*.

Length .65 inch; breadth .17 inch.

ACHATINA BLANDIANA. Shell regularly conic, but very slender: very pale brown or horn color, with very dark brown transverse broad bent stripes, about three on each whorl, less distinct on the upper whorls, and wanting on the nuclear whorls: with rather fine regular transverse striæ; rather thickly and very finely crenulated at the upper margin of the whorls: apex moderately obtuse, smooth on the first whorl: spire very long, with the outlines rectilinear: whorls nine, moderately convex, slightly and acutely shouldered above, with a well impressed suture: aperture rather long-ovate, small: labrum sharp, very thin: columella nearly straight. This species is most nearly allied to *A. propinqua*.

Mean divergence about 16° ; length .62 inch; breadth .135 inch; length of aperture .16 inch.

ACHATINA PUELLA. Shell ovate fusiform, much elongated: sub-transparent, pale brownish yellow, with brown transverse stripes, which are very narrow except at their summits, where they are much dilated and are very deeply colored; there are on each whorl four or five of these stripes except near the apex: varicose coincidently with the brown stripes; with rather fine regular transverse striæ: apex rather obtuse, with rather more than one whorl smooth: spire rather long, with the outlines a little curvilinear: whorls eight, moderately convex, with a well impressed suture: aperture rather long ovate, narrow and very acute above: labrum sharp and thin: columella nearly straight, but little truncated.

Mean divergence about 19° ; length .53 inch; breadth .125 inch; length of aperture .17 inch.

ACHATINA PERPLEXA. Shell ovate-fusiform, much elongated: almost transparent, pale yellowish brown, with transverse moderately curved lines of dark brown, of which the last colors the labrum, three to four on each whorl, wanting on the upper whorls, and scarcely perceptible at and above the middle of the spire: with fine not crowded transverse striæ; lines, which indicate the varices that are coincident with the brown stripes, scarcely distinguishable from the striæ: apex subacute, with nearly one and one-half smooth whorls: spire much elongated, with the outlines moderately curvilinear: whorls about six and one-half, moderately convex, with a well impressed suture: aperture long, ovate, quite narrow and acute above: columella a little twisted scarcely truncate. This species closely resembles *A. propinqua*, but the striæ are finer and more distant, and the outlines of the spire are more curvilinear. It attains about one-half of the size of that shell.

Mean divergence about 21° ; length .33 inch; breadth .09 inch; length of aperture .12 inch.

[TO BE CONTINUED.]

Through the the kindness of my friend T. Bland, Esq., of Jamaica, I have been able to verify Mr. Chitty's observations on the operculum of *Geometania*. It has a lateral apex, with one and one-half inner whorls (in *G. expansa*), and many fine inequidistant striæ on the last whorl, which is otherwise smooth and shining.

Cyclostoma aculeosum (p. 2 of this work) is probably a variety of *C. Hilliamum*, with a more elevated spire. It is difficult to fix a limit in their gradual passage into each other.

The next No. will contain species of *Cyclostoma* in continuation of the above; also descriptions of new land shells of Jamaica, which have just been received from T. Bland, Esq., to whose industry and generosity I have been much indebted on various occasions: —also the synonymy of *Helix picturata*; and more new marine shells of Jamaica.

Feb. 1850.

CONTRIBUTIONS TO CONCHIOLOGY.

NO 6.

REMARKS ON THE ORIGIN OF THE TERRESTRIAL MOLLUSCS
OF JAMAICA. By C. B. ADAMS. March. 1850.

SINCE the publication of the remarks on the distribution and differences of the types of the Terrestrial Molluscs of Jamaica, as illustrated by the '*sinuata*' group of Helices, (p. 78,) we have received an article * on the geographical distribution of animals by Professor Agassiz. In this article a similar statement is made respecting the distribution of the different types of lions. This case differs from that of the Helices above-named, inasmuch as there is no difficulty in defining the species, because the difference between the specific type and the types of its congeners is much greater than between the subtypes comprehended within the species. But the obvious conclusion, from the fact that different subtypes of one species exist in different Zoological provinces associated severally with distinct species of other genera, is boldly affirmed; viz. plurality of origin, with the same original differences which now exist. Following so eminent an authority and safe a guide, we need no longer hesitate to state the hypothesis, which was prepared with the remarks above referred to, on the '*sinuata*' group of Helices.

The distribution of the terrestrial Molluscs in Jamaica, (and probably of all Molluscs in all parts of the world,) is most easily accounted for by the following hypothesis:—that the introduction of the existing races was effected by the creation of many individuals, and that they were modeled after certain types, which were mostly local, and between which there existed, as at the present day, unequal differences, from those which merely distinguish individuals, to those of varieties, of species, of groups of species, of genera, &c. Of course we do not mean to assert that these differences proceed, from the less to the greater, in a regular arithmetical progression. On the contrary, it is because the spaces, which graduate the scale of differences, between the types of any group are themselves unequal, that we are able to

* Christian Examiner. March. 1850. Boston.

find the limits of species and genera, &c., in the wider spaces, and of less important distinctions in the narrower spaces; or if these spaces are small and more nearly equal, it becomes difficult to decide what shall be species, and what shall be varieties, what shall be genera and what shall be only sections of genera. Now it is well known that some classes and families in the animal kingdom have the spaces on this scale of differences more unequal than others have, so that most of their species and even of their more comprehensive groups appear to be well defined by the broad spaces. But other families, as the *Naiadæ* and *Melanidæ* of the United States, and the *Helicidæ* and *Cyclostomidæ* and especially the *Geomelaninæ* of Jamaica, have these spaces small and nearly equal. In such families there is therefore an intrinsic difficulty in the way of describing good species. The preconceived notions that many persons entertain, and with which probably most of our working naturalists began the study of nature, lead them to expect in all cases very distinct natural limits of species. Hence they are liable to ascribe a want of discrimination to the naturalist, who shall have undertaken to describe such groups.

The progress of discovery tends, more or less rapidly in different classes, to fill up the wider spaces existing between known types.

The laws of hybridity do not conflict with these views of the nature of species. Hitherto observations relating to them have been chiefly directed to species which are clearly separated from their congeners. So far as observations extend, the facility of hybridity appears to be inversely as the space between the types. If this could be proved to be a strict law, obviously hybridity would furnish a measure of these interspaces, or conversely might be predicted from them.

If these views are correct, we cannot retain the prevalent theory, that species are natural groups, but that genera and other groups are artificial. All groups are natural, so far as they are founded on actual types. Any groups are artificial, or to speak more correctly and intelligibly, are arbitrary, in proportion as the differences between individuals, varieties, species, and the successively more comprehensive groups, present a series of an indefinite number of nearly equal degrees. In proportion to the equality of the degrees, are the points, at which we mark off species and genera &c., arbitrary.

It must be acknowledged that these views are not essentially different from the theory of spontaneous generation, when that theory is disencumbered of speculations on the nature or conditions of a supposed

process by which animals are produced. The idea of the introduction of many individuals of a species without parentage is common to both theories. Of the nature of the process, or even of the existence of any process more than the volition of the Divine Mind, we have however no conception. The theory of the manifold origin of species approximates more nearly to that of spontaneous generation, if we do not admit, as does Professor Agassiz, the *contemporaneous* introduction of the original individuals. Of course the doctrine of contemporaneous origin must have a geological latitude. But whether in any sense it can be admitted, must be determined by the geological history of species. If the subtypes of those species, whose longevity is sufficient to furnish opportunity for observation, have been gradually introduced, the theory of contemporaneous origin cannot be applied to species, any more than to genera, except so far as results, with a mathematical necessity, from the circumstance that they are less comprehensive groups.

It is obvious that an illustration of this subject may be found in the different species and varieties of mankind.*

Description of a new genus of HELICIDÆ, from Jamaica. By C. B. Adams. March. 1850.

SPIRAXIS. G. t. parvâ, turritâ : columellâ medio in laminam spiralem productâ : aperturâ ovali, medio partim divisâ : labre simplice.

Shell small and thin, much elongated : with the columella produced into a large stout spiral lamina, which gradually becomes obsolete in ascending two to four whorls above the aperture : the aperture is oval, but by the contraction of the labrum and the intrusion of the columellar lamina is often divided into the form of the figure 8 : the labrum is simple and indented by a stricture on the middle of the whorl. To this genus may be referred *Achatina inusitata* Ad. p. 26

*In this case all the arguments, which some philologists urge against the theory of the plural origin of the nations which speak affiliated languages, are based on the *assumption* that original individuals could not have had the same nor even similar languages. Why it should be assumed that unity of Zoological origin is a necessary inference from philological affiliation or unity, we are unable to conceive. It seems to us a perfect example of a non-sequitur.

(of this work), which will therefore take the name of *Spiraxis imitata* Ad.; and the two following species. Like many other of the species of small land shells of Jamaica, the individuals are extremely rare.

SPIRAXIS ABERRANS. Shell elongate, nearly cylindrical in the lower half: pale horn color, subtransparent: with microscopic transverse rather distant striae: apex rather obtuse: spire with the outlines moderately curved: whorls a little more than six, slightly convex, with a distinct suture: aperture ovate, acute above: labrum sharp, well ex-curved, projecting a little in the upper half: columella with a moderately developed spiral lamella. This is probably identical with *Achatina aberrans* Pfr.

Mean divergence about 13° ; length of spire .21 inch; total length .28 inch; breadth .065 inch.

SPIRAXIS COSTULOSA. Shell elongate-conic: whitish or horn colored: with thirty-five to forty obtuse approximate transverse ribs: apex obtuse: spire with the outlines almost rectilinear except near the apex: whorls seven and one-half, very convex, with a deep suture; last two or three whorls with a spiral constriction on the middle, which gradually increases to the labrum, which is much indented by it: columellar lamina large.

Mean divergence about 13° ; length .175 inch; breadth .04 inch.

Description of **JAMAICIA**, a new subgenus of *Cyclostoma*. By C. B. Adams. March. 1850.

Cyclostoma t. Choanopomiformi, aperturâ orbiculari, margine simplici: opereculo extus spiraliter lamellifero, et maximè convexo, intus laevi et maximè concavo.

The shell resembles the more typical species of *Choanopoma*, but has the peritreme simple, with the edge not much sharpened. The operculum is extremely convex externally and concave within: it has a spiral lamella, and its striae of growth are lamelliferous. The only species known to us is described below, under the name of *Cyclostoma anomalum*.

Notes on certain species of the land shells of Jamaica. By C. B. Adams. March. 1850.

Some varieties of *Helicina Hollandi* occur, in which the shell is

much smaller than the type, but the characters, on which the species was proposed, appear to be constant.

A variety of *Lucidella aureola* is so strongly sculptured with granules, that it will be convenient to designate the variety with the name of *granulosa*.

A large and very dark colored variety of *Cyclostoma Jayanum* has the outer peritreme black, and may be designated by the name of *nigrilabre*.

Having received fresh specimens, with their opercula, of *Cyclostoma Chittyi*, I am able to confirm the validity of the species, which was proposed with some hesitation on p. 1. of this work. The whorls of these shells have a little more diameter than those of the original specimen, being about equal to those of *C. fimbriatulum* *Sowb.* In addition to the peculiarities of our species before mentioned, we find those of the operculum especially worthy of notice. In *C. fimbriatulum*, the spiral lamella is inclined almost to a horizontal position, with a breadth equal to one-fourth the diameter of the operculum. In the operculum of *C. Chittyi*, the spiral lamella, in its last whorl, is half as wide as the operculum, and is nearly perpendicular, with the upper edge strongly reflected. It has very strong oblique striae, which are continued over the reflected summit. In *C. Chittyi*, the peritreme of the aperture is considerably produced: the intercardinal spaces are colored more or less deeply with brown, like *C. amandum*. It is one of the most elegant species in the beautiful subgenus *Chœonopoma*.

The two species, which were referred to *Cylindrella*, as a *Geomelaniiform* group, are *Geomelaniae*, in which the linguliform part of the labrum is obtuse and moderately produced. We may now reckon 19 species of this interesting genus. In *GEOMELANIA BEARDSLEANA* Mr Chitty has observed an operculum. The other species referred to will take the name of *GEOMELANIA PYGMAEA*.

In the description of *Geomelaniae* on p. 18, the mean divergence was not correctly estimated, in consequence of the erroneous assumption that the divergence of the lost whorls was greater than that of the remaining whorls. 2° or 3° should be deducted from the amount assigned to each species.

Erata. In printing the description of *G. elegans*, the word 'except' was omitted from the last sentence, which should be read precisely as in the description of *G. striosa* on a subsequent page.

On p. 47, line 17 from the bottom, erase '*H. haemastoma* Moric,' and three lines below for 'two' read one, and for 'third' read 'second.'

On p. 51, 2nd line from the bottom, for '*haemastoma* Moric.' read '*H. aurantia* Gray.'

In *G. elegans* the spiral striæ ascend the sides of their ribs, but do not impress their edges.

In *Geomelania* the nucleus generally consists of two whorls, of which the second is larger than the following whorl.

At 'the Falls' in the eastern part of Jamaica, Mr. Chitty has found a variety of *Cylindrella brevis*, which is 1.07 inch long, and .415 inch in diameter! The lip is rather more expanded than is common in *C. brevis*, but I am unable to detect any other peculiarity. Some of the specimens from the same locality are of much less size.

A variety of *Achatina pellucens* has a few transverse brown stripes.

Description of supposed new species of land shells which inhabit Jamaica; continued from p. 84. By C. B. Adams. March. 1850.

CYCLOSTOMA VIRGINEUM. Shell short, globose-conic: dingy white, with transverse brown lines, most of which are on the last whorl; with the peritreme deep red: with crowded transverse rather strong perpendicular lamellæ, which are decussated by the slender spiral ridges, that begin to appear on the penult whorl and are well developed on the last whorl, the intersections being neither nodulous nor spinous: spire with very convex outlines: apex truncate with the loss of — whorls: whorls remaining three, very convex, with a very deep suture; last whorl not detached in any part from the penult whorl: aperture exactly circular: inner peritreme moderately produced and a little reflected: outer peritreme well expanded throughout in the plane of the aperture, subauriculate above, finely striated concentrically, rather concave; umbilicus not very wide, but of nearly equal diameter through the truncated summit.

Mean divergence about 68° ; length .35 inch; greatest breadth .39 inch; least breadth .28 inch.

CYCLOSTOMA ANOMALUM. Shell short, globose-conic: on the upper whorls very pale brown; on the last two whorls with numerous fine spiral lines of very pale brown on the ridges and of dark brown in the interspaces: with very numerous spiral ridges, of which a few small ones alternate with the larger, decussated by numerous inequidistant transverse perpendicular lamellæ, which are developed, at the

intersections, into triangular points thickened at their bases: spire short, with the outlines curvilinear: apex usually truncate, with the loss of one and one-half or two whorls: whorls remaining about three and one-half, very convex, with a very deep suture; last whorl moderately detached from the penult whorl near the aperture: aperture orbicular: contracted slightly at the margin, which is neither thickened nor expanded: umbilicus nearly half as wide as the last whorl. Operculum with the upper edges of the whorls moderately elevated into a spiral lamella, covered with irregular oblique lamellae, extremely convex externally and concave internally: the diameter of the operculum is .18 inch: the depth of the concavity from the inner side is .07 inch!

Mean divergence about 85° ; height .47 inch: greatest breadth .5 inch; least breadth .385 inch.

CYCLOSTOMA NODULOSUM. Shell elongate, ovate-conic: purple at the apex and behind the lip, with a few indistinct transverse spots of purplish brown and an anterior spiral band of the same; with the lip white: with very closely set strong transverse raised lines, which are decussated by numerous spiral lines, with the intersections nodulous: spire rather long, with the outlines scarcely curvilinear: apex truncate, with the loss of — whorls: four whorls remaining, with a deep suture; last whorl not detached from the penult whorl: aperture ovate-orbicular: inner peritreme scarcely produced, but reflected: outer peritreme moderately expanded, well reflected, thick and strong: umbilicus very narrow, but extending through the truncate apex.

Mean divergence about 35° ; height .53 inch; greatest breadth .34 inch; least breadth .25 inch.

CYCLOSTOMA RETRORSUM. Shell subovate: horn color, with small irregular flames of brown, and a few small dots of the same, which are inequidistant in spiral series: with numerous fine spiral ridges, (of which one or two next the suture are larger), which are decussated by numerous inequidistant moderately elevated lamellae, which are produced at the intersections into triangular points thickened at their bases: spire well lengthened, with the outlines quite curvilinear: apex truncate, with the loss of — whorls: remaining whorls nearly four, very convex, with a deep suture; last whorl not separated from the penult whorl: aperture orbicular: inner peritreme scarcely distinct from the outer, which is thick and wide, finely radiated with impressed lines, and reflected very far behind the plane of

the aperture, so as to form a canal behind it: umbilicus very small, but extending through the truncate apex.

Operculum with the spiral lamella dilated and reflected so as to leave only a very narrow channel between its whorls.

A fine perfect specimen, loaned to me by Mr. Cuming, has enabled me to describe the operculum and the color of the shell.

Mean divergence about 50° ; length .615 inch; greatest breadth .5 inch; least breadth .33 inch.

CYCLOSTOMA SHEPARDIANUM. Shell long ovate-conic: color very various, from horn color to reddish brown or slate color, with paler and darker lines alternating, with the lip red or yellowish white: with very closely set fine raised lines, which are traversed and partially interrupted by numerous finely waved or zigzag spiral striæ; with the upper ends of the transverse lines somewhat fascicled: spire long, with the outlines a little curvilinear: apex truncate, with the loss of — whorls: remaining whorls five to five and one-half, very convex, with a deep suture; the last whorl detached at its extremity from the penult whorl: aperture ovate-orbicular: inner peritreme moderately produced; outer peritreme moderately expanded, auriculate above, almost wanting on the left side: umbilicus very narrow, extending through the truncate apex.

	Mean divergence.	Length.	Greatest breadth.	Least breadth.
No. 1.	35°	.35 inch.	.25 inch.	.2 inch.
" 2.	33°	.57	.31	.225
" 3.	33°	.48	.31	.26
" 4.	30°	.46	.26	.225
" 5.	29°	.32	.18	.13
" 6.	25°	.45	.22	.17

The variations in color, in sculpture, in the degree of detachment of the last whorl, in form and in size, are remarkable. The varieties of coloring are sufficiently described above: those of sculpture depend on the occasional presence of delicate varices and the development of the spiral striæ, which are coarse or fine or scarcely perceptible: the distance of the aperture from the penult whorl varies from one-fifth to one-half of the diameter of the aperture.

CYCLOSTOMA PAPIRACEUM. Shell much elongated, ovate-conic: with dark brown irregular transverse bands, which are deeply and sharply undulated on the posterior side, and which are sometimes contracted into waving lines, on a ground of pale brown: thin; elegantly sculptured with very regular crowded striæ: with the intervening

ridges crossed by many microscopic spiral impressed lines; with a crowded sutural series of sharp crenulations: spire long, with the outlines moderately curvilinear: apex truncate with the loss of — whorls: a little more than five whorls remaining, with a moderately impressed suture: aperture ovate, rather large and spreading, a little modified by the penult whorl: peritreme single, scarcely reflected to the plane of the aperture, on the left side appressed to the penult whorl: umbilicus small, with strong spiral striae. This beautiful species receives the appropriate name suggested by Mr. Chitty.

Mean divergence 32° ; length .82 inch; greatest breadth .45 inch; least breadth .33 inch.

CYCLOSTOMA GRIFFITHIANUM. Shell ovate-conic, much elongated: with four to six spiral frequently interrupted lines of dark brown, on a ground of very pale reddish brown between,—and whitish on the summits of—the transverse ridges: with crowded fine transverse raised lines; anteriorly with feeble concentric striae: spire rather long, with the outlines moderately curvilinear: apex truncate with the loss of — whorls: whorls remaining five, convex, with a well impressed suture: aperture ovate, rather acute above: peritreme simple, moderately expanded and reflected, minutely auriculate above: umbilicus small.

Mean divergence about 30° ; length .55 inch; greatest breadth .28 inch; least breadth .25 inch.

CYCLOSTOMA GRANOSUM. Shell long ovate-conic: dingy white, with some irregular brown spots next below the suture, with a faint spiral band of the same anteriorly, reddish brown near the end of the last whorl: surface granosely decussated by numerous small transverse and spiral ridges, of which the latter commence on the second whorl from the truncated summit: spire with the outlines moderately convex: whorls remaining after truncation four and one-half, quite convex, with a rather deep suture: aperture nearly circular, with the left half of the outline compressed: inner peritreme moderately produced: outer peritreme thick, narrow, with the margin reflected behind the plane of the aperture: umbilicus small, extending through the truncated summit.

Mean divergence about 33° ; length .6 inch; greatest breadth .37 inch; least breadth .3 inch.

HELICINA DUBIOSA. Shell globose-conic: shining, reddish brown, with the lip and callus yellowish white: with excessively fine striae of growth, and very lightly impressed microscopic spiral striae: apex

subacute: spire well elevated, with the outlines rather convex: whorls four and one-half, rather convex, with a well impressed suture: aperture rather large, semicircular, with the notch at the base of the columella scarcely perceptible or wanting: labrum moderately reflected and thickened.

Mean divergence about 120° ; height .2 inch; greatest breadth .285 inch; least breadth .24 inch.

Var. *intermedia*; with a very small but distinct obtuse notch; the spire is less elevated, and the shell is larger and thinner. We should have considered this a distinct species, but are unable to find its limits in a series of specimens. It is intermediate between the type of the species and *H. solitaria*, the latter having an acute-angled notch. Height .24 inch; greatest breadth .34 inch; least breadth .29 inch.

I am indebted to the Hon. Edward Chitty for the opportunity of examining all the Geomelanice, which he has collected. The different types graduate into each other, so as to render the establishment of species extremely difficult. The value of the differences appears to be in the following order; 1, of the linguiform part* of the labrum; 2, of sculpture; 3, of form; 4, of size. The color is absolutely the same in all the species which I have seen. There are four distinct types represented by *G. elegans*, *G. Beardsleana*, *G. minor*, and *G. typica* or *G. fortis*.

GEOMELANIA FORTIS.—Shell elongate conic: whitish: with, on each whorl, about thirty-six rather slender transverse arcuated ribs: spire with rectilinear outlines: apex truncate with the loss of about eight whorls: whorls remaining seven, moderately convex, with a well impressed suture: aperture ovate, widely and deeply effuse: labrum well expanded and reflected; with the linguiform part at the anterior extremity, excessively produced obliquely and downwards, rather narrow, acute: labium well thickened, slightly separated from the penult whorl.

Mean divergence about 12° ; length .6 inch; greatest breadth .18 inch; least breadth .15 inch.

GEOMELANIA MAGNA. Shell elongate conic: whitish: with, on each whorl, about thirty-eight rather slender transverse much arcuated ribs: spire with rectilinear outlines: apex truncate with the loss of eight whorls: whorls remaining six and one half, moderately convex, with a well impressed suture: aperture ovate, widely and deeply effuse: labrum well expanded and reflected; with the linguiform

* This is more correctly denominated a *part of* than an *appendage* to the labrum.

part at the anterior end, wide, obtuse, well produced obliquely and laterally : labium well thickened, slightly separated from the penult whorl.

Mean divergence about 12° : length .65 inch ; greatest breadth .19 inch ; least breadth .15 inch : length of the part lost by truncation .22 inch.

GEOMELANIA PROCERA. Shell slender, conic-cylindrical : whitish : with, on each whorl, about thirty stout prominent, acute-edged transverse ribs, which are continued nearly to the anterior margin of the aperture ; with very numerous microscopic lightly impressed spiral striae in the intercostal spaces : spire with rectilinear outlines : apex truncate with the loss of seven or eight whorls ; whorls remaining seven to seven and one-half, moderately convex, with a well impressed suture : aperture ovate, widely and deeply effuse : labrum well expanded, reflected, and thickened ; with the linguiform part at the anterior extremity well produced obliquely and downwards, rather narrow, but not acute : labium well thickened, separated slightly from the penult whorl.

Mean divergence about 10° ; length .63 inch ; greatest breadth .15 inch ; least breadth .13 inch.

GEOMELANIA GRACILIS. Shell similar to that of *G. procera* ; but the ribs are much more slender and numerous (about forty on each whorl), and are more or less inequidistant ; only very slight traces of spiral striae can be detected under a magnifier : the apex is truncate with the loss of eight whorls : the linguiform part of the lip is subacute, and is much produced obliquely and laterally at the lower extremity of the right side : the labium is as thick as the labrum.

Mean divergence about 10° ; length .55 inch ; greatest breadth .13 inch ; least breadth .11 inch.

Var. *parva* is but .35 inch long, and has about thirty-six ribs.

GEOMELANIA TYPICA. Shell slender, conic : whitish : with, on each whorl, about twenty-six to thirty prominent acute-edged transverse ribs, which become obsolete only near the anterior extremity ; with very numerous microscopic lightly impressed spiral striae, which do not traverse the summits of the ribs : spire with rectilinear outlines : apex truncate with the loss of seven or eight whorls : whorls remaining about seven, moderately convex, with a well impressed suture : aperture ovate, widely and deeply effuse : labrum well expanded, moderately thickened ; with the linguiform part at the anterior extremity of the right side, excessively produced obliquely, very nar-

now and subacute: labium well thickened, a little reflected and separated from the penult whorl except at the upper extremity.

Mean divergence about 10° ; length .47 inch; greatest breadth .125 inch; least breadth .11 inch.

Var. *pygmaea* is but .3 inch long.

GEOMELANIA AFFINIS. Shell similar to that of *G. expansa*, but the aperture is very deeply effuse anteriorly, and the linguiform part of the lip is excessively produced obliquely, and is narrow: the apex is truncate with the loss of about seven whorls. Dimensions nearly as in *G. expansa*.

GEOMELANIA MEDIA. Shell nearly cylindrical: whitish: with, on each whorl, about thirty-five much arcuated prominent acute-edged rather slender transverse ribs: spire with rectilinear outlines: apex truncate with the loss of — whorls: whorls remaining six, moderately convex, with a well impressed suture: aperture ovate, widely effuse: labrum moderately expanded and thickened: with the linguiform part at the anterior extremity of the right side, well produced obliquely, not very narrow, subacute: labium well thickened, separated slightly from the penult whorl except at the upper extremity.

Mean divergence about 11° ; length .4 inch; greatest breadth .107 inch; least breadth .1 inch.

GEOMELANIA VICINA. Shell similar to that of *G. minor*, with a greater divergence: it is usually thinner: the linguiform part of the lip is excessively produced laterally, and is very wide: the periphery of the last whorl is more angular than in *G. minor*.

GEOMELANIA STRIOSA. Shell conic-cylindrical: whitish: with, on each whorl, about sixteen very slender somewhat arcuate ribs, and twenty-five to thirty fine spiral striæ, which traverse the ribs, but are sometimes obsolete on their summits; spire with rectilinear outlines: apex truncate with the loss of — whorls: whorls remaining about seven, moderately convex, with a deep suture: aperture ovate, widely and deeply effuse: labrum well expanded, reflected, and thickened; with the linguiform part moderately produced obtusely and obliquely at the lower part of the right side: labium well thickened, slightly separated from the penult whorl except at the upper extremity.

Mean divergence about 10° ; length .38 inch; greatest breadth .085 inch: least breadth .08 inch.

GEOMELANIA COSTULOSA. Shell conic-cylindrical: whitish: with, on each whorl, about forty very slender somewhat arcuated trans

verse ribs, which are continued to the margin of the aperture, and which are much widened at their bases; with a few inequidistant lightly impressed very fine spiral striae, which traverse the ribs or are obsolete at their edges: spire with rectilinear outlines: apex truncate with the loss of — whorls: whorls remaining about six and one-half, quite convex, with a deep suture: aperture ovate, widely effuse: labrum moderately reflected and thickened; with the linguiform part very obtuse and produced laterally in the lower half of the right side: labium well thickened, very widely detached from the penult whorl, and united to the labrum above at some distance from the extremity of the latter.

Mean divergence about 13° ; length .37 inch; greatest breadth .115 inch; least breadth .1 inch.

GEOMELANIA CONICA. Shell elongate conic; whitish: with, on each whorl, thirty to thirty-five transverse slender moderately arcuated ribs: spire with rectilinear outlines: apex truncate with the loss of five whorls: whorls remaining seven, moderately convex, with a well impressed suture: aperture ovate, rather widely effuse: labrum a little expanded and reflected, with the linguiform part excessively produced obliquely, and acute, at the lower part of the right side.

Mean divergence about 13° ; entire length .39 inch; greatest breadth .09 inch; least breadth .08 inch.

GEOMELANIA PAUPERATA. Shell elongate conic: whitish: with, on each whorl, about twenty-five rather wide obtuse transverse ribs: spire with rectilinear outlines: apex truncate with loss of — whorls: whorls remaining seven to eight, quite convex, with a well impressed suture: aperture ovate, slightly effuse: linguiform part of the labrum but slightly produced. This species resembles *G. pygmaea* and *G. Beardsleana*.

Mean divergence about 11° ; length .21 inch; breadth .05 inch.

GEOMELANIA EXILIS. Shell much elongated, conic-cylindrical: whitish: with, on each whorl, about thirty-five transverse, very slender, straight ribs, and numerous fine spiral striae which do not impress the summits of the ribs: spire with rectilinear outlines: apex truncate with the loss of — whorls: whorls remaining seven, quite convex, with a deep suture: aperture broadly ovate, widely and slightly effuse: labrum slightly expanded and reflected; with the linguiform part occupying the lower half, and scarcely produced; labium as much thickened and reflected as the labrum, rather widely separated throughout from the penult whorl.

Mean divergence about 10° ; length .27 inch; greatest breadth .064 inch; least breadth .056 inch.

CYLINDRELLA COSTULOSA. Shell fusiform, well elongated: whitish: with prominent somewhat oblique ribs, of which there are about fourteen or fifteen on each whorl, and which are more crowded and less prominent on the last whorl; with distinct crowded striæ parallel with the ribs: spire truncate with the loss of — whorls; whorls remaining seven or eight, flattened, with a deep suture: last whorl much detached and produced, obtusely angulated on the right and anterior sides; aperture dilated, angulated anteriorly and on the right; lip well expanded, moderately reflected, sharp. For the loan of this species I am indebted to Mr. Cuming.

Length .34 inch; breadth .09 inch.

[TO BE CONTINUED]

On page 33 we described *Helix sulphurea* as 'perhaps a young shell.' This opinion was founded on its papyraceous appearance. Mr. Chitty, from whom the original specimens were received, has recently furnished a series, which shews that this shell, with all the generic characters of *Helix*, is the last embryonic stage of the West Indian variety of *Dolium pernix*! In a mature *D. pernix*, this nucleus may be distinguished. In a young shell, near the apex, may be very easily seen a clearly defined margin of the nucleus, at which margin the smooth and polished nuclear surface is abruptly succeeded by the close spiral striæ which characterise the West Indian *D. pernix*. In the change from a continuous to a notched aperture, the anterior extremity becomes first angular, and before the next whorl is completed, the notch is perfect.

This example is instructive, not only as illustrating our dependence for true generic types on the soft parts, but also as indicating the inferior rank of the Helicidae as compared with the Purpuridae. A distinguished Zoologist has recently suggested that air-breathing animals are of higher rank than aquatic families of the same class. But so far as may be inferred from the embryonic history of the shells, the Lamarckian system is sustained in its general outlines.

The synonymy of *Helix picturata* (v. p. 30) needs some elucidation, and we offer the following remarks in the hope of contributing to this object. By some authors this shell has been mistaken for *H. sinuata* Mull. Dr. Pfeiffer, with his usual discrimination, accurately

ly distinguishes it, but assigns to it the rank only of a variety of that species, with the following characters:

“3. Depressior, maculis fulguratis cinereis ornata, perist. magis incrassato: diam. maj. 26, min. 23, alt. 13 mill.”

The following is the synonymy of this shell, as given by Dr. Pfeiffer:

“*Helix sinuata* Born Mus. p. 370. t. 14 f. 13. 14.

—— ——— *Deless.* recueil t. 26, f. 10.

—— ——— *var. Chem.* ed. II, *Helix* t. 15. f. 5. 6.

—— *sinuosa* *Gmel.* p. 3622. N. 163.

—— ——— *Fer.* pr. 117. Hist. t. 54. 3.”

The figures of Born appear to have been made from one of the rather more globular forms of this group of *Helices*; possibly from that which we have called *H. valida* (p. 77), or more probably from some variety of *H. sinuata* as we would restrict this species. The form is plainly much less compressed than that of *H. picturata*. The figure of Ferussac seems to represent the same variety.

In the text, Born expressly says of his shell, “color fuscus, fascia media cujusvis anfractus transversa alba.” This is evidently an accurate description of the color of the typical *H. sinuata*, but not of the color of *H. picturata*.

Gmelin, in the thirteenth edition of the *Systema Naturae*, refers to the above quoted figures of Born in the description of *H. sinuosa*. If Born's figures represent Gmelin's shell, then, for the reasons above given, *H. sinuosa* is not *H. picturata*. Gmelin's description is equally applicable to several species of this group, and even of other groups of *Helices*, except in respect of one phrase, “apertura transversa septendecimata,” which is not true of any in the group. If there be no error in his text, it would seem impossible to refer any of these shells to *H. sinuosa*, for the number of teeth in them is absolutely constant. In no case therefore can the name of *H. sinuosa* be used for *H. picturata*.

Of the two remaining references, in the synonymy of Dr. Pfeiffer, both Delessert and Kuster (the latter in *Chem. Ed.* 2da.), unquestionably have figured with accuracy and elegance the shell which we have called *H. picturata*, but they have confounded it with *H. sinuata*.

To these references may be added Chem's plate 12 of *Helix*, fig. 10, which, however, like many other of Chem's plates, is absolutely identical with that of Delessert, a few additional figures having been engraved in the spaces between the figures of the latter author.

It remains to inquire which of the two shells was originally described by Muller as *H. sinuata*. That *H. picturata* was not the shell is evident from the characteristic phrase "brunnea, carina candida," and from the words below "carina in medio candidissima."

Muller, referring to Lister t. 98. f. 99, evidently comprehended within the *H. sinuata* one of those forms in which the two outer teeth are joined at base, with a single exterior pit for both, as in *H. valida* and *H. Bronnii*. Consequently not in this reference, any more than in his descriptions referring to Lister t. 98. and to Klein, does Muller appear to have distinguished *H. picturata*.

It remains only to consider the value of the characters, which separate *H. picturata* from *H. sinuata*. To the characteristics mentioned on p. 30, should be added that the carina is never white as in *H. sinuata*. Although this group of shells is very perplexing on account of the want of constant characters, the peculiarities of *H. picturata* are remarkably constant. In a multitude of *H. sinuata* and many of *H. picturata* we have never found a passage from the one to the other. The only and a distant approximation to a connecting link is in *H. propenuda* (p. 79).

The *H. picturata* without umbilicus, which was described (p. 30) as variety *a*, proves to be the most common form. The beautiful *H. formosa* Fer. is a kindred but distinct species. We offer the following as the synonymy of our shell.

HELIX PICTURATA.

- *sinuata* Deless. Recueil. pl. 26. f. 10.
- ——— var. *Kust.* in Chem. Ed. II. Helix pl. 15. f. 56.
- ——— *Chenu.* Helix pl. 12. f. 10a, 10b, 10c. (exclus. 1847.
- ——— var. β *Pfr.* Mon. Hel. viv. I. p. 305. No. 796. Syn.
- *picturata* Ad. Cont. Conch. p. 30, 40. Oct. 1849.

It affords me much pleasure to acknowledge my indebtedness to my friend Dr. J. C. Jay, for his aid in examining the synonymy of this and other species, and for the use of his very ample library of Conchology, which, with his equally rich and ample collection of shells, constitute a Conchological paradise unequalled in this country.

CONTRIBUTIONS TO CONCHOLOGY.

No. 7.

DESCRIPTIONS OF SUPPOSED NEW SPECIES OF LAND SHELLS, WHICH
INHABIT JAMAICA—*continued from page 98.* By C. B. ADAMS.
April, 1850.

HELICINA AMPLIATA. Shell conic: whitish (?): with a few excessively fine striae of growth; otherwise smooth and shining: apex subacute: spire much elevated, with the outlines moderately curvilinear: whorls five and one half, a little convex, with a distinct suture; last whorl subangular, anteriorly subplanulate: aperture transversely much dilated, depressed in the upper part of the right side: labium with a large thick deposit. This shell resembles *H. Jamaicensis* Sowb., but is much larger, much less globose, and more conic.

Mean divergence about 90° ; height .6 inch; greatest breadth .67 inch; least breadth .57 inch.

HELICINA PUSILLA. Shell depressed globular: horn color for brownish (?): with excessively fine striae of growth: apex subacute: spire moderately elevated, with the outlines curvilinear: whorls more than four, a little convex, with a distinct suture: aperture rather large, well rounded in the right side, somewhat sinuate in the left side; labrum thin, moderately dilated, well reflected, with a deep curved incision, similar to that of *H. palliata*, and next below the columella, the end of which is sickle-shaped. This species is much less discoidal than *H. macilenta*.

Mean divergence about 120° ; height .16 inch; greatest breadth .25 inch; least breadth .2 inch.

CYLINDRELLA HUMILIS. Shell cylindrical in the lower two-fifths, tapering above: pale horn color; with rather numerous oblique, nearly straight equidistant fine elevated transverse lines: spire truncate, with the loss of — whorls: whorls remaining eight to eight and one-half, very convex, with a well impressed suture; last whorl subangular anteriorly, scarcely produced from the penult whorl;

aperture orbicular, moderately large : labrum moderately reflected and dilated, very thin.

Length .2 inch ; breadth .05 inch.

CYLINDRELLA PUSILLA. Shell fusiform-cylindric : pale horn color, subtranslucent : with oblique sinuous, rather inequidistant fine elevated transverse lines : spire truncate, with the loss of — whorls : whorls remaining about seven, moderately convex, with a well impressed suture ; last whorl smaller than the penult whorl, from which it is not produced, with a sharp spiral keel very near the left side of the aperture : aperture very large, very oblique : lip extremely narrow, slightly thickened, well reflected. This species belong to the group, of which *C. Dunkeri* is a type.

Length .23 inch ; breadth .06 inch.

CYLINDRELLA PUPAEFORMIS. Shell subcylindric : pale horn color, or whitish : with excessively fine regular quite oblique striæ ; spire very broadly truncate, with the loss of — whorls : whorls remaining six to six and one-half, slightly convex, with a distinct suture ; last whorl moderately produced from the penult whorl, subangulated anteriorly : aperture very large, a little angulated by the angle of the last whorl, orbicular : lip narrow, moderately thickened, well reflected.

Length .46 inch ; breadth .13 inch.

CYLINDRELLA PROCERA. Shell cylindric in the lower three-fifths, moderately tapering above : reddish or yellowish brown : with rather fine regular quite oblique striæ : spire very broadly truncate, with the loss of — whorls : whorls remaining ten to eleven, moderately convex, with a well impressed suture ; last whorl moderately produced, with a very prominent spiral carina anteriorly : aperture not large, sub-orbicular, subrectilinear in the left and upper sides, with a slight sinus between the lower and right sides : lip well reflected, moderately thickened and expanded. This is a slender species of the group, of which *C. cylindrus* Chem. is typical.

Length 1.15 inch ; breadth .3 inch.

ACHATINA COSTULOSA. Shell conic, turrated : translucent, very pale brownish horn color, darker at the varices : with the surface apparently striated, but having on each whorl about seventy small approximate regular transverse ribs ; but the nuclear whorls are smooth ; with rather indistinct varices, of which there are two or three on each whorl : apex rather obtuse ; spire with the outlines

nearly rectilinear, except near the apex : whorls nearly nine, moderately convex, with a well impressed suture : aperture broadly ovate : labrum not advanced along the middle, much reflected in the lower half : columella moderately produced, nearly straight, well truncated.

Mean divergence about 20° ; length of spire .65 inch ; total length .86 inch ; breadth .27 inch.

ACHATINA NITIDA. Shell well elongated, ovate-fusiform : reddish brown, with very dark brown transverse stripes, about four or five on each whorl : varicose coincidently with the brown stripes, the varices being indicated by the thickening of the shell within, and a deeply impressed line in front of each ; well polished and shining : apex subacute : spire with the outlines rectilinear, or moderately convex : whorls seven to eight, moderately convex, with a well impressed suture : aperture long ovate, very acute above : labrum sharp, subangular at two-thirds of the distance from its upper extremity : columella much curved, broadly truncated.

Mean divergence 30° to 35° ; length .96 inch ; greatest breadth .31 inch ; least breadth .3 inch ; length of aperture .44 inch.

ACHATINA GAYANA. Shell well elongated ovate-fusiform : light brownish yellow, with a series of very distant triangular spots of dark brown, descending from the suture, about five or six on each whorl : varicose coincidently with the brown spots, the varices being rather feebly indicated, as in *A. nitida* ; with fine regular rather crowded transverse striæ : apex subacute : spire with the outlines a little convex : whorls seven or eight, rather convex, with a well impressed suture : aperture long ovate, acute above : labrum sharp and thin : columella nearly straight, rather narrow and obliquely truncated.

Mean divergence about 30° ; length .76 inch ; greatest breadth .27 inch ; least breadth .25 inch ; length of aperture .36 inch.

This rare and elegant species is dedicated to my assistant, Mr. A. M. Gay, in testimony of his industry and rapid acquisitions in natural history.

ACHATINA SIMILIS. Shell similar to *A. nemorensis*, but the outlines of the spire are nearly rectilinear, and consequently the spire is more slender ; the surface is highly polished, and has but a few excessively fine transverse striæ ; the brown stripes are wider. It also

resembles *A. Phillipsii*, but its spire is shorter, with a greater divergence.

Mean divergence about 22° ; length of spire .45 inch; total length .75 inch; breadth .23 inch.

ACHATINA TENERA. Shell elongate, somewhat conic: horn color: with numerous well impressed regular transverse striae: apex subacute: spire with the outlines a little convex: whorls seven and one-half, scarcely convex, somewhat shouldered above, with a well impressed suture: aperture ovate, acute above: labrum thin, slightly advanced in the upper half, retreating below: columella moderately curved, distinctly truncated.

Mean divergence about 14° ; length of spire .21 inch; total length .3 inch; breadth .075 inch.

ACHATINA LONGISPIRA. Shell much elongated, conoidal: pale brown: shining, with very lightly impressed not very numerous transverse striae: apex obtuse: outlines of the spire slightly curvilinear: whorls ten, moderately convex, with a well impressed suture: aperture subrhomboidal, subacute above: labrum thin, slightly advanced in the upper half, retreating below: columella very oblique, distinctly truncated.

Mean divergence about 12° ; length of spire .33 inch; total length .45 inch; breadth .09 inch.

ACHATINA GRACILIOR. Shell conoidal, but very slender: pale horn color: with about twelve transverse oblique slightly prominent lamelloid ridges, which are more distinct next below the suture: apex rather acute: spire with the outlines nearly rectilinear: whorls eleven, a little convex, with a distinct suture: aperture ovate, very acute above, retreating below on both sides, but less on the left side: labrum thin: columella moderately arcuated and truncated.

Mean divergence about 9° ; length of spire .43 inch; total length .55 inch; breadth .09 inch.

