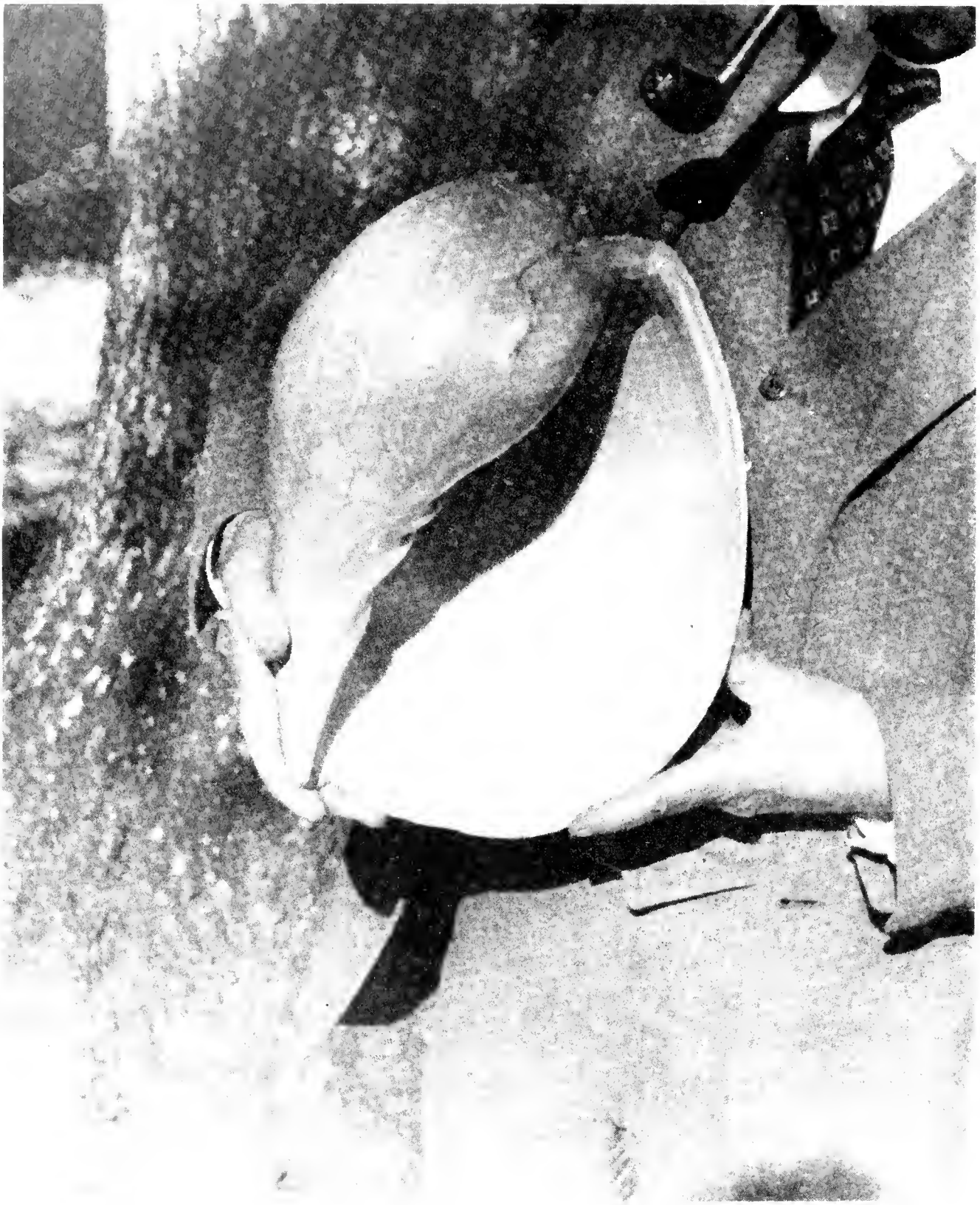
Maxwell Smith
July 20, 1942

A REVIEW OF
THE VOLUTIDAE



Cymbium aethiopicum aethiopicum L. as held by Dr. Henry A. Pilsbry, on grounds of Beal-Maltbie Shell Museum, February, 1942.

