A CLASSIFICATION OF THE AMERICAN OPERCULATE LAND MOLLUSKS OF THE FAMILY ANNULARIIDAE.

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INTRODUCTION.

This new classification of the American "Cyclostomidae" is the outcome of the critical study of an almost complete collection of the known species comprising that large and diversified assemblage of operculate land-snails. Opercular characters have been employed for all the larger groupings, that is, the subfamilies and genera. The comparatively few species, the opercula of which we have not actually seen, are excluded from consideration. We soon found that assumptions as to generic position of a species based upon similarity of shell characters were too often misleading. To the total of the species involved the proportion of those of which our specimens lacked opercula, while not negligible, is yet not sufficiently great materially to weaken our conclusions, nor likely, when their opercula may eventually be known, to call for any serious modification of our scheme of classification.

The new arrangement here offered calls, first, for a separation of all the American forms from the Old World groups with which they have been associated. This is accomplished by the creation of a new family, the Annulariidae, founded upon a constant and essential radular difference, the details of which are discussed under the description of the new family.

The second step has been the creation under the Annulariidae of four chief groups designated as subfamilies. These subfamilies are based wholly upon characters presented by the operculum—characters which have been accepted as basic and of primary importance. The natural order or sequence of these subfamilies has been determined by what we conceive to be progressive opercular changes through various gradations from the simplest or most primitive form to the most complicated or specialized types. These changes appear to proceed by easy gradations and with but slight interruption through continuous lines of development.

The third step has called for the proper disposition of the existing genera and for the creation of a few new genera. These are based

almost wholly upon minor modifications of the opercular characters, and, in some instances, upon certain distinguishing shell characters but only where such consideration does no violence to the more important opercular evidences.

To further refine the classification we have created a generous number of subgenera based almost wholly upon shell characters, using especially the "breathing apparatus" and the sculptural features in their various combinations. A final division under the subgenera carrying the classification to its ultimate rational end has been adopted by designating specific groupings wherever obvious similarity in form has made such assemblages useful for systematic study.

Among the numerous shell characters employed in our classification we have considered the most important the presence or absence of punctures or slits within or on the edge of the aperture, and when present, the nature of such devices for enabling the animal to obtain air when the operculum is withdrawn or seals the aperture. This character we believe to be of less taxonomic value than that of the opercula but of paramount importance among the shell characters.

Among the Annulariidae we have found no important radular differences and no range in nuclear characters worthy of note. A sufficiently large number of species from the different genera have already been described anatomically, or observed by ourselves, to warrant our belief that no fundamental anatomical differences exist within the scope of the entire family. The length of the proboscis seems to be merely relative. The division of the foot by a longitudinal groove into two independently functioning muscular masses is always present, but the peculiar method of progression caused thereby is merely exaggerated in those species where the foot is short and less apparent when the foot is longer.

OPERCULUM.

The outer periphery of the opercular whorls usually tapers to a very thin edge, which becomes upturned as the operculum is drawn into the aperture to close the shell. This upturning of the free edge is the introduction of the lamellar formation which we find so wonderfully diversified in this family. Even in Chondropoma, which was originally defined as a simple chondroid plate, we find that these outer upturned edges are not always cemented down flat upon the upper surface of the succeeding turn, but at times are left as a suggestion of a slender lamella, though more often they are worn away, leaving only an indication of a sutural thread. From this we can easily develop the Adamsiellinae, in which the inner edge of the whorl backs up and strengthens the slight chondroid upturned outer edge of the preceding turn until a strong, simple, elevated, calcified lamella is formed. In the Annularinae this process is carried a step

further and instead of a mere simple more or less erect spiral lamella, we have the calcified lamella variously strengthened by calcified riblets, or in extreme cases connected by trabeculae with the calcareous deposit on the basal plate. This is particularly true in such forms as have the lamella reflected outward to parallel the basal plate. In all the Annularinae the operculum has a double appearance, the outer and inner plate being separated by a concave groove at the free border. In some Annularinid mollusks the lamellae completely cover the space between succeeding turns, and did one not remove the operculum from the shell one would be left in doubt as to whether the operculum was simple or double.

The amount of calcification and the manner in which this takes place is also interesting and points out another line of progressive modification. In the Chondropominae we may find a few scattered calcareous granules, or enough of these to form a material thickening, but no matter what the amount, it is never built into ribs or lamellae. In the Rhytidopominae, on the other hand, we find in the simplest forms slender retractively placed riblets which radiate from the inner edge of the whorls outward across either a part or the whole whorl. In other members of the subfamily, these weak riblets are replaced by strong ribs which may fuse to form a spiral lamella at their inner, or outer, or both borders, but in no instance have we found the inner lamellae thus formed arch outwardly to form a plate, as is the case in the Annularinae, though in the Rhytidopomid genus *Xenopoma*, the outer lamella is extraordinarily developed and arches inwardly over the preceding turns, completely covering them.

BREATHING DEVICES.

The breathing devices found in Annulariidae are very ingenious. They range from a mere notch in the peripheral callus near the posterior angle of the aperture, which leaves a slender opening when the operculum is withdrawn, to a puncture in the parietal wall, which may or may not be provided with a projecting tube (siphon) on the outside. Some have a puncture in the parietal wall connected with the outer surface of the peristome by a slit. In some the puncture connects with an air chamber which passes back for several turns in the parietal wall and which is in communication with the hollow axis by a series of minute punctures. In some forms the puncture communicates directly with the hollow axis of the shell. The umbilicus being sealed by the parietal callus, the animal breathes through the perforation at the truncated apex. This apex breathing when the operculum is closed reaches its highest development in *Rhythidopoma*, in which the siphon bends down through the solute portion of the last turn over the base of the

preceding turn into the umbilicus, completely plugging it, breathing being effected through the axial puncture at the decollated apex.

Interesting as these characters are, they must be considered as of secondary systematic importance to those of the operculum. The latter develops its characteristics at an early stage of the mollusk's history, while the breathing device, with the exception of *Rhytidothyra bilabiatum* Orbigny, is developed near the final stage of the shell growth. Then, too, we find quite similar devices in the family Cyclophoridae, all of which strengthens the position of the opercular features as prime factors in phylogenetic classification, which is also more in harmony with the sum total of the characters presented by the shell.

CHRONOLOGICAL REVIEW OF THE SUPERSPECIFIC NOMENCLATURE OF THE ANNULARIIDEA.

nnaeus, Müller, Lamarck, Wood, and other early authors who described the first species of this family, employed the generic names of *Turbo*, *Nerita*, *Truncatella*, and finally *Cyclostoma*. This latter name proposed by Draparnaud in 1801, in his Tableau de Mollusques, had been unfortunately used by Lamarck for a marine mollusk. "*Cyclostoma*" was nevertheless indiscriminately used for a century by many authors in describing a host of species, both from the New and the Old World. This use continued even after the adoption of a number of genera created especially for various groups of American species. C. B. Adams, Poey, Orbigny, Morelet, and Gould may be cited among others who preferred "*Cyclostoma*" to the newer titles. The name was later expanded to family rank as the "Cyclostomatidae" or "Cyclostomacea" and as such has included both European and American forms save those that in 1885 were removed by Crosse to constitute a separate family—the Cyclophoridae.

The following is a chronological list of the genera heretofore founded upon New World species:

1797. *Cistula* (Humphreys) Museum Calonianum, p. 62. By reason of the opinion of the International Commission on Nomenclature as set forth in Smithsonian Publication No. 2060, in February, 1912, this work is excluded from scientific nomenclature, hence the name of *Cistula* as therein proposed can not be considered.

1801. *Cyclostoma* Draparnaud, Tab. Moll. France, p. 37, and later exemplified in his Hist. Nat. Moll. France (1805), pp. 25, 74. The name was preoccupied by Lamarck in 1779, having been applied by him to a marine mollusk.

1810. *Cyclostomus* Montfort, Conch. Syst., p. 287. Type, *Cyclostomus elegans* Müller, of southern Europe.

1817. *Annularia* Schumacher, Essai Nouv. Syst. Hab. Vers Test., pp. 60, 169. This name was wrongfully invalidated by Herrmannsen

in 1846 for that it was preoccupied in fossil plants. It was restored by Dall, Proc. Malac. Soc. London, vol. 1, p. 209 (1905), who selected *Turbo lincina* Linnaeus as its type.

1847. *Choanopoma* Pfeiffer, Zeitschr. Malak., vol. 4, p. 47. The four species cited by Pfeiffer without designating a type are all *Annularia* s. s. The genus therefore is an absolute synonym of *Annularia*.

1847. *Cistula* Gray, Proc. Zool. Soc. London, p. 181. This name was taken from the Museum Calonianum (Humphreys). Gray's genus, however, falls by reason of priority of Say's genus *Cistula*, 1825 (Reptilia).

1850. *Tudora* Gray, Brit. Mus. Cat. Cycloph., p. 48. Type, *Tudora similis* Gray, which is a synonym of *Cyclostoma megacheilos* Potiez and Michaud, which therefore becomes the type.

1850. *Jamaicia* C. B. Adams, Contr. Conch., p. 88. Type, *Cyclostoma anomalum* C. B. Adams.

1850. *Licina* Gray, Brit. Mus. Cat. Cycloph., p. 60. Type, *Nerita labeo* Müller. Gray took this name from Brown's work on Jamaica, 1756. The type must be selected from one of the two species cited by Gray of neither of which the operculum is known. We are therefore unable to assign the genus to any fixed position in our scheme of classification.

1851. *Adamsiella* Pfeiffer, Zeitschr. Malak., p. 155. Type, *Turbo mirabilis* Wood, selected by Dall, 1905.

1856. *Ctenopoma* (Shuttleworth) Pfeiffer, Malak. Blät., vol. 3, p. 58. Type, *Cyclostoma rugulosum* Pfeiffer. As shown by Sykes 1901 (Journ. Malac., vol. 8, p. 59) Pfeiffer's name is preoccupied by *Ctenopoma* Peters, 1844, for a genus of fishes. He renamed it *Rhytidopoma*.

1859. *Diplopoma* Pfeiffer, Malac. Blät., vol. 6, p. 73. Type, *Diplopoma architectonicum* Gundlach.

1888. *Colobostylus* Crosse and Fischer, Journ. Conchyl., vol. 36, p. 229. Type, *Cyclostoma jayanum* C. B. Adams, selected by Dall, 1905.

1890. *Blaesospira* Crosse, Journ. Conchyl., vol. 38, p. 280. Type, *Cyclostoma echinus* Wright.