ACHATINA OSCULANS. Shell conoidal, but very slender; dull horn color; with about fourteen transverse oblique rather prominent lamelloid ridges, which are somewhat arcuated with the convexity forwards: apex rather obtuse: spire with the outlines rectilinear, except near the apex: whorls nine, flattened or concave along the middle, with a well impressed suture: aperture ovate, very narrow and acute above, retreating much below on both sides: columella sub-

spiral, distinctly truncated in a young shell, indistinctly so in an old one, with the edge somewhat dilated, so as to resemble a *Spiraxis*.

Mean divergence about 9° ; length of spire .28 inch; total length .35 inch; breadth .06 inch.

HELIX CONNECTENS. Shell hemispherical: white, with a horn colored epidermis: with rather coarse striae of growth: apex very obtuse: spire with regular and very convex outlines: whorls nine, very narrow, moderately convex, with a well impressed suture: last whorl slightly convex beneath, with the umbilical region slightly concave: aperture nearly transverse, rather narrow, lunate; with a very prominent sharp stout revolving lamella far within in the lower part of the last whorl: labrum thin and sharp: labium in old shells, with a rather thick deposit: columella produced very obliquely; umbilicus wanting.

Mean divergence about 110° ; height .68 inch; greatest breadth .1 inch; least breadth .95 inch.

HELIX ALLIGANS. Shell globose conoid: white, with a yellowish brown epidermis: with regular striae of growth, which are very coarse on the spire, and fine on the last whorl: apex very obtuse: spire well elevated, with the outlines very convex above, nearly rectilinear below: whorls eight, narrow, rather convex, with a well impressed suture; last whorl scarcely convex beneath, with the umbilical region planulate: aperture oblique, rather broad, lunate; with a very prominent sharp stout revolving lamella far within in the lower part of the last whorl: labrum rather thin, sharp: columella moderately dilated, and well rounded: umbilicus wanting. This species resembles *H. epistylum* and *H. epistylioides*. It is most easily recognized by the plane surface of the umbilical region.

Divergence of the upper whorls about 140° ; mean divergence about 95° ; height 1.05 inch; greatest breadth 1.25 inch; least breadth 1.17 inch.

HELIX AMABILIS. Shell nearly planulate above, very convex beneath, transversely suborbicular: blackish brown, paler on the apex and lip: surface shining, with very fine unequal striae of growth, and obsolete spiral striae on both sides of the periphery: spire slightly elevated, convex: whorls four and one-half, slightly convex in the upper part, and concave in the lower part, with a lightly impressed suture; last whorl with the periphery extremely acute: aperture in

the form of a spherical triangle, moderately expanded, with three teeth in the lower side, of which the outer two stand over one exterior pit, with a separate impression beneath each one, and the third is also over an exterior furrow: labrum well thickened, very much reflected: umbilicus rather wide, scarcely contracted except near the apex very obtusely. This rare and elegant species is allied to *H. cara* and *H. Chittjana*.

Height .43 inch; greatest breadth 1.05 inch; least breadth .92 inch.

HELIX FUSCOLABRIS. Shell transversely ovate-orbicular, convex on both sides: deep reddish brown, paler next the labrum, and at the periphery, darker next below the periphery, often light green around the umbilical region, and behind the lower part of the labrum, clear brown at the margin of the lip, white within: finely but rather strongly granulated, except near the apex and the umbilical region: spire convex or subconoid, moderately elevated: whorls five and one-half, slightly convex, often a little concave in the lower part, with a lightly impressed suture: last whorl with a rather acute periphery: aperture almost horizontal, sublunate, moderately dilated; with, on the lower side, two white teeth, of which the outer one is very large, and both of which are accompanied exteriorly with proportionate furrows: labrum moderately thickened and reflected, much thicker and more reflected next the columella. This species is intermediate between *H. lucerna* and *H. acuta*.

Height .72 inch; greatest breadth 1.5 inch; least breadth 1.26 inch.

HELIX NOBILIS. Shell transversely ovate-orbicular, moderately and irregularly convex above, regularly and very convex beneath: above reddish or blackish brown, with paler spaces: beneath with a broad belt of blackish brown next below the periphery, within which the shell is of a bright yellowish green; with the lip purple, irregularly spotted with white: rather feebly granulated, smooth near the apex and umbilical region, with the lower part of the whorls, for the most part, undulated by short oblique impressions: spire moderately elevated: whorls a little more than five, subplanulate, with a lightly impressed suture: last whorl with an acute periphery, above which it is concave in its last half, and below which it is slightly concave in its first half: aperture subtriangular, with the lower outline much

curved : with one moderately developed tooth below near the right side : labrum well reflected, moderately thickened : umbilicus wanting. See Lister, 82, 83.

Height 1.12 inch ; greatest breadth 2.42 inch ; least breadth 2.07 inch.

HELIX REDFIELDIANA. Shell transversely ovate, quite convex on both sides : brown, or brownish black, with a paler line on the periphery, with the lip white or purple : with coarse transverse striae, which, on the upper side of the shell, are frequently interrupted so as to resemble transversely elongated granulations : apex very obtuse : spire very convex : whorls four and one-half, moderately convex, with a distinct but moderately impressed suture : last whorl with an acute or subacute periphery : aperture transversely and somewhat obliquely semielliptical, a little modified by the penult whorl : labrum well expanded, reflected, and thickened, expanding into a broad flattened callus, where it joins the labium at the base of the columella : umbilicus wanting.

Height 1 inch ; greatest breadth 1.82 inch ; least breadth 1.5 inch.

HELIX BLANDIANA. Shell transversely ovate, quite convex above, moderately convex beneath : brown, paler on the upper whorls and on the lip : with rather coarse transverse striae : apex rather obtuse : spire with the outlines quite convex : whorls five, quite convex, with a well impressed suture ; last whorl with the periphery scarcely subangular : aperture oblique, lunate, considerably modified by the intrusion of the penult whorl : labrum rather thin, moderately reflected : umbilical region slightly indented.

Height .42 inch ; greatest breadth .63 inch ; least breadth .55 inch.

HELIX OSCULANS. Shell very similar to that of *H. arboreoides* ; but the whorls increase rather less rapidly, so that the outer whorl and the aperture are not so wide as in that species ; the lower side of the last whorl is thicker, and within is furnished with a stout revolving lamella a little exterior to the middle of this side. This species connects the groups of Jamaica Helices, which are represented by *H. arboreoides* and *H. epistylum*.

Height .21 inch ; greatest breadth .44 inch ; least breadth .41 inch.

PROSERPINA PISUM. Shell globular: pale yellow and whitish: smooth and shining: apex very obtuse: spire well elevated, with very convex outlines: whorls five, quite convex, with the suture not impressed: last whorl very large and high: aperture longitudinally lunate: labrum sharp, moderately thickened within, without teeth or lamellae: columella moderately produced nearly in the direction of the axis of the shell, with one sharp prominent nearly transverse plait: labium with a very prominent and sharp revolving plait near the columella.

Mean divergence about 110° ; length of aperture .15 inch; total length .21 inch; greatest breadth .24 inch; least breadth .2 inch.

For this elegant species of *Proserpina*, and several of the above species, I am indebted to my friend, Rev. F. R. Holland, who has collected them in person; and, as on previous occasions, has liberally shared with me the results of his labors.

Additional specimens of *Helix ingens*, from Mr. Chitty and from Miss Agnes Hines, show that the umbilicus, although so remarkable in the specimen originally described, is often wanting! A highly colored specimen sent by Miss H. is, for both size and beauty, the most superb of all the land shells of Jamaica.

By the kindness of Mr. Bland, I am furnished with specimens of the elegant *Cyclostoma Sauliae* Sowb., from Worthy Park, St. John's, Jamaica. *C. suturale* Sowb., like most of the shells, which are ascribed to Demarara on the authority of Mr. Bainbridge, belongs to Jamaica.

In reply to an inquiry respecting the *distribution of the terrestrial shells of the Philippine Islands*, Mr. Cuming says, "I did not find more than ten species the same in different islands, at which I was much surprised." The general results of Mr. Cuming's researches, in relation to the distribution of the species, marine, fluviatile, and terrestrial, of the shells of these islands, would be a most interesting and valuable contribution to science.

Descriptions of supposed new species of MARINE SHELLS, which inhabit Jamaica. By C. B. Adams. April, 1850.

NARICA (?) *ANOMALA*. Shell ovate : white, with a tinge of brown : with, on the penult whorl four, and on the last whorl eight, stout obtuse very prominent spiral ridges, which are decussated imbricately by very prominent regular incremental laminae : apex acute : spire with the outlines rather convex : whorls four, quite convex, with a rather deep suture ; last whorl large and ventricose : aperture ovate, somewhat effuse and subacute anteriorly : labrum pectinate, rather sharp, thickened within : columella with a small transverse plait opposite the umbilicus, expanded and flattened below.

Mean divergence about 67° ; length of spire .08 inch ; total length .2 inch ; breadth .13 inch.

ODOSTOMIA GEMMULOSA. Shell ovate-turritid : white : rather thick ; with, on the upper whorls, three, and on the lower whorls four stout prominent obtuse spiral ridges, and on each whorl about twenty to twenty-two transverse ridges, which are continued over the summits of the spiral ridges with well developed nodular intersections ; anteriorly with five or six similar spiral ridges issuing from the aperture, and not decussated : apex subacute : spire with the outlines moderately convex : whorls seven and one-half, subplanulate, with a canaliculate suture : last whorl subacute anteriorly : aperture ovate, rather acute above, moderately effuse and pointed anteriorly : columellar plait more prominent than the spiral ridges on the labium above it.

Mean divergence nearly 20° ; length .155 inch ; breadth .055 inch.

ODOSTOMIA CANALICULATA. Shell conic, turritid : white : smooth : apex acute : spire with rectilinear outlines : whorls six, planulate, with the suture in a small spiral channel ; last whorl short and abruptly terminating : aperture broadly ovate : columellar plait nearly transverse.

Mean divergence about 20° ; length .12 inch ; breadth .045 inch.

ODOSTOMIA OYUOIDES. Shell rather long ovate : white : smooth and shining, with a scarcely impressed spiral line next below the suture : apex subacute : spire with the outlines moderately convex : whorls five and one-half, slightly convex, with a lightly impressed

suture; last whorl long and fusoid: aperture ovate, scarcely effuse anteriorly: columellar plait quite oblique.

Mean divergence about 30° ; length .115 inch; breadth .055 inch.

ODOSTOMIA SOLIDULA. Shell cylindrical in the lower half, conic above: dingy white: thick and smooth: apex subacute: spire with the outlines moderately curvilinear: whorls six, moderately convex, with a distinct suture; last whorl rather long: aperture ovate, a little effuse and pointed anteriorly: columellar plait stout, obtuse, quite oblique.

Mean divergence about 20° ; length .11 inch, breadth .04 inch.

EULIMA GRACILIS. Shell ovate-conic, turritid: white, translucent, opaque along the suture: smooth and shining, with an impressed spiral line next below the suture: apex acute: spire with the outlines nearly rectilinear: whorls thirteen, slightly convex, with an indistinct suture; last whorl gradually tapering anteriorly, rather short: aperture rather narrow: labrum much advanced along the middle.

Mean divergence about 20° ; length .24 inch; breadth .06 inch.

EULIMA ARCUATA. Shell ovate-conic, turritid: subtransparent, white: smooth and shining, with a fine impressed spiral line above the suture: apex acute: spire with the axis curved to an extraordinary degree in the upper whorls, with the outlines moderately curvilinear in the plane perpendicular to that of the curvature: whorls ten, quite convex, with a lightly impressed suture; last whorl long and fusoid: aperture rather long ovate: labium with a well defined deposit.

Mean divergence about 25° ; length .165 inch; breadth .055 inch.

EULIMA CONICA. Shell conic, turritid: white: smooth and shining: apex acute: spire with the axis moderately curved throughout, with the outlines rectilinear in the plane perpendicular to that of the curvature: whorls about eleven, planulate, with an indistinct suture: last whorl subangular, quite oblique anteriorly: aperture small, ovate.

Mean divergence about 22° ; length .1 inch; breadth .042 inch.

EULIMA AFFINIS. Shell similar to that of *E. conica*, but the form is more slender, the axis scarcely curved, the last whorl less oblique anteriorly, and the aperture is larger.

Mean divergence about 19° ; length .09 inch; breadth .031 inch.

EULIMA (?) *FULVO-CINCTA*. Shell ovate-conic, turritid: translucent, white, with a spiral band of bright brown below the middle of the whorls, and another along the suture, both of which bands are much and irregularly interrupted; with a few transverse irregular stripes of the same: smooth and shining: apex rather obtuse: spire with the outlines nearly rectilinear: whorls seven, planulate, with an indistinct suture: aperture narrow: columella subtruncated.

Mean divergence about 20° ; length .2 inch; breadth .065 inch.

NATICA *PROXIMA*. Shell obliquely ellipsoidal: mostly fawn color, or livid, white anteriorly, and on the callus, with an ill defined dingy white stripe next below the suture; anteriorly with a circle of transverse curved brown flames; above the middle of the last whorl, with a narrow pale revolving stripe, on which are rather distinct sagittate spots of dark brown; sometimes next below the middle is a similar but more faintly and closely spotted line: thin, smooth, and shining, with the oblique infrasutural striæ rather feeble: apex subacute: spire prominent, with the outlines moderately curvilinear: whorls five, quite convex, with a well impressed suture: aperture not very wide, ovate but compressed in the left outline: labial deposit rather thick, but subtransparent: umbilical callus about half filling the umbilicus in the lower and right side: umbilicus rather narrow, deep, partially concealed by the labial deposit.

This species resembles the young of *N. canrena*, but the spire is longer; the aperture is narrower, and the form consequently not ovate: the umbilical callus is rather smaller; the shell is thinner: the plan of coloring, although similar, is constantly different.

Mean divergence about 120° ; length of aperture about .52 inch; total length .7 inch; breadth .6 inch.

NATICA *JAMAICENSIS*. Shell obliquely ellipsoidal: pale brown or livid, somewhat mottled, often with three more or less distinct revolving series of transverse curved brown flames; with a white spiral infrasutural stripe; with the umbilical callus and most of the labial deposit dark brown: with obsolete spiral striæ; with the oblique infrasutural striæ quite distinct: apex acute: spire prominent, with the outlines moderately curvilinear: whorls nearly five, rather convex, with a well impressed suture: aperture not very wide, ovate but

compressed in the left outline: labial deposit rather thick; umbilical callus nearly filling the rather narrow umbilicus.

Mean divergence about 120° ; length of aperture .42 inch; total length .53 inch; breadth .43 inch.

Variety *nigrescens* is more concave around the umbilicus, is rather larger and thicker, and has the callus and interior of the aperture nearly or quite black.

NERITINA ORNATA. Shell obliquely ellipsoidal: rather pale greenish or livid brown, ornamented with numerous rather small irregular spots of bright red: rather thick and solid, with fine unequal striae of growth, and crowded microscopic spiral lines: spire small, not very prominent: whorls more than three, with a subcanaliculate suture: labium smooth, obsoletely toothed. Operculum divided into two concave regions by an acute ridge, which is curved in the direction of growth.

Length of spire .07 inch; total length .32 inch; breadth .24 inch.

NERITINA (?) PUSILLA. Shell transversely ovate: white, translucent: vitreous, smooth and shining: spire scarcely elevated: whorls one and one-half, with an indistinct suture; last whorl very large, concavely depressed above: aperture very large, semiorbicular: labrum very thin: labium tumid, covered with a large tumid smooth deposit. Obviously this species can scarcely be included in *Neritina*. A considerable number of specimens were obtained, which scarcely differ even in size.

Height .04 inch; greatest breadth .068 inch.

Like most of the *Neritinae* of Jamaica, this is strictly a marine shell.

Two or three of the following species of *Rissoa* may have been described by Orbigny in the *Moll. du Cuba*, but not having the text we are unable positively to identify them, and therefore offer the following preliminary description of all the species from Jamaica, which were not described in the *Proc. Bost. Soc. Nat. Hist.*, Jan., 1845.

The same remark may be true of one or two species of *Chemnitzia* on pp. 72-5.

RISSEA SUBANGULATA. Shell long ovate conic: white: with, on each whorl, eleven or twelve rather acute but stout ribs, which spread to their bases with concave sides, and which on the last whorl are produced to the anterior extremity; sometimes with very lightly im-

pressed microscopic spiral striæ: apex acute: spire with slightly convex outlines, often with a curved axis: whorls seven and one-half, quite convex, with a well impressed suture: aperture moderately effuse and rather large: labrum well produced and excurved, rather thick. The name of this species was originally suggested by specimens, in which the axis is more than usually distorted. Since it has been used in other collections, and in my printed catalogue of North American shells, I have not deemed it expedient to substitute a more appropriate name.

Mean divergence about 35° ; length of spire .13 inch; total length .21 inch; breadth .095 inch.

Rissoa aberrans. Shell long ovate conic: white: strongly sculptured with three or four spiral ridges, which are decussated, with nodulous intersections, by transverse ridges, of which there are about sixteen on each whorl; anteriorly the transverse ridges are obsolete, and three or four additional spiral ridges are nodiferous: apex acute: spire with the right side nearly rectilinear and the left quite curvilinear, the axis being curved: whorls seven, nearly planulate, with a subcanaliculate suture; last whorl rather large: aperture rather small, deeply notched anteriorly; labrum rather thick and well excurved. This species connects the genus with those *Cerithia*, in which the canal is reduced to a notch.

Mean divergence about 32° ; length of spire .1 inch; total length .165 inch; breadth .08 inch.

Rissoa scalaroides. Shell long ovate conic: white: with, on each whorl, sixteen or eighteen stout ribs, which are continued to the anterior extremity: apex acute: spire with the outlines moderately curvilinear; whorls seven and one-half, slightly convex, with a well impressed suture: aperture moderately effuse: labrum well advanced and excurved, rather thick.

Mean divergence about 27° ; length of spire .13 inch; total length .2 inch; breadth .08 inch.

Variety (?) *minor* is but .15 inch long.

R. scalarella Ad. (Proc. Bost. Soc. Nat. Hist., Jan. 1, 1845,) closely resembles the preceding; it has on each whorl twelve to fourteen ribs, which are larger than in *R. scalaroides*, and has, in large specimens, the following dimensions:—Mean divergence about 24° ; length of spire .1 inch; total length .155 inch; breadth .06 inch.

In the Zeitschrift für Malac. *R. scalarella* is referred to the genus *Rissoina*, on account of the presence of a solid calcareous operculum. Some fresh specimens obtained by me near Kingston in 1844, were found to have a horny operculum.

RISSEO LAEVIGATA. Shell long ovate conic, rather slender : white, translucent : smooth : apex acute : spire with the outlines slightly convex : whorls nearly seven, scarcely convex, with a moderately impressed suture : aperture moderately effuse : labrum well advanced and excurved, rather thick.

Mean divergence about 28° ; length of spire .08 inch ; total length .12 inch ; breadth .045 inch.

RISSEO DUBIOSA. Shell long ovate conic : white, translucent : with, on each whorl, nineteen or twenty obtuse ribs, which are produced on the last whorl to the anterior extremity : apex subacute : spire with the outlines moderately curvilinear : whorls seven, rather convex, with a well impressed suture : aperture moderately effuse : labrum well advanced : excurved, moderately thickened.

Mean divergence about 28° ; length of spire .115 inch ; total length .185 inch ; breadth .065 inch.

RISSEO PULCHRA. Shell subovate, turritid : white, with a pale yellowish brown spiral band on the upper part of the whorls, and a similar band anteriorly : with spiral ridges increasing from two on the upper whorls to four or five on the penult whorl, (of which the upper one is smaller,) and on the last whorl seven, which are crossed, with well developed nodulous intersections, by twenty to twenty-two small transverse ridges ; anteriorly with three nodiferous approximate spiral ridges, which are separated from the other seven by a broad groove : apex acute : spire with the outlines moderately curvilinear : whorls ten, quite convex, with a well impressed suture : aperture very effuse : labrum well advanced and excurved, very much thickened.

Mean divergence about 22° ; length of spire .155 inch ; total length .225 inch ; breadth .08 inch.

RISSEO MULTICOSTATA. Shell ovate conic, turritid : white : with on each whorl, about twenty-eight very regular ribs, which are produced on the last whorl to the anterior extremity, and numerous distinct spiral striae on the anterior half of the last whorl, which impress the summits of the ribs ; on the rest of the shell between the ribs are

very faintly impressed microscopic spiral striae : apex acute : spire with the outlines moderately curvilinear : whorls seven, quite convex, with a well impressed suture : aperture deeply effuse : labrum much excurved and very thick. Conf. *Rissoina elegantissima* Orb. Moll. du Cuba, Tab. XII. f. 27-29.

Mean divergence about 26° ; length of spire .12 inch ; total length .18 inch ; breadth .07 inch.

RISSEA VITREA. Shell ovate conic, turritid : with a scarcely perceptible bluish tinge, opaque white at the suture and in the thickening around the aperture ; in the rest *transparent as glass*, and clearly exhibiting the internal structure : highly polished, with some scarcely perceptible microscopic striae of growth, and a fine impressed spiral line very near and next below the suture : apex very acute : spire with the outlines moderately curvilinear : whorls nearly ten, slightly convex, with a distinct but moderately impressed suture : aperture very effuse and angular anteriorly : labrum very much excurved and advanced, moderately thickened.

Mean divergence 26° ; length of spire .19 inch ; total length .29 inch ; breadth .105 inch.

RISSEA LAEVISSIMA. Shell long ovate conic : dingy white, with a very pale reddish brown spiral band on the upper part of the whorls, and two others on the middle and anterior part of the last whorl ; but these bands are often obsolete, and speedily disappear in weathering : surface highly polished : apex very acute : spire with the outlines slightly curvilinear : whorls nine, slightly convex, with a moderately impressed suture : aperture rather small, very effuse : labrum well excurved and advanced, very much thickened. Conf. *Rissoina Browniana* Orb. Moll. du Cuba, Tab. XII. f. 33-35.

Mean divergence about 30° ; length of spire .13 inch ; total length .2 inch ; breadth .09 inch.

RISSEA EULIMOIDES. Shell elongate conic : white, translucent in a spiral line below the suture : smooth and shining, with a broad very obtuse varix on each whorl, forming a slightly oblique line with the labrum : apex rather obtuse : spire with the axis moderately curved, convex on the left and rectilinear on the right side : whorls seven or eight, scarcely convex, with a lightly impressed suture : aperture scarcely effuse : labrum well excurved, not advanced, moderately thickened.

Mean divergence about 26° ; length of spire .14 inch; total length .2 inch; breadth .09 inch.

Rissoa striosa. Shell ovate conic, somewhat turritid: dingy white or corneous: with, on each whorl, twenty-five to twenty-eight moderately developed transverse folds, which are obsolete on the lower part of the middle whorls and on most of the last whorls; with very numerous crowded deeply impressed spiral striae; with an infrasutural impressed line larger than the striae and constricting the whorls: apex acute: spire with the outlines moderately curvilinear: whorls nine, rather convex, with a moderately impressed suture: aperture somewhat effuse, large: labrum well advanced, much excurved, moderately thickened.

Mean divergence about 26° ; length of spire .135 inch; total length .2 inch; breadth .08 inch.

Rissoa princeps. Shell ovate conic, turritid: white: with very numerous crowded slender ribs, which become obsolete on the last whorl, and strong crowded spiral striae, which become larger on the last whorl: apex acute: spire with rectilinear outlines: whorls ten, nearly planulate, slightly contracted next below the suture, which is moderately impressed: aperture very effuse: labrum very much advanced a little below the middle, well excurved, moderately thickened. This species resembles *R. albida* Ad., but that shell is much smaller, and the outlines of its spire are curvilinear.

Mean divergence about 30° ; length of spire .25 inch; total length .37 inch; breadth .14 inch.

Rissoa (?) *melanura*. Shell conic, turritid: white, subtransparent, with the apex black: nearly smooth, shining, with some spiral striae, which are quite distinct anteriorly and at the lower part of the whorls of the spire, and are obsolete on the upper part of the whorls: apex acute: spire with the outlines nearly rectilinear: whorls eight, quite convex, with the suture rather deep: aperture scarcely effuse: labrum thin (?), well excurved below the middle: columella straight, subtruncate. On account of the imperfect condition of the labrum in the specimens before me, it remains doubtful, whether this shell is a *Rissoa*; it is evidently kindred to *R. tervaricosa* Ad., whose generic character is also doubtful, the labrum being thickened by the last varix.

Mean divergence about 28° ; length of spire .21 inch; total length .28 inch; breadth .11 inch.

CERITHIUM MODESTUM. Shell conic, turritid, sinistrorsal : reddish black, weathering to a cinereous color : with, on the upper whorls, two, and on the middle and lower whorls three spiral ridges, which are of equal size on the lower two-thirds of the shell ; and numerous transverse ridges, the intersections being well developed nodules ; anteriorly with two or three additional spiral ridges, which are less strongly nodulous, and which are separated by a broad groove from a small ridge around the base of the canal : apex very acute : spire with the outlines quite curvilinear : whorls about fourteen, planulate, with the place of the suture distinguished by a somewhat larger groove ; last whorl abruptly terminating : canal short, slightly turning to the right.

Mean divergence about 23° ; length .225 inch ; breadth .07 inch.

CERITHIUM MELANURA. Shell like that of *C. modestum*, but snow white except the dark brown apex, much more slender, with the outlines less curvilinear, and the aperture smaller.

Mean divergence about 17° ; length .2 inch ; breadth .045 inch.

CERITHIUM DECORATUM. Shell conic, turritid, sinistrorsal : white, dark reddish brown anteriorly, with many large rather square irregular spots of the same : with, on the upper whorls, two, and on the middle and lower whorls, three nearly equal spiral ridges, which are nearly concealed by numerous large nodules, that are produced by the excessive development of the intersections of twenty-five to twenty-eight small transverse ridges on each whorl ; anteriorly with two additional smaller or less strongly nodulous spiral ridges : apex very acute : spire with the outlines nearly rectilinear : whorls sixteen, planulate, with the place of the suture distinguished by a deeper groove ; last whorl terminating very abruptly, so as to be concave between the periphery and the canal : aperture ovate-orbicular, modified a little by the penult whorl : canal strongly bent to the right, closed except near the extremity. This shell resembles *C. ornatum* Desh., but that species has only ten or twelve whorls, its outlines are quite curvilinear, and the last whorl terminates less abruptly.

Mean divergence about 20° ; length .29 inch ; breadth .085 inch.

CERITHIUM DEALBATUM. Shell like that of *C. decoratum*, but snow white ; the outlines of the spire are exactly rectilinear ; the granules are less developed ; and the canal is nearly straight.

CERITHIUM NANUM. Shell conic, turritid, sinistrorsal : wax brown,

dark at the apex, sometimes with a white space next below the apex, followed by a white spiral band : with, on the upper whorls, two, and on the lower whorls, three nearly equal spiral ridges, and many transverse slender ridges, the intersections being well developed nodules ; anteriorly with two additional smaller less strongly nodulous spiral ridges : apex very acute : spire with the outlines nearly rectilinear : whorls about nine, planulate, with the place of the suture distinguished by a somewhat larger groove ; last whorl terminating very abruptly : aperture suborbicular, rather small : canal short, nearly straight.

Mean divergence about 20° ; length .11 inch ; breadth .08 inch.

CERITHIUM MIRABILE. Shell ovate conic, turrated, sinistrorsal : white, with a sutural band of blackish brown, which commences a few whorls below the light brown apex with an intervening white space : with a narrow very prominent sutural ridge, on which is the band of blackish brown, and a stouter strongly nodulous spiral ridge along the middle of the whorls, anteriorly with one or two additional slightly nodulous spiral ridges : apex very acute : spire with the outlines rectilinear in the upper half, quite fusiform in the lower half : whorls about fifteen, nearly planulate, with an indistinct suture ; last whorl very much smaller than the penult whorl : aperture suborbicular, extremely small : with two small canals, which are deflected nearly at right angles to the axis of the shell, and are open only at the extremity. This extraordinary species of subgenus *Triphora* is remarkable for the minute size of the aperture.

Mean divergence to the penult whorl about 20° ; length .2 inch ; breadth .062 inch ; length of aperture only .025 inch !

CERITHIUM EXIGUUM. Shell long ovate conic, sinistrorsal : wax color : with, on the middle whorls, two, and on the lower whorls, three spiral ridges, of which the middle one is more slender, and numerous transverse ridges, the intersections being well developed nodules ; anteriorly with three additional smaller less strongly nodulous spiral ridges : apex very acute : spire with the outlines most curvilinear along the middle, nearly rectilinear above and below : whorls ten, planulate, with the place of the suture distinguished by a somewhat larger groove ; last whorl much smaller than the penult whorl, gradually tapering to the end : aperture rather small, subrhombic : canal very short, nearly straight.

Mean divergence as far as the penult whorl about 17° ; length .09 inch; breadth .035 inch.

CERITHIUM INTERMEDIUM. Shell conoid, turritid, sinistrorsal: reddish black or dark brown, with a broad white spiral band on the lower part of the whorls; white near the apex: with, on the upper whorls, two, and on the lower whorls, three nodulous spiral ridges, and anteriorly three additional less strongly nodulous spiral ridges: apex acute: spire with the outlines rectilinear above, moderately curvilinear below: whorls about twelve, planulate, with the place of the suture distinguished by a rather deeper groove: last whorl terminating rather abruptly: aperture rather small, obliquely obcordate: canal short, nearly closed at the origin, much deflected obliquely backwards. This species is intermediate between *C. ornatum* and *C. modestum*.

Mean divergence about 20° ; length .2 inch; breadth .07 inch.

CERITHIUM VERSICOLOR. Shell ovate conic, turritid: usually mottled irregularly with reddish black and white, white prevailing on the varices and on the upper whorls, and the black on the lower whorls and especially on the granules; sometimes mostly white; sometimes mostly black: with numerous transverse ridges, which are prominent on the upper whorls; with, on most of the whorls, three spiral ridges, the intersections being developed into very prominent subacute nodules; and a fourth smaller spiral ridge in the suture of the last whorl; with intermediate spiral striae; anteriorly with four additional smaller less strongly nodulous spiral ridges and intermediary striae; with rather less than two irregular varices to each whorl: apex very acute: spire with the outlines slightly curvilinear: whorls ten or eleven, a little convex, with a well impressed suture: aperture subovate, rather acuminate at both extremities: labrum rather sharp, very much thickened both externally and internally a little behind the edge, deeply striated within: labium with a small callus on the upper part: canal very short, rather wide, much deflected to the left.

Mean divergence about 26° ; length of spire .42 inch; total length .57 inch; breadth .2 inch.

CERITHIUM MEGASOMA. Shell long ovate conic: mostly brownish or reddish black, white within the aperture: thick, with three small spiral rather minutely granulous ridges, of which the upper two are

larger and more distant, and intermediary spiral striae; anteriorly with six or seven additional feebly granulous small spiral ridges; often (?) with one broad varix on the left side: apex acute: spire with the outlines rectilinear except in the lower part: whorls about eight (?), a little convex, with a moderately impressed suture; last whorl large and rather ventricose: aperture subovate, rather acuminate at both extremities: labrum rather sharp, much thickened a little behind the edge, feebly striated within: labium with a small prominent callus above: canal very short.

Mean divergence nearly 40° ; length of spire .36 inch; total length .58 inch; least breadth .25 inch; greatest breadth .3 inch.

CERITHIUM GEMMULOSUM. Shell conoid, turritid: reddish black, sometimes wax-colored on the lower part of the whorls: with three spiral ridges, of which the middle one is more elevated; and on each whorl about thirty-three small transverse ridges, with the intersections nodulous; with a fourth ridge which is slightly nodulous at the periphery of the last whorl, anterior to which are only incremental striae: apex acute: spire with the outlines moderately curvilinear: whorls twelve, moderately convex, with a well impressed suture; last whorl abruptly terminating, concave anteriorly; aperture broadly ovate: labrum very thin, well advanced along the middle: canal very short, nearly straight, with a broad deep notch behind.

Mean divergence nearly 30° ; length of spire .17 inch; total length .21 inch; breadth .08 inch.

CERITHIUM EXILE. Shell conic, turritid, very slender: brownish red, paler at the apex, whitish on the nodules: with one slightly elevated and three well elevated spiral lines, and on each whorl about twelve rather large obtuse ridges, the intersections being moderately developed into nodules; with another spiral well elevated line at the periphery of the last whorl: apex very acute: spire with the outlines rectilinear: whorls twelve to fourteen, quite convex, with a well impressed suture; last whorl terminating abruptly, concave anteriorly: aperture suborbicular: canal extremely short, reduced behind to a broad deep notch.

Mean divergence about 10° ; length of spire .685 inch; total length .4 inch; breadth .03 inch. A fragment consisting of the lower five whorls of a larger shell is .04 inch wide.

CERITHIUM FUSIFORME. Shell ovate-fusiform: reddish black,

whitish at the apex, darkest on the ridges, paler between them and anteriorly : with, on most of the whorls, three spiral ridges, of which the upper two are nearer together and in the upper half of the shell are confluent, and of which the upper one is larger : with numerous scarcely perceptible transverse ridges, which on the spiral ridges are excessively developed into closely set nodules ; anteriorly with another subnodulous spiral ridge, and with transverse striæ : apex acute : spire with the outlines curvilinear : whorls eight or nine, slightly convex, with an indistinct suture ; last whorl much smaller than the penult whorl : aperture suborbicular : labrum well excurved and advanced, slightly thickened : labium with a small callus above : canal very short, straight, wide.

Divergence in the upper whorls about 35° ; length of spire .075 inch ; total length .1 inch ; breadth .04 inch.

CERITHIUM PULCHELLUM. Shell turritid, conic above, subcylindric in the lower three-fifths, conic above : snow white, with a spiral band of bright brown, which commences several whorls below the apex, and is placed on the inferior spiral ridge : with two spiral ridges, of which the upper one is larger, and is double on the lower whorls ; with small transverse ridges, which are developed on the spiral ridges into rather large nodules ; anteriorly with two other spiral ridges, of which the upper one is subnodulous : apex acute ; spire with the outlines slightly concave in the upper half and slightly convex in the lower half, often truncate with the loss of five whorls : whorls about eleven, a little convex, with a well impressed suture ; last whorl a little smaller than the penult whorl, terminating obtusely : aperture suborbicular : labrum well excurved, moderately thickened : canal very short and wide, nearly straight.

Divergence in the upper whorls about 22° ; length of spire .135 inch ; total length .17 inch ; breadth .045 inch.

CERITHIUM RUGULOSUM. Shell conoid, turritid : white : with one slightly elevated and three much elevated spiral lines, and on each whorl about sixteen to eighteen transverse ridges, the intersections being well developed into nodules, anteriorly with a fourth spiral nodulous slender ridge : apex acute : spire with the outlines nearly rectilinear : whorls about ten, quite convex, with a well impressed suture ; last whorl terminating rather abruptly, somewhat concave

anteriorly: aperture suborbicular: canal reduced almost to a broad deep notch.

Mean divergence about 13° ; length of spire .13 inch: total length .16 inch; breadth .055 inch.

CERITHIUM VICINUM. Shell similar to *C. rugulosum*, but in place of the spiral lines are spiral ridges, and in place of the transverse ridges are slender transverse elevated lines, the proportion of size being reversed; whorls about eight or nine; the canal is a little more developed.

Mean divergence about 11° ; length of spire .09 inch; total length .12 inch; breadth .04 inch.

CERITHIUM LATUM. Shell conic above, cylindric below: whitish, with a spiral brown band occupying the suture and the upper spiral ridge, on which however the granules are white: with three spiral ridges, of which the lower one is a little larger, and very small transverse ridges, which are developed on the spiral ridges into very large nodules; anteriorly with an additional nodulous ridge: apex acute: spire with the outlines quite curvilinear in the upper three-fifths: whorls seven, of which two are nuclear and smooth, slightly convex, with an indistinct suture; last whorl nearly as large as the penult whorl, terminating rather abruptly: aperture broadly ovate; labrum well excurved, moderately thickened: canal very short and wide, nearly straight.

Divergence in the upper whorls about 40° ; length of spire .07 inch; total length .09 inch; breadth .038 inch.

CERITHIUM FLAVUM. Shell conic, turritid: bright yellowish brown: with three prominent spiral carinae, and about twenty-six less prominent transverse slender ridges, the intersections being feebly nodulous; anteriorly with an additional slightly nodulous spiral ridge: apex acute: spire with the outlines nearly rectilinear: whorls about nine, a little convex, with a distinct suture; last whorl terminating very abruptly, concave anteriorly: aperture suborbicular: canal extremely short, very wide.

Mean divergence nearly 20° ; length of spire .12 inch; total length .15 inch; breadth .045 inch.

CERITHIUM ALBOVITTATUM. Shell conoid, turritid: light yellowish brown, with a spiral white band occupying the two lower spiral ridges: with three spiral ridges, of which the middle one is most

prominent, and on each whorl about sixteen very small transverse ridges, the intersections forming well developed nodules ; anteriorly with another slightly nodulous spiral ridge : apex acute : spire with the outlines moderately curvilinear : whorls nine, a little convex, with an indistinct suture, last whorl terminating abruptly, concave anteriorly : aperture suborbicular : canal extremely short, wide, and straight.

Mean divergence about 24° ; length of spire .09 inch ; total length .11 inch ; breadth .035 inch.

CONTRIBUTIONS TO CONCHIOLOGY.

No. 8.

Descriptions of new species of *PARTULA* and *ACHATINELLA*.

By C. B. ADAMS, Professor of Zoology, &c., in Amherst College. Read before the New-York Lyceum of Natural History, Oct. 21st, 1850.

PARTULA DIMINUTA. Shell rather thick, ovate-conic; translucent, horn-colored, sometimes reddish, with a thin shining brownish horn-colored epidermis, which is much interrupted by transverse stripes; with the tip white; with unequal, irregular, rather coarse transverse striae, and numerous excessively minute impressed spiral lines; apex subacute; spire rather short, with the outlines slightly curvilinear; whorls five, a little convex, with a moderately impressed suture; last whorl moderately oblique: aperture rather small, subovate, with a tubercle on the middle of the intruding part of the last whorl: lip much thickened, but narrow, with a regularly rounded surface: umbilicus small.

Mean divergence 58° ; length .63 inch; greatest breadth .36 inch; least breadth .3 inch; length of the aperture .23 inch: the corresponding dimensions of another specimen are 60° ; .525 inch; .28 inch; .32 inch; .21 inch.

Hab. — ?

This species resembles a variety, (*P. auriculata* Brod.,) or *P. Otaheitana* Brug., but is more slender, as well as smaller.

ACHATINELLA MAGNA. Shell thick, ovate-conic, elongate: blackish brown at the apex, reddish brown on the middle whorls, and ash-colored on the lower whorls: with unequal, irregular, very coarse transverse striae, with close-set transverse arcuate ribs near the apex, and some indistinct raised spiral lines on the lower part of the last whorl: apex subacute: spire rather long, with the outlines quite curvilinear: whorls seven, rather convex, with a well-impressed suture; last whorl

obtusely angular : aperture ovate, acute above, with an extremely thick deposit on the inner side, with a very large compressed columellar fold.

Mean divergence 50° ; length 1.33 inch ; breadth .7 inch ; length of aperture .61 inch.

The unique specimen which has served for this description is somewhat faded, and the lip probably is not quite mature, being sharp.

ACHATINELLA TAPPANIANA. Shell reversed, elongate ovate-conic : pure white, with one narrow brown spiral band on the periphery of the last whorl : with very unequal and irregular transverse striae, and numerous excessively minute wrinkled spiral impressed lines : apex subacute : spire elongate, with the outlines a little curvilinear : whorls nearly seven, moderately convex, and more or less subangular, margined above, with a well impressed suture : aperture ovate ; lip well thickened within the margin, expanded much anteriorly but not above ; columellar fold strong.

Mean divergence 43° ; length 1.06 inch ; breadth .55 inch ; length of aperture .44 inch.

Var. *dubiosa* differs in being a little more ventricose ; its whorls are not margined above, and the brown stripe is replaced by two fine paler brown lines, below which one or two other yet finer lines may be seen.

Habitat, Sandwich Islands.

This beautiful species is named in honor of Hon. Benjamin Tappan, of Ohio.

ACHATINELLA DIMONDI. Shell reversed, thick, long ovate-conic : dingy white or very pale yellowish brown, with a blackish margin to the aperture when mature ; with a greenish black fugacious epidermis : with the transverse striae rather slight, very unequal and irregular, without spiral striae : apex subacute : spire rather long, with the outlines moderately

curvilinear : whorls nearly seven, quite convex, with the suture well impressed ; last whorl often somewhat flattened on the middle : aperture subovate, with the columellar fold well developed, with the deposit on the inner side very thin ; labrum sharp, not reflected, well thickened within.

Mean divergence 45° ; length 1 inch ; breadth .5 inch ; length of aperture .38 inch.

Variety (?) *lala* has a divergence, in a specimen about two-thirds grown, of 55° .

Habitat, Sandwich Islands.

This fine species is named in honor of Mr. Henry Dimond, of Honolulu, to whom I have been much indebted for the shells of these islands.

ACHATINELLA DECEPTA. Shell rather thick, ovate-conic, much elongated : dingy white or very pale yellowish brown ; with a dark brown or greenish epidermis, which is interrupted more or less in transverse stripes, and often terminates abruptly on the periphery of the last whorl : with irregular transverse striae ; without spiral striae : apex subacute : spire long, with the outlines moderately curvilinear : whorls nearly seven and one-half, rather convex, with a well impressed suture ; last whorl rather small : aperture small, ovate ; lip sharp, not expanded, moderately thickened within ; columellar fold moderately developed.

Mean divergence 38° ; length .72 inch ; breadth .33 inch ; length of aperture .25 inch.

This shell is figured by Mr. Reeve (Icon. f. 42 *a*, non 42 *b*) as a variety of *A. rubens* Gould. We think it is entitled to specific rank. It is usually more slender, and always more conical and less ovate, the last whorl being shorter, and not so regularly rounded, and the outlines of the spire being much less curvilinear. *A. rubens*, always retaining its more regularly rounded outlines, varies in its proportions in extreme

varieties from .76 inch : .35 inch to .64 inch : .4 inch. The dimensions of Dr. Gould's type, .75 inch : .4 inch, are most common.

ACHATINELLA MODESTA. Shell rather thick and short, ovate-conic : dingy reddish or ash brown ; more or less covered with a dingy dark brown epidermis : with fine irregular transverse striae, which are coarser on the upper whorls ; without spiral striae : apex subacute : spire short, with the outlines quite curvilinear : whorls six, moderately convex, with a well impressed suture ; last whorl rather ventricose : aperture ovate, somewhat acute above ; lip sharp, not expanded, moderately thickened within ; columellar fold well developed, quite oblique.

Mean divergence 50° ; length .54 inch ; breadth .3 inch ; length of aperture .26 inch.

The corresponding dimensions of another specimen are— 47° ; .55 inch ; .29 inch ; .24 inch.

Habitat, Sandwich Islands.

ACHATINELLA REEVEI. Although the name *Achatinella radiata* Pfr. appears in Dr. Pfeiffer's Hel. Monog. as a synonyme of *A. viridans* Migh., yet Mr. Reeve, in his beautiful monograph of this genus, has represented this species under the name of *A. radiata*, and has given another species with Dr. Mighels' name. Dr. M. and myself about the same time received this very distinct species, and having seen it in his collection, I cannot doubt the correctness of Dr. Pfeiffer's synonymy. Some other specimens before me appear to be very exactly represented by Mr. Reeve's figure of *A. viridans*, and are most nearly allied to a group consisting of *A. pulcherrima* Swains., *A. castanea* Rv., *A. abbreviata* Rv., &c. I propose for Mr. R.'s *A. viridans* the name which stands at the head of this paragraph.