A REVIEW OF THE VOLUTIDAE

Synonymy, nomenclature, range and illustrations

By

MAXWELL SMITH

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TO

MY FRIEND

JAMES HARTLEY BEAL

WHO HAS PROVIDED THE

INSPIRATION AND ENCOURAGEMENT

BEHIND THIS BOOK

FOREWORD

Sixty years have passed without a comprehensive revision and monograph of this important and interesting family. The writer has been, for a number of years, engaged in collecting and consolidating data in connection with the group and has also had access to and acquired long series of the few common species and a considerable number of the rarities.

The present work is based largely upon this material, although in many cases it has been necessary to draw solely upon original descriptions of the respective authors, and also reproduce certain of their none too satisfactory illustrations.

A further study of the soft parts will, no doubt, result in changes in the position of certain genera.

The author wishes to acknowledge his gratitude to Dr. James Hartley Beal, Dr. Henry A. Pilsbry, Dr. Edward M. Davis, Dr. Paul Bartsch, Dr. Harold Rehder, Mrs. Jeanne Schwengel, Dick Albany, and others, for their kindness and many favors in connection with this work.

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NOMENCLATURE

In the year 1758 Carl von Linneus described and figured in his Systema Naturae, editions 10, 12, two species of Voluta, namely *musica* and *ebraea*.

Lamarck, during 1799, in the Prodrome announced a number of Volutes some of which are now recognized as subspecies of *musica*.

It was not until the first quarter of the following century that any considerable progress was made in adding to the number of species in the family. Lamarck became quite active and prolific. He supplied a number of additions to the growing number of recognized species. The peak of his career was attained in 1844 when, in the Animaux sans Vertebres he described what is now known as *Amoria undulata*.

Leach in 1814 described the well-known and distinctive shell which now bears the name of *Amoria zebra zebra* and also its subspecies *Amoria zebra lineata*.

Thomas Martyn began, in about 1780, the production of his Universal Conchologist which was destined to become one of the most beautiful and elaborate works upon shells ever undertaken in any country. He secured the services of as many as nine young boys who were trained to execute the coloring of the plates which had previously been etched upon copper. The specimens illustrated were obtained largely by men under the command of Captains Byron, Wallace, Cook, and others, upon their various voyages in the South Seas. It appears that Martyn concluded his work in 1792, there being in all 160 separate plates, although it is evident that many of the later plates prepared were completed prior to the date last mentioned.

The French text of Martyn's Introduction and preface, together with many of the plates, was reprinted in black and white by Chenu in 1845. This work contains many misprints most of which, however are obvious. In Martyn's work, following *Trochus*, *Voluta* contains only species of *Conus* and one coniform *Voluta* in the Linnean sense. Several typical Linnean Volutes are placed under *Buccinum* by Martyn. Number 82 of Chenu's entries was apparently intended to be *Buccinum vexillum* now known as *Harpulina arausaica* Solander.

The Portland Catalogue, printed in London in April 1786, included a number of Volutes. A sales catalog embraced material to be sold for the account of Margaret Cavendish, Dowager Duchess of Portland, and is attributed to an anonymous compiler. Dall (Nautilus, vol. 34, pages 97, 104, 1920) in his summary of the Portland Catalogue did not refer to the description of *aulica*, probably due to the fact that it was not figured there. It was entered in the Catalogue as No. 4021 "A very fine specimen of *Voluta aulica* S. (Solander), a beautiful red clouded species of the wild music kind, its country unknown, unique."

G. B. Sowerby, in the year 1825, prepared a catalogue of the shells contained in the collection of the Earl of Tankerville which at that time was offered for sale at auction. In the Tankerville Catalogue may be found several species of *Voluta* beautifully illustrated in hand colored plates. Here are four *Scapha* including the first figure of the present *Aulica pulchra pulchra* which lives on the Great Barrier Reef of Australia, also the first authentic figure of the present *Aulica aulica*. The latter was attributed to Solander by Sowerby who printed Solander's manuscript description in the Tankerville Catalogue. The manuscript was supplied by Broderip and originated in the Sir Joseph Bank's library.

G. B. Sowerby, Jr., monographed the family in the Thesaurus Conchyliorum under date of 1847. His descriptions, which were printed in both Latin and English, were somewhat longer than those of Reeve. Sowerby's figures, although considerably reduced in size, are useful today, but unfortunately he failed to indicate dimensions in connection with the illustrations. This fact somewhat lessens the value of his work.