1890. *Xenopoma* Crosse, Journ. Conchyl., vol. 38, p. 282. Type, *Choanopoma hystrix* Wright.

1901. *Rhytidopoma* Sykes, Journ. Malac., vol. 8, p. 60. Sykes proposed this name to replace *Ctenopoma* Pfeiffer, 1856 (not *Ctenopoma* Peters, 1844).

1905. *Parachondria* Dall, Proc. Malac. Soc. London, vol. 6, p. 209. Type, *Turbo fascia* Wood.

1905. *Opisthosiphon* Dall, Proc. Malac. Soc. London, vol. 6, p. 209. Type, *Cyclostoma bahamense* Shuttleworth.

1913. *Ramsdenia* Preston, Proc. Malac. Soc. London, vol. 10, p. 323. Type, *Ramsdenia mirifica* Preston.

ANNULARIIDAE, new family.

This family includes all the New World "Cyclostomoid" mollusks placed under the family name of Cyclostomatidae or Ericiidae.

The chief distinguishing character which separates this group from all other operculate pulmonates is found in the radula which fundamentally is uniform throughout the large number of species, which are included. The radula possesses a unicuspid rachidian tooth; a single unicuspid lateral tooth, and two marginals—the inner one resembling in form the lateral tooth but multicuspid—and an outer one which is long and curved like a bow and is pectinated both upon its recurved edge and upon its main portion, but is not thereby separated by the pectinations into a group of individual teeth. There is no jaw. The sole of the foot is longitudinally divided by a sulcus which separates it into two muscular masses functioning independently one of the other, and thus giving to the animal a method of progression by alternate waves of muscular contraction, first on one side and then on the other. The foot is relatively short. A bifid muzzle of varying length is always present. The tentacles are long, slender, and fibrillar or slightly swollen at the ends. The eyes are placed at the base of the tentacles on the outer side and often raised above the surface of the head by a fleshy protuberance.

The operculum shows a wide degree of variation through the various divisions of the family but follows, nevertheless, distinct lines of progression from a simple type to a very complicated structure, the steps from one extreme to the other being easily traceable. All the opercula possess a basal chondroid plate upon which calcareous ribs and lamellae are placed, the modifications of which are used in subdividing the family into a series of subfamilies, and genera, as will be set forth below.

The shell varies in shape from depressed helicoid to elongate conic. The sculpture varies from axially ribbed only to axially ribbed and spirally lirate, the intensity of these sculptural elements varying from obsolete to lamellose.

Type genus.—*Annularia* Schumacher.

The Annulariidae differs from the Ericiidae, an Old World group, in the radula. The Ericiidae possess multicuspid rachidian, lateral, and inner marginal teeth. The outer marginal is pectinated, but the pectinations are confined to the reflected portion of the tooth. In the Annulariidae, on the other hand, the rachidian and lateral teeth are always unicuspid, the inner marginal is multicuspid, and the outer marginal is pectinate, but the pectinations extend beyond the reflected portion, involving the main blade.

These radular differences have long since been cited by authors. There is an error on the part of Troschel (Das Gebiss der Schnecken,

vol. 1, p. 75, pl. 5, fig. 1) in describing and figuring a New World species, *Cistula candeana* d'Orbigny, or sometimes believed to have been *Cistula illustris* Poey, with a radula possessing a multicuspid rachidian and lateral tooth, or in other words, a typical Old World Erycid radula. The uniformly high order of Troschel's work caused this unfortunate error to be generally accepted without verifications; hence authors have hesitated to separate the American from the Old World forms, believing that the radular differences in the American forms showed a range of variation embracing the characteristics of the Old World group and those of the family now defined. We have examined the radula of both *Cistula candeana* and of *Cistula illustris* and have found them to be typically Annularid. An examination of the radula of many species, including all the groups discussed in this paper, has shown no variation in the Annularid characters; that is, unicuspid rachidian and lateral teeth, though minor variations do exist in the marginals.

The geographic range of the Annulariidae extends from the Bahamas and lower Florida on the north, throughout the Greater and Lesser Antilles, and on the mainland from Mexico to Bolivia. By far the greatest development is centered in the Greater Antilles.

KEY TO THE SUBFAMILY, GENERA, SUBGENERA, AND GROUPS OF THE FAMILY ANNULARIIDAE.

A¹. Lamellae absent or obsolete on the operculum.
  B¹. Basal plate without ribletlike reeuforcement.....Subfamily CHONDROPOMINAE.
    C¹. Breathing slit or pore absent .....Genus *Chondropoma*.
      D¹. Spiral sculpture confined to the umbilicus.
        E¹. Shell turbinate .....Subgenus *Chondropomatus*.
        E². Shell not turbinate .....Subgenus *Chondropomium*.
          F¹. Shell ovate-conic.
            G¹. Axial riblets low-rounded .....Group *weinlandi*.
            G². Axial riblets sublamellar .....Group *ambiguum*.
          F². Shell not ovate-conic.
            Shell elongate-conic.....Group *lindenianum*.
      D². Spiral sculpture not confined to the umbilicus.
        E¹. Shell turbinate .....Subgenus *Chondropometes*.
        E². Shell not turbinate.
          F¹. Intersections of axial and spiral threads forming sharp cusps.....
            Subgenus *Chondropomartes*.
          F². Intersections of axial and spiral threads not forming sharp cusps.
            G¹. Axial riblets developed into tufts at the summit.....
              Subgenus *Chondropomorus*.
              H¹. Axial riblets not rendered articulate by the spiral sculpture.....
                Group *dentatum*.
              H². Axial riblets rendered articulate by the spiral sculpture.....
                Group *santacruzense*.
            G². Axial riblets not developed into tufts at the summit.....
              Subgenus *Chondropoma*.
              H¹. Axial riblets stronger than the spiral sculpture....Group *raveni*.
              H². Axial riblets not stronger than the spiral sculpture.

I¹. Axial and spiral threads subequal.
J¹. Shell ovate, peristome not expanded .....Group *semilabre.*
J². Shell not ovate, peristome expanded.....Group *irradians.*
I². Axial and spiral threads not subequal.
J. Spiral threads stronger than the axial riblets.
K¹. Shell thin, translucent with interrupted color bands..... Group *pictum.*
K². Shell solid opaque without color bands.....Group *obesum.*
C². Breathing slit or pore present.....Genus *Chondrothyra.*
D¹. Breathing pore connected with the edge of the parietal wall by a slit Subgenus *Chondrothyrium.*
D². Breathing pore not connected with the edge of the parietal wall by a slit.
E¹. Shell turbinate, spiral scupture absent except in the umbilicus Subgenus *Chondrothyroma.*
E². Shell not turbinate, spiral sculpture present everywhere.
F¹. Peristome continuous in one plane.....Subgenus *Chondrothyra.*
G¹. Shell ovate conic.....Group *egregium.*
G². Shell elongate conic.....Group *canaliculata.*
F². Peristome not continuous in one plane.....Subgenus *Chondrothyretes.*
G¹. Shell ovate-conic.....Group *shuttleworthi.*
G². Shell elongate conic.....Group *sinuosa.*
B². Basal plate with ribletlike re-enforcements.....Subfamily RHYTIDOPOMINAE.
C¹. Calcareous deposit covering the full width of the whorls. Genus *Rhytidothyra.*
C². Calcareous deposit not covering the full width of the whorls.
D¹. Calcareous deposits covering only a portion of the width of each whorl.
E¹. Outer edge of the ribs fused to form a weak lamella.
F¹. Shell without breathing siphon.....Genus *Parachondria.*
G¹. Spiral sculpture absent.....Subgenus *Parachondrisca.*
G². Spiral sculpture not absent.
H¹. Spiral sculpture confined to umbilicus...Subgenus *Parachondrella.*
H². Spiral sculpture not confined to umbilicus.
I¹. Spiral sculpture strong not giving an articulate appearance to the axial ribs.....Subgenus *Parachondria.*
J¹. Peristome expanded.....Group *fascia.*
J². Peristome not expanded.....Group *dentilobata.*
I². Spiral sculpture not strong, giving an articulate appearance to the axial ribs.....Subgenus *Parachondrops.*
F². Shell with breathing siphon.....Genus *Opisthosiphon.*
G¹. Spiral sculpture confined to the umbilicus. Subgenus *Opisthosiphona.*
H¹. Shell turbinate.....Group *dalli.*
H². Shell not turbinate.
I. Shell conic.....Group *moreletiana.*
G². Spiral sculpture not confined to the umbilicus. Subgenus *Opisthosiphon.*
E². Outer edge of ribs fused to form a strong lamella.
F¹. Riblets joining the outer and inner lamella, not as high as the lamella.
G¹. Outer lamella in adult shells reflected inward over the whorls. Genus *Xenopoma.*
G². Outer lamella in adult shells not reflected inward over the whorls. Genus *Rhytidopoma.*
F². Riblets joining the outer and inner lamella as high as the lamellae. Genus *Torrella.*
G¹. Breathing siphon reflected into and closing the umbilicus. Subgenus *Torrella.*

G². Breathing siphon not reflected into nor closing the umbilicus. Subgenus *Torrellisca*.