Descriptions of NEW SPECIES AND VARIETIES OF SHELLS, which inhabit JAMAICA. By C. B. ADAMS, Professor of Zoology, &c., in Amherst College. Read before the New-York Lyceum of Natural History, Oct. 21st, 1850.

The following descriptions are in continuation of the CONTRIBUTIONS TO CONCHOLOGY, which were published by the writer in seven numbers, from Sept. 1849 to April 1850. They comprise the more important of the undescribed types of the land and fresh water shells of Jamaica, which are accumulating for a proposed monograph of the land and fresh water shells of that island, and such of the marine species as are believed to be undescribed.

I take this opportunity to explain that three species of the land shells of Jamaica had received the names of persons, both in the original manuscript descriptions, and in labels with which specimens were distributed. But at the request of the late lamented Dr. Binney, whose name had been used, and who deemed it inexpedient to name species in this manner, other names for these species were substituted, as the article went to press. Unfortunately the first names, taken from the labels, were published by Dr. Pfeiffer. These are now supposed by some writers to have priority; but by attention to the dates, it will be perceived, that the names published in the Proc. Bost. Soc. Jan. 1845, have priority. They were in fact published before the shells could have been received in Europe. I can only regret having thus inadvertently caused the existence of synonymes. The following are the species :

Cyclostoma pulchrius Ad. ; Syn. *C. Binneyanum* Pfr.

Cylindrella nobilior (Pupa) Ad. ; Syn. *C. Binneyana* Pfr.

Helix arboreoides Ad. ; Syn. *H. Haldemaniana* Pfr.

In the same article, *Achatina Griffithii* was erroneously

written *A. Griffithsii*. As this was merely an error in orthography, there can be no objection to the use of the name as elsewhere correctly written.

In the following descriptions of operculated land shells, the opercula are not described, except when important for the diagnosis of the species. We agree with M. Petit, (*Journ. de Conch.* 1850, p. 39.) who does not find in the opercula of *Cyclostoma* characters of sufficient importance to establish genera. Certainly they have not sufficient intrinsic value, and it is yet to be shown that they are always expressive of generic differences in the soft parts of these animals. A similar opinion has been expressed by Mr. Redfield, in his catalogue of operculated land shells. Specific differences, however, are often well defined in the opercula.

MARGINELLA GRACILIS. Shell between fusiform and cylindric, slender : white, with three spiral bands of orange brown, of which the upper one appears on the spire, a part of the middle one is seen in the deflection of the suture in the last part of the penult whorl ; the middle band is sometimes indistinct : smooth and shining : apex rather obtuse : spire moderately lengthened, with the outlines quite curvilinear : whorls nearly four, moderately convex, with the suture not very distinct ; last whorl long : aperture long and narrow ; lip moderately thickened, slightly incurved ; varix slightly extended on the penult whorl ; with four very oblique plaits.

Length .26 inch ; greatest breadth .09 inch ; least breadth .075 inch ; length of aperture .175 inch.

This species resembles *M. arena* Val., (*M. varia* Sowb.,) but is much smaller, and much more slender, and has a longer spire.

BUCCINUM PULCHELLUM. Shell ovate fusiform : pale yellowish brown, with the spiral ridges dark reddish brown, ex-

cept on the upper whorls : with twelve spiral prominent cord-like ridges, half of which appear on the spire, decussated by much less prominent regular transverse ridges, with the intersections well developed into nodules : apex acute : spire with the outlines moderately curvilinear : whorls five, rather convex, with the suture moderately impressed ; last whorl but little ventricose : aperture rather narrow and sinuous ; lip slightly thickened, not denticulate within, (in old shells ?) with the notch of medium size.

Mean divergence about 40° ; length .145 inch ; breadth .06 inch ; length of aperture .06 inch.

Of *Pleurotoma albella* Ad., (Cont. to Conch., p. 63,) a variety is wax-colored at both extremities, and has irregular spiral lines of the same on the lower part of the whorls.

VALVATA INCONSPICUA. Shell subdiscoidal : pale horn color ? with the striae of growth microscopic : spire convex, moderately elevated : whorls three, very rapidly increasing, with a deep canaliculate suture : aperture large, not much advanced above : umbilicus about half as wide as the penult whorl.

Greatest breadth .07 inch ; least breadth .05 inch ; height .04 inch.

PLANORBIS HUMILIS. Shell subdiscoidal : color — ? with coarse striae of growth : apex and spire moderately depressed on the right side : whorls two and one-half ; last whorl with a very acute periphery nearly in the plane of the spire, moderately dilated around the umbilical region : aperture large, subtriangular, acutely angled at the periphery of the last whorl : umbilical region abruptly excavated, with the concavity about two-thirds as wide as the last whorl.

Greatest breadth .06 inch ; least breadth .045 inch ; height .025 inch.

Probably the specimens before me are immature, but the species is quite distinct from any other.

Of *Planorbis dentiferus* Ad., (Proc. Bost. Soc. Jan. 1, 1845,) a variety occurs, which is destitute of teeth! After a careful examination of many specimens, I am unable to find any other differences constantly associated with this peculiarity. Many of the toothless shells are more compressed obliquely just below the periphery, than the type, but the same is true of some of the shells in which the teeth are well developed. It is not a *local* variety, both kinds occurring together at Hatfield, in Westmoreland. The variety may be designated by the name *EDENTATUS*.

ANCYLUS OBLIQUUS. Shell subovate, somewhat arcuate, very convex: translucent, pale horn color: extremely thin, with microscopic radiating raised lines, and less distinct striae of growth: apex very prominent, elevated, extending very far to one side and posteriorly, and projecting nearly over the margin.

Length .075 inch; breadth .05 inch; height .028 inch.

This remarkable shell may belong to a new genus, but without the soft parts, it is difficult to determine the generic value of its peculiarities. The shell is hitherto unique in the rich collection of the Hon. Edward Chitty, to whom I am indebted for the loan of it.

TRUNCATELLA MODESTA. Shell much elongate, ovate conic: yellowish horn color, with a white upper margin of the whorls: with about twenty-one prominent compressed ribs, and numerous spiral striae, which are interrupted by the ribs: apex truncate with the loss of — whorls: spire with the outlines somewhat curvilinear: whorls remaining after truncation seven, moderately convex, margined above: aperture subovate, slightly angulated anteriorly.

Length (after truncation) .175 inch; breadth .06 inch; length of aperture .045 inch.

HELICINA NOBILIS. Shell depressed globose conic, thick and solid: white beneath and at the end of the last whorl, otherwise rufous or dark brownish red: very smooth, the striae of growth being very light; sometimes with a few very light spiral striae: apex obtuse: spire convex conic: whorls nearly four and one-half, subplanulate, with a rather deep suture last whorl much depressed or even sinuate between the periphery and suture at its termination: aperture compressed above, expanded laterally: lip rather thick, moderately reflected along the middle only; with a notch like that of *H. maxima* Sowb.

Mean divergence 130° : greatest breadth .9 inch; least breadth .73 inch; height .55 inch.

This species differs from *H. maxima* in the flattening of the whorls, which renders the spire conic: in the compression of the aperture from above, and the slight reflection of the lip; it is also more solid and less convex beneath.

HELICINA HIRSUTA. Shell depressed globose, rather thin: brownish red, with an hirsute brown epidermis, having long hairs in six spiral lines, of which one is next below the suture and the others are on the middle and lower parts of the last whorl: with the striae of growth lightly impressed: apex rather obtuse, slightly mucronate: spire with the outlines much curved: whorls nearly five, slightly planulate, with a well impressed suture: aperture rather large, semi-elliptical; lip rather thin and sharp, but well reflected so as to form a canal behind; with the slit not very deep, but wide.

Mean divergence 110° ; greatest breadth .59 inch; least breadth .48 inch; height .04 inch.

The slit has about the same proportions as in *H. Hollandi*,

having less depth and a greater width than in *H. palliata* and *H. Brownii*. Except in its greater size, it very closely resembles the former species, which however wants the spiral lines of long hairs in the epidermis. The operculum of this species is much smoother. I adopt the name suggested by Mr. Chitty.

A variety of *Helicina palliata* occurs, in which the lip is excessively thickened both externally and internally, contracting the aperture. It may be designated by the name of *LABIOSA*. It is a local variety.*

A variety of *Helicina maxima* is remarkable for its pale lemon yellow color; it may be designated by the name of *CITRINA*. The usual color of this species, under the epidermis, is the same as that of *H. nobilis*, (see above,) with less of white.

A variety of *Helicina ampliata* in the collection of Mr. Chitty is of a greenish yellow color, with a broad spiral band nearly covering the upper whorls, where it is dark reddish brown, occupying the lower part of the middle whorls where it is of a brownish slate color, and gradually becoming paler, and at length on the last whorl of a red color.

HELICINA CONSANGUINEA. Shell subglobose, moderately thick: dark brownish red, with the lip white; with a somewhat hirsute epidermis, having the projecting points spirally arranged: with the striae of growth quite distinct: apex obtuse: spire with the outlines much curved: whorls five, moderately convex, with a well impressed suture: aperture semi-orbicular; lip sinuous above, moderately thickened and sharp, but well reflected except at the extremities; with the slit broad and shallow.

* Dr. Holland remarks, "The *H. palliata* found about here [Bethany, Manchester] never has such a thickened lip: [the same is true at Marlboro, Manchester C. B. A.]: but all the specimens from Maidstone (our station on the mountain opposite to Bethany) are of this description."

Mean divergence 110° ; greatest breadth .6 inch; least breadth .05 inch; height .45 inch.

The slit, or notch, as it might be called with equal propriety, is uniform in all the specimens before me. In this, as in most other characters, the species is intermediate between *H. hirsuta* and *H. albolabris*. It occurs in the parish of Westmoreland, the west part of the island.

Some specimens from the opposite extremity of the island, St. Thomas in the East, closely resemble *H. consanguinea*, except in having the aperture well dilated and rounded in the upper part, instead of being contracted by a sinus in the lip; they also have the notch a little deeper, and the last whorl is a little more convex beneath. The shell also is much like *H. hirsuta*, but the slit is not so deep, and the aperture is longer and narrower. They present a distinct type, but I merely propose for it the name of *soror*, without deciding whether it be of specific value.

HELICINA MICROSTOMA. Shell globose conic, moderately thickened: "brown, shaded off to a smoky white along the suture" and on the periphery of the last whorl: with rather light striae of growth, in which are a few spiral series of punctures: apex obtuse: spire with the outlines more or less and not uniformly curvilinear: whorls rather less than five, moderately convex, with a well impressed suture; last whorl subplanulate beneath: aperture semi-elliptical, compressed above and below, laterally dilated; with the lip sinuate, well expanded and reflected except at the extremities; with the slit not very deep, rather wide.

Mean divergence 69° ; greatest breadth .65 inch; least breadth .52 inch; height .4 inch.

The slit is about as deep as in *H. consanguinea*, but the sides are less divergent. The punctate spiral series indicate spiral lines of hairs on the epidermis. For two faded speci-

mens I am indebted to Mr. Holland, who has one fresh shell, the color of which he describes as quoted above, and as faintly indicated in the best of the specimens before me. In form it approaches more nearly to *H. ampliata* and *H. Jamaicensis* than any of the group, which is characterised by an anterior notch or slit in the margin of the aperture.

I am indebted to Mr. Holland for a variety of *Helicina depressa* of extraordinary size. Its mean divergence is 140° ; greatest breadth .33 inch; least breadth .28 inch; height .18 inch. The corresponding dimensions of an ordinary specimen are 140° ; .24 inch; .2 inch; .125 inch. It may be designated by the name of *VALIDA*.

A variety of *Trochatella Josephinae*, from the western part of the island, presents a type quite distinct from that which served for the description of the species, and which inhabit the eastern part. The spiral ridges are less conspicuous, and are more or less interrupted by various irregularities of the surface. The acute periphery is furnished with very prominent vaulted compressed scales, and is of a red color. The inferior surface is of a lemon yellow color, and its spiral striae are rather indistinct. The lower part of the lip is quite thick. This type may be designated by the name of *PULCHRA*. Its mean divergence is 100° ; height .29 inch; greatest breadth .52 inch; least breadth .44 inch.

Of *Trochatella Tankervillei* several types appear quite distinct in extreme specimens, but graduate into each other by innumerable intermediate varieties. In one type, variety *a*, the spiral ridges are stronger, and the other irregularities of surface are less developed. The last whorl is more convex on both sides of the periphery, which is consequently less acute. This variety approximates most nearly to *T. patchella* in form and size.

In a second type, variety β , the shells are more rugodens ; scabrous, but thinner. They are usually of small or medium size, and are the most richly colored. A modification of this type sometimes occurs with a more elevated spire.

In a third type, variety γ , the sculpture is more like that of the first, but the outline is more angular, and the shell attains a great size. The colors are not as vivid as in variety β .

The figure in Sowb. Thes. (pl. I. fig. 17) is more angular, and has a more elevated spire than any of the shells which I have seen.

The following are the dimensions of these varieties :

Var. α , mean div. 91° ;	height .53 inch ;	great. br. .63 in. ;	least br. .5 in.
" β , 1, " " 97° ;	" .51 " "	.67 " "	.50 "
" " 2, " " 90° ;	" .62 " "	.70 " "	.56 " ;
" γ , " " 98° ;	" .80 " "	.98 " "	.79 "
Fig. in Sowb. Thes. 80° ;	" .82 " "	.80 " "	?

CYCLOSTOMA SAGITTIFERUM. Shell elongate, ovate conic : dingy white, with numerous inequidistant dark brown zigzag lines, with the four angles which are directed backwards arranged in spiral series on stripes of paler brown : with irregular transverse spots of dark brown next below the suture : with very crowded fine transverse ridges, which interrupt minute spiral elevated lines : apex truncate, with the loss of — whorls : spire rather long, with the outlines curvilinear : whorls remaining after truncation four, quite convex, with a well impressed suture : aperture obliquely ovate, with two peritremes ; of which the outer one is moderately produced and not reflected posteriorly, but in the rest part is well produced, reflected nearly into the plane of the aperture, sinuous on the left side anteriorly : inner peritreme thick, moderately produced, slightly reflected : umbilicus very narrow, extending through the truncate summit.

For this species I am indebted to Mr. Chitty. It was found at Easington, in the parish of St. David's.

Mean divergence about 45° ; length .96 inch after truncation; greatest breadth .63 inch; least breadth .55 inch.

CYCLOSTOMA LAMELLOSUM. Shell ovate conic, rather short: with several inequidistant unequal more or less interrupted spiral lines of brown, of which four or five appear on the penult whorl: with rather closely set sharp elevated transverse lamellæ, which are more prominent at the sutures; without spiral striæ, except a few ridges in the umbilicus: apex truncate with the loss of two or three whorls: spire with the outlines quite convex: about three and one-half whorls remaining, very convex, with a rather deep suture: aperture orbicular, with two peritremes, of which the outer one is narrow, auriculate above, reflected nearly into the plane of the aperture; the inner peritreme is rather stout, well produced, a little reflected. The operculum has a spiral lamella, which has about four and one-half whorls, and is but little elevated and much produced laterally.

Mean divergence about 50° ; length after truncation .49 inch; greatest breadth .4 inch; least breadth .34 inch.

This shell much resembles *C. tectilabre*, but the outer peritreme is more expanded, and the margin of the operculum is not reflected backwards.

CYCLOSTOMA SIMULANS. Shell long ovate conic: very pale brown or dingy white, with numerous spiral series of small dark brown spots, which are often elongate, and which are arranged in inequidistant transverse stripes: with closely set rather strong transverse raised lines and indistinct spiral striæ, moderately crenulate along the suture: apex truncate with the loss of — whorls: spire with the outlines moderately curvilinear: whorls remaining after truncation four or five, quite

convex, with a well impressed suture: aperture ovate orbicular, with two peritremes, of which the outer one is moderately expanded and reflected nearly into the plane of the aperture; the inner one is moderately produced and reflected: umbilicus very narrow, but extending through the truncate summit.

Mean divergence about 37° ; length after truncation .54 inch: greatest breadth .34 inch; least breadth .23 inch.

From Easington. At first sight this species appears like *C. Adamsi*, but is distinguished by being less elongated, by the spiral striæ, and by the double peritreme.

Cyclostoma tenuistriatum is frequently of a dingy white or very pale brown color.

Cyclostoma modestum Ad. (Cont. Conch.)

A variety of *Cyclostoma fimbriatulum* has the transverse ridges rather more numerous and regular than the type of the species, and at their intersection with the spiral ridges more or less developed into small opaque white tubercles: its outer peritreme is not so wide or scabrous, and is less strongly scalloped, and is less flattened. Its size is less than that of the type of the species. It is a local variety, occurring in the centre of Westmoreland, the most western parish, while the typical *C. fimbriatulum* occurs forty miles to the east, in Manchester, near the centre of the island. At the suggestion of Mr. Chitty, I propose for it the name of *ALBINODATUM*.

Another variety of the same species inhabits an intermediate region, the parish of St. Elizabeth's. Yet although geographically intermediate between the other two forms, it is by no means so in its characters. It is smaller than the var. *albinodatum*, has its peritreme narrower, and the transverse ridges are more numerous and regular, in these characters diverging yet farther from the type of the species. On the other hand, it diverges in the opposite direction, having the

transverse ridges cross the spiral ridges with enlargement. We propose for it the name of *docens*, in allusion to its instructiveness on the question of the origin of varieties.

A specimen of *Cyclostoma lincina* from the mountains behind Spanish Town is remarkable for its size and the development of the outer peritreme. Its dimensions are—mean divergence 54° ; length 1 inch; greatest breadth .77 inch; least breadth .6 inch; transverse diameter of the aperture .3 inch, and including the peritreme .57 inch!

On pages 91 and 93 of Contr. Conch. two varieties of one species were accidentally published as distinct species, with the names of *C. nodulosum* and *C. granosum*. These varieties differ slightly. The name, *C. granosum*, having appeared in Mr. Redfield's catalogue, and being rather more appropriate, may be adopted to the exclusion of the other. Another variety of this species occurs, in which the last whorl is much detached from the penult whorl. It is also entirely destitute of the purplish brown color anteriorly. The two individuals, which we have received on loan from Mr. Chitty, make us acquainted with the operculum of this species. It has a spiral lamella, well elevated, of more than three whorls. The variety may be designated by the name of *ABERRANS*.

Analysis of the Group of Species of Cyclostoma, which is represented by C. JAMAICENSE CHEM.

This group has been more or less known for nearly sixty years under the name proposed by Chemnitz. In March, 1843, Mr. Sowerby, (Proc. Zool. Soc. Lond. and Thes. Conch. I. p. 95, pl. 23, f. 10, 11,) described a second species under the name of *C. corrugatum*. Both species have been repeated by Dr. Pfeiffer in Küster's Cyclostomacea. During the pres-

ent year Mr. Sowerby has described a third type under the name of *C. subrugosum*, (Thes. Conch. II. p. 161*, pl. Suppl 31 B. f. 308, 309.)

Having found some difficulty in identifying these species, I concluded first to study the shells themselves *and their opercula*, which are in my collection. Twenty types, which have seemed worthy of notice, are described below. Perhaps two or three of these may be due to accident or circumstances; but most of them are probably original types. Many of them are local. For the most part they are of less value than is usually assumed for a species.

1	<i>a.</i>	<i>a.</i>	} A.
2	<i>b.</i>	<i>b.</i>	
3	<i>c.</i>	<i>c.</i>	
4	<i>d?</i>	<i>d.</i>	} B.
5	} <i>e.</i>	} C.	
6			
7	} <i>f.</i>		
8			
9	} <i>g.</i>		
10			
11			
12			
13	} <i>h.</i>	} <i>f.</i>	
14			
15	<i>i.</i>	<i>f.</i>	} D.
16	<i>j.</i>	} <i>g.</i>	
17	<i>k.</i>		
18	<i>l.</i>	} <i>h.</i>	
19	<i>m.</i>		
20	<i>n.</i>	<i>i?</i>	

In the accompanying table we have endeavored to express the affinities and values of the types. In the first column the numbers corresponding to the types described. In the second column they are grouped under fourteen more comprehensive types, which are indicated by the italic letters. In the third

column they are grouped under nine types, indicated by the Roman letters; and in the fourth column, under four types, indicated by capitals.

Equivalent to the whole group thus constituted is a type, which appears in *C. suturale* Sowb. In the former case, the group is distributed in the various subtypes, over most of the island. The latter occurs only in the western third of the island, and is very uniform in its characters.

If, following the example of some, we should regard all types, which are probably original, as requiring to be named and described as species, we should soon be involved in an endless labyrinth. There would be not less than fifteen species in this group; the list of species of *Cyclostoma* inhabiting Jamaica would be swelled to hundreds; and the terrestrial shells of that island would exceed a thousand species. We prefer to treat species as we do genera, and endeavor to make them of as nearly equal value as the diversified system of nature will permit. We have deemed it useful to present an illustration of the actual scheme of nature.

The nine types of the third order, in the foregoing table appear to be of about the mean value of ordinary species. It becomes necessary to assign them names. In the absence of the opercula, d and i may be omitted as doubtful. Mr. Sowerby's figure of the operculum of *C. Jamaicensis* accurately represents that of No. 18; and Küster's figure, the operculum of Nos. 16 and 17; all of which, notwithstanding some difference in the opercula, we had united in one species. Most of our specimens are rather too coarsely sculptured to correspond with the figures given by these authors. Variety 16', however, corresponds with great exactness to Mr. Sowerby's figure. We may therefore conclude that Nos. 16-18 belong to the Chemnitzian species. Our No. 1 approximates so exactly to Mr. Sowerby's figure of *C. corrugatum*, that we shall provisionally refer it to that species, although Küster's figure and

the descriptions of both authors exclude an umbilical keel. No. 3 has the same general form as the figure of *C. subrugosum*, but wants the umbilical keel. This species we are unable to identify. The following nomenclature is proposed:

- No. 1. *Cyclostoma corrugatum* ? Sowb.
- 2. *Cyclostoma jugosum* Ad. sp. nov.
- 3. *Cyclostoma pallescens* Ad. sp. nov.
- 5-14. *Cyclostoma varians* Ad. sp. nov.
- 15. *Cyclostoma seminudum* Ad. sp. nov.
- 16-18. *Cyclostoma Jamaicense* Chem.
- 19. *Cyclostoma crassum* Ad. sp. nov.

It will be seen that we have made much use of the operculum. The differences of this part appear in this group to be more constant and better defined than those of the shell. They are evidently of value in distinguishing species and even groups which are somewhat more comprehensive than species. We would, however, with M. Petit and Mr. Redfield, stop far short of assigning a generic value to the differences in the opercula of the groups of *Cyclostoma*.

No. 1. Shell reddish in the upper whorls; in the lower whorls pale horn color or dingy white; with a brown epidermis: with deep transverse somewhat wrinkled striae on all the whorls; foveately wrinkled, with shallow depressions; with a distinct umbilical keel, and large curved pits exterior to the keel: spire well elevated: whorls nearly five, flattened on the upper part, with a well impressed suture: aperture suborbicular, quite effuse and pointed above; lip sinuate above, much advanced along the middle of the right side, isoderately thickened: umbilicus a little more than half as wide as the aperture. Operculum with a much elevated spiral lamella in nine whorls, which are much inflected curvately, the outer surface being convex, like the sides of an inverted saucer.

Mean divergence 120° ; height .55 inch; greatest breadth .88 inch; least breadth .69 inch.

No. 2. Shell white, with a light brown epidermis: with rather deep transverse striae, which are very regular on the upper whorls, and very irregular on the last whorl; with deep wrinkles commencing near the end of the penult whorl, where they are somewhat regular and oblique, as they are also on the lower side of the last whorl, on the upper side of which they are irregular and knotty; the umbilical keel is obsolete: spire much depressed: whorls nearly five, well rounded, with a

deeply impressed suture: aperture orbicular, slightly effuse and pointed above; lip scarcely sinuate above, much advanced along the middle of the right side, moderately thickened: umbilicus four-fifths as wide as the aperture. Operculum with a much elevated spiral lamella, in seven or eight whorls, which are much inflected but not so curvately as No. 1.

Mean divergence about 145° ; height .6 inch; greatest breadth 1.08 inch; least breadth .85 inch.

No. 3. Shell with the spire brownish red, and the last whorl white; with a brown epidermis: with the transverse striæ fine and regular on the spire, and very irregular on the last whorl; with fine wrinkles commencing above near the end of the penult whorl; last whorl very coarsely and irregularly wrinkled above, nearly or quite smooth beneath; the umbilical keel is obsolete: spire depressed: whorls nearly five; last whorl flattened above; with the suture moderately impressed: aperture orbicular, slightly effuse and pointed above; lip scarcely sinuate above, moderately advanced on the right side: umbilicus about two-thirds as wide as the aperture. Operculum with a much elevated spiral lamella, the whorls of which, six or seven in number, are saucer-shaped; that is, reflected, with the inner surface concave: the lamella is like that of No. 1 inverted.

Mean divergence about 145° ; height .67 inch; greatest breadth 1.15 inch; least breadth .91 inch. No. 3' differs in having the lower part of the last whorl finely wrinkled.

No. 4. This resembles No. 3, but the wrinkles on the last half of the last whorl are somewhat regular, oblique, and very large: the umbilical keel is well developed: the umbilicus is only half as wide as the aperture. The operculum is unknown.

No. 5. Upper whorls horn color or light red; lower whorls white, with a brown epidermis: with the transverse striæ rather fine and irregular; wrinkles commencing on the antepenult whorl, regular, oblique and well defined on the penult whorl, sometimes regular on the lower part of the last whorl; umbilical keel well developed: spire somewhat depressed: whorls about four and one-half, scarcely flattened above, with a well impressed suture: aperture orbicular, slightly effuse and pointed at the junction with the penult whorl; lip rather thin, slightly advanced in the right side: umbilicus two-thirds as wide as the aperture. Operculum with a spiral lamella of about eight whorls, with the upper margins reflected and expanded so as to be nearly in contact.

Mean divergence about 135° ; height .55 inch; greatest breadth .9 inch; least breadth .72 inch.

No. 6. White, often reddish above; with a brown epidermis: with the transverse striæ extremely fine, somewhat regular on the upper whorls; wrinkles commencing on the antepenult whorl, fine, regular and oblique on the penult whorl and at the beginning of the last whorl, on the rest of which they are fine and irregular: umbilical keel well developed: spire well elevated: whorls five; last whorl slightly depressed above; suture well impressed: aperture suborbicular, quite effuse and pointed above; lip well thickened, moderately advanced on the right side; umbilicus about three-fifths as wide as the aperture. Operculum slightly concave, with a thick spiral lamina of seven or eight whorls, the upper part of which is ex-

panded in both directions but mostly on the exterior, and is then curved downwards, presenting a broad rounded summit. A transverse section of the lamina somewhat resembles the italic letter *T*.

Mean divergence about 120° ; height .46 inch; greatest breadth .84 inch; least breadth .65 inch.

No. 7. This differs from No. 6: the depression of the last whorl above is rather deeper, and extends along the penult whorl where it is linear; the wrinkles are less regular, and are often wanting at the end and lower side of the penult whorl; the umbilical keel is very strongly developed; the epidermis is very dark brown; in the whorls of the opercular lamina, the lateral expansions come in contact, forming a covered way beneath. This type inhabits the parish of Portland. It attains a great size and solidity.

Mean divergence about 120° ; height .85 inch; greatest breadth 1.36 inch; least breadth 1.05 inch.

No. 8 differs from the preceding, in having the whole surface destitute of wrinkles.

No. 9 is also like No. 7; but its operculum is flatter, and has two more whorls, and all its whorls are therefore narrower; the epidermis is light brown; and the wrinkles are nearly obsolete, except a few which are small and well defined near the commencement of the penult whorl.

Mean divergence 130° ; height .6 inch; greatest breadth 1.03 inch; least breadth .81 inch.

No. 10. The wrinkles are well developed, rather sharp, oblique and regular on the penult and antepenult whorls, and are nearly obsolete on the last whorl, the lower side of which is quite smooth; the umbilical keel is very prominent; the operculum is like that of No. 9. Some have a few raised spiral lines on the last whorl.

Mean divergence 125° ; height .55 inch; greatest breadth .95 inch; least breadth .75 inch.

No. 11. White, often reddish; the epidermis is dark brown, with a white stripe next below the suture on the last whorl: with the transverse striæ excessively minute; the wrinkles are very small on the antepenult and penult whorls, and nearly obsolete on the upper part of the last whorl, which is smooth below; there are a few indistinct spiral striæ: the umbilical keel is well developed: spire well elevated: whorls nearly five, slightly depressed above; with a well impressed suture aperture suborbicular, quite pointed and effuse above: lip well thickened, much advanced on the right side: umbilicus half as wide as the aperture. Operculum like that of No. 9.

Inhabits St. John's.

Mean divergence about 120° ; height .55 inch; greatest breadth .92 inch; least breadth .74 inch.

No. 12 differs from No. 11 in having the whorls more flattened above, and the aperture more dilated. Operculum as in No. 9.

Inhabits the north side, in St. Mary's.

Mean divergence about 135° ; height .57 inch; greatest breadth .99 inch; least breadth .76 inch.

No. 13. Brownish red in the upper whorls, white in the last whorl; with a brown epidermis: with the transverse striæ quite fine; foveate wrinkles commencing in the latter part of the penult whorl, and becoming obsolete in the latter part of the last whorl; with some lightly impressed spiral striæ on the last whorl: umbilical keel moderately developed; spire moderately elevated: whorls nearly five; penult whorl flattened and last whorl much depressed above; with a well impressed suture: aperture orbicular, advanced above in an acute effuse point; lip sinuate above, moderately thickened: umbilicus about two-thirds as wide as the aperture. Operculum unknown.

Mean divergence about 130° ; height .7 inch; greatest breadth 1.15 inch; least breadth .93 inch.

No. 14. White, often more or less reddish; epidermis dark brown, sometimes paler and greenish; with a band on the periphery, and a very narrow one at the upper edge of the last whorl: with a few indistinct wrinkles on the last whorl near the suture; transverse striæ very fine; umbilical keel well developed with age: spire well elevated: whorls nearly five, very convex; last whorl with a slight depression above; suture well impressed: aperture suborbicular, quite effuse and acute above; lip well thickened, a little sinuate above, moderately advanced on the right side: umbilicus about two-thirds as wide as the aperture. Operculum with a spiral lamella of about five whorls, of which the inner whorls are a little inclined inwards, and the outer ones shelve inwards and are much thickened.

It inhabits Accompongtown, in the interior, in St. Elizabeth's parish.

Mean divergence about 120° ; height .5 inch; greatest breadth .73 inch; least breadth .58 inch.

No. 14' has a bright red spire, and on the last two whorls numerous minute wrinkles, which are indistinct about the periphery of the last whorl; without the white bands. Operculum unknown.

No. 14'' is intermediate between 14 and 14'.

No. 15. Shell brownish orange or brownish on the spire, reddish white on the last whorl; with a brown epidermis, which on the last whorl is mostly limited to two or three dark brown broad well defined spiral bands, which are often confluent in one: with the transverse striæ very fine; wrinkles commencing about the middle of the penult whorl, mostly foveate; last whorl very irregularly wrinkled above, with minute pits exterior to the well developed umbilical keel, otherwise smooth: spire well elevated: whorls nearly five, with a slight depression at the top of the last whorl; with the suture well impressed: aperture suborbicular, quite effuse and pointed above; lip thick, a little sinuate above, and well advanced on the right side: umbilicus about three-fourths as wide as the aperture. Operculum quite concave, with the spiral lamella scarcely elevated, but much thickened and appressed on the exterior side.

Inhabits Manchester.

Mean divergence about 120° ; height .65 inch; greatest breadth 1 inch; least breadth .79 inch.

No. 15' is more wrinkled and much smaller, its greatest breadth being .65 inch.

No. 16. More or less reddish, often with a white stripe at the upper edge of the last whorl; with a brown epidermis, which is more or less interrupted by naked spiral stripes, which are often numerous: wrinkles commencing in some before, in others after the end of the penult whorl, in some, narrow and well defined, often nearly obsolete, especially on the back of the last whorl; transverse striae fine but rather deep; rarely a little wrinkled near the umbilical keel, which is well developed: spire well elevated: whorls and aperture as in No. 15: umbilicus about half as wide as the aperture. Operculum with a spiral lamella of six or seven whorls, moderately sloping outwards, with the upper margin moderately reflected externally.

Mean divergence about 120° ; height .68 inch; greatest breadth 1.04 inch; least breadth .83 inch.

In No. 16' the wrinkles are obsolete.

No. 16'' has the wrinkles mostly on the penult whorl.

No. 17. Shell white with more or less reddish, pure white on the last whorl next the suture; with a rich brown epidermis: transverse striae rather coarse; wrinkles minute but well defined, occupying more or less of the last whorl; umbilical keel well developed: spire much elevated: whorls five and one-third; last whorl moderately depressed above; suture well impressed: aperture large, suborbicular, somewhat acute above; lip rather thin, slightly sinuated below by the umbilical keel: umbilicus half as wide as the aperture. Operculum a little concave; spiral lamella with seven or eight whorls, rather wide, curvately reflected, but not concealing the intermediate space.

Mean divergence about 110° ; height .9 inch; greatest breadth 1.08 inch; least breadth .87 inch.

No. 18. Shell white with a greenish brown epidermis, or reddish with a dark brown epidermis: with the transverse striae extremely coarse; with irregular coarse but not deep wrinkles on the upper part of the last whorl; with some more or less distinct striae on the last whorl: spire well elevated: whorls about five and one-third, scarcely depressed above, with a well impressed suture: aperture large, suborbicular; effuse, pointed and advanced above; lip slightly sinuate above, moderately thickened; in the white variety thin and sharp on the right side: umbilicus a little more than half as wide as the aperture. Operculum flat; lamella with six or seven distinct whorls, rather narrow, moderately reflected.

Inhabits the middle parts of Manchester.

Mean divergence about 120° ; height .88 inch; greatest breadth 1.23 inch; least breadth 1 inch.

No. 18' is probably an accidental variety, with the last whorl deflected below the middle of the penult whorl: the aperture and the umbilicus are consequently contracted: in the other details it agrees with the type.

No. 19. Shell white with a brown epidermis: with deep transverse striae; with indistinct spiral striae; not wrinkled; umbilical keel obsolete: spire moderately elevated: whorls five; last whorl scarcely depressed above; suture well impressed: aperture suborbicular, effuse, pointed, and advanced above: lip well thickened: umbilicus nearly two-thirds as wide as the aperture. Operculum rather concave; lamella with about seven whorls, of medium width, nearly perpendicular except that the thickened upper margin is moderately reflected.

Inhabits the back parts of Manchester.

Mean divergence about 130° ; height .53 inch ; greatest breadth .77 inch ; least breadth .62 inch.

No. 20. Shell white, reddish on the upper whorls, with a pale greenish brown epidermis: transverse striæ very fine, wrinkled; with minute wrinkles nearly covering the last whorl; umbilical keel wanting: spire moderately elevated: whorls five; last whorl flattened beneath, making the periphery subangular; with the suture well impressed: aperture suborbicular; effuse, pointed, and much advanced above; lip thick: umbilicus half as wide as the aperture. Operculum unknown.

Mean divergence about 130° ; height .45 inch ; greatest breadth .7 inch ; least breadth .58 inch.

Note on the genus STOASTOMA. Following the suggestion of Dr. Pfeiffer, (Zeitschr. Malak. 1849, p. 113.) I recognize the genus *Stoastoma* in the well-known *Cyclostoma succineum* Sowb. It appears to me, however, that Dr. P. has gone too far in saying that this species may be taken as the chief type ("Haupttypus") of the new genus. It differs from all the species of Jamaica, in having the labrum sharp and not produced beyond the labium, in the manner which suggested the name of the genus. *Stoastoma succineum* might therefore be considered as the type of a *Polynesian subgenus*, which has about the same degree of affinity to *Stoastoma* proper, that *Partula* has to *Bulimus*.

STOASTOMA VILKINSONIÆ. Shell subdiscoidal: pale horn color, subtransparent: with five spiral carinæ, of which one runs into the suture, and one appears on the middle of the whorls of the spire; some have, in place of the last one, two smaller carinæ; with very delicate spiral raised lines, usually four to six in each interspace: spire moderately and convexly elevated: whorls three and one-half, angulated, with a deep suture; last whorl rather large, detached from the penult whorl near the aperture: aperture campanulate; labrum produced very far, above abruptly produced and auriculate, with wide and deep scallops formed by the produced carinæ; labium much detached from the penult whorl and a little reflect-

ed: umbilicus rather wide, with the spiral lamella moderately developed. Operculum very deeply concave, auriculate at both extremities, very finely punctulate.

Mean divergence about 140° : height .035 inch; greatest breadth .07 inch; least breadth .055 inch.

This species closely resembles *S. bladdianum*, and is most readily distinguished by the difference in size. A closer inspection will detect the more essential differences.

STOASTOMA TAPPANIANUM. Shell subdiscoidal: pale horn color, subtransparent: with seven spiral carinae, of which the upper one is small and the lower one very minute, and of which two are visible on the upper whorls; with very delicate spiral raised lines, usually one between the first pair of carinae and two or three in each following interspace: spire moderately and convexly elevated: whorls three and one-half, moderately convex, with a deep suture; last whorl scarcely detached from the penult whorl near the aperture: aperture rather more than a semicircle, a little contracted behind the labrum, which is well produced, above rather abruptly produced, scarcely modified by the carinae; labium much detached from the penult whorl and a little reflected: umbilicus rather wide, with the spiral lamella moderately developed. Operculum very deeply concave externally, smooth, auriculate at both extremities.

Mean divergence about 140° : height .045 inch; greatest breadth .086 inch; least breadth .07 inch.

This shell also resembles *S. bladdianum*, and might be mistaken for the young of that species. But the labrum is thickened as in all mature shells of *Stoastoma* proper. It is most readily distinguished from that species by the peculiarities of the aperture.

STOASTOMA HOLLANDIANUM. Shell subdiscoidal: pale horn

color, subtransparent : with five spiral carinae, one of which is visible on the spire : with very delicate spiral raised lines, usually three to six in each interspace : spire moderately elevated convex : whorls three and one-half, moderately convex, subangular ; with a well impressed suture : last whorl scarcely detached from the penult whorl at the aperture : aperture rather large, slightly constricted behind the lip, which is moderately produced, above not very abruptly produced, scarcely modified by the carinae ; labium well detached from the penult whorl, scarcely reflected : umbilicus rather wide, with the spiral lamella moderately developed. Operculum deeply concave, subauriculate, smooth.

Mean divergence about 145° ; height .035 inch ; greatest breadth .065 inch ; least breadth .055 inch.

This species much resembles the preceding. It is most readily distinguished by its inferior size, and by the greater number of fine spiral striæ.

STOASTOMA MORICANDIANUM. Shell globose conic ; horn color, or very pale yellowish green : with numerous very fine somewhat tortuous raised spiral lines, of which three or four are visible on the spire ; and two or three still more minute lines in each interspace ; but in some, all the lines are nearly equal : spire well elevated, with the outlines nearly rectilinear : whorls four, quite convex, with a well impressed suture ; last whorl subglobose : aperture rather larger than a semicircle, a little campanulate : labrum moderately and above not abruptly produced, scarcely modified by the larger spiral lines : labium moderately detached from the penult whorl, slightly curved and reflected : umbilicus narrow, with the spiral lamella very small. Operculum rather deeply concave, subauriculate, very finely papillose.

Mean divergence about 85° ; height .075 inch ; greatest breadth .085 inch ; least breadth .075 inch.

This species resembles *S. Redfieldianum* ; but the shell is larger, the spiral lines are smaller, and the spire is larger in proportion at the last whorl.

STOASTOMA PETITIANUM. Shell between globose and discoidal : dingy white : with eight or ten raised slender spiral lines, of which three or four are visible on the spire, and as many others which are more minute : spire moderately elevated, convex : whorls three and one-half, moderately convex, with a lightly impressed suture ; last whorl well rounded : aperture much contracted behind the labrum, which is but moderately produced, and is double, with the outer margin scarcely modified by the larger spiral lines ; labium moderately detached from the penult whorl : umbilicus rather small, with the spiral lamella but moderately developed.

Mean divergence about 125° ; height .04 inch ; greatest breadth .06 inch ; least breadth .05 inch.

STOASTOMA ANTHONIANUM. This shell is like the preceding ; but the spire is much depressed ; the spiral lines are rather stronger ; and the aperture is very campanulate, the labrum being very much produced before the deep constriction.

Mean divergence about 145° ; height .035 inch ; greatest breadth .07 inch ; least breadth .055 inch.

CONTRIBUTIONS TO CONCHOLOGY.

NO. 9.

[From Annals of N. Y. Lyceum of Natural Hist. Vol. V. No. 3.]

Descriptions of New Species and Varieties of the LAND SHELLS of JAMAICA, with Notes on some previously described Species. By C. B. ADAMS, Professor of Zoology in Amherst College, Massachusetts. April, 1851.

The writer has recently spent some time in Kingston, Jamaica, in arranging the land shells of that island, which are in the collections of the Honorable Edward Chitty, and in selecting from them materials for the proposed monograph of Jamaica shells. Among them are several new species and varieties, which have recently been obtained by Mr. Chitty, and which, with some previously known, are described in this article.*

Cyclostoma Hillianum, var. *LEPORILABRE*. This variety is distinguished by having an abrupt reflection of a small part of the outer peritreme next above its contact with the penult whorl. The outer peritreme is also very much expanded, and is somewhat sinuate above.

Cyclostoma spinulosum (p. 1 of Contributions to Conch.) is perhaps identical with *C. lincinellum*, Lam., if we may judge from the figures of Lamarck's species in Kuster's "*Cyclostomacea*."

CYCLOSTOMA MOUSSONIANUM. Shell short, globose-conic: dingy white, with numerous more or less interrupted spiral reddish brown lines: with more or less crowded transverse subimbricate lamellæ, which are decussated by numerous small spiral ridges, with the intersections well developed into spines in the angle of the suture: spire with very convex outlines; apex usually truncate with the loss of two whorls; remaining whorls three and one-half, very convex; last whorl a little detached from the penult whorl near the aperture, but

* This and the following articles were prepared by the writer while in Kingston.

soldered to it by the outer peritreme: aperture circular; inner peritreme moderately produced; outer peritreme much expanded, and reflected very convexly back of the plane of the aperture; imbricate, slightly and finely scalloped: umbilicus not very wide, extending through the truncate apex.

Mean divergence about 75° ; length .54 inch; greatest breadth .53 inch; least breadth .38 inch.

Operculum very convex, very closely striated obliquely, with the spiral lamella moderately raised.

This shell closely resembles *C. spinulosum*, except in the outer peritreme and in the operculum, which widely distinguish it from the allied species. The operculum, however, somewhat resembles that of *C. anomalum*, and the lip is like that of *C. retrorsum*.

The species is named in honor of Professor A. H. Mousson of Zurich, Switzerland.

Cyclostoma amandum (p. 3 of C. C.) is probably identical with *C. scabriculum*, Sowb.

Cyclostoma virgineum (p. 90, C. C.) is identical with *C. pisum* (p. 9.)