Lovell Reeve in the year 1849 published his monograph of the *Volutidae* in the Conchologia Iconica. With the exception of certain small species his illustrations are faithful portrayals of the various species. Reeve usually figured exceptionally fine examples which are somewhat

misleading when compared with the average run of specimens. The publication of his monograph no doubt greatly stimulated interest in an already popular group. Many of the names he used then, including *magellanica, ancilla,* and *pacifica,* have been shifted about or included in the synonomy of the present day.

The Adams Brothers, Henry and Arthur, in the Genera of Recent Mollusca, which appeared in London during 1858, proposed four valuable genera or subgenera for the *Volutidae* most of which are considered valid today. These are: *Zidona* (which is represented by the sole species and genotype *V. angulata* Solander), *Alcithoe* (since raised from subgeneric to generic rank), *Enaeta* (since raised from subgeneric to generic rank). The Messers Adams also proposed the subgenus *Ausoba* as a repository for the present *Aulica cymbiola,* and the subfamily *Zidoninae* to contain the abovementioned genus *Zidona.* It appears best to ignore this latter subfamily designation until the soft parts of *Z. angulata* are better known. Under the genus *Voluta* the Adams brothers list two well-known species, *ebraea* (spelled *hebraea* by them) and *musica.* They also add a third, *musicalis* Mart., which incidentally is a fossil species occurring in the European Eocene.

George W. Tryon, Jr., in 1882 monographed the *Volutidae* in the Manual of Conchology, published by the Academy of Natural Sciences in Philadelphia. Like some of the early volumes in this series the shells figured are recognizable but the coloring often misleading and crude. The descriptions also were too brief in many cases. Furthermore there is an indiscriminate lumping of species and subspecies a policy hardly warranted with the meager material at hand for study.

In 1890 there appeared, under the auspices of the Wagner Free Institute of Philadelphia, and in their transactions, William H. Dall's monumental work The Tertiary of Florida. Here the author gives a lengthy and extremely valuable account of the *Volutidae,* its origin and facts concerning the formation of the shell. Dall offers a number of explanations covering certain details long neglected by earlier writers. One of the most interesting subjects discussed is that of the columella plaits and their use to the organism. The adductor muscle is in *Voluta* rather small at best. The plaits give an extension of the surface, and consequently a larger area of attachment for the muscle. This in turn is beneficial to the animal whose safety depends upon rapidly withdrawing within the shell upon the approach of danger. Deep-seated plications in other gastropod shells indicate a deeper seated adductor muscle. The origin of these characters might easily lead the student into paths of investigation which have hardly been touched. Anyone who has cleaned shells with strong plaits, particularly internal ones, knows how difficult it is to remove the soft parts entirely. This is due to the firm attachment of the muscle.

The "best-known type" which Swainson figured for his *Scaphella* was *Voluta undulata.* In 1890 Dall accepted the common usage of *Scaphella* with *Voluta junonia* Hwass as the type. As a further consideration of Swainson's introduction of *Scaphella* and *Cymbiola,* Dall later (1907) objected to their being based on *Voluta junonia.* His reasons were, while *V. junonia* was included among Swainson's species of Scaphella it is obvious to the careful student that it cannot be regarded as congeneric with the forms like *V. undulata,* which was the type of *Scaphella* and which was later named *Amoria* by Gray; nor with the *Cymbiola* group founded on *V. vespertilio,* which in turn is the *Scapha* of Gray and *Aulica* of Adams and Crosse. Both of these groups have shelly protoconch of the subfamily *Volutinae* Crosse. Dall therefore considered new generic names necessary and proposed *Maculopeplum* (type *V. junonia*) to replace the general use of *Scaphella* and *Adelomelon* (type *V. ancilla*) to replace that of *Cymbiola.* Von Ihring did not accept these changes, because he did not have the necessary literature to verify them. Neither did they appeal to Cossmann (1909, p. 205 et. seq.) who severely criticized Dall's action. Cossmann gave a revised summary of the family. He refused to recognize *Maculopeplum,* to replace the general use of *Scaphella,* on the grounds that Hermannsen had "clearly designated *V. junonia* as type of *Scaphella* in 1845" and *Adelomelon* "because it remains to be explained to what genotype the name *Cymbiola* ought to be applied.