A². Lamellae not absent or obsolete on the operculum.
B¹. Lamellae not reenforced by strong calcifications... Subfamily ADAMSIELLINÆ.
C¹. Axial and spiral sculpture about equal..... Subgenus *Adamsiella*.
D¹. Peristome almost or quite adnate to the last whorl.
E¹. Axial riblets gathered into tufts at the summit.....Group *mirabilis*.
E². Axial riblets not gathered into tufts at the summit.....Group *pulchrior*.
D². Peristome not almost or quite adnate to the last whorl.
E. Last whorl decidedly solute.....Group *monstrosa*.
C². Axial and spiral sculpture not equal.
D¹. Axial sculpture much stronger than the spiral.....Subgenus *Adamsiellops*.
E¹. Axial riblets gathered into tufts at the summit.....Group *antiguense*.
E². Axial riblets not gathered into tufts at the summit.....Group *ignilabre*.
B². Lamellae reenforced by strong calcifications.....Subfamily ANNULARINAE.
C¹. Lamellae placed obliquely upon the basal plate.....Genus *Annularia*.
D¹. Puncture or slit absent.
E¹. Spiral sculpture absent.....Subgenus *Annularisca*.
E². Spiral sculpture not absent.
F¹. Spiral sculpture confined to the umbilicus.....Subgenus *Annularosa*.
F². Spiral sculpture not confined to the umbilicus.
G¹. Axial sculpture consisting of almost uniform riblets.
H¹. Peristome broadly expanded, thin.....Subgenus *Annularia*.
I¹. Shell turbinate.....Group *fimbriatula*.
I². Shell not turbinate.
J¹. Shell ovate-conic.....Group *lincina*.
J². Shell not ovate-conic.
K. Shell elongate-conic.
L¹. Spiral sculpture strong.....Group *illustris*.
L². Spiral sculpture weak.....Group *lachneri*.
H². Peristome not broadly expanded.
I. Peristome thickened.....Subgenus *Annularito*.
G². Axial sculpture not consisting of almost uniform riblets.
H. Axial sculpture consisting of slender lamellae with fine axial threads between them.....Subgenus *Annularella*.
I¹. Shell turbinate.....Group *yunquensis*.
I². Shell ovate-conic.....Group *bertini*.
D². Puncture or slit present.
E¹. Puncture without external siphon, axial ribs articulate Subgenus *Annularops*.
E². Puncture with external siphon, axial ribs not articulate..... Subgenus *Annularodes*.
C². Lamellae not placed obliquely upon the basal plate.
D¹. Lamellae placed vertically upon the basal plate.....Genus *Blaesospira*.
E¹. Shell ovate-conic.
F¹. All whorls solute.....Group *echinus*.
F². All whorls not solute.....Group *pretrei*.
E². Shell not ovate-conic.
F. Shell depressed helicoid.....Genus *Abbottella*.
D². Lamellae not placed vertically upon the basal plate.
E¹. Lamellae reflected to parallel the basal plate.....Genus *Tudora*.
F¹. Lamellae marked by feeble oblique riblets.
G¹. Lamellae almost flat.
H¹. Breathing notch, slit, or pore absent.

I¹. Shell helicoid.....Subgenus *Tudorellata*.
J¹. Umbilicus bounded by a spiral cord.....Group *interstitialis*.
J². Umbilicus not bounded by a spiral cord...Group *auricomum*.
I². Shell not helicoid.
J¹. Shell elongate-ovate—elongate-conic.
K¹. Spiral sculpture absent.....Subgenus *Colobostylus*.
K². Spiral sculpture not absent.
L¹. Spiral sculpture confined to the umbilicus.....
Subgenus *Tudorisca*.
M¹. Shell elongate-ovate.....Group *albus*.
M². Shell not elongate-ovate.
N. Shell elongate-conic.....Group *chiapensis*.
L². Spiral sculpture not confined to the umbilicus.
M¹. Axial ribs not rendered articulated by the spiral sculpture.....Subgenus *Tudora*.
N¹. Riblets tufted at the summit.
O¹. Shell elongate-ovate.....Group *rangelinum*.
O². Shell not elongate-ovate.
P. Shell elongate-conic.....Group *abbotti*.
N². Riblets not tufted at the summit.
O¹. Suture channeled.....Group *habichi*.
O². Suture not channeled.....Group *megacheila*.
M². Axial ribs rendered articulated by the spiral sculpture
Subgenus *Tudorops*.
N¹. Shell ovate-conic.
O¹. Axial ribs gathered into tufts at the summit.
Group *banksiana*.
O². Axial ribs not gathered into tufts at the summit.
Group *xanthostoma*.
N². Shell elongate-conic.....Group *undosum*.
H². Breathing notch, slit, pore, or siphon present....Genus *Eutudora*.
I¹. Axial sculpture almost obsolete.
J¹. Breathing notch present.....Subgenus *Eutudorisca*.
J². Breathing notch not present.
K¹. Breathing slit present.....Subgenus *Eutudorella*.
K². Breathing slit not present.
L¹. Breathing pore present.....Subgenus *Eutudora*.
I². Axial sculpture not almost obsolete.
J. Axial sculpture sublamellar.....Subgenus *Eutudorops*.
K¹. Breathing pore without external siphon..Group *azucarensis*.
K². Breathing pore with external siphon.....Group *torquatum*.
G². Lamellae not flat.
H. Lamellae convex.....Genus *Ramsdenia*.
F². Lamellae not marked by feeble oblique riblets.
G. Lamellae marked by strong oblique riblets.....Genus *Diplopoma*.
H¹. Outer surface of operculum not convex in the center.....
Subgenus *Diplopoma*.
I¹. Shell ovate-conic.....Group *retrorsuum*.
I². Shell not ovate-conic.
J. Shell elongate-conic.....Group *architectonicum*.
H². Outer surface of operculum convex in the center.....
Subgenus *Jamaicia*.

CHONDROPOMINAE, new subfamily.

Shell ranging in form from turbinate to elongate-conic. The axial sculpture may consist of strong ribs, or range from those to slender, almost lamellar riblets, or it may be decidedly reduced. There is also a wide range of strength in the development of the spiral sculpture, which may be confined to the umbilicus or may cover the entire shell. Breathing devices are present in some groups and absent in others. The chief character of the subfamily, however, resides in the operculum, which consists of a thin, simple chondroid basal plate of several whorls, the outer edge of which may be faintly upturned to form a very fragile, low, slender lamella, suggesting the starting point of the Adamsiellinae. This is, however, usually soon brushed away, leaving the operculum as a plain plate. The operculum has a deposit of fine calcareous granules which may be very slight or fairly strong, depending upon the species in question.

Type genus.—Chondropoma.

Genus CHONDROPOMA Pfeiffer.

1847. *Chondropoma* PFEIFFER, Zeitschr. Malak., vol. 6, p. 109.

Shell ranging in form from turbinate to elongate-conic; the sculpture in varying intensity may consist of axial ribs only or of axial ribs and finer axial threads or of axial ribs and spiral threads. All, even those without spiral sculpture on spire and base, have spiral threads on the umbilical wall. No special breathing device is developed in the members of this genus. The operculum is simple; that is, it consists of a chondroid plate made up of a varying number of whorls, the outer thin edges of which are sometimes faintly upturned to form a suggestion of an obsolete lamella. The outer surface of the operculum has a deposit of calcareous granules which is usually very slight, but in some species rather pronounced. In no instance is this entirely absent. The position of the opercular nucleus, whether excentric or subcentral, depends upon the shape of the aperture.

Type of the genus.—Cyclostoma semilabre Lamarck. Selected by Dall in 1905.

CHONDROPOMATUS, new subgenus.

Shell of turbinate form, marked by strong axial ribs, between which finer threads parallel to the ribs are present. The axial sculpture extends into the open umbilicus, the wall of which is marked by strong spiral cords. Operculum typically Chondropomoid.

Type of the subgenus.—Chondropoma latum (Gundlach) Pfeiffer.

The type species is the only one known of this group at present. It comes from eastern Cuba.

CHONDROPOMIUM, new subgenus.

Shell varying in shape from ovate to elongate-conic, marked by axial ribs on spire and base. Spiral sculpture absent except on the umbilical wall, where spiral cords are present. Operculum typically Chondropomoid.

Type of the subgenus.—Chondropoma weinlandi Pfeiffer.

The following species are now referred to this subgenus. They fall easily into three groups as follows:

The group of *Chondropomium weinlandi:*

Cyclostoma weinlandi Pfeiffer.....Haiti.
Chondropoma weinlandi superba Henderson and Simpson.....Haiti.
Cyclostoma (Chondropoma) eusarcum Pfeiffer.....Santo Domingo
Cyclostoma magnifica (Salle) Pfeiffer.....Santo Domingo
Cyclostoma (Tudora) nobilis Pfeiffer.....Santo Domingo.

The group of *Chondropomium ambigua:*

Cyclostoma ambigua Lamarck.....Haiti.
Cyclostoma gutierezi (Gundlach) Pfeiffer.....Eastern Cuba.
Cyclostoma andrewsae Ancey..... Utilla.

The group of *Chondropomium lindeniana:*

Chondropoma lindeniana Weinland.....Haiti.
Cyclostoma loweana Pfeiffer.....Santo Domingo.
Cyclostoma papyracea Adams.....Jamaica.
Cyclostoma rubicundum Morelet.....Guatemala.
Cyclostoma plicatulum Pfeiffer.....Venezuela.

CHONDROPOMETES, new subgenus.

Shell of turbinate form, openly umbilicated, marked by axial and spiral threads. Operculum typically chondropomoid with the nucleus subcentral.

Type of the subgenus.—Chondropoma vignalensis (Gundlach) Pfeiffer.

The following species are referred to this subgenus:

Chondropoma vignalensis (Wright) Pfeiffer.....Western Cuba.
Cyclostoma latilabre Orbigny.....Western Cuba.

CHONDROPOMARTES, new subgenus.

Shell of ovate-conic form, the intersections of the axial ribs and spiral threads forming sharp cusps. Operculum typically Chondropomoid.

Type of the subgenus.—Chondropoma presasiana (Gundlach) Pfeiffer.

The following species are now referred to this subgenus:

Chondropoma presasiana (Gundlach) Pfeiffer.....Matanzas, Cuba.
Chondropoma scobina (Gundlach) Pfeiffer.....Western Cuba.
Chondropoma discolorans (Wright) Pfeiffer.....Western Cuba.
Cyclostoma dunkeri Arango.....Eastern Cuba.
Chondropoma rufopictum (Gundlach) Pfeiffer.....Eastern Cuba.

CHONDROPOMORUS, new subgenus.

Shell elongate-conic, marked by both axial and spiral threads, the axial threads being gathered into tufts at the summits of the whorls.

Type of the subgenus.—Cyclostoma dentatum Say.

The following species are now referred to this subgenus. They fall into two groups, as follows:

The group of *Chondropomorus dentatum:*

Cyclostoma dentatum Say.....Florida-Cuba.
Chondropoma dilatatum (Gundlach) Pfeiffer.....Eastern Cuba.
Cyclostoma neglectum (Gundlach) Pfeiffer.....Eastern Cuba.
Cyclostoma delatreanum Orbigny.....Central Cuba.
Cyclostoma canescens Pfeiffer.....East-Central Cuba.
Cyclostoma revinctum Poey.....Eastern Cuba, Bahamas.
Cyclostoma salleana Pfeiffer.....Santo Domingo.
Cyclostoma litturatum Pfeiffer.....Santo Domingo.
Cyclostoma (*Chondropoma*) *hemiotum* Pfeiffer.....Santo Domingo.
Cyclostoma petitiana Pfeiffer.....Haiti.
Cyclostoma caricae Pfeiffer.....Santo Domingo.
Chondropoma subreticulatum Maltzan.....Haiti.
Chondropoma adulteratum Pfeiffer.....Santo Domingo.
Chondropoma biforme Pfeiffer.....Bahamas.
Cyclostoma erectum (Gundlach) Pfeiffer.....Eastern Cuba.
Chondropoma abnatum (Gundlach) Pfeiffer.....Eastern Cuba.
Chondropoma textum (Gundlach) Pfeiffer.....Eastern Cuba.
Cyclostoma candeanum Orbigny.....Eastern Cuba.
Cyclostoma crenulata Ferussac.....Guadeloupe.
Cyclostoma (*Chondropoma*) *newtoni* Shuttleworth.....Porto Rico.
Cistula riisei Pfeiffer.....Porto Rico.
Chondropoma rawsoni Pfeiffer.....Bahamas.
Chondropoma watlingense Dall.....Bahamas.