Cyclostoma concentricum (p. 4, C. C.) is not sufficiently distinct from *C. variabile* (p. 3, C. C.) to take a higher rank than that of a variety.

CYCLOSTOMA MUTATUM. This name is here proposed for *C. articulatum* Sowb., inasmuch as Gray in Griffith's Cuvier (1836) had already applied the latter title to a species afterwards known as *C. filosum* Sowb. Sowerby's *C. articulatum* was not established until 1843, and must therefore be dropped.

CYCLOSTOMA CAMPBELLII. Shell elongate conic: color ? with numerous transverse moderately elevated lamellæ: apex acute: spire not truncated, with the outlines but little convex: whorls six and one-half, quite convex, with a rather deep suture; last whorl at the end much detached from the penult whorl, and angular above: aperture nearly circular, with the

inner peritreme moderately produced, and the outer peritreme small and expanded into the plane of the aperture: umbilicus small.

Mean divergence about 40° ; length .36 inch; greatest breadth .2 inch; least breadth .16 inch.

For this and several other new and interesting species we are indebted to Archibald Campbell, Esq., of New Hope, Westmoreland.

Cyclostoma xanthostoma and *C. ignilabre* have white-lipped varieties, each of which may be designated by the name ALBILABRE.

Cyclostoma proximum (p. 8, C. C.) is perhaps only a variety of *C. fascia*, Gray.

Cyclostoma nitens (p. 8, C. C.) appears to be connected with *C. Augusta* (p. 7, C. C.) by intermediate specimens, and is probably only a variety. Another variety of *C. Augusta* may be designated by the name of TESTUDINEUM. Its sculpture is more prominent, and the color is more or less like burnt umber. It approximates towards *C. fascia*.

The rufous or red lipped varieties of *Cyclostoma Jayanum* and *C. Augusta* may be designated by the name of RUFILABRE.

CYCLOSTOMA CHEVALIERI. Shell ovate conic: brown, darker at the summit, white along the suture, around the umbilicus, and with the peritreme white; also with several spiral series of dark brown dots, of which series two on the upper whorls and three on the last are most conspicuous: smooth and shining: spire rather convex, truncated with the loss of more than two whorls: about four whorls remaining, which are quite convex, with a moderately depressed suture: aperture nearly circular: the inner peritreme slightly developed; outer peritreme smooth and widely expanded, (especially above and on the left side,) well appressed to the penult whorl: umbilicus very small.

Mean divergence about 45° ; length .68 inch; greatest breadth .48 inch; least breadth .35 inch.

The operculum is similar to that of *C. album*, being sub-spiral, with oblique striæ.

Variety ALBUM wants the dark brown color, and has the spiral dotted lines more or less indistinct.

Variety VIRGATUM is dingy or pearl white, with the spiral dotted lines conspicuous.

This species is named in honor of the botanist M. Chevalier.

Cyclostoma album, var. FUSCUM, is distinguished by its smaller size, brown color, and a less smooth surface.

CYCLOSTOMA YALLAHENSE. This species resembles *C. hyacinthinum* (p. 9), which is probably identical with *C. Banksianum* Sowb. But it is smaller and more slender; the color is bluish brown, and does not change by age or exposure into orange near the aperture; the striæ are coarser; the oblique indentations are often obsolete. The operculum is similar to that of *C. hyacinthinum*.

Mean divergence about 46° ; length .48 inch; greatest breadth .32 inch; least breadth .27 inch.

Although this shell so much resembles the species with which we have compared it, a peculiar type is easily recognized in it. The two types are geographically remote; this species inhabiting the east end of the island from Yallahs' Hill eastward, while the other occurs in the middle of the south side (Manchester) and westward. Neither species has been found in the intermediate regions.

CYCLOSTOMA SERICINUM. Shell much elongated, conic: silky white, with four spiral series of brown dots, of which three appear on the spire; around the umbilicus is a fifth series less distinct: with crowded regular transverse obtuse fine raised lines: spire with the outlines moderately convex, truncated with the loss of two whorls; whorls remaining four and one-half, quite convex, with a rather deep suture: aperture slightly detached from the penult whorl; inner peritreme in-

distinct; outer peritreme moderately expanded, except on the left side, which is not reflected: umbilicus small.

Mean divergence about 38° ; length .62 inch; greatest breadth .36 inch; least breadth .26 inch.

Inhabits New-Hope, Westmoreland.

CYCLOSTOMA TAPPANIANUM. Shell elongate conoid: brownish orange, with a paler band below the periphery of the last whorl, with the columella brown: with crowded strong transverse striae, and less strongly impressed spiral striae; spire with the outlines moderately convex, truncated with the loss of — whorls; remaining whorls four, slightly convex, with a moderately impressed suture: aperture ovate, acute above, with the margin not reflected but sharp: umbilicus indistinct.

Mean divergence about 30° ; length .41 inch; greatest breadth .2 inch; least breadth .18 inch.

Named in honor of the Hon. Benjamin Tappan, of Ohio. This species was found in a lot of Jamaica shells in the collection of R. G. Marshall, Esq., of Morant Bay.

A variety of *Cyclostoma papyraceum* has the whorls much abbreviated; the last whorl is more abruptly rounded, and the aperture is consequently shorter. It may be called *ABREVIATUM*.

CYCLOSTOMA PERPALLIDUM. This name is given to "No. 20," described on page 148. Having seen a considerable number of specimens, all of which very exactly coincide in their characters, I can no longer hesitate to regard it as a good species, although the operculum is yet unknown.

CYCLOSTOMA DUBIOSUM. This species differs in one very striking character from *C. suturale* Sowb.: it wants the keel next below the suture, in the place of which there is a depression of the upper part of the whorls. We have seen several specimens of this species and many of *C. suturale*, and all of them conform exactly to their respective types. When the operculum of *C. dubiosum* shall have been found, additional peculiarities may be discovered.

STOASTOMA PHILIPPIANUM. Shell subdiscoidal, convex above: pale horn color, subtransparent: surface smooth and shining: spire moderately and convexly elevated: whorls three and one-half, slightly convex, with a moderately impressed suture; last whorl regularly rounded over the periphery, very slightly detached from the penult whorl near the aperture: aperture slightly campanulate: labrum slightly produced beyond the labium, not scalloped: labium in its upper half a little detached from the penult whorl, with the lower half extending below the penult whorl: umbilicus of moderate size, with the spiral lamella excessively developed and usually soldered by its exterior edge to the last whorl, forming over the umbilicus a large arch, which has an opening rather larger than the aperture of the shell. Inhabits Ackendown in Westmoreland.

Mean divergence about 130° ; height .055 inch; least breadth .09 inch; greatest breadth .075 inch.

STOASTOMA AGASSIZIANUM. Shell subdiscoidal: horn color, subtransparent: with, on the last whorl, four very prominent sharp carinæ, viz., one along the periphery, and two below and one above, the latter appearing only for a short distance on the penult whorl; with a few fine raised spiral lines on the upper part of the whorls and between the carinæ: spire slightly elevated: whorls three and one-half, planulate, with a moderately impressed suture; last whorl planulate beneath, near the end rapidly descending and slightly detached from the penult whorl: aperture very slightly campanulate: labrum slightly reflected, rounded, not scalloped: labium —: umbilicus of moderate size, with the spiral lamella excessively developed and soldered by its exterior edge to the last whorl, forming over the umbilicus a large arch, which has an opening much larger than the aperture of the shell. In the only specimen now before me, there is, around the lip within, a deposit which contracts the aperture, and rising over the labi-

um in a rather thin curved lamella, extends over half the entrance to the umbilical arch.

Mean divergence 165° ; height .065 inch; least breadth .095 inch; greatest breadth .118 inch.

A small thick variety of *Trochatella pulchella* occurs in Portland, with the spiral ridges remarkably prominent. It may be designated by the name of *MULTICARINATA*. Another variety occurs at the opposite extremity of the island, at New Hope in Westmoreland, which is very large, and has the last whorl well rounded over the periphery, without any keel: it has no sculpture except the impressed spiral lines on the spire and on the upper part of the last whorl. The lip is less expanded than in the type of the species. It may be designated by the name of *NOBILIS*.

Of *Helicina neritella*, a variety, *ANGULATA*, is distinguished by an angular periphery, and by a double and much thickened lip.

GEOMELANIA ILLIANA. Shell conic-cylindric: white: with, on each whorl, about 33 to 35 small obtuse ribs, which are obsolete anteriorly and behind the labrum: spire with rectilinear outlines: apex truncate with the loss of — whorls: whorls remaining six, very convex, with a deep suture: aperture suborbicular, moderately effuse: labrum well expanded and reflected, thin; linguiform part moderately produced obliquely on the side, obtuse: labium well thickened and regularly reflected, slightly disjunct from the penult whorl.

Mean divergence about 11° ; length .25 inch; greatest breadth .085 inch; least breadth .07 inch.

GEOMELANIA PYRAMIDATA. Shell elongate conic: whitish: with, on each whorl, about 28 small obtuse ribs, which, on the last whorl, terminate a little below the periphery: spire with rectilinear outlines: apex usually truncate with the loss of two or three whorls: whorls remaining seven or eight, quite

convex, with a deep suture : aperture widely ovate, moderately effuse : labrum rather thin, slightly reflected : linguiform part obtuse, moderately produced laterally at the lower part of the right side : labium a little thickened and reflected.

Mean divergence about 15° ; length .32 inch ; greatest breadth .11 inch ; least breadth .09 inch.

Geomelania costulosa, *G. exilis*, *G. Hilliana*, and *G. striosa* are as yet unique in the collection of the Hon. Edward Chitty. *G. conica* is unique in the Zoological Museum of Amherst College.

Cylindrella Agnesiana, var. *diminuta*. We are indebted to Dr. A. Barrett for this remarkably small variety, with the following dimensions : length after truncation .67 inch ; breadth .22 inch. In the specimens before us the lip is but slightly expanded. It inhabits Flamstead, in the Port Royal Mountains.

CYLINDRELLA ROBERTSI. Shell elongate, fusiform, widest a little below the middle : pearl white : with, on each side of the suture, a series of very short transverse prominent ribs, which abruptly terminate so as to leave a large portion of the middle of the whorls smooth ; ribs about fifteen on each whorl ; the series below the suture being the larger ; both series are continued on the two angles of the produced part of the last whorl, over on the back part of which each rib is united to its opposite by a small lamella : spire with the outlines quite convex except in the upper third : apex truncate with the loss of — whorls : whorls remaining nine or ten, planulate or slightly concave, with a deep suture ; last whorl widely disjunct in its last third part from the penult whorl, with an angle on the right and another on the lower side : aperture subangular above and below, more angular on the right : lip rather thin, reflected into the plane of the aperture, moderately expanded.

Length .37 inch ; breadth .095 inch.

Named in honor of the Honorable Mr. Roberts of Jamaica, to whom we are indebted for this and other interesting species.

Cylindrella rosea, var. *FORTIS*. Shell as long as var. *major*, (p. 21,) but with less diameter and more cylindric.

CYLINDRELLA ZONATA. Shell cylindric in the lower two-thirds, very robust: pink with a tinge of brown or purple, with a pearl white zone along the suture; pale brown in the aperture: with an elegant silky lustre produced by crowded oblique very fine striae: spire with the outlines convex in their upper half: apex truncate with the loss of — whorls: whorls remaining eight, moderately convex, slightly margined on the lower side, with a moderately impressed suture: aperture similar to that of *C. rosea*, but more dilated in the lower part of the left side, and with the lip less expanded. It resembles *C. cylindrus*, but differs in always having a white zone, and in being often tinged with brown; it is much more robust: the aperture of *C. cylindrus* is more like that of *C. rosea* than of this shell.

Length 1.18 inch; breadth .41 inch.

Cylindrella lata often occurs with a much elongate sub-conic form. This variety may be designated by the name *PRODUCTA*. A specimen is 1.23 inch long and .34 inch broad.

Under *Cylindrella Maugeri* may be comprehended many types, which differ in color, form, and sculpture. These varieties are very local, being strictly limited to their several districts. But many of these districts have two varieties. They all conform with great exactness to a common type, which is of much less than generic value. The very considerable numbers of each variety, their strict conformity to their respective subtypes, and their geographical distribution, seem to indicate a specific value in the differences between them. Yet the number of types is so great and the differences between many of them are so slight, that we may well hesitate to pronounce

them species. It is difficult to avoid the conclusion that the whole group is more comprehensive than a species, while the several local types are of less than specific value, and that it is impracticable to recognise in these shells types of the average value of species.

In attempting to classify such of the varieties as are now before us, we have been surprised at the great constancy of coloring in respect of the kinds and distribution of color. The differences of color in a given variety are almost wholly in their greater or less depth.

The following varieties are in the collection of Mr. Chitty, to whom I am greatly indebted for information respecting them. There are a few more in the collection at Amherst College.

a. Dark colored varieties. In this group, the dark colors fade to a pale brown or cinnamon color.

Var. NIGRESCENS. Shell robust in the lower part, conic above: black on the last whorl and on several of the upper whorls, fading into brown in the middle, with a dingy white stripe anteriorly and a red lip: with a few striæ behind the lip. In some localities the shell is of medium size and form, rather more coarsely striate on the last half of the last whorl, and faintly striated on the first half. Inhabits Portland, and Manchioneal in St. Thomas-in-the-East.

Var. SOLIDA. Shell very thick and robust: very dark or blackish brown at both extremities, pale brown along the middle, with a pure white widening stripe next below the suture of the last whorl; pink in the lip and behind it: very coarsely striated on the last whorl, otherwise feebly striated. In paler specimens a faint tinge of red is seen on both extremities, and the lip is white. Inhabits the vicinity of Peace R. in the east part of Manchester.

Var. LEVIS. Shell robust but rather thin: livid black in the upper whorls, pale livid brown along the middle, anteriorly

with a rapidly widening pure white stripe, which unites behind the lip with a broad transverse white stripe that runs through a large triangular black spot; lip white: without striae. Some pale specimens have a tinge of red along the middle. Inhabits Kilmarnock, in the east part of Westmoreland. In another part of Westmoreland is a subvariety, in which the form is less robust, the anterior white stripe is larger and tinged with yellow, and the transverse white stripe, being interrupted by the black spot, appears more like a short spiral stripe: the lip is rather less reflected, and the aperture smaller and more oblique.

Var. TRICOLOR. Shell rather robust: very dark brown at both extremities, with a narrow slowly widening snow white line next below the suture; lip rose red, a little whitish where it joins the penult whorl: with excessively minute striae behind the lip. This appears to be Dr. Pfeiffer's var. *z*. A subvariety is more slender, paler at the end, and darker in the middle, with the aperture less wide. Inhabits Manchester. Paler specimens occur near Peace R., with the middle whorls of a dingy pearl color.

b. Light colored fasciate varieties, not distinctly striated above the middle whorls. In this group pale yellow fades into a dingy or pearl white, or is replaced by pearl white in fresh shells.

Var. CRASSA. Shell rather small, but robust and thick: dark livid brown at both extremities or bluish grey anteriorly; with a thick white lip; with a narrow white stripe next below the suture of the last whorl, and a slender white line on the anterior keel; otherwise pearl white: with very strong striae on the back of the last whorl, which diminish in ascending the spire, becoming microscopic on the middle whorls. Inhabits Portland.

Var. UNICINCTA. Shell of medium size and form: dingy pale yellow, whiter and sometimes reddish on the last whorl,

with a broad dark brown stripe anteriorly; white on the lip, with a tinge of rose red behind: finely striate near the end of the last whorl. Inhabits Manchester.

Var. *BICINCTA*. Shell either short and robust, or of medium size and form: pale yellow in the upper whorls and in the lip and behind it; on the back of the last whorl pure white with two brownish black stripes; otherwise pearl white: with fine striæ on the last half of the last whorl. This shell appears to be similar to Dr. Pfeiffer's var. γ . Inhabits Westmoreland.

Var. *CONCINNA*. Shell small but robust: on the back of the last whorl pure white, with a short black brown stripe; lip white; otherwise pearl white, more or less tinged with pale yellow, especially on the middle whorls: slightly striated on the back of the last whorl. Inhabits Whitney River estate in the east part of Manchester.

Var. *SINUATA*. Shell not robust and rather thin, with the lip remarkably sinuate: of a dingy pearl white, with, on the last whorl, a fine white line below the suture, and another on the anterior keel; lip pale red, with a tinge of brown behind: with excessively fine striæ on the back of the last whorl. Inhabits the east part of Portland.

c. Light colored varieties, not fasciate, and not distinctly striated above the middle whorls. Changes of color the same as in the preceding group.

Var. *RUFILABRIS*. Shell more or less robust, but rather thin: pearl white, with a tinge of yellow; lip vermilion, sometimes whitish on the inner side: finely striated on the back of the last whorl. Inhabits Portland.

Var. *CITRINA*. Shell more or less robust: sulphur yellow; sometimes pearl white when the lip is pure white; with a pure white, well defined, narrow stripe next below the suture; tinged with red at the end of the last whorl: with excessively fine striæ behind the lip only. Inhabits Manchester.

Var. *fusiformis*, Ad. vide Proc. Bost. Soc. Nat. Hist., Jan.

1, 1845, p. 14. It is of a pearl or ashy white color. It is Dr. Pfeiffer's variety β .

Var. ALBIDA. Shell like var. *citrina*, but with the white stripe reduced to an ill-defined line, slightly tinged with yellow on the penult whorl, with the red tinge very faint.

Var. VALIDA. Shell robust and very thick: pearl white, with a tinge of yellow on the middle or on all the whorls of the spire; last whorl whiter, with a pure white stripe on it next below the suture; lip pure white and very thick: strongly striated on the back of the last whorl, finely striated up to the middle of the shell. Inhabits near Peace R., Manchester.

Var. UNICOLOR. Shell of medium size and form: pale yellow or pearl white, with a white lip: strongly striated on the back of the last whorl, finely striated on the middle whorls. Inhabits Porus in the east part of Manchester.

d. Strongly striated varieties, light colored, not fasciate.

Var. STRIATULA. Shell thick, short, robust: pale greenish yellow, sometimes with a tinge of pale brown or horn color; lip white, thick, and well expanded: with fine regular approximate striæ, which are obsolete only at the summit.

Var. STRIATA. Shell short, robust: pearl white or pale horn color; with a white, much expanded, but rather thin lip: aperture not oblique: with fine regular, rather distinct striæ, which are obsolete only at the summit. Inhabits Waterloo in the back part of Manchester.

Var. CORPULENTA. Shell large and robust, but moderately thickened: pearl white, sometimes with a tinge of red on the upper whorls and anteriorly; lip white; with a large irregular black spot behind the lip: coarsely striated near the end of the last whorl; otherwise with the striæ of the lower half of the shell most lightly impressed. Inhabits St. Elizabeth.

Var. FUSCA. Shell short, robust, but moderately thickened: pale umber color, darker near the end of the last whorl; lip white: lightly striated on the upper whorls; in the rest

regularly and rather coarsely striated. Inhabits Maroon Town in Hanover.

Var. CONICA. Shell widest in the penult whorl: white, with a tinge of red at both ends.

e. Tesselated varieties.

Var. TESSELATA. Shell rather robust: covered with alternate rectangular spots of cream color and amber, which terminate anteriorly at the cream colored keel; black behind the lip, which is white: smooth above, lightly striated on the lower whorls, and coarsely striated on the black part of the last whorl. Inhabits St. Elizabeth.

Var. CINEREA. Shell of medium size and form: pale ash color; black at the summit: with transverse broad umber stripes, which are numerous and deeply colored on the upper whorls, distant and pale on the middle whorls, and obsolete on the last whorl; with a dark brown line along the suture and another on the anterior keel; lip white, with a black stripe behind on the right, and a black spot behind on the left: back of the last whorl distinctly striated, otherwise very lightly striated. Inhabits near Accompong town, in the borders of St. Elizabeth, St. James, and Trelawney.

f. Aberrant slender forms.

Var. GRACILIS. Shell quite slender: pearl white, with a pure white keel and lip: at the end of the last whorl coarsely striated; otherwise with excessively minute striæ.

Var. INTEGRÆ. Shell quite slender: dull white, with a clear white lip: striæ very oblique, quite distinct on the last whorl, very minute on the spire. The only specimen before me is not truncated. Inhabits Maroon Town in Hanover.

We have been assured by Robert Swift, Esq., and by Rev. E. Hartvig, of St. Thomas, (W. Ind.,) that *Cylindrella Maugeri* does *not* occur in that island.

The following forms of *Cylindrella* belong to the group, of

which *C. Dunkeri* is the type. The differences, although very constant, are small, except in size. In this respect the differences are both greater and less constant. Since however the peculiarities extend to many characters, as size, general form, form of the whorls and of the aperture, the sculpture, and color, we regard them provisionally as species, although it must be acknowledged that the varieties of *C. Maugeri* have nearly as good a claim to this rank. The same general remarks on their distribution might be made, as in the case of *C. Maugeri*.

CYLINDRELLA PRINCEPS. Shell like *C. Dunkeri*, but differing in the following characters: it is much larger; is of a reddish brown or horn color; the striae are much finer, being nearly microscopic; the whorls are flat: aperture elliptical and angulated at the lower extremity; lip quite thick: it loses about eight whorls by truncation and has twelve remaining. Inhabits Swift R. head, St. George. Length .98 inch; breadth .15 inch.

CYLINDRELLA ELATIOR. This is also a larger shell than *C. Dunkeri*, thicker, and strongly striated, with the whorls more planulate: it is much longer and more slender than *C. rubra*. Inhabits Westmoreland. Length .93 inch; breadth .13 inch.

Achatina striosa is possibly only a variety of *Bulimus octonoides* with the columella truncated.

ACHATINA PROXIMA. Shell conic but slender: very pale brown or horn color; with dark brown transverse stripes, about three on each whorl, less distinct on the upper whorls: with fine regular transverse small elevated lamellae: apex moderately obtuse, smooth on the nuclear whorls: spire long, with the outlines nearly rectilinear: whorls eight, planulate, abruptly shouldered above, with a rather deep suture: aperture small, ovate: labrum thin and sharp: columella nearly straight. This shell resembles *A. Blandiana*. Its divergenco

in the upper whorls is less than in that shell, but its mean divergence is greater.

Mean divergence about 18° ; length .385 inch; breadth .095 inch; length of aperture .11 inch. Inhabits near Swift River head, Portland.

ACHATINA SOLITARIA. Shell elongate, ovate conic: pale brown; with dark brown transverse lines, about three on each whorl, wanting on the first two or three whorls: with excessively minute crowded transverse striæ: spire with the outlines a little convex: apex rather small: whorls eight, moderately convex, slightly shouldered, with a rather deep suture; last whorl subplanulate, long: labrum thin, sharp, a little produced in the middle: columella well produced and turning a little to the left.

Mean divergence about 20° ; length .52 inch; breadth .15 inch; length of aperture .185 inch. Inhabits New Hope, Westmoreland.

SPIRAXIS BREVIS. Shell long-ovate: pale horn color, translucent: shining, smooth anteriorly, otherwise with rather numerous microscopic striæ: spire with the outlines moderately curvilinear: apex rather small: whorls six, moderately convex, with a well impressed suture: aperture ovate: labrum thin and sharp: columella with the edge moderately projected into the aperture.

Mean divergence about 20° ; length .19 inch; breadth .07 inch; length of aperture .08 inch.

The variety of *Spiraxis aberrans*, which was described on page 88 as destitute of the transverse brown stripes, may be designated by the name UNICOLOR.

Bulimus mirabilis and *B. anomalus* may be referred to the genus *Spiraxis*.

BULIMUS HORTENSIS. Shell much elongate, conic: horn

color, (or black in the upper whorls, and lemon yellow in the lower whorls, when containing the animal alive): with numerous microscopic striæ: spire with the outlines nearly rectilinear: apex small: whorls eight or nine, moderately convex, with a well impressed suture: aperture very thin and sharp: columella straight. The whorls are proportionally shorter, and the aperture is wider than in *B. subula*, Pfr., the revolution of the whorls being much less oblique. It nearly resembles *B. octonoides*.

Mean divergence about 18° ; length .42 inch; breadth .12 inch; length of aperture .12 inch. Inhabits gardens in Kingston.

BULIMUS MACROSPIRA. Shell much elongated, conic: pale horn color, or brownish, with a few scattering stripes of dark brown: shining, with excessively minute distant striæ: spire with the outlines a little concave above, otherwise slightly curvilinear: apex obtuse, rather small: whorls twelve, a little convex, with a well impressed suture; last whorl short: aperture ovate, rather wide: labrum thin and sharp: columella nearly straight.

Mean divergence about 18° ; length .8 inch; breadth .22 inch; length of aperture .2 inch. Inhabits Maroon Town, in St. James.

Helix Chittiana, var. *BICOLOR*, is distinguished by a white lip, and by having the whole lower surface, except the whitish zone at the periphery, of a blackish brown.

A series of specimens connects *H. cara* with *H. amabilis* so closely, that the latter cannot be entitled to rank as more than a variety. Some which have the color of *H. cara*, and a well elevated spire, but otherwise resemble *H. amabilis*, may be called var. *MEDIA*.

HELIX SWAINSONIANA. Shell depressed, conic, subplanulate beneath; with a moderately sharpened periphery, on both

sides of which the outline is convex : dingy or brownish white ; with an ill defined infrasutural line of dark brown, commencing a little below the apex, and a spiral stripe of the same color below the middle of the whorls, commencing at the middle of the spire, and another stripe on the last whorl below the periphery ; with the lip white : indistinctly granulated ; with fine irregular striae of growth : spire convex, moderately elevated : whorls nearly five, concave in the lower part, in the rest convex, with the suture lightly impressed : aperture transversely ovate or elliptical, with the lip well reflected backwards, and much thickened, with three teeth on the lower side, of which the outer pair are joined together at base, and all of which have corresponding external furrows : umbilicus deep, partly covered by the expanded and thickened columella. Inhabits Westmoreland.

Greatest breadth 1.13 inch ; least breadth .98 inch ; height .6 inch ; diameter of umbilicus .2 inch.

Helix ingens, var. IMPERFORATA, without an apparent umbilicus, is more common than the umbilicated type. Another variety, INDIGNA, is of much less size, and is much less acute at the periphery. It is also imperforate.

HELIX CONSANGUINEA. Shell depressed, rather more convex above than below : very dark reddish brown, with a pale brown or dingy white lip ; often with a pale stripe on the periphery : finely but strongly granulated on both sides : spire regularly convex : whorls rather more than four and one-half, moderately convex, a little depressed at the lower side next the suture ; last whorl with a narrow not very prominent keel on the periphery : aperture transversely ovate, much dilated, and produced laterally ; labrum well reflected backwards, and thickened, with four teeth below, of which three have corresponding deep external furrows, labium closely appressed but thick : umbilicus rather narrow, deep, partly covered with the dilated columella. Inhabits Portland.

Greatest breadth 1.08 inch ; least breadth .94 inch.

A variety, *IMPERFORATA*, is larger, rather less depressed, and without an open umbilicus. It inhabits Swift River head, in St. George. Another variety, *CARINATA*, is more sharply and prominently carinated at the periphery. It inhabits the other end of the island, at Belle Isle, in Westmoreland.

Helix anomala, var. *PALLESCENS*, is horn colored, sometimes with a reddish brown tinge, without a white line on the periphery. The umbilicus is somewhat narrower, and the shell is higher in the last whorl. It inhabits Accompong Town, in the back part of St. Elizabeth. Another variety, *CONVEXA*, is remarkably convex on both sides, especially beneath, and has a very narrow umbilicus. It inhabits the borders of Manchester and St. Elizabeth.

Helix Bainbridgei, var. *PRETIOSA*, differs from the ordinary type of the species in being white, with an exceedingly thin greenish epidermis on the last whorl ; the lip is of a very pure snow white color ; and the last whorl is larger and higher.

HELIX BUDDIANA. Shell subglobose, obliquely ellipsoidal : white, with a very thin yellowish brown epidermis : with very fine striae of growth ; some specimens have, on the last whorl, lightly impressed microscopic spiral lines, and rarely its surface is microscopically punctulated : spire convex : apex very obtuse : whorls nearly four and one-half, convex, with a rather deep suture : last whorl very large and globose : aperture rather large, with a semicircular outline on the right, and a sinuate outline on the left : labrum thin and sharp : labium with a dilated closely appressed deposit : umbilicus wanting. Allied to *H. tunicata* and *H. munda*. Inhabits Westmoreland.

Greatest breadth .65 inch ; least breadth .55 inch ; height .53 inch.

Named in honor of my Conchological friend, Dr. B. W. Budd, of New-York City.

Fresh specimens of *Helix Blandiana* have reddish brown transverse ill defined stripes alternating with pale brown spaces.

HELIX PULCHRIOR. Shell subconic, rather thin : of a very light burnt-sienna color, sometimes with a tinge of cream color, on which are more or less numerous ill defined unequal transverse lines of a rich dark burnt-sienna ; often with a tinge of ash color on the upper whorls ; with a spiral rather dark line of the burnt-sienna a little below the suture, above which the transverse dark lines rarely extend ; with another very dark spiral stripe of the same color along the suture and on the periphery of the last whorl ; with a well defined large very dark circular spot of the same color on the umbilical region, which is sometimes margined by a pale circle, exterior to which is a line of rather dark burnt-sienna ; sometimes with a fine spiral line of the same color on each side of the periphery : surface moderately shining, with fine close striæ of growth : spire with the outlines moderately curvilinear : whorls five, a little convex ; last whorl subangular on the periphery : aperture wider than long : lip thin and rather sharp, slightly reflected : umbilicus wanting. This most richly colored of the Jamaica Helices is allied to *H. subconica*. Inhabits Portland.

Greatest breadth .65 inch ; least breadth .57 inch ; height .5 inch.

A variety has the dark umbilical spot margined with a circle of bright cream color, with another stripe of the same next below the dark periphery. It inhabits St. Thomas-in-the-East.

HELIX JACOBENSIS. Shell depressed conic, transversely ovate : yellowish horn color : with very fine well impressed crowded striæ of growth : spire with the outlines but little

convex : whorls four and one-half to five, a little convex, with a moderately impressed suture ; last whorl subangular : aperture transversely ovate, laterally dilated : lip but little reflected and thickened except in the columellar part, which is well thickened, reflected, and appressed : umbilicus wanting. In form this shell most resembles a very depressed *H. fusco-cincta*, but is much more dilated laterally near the aperture.

Greatest breadth .94 inch ; least breadth .75 inch ; height .6 inch.

This species is named for its habitat, the parish of St. James.

HELIX SPRETA. Shell orbicular, moderately depressed : very pale horn color, translucent : smooth : spire with the outlines a little curvilinear : whorls five, quite convex, shouldered, with a rather deep suture ; last whorl well rounded : aperture sublunate : labrum thin and sharp : umbilicus rather narrow and deep. This species is best described by comparison with *H. peraffinis* and *H. Boothiana*. Above, the spire is nearly as much depressed as in the former species : beneath, the last whorl is nearly as convex as in the latter, while the umbilicus is as wide as in the former ; the aperture is not so wide as in *H. peraffinis* nor so high as in *H. Boothiana*.

Greatest breadth .25 inch ; least breadth .22 inch ; height .17 inch.

Variety *ERRANS* differs from the above, in having the whorls less shouldered and consequently the suture less deep, and in having the region around the umbilicus somewhat thickened internally so as to be opaque.

Helix epistylum var. *MINOR* differs from the common type of the species in being much smaller, with a more rounded outline ; beneath it is considerably more convex ; the surface is less shining. Greatest breadth .52 inch ; least breadth .49 inch ; height .45 inch. It inhabits Westmoreland. At the opposite extremity of the island, in Portland, *H. epistylum* is

represented by a variety which is more variable in size, and the small mature specimens are nearly intermediate between var. minor and the common large type, which inhabits Manchester and other middle parts of the island. At Easington in St. David's, is another variety, distinguishable from the small specimens, which occur in the neighboring district of Portland, by the entire absence of any internal lamina or teeth. It may be called *DELAMINATA*.

The same name, *DELAMINATA*, may be given to a variety of *H. osculans* which wants the internal lamina.

Proserpina nitida var. *PLANULATA* is distinguished by being much flattened above.

Descriptions of New fresh-water SHELLS which inhabit JAMAICA. By C. B. ADAMS. April, 1851.

PHYSA JAMAICENSIS. Shell long ovate, acuminate: brownish horn color: with microscopic striae of growth, and some lightly impressed microscopic spiral striae: apex acute: spire well lengthened, with the outlines slightly curvilinear, with a well impressed suture: aperture long ovate: lip thin.

Length of aperture .32 inch; total length .48 inch; breadth .25 inch.

This species was found plentifully in a tank at Malvern, more than 1000 feet high, in the isolated group of the St. Cruz Mountains in St. Elizabeth. The structure of the country for many miles in every direction is such that no water is ever seen standing on the surface. Through innumerable subterranean fissures rain immediately percolates to unseen depths. Artificial tanks are therefore the only places where fresh water

shells can exist in this region. We are quite ignorant of the manner in which this species was introduced to its habitat.

NERITINA JAMAICENSIS. Shell obliquely ellipsoidal, rather thin: white near the apex: otherwise covered with violet, which is sometimes tinged with dark gray, with lighter and darker shades in spiral bands, and is more or less interrupted by lines of growth and irregular white spots: surface smooth and shining: apex rather prominent: spire convex: whorls nearly three, with a fine but well impressed sutural line: labium smooth, moderately thickened.

Length of spire .07 inch; height .3 inch; breadth .32 inch.

NERITINA TENEBRICOSSA. Shell obliquely ellipsoidal, rather thin: black, with numerous angular translucent spots of horn color: white on the labium, blue within the aperture: with numerous excessively fine spiral and incremental striae: apex quite prominent: spire convex: whorls two and one-half, with a very fine but well impressed sutural line: labium smooth, moderately thickened. Inhabits Black River.

Length of spire .06 inch; height .36 inch; breadth .41.

It affords us much pleasure to find two new fluviatile species of this genus in the Jamaica Fauna. With the exception of *N. punctulata*, all the other species are strictly marine, living upon the open sea-shore. If authors are correct in stating that St. Domingo is the habitat of *N. punctulata*, that species is the only fluviatile shell in Jamaica, belonging to a genus of well characterized species, which is not peculiar to the island. Possibly Lamarek's statement of habitat is erroneous, arising from the shells having gone to France by way of St. Domingo.

Remarks on the Habitats of certain species of LAND SHELLS.

By C. B. ADAMS, Professor of Zoology in Amherst College, Massachusetts, and EDWARD CHITTY, Chairman of Quarter Sessions, JAMAICA. April, 1851.

In the following catalogue of the shells of Jamaica, some species are enumerated which we have not yet been able to find in the island. Some described species are doubtfully identified with our specimens. Others, which are clearly identical with Jamaica shells, have been referred by authors to other habitats. In the hope of eliciting information from any, who may be more particularly acquainted with the facts, we invite the attention of our readers to such species.

The following species, said to inhabit Jamaica, we have not found. *Cyclostoma labeo* has been described by many authors as a Jamaica species. It is very unlike any shell that we have seen or heard of in Jamaica. *Cyclostoma asperulum*, Sowb., may perhaps be identical with some of our shells. Its affinities confirm the statement of its habitat. As to *Cyclostoma corrugatum*, see C. C., page 141.

Trochatella Greyana Pfr. and *Helicina Gossei* Pfr. we have not identified. *Helicina picta* Fer., said to occur both in Martinique and in Jamaica, we have excluded from the catalogue. *Cylindrella alabastrina* Pfr., a sinistrorsal variety of *C. Humboldtiana* Pfr., and a uniformly white variety of *C. variegata* Pfr., Cuban species, are also said to occur in Jamaica, but we have not yet identified them.

Bulimus rufescens Gray and *Helix Martiniana* Pfr. are also unknown to us. The latter is referred to Jamaica on the authority of Attanasio, a dealer who collected some of the shells of Jamaica during a visit to the island. On the same authority *H. Okeniana* Pfr. is said to occur at Savanna-la-mar. Having seen a specimen kindly loaned to us by Mr. Cuming, we think it distinct from any of our shells. It ap-

pears to be a Jamaica type. *Helix angustata* Fer. is said to occur both in Hayti and in Jamaica. (Mke. in Zeitschr. f. Malak. 1845, p. 61.) We have never seen it in this island.

We are also somewhat doubtful of the identity of *Cyclostoma lincinellum* Lam. with *C. spinulosum* Ad., and of *C. Banksianum* Sowb. with *C. hyacinthinum* Ad.

Several species of Jamaica shells, described by Mr. Sowerby, are said by him, on the authority of Mr. G. C. Bainbridge, of Liverpool, to inhabit Demerara. To the species mentioned by us on pp. 47-9, and p. 108, (Cont. Conch.) may be added *Cyclostoma mirabile* Wood, if, as we now suppose, that species is identical with *C. decussatulum* Ad. In the absence of direct information concerning the shells of Mr. Bainbridge, we must be allowed to doubt whether species, which inhabit the rocky mountains of Jamaica, do also inhabit Demerara.

The following species also are known to us to inhabit Jamaica, but are said to occur in other islands: *Cylindrella brevis* Pfr. in Martinique and Cuba; *Achatina leucozonias* in Martinique; *Dominicensis* in Hayti; and *A. venusta* var. *unicolor* Pfr. in Demerara. We mention only those examples which are most likely to be erroneously referred to other islands.

We suppose the following species, which have been described by one of us, to be natives of Jamaica, but they are not certainly known to us as such. *Cyclostoma Newcombianum* was received from Dr. Newcomb as a Jamaica shell. *Cyclostoma aurora* formed a part of a valuable collection of the shells of Jamaica, which had been made by the late Mrs. W. J. Wilkinson. *Cyclostoma Tappanianum* was presented to us by R. G. Marshall, Esq., of Morant Bay, being the only terrestrial species in a small collection of supposed Jamaica shells, which belonged to the late Mr. Houseman, a musician, in Kingston.

The following errata occur in No. 8 : On p. 137, first line, for "rugodens;" read "rugose and". On p. 139 erase the 13th line. At the bottom of p. 140, we neglected to mention *Cyclostoma asperulum* as belonging to the group of shells there mentioned.

CATALOGUE

OF THE

LAND SHELLS WHICH INHABIT JAMAICA.

BY C. B. ADAMS,

PROFESSOR OF ZOOLOGY, ETC., IN AMHERST COLLEGE, MASSACHUSETTS.

APRIL,

1851.

FAMILY CYCLOSTOMIDÆ.

CYCLOSTOMA.

§ 1.

1. *C. anomalum* Ad.

§ 2.

2. *C. pulchrum* Wood.
3. *C. fimbriatulum* Sowb.
 a. var. *docens* Ad.
 b. var. *albinodatum* Ad.
4. *C. Chittyi* Ad.
5. *C. amabile* Ad.
6. *C. Hillianum* Ad.
 a. var. *aculeosum* Ad.
 b. var. *leporilabre* Ad.
7. *C. lincinellum* Lam.
 Syn. (?) *C. spinulosum* Ad.
8. *C. Moussonianum* Ad.
9. *C. scabriculum* Sowb.
 Syn. *C. amandum* Ad.
10. *C. lincinum* Linn.
11. *C. lima* Ad.
12. *C. Blandianum* Ad.

13. *C. retrorsum* Ad.

14. *C. pisum* Ad.

Syn. *C. virgineum* Ad.

§ 3.

15. *C. variabile* Ad.

a. var. *concentricum* Ad.

16. *C. intermedium* Ad.

17. *C. Grayanum* Ad.

Syn. *C. obscurum* Gray.

18. *C. serriferum* Ad.

19. *C. granosum* Ad.

Syn. *C. nodulosum* Ad.

a. var. *aberrans* Ad.

20. *C. pulchrius* Ad.

Syn. *C. Binneyanum* Pfr.

21. *C. mutatum* Ad.

Syn. *C. articulatum* Sowb.

22. *C. mirabile* Wood.

Syn. (?) *C. decussatum* Ad.

23. *C. mirandum* Ad.

24. *C. moribundum* Ad.

25. *C. monstrosus* Ad.

§ 4.

26. *C. Vilkinsoni* Ad.
 27. *C. modestum* Ad.
 28. *C. Campbellii* Ad.
 29. *C. avena* Ad.
 30. *C. Shepardianum* Ad.
 31. *C. xanthostoma* Sowb.
 a. var. *albilabre* Ad.
 32. *C. tenuistriatum* Ad.
 33. *C. ignilabre* Ad.
 a. var. *albilabre* Ad.
- § 5.
34. *C. Newcombianum* Ad.
 35. *C. fascia* Gray.
 a. var. *proximum* Ad.
 36. *C. Angustæ* Ad.
 a. var. *nitens* Ad.
 b. var. *testudineum* Ad.
 c. var. *rufilabre* Ad.
 37. *C. sagittiferum* Ad.
 38. *C. thysanoraphe* Sowb.
 39. *C. Jayanum* Ad.
 Syn. *C. solidum* Ad. non Mke.
 a. var. *rufilabre* Ad.
 b. var. *nigrilabre* Ad.
40. *C. Redfieldianum* Ad.

41. *C. labeo* Müll.
 42. *C. Humphreysianum* Pfr.
 Syn. *C. pictum* Sowb.
 43. *C. interruptum* Lam. non
 Deless.

Syn. *C. ambiguum* Deless.
 Chenu. non Lam.

44. *C. Chevalieri* Ad.
 a. var. *album* Ad.
 b. var. *virgatum* Ad.

§ 6.

45. *C. album* Lam.
 a. var. *fuscum* Ad.
 46. *C. Bronnii* Ad.
 a. var. *fuscolineatum* Ad.
 47. *C. Banksianum* Sowb.
 a. var. *hyacinthinum* Ad.

§ 7.

48. *C. Yallahense* Ad.
 49. *C. lamellosum* Ad.
 50. *C. tectilabre* Ad.

§ 8.

51. *C. pauperatum* Ad.
 52. *C. simulans* Ad.
 53. *C. crenulosum* Ad.
 54. *C. columna* Wood.
 Syn. (?) *C. 5-fasciatum* Ad.
 55. *C. Sauliæ* Sowb.
 56. *C. sericinum* Ad.
 57. *C. maritimum* Ad.
 58. *C. aurora* Ad.
 59. *C. Tappanianum* Ad.
 60. *C. Adamsi* Pfr.
 61. *C. fecundum* Ad.
 n. var. *distinctum* Ad.
 62. *C. Griffithianum* Ad.
 63. *C. mordax* Ad.
 64. *C. muticum* Ad.
 65. *C. armatum* Ad.
 66. *C. papyraceum* Ad.
 a. var. *abbreviatum* Ad.

§ 9.

67. *C. Duffianum* Ad.
 68. *C. corrugatum* Sowb.
 69. *C. jugosum* Ad.
 70. *C. pallescens* Ad.
 71. *C. subrugosum* Sowb.
 72. *C. Jamaicense* Chem.
 73. *C. seminudum* Ad.
 74. *C. varians* Ad.
 75. *C. crassum* Ad.
 76. *C. perpallidum* Ad.
 77. *C. asperulum* Sowb.
 78. *C. dubiosum* Ad.
 79. *C. suturale* Sowb.

STOASTOMA.

§ 1.

80. *S. Agassizianum* Ad.
81. *S. Philippianum* Ad.

§ 2.