Hedley (1914) also investigated the position of these genera, his conclusions being similar to Dall's except that he

gave *V. maculata* as the type of *Scaphella*.

According to Iredale *Scaphella* was proposed first by Swainson in the Zoological Illustrations (ser. 2, vol. 2, pt. 19, pl. 87, 1832), and *Scaphella maculata* was figured. Swainson however stated "Typical species *Scaphella undulata, junonia, maculata, zebra.* Aberant species *Scaphella papillaris, elongata*?" Hermannsen was within his rights in selecting (index Generum Malacog. vol. 2, p. 423, 1848) as type *V. junonia* Chemnitz especially as he gave the introduction of the genus above. Hedley was therefore incorrect in naming *Scaphella maculata,* now *Amoria caroli* Iredale, even though it were the figured species. *Cymbiola* was introduced at the same time and place, the shell figured was named *vespertilio.* Swainson then wrote "The second or subtypical genus of the Volutes appears to be represented by this common though elegant species, adding 'as we have deemed it as a generic appelation for the whole group we trust that those who may adopt our views will hereafter distinguish the *V. cymbiola* of Sowerby, now in the cabinet of Mr. Broderip, by the name of *Cymbiola broderipia.*'"

On the whole the adoption of Gray's genus *Amoria,* with the genotype of *undulata,* seems advisable on account of the confusion relative to *Scaphella* and the removal of certain species now grouped under *Aurinia.*

Furthermore *Adelomelon* is now used to contain the new-world species formerly placed under *Cymbiola.*

SUBFAMILIES

Cossmann (1899) proposed six subfamilies, *Volutinae, Homocoplocinae, Cymbinae, Zidoninae, Volutobulbinae, and Loxoplocinae,* based on the shell characters alone. These proposals were not followed by Dall in his Revision of the American Volutidae (1907) where he used the subfamily divisions *Volutinae* and *Caricellinae.* In 1924 Dall gave reasons for discounting the importance which he and other writers had attached previously to the protoconch as a means of classification.

IMPORTANT CHARACTERS

The shape of the nucleus is a valuable guide in grouping related shells. Allowance must be made, however, for exceptionally early or late calcification. Whenever a long series of individuals is examined adherence to a general form is apparent.

The number of columellar plaits is variable but there are always fairly strict limits. Out of a dozen *Alcithoe gracilis* studied only one had other than four plaits.

The anterior notch has considerable systematic value. A shallow notch is a primitive character and deepening marks indicate evolutionary progress.

The primitive sculpture of most of the New Zealand Volutes consist of strong, smooth, sharp axial ribs. Remains of an early spiral ornamentation are occasionally seen, but do not assume any importance. Evolution from simple axial ornamentation may follow two paths;

a. The costae may become angled and then tubercular.
b. The costae may become obsolete and the shell have a smooth surface.

Often a tendency is manifested to revert to axial costae or tubercles after a smooth stage has been reached. This is shown in the large examples of *Alcithoe swainsoni* where the penultimate whorl is smooth but the body whorl shows a return to tubercles. *Amoria vespertilio* is frequently represented in warm seas of the Pacific by colonies of comparatively smooth shells. Occasional individuals possess shells with feeble tubercular processes.

Under characters of the nucleus Dall states that in the very ancient Mesozoic transition forms the larval covering was shelly and minute in size, like that of certain small land shells living today. In Mesozoic times reproduction depended upon a large number of small shell bearing larvae, rather than a small number of large ones.

Dall calls attention to the term "papillose" apex which strictly speaking should be applied to the type of nucleus found in the genus *Tudicla.*

Deshayes largely ignored the nuclear characters as exhibited by the Parisian Eocene Volutes and which possess peculiar and remarkable protoconchs. He illustrated these characters well but failed to attach any significance to their presence.

Of the shelly nucleus there are several forms. The most common type Dall called the trochiform nucleus. It appears

conical or trochoid, polished, unsculptured and consisting of few whorls. From the trochoid evolved the pupiform and the bulbous nucleus, the latter a variation of the trochiform in the planorboid coil. The enormous *Cymbium* nucleus is of trochoid type but greatly exaggerated and dome-like, being as large as the end of a pigeon egg. This is characteristic of the genus *Cymbium* as contrasted with *Cymba*.