The group of *Chondropomorus santacruzense:*

Chondropoma santacruzense Pfeiffer.....St. Croix.
Cyclostoma basicarinatum Pfeiffer.....St. Croix.
Cyclostoma newcombianum C. B. Adams.....St. Thomas.
Chondropoma tortolense Pfeiffer.....Tortola.
Adamsiella chordata (Gundlach) Pfeiffer.....Eastern Cuba.

Subgenus CHONDROPOMA Pfeiffer.

1847. *Chondropoma* PFEIFFER, Zeitschr. Malak., vol. 6, p. 109.

Shell ranging in form from ovate-conic to elongate-conic. The axial sculpture consists of ribs or riblets which vary considerably in strength in the different species. The riblets are never gathered into tufts at the summit. The spiral sculpture is also quite variable, but regardless of its strength it is found upon all parts of the spire and base. The peristome may be simple or expanded. No breathing device is present. Operculum typically Chondropomoid.

Type of the subgenus.—Cyclostoma semilabre Lamarck.

The following species fall into this subgenus, in five groups:

The group of *Chondropoma raveni:*

Cistula raveni Crosse.....Curacoa.
Cylostoma serraticosta Weinland.....Haiti.
Colobostylus rollei Weinland.....Haiti.

The group of *Chondropoma semilabre:*

Cyclostoma semilabre Lamarck.....Haiti.
Chondropoma navassense Tryon.....Navassa.
Cyclostoma (*Chondropoma*) *blandum* Pfeiffer.....Santo Domingo.
Cyclostoma (*Chondropoma*) *blauneri* Shuttleworth.....Porto Rico.
Cyclostoma (*Chondropoma*) *swifti* Shuttleworth.....Porto Rico.
Chondropoma brownianum Weinland.....Haiti.
Chondropoma hjalmersoni Pfeiffer.....Bahamas.
Cyclostoma moestum (Shuttleworth) Pfeiffer.....Matanzas.
Chondropoma garceanum Torre.....Matanzas.
Cyclostoma revocatum Gundlach.....Eastern Cuba.
Chondropoma wilcoxi Pilsbry and Henderson.....Central Cuba.
Chondropoma ernesti Pfeiffer.....Eastern Cuba.

The group of *Chondropoma irradians:*

Cyclostoma irradians (Shuttleworth) Pfeiffer.....Matanzas.
Cyclostoma grunneri Pfeiffer.....Honduras.

The group of *Chondropoma pictum:*

Cyclostoma pictum Pfeiffer.....Matanzas.
Chondropoma yucayum (Presas) Pfeiffer.....Matanzas.
Cyclostoma dissolutum Poey.....Isle of Pines.
Cyclostoma pfeifferianum Poey.....Havana.
Cyclostoma poeyanum Orbigny.....Havana.
Chondropoma tenuilirata Pfeiffer.....Havana.
Cyclostoma perlatum Gundlach.....Matanzas.
Cyclostoma laetum (Gutierrez) Poey.....Eastern Cuba.

The group of *Chondropoma obesum:*

Truncatella obesum Menke.....Matanzas.
Chondropoma carenasense Pilsbry and Henderson.....Central Cuba.
Chondropoma carenasense guantanamensis Torre.....Eastern Cuba.
Chondropoma oxytremum (Gundlach) Pfeiffer.....Eastern Cuba.
Chondropoma solidulum (Gundlach) Pfeiffer.....Eastern Cuba.
Chondropoma solidulum tanamensis Torre.....Eastern Cuba.
Cyclostoma (*Chondropoma*) *simplex* Pfeiffer.....Santo Domingo.
Chondropoma caribbeum Clapp.....Swan Island.
Chondropoma marginalbum (Gundlach) Pfeiffer.....Eastern Cuba.
Cyclostoma (*Chondropoma*) *kisslingianum* Weinland.....Haiti.
Ctenopoma bryanti Pfeiffer.....Bahamas.
Cyclostoma rufilabre (Beck) Potiez and Michaud.....Lesser Antilles.
Chondropoma julieni Pfeiffer.....Sombrero Island.
Chondropoma ignea Reeve.....Lesser Antilles.

CHONDROTHYRA, new genus.

Shell ranging in form from turbinate to elongate-conic. The sculpture in varying intensity may consist of axial ribs only, or of

axial ribs and spiral threads. All, even those without spiral sculpture on the spire and base, have spiral threads on the umbilical wall. A special breathing device is present in all members of this genus. This may consist of a pore connected with the outer edge of the peristome, as in the subgenus *Chondrothyrium*, or of a puncture without slit, as in the subgenera *Chondrothyroma*, *Chondrothyra*, and *Chondrothyretes*. The operculum is simple; that is, it consists of a chondroid plate made up of a varying number of whorls, the outer thin edges of which are sometimes faintly upturned to form a suggestion of an obsolete lamella. The outer surface of the operculum has a deposit of calcareous granules, which is usually very slight, but in some species rather pronounced.

Type of the genus.—Cyclostoma egregium (Gundlach) Pfeiffer.

CHONDROTHYRIUM, new subgenus.

Shell of ovate-conic form marked by axial and spiral threads. Breathing pore present in the parietal wall, connected with the outer edge of the peristome by a slit. Operculum typically Chondropomoid.

Type of the subgenus.—Cyclostoma violaceum Pfeiffer.

The following species are now referred to this subgenus:

Cyclostoma violaceum Pfeiffer.....Central Cuba.
Cyclostoma crenimargo Pfeiffer.....Central Cuba.

CHONDROTHYROMA, new subgenus.

Shell turbinate, openly umbilicated, marked by axial ribs only, excepting the umbilical wall, which shows strong spiral threads. The breathing pore is on the parietal wall, a little behind the broadly expanded peristome, close to the posterior angle of the aperture. Operculum typically Chondropomoid with subcentral nucleus.

Type of the subgenus.—Cyclostoma sagebieni Poey.

The type species is the only one known of this group at present. It comes from western Cuba.

CHONDROTHYRA, new subgenus.

Shell varying from ovate-conic to elongate-conic, marked by axial and spiral threads. Peristome broadly expanded in one plane; that is, not notched or inbent at the umbilicus. The breathing pore perforates the parietal wall a little behind the peristome and a little anterior to the posterior angle of the aperture. Operculum typically Chondropomoid.

Type of the subgenus.—Cyclostoma egregium (Gundlach) Poey.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Chondrothyra egregium:*

Cyclostoma egregium (Gundlach) Poey.....Western Cuba.
(*Licina percrassa* (Wright) Pfeiffer).....Western Cuba.

The group of *Chondrothyra canaliculata:*

Chondropoma hendersoni Torre.....Western Cuba.
Chondropoma canaliculata (Gundlach) Pfeiffer.....Western Cuba.
Chondropoma deceptor Arango.....Western Cuba.
Chondropoma hamlini Arango.....Western Cuba.

CHONDROTHYRETES, new subgenus.

Shell varying from ovate-conic to elongate-conic, marked by axial and spiral threads. Peristome broadly expanded, notched or inbent at the umbilicus. The breathing pore perforates the parietal wall a little behind the peristome, and a little anterior to the posterior angle of the aperture. In some of the members of this subgenus the exterior perforation leads to the surface at the posterior angle of the aperture; in others to the umbilicus; in the species which have the umbilicus sealed with a callus the breathing pore communicates with the exterior by means of the hollow axis and the opening at the truncated summit of the shell. Operculum typically Chondropomoid.

Type of the subgenus.—Cyclostoma shuttleworthi Pfeiffer.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Chondrothyrates shuttleworthi:*

Cyclostoma shuttleworthi Pfeiffer.....Western Cuba.
Cyclostoma shuttleworthi incrassatum (Wright) Pfeiffer.....Western Cuba.
Cyclostoma (*Chondropoma*) *shuttleworthi gundlachi* Arango.....Western Cuba.
Chondropoma foveatum (Gundlach) Pfeiffer.....Western Cuba.
Cyclostoma ottonis Pfeiffer.....Western Cuba.
Cyclostoma claudicans Poey.....Western Cuba.
Chondropoma excisum (Gundlach) Pfeiffer.....Western Cuba.
Chondropoma unilabiatum (Gundlach) Pfeiffer.....Eastern Cuba.
Cyclostoma tenebrosum Morelet.....Western Cuba.
Cyclostoma sericatum Morelet.....Western Cuba.
Chondropoma assimile (Gundlach) Pfeiffer.....Western Cuba.

The group of *Chondrothyretes sinuosa:*

Chondropoma sinuosa (Wright) Pfeiffer.....Western Cuba.
Chondropoma echinulata (Wright) Pfeiffer.....Western Cuba.

RHYTIDOPOMINAE, new subfamily.

Shell ranging in form from turbinate to elongate-conic. The sculpture may be axial ribs only, or axial ribs on the spire and base, with spiral cords in the umbilicus, or axial and spiral threads on spire and base. In strength the sculptural elements may vary in different species from lamellar to obsolete. A breathing device may be present or absent; these are discussed under the subdivision in which they occur. The operculum in all forms has as a basis a chondroid plate composed of a number of whorls. The outer edge of these whorls is never upturned to form a strong lamella. The

outer surface of the lamellae bears a calcareous deposit which may consist of simple retractively curved riblets that may remain distinct or may become fused into a solid plate. These deposits may cover the entire width of the whorl or only a fraction thereof. The inner and outer termination of the ribs may or may not fuse to form a strong spiral lamella, but in no instance does the inner lamella rise up as a simple spiral band as in the Adamsiellinae nor become reflected outward and calcified as a second or roofing plate as in the Annularinae.

Type genus.—Rhytidopoma Sykes.

RHYTIDOTHYRA, new genus.