82. *S. Gouldianum* Ad.
83. *S. Vilkinsoniæ* Ad.
84. *S. Tappanianum* Ad.
85. *S. Blandianum* Ad.
86. *S. Hollandianum* Ad.
87. *S. Anthonianum* Ad.
88. *S. Fadyenianum* Ad.
89. *S. Petitianum* Ad.
90. *S. Pfeifferianum* Ad.
91. *S. Cumingianum* Ad.
92. *S. Chittyanum* Ad.
93. *S. pisum* Ad.
94. *S. Lindsleyanum* Ad.
95. *S. Redfieldianum* Ad.
96. *S. Moricandianum* Ad.
97. *S. Jayanum* Ad.
98. *S. Leanum* Ad.

LUCIDELLA.

99. *L. aureola* Gray.
a. var. *granulosa* Ad.

TROCHATELLA.

100. *T. Tankervillii* Gray.
101. *T. pulchella* Gray.
a. var. *multicarinata* Ad. †
b. var. *nobilis* Ad.
102. *T. Grayana* Pfr.
103. *T. Josephinæ* Ad.
a. var. *pulchra* Ad.
104. *T. tenuis* Ad.

HELICINA.

§ 1.

105. *H. palliata* Ad.
a. var. *labiosa* Ad.
106. *H. Brownii* Gray.
107. *H. consanguinea* Ad.
a. var. *soror* Ad.
108. *H. hirsuta* Ad.
109. *H. microstoma* Ad.
110. *H. Hollandi* Ad.
111. *H. pusilla* Ad.
112. *H. macilenta* Ad.

§ 2.

113. *H. maxima* Sowb.
a. var. *citrina* Ad.
114. *H. nobilis* Ad.
115. *H. albolabris* Ad.
116. *H. citrinolabris* Ad.
117. *H. dubiosa* Ad.
a. var. *intermedia* Ad.
118. *H. solitaria* Ad.
Syn. II. *Guildingiana* Pfr.
119. *H. affinis* Ad.
120. *H. megastoma* Ad.
121. *H. Gossei* Pfr.

§ 3.

122. *H. Adamsiana* Pfr.
123. *H. depressa* Gray.
Syn. II. *Leana* Ad.
a. var. *valida* Ad.
124. *H. lineata* Ad.

§ 4.

125. *H. neritella* Lam.
a. var. *angulata* Ad.
126. *H. ampliata* Ad.
127. *H. Jamaicensis* Sowb.
128. *H. aurantia* Gray.

§ 5.

129. *H. costata* Sowb.

TRUNCATELLA.

130. *T. scalaris* Mich.
 Syn. T. Cumingii Ad.
 Syn. T. costata Pfr.
 131. *T. modesta* Ad.
 132. *T. Adamsi* Pfr.
 Syn. T. scalariformis Ad.
 133. *T. succinea* Ad.

141. *G. expansa* Ad.
 142. *G. affinis* Ad.
 143. *G. media* Ad.
 144. *G. vicina* Ad.

§ 3.

145. *G. minor* Ad.
 146. *G. Hilliana* Ad.
 147. *G. exilis* Ad.

GEOMELANIA.

§ 1.

134. *G. Greyana* Ad.

§ 2.

135. *G. fortis* Ad.
 136. *G. Jamaicensis* Pfr.
 137. *G. magna* Ad.
 138. *G. procera* Ad.
 139. *G. gracilis* Ad.
 a. var. parva Ad.
 140. *G. typica* Ad.
 a. var. pygmæa Ad.

148. *G. pauperata* Ad.
 149. *G. Beardsleana* Ad.
 150. *G. pygmæa* Ad.

§ 5.

151. *G. conica* Ad.
 152. *G. pyramidata* Ad.

§ 6.

153. *G. costulosa* Ad.
 154. *G. striosa* Ad.
 155. *G. elegans* Ad.

FAMILY HELICIDÆ.

CYLINDRELLA.

§ 3.

§ 1.

156. *C. gracilis* Wood.
 157. *C. elongata* Chem.
 Syn. C. Cumingii Ad.
 Syn. C. Chemnitziana (Helix) Fer.

164. *C. seminuda* Ad.
 165. *C. Robertsi* Ad.
 166. *C. costulata* Ad.
 167. *C. costulosa* Ad.

§ 4.

§ 2.

158. *C. Agnesiana* Ad.
 a. var. diminuta Ad.
 159. *C. alba* Ad.
 a. var. striatula Ad.
 160. *C. subula* Fer.
 [161. *C. alabastrina* Pfr.
 162. *C. Humboldtiana*, var. β Pfr.
 163. *C. variegata*, var. γ Pfr.]

168. *C. Hydeana* Ad.
 Syn. Bulimus Gossei Pfr.

§ 5.

169. *C. Gossei* Pfr.
 170. *C. Maugeri* Wood.
 a. var. nigrescens Ad.
 b. var. solida Ad.
 c. var. levis Ad.
 d. var. tricolor Ad.

- e. var. *crassa* Ad.
- f. var. *unicincta* Ad.
- g. var. *bicincta* Ad.
- h. var. *concinna* Ad.
- i. var. *sinuata* Ad.
- j. var. *ruflabris* Ad.
- k. var. *citrina* Ad.
- l. var. *fusiformis* Ad.
- m. var. *albida* Ad.
- n. var. *valida* Ad.
- o. var. *unicolor* Ad.
- p. var. *striatula* Ad.
- q. var. *striata* Ad.
- r. var. *corpulenta* Ad.
- s. var. *fusca* Ad.
- t. var. *conica* Ad.
- u. var. *tesselata* Ad.
- v. var. *cinerea* Ad.
- w. var. *gracilis* Ad.
- x. var. *integra* Ad.

§ 6.

- 171. *C. Hollandi* Ad.
- a. var. *Augustæ* Ad.
- 172. *C. procera* Ad.
- 173. *C. montana* Ad.
- 174. *C. rosea* Pfr.
- a. var. *magna* Ad.
- b. var. *major* Ad.
- c. var. *fortis* Ad.
- d. var. *ambigua* Ad.
- 175. *C. cylindrus* Chem.
- 176. *C. rubella* Ad.
- 177. *C. zonata* Ad.
- 178. *C. aspera* Ad.
- 179. *C. brevis* Pfr.
- a. var. *obesa* Ad.
- b. var. *columna* Ad.
- c. var. *intermedia* Ad.
- 180. *C. Gravesii* Ad.
- 181. *C. lata* Ad.
- a. var. *producta* Ad.
- 182. *C. nobilior* Ad.
- 183. *C. carnea* Ad.
- a. var. *cerina* Ad.
- 184. *C. sanguinea* Pfr.
- 185. *C. pupæformis* Ad.

§ 7.

- 186. *C. humilis* Ad.

- 187. *C. inornata* Ad.

- 188. *C. simplex* Ad.

§ 8.

- 189. *C. pusilla* Ad.

- 190. *C. rubra* Ad.

- 191. *C. elatior* Ad.

- 192. *C. princeps* Ad.

- 193. *C. Dunkeri* Pfr.

- 194. *C. similis* Ad.

- 195. *C. tenella* Ad.

- 196. *C. tenera* Ad.

ACHATINA.

- 197. *A. solitaria* Ad.

- 198. *A. ligata* Ad.

- 199. *A. Jamaicensis* Pfr.

- 200. *A. procera* Ad.

- 201. *A. Griffithii* Ad.

- 202. *A. Philippiana* Pfr.

- 203. *A. elegans* Ad.

- 204. *A. venusta* Ad.

- 205. *A. leucozonias* Walch.

- 206. *A. Dominicensis* Gm.

- 207. *A. nitida* Ad.

- 208. *A. angustoma* Ad.

- 209. *A. Ingallsiana* Ad.

- 210. *A. unicolor* Ad.

- 211. *A. Gayana* Ad.

- 212. *A. nemorensis* Ad.

- 213. *A. similis* Ad.

- 214. *A. Phillipsii* Ad.

- 215. *A. arcuata* Pfr.

- 216. *A. puella* Ad.

- 217. *A. tenera* Ad.

- 218. *A. longispira* Ad.

- 219. *A. proxima* Ad.

- 220. *A. Blandiana* Ad.

- 221. *A. propinqua* Ad.

222. *A. osculans* Ad.

§ 2.

223. *A. perplexa* Ad.253. *B. rufescens* Gray.224. *A. Gossei* Pfr.254. *B. erubescens* Pfr.225. *A. costulata* Ad.255. *B. immaculatus* Ad.226. *A. gracilior* Ad.256. *B. zebra* Müll.227. *A. costulosa* Ad.Syn. *B. undatus* Brug.228. *A. curvilabris* Pfr.

§ 3.

229. *A. vicina* Ad.257. *B. macrospira* Ad.230. *A. pellucens* Ad.231. *A. levis* Ad.

PUPA.

232. *A. micans* Ad.

§ 1.

233. *A. iota* Ad.258. *P. exilis* Ad.234. *A. octona* Chem.235. *A. striosa* Ad.

§ 2.

SPIRAXIS.

259. *P. fallax* (?) Say.236. *S. costulosa* Ad.260. *P. lata* Ad.237. *S. inusitata* (*Achatina*) Ad.261. *P. contracta* (?) Say.238. *S. mirabilis* (*Bulimus*) Ad.262. *P. tenuidens* Ad.239. *S. anomala* (*Achatina*) Ad.263. *P. hexodon* Ad.240. *S. brevis* Ad.264. *P. servilis* Gould.241. *S. aberrans* (*Achatina*) Pfr.265. *P. Jamaicensis* Ad.a. var. *unicolor* Ad.

§ 3.

266. *P. striatella* (?) Pfr.

BULIMUS.

SUCCINEA.

§ 1.

267. *S. angustior* Ad.242. *B. minimus* Ad.268. *S. Sagra* (?) Orb.243. *B. striatellus* Ad.269. *S. latior* Ad.244. *B. terebella* Ad.270. *S. contorta* Ad.245. *B. pauperculus* Ad.

HELIX.

246. *B. hortensis* Ad.

§ 1.

247. *B. octonoides* Ad.271. *H. Martiniana* Pfr.248. *B. pallidus* Ad.272. *H. peracutissima* Ad.249. *B. monodon* Ad.273. *H. soror* Fer.250. *B. nitidiusculus* Ad.274. *H. cara* Ad.251. *B. subula* Pfr.Syn. *B. procerus* ? Ad.a. var. *media* Ad.252. *B. læviusculus* Ad.b. var. *amabilis* Ad.

275. *H. Chittyana* Ad.
 276. *H. patina* Ad.
 a. var. *nobilis* Ad.
 277. *H. fluctuata* Ad.
 278. *H. ingens* Ad.
 a. var. *imperforata* Ad.
 b. var. *indigna* Ad.
 279. *H. acuta* Lam.
 a. var. *acutissima* Lam.
 280. *H. fuscolabris* Ad.
 281. *H. lucerna* Müll.
 282. *H. fortis* Ad.
 283. *H. Okeniana* Pfr.
 284. *H. Swainsoniana* Ad.
 285. *H. tridentina* Fer.
 286. *H. Bronni* Pfr.
 287. *H. valida* Ad.
 288. *H. consanguinea* Ad.
 a. var. *imperforata* Ad.
 b. var. *carinata* Ad.
 289. *H. picturata* Ad.
 290. *H. invalida* Ad.
 291. *H. sinuata* Müll.
 a. var. *propenuda* Ad.
 b. var. *candescens* Ad.
 292. *H. strangulata* Ad.
 293. *H. anomala* Pfr.
 a. var. *pallescentes* Ad.
 b. var. *convexa* Ad.
 294. *H. Bainbridgei* Pfr.
 a. var. *pretiosa* Ad.
 295. *H. Spengleriana* Pfr.

§ 2.

296. *H. Redfieldiana* Ad.

§ 3.

297. *H. aspera* Fer.

§ 4.

298. *H. Jamaicensis* Chem.
 Syn. *H. pulla* Gm.

§ 5.

299. *H. angustata* Fer.

No. 9—5.

300. *H. Cubensis*, var. 9 Pfr.
 301. *H. tunicata* Ad.
 302. *H. Buddiana* Ad.
 303. *H. MacMurrayi* Ad.
 304. *H. munda* Ad.
 305. *H. columellata* Ad.
 306. *H. tenerrima* Ad.
 307. *H. graminicola* Ad.
 308. *H. nemoraloides* Ad.
 309. *H. pulchrior* Ad.
 310. *H. Gossei* Pfr.
 311. *H. Blandiana* Ad.
 312. *H. subconica* Ad.
 313. *H. fuscocincta* Ad.
 314. *H. virginea* Ad.
 315. *H. Jacobensis* Ad.
 316. *H. fuscula* Ad.

§ 6.

317. *H. immunda* Ad.
 318. *H. rufula* Pfr.
 319. *H. ptychodes* Pfr.

§ 7.

320. *H. alveus* Ad.

§ 8.

321. *H. perdepressa* Ad.
 322. *H. brevior* Ad.
 Syn. *H. depressa* Ad.
 323. *H. sincera* Ad.
 324. *H. diminuta* Ad.
 325. *H. apex* Ad.
 326. *H. inconspicua* Ad.
 327. *H. peraffinis* Ad.
 328. *H. Boothiana* Pfr.
 Syn. *H. pellucida* Ad.
 329. *H. spreta* Ad.
 a. var. *errans*.
 330. *H. turbiniformis* Pfr.
 Syn. *H. subpyramidalis* Ad.
 331. *H. Anthoniana* Ad.

332. *H. angustispira* Ad.
 333. *H. brevis* Ad.
 334. *H. Hollandi* Ad.
 335. *H. similis* Ad.
 336. *H. arboreoides* Ad.
 Syn. H. Haldemaniana Pfr.
 337. *H. ambigua* Ad.
 338. *H. osculans* Ad.
 a. var. delaminata Ad.
 § 9.
 339. *H. lamellifera* Ad.
 340. *H. pila* Ad.
 341. *H. Foremaniana* Ad.
 342. *H. Cookiana* Gm.
 343. *H. epistylioides* Fer.
 344. *H. alligans* Ad.
 345. *H. epistylum* Müll.
 a. var. minor Ad.
 b. var. delaminata Ad.
 346. *H. torrefacta* Ad.
 347. *H. connectens* Ad.
 348. *H. epistyliulum* Ad.
 § 10.
 349. *H. simulans* Ad.
 350. *H. dioscoricola* Ad.
 § 11.
 351. *H. paludosa* Pfr.
 PROSERPINA.
 352. *P. discoidea* Ad.
 353. *P. opalina* (*Helix*) Ad.
 354. *P. nitida* Sowb.
 a. var. planulata Ad.
 355. *P. pulchra* Ad.
 356. *P. bidentata* Ad.
 357. *P. pisum* Ad.

FAMILY AURICULIDÆ.

MELAMPUS.

358. *M. coniformis* Brug.
 359. *M. flavus* Gm.
 Syn. Auricula monile Lam.
 360. *M. pusillus* Gm.
 Syn. Auricula nitens Lam.

361. *M. coronatus* Ad.
 362. *M. cingulatus* Pfr.

PEDIPES.

363. *P. quadridens* Pfr.
 364. *P. ovalis* Ad.

CATALOGUE OF THE FRESH WATER SHELLS WHICH INHABIT JAMAICA.

-
- 365. *NERITINA punctulata* Lam.
 - 366. " *Jamaicensis* Ad.
 - 367. " *tenebricosa* Ad.
 - 368. *MELANOPSIS lineolata* Gray.
 - 369. *MELANIA spinifera* Ad.
 - 370. *VALVATA pygmæa* Ad.
 - 371. " *inconspicua* Ad.
 - 372. *PALUDINA rivularis* Ad.
 - 373. " *Jamaicensis* Ad.
 - 374. *AMPULLARIA fasciata* (?) Lam.
 - 375. *PLANORBIS MacNabianus* Ad.
 - 376. " *Redfieldi* Ad.
 - 377. " *Haldemani* Ad.
 - 378. " *dentiferus* Ad.
 - " *var. edentatus* Ad.
 - 379. " *pallidus* Ad.
 - 380. " *decipiens* Ad.
 - 381. " *affinis* Ad.
 - 382. " *humilis* Ad.
 - 383. *ANCYLUS obscurus* (?) Hald.
 - 384. " *obliquus* Ad.
 - 385. *PHYSA Sowerbyana* (?) Orb.
 - 386. " *Jamaicensis* Ad.
 - 387. *LIMNÆA umbilicata* Ad.
 - 388. *CYCLAS pygmæa* Ad.
 - 389. " *Veatleyi* Ad.

NOTICE.—The Hon. Edward Chitty of Jamaica having furnished the writer with his duplicates of the land and fresh-water shells of Jamaica, so far as necessary for making out suites, a few collections, each containing nearly all the discovered species,—about 500 species and varieties,—will be put up for sale, at prices from \$100 to \$150. Suites of single genera, and miscellaneous parcels for selection, (with the privilege of returning such shells as may not be wanted,) can also be furnished. It is proper to add, that the object of the sales is not pecuniary profit, but to meet the expenses of an illustrated monograph, the outlay for which probably will much exceed the receipts.

C. B. ADAMS, *Amherst, Massachusetts.*

CONTRIBUTIONS TO CONCHOLOGY.

No. 10.

*On the Nature and Origin of the Species of the TERRESTRIAL
MOLLUSCA in the ISLAND OF JAMAICA. By C. B. ADAMS.
November, 1851.*

NOTE.—This article, and the one which follows, were read before the American Association for the Promotion of Science, in New Haven, at the meeting in August, 1850, and were subsequently published in the Proceedings of the Association. Having failed to obtain extra copies for distribution among conchological friends, we reprint them with a few unimportant alterations.

Notwithstanding the difficulty of exploration in tropical regions, the Island of Jamaica presents remarkable facilities for the investigation of subjects which are connected with the geographical distribution of species. Among the *terrestrial shells*, typical forms exist in great profusion. These forms are of every conceivable grade of value, from varieties up to genera and families. They have also a determinate geographical distribution. The facts on these subjects are even more numerous than those which are expanded over the whole temperate regions of North America. In this respect, therefore, the island is a miniature continent. Probably the same is true of each of the larger Antilles.

The following remarks will be restricted to certain conclusions, which are suggested by these facts. The special description of the facts themselves is reserved for another opportunity.

I. *The Nature of the Species.*

1. Our first conclusion is this ;—that in many groups the species are distinguishable by types * only, and not by well

* A type is the aggregate of distinctive characters. In order to be of specific value it must perpetuate itself in successive generations.

defined limits. This proposition may be illustrated by a figure, in which species are represented by circles, many of which are in contact, and whose areas are sprinkled irregularly with dots, which represent varieties. One central dot represents the type of the species. Some larger dots represent types of a value intermediate between that of species and ordinary varieties. The amount of difference between the types may be represented by their distances. On the boundaries of the species we find varieties which closely resemble their neighbors in the adjacent species, while their affinities with the central types of both species are so nearly balanced, that it is not really a matter of much consequence on which side of them the imaginary boundary line of the species is drawn. On a plane surface, however, we have only an approximation to the truth. A more exact representation of the relations of the types would require the three dimensions of space. It should be observed also, that the boundaries of the circles do not represent any facts, which have an objective existence. With the boundary lines, we represent the species as described in books; without them, we see the species as they exist in nature.

If all the examples of this kind should be enumerated, very few species would remain isolated. Of such, some might be united by further discoveries; while others might remain isolated, since it is a part of the general plan of organic nature that the spaces between the groups shall be unequal, so that some species, some genera, some families, &c., shall stand quite alone.

The principle is not peculiar to the terrestrial mollusca of Jamaica. The Naiadæ and the Melanidæ of the United States, which have been so thoroughly studied by Mr. Lea, of Philadelphia, are exactly in the same case, but the facts are expanded over wider geographical limits. The same is true of the snails and fresh water shells of Europe, of many groups of marine mollusca, of fishes, of birds, and even of mammals.

The special investigation of varieties is rapidly filling up the gaps which were once supposed to exist between species. Not dissimilar is the case of the human species, which graduate into each other in such a manner, that the fact is often used as an argument for confounding all the races in one species. Yet it is admitted that the differences between the human races are much greater than between many distinct species of animals.

Our conclusion is briefly expressed in the proposition, that *species are of the same nature as genera*; that is, are to be founded on types, whether or not an impassable vacuum can be found between the types.

2. The second inference on the nature of the species and higher groups, is this;—that the natural types are not susceptible of being wholly comprehended in a few successive ranks, in each of which all the types shall be of exactly equal value; but there is an indefinite series of types within types, which are inequidistant. If in one group, as that of *Helix ziaua* and the kindred species, it is practicable to establish several species of a given value, in another, as that of *Cylinidrella Maugeri*, it is impossible to find species of the same value. We must either make numerous species of less value, or regard the group as one species of greater value. The same doctrine is illustrated also by the comparison of the genus *Helix*, in which the number of distinct subtypes is very great, with *Succinea*, in which subtypes are indistinguishable. There is no mathematical or physical reason why the generic form of *Succinea* should not have been repeated with a great diversity of subtypes. Yet it is so slightly modified in the species, that Dr. Pfeiffer has grouped them geographically. On the contrary, *Helix* contains nearly one hundred types, of all values intermediate between a generic and a specific value.

In the same manner numerous other genera, families, and

orders in all departments of organic nature may be compared, and the same result obtained.

3. Since the subtypes of species are distributed with great regard to locality, it is obvious that much of the perplexity which results from the graduation of species into each other, is avoided by those travellers who take but a few specimens from distant localities and by those collectors who are satisfied with a single well-characterized specimen of each species. Such collections are valuable as exhibiting types; but they very imperfectly represent *the relations of types*: as a small group of human figures, of which one should be an Apollo, another a Congo negro, with two or three other as well characterized specimens of distinct races, would very inadequately illustrate the natural history of mankind.

It is obvious, also, that a difference of opinion between any two naturalists on the question, whether a given species is a good species, does not necessarily indicate a want of discrimination in the observers. It rather indicates that the type in question is a little above or below the rank into which it is attempted to force it.

What shall we say now of the logical notion of *infima species*, which would not only hypothetically characterize a species by unity of origin, but require us to find an impassable gulf between those species which are most closely allied! Such a doctrine only shows how the world would have been constructed, if the philosophers had made it. We will venture to affirm that the facility of discovering such species will be inversely as the knowledge of the facts.

II. *Origin of the Species.*

The common notion of *infima species* settles the question of unity or plurality of origin by definition! But facts conduct to the inference, that the existing species were introduced by the creation of many individuals, which were modelled

according to certain types, that were mostly but not wholly local, and which differed from each other unequally, as do the existing varieties.

The proof of this proposition is found in the geographical distribution of the varieties. In the great majority of species, the varieties are so distributed, that the space which is occupied by one of them coincides with that of other two or more. Now, if the circumstances of locality had produced the local types by modifications of one original type of the species, then all the varieties which inhabit a locality should have been affected. In that case, all the varieties in any given place would have the same geographical limits. But the contrary more frequently occurs. Each variety has its own limits of distribution. If a few coincide in the boundary of their province, on the other hand one is often found to have an extent of distribution, which is equal to that of two or more other varieties. But such a geographical coincidence of one variety with several other varieties is inconsistent with any other theory than that of an original constitutional peculiarity of character in each variety. This inference is confirmed by the occasional intermingling in one locality of varieties, which differ from each other as much as those which occupy distinct regions. If then we assume the original independent creation of all the varieties, each originally represented by at least several individuals, the facts of distribution become explicable with the greatest facility.

The same statements might be made respecting entire species, and even groups of species and genera. Some are very local, and others, more widely distributed, occupy the ground of several local species. We have then indistinct varieties, distinct varieties, doubtful species, good species, and groups of species, and all the intermediate types, distributed in the same manner. Now, the theory of unity of origin requires us to believe that all the types which are comprised within one

species are the effects of locality: that the types which are exactly of a specific value were created in one centre in a single stock; (although, as we have seen, the notion, that all animals can be referred to species which are of precisely the same value, is wholly fanciful); but that those types which are more comprehensive than species had a plural origin of exactly as many stocks as they contain good species! and that species of doubtful value would not be doubtful, if we looked at nature through the doctrine of the logical infimæ species!

NOTICE OF A REVERSED CYCLOSTOMA.

In the extensive genus *Cyclostoma*, only one reversed specimen, so far as we can learn, has hitherto been known to Conchologists. It belongs to the small European species *C. scalarinum* Villa, and is in the collection of Dr. L. Pfeiffer.

Among the multitude of shells of the *Cyclostomidæ*, which have been accumulating for ages in Jamaica, I was unable to find one reversed specimen. Recently, however, the Rev. F. R. Holland has sent me from Jamaica a reversed specimen of *C. jayanum*. The shell has attained nearly its full size, being 0.7 inch. long, but it wants the reflected lip of maturity. This species is one of the most abundant in the island.

From the Proceedings of the American Association for the Promotion of Science. Aug., 1850.

On the Value of the SHELLS of MOLLUSCA for the purpose of distinguishing Species and Higher Groups. By C. B. ADAMS, November, 1851.

The following remarks contain little or nothing that is new; on the contrary, their object will require allusion to very familiar facts. For this, I hope that a sufficient apology

may be found in the, at least, apparent diversity of views which exist in relation to the subject that I have announced.

On the one side Conchologists *are said* to have no regard to the inhabitants of the shells which they admire; on the other hand a heterogeneous class of writers publish their own opposite opinion that shells are of no more consequence in Natural History than the fur of quadrupeds, or even the clothing or houses of men.

We cannot avoid an expression of dislike to the phrase, "inhabitants of shells," as applied in science to Mollusca. There would be an obvious propriety in it, if applied to hermit crabs (Paguridæ,) since they have no organic connection with the shells which they occupy. But there is such a connection between the soft parts and the shell of a Mollusca, that neither alone constitutes an individual being, but the whole together constitutes one animal. It would be no more absurd, in scientific language, to denominate birds the inhabitants of feathers, and mammals the inhabitants of fur or wool, &c. The term, "the animal," which is frequently used for the soft parts only, is liable to the same objection,—that these parts alone do not constitute an animal. We fully admit, however, the propriety of these terms as figurative language, and would therefore by no means entirely discard them.

A writer in the *Zoological Journal* of London has considered the question, whether the shell or "the animal" is entitled to the name of the species, and suggests that two names are necessary! This would be like giving one name to the bones and another to the flesh of a quadruped. But whether we call a skeleton a mammoth, or apply a specific name to a shell, there is no danger of being misunderstood: we neither intend to give the shell the monopoly of its name, nor to say that the mammoth never had any "soft parts." In organic nature, individuality resides in the whole being only, and it is the *specific individuality* to which the name belongs.

That Conchologists do not regard the soft parts of the animal, is partly untrue and partly excusable.

In the case of amateur collectors, who value the shells for their beauty or rarity only, it is obvious that "the animals" have no other means of gaining the attention of this class of persons, except as their shells commend them to notice. The tendency, therefore, of amateur collections, in this, as in other branches of Natural History, is favorable. Many who begin as amateurs become scientific. If they do not, we yet find them availing themselves more or less of the results of Malacology for the arrangement of their shells, and in various ways encouraging the progress of investigations in which inclination or circumstances do not permit them to engage. We protest, therefore, against the application to such collectors of any terms of disparagement, but would honor those whose hours of recreation, after the fatigues of business, are occupied with the enjoyment and study of the beauties of nature.

With the Conchologists properly so called, there is no ground for any imputation. Either by personal examination of the soft parts, or by availing themselves of observations made by others, every possible use is made of the anatomy of the animals, while their habits and geographical distribution are probably as well known as those of any invertebrated animals, unless, perhaps, insects should be excepted. If a Conchologist should in these days classify shells as univalves, bivalves, and multivalves, and separate the Testacea from the naked Mollusca, he would indicate a contempt for the animals. If he should suppose that the position in which shells were once placed for description, upside down, and sideways, is that in which locomotion is effected, it might be said that he had much to learn. So far, however, is conchology from disregarding the soft parts, that there is in some quarters even a tendency to undervalue the shell.

The study of shells is important on account of the facili-

ties which they furnish for learning the extent of the department of Mollusca. Of the 15,000 or 20,000 species which have been described, the soft parts of only a small minority have been described, and of a very large majority the shells only have been seen by naturalists. I only allude to the value of this subject to Geology, and to the utility of a division of labor in the study of the details of Natural History.

The proposition which I intend to illustrate is this: that the value of the shells of Mollusca, as a source of distinctive characters, commencing at zero for the entire department, increases as we descend through the less comprehensive groups (not of course in a uniform ratio, but irregularly,) until we arrive at the species, which may be amply distinguished by the shells only.

That the shells are of no value for the purpose of distinguishing the department of Mollusca, is evident from the multitude of naked Mollusca.

In the first subdivision into classes, they begin to be of some value. The class Brachiopoda is distinguished by two valves, one dorsal and one ventral; the Conchifera always by two lateral valves, and the Tunicata, which otherwise much resemble the Conchifera, are naked. But of the Gasteropoda, some are naked and others are not, and some have shells, which can be distinguished from those of the class of Articulata only when we descend to the characters proper to genera and species. Of the Pteropods also, which some regard as entitled to the rank of a class, many are naked, but the rest have peculiar shells. While a large majority of the existing Cephalopoda are naked, the shells of the testaceous species (if we include Argonauta) agree only in characters which are common to those of the Gasteropoda, although easily distinguished in the genera. But if, with Mr. Gray, we regard Argonauta as the shell of a Gasteropod, similar to Carinaria,

the testaceous species have a well marked characteristic in being polythalamous.*

It is very obvious, therefore, that the shells begin to be of some value in the first subdivision into classes, since of the six classes two are wholly testaceous, and may be distinguished, not by the shells alone, but by their position on the soft parts: and three are partly testaceous, of which two may be distinguished by their shells so far as they are testaceous.

In the *orders*, we find their value not much increased. The two orders of Brachiopoda are distinguished by a single character of the shells, namely, the presence or absence of articulation between the valves. This is not the *basis* of their ordinal classification, which would be artificial if founded on one character, but it is an *index* of differences which characterize the entire animals.

The two Lamarckian orders of Conchifera are separated on account of a difference in their soft parts, namely, the number (whether one or two) of the adductor muscles, which character is clearly indicated in the shells of all the families except in the Tridacnidae, where the approximation of the two muscles presents the appearance of a single impression. In the Mytilidae, which have several adductor muscles, some of which are inconspicuous, the defect in the ordinal character of the soft parts is itself indicated in the shells. In Mr. Gray's list of the Genera of Recent Mollusca, five orders of Conchifera is enumerated. I have not seen them characterized, but it is obvious from their genera that ordinal characters cannot be found in the shells. The two orders of Pteropoda in Mr. Gray's list, as in several other authors, are indicated by the presence or absence of a shell, although the classification of

* Since this article was read before the Association, we have seen, with great pleasure, the complete solution of the problem of the Argonauta in the "Voyage of the Samarang." Arthur Adams, Esq., Surgeon and Naturalist of the Samarang, found that the paper Nautili are the egg cases of an Octopod, carried about by the female.

Mollusca in that elaborate and excellent paper was designed to include all the modifications that were suggested by an examination of the soft parts of 5,000 species.

The two Lamarekian orders of Gasteropoda, Gasteropods proper and Trachelipods, each contain both naked and testaceous Mollusca, but, with some important exceptions, the shells in each order may be distinguished. Mr. Gray's five orders of this class cannot be distinguished by ordinal characters of the shells.

In the three orders of Cephalopoda, one is indicated by the shells of Nautilus. The other two orders, including Argonautidæ, contain each one testaceous genus, with many naked genera; but these testaceous genera are widely different.

If we modify Mr. Gray's system by dividing the Brachiopoda into two orders, and by regarding Argonauta as the shell of an Octopod, we have (including the Tunicata) seventeen orders, of which two are naked, ten are wholly testaceous, and five are partly testaceous. But of the fifteen which are more or less testaceous, only five are easily separated by ordinal characters in the shells, and the others are distinguished with more or less difficulty.

In descending to the *families*, we find the value of the shells much greater than in the orders. Here I will limit my remarks to the families in Mr. Gray's list of genera, both to avoid unnecessary detail, and because they are constituted with more regard to the soft parts than those of any other classification.

In the class Cephalopoda, the two testaceous genera (Argonauta being excluded from the class,) constitute as many families, which are, therefore, amply *indicated* by their shells.

In the first order of Gasteropoda, Pectinibranchiata, Mr. Gray makes five families, of which three, Strombidæ, Volutidæ, and Cypræadæ, are easily distinguished by their shells;

but the family Muricidæ embraces some species of *Pleurotoma* and of *Conus*, whose shells are not easily distinguished by family characters from some of the Buccinidæ. We are not aware, however, that the soft parts could be distinguished with any greater facility. This is an example of the gradation of types into each other.

The second order, *Phytophaga*, contains twenty-five families, of which one, *Atlantidæ*, is naked; *Tecturidæ* (= *Lottiadæ*) is not distinguishable by ordinal characters of the shells from *Patellidæ* in another order; the *Littorinidæ*, containing *Solarium*, cannot be distinguished from the *Trochidæ*, which contains *Phillippia*; and *Vermetidæ* and *Dentalidæ* so closely resemble certain *Annelides*, that it is doubtful whether any family characters can distinguish them. The remaining nineteen families may be distinguished by their shells with greater or less facility; the difficulties, where they exist, arising from gradation of types, not from a want of correspondence between the shells and the soft parts.

The third order, *Pleurobranchiata*, contains five families, with a remarkable intermingling of testaceous and of naked genera; yet the shells in each family are characterized with the greatest facility, as may be seen from the well known types of four of them, *Bulla*, *Aplysia*, *Umbrella*, and *Carinaria*, with which last Mr. Gray associates *Argonauta*.

The fourth order, *Gymnbranchiata*, contains eight families, of which two are testaceous, the *Patellidæ* and *Chitonidæ*, which are amply distinguished by their shells, except that the former is too closely allied by its shells to *Lottiadæ*, as above mentioned.

The fifth order, *Pulmobranchiata*, consisting of the air-breathing *Gasteropoda*, contains twelve families, of which ten are testaceous, and are easily distinguished by the shells, except that *Nanina* is removed from the *Helicidæ* and placed with the *Arionidæ*.

Although, in the class Conchifera, the shells do not furnish good ordinal characters for the five orders of Mr. Gray's list, yet all of the forty-two families which are distributed through these orders may be easily distinguished by their shells. Also the six families of the Brachiopoda, and those four of the Pteropoda which are testaceous, are easily distinguished by their shells.

Thus of the 95 testaceous families of Mollusca, 88, or more than 92½ per cent., are distinguishable by their shells.

For the *generic* value of the shells, we may take the results in Mr. Gray's list, which is remarkable for its multiplication of genera; 810 recent genera are recognized. Of these 152 are naked, and 648 are testaceous. Of the latter, the shells of two genera are said by Mr. Gray to be indistinguishable from certain annelides; and of seven others it is said to be impossible to characterize them by the shells only. This list, although small, is susceptible of reduction; for M. Deshayes has pointed out the difference between the shells of *Vermetus* and of *Serpula*, and Dr. Gould has discovered generic characters in the shells of *Lottia*, distinguishing them from *Patella*. Of 648 testaceous genera, 641, therefore, may be distinguished by their shells. This amounts nearly to 99 per cent.

Although the soft parts of 5,000 species of Mollusca, including both the naked and the testaceous species, are known, we are not aware of the existence of a single testaceous *species*, which is not distinguishable by the shell with as much facility as by the soft parts. The examples are very few, indeed, if any exist, in which the species are not recognized by their shells with much greater ease than by the soft parts.

Of the 20,000 species of shells which are known, the specific value of many is more or less doubtful. It is barely possible that a knowledge of the soft parts will aid materially in determining such species. But this is not probable, since the

difficulties arise from the graduation of the specific types into each other, which graduation is, therefore, likely to pervade the whole animal.

The general proposition which we have thus endeavored to illustrate, is only a part of a yet more general fact in organic nature—that in descending from the more to the less comprehensive groups, the characters which are proper to distinguish the groups are more and more perfectly and uniformly diffused through the parts of the entire being. We have been informed, on the best authority, that the most kindred species of fishes may be distinguished by their scales only. Species of birds may be distinguished by their feathers, or by their eggs. If we descend to individuals, nothing but observation is wanting to detect their peculiarities in each part of the entire being.

We have thus far considered the subject practically; that is, we have considered the utility of the shells of Mollusca in existing systems. A few words should be added on the principles which are involved.

The principles involved in this subject are three-fold; as they belong to the structural relations of the shell, to its functional relations, and to its embryonic history. On the latter we shall not offer any remarks.

The shells of Mollusca, having their origin in the skin, correspond, strictly, with the plumage of birds, the furs of mammals, and the scales of fishes; in general, to the covering of vertebrated animals. The correspondence is exact so far as it relates to the peculiarities of color. But the details of form are more perfectly represented by the skins of Vertebrata than by the shells of Mollusca. Yet most of the details of form in the soft parts, which are not moulded in the shells, are *indicated* by constantly associated characters.

In their functional relations, shells are skeletons. They serve for the attachment of muscles and the support of the soft parts. On this ground, therefore, we may claim for them

a value similar to that of the skeletons of Vertebrata, but admit the amount of the value to be less, on account of the greater simplicity of shells.

It is, therefore, true that a collection of the shells of Mollusca corresponds to a collection of both the stuffed skins and the skeletons of Vertebrata, but is of inferior value, both for the reasons just mentioned and because their presence is not universal in their department.

It is perhaps unnecessary to add that while we believe that the shells of Mollusca are sufficient for distinguishing species, we would not regard them as alone the basis of species. This would be an artificial method, although in the results it would coincide with the natural method of classification. But the shells are partly the basis of, and partly the index to, specific characters.

The following *errata* in the catalogue of the land and fresh-water shells of Jamaica (pp. 179-187) have been detected:—

No. 34, *Cyclostoma Newcombianum*, Ad., may be erased from the catalogue. Since the remark on p. 177, it has been proved to belong to the Island of St. Thomas. I am indebted to the kindness of a friend for an extensive suite of varieties of this species, which he collected in that island. The most common variety is that which has been known in many collections as *C. Swiftianum*. This name was derived from the MSS. of Dr. W. Newcomb, now of Honolulu in the Sandwich Islands, and was given to the species in honor of Robert Swift, Esq., of St. Thomas. A red variety has been described in the *Zeitschrift für Malakazologie*, subsequently to our description, by Dr. Pfeiffer, as *C. Troscheli*. The synonymy therefore will stand thus:

(*Cyclostoma Swiftianum* Newcomb MSS., 1845.)

————— *Newcombianum* Ad. Cont. Conch. Sept., 1849.

————— *Troscheli* Pfr., *Zeitschr.*, June, 1850.

After No. 235, *Tornatellina Cubensis* Pfr., should be inserted.

After No. 285, *Helix Schroeteriana* Pfr., should be inserted.

No. 291 *a* may be elevated to the rank of a species, with the name *HELIX PRETIOSA*. This name was used by Ferussac for a species of *Achatina*, *A. Peruviana*. It is however, in accordance with the usage of many, still admissible for a true *Helix*. Another name certainly would have been preferable, had not the present name been used by us already to distinguish the type as a variety.

No. 384. The name *Ancylus obliquus* having been anticipated by Mr. Broderip for a Chilian species, Proc. Zool. Soc. Lond., 1832, p. 202, we propose for this Jamaica species the name of *A. CHITTYI*, in honor of its discoverer.

Mr. Redfield informs us that in the September number of Reeve's *Conch. Icon.*, which has not yet been received here, (Amherst), *Helix incerta* and *H. lima*, regarded by Mr. Reeve as one species, are said to inhabit Jamaica. It is well known to collectors in this country that *H. lima* inhabits Porto Rico, and that *H. incerta* comes from St. John's, near St. Thomas. We are confident that neither of them inhabits Jamaica.

In the same number of the *Iconica*, the habitat of *Helix angustata* is said, on our authority, to be Jamaica. We have before remarked (p. 177.) on what authority this species was included in the catalogue of Jamaica shells, although we have never seen it in Jamaica; and since it is said to occur both in Hayti and in Jamaica, it is not improbable that it inhabits Hayti only.

Remarks on certain HELICES which are described and figured in the Conchologia Iconica for Oct. 1851. By C. B. ADAMS. November, 1851.

By the politeness of Mr. Redfield we have received, in advance of our own copy, the loan of the October number of Mr. Reeve's *Conchologia Iconica*. Several species of *Helix* from Jamaica are therein described and figured, with the accuracy and elegance for which this work is so justly celebrated.

Helix patina Ad. Mr. Reeve observes that this may prove to be a variety of *H. ingens*, and not, as we had suggested, of *H. acuta*. A full suite of specimens exhibits its relationship, in opposite directions, to *both* of these species. When *H. patina* was described, *H. ingens* was unknown; and when *H. ingens* was described, we had but two or three of the most characteristic specimens.

H. acuta Lam. The var. *acutissima* is so unlike the form which Mr. Reeve has selected as the type, that those who may not possess an extensive suite of this Protean species, would hardly be able to identify it.

H. Chemnitziana Pfr. Syn. *H. fluctuata* Ad. Dr. Pfeiffer's name has priority. The habitat was unknown to Dr. P. when the species was described in the *Proc. Zool. Soc. Lond.*, 1845, and subsequently in the *Mon. Helic.* in 1847.

H. ingens Ad. Only three or four well colored specimens have been obtained. Such are much more intensely colored than those which Mr. R. has figured.

H. Bainbridgei Pfr. The habitat of this species is said to be "Jamaica, Demerara." We are still utterly incredulous of the latter habitat. If any individuals ever have been found in Demerara, they must have been introduced there by human agency.

H. lucerna Mull. Mr. Reeve's figure of this species represents our *H. fuscolabris*. The shell which we have regarded as *H. lucerna* is much smaller, has the surface nearly smooth, the aperture less dilated, and the lip of the same color within as at the margin. Between this shell and *H. acuta*, the shell figured by Mr. R. is intermediate.

H. tumida Pfr. "Habitat, West Indies?" This species, if we may judge without a specimen, appears identical with our *H. tunicata*. If so, Dr. Pfeiffer's name, published in Proc. Zool. Soc. Lond., 1845, has priority.

H. Chittiana Ad. Elegantly figured.

H. valida Ad. Good specimens are colored more intensely than Mr. R's figure.

H. anomala Pfr. Mr. R. has inadvertently cited us as the original describer of this species. The paragraph cited describes two varieties only.

This number of the *Iconica* contains also the following species from Jamaica:—*H. cara*; *H. peracutissima*; *H. Okeniana*; *H. Spengleriana*; *H. Jamaicensis*; *H. picturata*; *H. Schroeteriana*; *H. soror*; *H. Bronni*; *H. invalida*; *H. sinuata*; *H. consanguinea*.

CONTRIBUTIONS TO CONCHOLOGY.

No. 11.

HINTS ON THE GEOGRAPHICAL DISTRIBUTION OF ANIMALS,
with Special Reference to the Mollusca. By C. B. ADAMS.
October, 1852.

Areas of Species.

1. Each species occupies one geographical area only.
2. Species 'introduced' by human agency from one area into another are obvious exceptions.

3. The literature of Zoology, especially of Conchology, conflicts with the first proposition (§ 1) in a great number of examples, chiefly on account of the common practice of publishing statements of habitats, without thorough scrutiny into their authenticity.*

4. Inasmuch as natural types are of all grades of value (v. p. 191), so that some are of a little less and others of a little more than the average value or importance of a species, the difficulty which hence arises in the discrimination of species must cause some apparent or doubtful exceptions to our first proposition. The differences between some types, which inhabit distinct areas, is slight: and other types exist, between which differences have not yet been detected, although they may actually exist.† If such differences prove to be absolutely constant, the types will generally be regarded as good species. But if other-

* We have elsewhere proposed to distinguish original from hearsay testimony, by an exclamation mark. (!)