Shell elongate-ovate, marked by both axial and spiral threads. The breathing pore communicates with a tube located in the posterior angle, extending backward for more than three whorls. This tube, in turn, communicates, by slender clefts, with the hollow axis, through which breathing is evidently effected when the operculum is closed. The operculum consists of many strongly raised, retractively curved lamellar ribs, which extend completely across the turns. These lamellar ribs are high at their inner edge, from which they pass down in a gentle curve, rising again to their highest altitude at their outer border, where they become fused into a spiral lamella, which projects almost as far as the basal chondroid plate. The lateral margin of the operculum is strongly channeled.

Type of the genus.—Cyclostoma bilabiatum Orbigny.

Genus PARACHONDRIA Dall.

1905. *Parachondria* Dall, Proc. Malac. Soc. London, vol. 6, p. 209.

Shell ranging in shape from elongate-ovate to elongate-conic, marked by axial ribs only or by axial ribs and spiral threads which are confined to the umbilicus or by axial and spiral threads on spire and base or slender axial lamellae and subobsolete spiral threads which give to the axial sculpture an articulate appearance. No breathing device is present. The operculum has the inner portion of its turns covered by a calcareous deposit which consists of numerous low retractively curved fused riblets, which are not fused into a raised lamella at their outer edge, nor does the calcareous deposit extend to the edge of the chondroid basal plate. There is thus left a narrow channel in the bottom of which the chrondroid plate may be seen at the outer edge of each whorl.

Type of the genus.—Turbo fascia Wood.

PARACHONDRISCA, new subgenus.

Shell elongate-conic, marked by axial riblets only. No trace of spiral riblets, even in the umbilicus, is present. Operculum typically Parachondroid.

Type of the subgenus.—Cyclostoma umbricola Weinland.

Of this subgenus the type species only is known. It comes from Haiti.

PARACHONDRELLA, new subgenus.

Shell elongate-conic, marked by axial ribs, spiral sculpture confined to the umbilicus. Operculum typically Parachondroid.

Type of the subgenus.—Cyclostoma fecunda C. B. Adams.

The following species are now referred to this subgenus:

Turbo columna Wood.....Jamaica.
Cyclostoma adamsi Pfeiffer.....Jamaica.
Cyclostoma avena C. B. Adams.....Jamaica.
Cyclostoma fecunda C. B. Adams.....Jamaica.
Cyclostoma fecunda distincta C. B. Adams.....Jamaica.
Cyclostoma armata C. B. Adams.....Jamaica.
Cyclostoma maritima C. B. Adams.....Jamaica.
Cyclostoma maritima aurora C. B. Adams.....Jamaica.

Subgenus PARACHONDRIA Dall.

1905. *Parachondria* Dall, Proc. Malac. Soc. London, vol. 6, p. 209.

Shell elongate-conic, marked by strong axial and spiral threads. Operculum typically Parachondroid.

Type of the subgenus.—Turbo fascia Wood.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Parachondria fascia:*

Turbo fascia Wood.....Jamaica.
Cyclostoma fascia proxima C. B. Adams.....Jamaica.
Cyclostoma barklyana Chitty.....Jamaica.
Cyclostoma simulans C. B. Adams.....Jamaica.
Cyclostoma angustae C. B. Adams.....Jamaica.

The group of *Parachondria dentilobata:*

Cyclostoma quarternata Lamarck.....Haiti.
Cyclostoma hydii Weinland.....Inagua.
Cyclostoma pupaeformis Sowerby.....Haiti.
Cyclostoma aminensis Pfeiffer.....Santo Domingo.
Cyclostoma emilianum Weinland.....Haiti.
Cistula capillacea Pfeiffer.....Santo Domingo.
Cyclostoma cinclidodes Pfeiffer.....Santo Domingo.
Cyclostoma dentilobata Weinland.....Haiti.
Cyclostoma tappaniana C. B. Adams.....Jamaica.
Parachondria (Parachondria) gonavicola, new species.....Haiti.

PARACHONDROPS, new subgenus.

Shell ranging in shape from elongate-ovate to elongate-conic. The axial sculpture consists of slender sublamellar riblets, which are rendered wavy or articulate by the ill-defined spiral sculpture. Operculum typically Parachondroid.

Type of the subgenus.—Cyclostoma campbelli C. B. Adams.

The following species are now referred to this subgenus:

Cyclostoma campbelli C. B. Adams.....Jamaica.
Cyclostoma sheppardiana C. B. Adams.....Jamaica.
Rhytidopoma fraterminor Pilsbry and Brown.....Jamaica.
Ctenopoma nigriculum (Gundlach) Pfeiffer.....Eastern Cuba.
Ctenopoma jeannereti Pfeiffer.....Eastern Cuba.
Cyclostoma wilkinsoni C. B. Adams.....Jamaica.
Tudora lurida (Gundlach) Pfeiffer.....Eastern Cuba.

Genus OPISTHOSIPHON Dall.

1905. *Opisthosiphon* Dall, Proc. Malac. Soc. London, vol. 6, p. 209.

Shell ranging in shape from turbinate to elongate-conic, marked by axial ribs and spiral threads. In the subgenus *Opisthosiphona* the latter are confined to the umbilicus, while in *Opisthosiphon* they are found both on the spire and base. All members of this genus have a breathing siphon situated on the angle formed by the junction of the parietal and outer walls a little behind the peristome. In some forms this siphon is a mere upright tube; in others, it is flexed and bent to pass through the chink formed behind the peristome when the last whorl is solute, the breathing pore thus communicating with the hollow axis. In some forms where the whorl is not solute, the siphon is reflected backward. Operculum typically Parachondroid.

Type of the genus.—Cyclostoma bahamense Shuttleworth.

OPISTHOSIPHONA, new subgenus.

Shell ranging from turbinate to elongate-conic. Spire and base marked by axial riblets; spiral threads confined to the umbilicus. Breathing siphon present. Operculum typically Parachondroid.

Type of the subgenus.—Cyclostoma moreletiana Petit.

The following species are now referred to this subgenus. They fall into two groups, as follows:

The group of *Opisthosiphona moreletianum:*

Cyclostoma moreletianum Petit.....Isle of Pines.
Cyclostoma pupoides Morelet.....Isle of Pines.
Tudora excurrens (Gundlach) Pfeiffer.....Eastern Cuba.
Opisthosiphon berryi Clapp.....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *berryi semiapertus* Torre and Henderson Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *paredonensis* Torre and Henderson..Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *obturatus* Torre and Henderson....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *subobturatus* Torre and Henderson..Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *apertus* Torre and Henderson.....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *bioscai* Torre and Henderson.....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *salustii* Torre and Henderson.....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *occultus* Torre and Henderson.....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *trincheracensis* Torre and Henderson.Eastern Cuba.

Opisthosiphon (*Opisthosiphona*) *protractus* Torre and Henderson....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *judacensis* Torre and Henderson....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *detectus* Torre and Henderson.....Eastern Cuba.
Opisthosiphon (*Opisthosiphona*) *obtectus* Torre and Henderson.....Eastern Cuba.

Descriptions of the last thirteen forms are now going through press. The group of *Opisthosiphona dalli:*

Opisthosiphon (*Opisthosiphona*) *dalli* Torre and Henderson.....Eastern Cuba.

Subgenus OPISTHOSIPHON Dall.

1905. *Opisthosiphon* Dall, Proc. Malac. Soc. London, vol. 6, p. 209.

Shell elongate-conic, marked by axial and spiral threads on base and spire. External breathing siphon present at the posterior angle. Operculum typically Parachondroid.

Type of the subgenus.—Cyclostoma bahamense Shuttleworth.

The following species are now referred to this subgenus:

Cyclostoma bahamense Shuttleworth.....Bahamas.
Cyclostoma sculptum (Gundlach) Pfeiffer.....Eastern Cuba.
Cyclostoma echinatum (Gundlach) Pfeiffer.....Eastern Cuba.

Genus XENOPOMA Crosse.

1890. *Xenopoma* Crosse, Journ. Conchyl., vol. 38, p. 282.

Shell elongate-conic; the last part of the last whorl is detached and deflected considerably below the preceding turn. The sculpture consists of widely spaced ribs which bear strong hollow cusplike tubercles at their intersections with the obsolete spiral cords. In addition to this, fine wavy axial threads occur between the cusped ribs. Peristome reflected, widely expanded and fluted. Operculum marked by retractively curved ribs, which do not extend across the entire width of the whorls. The inner border of these ribs is fused to form a lamella, which is a little higher than the ribs. The outer border of the ribs become fused to form an enormously developed lamella in the last turn, which is reflected domelike inward over the operculum and almost completely covers it. This reflected lamella bears fine corrugations on its surface. The edge of the operculum is concave.

Type of the genus.—Choanopoma hystrix (Wright) Pfeiffer.

The following species are now referred to this genus:

Choanopoma hystrix (Wright) Pfeiffer.....Eastern Cuba.
Choanopoma humboldtiana Pfeiffer.....Eastern Cuba.

Genus RHYTIDOPOMA Sykes.

1901. *Rhytidopoma* Sykes, Journ. Malac., vol. 8, p. 60.

Shell elongate-conic, axial riblets and spiral threads present in all the known species; the axial sculpture is usually stronger than the spiral. A recurved breathing siphon is present a little behind the peristome at the junction of the parietal and outer wall. Operculum

with the ribs not completely covering the whorls, thus showing the basal chondroid plate in a narrow sinus, which marks the outer edge of the turns. Both the inner and outer end of the retractively curved ribs are fused into lamellae, which are considerably higher than the ribs which extend in a gentle curve between them.

Type of the genus.—Cyclostoma rugulosum Pfeiffer.

The following species are now referred to this genus:

Cyclostoma rugulosum Pfeiffer.....Matanzas
Cyclostoma nodulatum Poey.....Matanzas.
Cyclostoma clathratum Gould.....Matanzas.
Ctenopoma wrightianum (Gundlach) Arango.....Western Cuba.
Ctenopoma nodiferum Arango.....Cuba.
Cyclostoma honestum Poey.....Havana.
Cyclostoma coronatum Poey.....Havana.

TORRELLA, new genus.

Shell elongate-conic, marked by sublamellar axial riblets only on the spire, or by sublamellar axial riblets and obsolete spiral threads. The umbilicus may be marked by weak or strong spiral cords. Peristome expanded, simple or fimbriated. Breathing siphon almost straight or decidedly flexed and bent into the umbilicus. Operculum with the ribs occupying only a portion of each whorl and as high as the inner and outer lamellae, which are formed by the fusing of the ribs. Dedicated to Dr. Carlos de la Torre.

Type of the genus.—Ctenopoma torreianum (Gundlach) Arango.

TORRELLA, new subgenus.

Shell elongate-conic, marked by slender sublamellar axial ribs and obsolete spiral cords. The latter render the ribs somewhat sinuous, and slightly foliate at their junctions. Umbilicus marked by strong spiral cords. Peristome expanded and fimbriated at the edge. Breathing siphon strongly flexed and bent into the umbilicus, which it completely closes. Breathing, when the animal is withdrawn, is effected through the hollow axis of the shell. Operculum typical Torrelid.

Type of the subgenus.—Ctenopoma torreianum (Gundlach) Arango.

The following species are now referred to this subgenus:

Ctenopoma torreiana (Gundlach) Arango.....Havana.
Cyclostoma deficiens Gundlach.....Matanzas.
Cyclostoma immersum Gundlach.....Matanzas.

TORRELLISCA, new subgenus.

Shell elongate-conic, marked by slender sublamellar axial riblets only on the spire. Umbilicus marked by weak spiral cords. Peristome expanded but not fimbriated. Breathing siphon a simple

tube but slightly bent, opening on the outside. Operculum typically Torrellid.

Type of the subgenus.—Torrella (Torrellisca) simpsoni, new species.

The type species is the only one known of this group at present. It comes from central Cuba.

ADAMSIELLINAE, new subfamily.

Shell ranging in form from ovate-conic to elongate-conic, marked by axial and spiral sculpture of equal strength, giving the surface a granulose appearance, or by axial ribs stronger than the spiral threads, the latter giving the ribs an articulate appearance. In two groups the ribs are gathered into tufts at the summit. No special breathing device has been observed in any of the species. The operculum consists of a chondroid basal plate composed of several whorls, in which the upturned outer edge of the preceding whorl is strengthened and built into a strongly elevated lamella by the inner edge of the succeeding turn. There is no ribbing or buttressing to this lamella.

Type genus.—Adamsiella Pfeiffer.

Genus ADAMSIELLA Pfeiffer.

1851. *Adamsiella* PFEIFFER, Zeitschr. Malak., p. 155.

The definition for the subfamily may cover the genus.

Type of the genus.—Turbo mirabilis Wood.

Subgenus ADAMSIELLA Pfeiffer.

1851. *Adamsiella* PFEIFFER, Zeitschr. Malak., p. 155.

Shell ranging from ovate-conic to elongate-conic in form. Axial and spiral sculpture about equal, producing a granular surface. Operculum typically Adamsielloid.

Type of the subgenus.—Turbo mirabilis Wood.

The following species are now referred to this subgenus. They fall into three groups as follows:

The group of *Adamsiella mirabilis*:

Turbo mirabilis Wood.....Jamaica.
Cyclostoma irrorrata Gloyne.....Jamaica.
Cyclostoma variabilis C. B. Adams.....Jamaica.
Cyclostoma grayana Pfeiffer.....Jamaica.
Adamsiella grayana aureolabre Simpson.....Jamaica.

The group of *Adamsiella pulchrior*:

Cyclostoma pulchrior C. B. Adams.....Jamaica.

The group of *Adamsiella monstrosa*:

Cyclostoma moribunda C. B. Adams.....Jamaica.
Cyclostoma intermedia C. B. Adams.....Jamaica.

Cyclostoma monstrosa C. B. Adams.....Jamaica.
Cyclostoma pearmanaeanum Chitty.....Jamaica.
Cyclostoma simillima Vendryes.....Jamaica.
Adamsiella jarvisi Henderson.....Jamaica.
Cyclostoma miranda C. B. Adams.....Jamaica.

ADAMSIELLOPS, new subgenus.

Shell ranging from ovate-conic to elongate-conic in form. Axial sculpture stronger than the spiral, the latter imparting an articulated appearance to the ribs. Operculum typically Adamsielloid.

Type of the subgenus.—Cyclostoma ignilabre C. B. Adams.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Adamsiellops antiguense*:

Choanopoma occidentale Pfeiffer.....Lesser Antilles.
Cyclostoma antiguense Shuttleworth.....Lesser Antilles.
Cyclostoma lugubris Pfeiffer.....Lesser Antilles.

The group of *Adamsiellops ignilabre*:

Cyclostoma ignilabre C. B. Adams.....Jamaica.

ANNULARINAE, new subfamily.

Shell ranging in form from helicoid to elongate-conic. The axial sculpture may be almost obsolete or it may consist of strong ribs or many slender lamellae which may or may not be gathered into tufts at the summit. The spiral sculpture may be absent, confined to the umbilicus, or cover spire and base. In strength the spiral sculpture varies from fine threads to strong cords. Breathing devices are present in some groups and absent in others. They range from a mere notch or slit puncture to a pore with external siphon. The operculum may be flat or convex on the outside, provided with strong calcified lamellae, which rise from the inner edge of the whorls. These lamellae may be vertically placed upon the basal plate or they may be obliquely situated or reflected to parallel the basal plate. They may be almost smooth or ribbed.

Type genus.—Annularia Schumacher.

Genus ANNULARIA Schumacher.

1817. *Annularia* SCHUMACHER, Nouv. Syst. Hab. Vers Test., pp. 60 and 196.

Shell ranging in form from turbinate to elongate-conic. The sculpture may consist of axial riblets only, or of axial riblets and spiral threads. The latter may be confined to the umbilicus or may be present on the entire shell. There is a great range of variation in the strength of these sculptural features in different species. Breathing devices may be present or absent. The operculum consists of a chondroid plate, composed of a number of whorls which

bear an oblique calcified spiral lamella on their inner edge, which is obliquely deflected outward. This lamella is always finely obliquely striated, the striations varying considerably in strength in different species.

Type of the genus.—*Turbo lincina* Linnaeus.

ANNULARISCA, new subgenus.

Shell depressed helicoid, widely umbilicated, marked on spire and base by axial riblets. No trace of spiral sculpture is present, even on the umbilical wall. Operculum typically Annularid.

Type of the subgenus.—*Choanopoma eburneum* (Gundlach) Pfeiffer.

The type species is the only one known of this group at present. It comes from Eastern Cuba.

ANNULAROSA, new subgenus.

Shell turbinate, umbilicated. The early whorls with faint axial riblets, which become quite obsolete on the last turn. Umbilicus marked by spiral cords. Operculum typically Annularid.

Type of the subgenus.—*Choanopoma fragile* (Gundlach) Pfeiffer.

The type species is the only one known of this group at present. It comes from eastern Cuba.

Subgenus ANNULARIA Schumacher.

1817. *Annularia* SCHUMACHER, Nouv. Syst. Hab. Vers Test., pp. 60 and 196.

Shell ranging in form from turbinate to elongate-conic. Axial sculpture consisting of almost uniform riblets, varying considerably in strength and spacing in different species. Spiral sculpture ranging from weak to very strong, covering spire and base, usually more strongly expressed within the umbilicus. Peristome thin, broadly expanded. Operculum typically Annularid.

Type of the subgenus.—*Turbo lincina* Linnaeus.

The following species are now referred to this subgenus. They fall into four groups, as follows:

The group of *Annularia fimbriatulum*:

Turbo pulchrum Wood.....Jamaica.
Cyclostoma fimbriatulum Sowerby.....Jamaica.
Cyclostoma fimbriatulum docens C. B. Adams.....Jamaica.
Cyclostoma fimbriatulum albinodatum C. B. Adams.....Jamaica.
Cyclostoma chittyi C. B. Adams.....Jamaica.
Cyclostoma scabriusculum C. B. Adams.....Jamaica.
Cyclostoma scabriusculum amabile C. B. Adams.....Jamaica.
Cyclostoma hillianum C. B. Adams.....Jamaica.
Cyclostoma hillianum amandum C. B. Adams.....Jamaica.
Cyclostoma hillianum aculeosum C. B. Adams.....Jamaica.
Cyclostoma hillianum leporilabre C. B. Adams.....Jamaica.
Cyclostoma mite C. B. Adams.....Jamaica.
Cyclostoma lincinellum Lamarck.....Jamaica.

The group of *Annularia lincina:*

Turbo lincina Linnaeus.....Jamaica.
Cyclostoma lima C. B. Adams.....Jamaica.
Cyclostoma lima blandiana C. B. Adams.....Jamaica.
Cyclostoma pisum C. B. Adams.....Jamaica.

The group of *Annularia illustris:*

Cyclostoma minium Gundlach.....Eastern Cuba.
Choanopoma bebini (Arango) Pfeiffer.....Western Cuba.
Cyclostoma tractum Gundlach.....Western Cuba.
Choanopoma jiguanensis Pfeiffer.....Eastern Cuba.
Cyclostoma perplicatum Gundlach.....Cuba.
Cyclostoma arangianum Gundlach.....Eastern Cuba.
Cyclostoma decussatum Lamarck.....Porto Rico.
Cyclostoma (*Choanopoma*) *senticosum* Shuttleworth.....Porto Rico.
Cyclostoma sulculosum Ferussac.....Porto Rico.
Cyclostoma trochlearis Pfeiffer.....Mexico.
Choanopoma storchi Pfeiffer.....Eastern Cuba.
Cyclostoma largillierti Pfeiffer.....Yucatan.
Cyclostoma mordax C. B. Adams.....Jamaica.
Cyclostoma inculta Poey.....Central Cuba.
Cyclostoma illustris Poey.....Central Cuba.
Cyclostoma sauliae Sowerby.....Jamaica.

The group of *Annularia lachneri:*

Choanopoma lachneri Pfeiffer.....Eastern Cuba.
Choanopoma blandi Weinland.....Haiti.

ANNULARITA, new subgenus.

Shell ovate-conic, marked by both axial riblets and spiral threads. Peristome not expanded into a broad thin disk, but much thickened, slightly flaring to a thin edge. Operculum typically Annularid.

Type of the subgenus.—Cyclostoma majusculum Morelet.

The type species is the only one known of this group at present. It comes from western Cuba.

ANNULARELLA, new subgenus.

Shell ranging in form from turbinate to elongate-ovate. The axial sculpture consists of sublamellar axial ribs between which finer threads parallelling these are present. The spiral sculpture varies considerably in strength in different species. Operculum typically Annularid.

Type of the subgenus.—Cyclostoma (*Choanopoma*) *yunquense* Pfeiffer.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Annularella yunquense:*

Choanopoma yunquense Pfeiffer.....Eastern Cuba.
Annularia pseudalatum Torre.....Eastern Cuba.

The group of *Annularella bertini:*

Choanopoma bertini Maltzan.....Haiti.
Choanopoma bertini gracillima Maltzan.....Haiti.

ANNULAROPS, new subgenus.

Shell ranging in form from elongate-ovate to elongate-conic. Axial riblets sublamellar, rendered articulate by the spiral sculpture. Parietal wall perforated by a breathing pore near the posterior angle. Operculum typically Annularid.