† Of such types Dr. Gould "admits it as an axiom in Zoology," that they "should be assumed as different, until their identity can be proved."—*Introd Moll. Expl. Exped.* p. XI.

wise, the question of their specific value may ever remain in doubt.

5. But if we admit the doctrine of species above referred to, a few examples of identical types in distant areas are not exceptions to the general plan of nature, but an integral part of it. The general fact may be thus stated: a number of pairs of analogues from two distinct provinces may be so arranged, that the amount of difference between each two shall successively diminish from very distinct species to species less distinct, and then to species scarcely distinguishable, until at length the series shall terminate in two forms quite indistinguishable from each other, that is, in one species. In other words, if the pairs

be arranged on both sides of an angle, as in the accompanying figure, with the amount of difference expressed by the distance across the angle, as from a to a' , b to b' , &c., the vanishing point of the differences will be in an identical type, as g .

6. The areas of species vary from a few miles to several thousand miles in diameter. There are few which exceed three or four thousand miles. But a great number exceed two thousand miles; and, with the exception of insular terrestrial fauna, a large majority of the areas exceed one thousand miles in diameter.

7. The areas of insular terrestrial species, excepting those which have the power of flight, do not usually exceed the islands which they inhabit, if the islands are thirty to fifty miles distant from each other. As to islands which are separated by one hundred miles or more of water, the examples of species common to two or more are rare.

Zoological Provinces.

8. The geographical coincidence, more or less exact, of many specific areas constitutes a zoological province.

9. Zoological Provinces, except those which are insular, are for the most part three or four thousand miles in diameter.

10. The fact that one fauna extends through all longitudes in the Arctic regions is not an isolated fact, as has been supposed. It results from the diminution of the degrees of longitude, so that the Arctic zoological province extends through all longitudes, merely because it has the ordinary dimensions of a zoological province. On the other hand, the three great southern points of land, Patagonia, South Africa, and New Holland, are too remote from each other to be comprised in one zoological marine province.* But it may be predicted, that only one zoological province will be found in the Antarctic zone.

11. The difference of aquatic, terrestrial, and aerial habits has the most important connexion with geographical distribution. Next in importance is climate. Next, and of much less importance, is zoological affinity. The influence of zoological affinity is seen in the fact that the area of one group of species sometimes does not coincide with that of another group, of the same habits in respect of climate and station; as the Melanidæ and Limniadæ of the United States. The same species of Limniadæ extend through the Western, Middle, and Eastern States, but the Melanidæ do not enter any of the Eastern States. Their eastern boundary is therefore four to five hundred miles west of the eastern boundary of the Limniadæ.

12. The figure of a zoological province depends chiefly on the distribution of land and water in connexion with latitude.

13. Several distinct insular terrestrial zoological provinces

* The separation by water, irrespective of great distance, would alone give them distinct terrestrial faunæ.

are often comprised within a single marine province. Thus the terrestrial faunæ of Cuba, St. Domingo, Porto Rico, and Jamaica, are distinct from each other; and the same is true to a great extent of the West Indian Islands generally; those of the Bahamas and Bermudas are also distinct. But a single marine province extends from the Bermudas to the southern part of Brazil.

14. The attempt to divide up the earth into one set of zoological provinces for all animals, whether aquatic or terrestrial, is therefore futile.

15. The converse of proposition 13, in respect of bodies of water surrounded by land, does not hold true. In any one lake or river, the proportion of species peculiar to it is small. This may be said to be owing to the means of communication in the case of rivers emptying into a lake or chain of lakes. But the same extent of distribution is equally common in respect of unconnected rivers and isolated ponds. It may, therefore, be inferred that the original plan of creation was different from that of the insular species.

16. Because change of climate is always nearly or quite in one direction (N. and S.), and is always more or less gradual, differences of climate do not cause several zoological provinces of one sort to be comprised within zoological provinces of another sort, but merely render their boundaries indistinct.

17. Because zoological affinities have some connexion with distribution (§ 11), indefiniteness of boundaries will result from the attempt to comprise any considerable portion of the animal kingdom in one scheme of zoological provinces. Absolutely distinct, that is, linear boundaries exist only between single species, except that the boundaries between terrestrial and insular faunæ are linear, and those between indistinct species are necessarily ill defined.

The cause of indefiniteness of boundaries is to be found in the fact that the areas of different species do not exactly coincide; although sometimes several nearly coincide, as at

Cape Cod in Massachusetts, where many marine species meet from either side, but do not pass the boundary.

In general, the boundaries of zoological provinces which are not insular, are more indefinite, in proportion as we include a greater part of the animal kingdom in one set of provinces.

18. Analogues are usually more numerous in adjacent or approximate zoological provinces than in those which are remote from each other. Thus there are more analogues in the Caribbean and Panama marine provinces than in the Caribbean and Indian Oceans. The terrestrial faune of Cuba, St. Domingo, Porto Rico, and Jamaica, contain many more analogues than either of these islands compared with the Philippine Islands.

Areas of Genera and of more Comprehensive Groups.

19. The proposition respecting specific areas (§ 1), may be applied to groups more comprehensive than species, but with more and more qualification, as the groups are more and more comprehensive, until at length it fails entirely; and the areas become greater, until at length the whole planet becomes a single area.

Thus many genera inhabit each a single area, as *Cylindrella*. Some genera are chiefly restricted to a single area, as *Clausilia*.* Others are cosmopolite. Some families, a few orders, and at least one class (Reptiles) are restricted each to one area. Tropical regions constitute a single area for several natural families and orders in both the vegetable and animal kingdoms. The area of the Cypræide consists of the tropical zone with adjacent parts of the temperate zones. The area of the class of Reptiles comprises all the warm and temperate regions of the earth's surface.

The vanishing point of this proposition is in the truism—that the area of the whole animal kingdom is the whole of the planet.

* See article following, on the *Clausilia* of America, by Thomas Bland, p. 224.

Relations of the subject to theories of the origin of species.

20. It should not be assumed, before it has been proved, that each species has originated in a single central point in its area, nor that physical agents have been the principal causes of the existing phenomena of distribution.*

21. Natural agents may somewhat enlarge the area of a species, but are not likely to transplant a species into a distinct remote area. Thus if currents or locomotion transport a species into a new habitat, the same species will be likely to occur at places intermediate between this new habitat and the original area. Consequently the effect of physical causes must usually be limited to the enlargement of specific areas.

22. The small areas of insular terrestrial species and large areas of continental species suggest the theory of centres of creation; for it may be said that the insular species would have spread over equally large areas, if they had not been restrained by water. But although such a theory accounts for these facts, the theory is not proved, because the facts are as satisfactorily accounted for by another theory, viz. that the original plan of creation was different in the two cases.

23. The fact, that the number of species in an insular province is generally much greater, proportionally to the area of the provinces, than in a continental province, proves that the original plan of creation was different. Thus Jamaica contains more known species of terrestrial Mollusca than the whole of North America, from the Isthmus to Melville Island. It is indeed probable that there are more unknown species in Mexico and in Central America than in Jamaica; but it is not probable that enough remain undiscovered materially to affect

* Some writers account for the facts of distribution, and for the introduction of *varieties* of species by physical agents, while they designate such a method of accounting for *species* and genera as atheistical. But it should ever be remembered that physical agents are only the agents of the Divine will; consequently such opinions are not atheistical.

the proportion. The species of Cuba, St. Domingo, and Porto Rico are but partially known; yet they confirm the general proposition. The same is true of the land shells of the Philippine Islands, and of the Sandwich Islands.

24. The distribution of fresh water continental species also proves that the original creation of the insular species was on a different plan from that of the continental species (§ 15).

25. If large groups of such islands, as the West Indies, should be united in a common area of dry land, then, according to the theory which accounts for the facts of distribution by actual dispersion from centres, there would be zoological provinces containing five to tenfold as many species as any which now exist.

26. The geological fact, that continents by submergence become islands, and that islands by emergence become continents, does not affect the foregoing reasoning, because such changes require an amount of time exceeding one geological period, during which time there is a change of faunæ.

27. The original creation of many individuals of a species in different parts of its area has been the principal cause of the present facts of the distribution of the individuals of the species. Physical agents have exerted only a modifying agency.

28. In organic nature, principles are not observed throughout any department, with mathematical uniformity; on the contrary each idea appears with various degrees of development from its maximum to its minimum, and often to a vanishing point. Hence it is probable that the introduction of species has been accomplished by the creation of original individuals varying in number from a great multitude to a few. In the same manner the actual numbers of the individuals of species now range from inconceivable profusion to extreme rarity.

Relations of the subject to geological reasoning.

29. Such insular faunæ, as have been described in § 7 and § 13, prove that the islands which they inhabit, have been

geographically separate since an era anterior to the introduction of the existing species. But this conclusion does not depend on the assumption that the species would have dispersed themselves over several islands if they had not always been restrained by water; but on the fact that such small zoological provinces exist nowhere on continents.*

30. The occurrence of a very *few* identical species on different islands, or on islands and the mainland, does not prove the union of such land since the existence of the species, because such a distribution may have been caused by the accidents of dispersion, or (§ 27) by independent creation.

31. If the time, when any islands were once united, can be proved geologically to have been more remote than the introduction of existing species, any facts relating to the distribution of the existing species cannot prove the union of such islands. This is a truism, but it seems to have been sometimes forgotten.

32. The occurrence of many species common to different islands, in some parts of Polynesia, renders it probable that such islands have constituted one island since the existence of these species.

33. The frequent occurrence of analogues and the prevalence of generic or subgeneric types in some islands do not prove the former union of these islands, but may indicate their greater proximity at a former period (v. § 18).

34. An apparent exception to § 18 is mentioned by Dr. Gould (Introd. Rep. Moll. Expl. Exped.). The Samoa and Friendly Islands are more intimately related zoologically to the Society Islands, than to the Feejee Islands, although the latter are much nearer. Hence we may infer the greater magnitude and proximity to each other at some former period of the Samoa, Friendly, and Society Islands.

The above hints have been hastily written down. They may

* The very limited distribution of certain tribes of animals is not an exception to this statement, which has reference to the general fauna of a country.

require modification: certainly much is to be done in giving the subject precision and elaboration of details.

In perfecting the science of the geographical distribution of animals, Conchology may, with the greatest facility, render important aid, in consequence of the ease with which great numbers of specimens are collected, transported, and preserved.

Catalogue of the TERRESTRIAL SHELLS OF ST. THOMAS, West Indies. By THOMAS BLAND, F. G. S., *London.* Oct., 1852.

The study of the land shells of the West India Islands has proved the existence of several distinct terrestrial insular faunæ, within the area of the marine Caribbean zoological province. Professor Adams collected in Jamaica about 350 species of land shells, of which three or four per cent. only have been found elsewhere. Increased attention is being devoted to the land shells of the other Islands, and we now contribute a list of those which inhabit St. Thomas.

It should be explained that the numbers printed within brackets, after the numbers of the species, refer to a list in the hands of several gentlemen resident in St. Thomas and elsewhere, who have collected the shells of that island, and that specimens, with corresponding numbers, have been deposited in the cabinet of Amherst College, Mass., U. S. Specimens of the undetermined species (excepting only No. 13) have been sent to Mr. Hugh Cuming, London, who forwarded them to Dr. Pfeiffer of Cassel for description. We hope to publish in a subsequent number of these "Contributions" the names, with references to the descriptions, by Dr. Pfeiffer.

The following shells have been described as inhabiting St. Thomas, but we believe erroneously.

Helix depicta Grat. St. Thomas and New Orleans; Grat. Pfr. Mon. Hel. Viv. No. 28.

II. plicaria Lam. Teneriffé; Lam. Porto Rico, St. Thomas,
Fér. Pfr. l. c. No. 761.

H. squamosa Pér. Porto Rico; Mougé: Lam. var. β depressa.
St. Thomas; Grat. Pfr. l. c. No. 767.

Bulinus beticatus (Helix) Fér. St. Thomas: Fér. Canary Is.; Webb and Berth. Pfr. l. c. No. 200.

B. baobabus (*Helix*) Fér. St. Thomas; Fér. Teneriffe; Webb and Berth. Pfr. l. c. No. 201.

Pupa decumana (Helix) Fér. St. Thomas; Beck. Cuba;
Orb.? Pfr. l. c. No. 49.

Cylindrella gracilicollis (Helix) Fér. St. Thomas; Maugé:
Fér. Pfr. l. c. No. 22.

C. Mangeri (*Helix*) Wood. St. Thomas; Hornbeck. Jamaica; Pfr. l. c. No. 46. Vid. Ad. Contrib. p. 166. as to the error regarding this shell.

The following shells inhabit the Island of St. Thomas. (The most important part of the synonymy of the shells is added.)

1. (1.) **Cyclostoma Antillarum** Sowb. Thes. Conch. I. 150.
No. 168. t. 28. f. 180. 1843.
Megalomastoma ————— Gray Nom. of Moll. &c. in
Brit. Mus. Pt. 1. p. 31. 1850.
————— ————— Pfr. Consp. Cyclos. No. 199. 1852.

Sowerby's figure is apparently from a dead shell: when alive it is of a very much darker color. He describes it as having 8 whorls. Specimens occur in St. Thomas with 7, 8, and 9 whorls.

Station.—Among wet decaying leaves under stones.

Habitat.—Tortola; Sowerby. St. Vincent; Guilding! Gray. Tortola and St. Vincent; Pfeiffer. Hill opposite Baker's, near Smith's Bay Estate, East End, St. Thomas; T. B.!

2. (2.)	Cyclostoma Newcombianum	Ad. Contrib. p. 8.	1849.
—	<i>Swiftianum</i>	Newcomb MSS.	1845.
—	<i>Troscheli</i>	Pfr. Z. f. Malak. p. 64.	1850.
—	<i>Newcombianum</i>	Pfr. Consp. Cyclos.	
		No. 424.	1852.

Station.—Under stones, and on old walls. After rains, on shrubs, and trunks of trees.

Habitat.—Jamaica; Ad. Contrib. p. 8. corrected on p. 203. St. Thomas; Adams. St. Thomas; T. B.!

3. (4.) ***Helicina subfusca*** Menke Synop. p. 79. 1828.
 ———— *rotellina* Mich. Pot. et Mich. Gal. I. p. 230.
 No. 6. t. 23. f. 11. 12. - 1838.
Helicina castanea (?) Guild (?) Sowb. Thes. I. p. 13. No.
 67. t. 1. f. 31, 32. - - 1842.
 ———— *Hornbeckii* Phil. Z. f. Malak. p. 125. No. 64. 1847.
 ———— *subfusca* Küster Conch. Cab. Pt. 36. p.
 24. No. 23. t. 4. f. 34-36. 1850.

Küster refers to *H. castanea* as a variety, of which Sowerby gives N. America as the habitat.

Station.—Under stones, and among dead leaves,—very common.

Habitat.—Porto Rico; Menke. St. Thomas; Potiez and Michaud: also Philippi: also Küster. St. Thomas; T. B.!

4. (5.) ***Helicina*** ——— ? Sp. indet.

Shell moderately depressed, with microscopic spiral striae,—brown or yellow, columella produced into a small tooth. Diam. .25 inch.

Station.—Under stones.

Habitat.—Blair's Hill, E. of the town, St. Thomas; T. B.!

(5a.) Variety of the above, with a white band on the periphery.

Station.—Under stones,—after rain, on the leaves of shrubs.

Habitat.—Hill opposite Baker's, and on sides of footroad between it and Tutu, St. Thomas; T. B.!

5. (6.) ***Cylindrella pallida*** (Brachypus) Guild. in Sched. Orig.
 teste Pfr.
 ———— ——— Phil. Abil. II. t. 2. f. 14. 1845.
 ———— ——— Pfr. Monog. Hel. Viv. II. p. 379.
 No. 31. - - - 1848.

Pfeiffer describes this as having 9 to 13 whorls. The mature shell has 15 to 16 whorls.

Station.—Under side of stones—abundant.

Habitat.—West Indies; Philippi; also Pfeiffer. St. Thomas and St. John; Mus. Amh. Upper part of the hill opposite Baker's, St. Thomas; T. B.!

6. (10.) **Cylindrella** ——— ? Sp. indet.

This species belongs to the genus *Macroceramus* of Guilding. In shape and size it is not unlike *Bulinus Kieneri* Pfr. (Mon. Hel. Viv. II. No. 202. Rv. Conch. Icon. sp. 463,) from Honduras, but the sutures are not crenulated, and the last whorl has a single sharp keel at the base, somewhat similar to *B. unicarinatus* (Pupa) Lam. (Ed. Desh. VIII. p. 173. No. 10. Pfr. l. c. No. 205. Rv. l. c. sp. 468,) from Cuba. A Porto Rico species is very like the St. Thomas shell, but is larger, and has the keel less developed. *Cylindrella Hyblana* Ad. Contrib. p. 23 (*B. Gossei* Pfr. l. c. No. 206. Rv. l. c. sp. 462), from Jamaica, is of the same general character, but is much smaller, and has no keel. *B. turricula* Pfr. (l. c. No. 207. Rv. l. c. sp. 497,) from Cuba, and *Cylindrella pontijica* Gould (in Bin. Terr. Moll. of U. S. II. p. 306,) from East Florida, and also from Cuba, belong to the same group.

Station.—Under stones, and on rocks.

Habitat.—Summit of the Hill opposite Baker's, St. Thomas; T. B.!

7. (7.) **Achatina octona** Chemn. IX. P. 2. p. 190. t. 136. f.
 1264. - - - - 1786.
Bulinus octonus Lam. ed. Desh. VIII. p. 233. No. 27. 1838.
Achatina octona Pfr. Monog. Hel. Viv. II. p. 266.
 No. 65. - - - - 1848.
 ——— ——— Rv. Conch. Icon. sp. 84. - 1849.

Station.—Under stones, and among dead leaves: very common.

Habitat.—W. Indies; Chemnitz; W. Indies, S. America, Pacific Is.; Reeve. St. Thomas; T. B.!

8. (22.) **Achatina** ——— ? Sp. indet.

Shell like *A. pellucens* Ad. (Proc. Bost. Soc. p. 13, 1845,) from Jamaica, but the columella is much curved. Length .27 inch.

Station.—Unknown—a few dead specimens only were collected.

Habitat.—Hill opposite Baker's, St. Thomas; T. B.!

9. (15.) **Achatina iota**? Ad. Proc. Bost. Soc. p. 13. - - 1845.
————— Pfr. Mon. Hel. Viv. II. p. 295. No. 150. 1848.

It is not easy to distinguish this from the shell originally described by Prof. Adams as *A. iota*, from Jamaica, although it is much larger than the shells which have been commonly distributed under that name.

Station.—Unknown—dead specimens only were collected.

Habitat.—Catharineberg, St. Thomas; T. B.!

10. (8.) **Bulimus exilis** (Helix) Gmel. p. 3668. N.
252. - - - 1788.
———— *Guadaloupensis* Brug. Enc. Meth. I. p. 313.
N. 26. - - - 1789-1792.
———— Lam. Ed. Desh. VIII. No. 22. 1838.
———— *exilis* Pfr. Mon. Hel. Viv. II. p.
223. No. 612. - 1848.
———— Rv. Conch. Icon. sp. 292. 1848.
———— *Guadaloupensis* Rv. Conch. Icon. sp. 294. 1848.

Reeve describes and figures *B. exilis* Gmel. as a species distinct from *B. Guadaloupensis* Brug., but Lamarck and Pfeiffer describe them as one species. Reeve particularizes as to the former, that the sutures are inclined to be white, and as to the latter, that it may be distinguished by the peculiar quadrate form of the aperture. An examination of a considerable number of specimens collected in St. Thomas, shows that the characters pointed out by Reeve are not so constant as to warrant the division into two species. Reeve's *B. rubrifasciatus* (Conch. Icon. sp. 277) may be nothing more than a variety of *B. exilis* Gmel. allied to Pfeiffer's var. *trifasciatus*. Reeve, alluding to *B. rubrifasciatus*, says, that Deshayes, he believes, has "proposed the

name *B. exilis* for this species, already occupied by Gmelin." Deshayes in his edition of Lamarek (VIII. p. 232) adds a note to the description of *B. Guadeloupensis* Brug., in which he merely asserts that Gmelin's name, *exilis*, has priority over that of Bruguière.

Var. β **trifasciatus** Pfr. Mon. Hel. Viv. II. p. 224. No. 612.

Station.—Under stones, amongst grass, and on stems of shrubs: very common.

Habitat.—Unknown; Gmelin. Guadeloupe; Bruguière: also Lamarek: also Pfeiffer. West Indies; Reeve. (Unknown; (*B. exilis*) Reeve.) Guadeloupe, Martinique, St. Bartholomew, St. Thomas; Mus. Amh. The graveyard W. of the town, St. Thomas; T. B.!

11. (11.)	Bulimus virgulatus	(Cochlogena) Fer. Prod. p.	
		396. - - -	1821.
— — — — —		Fer. et Desh. Hist. II. 2d	
		part. p. 91. t. 142. B. f.	
		1-7. - - -	1820-1851.
— — — — —	<i>Caribæorum</i>	Lam. ed. Desh. VIII. No. 26.	1838.
— — — — —	<i>virgulatus</i>	Pfr. Mon. Hel. Viv. II. p.	
		202. No. 551. - - -	1848.
— — — — —		Rv. Conch. Icon. sp. 320.	1848.

Several pretty varieties occur; the most common are, exterior wholly white, pale brown within, often with the columella blackish brown; or white with chestnut colored transverse lines. The spirally banded varieties are scarce, and that of a "rich reddish saffron" color (Rv. Conch. Icon. fig. 320 *a*) does not inhabit St. Thomas.

Station.—On the trunks of trees.

Habitat.—Brazil? Antilles, Porto Rico, St. Bartholomew, St. Domingo; Férussac in Prod. Antilles; Férussac and Deshayes in Hist.: also Lamarek: also Pfeiffer. West Indies; Reeve. Martinique, St. Bartholomew, Tortola, St. Thomas, Porto Rico. Curaçoa? and Bonaire: Mus. Amh. Hills about Baker's, St. Thomas; T. B.!

12. (9 and 9a.)	Bulimus Dysoni?	Pfr. in Proc. Zool. Soc. p.	
		39. - - -	1846.
—————	—————	Pfr. Mon. Hel. Viv. II. p.	
		183. No. 493. -	1848.
—————	—————	Rv. Conch. Icon. sp. 425.	1849.

Station.—Under stones, and among dead leaves,—common.

Habitat.—Honduras; Pfeiffer. Catherineberg, Baker's, Blair's Hill, &c., St. Thomas; T. B.!

The occurrence of this species, and of *Cylindrella Kieneri* (Bulimus) Pfr. in St. Thomas, suggests the inquiry whether they may not have been accidentally mixed with Mr. Dyson's Honduras shells.

13. (9b.) **Bulimus** ——— ? Sp. indet.

This species resembles *B. Dysoni* Pfr., but is shorter, and more ovate, with the aperture narrower anteriorly.

Station.—Unknown; a very few dead specimens only were collected.

Habitat.—Catharineberg, St. Thomas; T. B.!

14. (12.)	Bulimus subula ? (Achatina) Pfr. in Weigm. Arch.	
	Pt. I. p. 352. No. 24.	- 1839.
—————	Pfr. Mon. Hel. Viv. II. p. 158. No.	
	413. - - - -	1848.
—————	Rv. Conch. Icon. sp. 494.	1849.
—————	<i>hortensis</i> ? Ad. Contrib. p. 169.	1851.

The *B. procerus* Ad (Proc. Bost. Soc. p. 13, 1345,) from Jamaica, which is considered by Pfeiffer and Reeve as identical with *B. subula* Pfr. is, according to Poey (MS.), quite distinct from that species, while the true *B. subula* from Cuba appears to be identical with the *B. hortensis* of Jamaica, and with this species from St. Thomas.

Station.—Under stones, and amongst dry earth; common.

Habitat.—Cuba; Pfeiffer: also Poey! in Mus. Amh. Jamaica; Adams! also Pfeiffer. The graveyard west of the town, St. Thomas; T. B.!

15. (13.) **Bulimus** ——— ? Sp. indet.

This resembles *B. terebella* Ad. Contrib. p. 28, 1849, but is less slender, and has the whorls somewhat flattened.

Station.—Under stones, and among dead leaves, and dry earth; common.

Habitat.—Catharineberg, Misgen &c., St. Thomas; T. B.!

16. (14.) **Bulimus** ——— ? Sp. indet.

This approaches somewhat in character to *B. gracillimus* (Achatina) Pfr. in Wieg. Arch. pt. I. p. 352. No. 25. (1839) Pfr. Mon. Hel. Viv. II. p. 160. No. 418. 1848 Rv. Conch. Icon. sp. 594. 1849.

Station.—Under stones, amongst fine dry earth.

Habitat.—Hill opposite Baker's, St. Thomas; T. B.!

17. (16.) **Pupa servilis** ? Gould Jour. Bost. Soc. IV. p. 356.

t. 16. f. 14. - - - 1844.

————— Pfr. Mon. Hel. Viv. II. p. 366.

No. 142. - - - 1848.

Station.—Among fine earth with decaying vegetable matter.

Habitat.—St. Croix, and Matanzas; Gould. Cuba; Pfeiffer. Jamaica; Adams! St. Croix; R. E. Griffith! Mus. Amh. About ruined buildings, Catharineberg, St. Thomas; T. B.!

18. (17.) **Succinea Sagra** ? Orb. Moll. Cub. I. p. 141. t.

7. f. 1-3. - - - 1841.

————— Pfr. Mon. Hel. Viv. II. p. 529.

No. 58. - - - 1848.

This appears to be identical with the Jamaica shell (Ad. Contrib. pp. 40, 184), and is probably so with that from Cuba.

Station.—Under stones, and among dead leaves, in moist places.

Habitat.—Cuba; Orbigny; also Pfeiffer. Jamaica; Adams! St. Thomas; T. B.!

19. (18.) **Helix incerta** (Helicostyla) Fer. and Desh. Hist. I.

p. 221. t. 105. f. 2. - 1820-1851.

————— Pfr. Mon. Hel. Viv. I. p. 266. No. 697. 1848.

————— *lima* Rv. Conch. Icon. sp. 214. - 1851.

Reeve is certainly in error in treating *H. incerta* Fér. and *H. lima* Fér. as one species; the latter inhabits Porto Rico.

Station.—Unknown; dead specimens only were found.

Habitat.—St. Thomas; Férussac: also Pfeiffer. Jamaica; Reeve: corrected in Ad. Contrib. p. 204. St. Thomas, St. John's Tortola, and Anegada; Mus. Amh. St. Thomas; T. B.!

20. (19.) **Helix nemoralina** Pet. in Guer. Mag. de Zool. t. 80. 1836.

————— Pfr. Mon. Hel. Viv. I. p. 281.

No. 733. - - - 1848.

A variety also occurs, which we found dead only, at the base of the Hill opposite Baker's, St. Thomas, with a very pale brown band along the periphery.

Station.—Unknown; (said to have been found on shrubs at Dorothea, West End, St. Thomas.)

Habitat.—St. Thomas; Petit: also Pfeiffer: also T. B.!

21. (20.) **Helix** ———? Sp. indet.

This somewhat resembles *H. sincera* Ad. (Proc. Bost. Soc. p. 16, 1845,) from Jamaica, but is more finely striated; the umbilicus is larger, and the suture not so deeply impressed. Compare also *H. brevior* (depressa antea Ad. Proc. Bost. Soc. p. 16, 1845), from Jamaica and St. Croix. The animal has the habit of attaching dirt to the shell, like *H. ptychodes*, Pfr. *Succinea avara* Say, and *Helicina agglutinans* Sowb.

Station.—On the under side of stones; common.

Habitat.—Louisenhöi, Misgen, &c., St. Thomas; T. B.!

22. (21.) **Helix** ———? Sp. indet.

A thin brown shell, with simple lip, strongly striated, width .45 inch.

Station.—Under stones, and among dead leaves; common.

Habitat.—The garden at Baker's, &c., St. Thomas; T. B.!

23. (23.) **Helix peraffinis**? Ad. Proc. Bost. Soc. p. 16. 1845.

————— Pfr. Mon. Hel. Viv. II. p. 95.

No. 237. - - - 1848.

The umbilicus is rather less open than in the Jamaica shell.

Station.—Under stones.

Habitat.—Catharineberg, St. Thomas ; T. B. !

24. (24.) **Helix** ——— ? Sp. indet.

This is like *H. fulva* Müll. (Pfr. Mon. Hel. Viv. p. 30. No. 36.) of Europe, and *H. simulans* Ad. (Contrib. p. 35,) from Jamaica ; but the microscopic impressed spiral lines are much more minute than in the latter, being visible only under a very high power. Compare also the Cuba shell, *H. Gundlachi* Pfr. in Wieg. Arch. I. p. 250, 1840.

Station.—Among fine earth, and decayed vegetable matter.

Habitat.—Catharineberg, St. Thomas ; T. B. !

On the CLAUSILIE OF AMERICA. By THOMAS BLAND.
Oct. 1852.

The Genus *Clausilia* is represented in America and the West Indies by three species only, of which we subjoin an account.

Pfeiffer in his Mon. Hel. Viv. (1848) describes 222 species, of which, we learn from his table, vol. ii. p. 489, no less than 136 occur in Central Europe, and the remaining 86 as follows :—

In Tauria,	-	-	-	-	-	-	7 species.
" Greece and Ionian Islands,	-	-	-	-	-	-	25 "
" Turkey and Asia Minor,	-	-	-	-	-	-	20 "
" Caucasus,	-	-	-	-	-	-	1 "
" Syria,	-	-	-	-	-	-	9 "
" East Indies,	-	-	-	-	-	-	4 "
" China,	-	-	-	-	-	-	4 "
" Cochín-China,	-	-	-	-	-	-	1 "
" Japan,	-	-	-	-	-	-	2 "
" Philippines,	-	-	-	-	-	-	1 "
" Java,	-	-	-	-	-	-	5 "
" Egypt,	-	-	-	-	-	-	1 "
" Madeira,	-	-	-	-	-	-	3 "
" America,	-	-	-	-	-	-	3 "

The Genus does not occur in North America; two, *C. peruana* and *C. epistomium*, inhabit South America, and one, *C. tridens*, is found in the Island of Porto Rico. The Porto Rico species is described and figured by Chemnitz in his work, published in 1786, but Férussac first gave the correct habitat in 1821, on the authority of Maugé. *C. peruana* was described by Troschel, in April, 1847, as the only known American species, excepting *C. tridens*, and in the same year Küster described and figured *C. epistomium*.

The Genus *Clausilia* was instituted by Draparnaud in 1805, but the *clausium* had been described by O. F. Müller in his Hist. Vermium, &c., 1773, and afterwards by Daubenton in the Mem. de l'Acad. des Sciences. See Mr. Gray's paper in the Zool. Journ. I. 212. We detected the *clausium* in six of our specimens of the *C. epistomium*, and in several of the *C. tridens*.

1. *Clausilia tridens*.

Synonymy.

<i>Clausilia tridens</i>	(Turbo) Chem. IX. P. 1. p. 115, t. 112. f. 957. - - - - - 1786.
<i>Turbo labiatus</i>	Dillw. Deser. Cat. II. p. 875. No. 146. in parte. (1.) - - - - - 1817.
<i>Clausilia tridens</i>	Schweigg. Naturg. p. 741. teste Pfr. in Mon. Hel. Viv. - - - - - 1820.
<i>Helix bicanaliculata</i> (Cochlodina)	Fér. Prod. p. 62. No. 523. 1821.
<i>Clausilia costulata</i>	Lam. An. sans Vert. VI. pt. 2. p. 113. No. 4. - - - - - 1822.
	Bowd. El. Conch. pt. 1. t. 8. f. 28. ?? (2.) 1822.
<i>Clausilia labiata</i>	Sowb. Gen. fasc. 30 <i>Clausilia</i> , f. 3. (3.) 1824.
<i>Turbo costulatus</i>	Wood Suppl. t. 6. f. 36. 1828.
<i>Clausilia tridens</i>	Beck. Ind. p. 90. No. 1. 1837.
———— <i>costulata</i>	Desh in Lam. An. sans Vert. VIII. p. 198. No. 4. - - - - - 1838.
———— ————	Pfr. Symb. I. p. 47. teste Pfr. in Mon. Hel. Viv. - - - - - 1841.
———— ————	Rossm. XI. p. 8. No. 718. t. 52. f. 718. 1842.
———— <i>labiata</i>	Rv. Conch. Syst. II. p. 77. t. 171. f. 3. (4.) 1842.
———— <i>costulata</i>	Catlow Conch. Nom. p. 146. No. 40. (5.) 1845.

<i>Clausilia tridens</i>	Küster Mon. p. 12. t. 1. f. 1-4.	1847.
—————	Pfr. Mon. Hel. Viv. II. p. 396. No. 1. (6.)	1848.
—————	Jay's Cat. p. 247.	1850.
—————	Fér. et Desh. Hist. II. p. 234. No. 1. t.	
	166. f. 1. - - - - -	1820-1851.

Station.—Unknown.

Habitat.—Spain; Chemnitz. Near London; Dillwyn. Malta; Sowerby. Unknown; Wood. Porto Rico; Férussac: also Lamarek: also Beck: also Deshayes: also Rossmässler: also Pfeiffer: also Jay. Porto Rico, and probably other West India Islands; Küster. Porto Rico; Knox! Riise! in Mus. Amh.

(1.) Dillwyn gives the following erroneous synonymy, to which much of the confusion as to *C. tridens* may be attributed:

" <i>Turbo labiatus</i>	Mont. Test. Brit. p. 362. t. 11. f. 6. (1803)
	Maton and Racket, in Linn. Trans.
	VIII. p. 180. (1804). Dorset Cat. p. 51.
	t. 21. f. 15. (1813.)
<i>Turbo tridens</i>	Chem. IX. P. 1. 115. t. 112. f. 957?
———— <i>perversus</i>	Var. E. Gmelin, p. 3610?
<i>Strombiformis perversus</i>	Da Costa Brit. Conch. p. 107. t. 5. f. 15.
<i>Bulinus perversus</i>	Brug. Enc. Meth. p. 351.?"

Montagu, in his work (republished in Chenu. Bibl. Conch. Vol. 4. 1st series, p. 161. 1846,) as Syn. of *T. labiatus*, has *S. perversus* Da Costa, and *T. tridens* Chem. but the latter with a ? : he states that he preserves the name *labiatus*, of which he believes Dr. Solander was the author.

Forbes and Hanley in Hist. Brit. Moll. vol. iv. p. 121 (1852) mention that perhaps Da Costa's figure, copied in the Dorset Catalogue, "although from its rudeness it is impossible to pronounce with certainty upon it," was drawn from the British *C. nigricans*. For a description of *C. labiata* (Turbo) Mont., from France and Northern Italy, vid. Pfr. Mon. Hel. Viv. II. p. 458. No. 154. Maton and Racket, (republished in Chenu. Bibl. Conch. 2d ser. vol. i. p. 204. 1845.) describe *Turbo labiatus*, referring to Da Costa, Chem. with a ?, to Mont., and also to Olivier, Voy. dans l'empire Othoman, t. 17. f. 6. (1804). The

latter author states that his shell, so figured, and called by him *Bulimus teres*, was collected in Crete. It is described by Pfr. as *C. teres* (Bulimus) Oliv. in Mon. Hel. Viv. II. p. 414. No. 45.

We have not traced the *B. perversus* var. ϵ . Gmel., but the *B. perversus* Brug. is stated by Pfr. (in Mon. Hel. Viv. II. p. 536 with a ?) to be a Syn. of *C. rugosa* Drap., from Spain.

(2.) It is impossible to identify the figure given by Bowdich, but it is referred to in Fér. and Desh. Hist., the latest published synonymy of *C. tridens*.

(3.) Sowerby, at the foot of his plate, has Olivier as the authority for the specific name *labiata*, copied probably from Maton and Racket, without examination of Olivier's work. In the text, Sowerby gives as Syn. *T. labiatus* Mont. "from Malta."

(4.) Reeve also has the name *labiata* on the authority of Olivier, copied apparently from Sowerby, to whose work he refers. As Syn. he also has *T. labiatus* Mont.

(5.) Miss Catlow, under *C. costulata* Lam. refers to Sowb. Gen. f. 3. (*C. labiata*, Oliv.) and adds as Syn., *Helix bicanaliculata*, Fér. and *Turbo bidens* Chem., which latter is, according to Pfr. in Mon. Hel. Viv. II. p. 397. No. 4., Syn. of *C. laminata* (Turbo) Mont., from Europe. Under *C. labiata* Oliv. (Conch. Nom. p. 147. No. 83.) the authoress has the same reference to Sowb. Gen., adding as Syn. *Helix labiatus* Mont.

(6.) Pfeiffer in his synonymy of *C. tridens* refers to Dillwyn, without any qualification, thereby, in a measure, adopting the whole of his errors; and this is the more extraordinary, inasmuch as Pfeiffer has precisely the same unqualified reference to Dillwyn, as part of the synonymy of *C. labiata*.

2. *Clausilia peruana*.

Synonymy.

Clausilia peruana Troschel in Zeitschr. f. Malak. p. 51. April 1847.

————— Pfr. Mon. Hel. Viv. II. p. 483. No. 204. 1848.

Station.—Unknown.

Habitat.—Peru ; Troschel : also Pfeiffer, teste de Tschudi.
Pfeiffer mentions that one specimen only was collected.

3. *Clausilia epistomium*.

Synonymy.

Clausilia epistomium Küster Monogr. p. 13. t. 1. f. 5-8. 1847.
————— Pfr. Mon. Hel. Viv. II. p. 397, No. 2. 1848.

Station.—On rotten wood, and among dead leaves and sticks under stones, in moist shady places.

Habitat.—Marmato, (near Vega de Supia) Andes, west bank of the river Cauca, in New Granada, at elevations above the level of the sea of from five to seven thousand feet. T. B. ! Central America ; Küster : also Pfeiffer, "teste Cl. Thomæ."

We collected fourteen live and three dead specimens.

Catalogue of TERRESTRIAL SHELLS COLLECTED by T. BLAND IN NEW GRANADA, in 1851.

1. **Cyclostoma giganteum** Gray. Sowb. Thes. Conch. I.
92. No. 5. t. 23. f. 8. 9. 1843.

Station.—Among dead leaves, in moist places.

Habitat.—Mountains about Marmato (western Cordillera of the Andes) ; also on the mountains, (central Cordillera) east of the Paramo of Ervé, towards Fresno.

2. **C. Popayanm** Lea Trans. Am. Phil. Soc. VI. new series
p. 94. pl. 23. f. 76. - - - 1834.

Station.—Among dead leaves.

Habitat.—Banks of the Cauca, below Marmato, and east side of the Magdalena near Mendes.

3. **C. Quitense** Pfr. Proc. Zool. Soc. - - - 1851.

Station.—Same station.

Habitat.—Marmato ; and Santa Ana, near Mariquita.

4. **Helicina concentrica** Pfr. Proc. Zool. Soc. p. 120 No. 6. 1848.
Station.—Among dead leaves.
Habitat.—Old plantain ground near the junction of the rivers Cauca and Arquia, below Marmato.
 A larger variety occurred at Santa Ana.

5. **Bulimus Dennisoni** Rv. Conch. Icon. pl. 26. f. 166 *a.* 166. *b.* 1848.
Station.—Among ferns, moss, and dead leaves, in damp places.
Habitat.—Marmato.

6. **B. Powisianus** Pet. in Revue Zool. p. 53. - - 1845.
 ————— Rv. Conch. Icon. pl. 27. f. 167 *b.* 167 *c.* 1848.
 One individual laid three dark olive brown eggs, about .3 inch in length.
Station.—On damp banks under trees, and on shrubs.
Habitat.—Marmato, and the forest on the east side of the Cauca, on the road to Salamina.

7. **B. Gibbonius** Lea. Trans. Am. Phil. Soc. VI. new series,
 p. 85. pl. 23. f. 99. - - - 1834.
 ————— Rv. Conch. Icon. pl. 32. f. 197. - 1848.
Station.—Among moist decaying vegetation.
Habitat.—Roadside thicket between Guaduas and Villeta.

8. **B. castaneus** Pfr. Proc. Zool. Soc. p. 68. - - 1845.
 ————— Rv. Conch. Icon. pl. 32. f. 196. - - 1848.
Station.—Among dead leaves.
Habitat.—Forest near Fresno, on the road to Santa Ana, from the Paramo of Ervè.

- 9 **B. maximus** Sowb. Tank. Cat. App. p. VII. No. 973. 1825.
 ————— Rv. Conch. Icon. pl. 51, f. 337. - - 1848.
Station.—Among dead leaves, about the roots of trees in moist places.
Habitat.—Marmato, and below it on the banks of the Cauca; also near Arma.

10. **B. oblongus** Müll. Hist. Verm. II. p. 86. - - 1774.
 ————— Rv. Conch. Icon. pl. 35. f. 210. - - 1848.

Station.—Among moist decaying vegetation.

Habitat.—Santa Ana, Mendes, and Villeta.

11. **B. geometricus** Pfr. Symb. III. p. 84. - - 1846.
 ————— Rv. Conch. Icon. pl. 54. f. 278 a. - 1848.

Station.—Among dead leaves.

Habitat.—Forests in the mountains below Ervé, on the road to Santa Ana.

12. **B. spectatus** Rv. Conch. Icon. pl. 81. f. 601 b. - 1849.

Station.—Unknown.

Habitat.—Between Salamina and Cabuyal, west of Ervé.

13. **B. linostoma** ? D'Orb. Syn. p. 19. - - - 1835.
 ————— Rv. Conch. Icon. pl. 85. f. 613. - 1850.

Station.—Unknown.

Habitat.—Marmato.

14. **B. Pealianus** ? Lea, Trans. Am. Phil. Soc. VI. new series
 p. 64. pl. 23. f. 105. - - 1834.

Station.—On rotten wood.

Habitat.—Near the cascade of Tequendama.

15. **B. succinoides** Pet. in Revue Zool. p. 75. - - 1840.
 also in Guérin Mag. t. 31. - - 1841.
 ————— Rv. Conch. Icon. pl. 52. f. 264. - 1848.

Station.—Unknown.

Habitat.—Boca del Monte, entrance of plains of Bogotá from Villeta.

16. **B. nitelinus** Rv. Conch. Icon. pl. 59. f. 398. - 1849.

Station.—Among dead leaves.

Habitat.—Marmato, and old plantain ground near the junction of the rivers Cauca and Arquia.

17. **B. Gruneri** Pfr. Proc. Zool. Soc. p. 30. No. 11. - 1846.
 ————— Rv. Conch. Icon. pl. 51. f. 332. - 1848.

Station.—Unknown.

Habitat.—Mendes.

(To be continued.)

CONTRIBUTIONS TO CONCHOLOGY.

No. 12.

*Catalogue of TERRESTRIAL SHELLS COLLECTED by T. BLAND
IN NEW GRANADA, in 1851—(Continued.)*

18. **B. Lamarckianus** Pfr. Proc. Zool. Soc. p. 229. No. 6. 1847.
— ———— Rv. Conch. Icon. pl. 24. f. 156. 1848.

Station.—Unknown.

Habitat.—La Esperanza Estate, near Rio Negro.

19. **B. Adamsoni** Gray. Proc. Zool. Soc. p. 123. 1833.
— ———— Rv. Conch. Icon. pl. 26. f. 165 a, 165 b. 1848.