Type of the subgenus.—Choanopoma blaini (Gundlach) Pfeiffer.

The following are now referred to this subgenus:

Choanopoma sauvallei (Gundlach) Pfeiffer.....Western Cuba.
Cyclostoma sordidum (Gundlach) Poey.....Western Cuba.
Choanopoma tryoni Arango.....Western Cuba.
Choanopoma blaini (Gundlach) Pfeiffer.....Western Cuba.

ANNULARODES, new subgenus.

Shell elongate-ovate, marked by regular nonarticulate axial ribs and fine spiral threads; breathing pore provided with an external siphon. Operculum typically Annularid.

Type of the subgenus.—Choanopoma uncinatum Arango.

The type species is the only one known of this group at present. It comes from Central Cuba.

Genus BLAESOSPIRA Crosse.

1890. *Blaesospira* CROSSE, Journ. Conchyl., vol. 38, p. 280.

Shell ranging in form from ovate-conic to elongate-conic. All the whorls or only the last portion of the last whorl may be solute. The axial sculpture consists of distantly spaced ribs, between which finer axial threads are present. The spiral sculpture consists of a series of spiral cords that form strong hollow tubercles at their junction with the axial ribs. Operculum with the calcified spiral lamella rising vertically from the whorls.

Type of the genus.—Cyclostoma (*Choanopoma*) *echinus* (Wright) Pfeiffer.

The following species are now referred to this genus. They fall into two groups as follows:

The group of *Blaesospira echinus:*

Cyclostoma (*Choanopoma*) *echinus* (Wright) Pfeiffer.....Western Cuba.

The group of *Blaesospira pretrei:*

Cyclostoma pretrei Orbigny.....Western Cuba.

ABBOTTELLA, new genus.

Shell depressed, helicoid, marked by axial ribs between which finer wavy axial threads are present. The spiral sculpture consists of

obsolete cords, the intersection of which with the axial ribs forms tubercles ranging in strength from minute to strong and hollow projections. Operculum with the calcified spiral lamella rising vertically from the whorl. Dedicated to Dr. W. L. Abbott.

Type of the genus.—Choanopoma moreletianum Crosse.

The following species are now referred to this genus:

Cyclostoma tentorium Pfeiffer.....Haiti–Santo Domingo.
Choanopoma solutum (Richard) Pfeiffer.....Santo Domingo.
Choanopoma newcombi Crosse.....Santo Domingo.
Choanopoma rosaliae Pfeiffer.....Santo Domingo.
Cyclostoma (*Choanopoma*) *adolfi* Pfeiffer.....Santo Domingo.
Choanopoma gabbi Crosse.....Santo Domingo.
Choanopoma morletianum Crosse.....Santo Domingo.
Choanopoma wilhelmi Pfeiffer.....Santo Domingo.

Genus TUDORA Gray.

1850. *Tudora* Gray, Brit. Mus. Cat. Cycloph., p. 48.

Shell ranging from helicoid to elongate-conic in form, marked by axial ribs only, or with axial ribs and spiral sculpture. The latter may be confined to the umbilicus or may be present on spire and base. The axial sculpture varies from strong to almost obsolete, or it may consist of slender sublamellar riblets. The spiral sculpture is equally variable as far as strength is concerned in the different species. Breathing devices are not present in this genus. The operculum has a basal chondroid plate composed of a number of whorls, the inner edge of which develops a strong calcified lamella which is reflected outward until it parallels the base. The lamellae are usually marked by fine retractively slanting striations or riblets.

Type of the genus.—Cyclostoma megacheilos Potiez and Michaud.

TUDORELLATA, new subgenus.

Shell helicoid. The axial sculpture ranges from regular simple closely crowded ribs to distantly spaced ribs with finer threads between. The spiral sculpture is present in varying intensity in the different species. The open umbilicus may or may not be bounded by a spiral cord. Operculum typically Tudoroid.

Type of the subgenus—Cistula interstitialis (Gundlach) Pfeiffer.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Tudorellata interstitialis:*

Cyclostoma roemeri Pfeiffer.....Eastern Cuba.
Cistula mackinlayi (Gundlach) Pfeiffer.....Eastern Cuba.
Choanopoma yateracense Pfeiffer.....Eastern Cuba.
Annularia ramsdeni Pilsbry and Henderson.....Eastern Cuba.
Cyclostoma heynemani Pfeiffer.....Eastern Cuba.
Cistula interstitialis (Gundlach) Pfeiffer.....Eastern Cuba.
Annularia mayensis Torre and Ramsden.....Eastern Cuba.

Cistula cumulata Pfeiffer.....Eastern Cuba.
Cyclostoma alatum Pfeiffer.....Eastern Cuba.
Cyclostoma decoloratum Gundlach.....Western Cuba.

The group of *Tudorellata auricomum:*

Choanopoma auricomum (Gundlach) Pfeiffer.....Eastern Cuba.
Choanopoma putre (Gundlach) Pfeiffer.....Eastern Cuba.

Subgenus COLOBOSTYLUS Crosse and Fischer.

1888. *Colobostylus* CROSSE and FISCHER, Journ. Conchyl., vol. 36, p. 229.

Shell ranging from elongate-ovate to elongate-conic. Axial ribs present, spiral sculpture absent. Operculum typically Tudoroid.

Type of the subgenus.—Cyclostoma jayanum C. B. Adams, selected by Dall, 1905.

The following species are now referred to this subgenus.

Cyclostoma jayanum C. B. Adams.....Jamaica.
Cyclostoma jayanum rufilabre C. B. Adams.....Jamaica.
Cyclostoma jayanum nigrolabre C. B. Adams.....Jamaica.
Cyclostoma humphreysiana Pfeiffer.....Jamaica.
Cyclostoma chevalieri C. B. Adams.....Jamaica.
Cyclostoma chevalieri virgatum C. B. Adams.....Jamaica.
Cyclostoma chevalieri pulchrius C. B. Adams.....Jamaica.
Cyclostoma thysanoraphe Sowerby.....Jamaica.

TUDORISCA, new subgenus.

Shell ranging from elongate-ovate to elongate-conic. Axial ribs present. Spiral sculpture confined to the umbilicus. Operculum typically Tudoroid.

Type of the subgenus.—Cyclostoma albus Sowerby.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Tudorisca albus:*

Cyclostoma albus Sowerby.....Jamaica.
Cyclostoma albus fuscus C. B. Adams.....Jamaica.
Cyclostoma tectilabris C. B. Adams.....Jamaica.
Cyclostoma bronni C. B. Adams.....Jamaica.
Cyclostoma lamellosum C. B. Adams.....Jamaica.
Colobostylus nelsoni Clapp.....Swan Island.
Cyclostoma interruptum Lamarck.....Jamaica.

The group of *Tudorisca chiapensis:*

Adamsiella aripensis Guppy.....Trinidad.
Choanopoma chiapensis Crosse.....Mexico.
Cyclostoma tamsiana Pfeiffer.....Venezuela.
Cyclostomas rectus (Gundlach) Pfeiffer.....Central Cuba.
Cyclostoma crenulosus C. B. Adams.....Jamaica.

Subgenus TUDORA Gray.

1850. *Tudora* GRAY, Brit. Mus. Cat. Cycloph., p. 48.

Shell ranging in form from ovate-conic to elongate-conic, marked by axial ribs and spiral threads on spire and base, the former never

articulated. The riblets may or may not be gathered into tufts at the summit, which may be appressed to the preceding whorl, or the suture may be channeled. Operculum typically Tudoroid.

Type of the subgenus—Cyclostoma megacheilos Potiez and Michaud.

The following species are now referred to this subgenus. They fall into four groups as follows:

The group of *Tudora rangelinum:*

Cyclostoma rangelinum Poey.....Western Cuba.

The group of *Tudora abbotti:*

Tudora (*Tudora*) *abbotti*, new species.....Haiti.

The group of *Tudora habichi:*

Cyclostoma habichi Weinland.....Haiti.
Cyclostoma reeveana Pfeiffer.....Haiti.
Cyclostoma rollei Maltzan.....Haiti.
Nerita labeo Müller.....“Jamaica”–Haiti.
Cyclostoma kobelti Maltzan.....Haiti.

The group of *Tudora megacheila:*

Cyclostoma megacheila Potiez and Michaud.....Curacoa.
Cyclostoma versicolor Pfeiffer.....Bonaire.

TUDOROPS, new subgenus.

Shell ranging in form from ovate-conic to elongate-conic. The axial riblets, which are rendered articulate by the finer spiral threads, may or may not be gathered into tufts at the summit. Operculum typically Tudoroid.

Type of the subgenus—Cyclostoma banksianum Sowerby.

The following species are now referred to this subgenus. They fall into three groups as follows:

The group of *Tudorops banksianum:*

Cyclostoma banksianum Sowerby.....Jamaica.
Cyclostoma yallahensis C. B. Adams.....Jamaica.
Cyclostoma redfieldianum C. B. Adams.....Jamaica.
Cyclostoma redfieldanum concentrica C. B. Adams.....Jamaica.

The group of *Tudorops xanthostoma:*

Cyclostoma xanthostoma Sowerby.....Jamaica.
Cyclostoma tenuistriata C. B. Adams.....Jamaica.

The group of *Tudorops undosum:*

Ctenopoma undosum (Gundlach) Pfeiffer.....Western Cuba.
Ctenopoma enode (Gundlach) Pfeiffer.....Eastern Cuba.
Choanopoma troscheli Pfeiffer.....Western Cuba.
Ctenopoma pulverulentum (Wright) Pfeiffer.....Western Cuba.
Cyclostoma rotundatum Poey.....Western Cuba.
Ctenopoma garridoianum (Gundlach) Pfeiffer.....Eastern Cuba.

EUTUDORA, new genus.

Shell ranging in form from turbinate to elongate-conic. The axial sculpture may consist of sublamellar riblets, or may be almost reduced to lines of growth. The spiral sculpture may be strong or feeble. A breathing notch, slit, pore or siphon is present. Operculum typically Tudoroid.

Type of the genus.—Cyclostoma limbifera (Menke) Pfeiffer.

EUTUDORISCA, new subgenus.

Shell almost turbinate in form, spiral cords much stronger than the axial sculpture, which is decidedly reduced, almost obsolete. A notch in the parietal callus near its junction with the outer lip leaves a breathing space here, when the animal is withdrawn. Operculum typically Tudoroid.

Type of the subgenus.—Cistula jimenoi (Arango) Pfeiffer.

The following species are now referred to this subgenus:

Cistula jimenoi (Arango) Pfeiffer.....Havana.
Cyclostoma catenata Gould.....Havana.

EUTUDORELLA, new subgenus.

Shell almost turbinate in form. Spiral cords much stronger than the axial sculpture, which is almost obsolete. A slit in the parietal wall connects the breathing pore with the outer face of the peristome. Operculum typically Tudoroid.

Type of the subgenus.—Cistula agassizii (Charpentier) Pfeiffer.

The type species is the only one known of this group at present. It comes from Havana, Cuba.

EUTUDORA, new subgenus.

Shell almost turbinate. Spiral cords much stronger than the axial sculpture, which is almost obsolete. A breathing pore is present in the parietal wall a little anterior to the junction with the outer lip. Operculum typically Tudoroid.

Type of the subgenus.—Cyclostoma limbifera (Menke) Pfeiffer.

The type species is the only one known of this group at present. It comes from Havana, Cuba.

EUTUDOROPS, new subgenus.

Shell ranging from ovate-conic to elongate-conic. Axial sculpture consisting of slender sublamellar riblets, which are rendered wavy by the low-rounded spiral cords. Breathing pore with or without external siphon. Operculum typically Tudoroid.

Type of the subgenus.—Cyclostoma torquatum (Gutierez) Poey.

The following species are now referred to this subgenus. They fall into two groups as follows:

The group of *Eutudorops azucarensis:*

Eutudorops azucarensis, new species.....Western Cuba.

The group of *Eutudorops torquatum:*

Cyclostoma torquatum (Gutierriez) Poey.....Central Cuba.

Genus RAMSDENIA Preston.

1913. *Ramsdenia* PRESTON, Proc. Malac. Soc. London, vol. 10, p. 323.

Shell elongate-conic, marked by slender wavy sublamellar axial riblets and obsolete spiral cords. The riblets are gathered into irregular tufts at the summit. Operculum with the calcified lamella arched convexly over the entire whorl, marked by slender retractively curved threads.

Type of the genus.—Ramsdenia mirifica Preston.

The following species are now referred to this genus:

Ramsdenia mirifica Preston.....Eastern Cuba.
Cyclostoma nobilitatum (Gundlach) Poey.....Eastern Cuba.
Rhytidopoma tolleni Ramsden.....Eastern Cuba.
Ctenopoma bufo Pfeiffer.....Eastern Cuba.
Ctenopoma perspectivum (Gundlach) Pfeiffer.....Eastern Cuba.
Ctenopoma semicoronatum (Gundlach) Pfeiffer.....Eastern Cuba.

Genus DIPLOPOMA Pfeiffer.

1859. *Diplopoma* PFEIFFER, Malak. Blät., vol. 6, p. 73.

Shell elongate-ovate to elongate-conic, marked by strong axial riblets and spiral threads. Operculum with the calcified lamellae reflected to parallel the basal plate. The lamellae marked by strong retractively slanting riblets. The outer surface of the operculum may be flat or convex.

Type of the genus.—Diplopoma architectonicum (Gundlach) Pfeiffer.

Subgenus DIPLOPOMA Pfeiffer.

1859. *Diplopoma* PFEIFFER, Malak. Blät., vol. 6, p. 73.

Shell almost turbinate to elongate-conic, marked by strong axial riblets and spiral threads. Operculum flat, with the calcified lamellae reflected to parallel the basal plate. Lamellae marked by strong retractively slanting riblets.

Type of the subgenus.—Diplopoma architectonicum (Gundlach) Pfeiffer.

The following species are now referred to this subgenus. They fall into two groups, as follows:

The group of *Diplopoma retrorsus:*

Cyclostoma retrorsus C. B. Adams.....Jamaica.
Cyclostoma moussonianum C. B. Adams.....Jamaica.
Cyclostoma radiosum Morelet.....Guatemala.

The group of *Diplopoma architectonicum:*

Diplopoma architectonicum (Gundlach) Pfeiffer.....Eastern Cuba.
Diplopoma torrei Ramsden.....Eastern Cuba.

Subgenus JAMAICIA C. B. Adams.

1850. *Jamaicia* C. B. ADAMS, Contrib. Conch., p. 88.

Shell almost turbinate, marked by strong axial riblets and spiral threads. Operculum convex, the reflected lamellae marked by strong retractively slanting riblets.

Type of the subgenus.—Cyclostoma anomala C. B. Adams.

The type species is the only one known of this group at present. It comes from Jamaica.

The descriptions of the following species are necessary in order to give status to the groups which they represent and which are referred to in the preceding pages.

PARACHONDRIA (PARACHONDRIA) GONAVICOLA, new species.

Shell elongate-ovate, ashy gray. Early whorls decollated. The three and a half remaining in the type are well rounded and crossed by numerous slender, retractively slanting, axial riblets, which are decidedly crowded on the last turn. These riblets are gathered together as tufts at the summit of the whorls, and render the suture denticulate. The spiral sculpture consists of numerous slender low rounded threads, which render the axial riblets wavy and very slightly nodulose. Periphery of the last whorl well rounded. Base somewhat inflated, well rounded, narrowly umbilicated, marked like the spire, excepting the umbilicus, in which the spiral sculpture is intensified. The last whorl is solute for an eighth of a turn. Aperture ovate; posterior angle acute, continuing backward as a nodulose keel to where the whorl becomes appressed to the preceding turn. Peristome not expanded but somewhat thickened. Operculum typically Parachondroid.

Type.—Cat. No. 314944, U. S. N. M., and thirty-three specimens, were collected by Dr. W. L. Abbott on Gonave Island, Haiti. The type measures: Length, 15.4 mm.; greater diameter, 10.4 mm.; lesser diameter, 9 mm.; length of aperture, 7.1 mm.; diameter of aperture, 5.2 mm.

This species is related to *Parachondria* (*Parachondria*) *dentilobata*, Weinland, but is uniformly much smaller than that species.

TORRELLA (TORRELLISCA) SIMPSONI, new species.

The shell is elongate-conic, decollated, leaving four and a quarter well rounded whorls, the last being solute for a short distance, and obtusely carinated along its posterior angle. The shell is narrowly umbilicated and open at the truncated apex, leaving a hollow axis.

The color is ashy white without color markings of any sort. The sculpture consists of sublamellar riblets which are more widely spaced on the upper whorls and more or less unevenly spaced on all the whorls. Some of these riblets project above the rather deeply impressed suture in thin, somewhat flexuous lamellae, sometimes touching a riblet of the whorl above, and giving the appearance of a continuous riblet crossing the suture. The spiral sculpture is confined to several nodulose cords within the umbilicus. The aperture is vertical and subcircular, the inner peritreme of the peristome is not projecting; the outer peritreme is moderately expanded throughout, slightly more so in its outer portion and in the lower inner portion slightly fluted or showing a tendency in some specimens to fimbriation. The surface of the expanded outer peritreme is coarsely concentrically laminated. Just within the aperture near the posterior margin is a breathing pore which communicates with a prominent siphon without, which projects upward and then curves inward and downward almost to touch the preceding whorl; the siphon presents a coarsely ribbed surface.

The operculum is typical of the genus.

Type.—Cat. No. 314942, U. S. N. M., measures: Length, 7.8 mm.; major diameter, 4 mm.; minor diameter, 3.8 mm.; length of aperture within peristome, 1.75 mm.

The type is selected from a large number of specimens collected by Charles T. Simpson and J. B. Henderson at the Soledad plantation at Cienfuegos, in the Santa Clara Province, Cuba.

No notable variation is observable throughout the large series of specimens. The opercular characters remove this species from *Rhytidopoma*, to the members of which genus this shell bears a strong resemblance in its general facies.

TUDORA (TUDORA) ABBOTTI, new species.

The shell is elongate-conic, with seven whorls including the apex, the last nonsolute, openly umbilicated. The color is yellowish straw and further ornamented by 8 to 10 chestnut-colored interrupted spiral bands. On the last two whorls these bands are arranged in both axial and spiral series. The extreme tip is chestnut, the other nuclear whorls being of lighter color. The nuclear whorls are smooth; the postnuclear turns are marked by well-rounded, retractively curved axial riblets, some of which at irregular intervals become thickened at the summit, where they sometimes fuse with neighboring riblets, thus forming an irregularly denticulated suture. The spiral sculpture consists of feeble, low, rounded cords, of which there are 20 between the summit and the periphery on the last turn. These cords render the axial riblets feebly tuberculated at their

intersections. The base is marked like the spire, but in the umbilicus the axial sculpture becomes reduced and the spiral intensified. Aperture broadly oval, showing the external color markings within. Peristome double, the outer moderately broadly expanded and somewhat wavy, the inner but slightly expanded, reflected over and appressed to the outer. They both carry the color markings of the outer surface. The operculum is typical Tudorid.

Type and thirteen specimens.—Cat. No. 218044, U. S. N. M., were collected by Dr. W. L. Abbott at Trou de Bon Dieu, Port de Paix, Haiti. The type measures: Length, 14.8 mm.; major diameter, 7.8 mm.; minor diameter, 6.8 mm.; altitude of aperture, 6 mm.; width of aperture, 5 mm.

EUTUDORA (EUTUDOROPS) AZUCARENSIS, new species.

The shell is ovate, pale brown, early whorls decollated. The three and a half remaining in the type are crossed by numerous sublamellar axial riblets which are decidedly expanded at the summit, where they project conspicuously above the suture. These riblets are separated by spaces about as wide as the riblets; on the early whorls, however, there are irregular interruptions in the even spacing of them so that smooth spaces occur in places between the lamella. There are five broad, low, rounded spiral cords, the first of which is about three times as far from the summit as it is from its neighbor. The spiral cords render the axial riblets slightly tuberculated and wavy at their intersections. Base well rounded, marked by five spiral cords which increase regularly in strength from the periphery to the umbilicus. These cords render the axial riblets, which extend to the umbilicus, wavy and slightly nodulose. Aperture subcircular; outer peristome broadly expanded, notched on the upper lip and bent inward to seal the umbilicus, covering the parietal wall with a broad callus. Inner peristome reflected over and almost fused with the outer. A breathing-pore punctures the parietal wall a little behind the peristome at the posterior angle of the aperture.

Operculum typically Tudorid.

Type and ten specimens.—Cat. No. 314943, U. S. N. M., were collected on the *Tomas Barrera* Expedition at Pan de Azucar, Cuba.

The type measures: Length, 7 mm.; greater diameter, 7 mm.; lesser diameter, 6.2 mm.; length of aperture, 5 mm.; width of aperture 5 mm.