Station.—Unknown.

Habitat.—One dead specimen was obtained from the late General J. Acosta, by whom it was collected, we believe, in the valley of Guaduas.

20. **Streptaxis Candearia** (Helix) Pet. Revue Zool. p. 177. 1842.
——— Pfr. Mon. Hel. Viv. I. p. 7. No. 11. 1848.

Station.—Unknown—dead specimens only collected.

Habitat.—Woods near Barranquilla.

21. **Helix Gibboni** Pfr. Symb. III. p. 37. - - - 1846.
——— Rv. Conch. Icon. pl. 98. f. 539. - - 1852.
——— *magnifica* Lea Trans. Amer. Phil. Soc. VI. new series
pl. 23. f. 88. - - - 1834.

Station.—Among dead leaves, in moist places.

Habitat.—Marmato, also below Salamina towards the River Cauca, and near Arma.

22. **H. Oreas** Koch. in Phil. Abbil. I. p. 151. pl. 5. f. 2. 1842–1845.
——— Rv. Conch. Icon. pl. 99. f. 546.

Station.—Among dead leaves, in moist places.

Habitat.—Marmato, and mountains above it,—also near Salamina, and below Ervè, towards Fresno.

H. Oreas var. white,—with very thin pale brown epidermis.

Station.—Same as the last.

Habitat.—Tacon, above Marmato.

23. **H. atrata** ? Pfr. Proc. Zool. Soc. - - - - 1850.

Station.—Same.

Habitat.—Marmato and Tacon.

24. **Helix subplanata** ? (Caracolla) Petit in Revue Zool. p. 238. 1843.

_____ " in Guér. Mag. de
Zool. t. 68. - - - 1843.

We cannot agree with Pfeiffer and Reeve in considering this to be a variety of *H. labyrinthus* Chem. It is much more nearly allied to *H. plicata* Born. Our shell is thin and delicate, in size like Petit's figure above referred to; the basal margin of the aperture has a lamina next the canal, and one rather broad grooved tooth beyond, with a small narrow lamina or tooth, slightly developed, some distance within the upper lip, visible on the exterior through the shell,—in which latter character it agrees with *H. plicata* Born. This last mentioned tooth is shown in Lea's figure of *Carocolla Hydiana* Lea, from Porto Cabello (held to be identical with *H. plicata* Born), Trans. Am. Phil. Soc. VI. new series, pl. 23. f. 73 a, but is not noted in the descriptions of that shell by Pfr. in Mon. Hel. Viv. I. p. 398, or Rv. in Conch. Icon. sp. 553.

Station.—Among dead leaves.

Habitat.—Marmato.

25. **Helix monile** ? Brod. Proc. Zool. Soc. p. 29. - - 1832.

_____ *planorbis* Jay Cat. p. 112. pl. 1. f. 6, 7. - - 1839.

Station.—Unknown—one dead but perfect specimen only collected.

Habitat.—Marmato.

26. **Clausilia epistomium** Küster Mon. p. 13. t. 1. f. 5-8. 1847.

Station.—On rotten wood, and among dead leaves and sticks under stones, in moist shady places.

Habitat.—Marmato, and Tacon.

Several undetermined and new species of *Helix*, *Bulimus*, *Achatina*, and *Succinea*, and of *Ampullaria*, and other freshwater shells, were also collected.

T. B.

October, 1852.

Descriptions of new Species of CORBULA from JAMAICA. By
C. B. ADAMS. *October, 1852.*

Mr. Reeve's monograph of CORBULA (1843-4) describes 43 species, including Potamomya. Philippi has since described 2 species in the Zeitschrift für Malak., and we have added (Catal. Panama Shells) 1 Corbula proper, and 3 Potamomyæ. Omitting some of doubtful generic character, about 6 others had been previously described. Of these 55 species, 5 are from unknown habitats, 1 is from the Arctic regions, 2 from Europe, 2 from West Africa, 21 from the Indian Ocean and the adjacent part of the Pacific, mostly from the Philippine Is., 4 from New Zealand and New Holland, 15 from the Panama zoological province, 1 from Chili, 1 from the United States, 2 from the West Indies, and 2 (which are Potamomyæ) from the Rio de la Plata. The 2 Corbulæ proper from the Caribbean zoological province are *C. operculata* Phil. from St. Thomas, and *C. equivalvis* Phil from Cuba.

To these we now add 10 species. We have great pleasure in commemorating with them the names of gentlemen who, by personal collections in the West Indies, have contributed valuable materials for the subject of the geographical distribution of the Mollusca.

In the following descriptions, the larger is called the right valve, the shorter end being anterior, with the ligament a little behind the beaks. This explanation appears necessary, on

account of a different orismology in Mr. Reeve's excellent monograph.

CORBULA KREBSIANA. *C. t. trigonâ*, perinequivalvi, inequilaterali; valvâ dextrâ rostratâ; margine ventrali anticè rotundatâ, posticè rectâ: albidâ, suprâ et anticè rubro tinctâ: valvâ parvâ concentricè striatâ; valvâ dextrâ concentricè sulcatâ, sulcis crebris, parvis: apicibus prominentibus, involutis: umbonibus convexis: dentibus parvis. Long. 6.1 millim.; alt. 5.1 millim.; lat. 3.8 millim.

Shell trigonal, very inequivalve, inequilateral, with the large valve rostrated; with the ventral margin rounded anteriorly, nearly straight posteriorly: white, often tinged with pink on the beaks and umbones except posteriorly: small valve finely concentrically striated; large finely and closely furrowed: beaks prominent, much involuted: umbones very convex; with small posterior angles, one on the small valve and two on the other: teeth small.

Length .24 inch; height .2 inch; breadth .15 inch.

Probably it resembles *C. operculata* Phil.

Station.—Muddy bottom, at a depth of 3 or 4 fathoms; C. B. A.!

Habitat.—In the harbor of Kingston, between K. and Port yal; C. B. A.! About 60 specimens were obtained, most of which are less than .2 inch long.

CORBULA BLANDIANA. *C. t. crassâ*, subrhombicâ, vix inequivalvi, perinequilaterali; margine anticè rotundatâ, aliunde rectilineari, posticè infrâ acuminatâ: albâ: costis magnis, subcutis, concentricis, posticè minoribus; lineis radiantibus tuberculatis, microscopicis; tuberculis deciduis; valvis ambobus similiter insculptis; apicibus prominulis, vix involutis: umbonibus planulatis, posticè valdè angulatis: dentibus parvis. Long. 11'''.2; alt. 6'''.6; lat. 4'''.5.

Shell thick, subrhombic, slightly inequivalve, very inequilateral; anteriorly well rounded, with the other margins nearly

or quite rectilinear; posteriorly and inferiorly acuminate: white: with large blunt edged concentric ribs, which are more slender in the posterior area; with microscopic radiating lines of deciduous tubercles, which are visible only under a good magnifier; with both valves sculptured alike: beaks prominent, slightly involute: umbones flattened, with a stout posterior angle: teeth rather small. Under a good magnifier a crystalline structure is very conspicuous.

Length .44 inch; height .26 inch; breadth .18 inch.

Station.—Muddy bottom, at the depth of 3 or 4 fathoms; C. B. A.!

Habitat.—Port Royal, in Jamaica; C. B. A.! 5 specimens were collected.

CORBULA DIETZIANA. C. t. solidâ, valdè distortâ, juniore vix inequivalvi, seniore perinequivalvi, inequilaterali; margine anticè rotundatâ, aliunde rectilineari, posticè infrâ acuminatâ: albidâ, radiis rubris, inequalibus, sæpe confluentibus, in juniore obsoletis, ornatâ: costis magnis, subacutis, concentricis, in seniore irregularibus et in valvâ parvâ exilibus: apicibus prominulis, vix involutis: umbonibus planulatis, posticè valdè angulatis: dentibus robustis. Long. 10''' .7; alt. 8''' .4; lat. 9''' .1: junioris, long. 10''' .1; alt. 6''' .6; lat. 4''' .3.

Shell solid, much distorted, moderately inequivalve in the first stage of growth, afterwards very inequivalve, inequilateral; anteriorly well rounded, with the other margins subrectilinear, posteriorly and inferiorly acuminate: whitish, with unequal often confluent bright red rays, which are indistinct in the first stage of growth: with concentric blunt edged unequal ribs, which are more irregular in the last stage of growth; with both valves sculptured alike in the first stage of growth, but in the second, the small valve is only striated: beaks prominent, slightly involute: umbones flattened, with a strong posterior angle: teeth rather stout.

Length .42 inch; height .33 inch; breadth .36. The corre-

sponding dimensions of a shell commencing the second stage of growth are .4 inch; .26 inch; .17 inch.

This species is remarkable for two very distinct stages of growth, with a very abrupt transition from the first to the second. Until a little more than half grown, it is very much like *C. Blandiana* in the form of the outline, in the sculpture, and in having the valves similarly sculptured, and nearly equal. In the second stage of growth, the larger valve increases nearly three times as much as the other, and the growth is abruptly and strongly directed inwards so as greatly to increase the breadth of an old shell. The sculpture is more irregular, and on the small valve it is much finer, and is covered with a coarse deciduous epidermis. Posteriorly the small valve is deeply set into the larger one. So abrupt is the change from the first to the second stage of growth, that the edge of the umbonial angle in the first makes an angle with the edge in the second of only about 115° , and the general form is made very irregular. It is the analogue of *C. speciosa*, which inhabits the west coast of tropical America.

Station.—Unknown.

Habitat.—Kingston harbor (Jamaica), along "the Palisades," southeast from the city; A. Barratt! C. B. A.! 22 specimens were obtained, of which several were collected by my companion Dr. Barratt, who kindly gave me nearly all his specimens of this remarkable shell.

CORBULA SWIFTIANA. C. t. subovoideâ, solidissimâ, inequivalvi, vix inequilaterali, posticè acutè rostratâ; margine ventrali excurvatâ: albidâ: rugis irregularibus et striis concentricis; junioribus exilissimè radiatim striatis: apicibus parvis, haud involutis: umbonibus perconvexis, anticè subangulatis, posticè acutè angulatis: dentibus robustis. Long. $10''$.4; alt. $5''$.9; lat. $5''$.9.

Shell subovoid, very solid, inequivalve, slightly inequilateral, acutely rostrated posteriorly, anteriorly well rounded and glo-

bose, with the dorsal margins nearly straight and the ventral margin well excurved: whitish: with moderately developed concentric irregular ridges and striæ; with the larger valve sculptured more regularly and deeply than the other; with very minute radiating striæ in the young: beaks small, not involute: umbones very convex, indistinctly angulated anteriorly, with a sharp but not very prominent angle posteriorly: teeth robust. It is the analogue of *C. nasuta*, which inhabits the Pacific coast of tropical America.

Length .41 inch; height .235 inch; breadth .235 inch.

Station.—Sand, in 3 or 4 fathoms water; C. B. A.!

Habitat.—St. Thomas; T. Bland! in sched. in Mus. Amh. In the east part of the harbor of Kingston, Jamaica; C. B. A.!

About 250 specimens were collected.

CORBULA KJÆRIANA. C. t. *C. Swiftianæ* simili; sed posteriori vix rostratâ, paullulum productiore: rugis concentricis robustioribus, in lunulam productis; valvis ambobus similiter insculptis: angulo umbonali acutior, a margine dorsali plùs remotâ. Speciminis magni long. 12'''.2; alt. 7'''.6; lat. 5'''.2.

This species so closely resembles *C. Swiftiana*, that a specification of the differences will suffice for description. *C. Kjæriana* is not so distinctly rostrated, although usually a little more elongated posteriorly: the concentric ridges are stouter, and are continued into the lunule; both valves are sculptured alike: the umbonial angle is more acute and distinct, and is a little more distant from the posterior dorsal margin.

Length of a large specimen .48 inch; height .3 inch; breadth .26 inch.

Station.—In mud, in 4 or 5 fathoms water; C. B. A.!

Habitat.—St. Thomas; T. Bland! in sched. in Mus. Amh. Kingston harbor, Jamaica; C. B. A.!

We obtained 70 specimens, most of which are immature.

CORBULA BARRATTIANA. C. t. ovato-triangulari, subtenui,

inequivalvi, vix inequilaterali, posticè acuminatâ, margine ventrali excurvatâ: albidâ: rugis irregularibus parvis concentricis, in lunulam haud productis, ad valvam magnam haud multum majoribus; junioribus exilissimè radiatim striatis: apicibus parvis, haud involutis: umbonibus posticè acutè angulatis: dentibus parvis. Long. 8''' .9; alt. 5''' .2; lat. 4''' .3.

Shell ovate-triangular, somewhat thin, inequivalve, slightly inequilateral, posteriorly acuminate, with the ventral margin well rounded: whitish: with small concentric irregular ridges, which are a little larger on the large valve, not produced into the lunule; with minute radiating striæ in young shells: beaks small, not involute: umbones with an acute angle posteriorly: teeth moderately developed.

Length .35 inch; breadth .26 inch; height .17 inch.

Station.—In mud, in 4 or 5 fathoms water; C. B. A.!

Habitat.—Kingston harbor, Jamaica; C. B. A.! About 200 specimens were collected, many of which are immature.

CORBULA CHITTYANA.—C. t. *Barrattianæ* simili; sed multum crassiore, latiore, inequivalvior; præcipuè differt quoad crescendo rationem duplicem, sicut *C. Dietziana*. Long. 8''' .6; alt. 5''' .8; lat. 5''' .2.

This species resembles *C. Barrattiana*, but differs in being very thick and solid, very wide, and in having two periods of growth, like *C. Dietziana*: it is also more inequivalve.

Length .34 inch; height .23 inch; breadth .22 inch.

Station.—In 4 or 5 fathoms water, in a muddy bottom; C. B. A.!

Habitat.—Kingston harbor, Jamaica; C. B. A.! We obtained only 4 specimens of this rare shell.

CORBULA KNOXIANA. C. t. ovato-rhombicâ, subcrassâ, subequivalvi, vix inequilaterali, posticè truncatâ et infrâ acuminatâ; margine ventrali rectâ vel haud multum excurvatâ: albidâ: rugis concentricis reclinatis acutis regularibus, in speciminibus

magnitudinem variantibus, ad aream posticam crebrioribus: apicibus parvis, haud involutis: umbonibus subplanulatis, posticè concavis, acutissimè angulatis; areâ posticâ sulco bisectâ, a labiis angulo disjunctâ; dentibus validis, brevibus. Long. 12^{'''}.7; alt. 8^{'''}.1; lat. 7^{'''}.1; spec. alterius, long. 9^{'''}.4; alt. 7^{'''}.9.

Shell ovate-rhombic, moderately thick, subequivalve, slightly inequilateral, posteriorly truncated, and acuminate below, with the ventral margin straight or moderately excurved: whitish: with concentric regular acute-edged reclivate ridges, varying in size in different specimens, smaller and more crowded in the posterior area: beaks small, not involute: umbones flattened, with a very acute much developed angle, with the posterior area more or less concave and divided along the middle by a furrow, separated by an angle from the corselet: teeth short and strong.

Length .5 inch; height .32 inch; breadth .28 inch; another shell is .37 inch long, and .31 high.

Station.—In mud, in 3 or 4 fathoms water; C. B. A.!

Habitat.—Kingston harbor, Jamaica; C. B. A.! We obtained 2 entire shells and 20 odd valves of this rare species. It is an analogue of *C. bicarinata* of the Panama zoological province.

CORBULA QUADRATA Hinds. *C. t. subtriangulari*, tenui, (inequivalvi?) perinequilaterali, anticè brevissimâ, posticè suprâ excurvatâ et infrâ subacuminatâ; margine ventrali subrectâ: albâ: concentricè irregulariter striatâ, exilissimè granulatâ: apicibus parvis, haud involutis: umbonibus planulatis, posticè angulatis: angulo acuto, editissimo; areâ posticâ magnâ, concavâ; dentibus gracilibus. Long. 11^{'''}.4; alt. 8^{'''}.9; lat. 7^{'''}.1.

Shell subtriangular, thin, (inequivalve?) very inequilateral, the anterior part being very short, posteriorly well rounded above and subacuminate below; ventral margin nearly straight: white: sculptured only with fine irregular striæ of growth, and with microscopic granules except on the posterior third: beaks small, not involute; umbones flattened, with an acute exces-

sively prominent posterior angle, behind which is a large concave area: teeth prominent, not robust.

Length .45 inch; height .35 inch; breadth .28 inch.

Station.—Unknown.

Habitat.—Unknown; Hinds: also Reeve. St. Thomas; T. Bland! in sched. in Mus. Amh. We have only 5 odd valves; the relative size of the valves is therefore doubtful.

Synonymy.—*C. quadrata* Hinds, in Proc. Zool. Soc. Lond.

p. 57. - - - - May 1843.

— — — — Reeve Conch. Icon. pl. 5, f. 40. May 1844.

After the brief descriptions by Mr. Hinds and Mr. Reeve, additional description may not be wholly useless. The figure given by Mr. Reeve exactly represents our specimens even to the irregularity of the umbonial angle, which appears as if actually distorted by the compression of the upper part of the umbo.

CORBULA NEWTONIANA.—*C. t. obovata-rhombicâ, tenui, (inequivalvi?) perinequilaterali, anticè brevissimâ, anticè et posticè excurvatâ; margine ventrali rectâ: albâ: concentricè irregulariter et exilè striatâ: apicibus parvis, haud multùm editis, haud involutis: umbonibus subangulatis; dentibus gracilibus.* Long. 12''' .7; alt. 8''' .6; lat. 7''' .9.

Shell between an obovate and rhombic form, thin, (inequivalve?) very inequilateral, the anterior part being very short, anteriorly and posteriorly well rounded; ventral margin straight: white: with fine irregular striæ of growth: beaks small but somewhat prominent, acute, not involute: umbones with an obtuse angle extending diagonally through the posterior half of the disk; teeth prominent, not robust.

Length .5 inch; height .34 inch; breadth .31 inch.

Station.—Unknown.

Habitat.—St. Thomas; T. Bland! in sched. in Mus. Amh. We have only 4 specimens of the left valve.

CORBULA FULVA.—*C. t. ovato-triangulari, crassâ, (inequi-*

valvi?) vix inequilaterali, posticè subrostratâ; margine ventrali excurvâtâ: fulvâ, intus roseo tinctâ: concentricè suprâ striatâ, infrâ fortiter sulcatâ: apicibus parvis, haud involutis: umbonibus perconvexis, posticè biangulatis: dentibus medioeribus. Long. 7''' .9; alt. 5''' .6; lat. 5''' .1.

Shell ovate-triangular, thick, (inequivalve?) subinequilateral, subrostrated posteriorly; ventral margin excurved: yellowish brown, tinged with red within: striated above, and strongly furrowed below, concentrically: beaks small, not involute: umbones very convex, posteriorly biangulated: teeth moderately developed. It differs from *C. Swiftiana* in being less rostrated; it is also shorter than *C. Kjeriana*; and differs from both in color, and in being very strongly sulcated. We have therefore ventured to describe it from a single right valve.

Length .31 inch; height .22 inch; breadth .21 inch.

Station.—Unknown.

Habitat.—The specimen (in Mus. Amh.) was said to have come from the Amazon; but the species is not a *Potamomya*.

JOURNAL DE CONCHYLIOLOGIE, *comprenant l'étude des Animaux, des Coquilles vivantes et des Coquilles fossiles, publié sous la direction de M. Petit de la Saussaye.*—We desire to call the attention of Conchologists to this valuable journal. The first volume, published at Paris in 1850, contains 440 pages, with 15 plates, and the second volume, published in 1851, has 444 pages, with 12 plates. Parts 1 and 2 of the third volume were issued in April and June of the present year, and have together 240 pages, with 8 plates. The plates are beautifully executed, and consist of figures of fossil and recent shells, the latter coloured, with anatomical drawings of the soft parts of some species. The articles in this Journal, contributed by D'Orbigny, Petit, Recluz, Moricand, Morelet, and other eminent scientific men, are very interesting. The last number contains, among other

papers, anatomical descriptions of the animal of *Ancylus fluviatilis*, and of the animal of *Glandina*—the former by Mr. Moquin-Tandon, the latter by M. Morelet: also descriptions of various new species of Mollusks, and a Catalogue of the marine shells of the coasts of France. The price of each volume of the Journal is 18 fr. Address M. Petit de la Saussaye, Rue neuve des Mathurins No. 19. Paris. T. B.

MEMORIAS sobre la HISTORIA NATURAL de la ISLA DE CUBA, acompañadas de sumarios latinos y extractos en francés. By Felipe Poey. Havana, 1851.—The two first parts of the first volume of this work have been published, and contain 16 fine plates, some of them highly coloured, with 120 pages of letterpress. Of the plates, 2 are of mammalia, 5 of fishes, 3 of insects, and 6 of land shells. The first part contains, on the subject of Conchology, an introductory article on Terrestrial Univalves, and the second, an article on the Genus *Cyclostoma*, with general remarks on Gasteropods, and particularly on terrestrial operculated shells, followed by descriptions of ten new species of *Cyclostoma*, a note on *C. tortum* Wood, and also descriptions of thirteen species of *Helicina*. We hope that this undertaking will meet with the liberal encouragement which it deserves. The author proposes to complete the work in 24 parts, to be issued periodically, the last by the end of 1854. The price of each part at Baillière's, Broadway, New York, is \$2 50.

T. B.

Catalogue of SPECIES OF LUCINA, which inhabit the WEST INDIAN SEAS. By C. B. ADAMS. November, 1852.

The genus *Lucina* contains about 90 known species, of which 69 are described in Mr. Reeve's monograph. The following list of 20 West Indian species is presented chiefly as a vehicle for some miscellaneous statements respecting the nomenclature, and the habitats of some of them.

1. **Lucina Americana.** Nov. sp.

L. t. Lucinæ divaricatæ simili; crassiore, majore; striis profundioribus ornatâ; lunulâ minimâ, elongatâ, sinuosâ; marginibus exilissimè crenulatis, haud serratis. Long. 19.8 millim.; alt. 19.6 millim.; lat. 12.7 millim.

We wish to call the attention of *geologists* and of others, who have believed in the great geological antiquity and the wide geographical distribution of the so-called *L. divaricata*, to the just remark of Philippi (Zeit. f. Mal. 1848. p. 151): "nomine *L. divaricatæ* plures species confusæ, omnes divaricatum striatæ." When the types shall have been properly distinguished, we believe they will be found to have the ordinary restriction both in time and in area. The Linnæan name should be reserved for the Mediterranean species, since Linnæus assigns his shell to a Mediterranean habitat.

L. eburnea Rv., from the west coast of tropical America, resembles this species more closely than does any other Atlantic species, but differs in having a more distinct and cordate lunule, and in having the striae more arcuated. The beaks of our shell are not oblique as in *L. ornata* Rv.

Habitat.—Coney Is., New York; C. B. A. ! and Jamaica; C. B. A. ! St. Thomas; T. H. Newton ! in Mus. Amh.

2. **Lucina Anatellinoides** Reeve, Conch. Icon.

"*Habitat.*—West Indies;" Reeve.

3. **Lucina Antillarum** Reeve, Conch. Icon. Aug. 1850.

This species was described by me, under the name of *L. ornata*, in a paper read before the Bost. Soc. Nat. Hist. May 5, 1847. This name occurs in the published record (Proc. vol. ii. p. 228), but the description of this and of several other species appears to have been overlooked in publication. The species was also included, with the same name, in my Catalogue of North American Shells, Jan. 1, 1847. Subsequently Mr. Reeve has given the same name to another species; but both of Mr. R.'s names must stand.

Habitats of specimens in the Mus. Amh.; Guadaloupe; Petit. St. John's I.; E. Hartwig! St. Thomas; T. Bland!: also Krebs! Jamaica; C. B. A.! West Indies; S. Hovey!*

4. **Lucina aurantia** Desh. Encyc. Meth. Vers. 1830. Ib. in Lam. An. sans Vert. 1835. Menke in Zeit. f. Mal. 1849. Reeve Conch. Icon. 1850.

Habitat.—"Nous la croyons des mers de l'Inde;" Deshayes. "Cuba and St. Thomas;" Menke. "West Indies;" Reeve. Of specimens in Mus. Amh.: St. Thomas; Krebs! W. Indies; S. Hovey!

5. **Lucina Chemnitzii** Phil. Zeit. f. Mal. 1848. *L. divaricata* Reeve (non Linn.) Conch. Icon. 1850. An *L. serrata* Orb.?

Habitat of specimens in Mus. Amh.; St. Thomas; Krebs! West Indies; S. Hovey!

6. **Lucina edentula** (Venus) Linn.

Habitats of specimens in Mus. Amh.: St. Thomas; Krebs! Porto Rico (red var.); Hartwig. Jamaica; C. B. A.! West Indies; S. Hovey! An odd valve is 3 inches long and 2.9 inches high.

7. **Lucina exasperata** Reeve, Conch. Icon. Aug. 1850. *L. tigrina* Lam. var. 3.

Several large specimens of this species, now in the Mus. Amh., were said to have been collected by the Rev. Henry Lyman, in the East Indies, on his way to Borneo, where he was killed by the savages. If Lamarck's statements of habitat were more reliable, we might suppose, therefore, as his *L. tigrina* is said to inhabit "l'océan Indien et Americain," that this was his East Indian type. But Mr. Reeve quotes Dyson as an original collector of the shell in Honduras.

8. **Lucina funiculata** Reeve, Conch. Icon. 1850.

Habitat.—"Honduras; Dyson!" Reeve.

* Professor Hovey's collections were made chiefly in St. Croix and Antigua.

9. **Lucina granulosa** Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845.

Habitats of specimens in Mus. Amh.: St. Thomas; T. Bland! Jamaica; C. B. A.!

10. **Lucina imbricatula** Ad. Proc. Bost. Soc. Nat. Hist. Jan. 1, 1845. *L. pecten* Reeve, Conch. Icon. pl. 7. f. 34, 35 *a* (35 *b* excl.) June 1850. *L. occidentalis* Reeve, Conch. Icon. Aug. 1850. *L. pecten* Petit in sched.

Habitat.—"I. of St. John, W. Indies; Hartwig! Lord Hood's I.; Cuming!" Reeve. Has not Mr. R. confounded with our species a Pacific analogue? Of specimens in Mus. Amh.: Guadaloupe; Petit. St. John's I.; E. Hartwig! St. Thomas; Krebs! Jamaica; C. B. A.; in 2 to 4 feet of water. West Indies; S. Hovey!

11. **Lucina Jamaicensis** (Venus) Chem.

Habitats of specimens in Mus. Amh.: San Juan de Nicaragua; Krebs! Carthagena; Krebs! St. Croix; E. Hartwig! St. Thomas; Krebs! Jamaica; C. B. A.! West Indies; S. Hovey!

12. **Lucina Janeirensis** Reeve, Conch. Icon. June 1850.

In the Catalogue of North American Shells (Jan. 1, 1847), this species appeared with the name *L. lupinus* Broc. on the authority of Prof. Brown. Finding that it was distinct, I described it before the Bost. Soc. N. H., May 5, 1847, with the name of *L. subglobosa*, which was inserted in the Proceedings. But the description having been omitted, as before stated, Mr. Reeve's name must stand.

Habitat.—"Rio Janciro;" Reeve. Of specimens in Mus. Amh.: St. Thomas; Krebs! Jamaica; C. B. A.!

13. **Lucina pectinata** Ad. Catal. N. Amer. Shells, Jan. 1, 1847.

This is another of the species of which the name only occurs in the Proc. Bost. Soc. May 5, 1847. It does not appear to have been described elsewhere.

L. t. *Lucinæ pectini* affini, sed perobliquâ, posticè declivi, exilissimè concentricè striatâ; costis radiantibus latioribus, pluribus

bi- vel tri-furcatis. Long. 18.8 millim.; alt. 13 millim.; lat. 10 millim.

It must also resemble *L. obliqua* Reeve, said to have been collected by Benson at Chusan. But in that shell, the concentric and radiant lines are described in the same terms, and the posterior margin is figured as broadly subtruncate.

Habitat.—Jamaica; C. B. A.! It is found, rarely, among collections of West Indian shells.

14. ***Lucina pectinella*** Ad. Nov. sp.

L. t. suborbiculari, margine dorsali subrectâ, marginibus alteris rotundatis; costis radiantibus planulatis, subapproximatis, nonnullis angustè bifurcatis, ad extremitates nullis; lineis elevatis concentricis regularibus, costas superantibus; striis concentricis intermediis microscopicis; lunulâ conspicuâ, cordatâ, subelongatâ; limbo interno a costis pectinato; dentibus lateralibus magnis. Long. 7.8 millim.; alt. 8.1 millim.; lat. 2.8 millim.

Dredged in 4 or 5 fathoms, in soft mud, in the harbor of Kingston, Jamaica; C. B. A.!

15. ***Lucina Pennsylvanica*** (Venus) Linn.

Habitats of specimens in Mus. Amh.: St. Thomas; E. Hartwig!; also Krebs! W. Indies; S. Hovey! Jamaica; C. B. A.! Yucatan; Largilliert.

16. ***Lucina pilula*** Ad. Nov. sp.

L. t. *Lucinæ divaricatæ* affini; sed minore, crassiore, globosâ; apicibus prominentibus, haud obliquis; lunulâ parvâ, subdepressâ, subcordatâ; striis divaricatis crebris, radiantibus microscopicis, evanescentibus; limbo crenulato. Long. 10.7 millim.; alt. 9.9 millim.; lat. 7.3 millim.

The lunule is not elongate as in *L. Americana*, and the marginal crenulations are stronger, and the depressions between them are prolonged into the interior.

Habitat.—We have received 2 specimens from M. Krebs as West Indian shells.

17. **Lucina scabra** Reeve (Lam.?)

Lamarek cites *Tellina muricata* Chemn. in his synonymy of *L. scabra*, without assigning any reason for changing the name. Mr. Reeve uses the Lamarekian name for this West Indian species, but applies the Chemnitzian name to a Peruvian species obtained by Mr. Cuming.

Habitat.—One large and several smaller specimens were obtained with *L. pectinella*.

18. **Lucina soror** Ad. Nov. sp.

L. t. suborbiculari; margine superiore anticè et posticè declivi, inferiore anticè subarcuatâ; cinereo-albidâ; microscopicè creberrimè punctulatâ; striis concentricis exilissimis creberrimis; umbonibus prominentibus; apicibus subobliquis; lunulâ minutissimâ; limbo simplici; dentibus lateralibus obsoletis. Long. 19.6 millim.; alt. 18 millim.; lat. 12.7 millim.

Except in form, it resembles *L. Janeirensis*. It was obtained with *L. pectinella*.

19. **Lucina tigerina** (Venus) Linn.

Habitats of specimens in Mus. Amb.: St. Thomas: E. Hartwig!: also T. Bland!: also H. Krebs! W. Indies; S. Hovey! Jamaica: C. B. A.! Bermudas: J. H. Redfield MS.; also C. U. Shepard MS.

20. **Lucina virgo** Reeve Conch. Icon. June 1850.

Habitat.— —: Reeve. With this species we doubtfully identify certain shells from Jamaica and the other West Indies.

ERRATA.

This list of errata includes chiefly errors of typography or of grammar. Some errors in the synonymy and in the limitation of species have not been corrected, but may be noticed in a final work on the land shells of Jamaica.

On p. 3, 6th line from the bottom, after *old* insert *shells*.

Pages 1-8 of No. 2 should be paged 17-24.

On p. 19, 8th line from the top, after *whorl* insert *except*.

" 30, 4th " " for *fine* read *five*.

" 32, 9th " the bottom, for *fine* read *five*.

" 25, 1st line at the top, for *Phillipiana* read *Philippiana*.

" 39, 4th line from the bottom, for *Phillipiana* read *Philippiana*.

" 40, 5th " " top, for *aberrans* read *aberrans*.

" 40, 3d " " bottom, for *Spengleri Hinds* read *Spengleriana Pfr.*

" 47, 14th " " dele *H. hamastoma Moric.* and *of*.

" 47, 11th " " for *two* read *one*.

" 47, 10th " " for *third* read *second*.

" 48, 9th " " top, dele *of* before *γ*.

" 50, 5th " " bottom, for *the West in* read *in the West*.

" 51, 2d " " for *hamastoma Moric.* read *aurantia Gray*.

" 63, 10th " " top, for *Rv.* read *Knr.*

" 69, 2d " " before 1850 insert *Feb.*

" 78, 16th " " for *Schroeteri* read *Schroeteriana*.

" 88, 2d " " for *inusitata* read *inusitatus*.

" 88, 15th " " for *costulosa* read *costulosus*.

" 135, 14th and 15th lines from the top, dele the quotation marks.

" 137, 1st line at the top, for *rugodens* read *rugose and*.

" 139, dele the 13th line.

" 141, 3d line from the bottom, for *corresponding* read *correspond*.

" 142, 11th line from the bottom, for *Jamaicensis* read *Jamaicense*.

The description of *Halimus immaculatus* was omitted from p. 29. The authorship of this name must therefore be ascribed to Mr. REEVE, who subsequently adopted it in the CONCHOLOGIA ICONICA.

INDEX.

[Names of families and of more comprehensive groups are in SMALL CAPITALS. All synonyms, and names of species and genera not first described in this volume, are in *italics*. Names of new species and genera regarded as valid, are in Roman letters. Synonyms introduced by the author are referred to the valid names of the species.]

	Page		Page
<i>Achatina</i> ,	27	<i>Achatina venusta</i> Ad.	39, 183
<i>aberrans</i> Pfr. v. <i>Spiraxis</i> a.	40, 52,	var. γ Pfr.	48
	88, 184	var. <i>unicolor</i> Pfr.	177
<i>angiosoma</i> Ad.	25, 39, 103, 183	<i>vicina</i> Ad.	40, 184
<i>anomala</i> Ad. v. <i>Spiraxis</i> a.	184	<i>Achatinella abbreviata</i> Rv.	128
<i>arcuata</i> Pfr.	39, 183	<i>castanea</i> Rv.	128
<i>Blandiana</i> Ad.	83, 167, 183	<i>decepta</i> Ad.	127
<i>costulata</i> Ad.	40, 184	<i>Dimondi</i> Ad.	126
<i>costulosa</i> Ad.	102, 184	var. <i>lata</i> ,	127
<i>curvilabris</i> Pfr.	39, 184	<i>magna</i> Ad.	125
<i>Dominicensis</i> Gmel.	39, 48, 177, 183	<i>modesta</i> Ad.	128
<i>elegans</i> Ad.	25, 39, 183	<i>pulcherrima</i> Swain.	128
<i>Gayana</i> Ad.	103, 183	<i>radiata</i> Pfr.	128
<i>Gossei</i> Pfr.	40, 184	<i>Reevii</i> Ad.	128
<i>gracilior</i> Ad.	104, 184	<i>rubens</i> Gould,	127
<i>Griffithii</i> Ad.	39, 129, 180, 183	<i>Tappaniana</i> Ad.	126
<i>Griffithsii</i> Ad.	180	var. <i>dubiosa</i> Ad.	126
<i>Ingallsiana</i> Ad.	25, 39, 183	<i>viridans</i> Migh.	128
<i>inuitata</i> Ad. v. <i>Spiraxis</i> i.	26, 40,	" Rv.	128
	87, 184	<i>Ampullaria fasciata</i> Lam.	45, 50, 187
<i>iota</i> Ad.	40, 52, 53, 184, 219	<i>Ancylus Chittyi</i> Ad.	204
<i>Jamaicensis</i> Pfr.	39, 183	<i>fluvialis</i> Müll.	242
<i>leucozonias</i> Walch.	24, 39, 48, 177,	<i>obliquus</i> Ad. v. A. Chittyi,	132, 187,
	183		204
<i>levis</i> Ad.	26, 40, 184	<i>obscurus</i> Hald.	45, 50, 187
<i>ligata</i> Ad.	25, 39, 183	ANNELIDES,	200, 201
<i>longispira</i> Ad.	104, 183	<i>Aplysia</i> ,	200
<i>micans</i> Ad.	26, 40, 184	<i>Argonauta</i> ,	197, 198, 200
<i>nemorensis</i> Ad.	25, 39, 103, 183	ARGONAUTIDÆ,	199
var. a. Ad.	25	ARIONIDÆ,	200
<i>nitida</i> Ad.	103, 183	ARTICULATA,	197
<i>octona</i> Chem.	40, 48, 184, 218	ATLANTIDÆ,	200
<i>oseulans</i> Ad.	104, 184	<i>Auricula monile</i> Lam.	42, 186
<i>pellucens</i> Ad.	26, 40, 90, 184, 219	<i>nitens</i> Lam.	42, 186
<i>perplexa</i> Ad.	84, 184	BRACHIOPODA,	197, 198, 199, 201
<i>Peruviana</i> Fer.	204	BUCCINIDÆ,	200
<i>Philippiana</i> Pfr.	25, 39, 183	<i>Buccinum concinnum</i> Ad.	55
<i>Phillipsii</i> Ad.	39, 104, 183	<i>obesum</i> Ad.	55
<i>procera</i> Ad.	24, 39, 183	<i>pulchellum</i> Ad.	130
<i>propinqua</i> Ad.	40, 83, 84, 183	<i>Bulimus</i> ,	27
<i>proxima</i> Ad.	167, 183	<i>Adamsoni</i> Gray	231
<i>puella</i> Ad.	83, 183	<i>anomalus</i> Ad. v. <i>Spiraxis</i> a.	28, 40,
<i>similis</i> Ad.	103, 183		168
<i>solitaria</i> Ad.	168, 183	<i>badius</i> (Helix) Fer.	216
<i>striosa</i> Ad.	26, 40, 167, 184	<i>baticatus</i> (Helix) Fer.	216
<i>tenera</i> Ad.	104, 183	<i>Caribæorum</i> Lam.	220
<i>unicolor</i> Ad.	26, 39, 183	<i>castaneus</i> Pfr.	229

	Page		Page
<i>Bulinus Dennisoni</i> Reeve,	229	<i>Cerithium flavum</i> Ad.	122
<i>Dysoni</i> Pfr.	221	<i>fusiforme</i> Ad.	120
<i>erubescens</i> Pfr.	40, 184	<i>gemmaulosum</i> Ad.	120
<i>exilis</i> (Helix) Gmel.	219, 220	<i>intermedium</i> Ad.	119
var. <i>trifasciatus</i> Pfr.	219, 220	<i>latum</i> Ad.	122
<i>geometricus</i> Pfr.	230	<i>megasoma</i> Ad.	119
<i>Gibbonius</i> Lea,	229	<i>melanura</i> Ad.	117
<i>Gossei</i> Pfr.	23, 182, 218	<i>mirabile</i> Ad.	118
<i>gracillimus</i> Pfr.	222	<i>modestum</i> Ad.	117, 119
<i>Gruneri</i> Pfr.	230	<i>nanum</i> Ad.	117
<i>Guadaloupensis</i> Brug.	219, 220	<i>ornatum</i> Desh.	117, 119
<i>hortensis</i> Ad. v. <i>B. subula</i> Pfr.	168, 184, 221	<i>pulchellum</i> Ad.	121
<i>immaculatus</i> Reeve,	40, 184	<i>rugulosum</i> Ad.	121, 122
<i>Kieneri</i> Pfr.	218	<i>versicolor</i> Ad.	119
<i>levisculus</i> Ad.	40, 48, 184	<i>vicinum</i> Ad.	122
<i>Lamarckianus</i> Pfr.	231	<i>Chemnitzia exilis</i> Ad.	74
<i>linostoma</i> Orb.	230	<i>flavocincta</i> Ad.	74
<i>macrospira</i> Ad.	169, 184	<i>latior</i> Ad.	72
<i>maximus</i> Sowb.	229	<i>levis</i> Ad.	73, 74
<i>minimus</i> Ad.	28, 40, 52, 184	<i>multicostata</i> Ad.	74
<i>mirabilis</i> Ad. v. <i>Spiraxis</i> m.	29, 40, 168, 184	<i>obeliscus</i> Ad.	72
<i>monodon</i> Ad.	28, 40, 184	<i>puneta</i> Ad.	72
<i>nitelinus</i> Reeve,	230	<i>pusilla</i> Ad.	74
<i>nitidiulusculus</i> Ad.	27, 40, 184	<i>reticulata</i> Ad.	75
<i>oblongus</i> Müll.	229	<i>substriata</i> Ad.	73
<i>octonoides</i> Ad.	40, 167, 169, 184	<i>subulata</i> Ad.	75
<i>octonus</i> Lam.	218	CHITONIDE,	200
<i>pallidus</i> Ad.	40, 184	<i>Choanopoma</i> ,	88
<i>paupereulus</i> Ad.	27, 40, 184	<i>Cingula concinna</i> Ad.	70
<i>Powisianus</i> Pet.	229	<i>conica</i> Ad.	70
<i>procerus</i> Ad.	184, 229	<i>solida</i> Ad.	70
<i>rubrifasciatus</i> Reeve,	219	<i>Clausilia</i> ,	211, 224, 225
<i>rufescens</i> Gray,	40, 176, 184	<i>costulata</i> Lam.	225, 227
<i>spectatus</i> Reeve,	230	<i>epistomium</i> Küst.	225, 228, 233
<i>striatellus</i> Ad.	40, 184	<i>labiata</i> Sowb.	225, 226, 327
<i>subula</i> Ad. (non Pfr.) v. <i>B. pro-</i>		" Oliv.	227
<i>cerus</i> ,	169, 184	<i>laminata</i> (Turbo) Mont.	227
" Pfr.	221	<i>nigricans</i> Jeff.	226
<i>succinoides</i> Pet.	230	<i>Peruana</i> Trosch.	225, 227
<i>terebella</i> Ad.	28, 40, 184, 222	<i>rugosa</i> Drap.	227
<i>teres</i> Oliv.	227	<i>tridens</i> Chem.	225, 226, 227
<i>turricula</i> Pfr.	218	<i>Columbella atomella</i> Duclou,	55
<i>undatus</i> Brug.	184	<i>costulata</i> Ad.	58
<i>unicarinatus</i> (Pupa) Lam.	218	<i>decipiens</i> Ad.	55
<i>virgulatus</i> Fer.	220	<i>dormitor</i> Sowb.	55
<i>zebra</i> Müll.	40, 48, 184	<i>fenestrata</i> Ad.	57
<i>Bulinus perversus</i> Brug.	226, 227	<i>monilifera</i> Sowb. v. <i>Pleurotoma</i> m.	55
<i>Bulla</i> ,	200	<i>obesa</i> Ad.	55
<i>Carinaria</i> ,	197, 200	<i>ovaloides</i> Ad.	53
<i>Carocolla Hydiana</i> Lea,	232	<i>purpurascens</i> Ad.	55
<i>CERIALOPODA</i> ,	197, 199	<i>pygmaea</i> Sowb.	58
<i>Cerithium albo vittatum</i> Ad.	122	CONCHIFERA,	197, 198, 201
<i>dealbatum</i> Ad.	117	<i>Conus armillatus</i> Ad.	59
<i>decoratum</i> Ad.	117	<i>Corbula</i> ,	233
<i>exiguum</i> Ad.	118	<i>Barrattiana</i> Ad.	237, 238
<i>exile</i> Ad.	120	<i>bicarinata</i> Sowb.	239
		<i>Blandiana</i> Ad.	234, 236
		<i>Chittyana</i> Ad.	238

	Page		Page
<i>Corbula Dietziana</i> Ad.	235, 238	<i>Cyclostoma crenulosum</i> Ad.	12, 15, 180
<i>equivallis</i> Phil.	233	<i>decussatum</i> Ad. v. <i>C. mirabile</i> ,	
<i>fulva</i> Ad.	240	4, 15, 177, 179	
<i>Kjærjana</i> Ad.	237, 241	<i>dubiosum</i> Ad.	157, 180
<i>Knoxiana</i> Ad.	238	<i>Duffianum</i> Ad.	16, 180
<i>Krebsiana</i> Ad.	234	<i>fascia</i> Gray,	8, 15, 47, 155, 180
<i>nasuta</i> Sowb.	237	a. var. <i>proximum</i> Ad.	
<i>Newtoniana</i> Ad.	240	8, 15, 155, 180	
<i>operculata</i> Phil.	233, 234	<i>fecundum</i> Ad.	11, 16, 180
<i>quadrata</i> Hinds,	239, 240	a. var. <i>distinctum</i> Ad.	11, 180
<i>speciosa</i> Hinds,	236	<i>filosum</i> Sowb.	154
<i>Swiftiana</i> Ad.	236, 237, 241	<i>finbriatulum</i> Sowb.	1, 15, 89, 179
<i>Cyclas</i> ,	50	a. var. <i>docens</i> Ad.	140, 179
<i>pygmæa</i> Ad.	44, 45, 187	b. var. <i>albinodatum</i> Ad.	139, 179
<i>Veatleyi</i> Ad.	44, 45, 187	<i>giganteum</i> Gray,	228
CYCLOSTOMIDÆ,	86	<i>granosum</i> Ad.	93, 140, 179
<i>Cyclostoma</i> ,	130, 143	a. var. <i>aberrans</i> Ad.	140, 179
<i>aculeosum</i> Ad. v. <i>C. Hillianum</i> ,		<i>Grayanum</i> Pfr.	4, 15, 179
2, 15, 84, 179		<i>Griffithianum</i> Ad.	93, 180
<i>Adamsi</i> Pfr.	16, 47, 139, 180	<i>Hillianum</i> Ad.	15, 84, 153, 179
<i>album</i> Lam.	15, 156, 180	a. var. <i>aculeosum</i> Ad.	
a. var. <i>fuscum</i> Ad.	156, 180	2, 15, 84, 179	
<i>amabile</i> Ad.	2, 15, 179	b. var. <i>leporilabre</i> Ad.	153, 179
<i>amandum</i> Ad. v. <i>C. scabriculum</i> ,		<i>hyacinthinum</i> Ad. v. <i>C. Banksi-</i>	
3, 15, 89, 154, 179		<i>anum</i> ,	9, 15, 156
<i>ambiguum</i> Deless. non Lam.	15, 180	<i>Humphreysianum</i> Pfr.	180
<i>anomalum</i> Ad.	88, 90, 154, 179	<i>ignilabre</i> Ad.	9, 15, 155, 180
<i>Antillarum</i> Sowb.	216	a. var. <i>albilabre</i> Ad.	9, 155, 180
<i>armatum</i> Ad.	10, 11, 16, 180	<i>intermedium</i> Ad.	5, 15, 179
<i>articulatum</i> Sowb. v. <i>C. muta-</i>		<i>interruptum</i> Lam. non Deless.	180
<i>tum</i> ,	15, 47, 154, 179	<i>Jamaicense</i> Chem.	
<i>asperulum</i> Sowb.	16, 176, 178, 180	16, 140, 142, 143, 180	
<i>Augustæ</i> Ad.	7, 15, 155, 180	<i>Jayanum</i> Ad.	50, 89, 155, 180, 194
a. var. <i>nitens</i> Ad.	8, 15, 155, 180	a. var. <i>rufilabre</i> Ad.	7, 155, 180
b. var. <i>testudineum</i> Ad.	155, 180	b. var. <i>nigrilabre</i>	Ad. 89, 180
c. var. <i>rufilabre</i> (a) Ad.	8, 155, 180	<i>jugosum</i> Ad.	143, 180
<i>aurora</i> Ad.	11, 16, 177, 180	<i>labeo</i> Müll.	15, 176, 180
<i>avena</i> Ad.	6, 15, 51, 180	<i>lamellosum</i> Ad.	138, 180
<i>Banksianum</i> Sowb.		<i>lima</i> Ad.	3, 15, 179
10, 15, 156, 177, 180		<i>lincinellum</i> Lam.	15, 153, 177, 179
var. <i>hyacinthinum</i> Ad.		<i>lincinum</i> Linn.	15, 140, 179
9, 15, 156, 177, 180		<i>maritimum</i> Ad.	16, 180
<i>Binneyanum</i> Pfr.	129, 179	<i>mirabile</i> Wood,	4, 177, 179
<i>Blandianum</i> Ad.	3, 15, 179	<i>mirandum</i> Ad.	4, 15, 179
<i>Bronnii</i> Ad.	15, 180	<i>modestum</i> Ad.	6, 15, 139, 180
a. var. <i>fuscolineatum</i> Ad.	15, 180	<i>monstrosum</i> Ad.	5, 15, 179
<i>Campbellii</i> Ad.	154, 180	<i>mordax</i> Ad.	12, 16, 180
<i>Chevalieri</i> Ad.	155, 180	<i>moribundum</i> Ad.	5, 15, 179
a. var. <i>album</i> Ad.	156, 180	<i>Moussonianum</i> Ad.	153, 179
b. var. <i>virgatum</i> Ad.	156, 180	<i>mutatum</i> Ad.	154, 179
<i>Chittyi</i> Ad.	1, 15, 89, 179	<i>muticum</i> Ad.	11, 16, 180
<i>columna</i> Wood,	180	<i>Newcombianum</i> Ad.	
<i>concentricum</i> v. <i>C. variabile</i> ,		8, 15, 177, 180, 203, 216	
4, 15, 154		<i>nitens</i> Ad. v. <i>C. Augustæ</i> ,	8, 155
<i>corrugatum</i> Sowb.		<i>nodulosum</i> Ad. v. <i>C. granosum</i> ,	
16, 140, 142, 143, 176, 180		91, 140, 179	
<i>crassum</i> Ad.	143, 180	<i>obscurum</i> Gray,	15, 179
<i>crenulatum</i> Gray,	47	<i>pallescens</i> Ad.	143, 180

	Page		Page
<i>Cyclostoma papyraceum</i> Ad.	92, 157, 180	<i>Cylindrella Binneyana</i> Pfr.	129
a. var. <i>abbreviatum</i> Ad.	157, 180	<i>brevis</i> Pfr.	22, 39, 47, 90, 177, 183
<i>pauperatum</i> Ad.	13, 15, 180	var. <i>obesa</i> Ad.	22, 39, 183
<i>perpallidum</i> Ad.	157, 180	var. <i>columna</i> Ad.	22, 39, 183
<i>pictum</i> Sowb.	7, 15, 180	var. <i>intermedia</i> Ad.	22, 39, 183
<i>pisum</i> Ad.	9, 15, 154, 179	<i>carnea</i> Ad.	22, 39, 183
<i>Popayanum</i> Lea,	228	var. <i>cerina</i> Ad.	22, 39, 183
<i>proximum</i> Ad. v. <i>C. fascia</i>	8, 15	<i>Chemnitziana</i> (Helix) Fer.	182
<i>pulchrius</i> Ad.	15, 129, 179	<i>columna</i> Ad. v. <i>C. brevis</i> ,	22, 39
<i>pulchrum</i> Wood,	15, 179	<i>costulata</i> Ad.	20, 27, 39, 182
<i>quinquefasciatum</i> Ad. v. <i>C. co-</i>		<i>costulosa</i> Ad.	98, 182
<i>lumna</i> ,	12, 15, 180	<i>Cumingii</i> Ad. v. <i>C. elongata</i>	182
<i>Quitense</i> Pfr.	228	<i>cylindrus</i> Ad. v. <i>C. rubra</i>	23
<i>Redfieldianum</i> Ad.	10, 15, 180	" Chem.	39, 102, 161, 183
<i>retrosum</i> Ad.	91, 154, 179	<i>densstriata</i> Ad. v. <i>C. brevis</i>	22
<i>sagittiferum</i> Ad.	137, 180	<i>Dunkeri</i> Pfr.	23, 39, 102, 167, 183
<i>Saulæ</i> Sowb.	16, 47, 103, 180	<i>elator</i> Ad,	167, 183
<i>scabriculum</i> Sowb.	3, 15, 89, 154, 179	<i>elongata</i> Chem.	39, 182
<i>scalarinum</i> Villa.	194	<i>Gossei</i> Pfr.	39, 182
<i>seminudum</i> Ad.	143, 180	<i>gracilicollis</i> (Helix) Fer.	216
<i>sericinum</i> Ad.	156, 180	<i>gracilis</i> Wood,	39, 182
<i>serriferum</i> Ad.	4, 15, 179	<i>Gravesii</i> Ad.	21, 39, 183
<i>Shepardianum</i> Ad.	92, 180	a. var. Ad.	21
<i>simulans</i> Ad.	138, 180	<i>Greyana</i> Ad. v. <i>Geomelania</i> G.	82
<i>solidum</i> Ad. v. <i>C. Jayanum</i> ,		<i>Hollandi</i> Ad.	82, 183
7, 15, 50, 180		a. var. <i>Augustæ</i> Ad.	83, 183
<i>spinulosum</i> Ad. v. <i>C. lincinellum</i> ,		<i>Humboldtiana</i> var. β Pfr.	
1, 15, 153, 154, 177, 179		39, 47, 176, 182	
<i>subrugosum</i> Sowb.	141, 143, 180	<i>humilis</i> Ad.	101, 183
<i>succineum</i> Sowb.	148	<i>Hydeana</i> Ad.	23, 39, 182, 218
<i>suturale</i> Sowb.	103, 142, 157, 180	<i>inornata</i> Ad.	22, 39, 183
<i>Swiftianum</i> Newcomb,	203, 216	<i>lata</i> Ad.	82, 161, 183
<i>Tappanianum</i> Ad.	157, 177, 180	a. var. <i>producta</i> Ad.	161, 183
<i>teetilabre</i> Ad.	10, 15, 138, 180	<i>Kieneri</i> (Bulimus) Pfr.	221
<i>tenuistriatum</i> Ad.	8, 15, 139, 180	<i>Maugeri</i> Wood,	39, 47, 161, 166,
<i>thysanoraphe</i> Sowb.	15, 180	167, 182, 191, 216	
<i>tortum</i> Wood,	242	var. α Pfr.	163
<i>Troscheli</i> Pfr.	203, 216	var. β Pfr.	165
<i>variabile</i> Ad.	3, 4, 5, 15, 154, 179	var. γ Pfr.	164
a. var. <i>concentricum</i> Ad.		a. var. <i> nigrescens</i> Ad.	162, 182
4, 15, 154, 179		b. var. <i>solida</i> Ad.	162, 182
<i>varians</i> Ad.	143, 180	c. var. <i>levis</i> Ad.	162, 182
<i>Vilkinsonii</i> Ad.	6, 7, 15, 180	d. var. <i>tricolor</i> Ad.	163, 182
<i>virgineum</i> Ad. v. <i>C. pisum</i> ,	90, 154, 179	e. var. <i>crassa</i> Ad.	163, 183
<i>xanthostoma</i> Sowb.	9, 15, 155, 180	f. var. <i>uncincta</i> Ad.	163, 183
a. var. <i>albilabre</i> Ad.	155, 180	g. var. <i>bicincta</i> Ad.	164, 183
<i>Yallahense</i> Ad.	156, 180	h. var. <i>concinna</i> Ad.	164, 183
<i>Cylindrella</i> ,	24, 211	i. var. <i>sinuata</i> Ad.	164, 183
<i>Agnesiana</i> Ad.	19, 39, 160, 182	j. var. <i>rufilabris</i> Ad.	164, 183
var. <i>diminuta</i> Ad.	160, 162, 182	k. var. <i>citrina</i> Ad.	164, 165, 183
<i>alabastrina</i> Pfr.	39, 176, 182	l. var. <i>fusiformis</i> Ad.	164, 183
<i>alba</i> Ad.	20, 39, 182	m. var. <i>albida</i> Ad.	165, 183
var. <i>striatula</i> Ad.	20, 182	n. var. <i>valida</i> Ad.	165, 183
<i>ambigua</i> Ad. v. <i>C. rosca</i>	21, 39	o. var. <i>unicolor</i> Ad.	165, 183
<i>aspera</i> Ad.	21, 29, 39, 183	p. var. <i>striatula</i> Ad.	165, 183
<i>Augustæ</i> Ad. v. <i>C. Hollandi</i>	83	q. var. <i>striata</i> Ad.	165, 183
<i>Beardsleana</i> Ad. v. <i>Geomelania</i>		r. var. <i>corpulenta</i> Ad.	165, 183
<i>B.</i>	19, 39, 52, 89	s. var. <i>fusea</i> Ad.	165, 183

	Page		Page
<i>Cylindrella Maugeri</i> ,		<i>Geomelania Hilliana</i> Ad.	159, 160, 182
t. var. <i>conica</i> Ad.	166, 183	<i>Jamaicensis</i> Pfr.	17, 18, 39, 55, 182
u. var. <i>tesselata</i> Ad.	166, 183	<i>magna</i> Ad.	94, 182
v. var. <i>cinerea</i> Ad.	166, 183	<i>media</i> Ad.	96, 182
w. var. <i>gracilis</i> Ad.	166, 183	<i>minor</i> Ad.	17, 18, 39, 52, 55, 94, 96, 182
x. var. <i>integra</i> Ad.	166, 183	<i>pauperata</i> Ad.	97, 182
<i>montana</i> Ad.	20, 39, 83, 183	<i>procera</i> Ad.	95, 182
<i>nobilior</i> Ad.	39, 129, 183	<i>pygmæa</i> Ad.	89, 97, 182
<i>obesa</i> Ad. v. <i>C. brevis</i> ,	22, 39	<i>pyramidata</i> Ad.	159, 182
<i>pallida</i> (<i>Brachypus</i>) Guild.	217	<i>striosa</i> Ad.	89, 96, 160, 182
<i>pontifica</i> Gould,	23, 218	<i>typica</i> Ad.	94, 95, 182
<i>princeps</i> Ad.	167, 183	a. var. <i>pygmæa</i> Ad.	96, 182
<i>procera</i> Ad.	102, 183	<i>vicina</i> Ad.	96, 182
<i>pupæformis</i> Ad.	102, 183	<i>Glandina</i> ,	242
<i>pusilla</i> Ad.	102, 183	GYMNOBRANCHIATA,	200
<i>pygmæa</i> Ad. v. <i>Geomelania</i> p.	19, 39, 52	HELICIDÆ,	86, 98, 200
<i>Robertsi</i> Ad.	160, 182	<i>Helicina Adamsiana</i> Pfr.	16, 51, 181
<i>rosea</i> Ad. v. <i>C. carnea</i>		<i>affinis</i> Ad.	16, 51, 181
" Pfr.	21, 22, 39, 82, 161, 183	<i>agglutinans</i> Sowb.	223
a. var. <i>magna</i> Ad.	21, 39, 183	<i>albolabris</i> Ad.	13, 14, 16, 52, 135, 181
b. var. <i>major</i> Ad.	21, 39, 161, 183	<i>ampliata</i> Ad.	101, 124, 136, 181
c. var. <i>fortis</i> Ad.	161, 183	<i>aurantia</i> Gray,	16, 89, 181
d. var. <i>ambigua</i> Ad.	183	<i>Brownii</i> Gray,	13, 14, 16, 134, 181
<i>rubella</i> Ad.	39, 183	<i>castanea</i> (?) Sowb.	217
<i>rubra</i> Ad.	23, 39, 167, 183	<i>citrinolabris</i> Ad.	14, 16, 181
<i>sanguinea</i> Pfr.	39, 82, 183	<i>concentrica</i> Pfr.	229
<i>seminuda</i> Ad.	39, 182	<i>consanguinea</i> Ad.	134, 135, 181
<i>similis</i> Ad.	23, 39, 183	a. var. <i>seror</i> Ad.	135, 181
<i>simplex</i> Ad.	22, 39, 183	<i>costata</i> Sowb.	16, 51, 181
<i>subula</i> Fer.	39, 182	<i>depressa</i> Gray,	16, 51, 136, 181
<i>tenella</i> Ad.	23, 39, 183	a. var. <i>valida</i> Ad.	136, 181
<i>tenera</i> Ad.	23, 39, 52, 183	<i>dubiosa</i> Ad.	93, 181
<i>variegata</i> var. γ Pfr.	39, 47, 176, 182	a. var. <i>intermedia</i> Ad.	94, 181
<i>zonata</i> Ad.	161, 183	<i>Gossei</i> Pfr.	176, 181
CYPRIDÆ,	199, 211	<i>Guildingiana</i> Pfr.	181
DENTALIDÆ,	200	<i>hemastoma</i> Moric.	47, 51, 89
<i>Dolium perdix</i> ,	98	<i>hirsuta</i> Ad.	133, 135, 181
<i>Eulima affinis</i> Ad.	110	<i>Hollandi</i> Ad.	13, 16, 88, 133, 181
<i>arcuata</i> Ad.	110	<i>Hornbeckii</i> Phil.	217
<i>conica</i> Ad.	110	<i>Jamaicensis</i> Sowb.	16, 51, 101, 136, 181
<i>gracilis</i> Ad.	110	<i>Josephinae</i> Ad. v. <i>Trochatella</i> J.	14
<i>fulvo-cincta</i> Ad.	111	<i>Leana</i> Ad. v. <i>H. depressa</i> ,	181
<i>Fusus decussatus</i> Brown,	54	<i>lineata</i> Ad.	16, 51, 181
<i>nitens</i> Ad.	60	<i>macilenta</i> Ad.	13, 16, 101, 181
GASTEROPODA,	197, 199, 200	<i>mazima</i> Sowb.	13, 16, 52, 133, 134, 181
<i>Geomelania</i> Pfr.	17, 47, 56, 84, 86, 89, 90, 94	a. var. <i>citrina</i> Ad.	134, 181
<i>affinis</i> Ad.	96, 182	<i>megastoma</i> Ad.	14, 16, 51, 181
<i>Beardsleana</i> Ad.	89, 94, 97, 182	<i>microstoma</i> Ad.	135, 181
<i>conica</i> Ad.	97, 160, 182	<i>neritella</i> Lam.	16, 47, 52, 159, 181
<i>costulosa</i> Ad.	96, 160, 182	a. var. <i>angulata</i> Ad.	159, 181
<i>elegans</i> Ad.	17, 18, 39, 82, 90, 94, 182	<i>nobilis</i> Ad.	133, 134, 181
<i>exilis</i> Ad.	97, 160, 182	<i>palliatæ</i> Ad.	13, 16, 101, 134, 181
<i>expansa</i> Ad.	18, 39, 84, 96, 182	a. var. <i>labiosa</i> Ad.	134, 181
<i>fortis</i> Ad.	94, 182	<i>picta</i> Fer.	47, 176
<i>gracilis</i> Ad.	95, 182	<i>pusilla</i> Ad.	101, 181
a. var. <i>parva</i> Ad.	95, 182		
<i>Greyana</i> (<i>Cylindrella</i>) Ad.	82, 182		

	Page		Page
<i>Helicina rotellina</i> Mich.	217	<i>Helix epistyliulum</i> Ad.	31, 41, 186
• <i>solitaria</i> Ad.	16, 51, 94, 181	<i>fluctuata</i> Ad. v. <i>H. Chemnitziana</i> ,	29, 40, 77, 185, 205
<i>subfusca</i> Mke.	217	<i>Foremaniana</i> Ad.	80, 186
<i>tenuis</i> Ad. v. <i>Trochatella t.</i>	14	<i>formosa</i> Fer.	100
<i>Helix acuta</i> Lam.		<i>fortis</i> Ad.	77, 185
77, 100, 106, 185, 205, 206		<i>fulva</i> Müll.	35, 224
a. var. <i>acutissima</i> Lam.		<i>fuscocincta</i> Ad.	34, 41, 173, 185
29, 40, 185, 205, 206		<i>fuscolabris</i> Ad.	106, 185, 206
<i>alligans</i> Ad.	105, 186	<i>fuscula</i> Ad.	35, 41, 185
<i>alveus</i> Ad.	80, 185	<i>Gibboni</i> Pfr.	231
<i>amabilis</i> Ad. v. <i>H. cara</i>	105	<i>Gossei</i> Pfr.	41, 185
<i>ambigua</i> Ad.	35, 41, 186	<i>graminicola</i> Ad.	32, 41, 185
<i>angustata</i> Fer. 40, 49, 177, 185, 204		<i>Gundlachi</i> Pfr.	224
<i>angustispira</i> Ad.	36, 41, 186	<i>Haldemaniana</i> Pfr.	129, 186
<i>anomala</i> Pfr. 40, 78, 171, 185, 206		<i>Hollandi</i> Ad.	34, 41, 186
a. var. <i>pallescentes</i> Ad.	171, 185	<i>immunda</i> Ad.	36, 41, 185
b. var. <i>convexa</i> Ad.	171, 185	<i>incerta</i> Fer.	204, 222, 223
<i>Anthoniana</i> Ad.	35, 41, 185	<i>inconspicua</i> Ad.	37, 41, 185
<i>apex</i> Ad.	36, 41, 52, 53, 185	<i>ingens</i> Ad.	76, 108, 170, 185, 205
<i>arboreoides</i> Ad.		a. var. <i>imperfurata</i> Ad.	170, 185
34, 35, 41, 107, 129, 186		b. var. <i>indigna</i> Ad.	170, 185
<i>aspera</i> Fer.	40, 185	<i>invalida</i> Ad.	79, 80, 185, 206
<i>atrata</i> Pfr.	232	<i>Jacobensis</i> Ad.	172, 185
<i>Bainbridgii</i> Pfr. 40, 49, 171, 185, 205		<i>Jamaicensis</i> Chem.	40, 185, 206
a. var. <i>pretiosa</i> Ad.	171, 185, 204	<i>labiatus</i> Mont.	227
<i>bicanaliculata</i> Fer.	225, 227	<i>labyrinthus</i> Chem.	232
<i>Blandiana</i> Ad.	107, 172, 185	<i>lamellifera</i> Ad.	31, 41, 186
<i>Boothiana</i> Pfr.	41, 49, 173, 185	<i>lima</i> Fer.	204, 222, 223
<i>brevior</i> Ad.	185, 223	<i>lucerna</i> Müll.	40, 106, 185, 206
<i>brevis</i> Ad.	35, 41, 186	<i>MacMurrayi</i> Ad.	32, 41, 185
<i>Bronni</i> Pfr.		<i>magnifica</i> Lea,	231
30, 40, 77, 78, 100, 185, 206		<i>Martiniana</i> Pfr.	40, 176, 184
<i>Buddiana</i> Ad.	171, 185	<i>minuscula</i> Binney,	52
<i>candescens</i> Ad. v. <i>H. sinuata</i>	80	<i>monile</i> Brod.	232
<i>cara</i> Ad. 29, 40, 106, 169, 184, 206		<i>munda</i> Ad.	32, 33, 41, 171, 185
a. var. <i>media</i> Ad.	169, 184	<i>nemoralina</i> Pet.	223
b. var. <i>amabilis</i> Ad.	105, 169, 184	<i>nemoroides</i> Ad.	41, 185
<i>Chemnitziana</i> Pfr.	205	<i>nobilis</i> Ad. v. <i>H. patina</i>	106
<i>chersina</i> Say,	35	<i>Okeniana</i> Pfr.	40, 176, 185, 206
<i>Chittyana</i> Ad.		<i>opalina</i> Ad.	186
30, 40, 106, 169, 185, 206		<i>Oreas</i> Koch.	231, 232
a. var. <i>bicolor</i> Ad.	169	<i>osculans</i> Ad.	107, 174, 186
<i>columellata</i> Ad.	80, 185	a. var. <i>delaminata</i> Ad.	174, 186
<i>connectens</i> Ad.	105, 186	<i>paludosa</i> Pfr.	186
<i>consanguinea</i> Ad.	170, 185, 206	<i>patina</i> Ad.	29, 40, 77, 185, 205
a. var. <i>imperfurata</i> Ad.	171, 185	a. var. <i>nobilis</i> Ad.	185
b. var. <i>carinata</i> Ad.	171, 185	<i>pellucida</i> Ad. v. <i>H. Boothiana</i> ,	185
<i>Cookiana</i> Fer.	31, 41, 186	<i>peracutissima</i> Ad.	40, 184, 206
<i>Cubensis</i> var. $\S$ Pfr.	40, 49, 185	<i>peraffinis</i> Ad.	37, 41, 173, 185, 223
<i>depicta</i> Grat.	215	<i>perdepressa</i> Ad.	36, 41, 185
<i>depressa</i> Ad. v. <i>H. brevior</i> ,	37, 41, 185	<i>picturata</i> Ad.	30, 40, 78, 84, 98, 99,
<i>diminuta</i> Ad.	36, 41, 185	100, 185, 206	
<i>dioscoricola</i> Ad.	41, 186	var. <i>a.</i> Ad.	30
<i>epistylioides</i> Fer.	41, 105, 186	<i>pila</i> Ad.	31, 41, 186
<i>epistylium</i> Müll.	31, 34, 41, 105,	<i>planorbis</i> Jay,	232
107, 173, 174, 186		<i>plicaria</i> Lam.	216
a. var. <i>minor</i> Ad.	173, 186	<i>plicata</i> Born,	232
b. var. <i>delaminata</i> Ad.	174, 186		

	Page		Page
<i>Helix pretiosa</i> Ad.	204	LOTTIADÆ, †	200
<i>propenuda</i> Ad. v. <i>H. sinuata</i>	79, 100	<i>Lucidella aureola</i> Gray,	16, 52, 89, 181
<i>ptychodes</i> Pfr.	41, 185, 223	a. var. <i>granulosa</i> Ad.	89, 181
<i>pulchella</i> Müll.	52	<i>Lucina</i> ,	242
<i>pulehrior</i> Ad.	172, 185	<i>Americana</i> Ad.	243, 246
<i>pulla</i> Gmel.	185	<i>anatellinoides</i> Rv.	243
<i>Redfieldiana</i> Ad.		<i>Antillarum</i> Rv.	243
(<i>H. Carmelita</i> Fer.)	107, 185	<i>aurantia</i> Desh.	244
<i>rufula</i> Pfr.	185	<i>Chemnitzii</i> Phil.	244
<i>Schröteriana</i> Pfr.	78, 204, 206	<i>divaricata</i> Lin.	243
<i>similis</i> Ad.	34, 35, 41, 186	<i>divaricata</i> Rv.	244
<i>simulans</i> Ad.	35, 41, 186, 224	<i>eburnea</i> Rv.	243
<i>sincera</i> Ad.	41, 49, 185, 223	<i>edentula</i> (<i>Venus</i>) Lin.	244
<i>sinuata</i> Born,	99	<i>exasperata</i> Rv.	244
" Chem.	100	<i>funiculata</i> Rv.	244
var. Chem.	99	<i>granulosa</i> Ad.	245
var. Deless.	99, 100	<i>imbricatula</i> Ad.	245
var. Küster,	100	<i>Jamaicensis</i> (<i>Venus</i>) Chem.	245
var. β Pfr.	100	<i>Jancirensis</i> Rv.	245, 247
" Müll.	30, 40, 77, 78, 79,	<i>lupinus</i> Broc.	245
85, 98, 100, 185, 191, 206		<i>obliqua</i> Rv.	246
a. var. <i>propenuda</i> Ad.	185	<i>occidentalis</i> Rv.	245
b. var. <i>candescens</i> Ad.	185	<i>ornata</i> Ad.	243
<i>sinuosa</i> Gmel.	99	<i>ornata</i> Rv.	243
" Fer.	99	<i>pecten</i> Rv.	245
<i>soror</i> Fer.	29, 40, 184, 206	<i>pectinata</i> Ad.	245
<i>Spengleriana</i> Pfr.	40, 185, 206	<i>pectinella</i> Ad.	246, 247
<i>spreta</i> Ad.	173, 185	<i>Pennsylvanica</i> (<i>Venus</i>) Lin.	246
a. var. <i>errans</i> Ad.	173, 185	<i>pilula</i> Ad.	246
<i>squamosa</i> Fer.	216	<i>scabra</i> Rv.	247
<i>strangulata</i> Ad.	30, 40, 78, 185	<i>serrata</i> Orb.	244
<i>subconica</i> Ad.	41, 172, 185	<i>soror</i> Ad.	247
<i>subplanata</i> Pet.	232	<i>subglobosa</i> Ad.	245
<i>subpyramidalis</i> Ad. v. <i>H. turbi-</i>		<i>tigerina</i> (<i>Venus</i>) Lin.	247
<i>niformis</i> ,	185	var. 3 Lam.	244
<i>sulphurea</i> Ad. v. <i>Dolium perdis</i> ,		<i>virgo</i> Rv.	247
33, 41, 98		<i>Mangelia alborittata</i> (<i>Pleurotoma</i>) Ad.	55
<i>Swainsoniana</i> Ad.	169, 185	<i>badia</i> Rv.	66
<i>tenerrima</i> Ad.	41, 81, 185	<i>biconica</i> Ad.	65
<i>torresfacta</i> Ad.	31, 41, 186	var. <i>alba</i> Ad.	65
<i>tridentina</i> Fer.	40, 78, 185	<i>brevis</i> Ad.	66, 67
<i>tumida</i> Pfr.	206	<i>candidissima</i> (<i>Pleurotoma</i>) Ad.	55
<i>tunicata</i> Ad. v. <i>H. tumida</i> ,		<i>crassicostrata</i> Ad.	66
33, 41, 171, 185, 188, 206		<i>densistriata</i> Ad.	65
<i>turbiniiformis</i> Pfr.	41, 49, 185	<i>dubia</i> (<i>Pleurotoma</i>) Ad.	55
<i>valida</i> Ad. 77, 78, 99, 100, 185, 206		<i>Dysoni</i> Rv.	65
<i>virginea</i> Ad.	33, 41, 185	<i>fusca</i> (<i>Pleurotoma</i>) Ad.	55, 66
<i>Jamaica</i> ,	88	<i>lanecolata</i> Ad.	66
<i>Limnæa umbilicata</i> Ad.	45, 50, 187	<i>multilineata</i> (<i>Pleurotoma</i>) Ad.	55
LIMNADÆ,	209	<i>muricoides</i> Ad.	65
<i>Litiopa effusa</i> Ad.	71	<i>trilineata</i> (<i>Pleurotoma</i>) Ad.	55
<i>obesa</i> Ad.	71	<i>vicina</i> Ad.	66
LITTORINIDÆ,	200	<i>Marginella abbreviata</i> Ad.	56
<i>Littorina carinata</i> Orb.	71	<i>alba</i> Ad.	56
<i>Jamaicensis</i> Ad.	71	<i>avena</i> Val.	130
<i>lineata</i> Orb.	71	<i>fluctuata</i> Ad.	56
<i>ziczac</i> Desh.	71	<i>frumentum</i> Sowb.	57
<i>Lottia</i> ,	201	<i>gracilis</i> Ad.	130

	Page		Page
<i>Marginella lactea</i> Kr.	56	<i>Phasianella concolor</i> Ad.	68
<i>nivea</i> Ad.	56	<i>pulla</i> Linn.	67
<i>pruinosa</i> Hinds,	56	<i>tesselata</i> Ad.	67
<i>varia</i> Sowb.	130	<i>Philippia</i> ,	200
<i>Megalomastoma Antillarum</i> Gray,	216	<i>Pholas corticaria</i> Gray,	75
<i>Melampus</i> ,	47	" Sowb.	75
<i>cingulatus</i> Pfr.	42, 186	<i>pusilla</i> Linn.	75
<i>coniformis</i> Brug.	42, 186	<i>rosea</i> Ad.	75
<i>coronatus</i> Ad.	41, 42, 186	<i>Physa Jamaicensis</i> Ad.	174, 187
<i>flavus</i> Gmel.	42, 186	<i>Soverbyana</i> Orb.	45, 50, 187
<i>pusillus</i> Gmel.	42, 186	PHYTOPHAGA,	200
<i>Melania spinifera</i> Ad.	45, 187	<i>Planorbis affinis</i> Ad.	44, 45, 50, 187
MELANIDÆ,	86, 190, 209	var. <i>a</i> Ad.	44
<i>Melanopsis lineolata</i> Gray,	45, 187	<i>decipiens</i> Ad.	43, 45, 187
<i>Mitra albicostata</i> Ad.	57	<i>dentiferus</i> Ad.	45, 132, 187
<i>cavea</i> Rv.	57	a. var. <i>edentatus</i> Ad.	132, 187
<i>leucodesma</i> Rv.	57	<i>Haldemani</i> Ad.	43, 45, 187
<i>microzonias</i> Lam.	57	<i>humilis</i> Ad.	131, 187
<i>monilifera</i> Ad.	57	<i>lentus</i> Say,	41, 50
<i>Murex alveatus</i> Kr.	60	<i>MacNabianus</i> Ad.	43, 45, 187
<i>costellaris</i> Lam.	59	<i>pallidus</i> Ad.	44, 45, 187
<i>erosus</i> Brod.	60	<i>Redfieldi</i> Ad.	43, 45, 187
<i>intermedius</i> Ad.	60	<i>vortex</i> Müll.	43
<i>pauperculus</i> Ad.	60	PLEUROBRANCHIATA,	200
MURICIDÆ,	200	<i>Pleurotoma albella</i> Ad.	63, 131
MYTILIDÆ,	198	<i>albinodata</i> Rv.	64
NALIDÆ,	49, 78, 86, 190	<i>albovittata</i> Ad.	55
<i>Nanina</i> ,	200	<i>Augustæ</i> Ad.	61
<i>Narica anomala</i> Ad.	109	<i>decorata</i> Ad.	62
<i>Natica canrena</i> Linn.	111	<i>decussata</i> Macgill.	54
<i>Jamaicensis</i> Ad.	111	<i>diminuta</i> Ad.	62
a. var. <i>nigrescens</i> Ad.	112	<i>flavocincta</i> Ad.	63
<i>proxima</i> Ad.	111	<i>fuscescens</i> Gray,	62
<i>Nautilus</i>	199	<i>fuscocincta</i> Ad.	62
<i>Neritina Jamaicensis</i> Ad.	175, 187	<i>fuscolineata</i> Ad.	54
<i>ornata</i> Ad.	112	<i>fusiformis</i> Ad.	64
<i>punctulata</i> Lam.	175, 187	<i>Jayana</i> Ad.	61
<i>pusilla</i> Ad.	112	<i>luteofasciata</i> Rv.	55
<i>tenebricosa</i> Ad.	175, 187	<i>lymneiformis</i> Kr.	63
<i>Odostomia canaliculata</i> Ad.	109	<i>maculata</i> Ad.	62
<i>gemmaeformis</i> Ad.	109	<i>Macgillivrayi</i> Ad.	54
<i>ovuloides</i> Ad.	109	<i>minor</i> Ad.	54
<i>solidula</i> Ad.	110	<i>monilifera</i> (<i>Columbella</i>) Sowb.	55
PAGURIDÆ,	195	<i>nigrescens</i> Ad.	54
<i>Paludina Jamaicensis</i> Ad.	42, 45, 187	" Gray,	54
<i>rivularis</i> Ad.	45, 187	<i>nodata</i> Ad.	64
<i>Partula auriculata</i> Brod.	125	<i>patula</i> Rv.	63
<i>diminuta</i> Ad.	125	<i>plicata</i> Ad.	54
<i>Otaheitana</i> Brug.	125	<i>plicosa</i> Ad.	54
<i>Patella</i> ,	201	<i>pygmæa</i> Ad.	63
PATELLIDÆ,	200	<i>quadrata</i> Rv.	62
PECTINIBRANCHIATA,	199	<i>quadrilineata</i> Ad.	64
<i>Pedipes</i> ,	47	<i>Reevii</i> Ad.	54
<i>ovalis</i> Ad.	41, 42, 186	<i>rustica</i> Sowb.	62
<i>quadridens</i> Pfr.	41, 42, 52, 186	<i>scalpta</i> Rv.	54
<i>Phasianella affinis</i> Ad.	67	<i>solida</i> Ad.	61
<i>brevis</i> Ad.	67	<i>symmetrica</i> Rv.	65
<i>concinna</i> Ad.	69	<i>trifasciata</i> Gray,	55

	Page		Page
<i>Pleurotoma trilineata</i> Ad.	55	<i>Spiraxis aberrans</i>	
<i>unicolor</i> Sowb.	62	a. var. <i>unicolor</i> Ad.	168, 184
<i>violacea</i> Hinds,	54	<i>Spiraxis anomalus</i> Ad.	168, 184
<i>zebra</i> Kr.	61	<i>brevis</i> Ad.	168, 184
<i>Potamomya</i> ,	233	<i>costulosus</i> Ad.	88, 184
<i>Proscarpina</i> ,	49	<i>inuitatus</i> Ad.	88, 184
<i>bidentata</i> Ad.	81, 186	<i>mirabilis</i> Ad.	168, 184
<i>discoidea</i> Ad.	81, 186	<i>Stoastoma</i> ,	148
<i>nitida</i> Sowb.	41, 81, 82, 174, 186	<i>Agassizianum</i> Ad.	158, 181
a. var. <i>planulata</i> Ad.	174, 186	<i>Anthonianum</i> Ad.	151, 181
<i>opalina</i> Ad.	41, 81, 186	<i>Blandianum</i> Ad.	16, 52, 181
<i>pisum</i> Ad.	108, 186	<i>Chittyanum</i> Ad.	16, 181
<i>pulchra</i> Ad.	81, 82, 186	<i>Cumingianum</i> Ad.	16, 52, 181
PTEROPODA,	197, 198, 201	<i>Fadyenianum</i> Ad.	16, 52, 181
PULMOBRANCHIATA,	200	<i>Gouldianum</i> Ad.	16, 52, 149, 181
<i>Pupa contracta</i> Say,	40, 48, 184	<i>Hollandianum</i> Ad.	149, 181
<i>decumana</i> (<i>Helix</i>) Fer.	216	<i>Jayanum</i> Ad.	16, 52, 181
<i>exigua</i> Say,	38	<i>Leanum</i> Ad.	16, 52, 181
<i>exilis</i> Ad.	38, 40, 184	<i>Lindsleyanum</i> Ad.	16, 181
<i>fallax</i> Say,	40, 48, 184	<i>Moricandianum</i> Ad.	150, 181
<i>hexodon</i> Ad.	37, 40, 184	<i>Petitianum</i> Ad.	151, 181
<i>Jamaicensis</i> Ad.	37, 40, 52, 53, 184	<i>Pfeifferianum</i> Ad.	16, 52, 181
<i>lata</i> Ad.	37, 40, 184	<i>Philippianum</i> Ad.	158, 181
<i>miliun</i> Gould,	52, 53, 71	<i>pisum</i> Ad.	16, 52, 181
<i>minutissima</i> Hartm.	52	<i>Redfieldianum</i> Ad.	16, 52, 151, 181
<i>ovata</i> Say,	38, 71	<i>succineum</i> Sowb.	148
<i>procera</i> Gould,	37	<i>Tappanianum</i> Ad.	149, 181
<i>servilis</i> Gould,	37, 40, 48, 184, 222	<i>Vilkinsoniæ</i> Ad.	148, 181
<i>striatella</i> Fer.	40, 48, 184	<i>Streptaxis Candearia</i> Pet.	231
<i>tenuidens</i> Ad.	40, 184	STROMBIDÆ,	199
<i>Purpura aberrans</i> Ad.	58	<i>Strombiformis perversus</i> Da Costa,	226
<i>castularis</i> Rv.	59	<i>Succinea angustior</i> Ad.	38, 40, 184
PURPURIDÆ,	98	<i>avara</i> Say,	223
<i>Rissoa aberrans</i> Ad.	113	<i>campestris</i> Say,	38
<i>albida</i> Ad.	116	<i>contorta</i> Ad.	40, 184
<i>dubiosa</i> Ad.	114	<i>laticornis</i> Ad.	38, 40, 184
<i>eulimoides</i> Ad.	115	<i>obliqua</i> Say,	38
<i>laevigata</i> Ad.	114	<i>Sagra</i> Orb.	38, 40, 49, 184, 222
<i>levissima</i> Ad.	115	TECTURIDÆ,	200
<i>melanura</i> Ad.	116	<i>Terebra Jamaicensis</i> Ad.	58
<i>multicostata</i> Ad.	114	<i>stylata</i> Hinds,	58
<i>princeps</i> Ad.	116	<i>Tornatellina Cubensis</i> Pfr.	204
<i>pulchra</i> Ad.	114	TRACHELIPODA,	199
<i>scalarella</i> Ad.	113, 114	TRIDACNIDÆ,	198
<i>scalaroides</i> Ad.	113	<i>Triton angulatus</i> Rv.	60
a. var. <i>minor</i> Ad.	113	<i>chrysostoma</i> ,	60
<i>striosa</i> Ad.	116	<i>parvus</i> Ad.	59
<i>subangulata</i> Ad.	112	<i>pulchellus</i> Ad.	60
<i>terravica</i> Ad.	116	<i>Trochatella Grayana</i> Pfr.	16, 176, 181
<i>vitrea</i> Ad.	115	<i>Josephineæ</i> Ad.	14, 16, 52, 136, 181
<i>Rissoina</i>	114	a. var. <i>pulchra</i> Ad.	136, 181
<i>Browniana</i> Orb.	115	<i>pulchella</i> Gray,	16, 52, 136, 159, 181
<i>elegantissima</i> Orb.	115	a. var. <i>multicarinata</i> Ad.	159, 181
<i>Scalaria ligata</i> Ad.	67	b. var. <i>nobilis</i> Ad.	159, 181
<i>Serpula</i> ,	201	<i>Tankervillei</i> Gray,	16, 52, 136, 181
<i>Solarium</i> ,	200	var. <i>a</i> Ad.	136
<i>Spiraxis</i> ,	87, 105	var. <i>β</i> Ad.	137
<i>aberrans</i> Ad.	88, 168, 184		

	Page		Page
<i>Trochatella Tankervillei</i>		TUNICATA,	197, 199
var. γ Ad.	137	<i>Turbo bidens</i> Chem.	227
tenuis Ad.	14, 16, 52, 181	costulatus Wood,	225
TROCHIDÆ,	200	labiatus Dillw.	225, 226
<i>Trochus puzosinus</i> Gm.	69	" Mont.	227
pulcher Ad.	69	perversus Gmel.	226, 227
pyramidatus Lam.	69	UMBRELLA,	200
Truncatella,	47	Valvata inconspicua Ad.	131, 187
Adamsi Pfr.	16, 52, 182	pygmæa Ad.	42, 45, 187
costata Pfr.	16, 182	Venus edentula Lin. v. <i>Lucina c.</i>	244
costellaris Risso,	52	Jamaicensis Chem. v. <i>Lucina J.</i>	245
Cumingii Ad. v. <i>T. scalaris</i> ,	182	Pennsylvanica Lin. v. <i>Lucina</i>	
fusca Phil.	52	P.	246
modesta Ad.	132, 182	tigerina Lin. v. <i>Lucina t.</i>	247
scalariformis Ad. v. <i>T. Adamsi</i> ,	182	VERMETIDÆ,	200
scalaris Mich.	52, 182	Vermetus,	201
succinea Ad.	16, 52, 182	VOLUTIDÆ,	199

SMITHSONIAN INSTITUTION LIBRARIES

3 9088 00073 5936