A type of nucleus which begins with a horny protoconch is described by Dall from material obtained on a voyage of the Albatross while off Patagonia. The material which formed the basis of this study consisted of ovicapsules of *Adelomelon magellanica*. These were circular, about an inch in diameter, with a flat base attached to a valve of *Pecten*. The upper part of each capsule consisted of a rounded dome, exactly like the ovicapsule of *Volutopsis* from Alaska, and like that containing two to four surviving larval shells. The apical point was found to be acutely conical, slightly twisted, and in the youngest specimen still retained some shreds of the extremely fragile membranous protoconch adhering to the first whorl.

A deplorable fact is the habit of dealers who grind and polish every Volute they can put their hands on, with the result that it is impossible to tell with accuracy what sort of nucleus the recent Volutes possess. Fossil shells are often much more satisfactory for purposes of study as no one considers that they are worth polishing, and therefore are left in the natural state. Many of the specimens in museums, even the National Collection, have been partially ruined, and students are warned when examining specimens to make due allowance for this damage. Otherwise conclusions drawn may be at variance with the truth.

There is a great extension of the mantle in certain groups of the *Volutidae*. Thus there is deposited in some cases a coat of enamel over the entire shell as in *Cypraea*. A good example of this disposition of enamel is *Zidona angulata*.

DISTRIBUTION

In common with other abyssal molluscs the deep-water Volutes are already known to be rather widely dispersed. Among the deep sea forms are many isolated types which have been shifted about from one family to another. Those now retained in the *Volutidae* are generally known to be genuine members of this family, due to extensive anatomic studies of the soft parts. This applies to the genera *Neptuniopsis* and *Voluticorbis* which so far have only been taken living off the Cape of Good Hope in moderate depths. The genus *Volutomitra* of Gray includes a small compact group, the two species being confined to Boreal Seas, one in the North Atlantic adjacent to Greenland and Iceland, the other species in or near Bering Sea in an average depth of 75 fathoms and extending southward in the Pacific to a point off San Diego, California, where it occurs at a depth of 822 fathoms.

The range of the genus *Voluta* s.s. requires further study. In a general way the group is known to extend from the north coast of South America through the Caribbean and Gulf of Mexico. *Voluta musica* has been reported from the east coast of Florida but the specimen may be adventitious, and further records are required before it may safely be included in the fauna of that state. *Voluta musica* has, together with its various subspecies, been reported from the West coast of Africa as well as the Antilles. *Voluta virescens* has been collected upon the shores of Texas while the large slender form of this species appears to be confined to the west coast of Africa. *V. virescens* varies greatly in size and this no doubt is largely due to peculiar environmental conditions rather than latitude. Shells of the *musica* type are said to be inhabitants of shallow water and may be sought for after dark among rocks exposed at extreme low tide.

Essentially an Atlantic genus *Aurinia* appears to be confined to American waters, chiefly in the region of the Caribbean. The species occur at moderate depths and include the well-known *Aurinia junonia*. Allied to this group is the genus *Bathyaurinia* established by Clench and Aguayo in 1940 to include the species *torrei* and *piratica*. *Bathyaurinia* has been obtained off Cuba in from 10 to around 265 fathoms. The genus, so far, has not been reported elsewhere but it is likely to occur generally in Antillean waters.

In the Cape Horn region and southern

shores of South America there occurs the genus *Adelomelon* a group of large and distinctive shells. While certain species undoubtedly extend upon the west coast of South America in Chile, the metropolis appears to be that region bounded by the Straits of Magellan on the south and extending northward to the mouth of the La Plata river and Brazil. The region of the Rio Negro mouth in Patagonia and Maldonado Bay in Uruguay have been cited as specific localities. Most of the specimens of *Adelomelon* in museum collections are beach rolled shells. These were probably casually collected by those who have gone ashore from ships for very brief periods. This is true of many specimens contained in the National Collection.

Miomelon is an isolated genus living off the coast of Chile and was taken by the steamer Albatross in 677 fathoms. Only one example of the single living species has been obtained so far, although one or more fossil species exist.

Boreomelon, a genus of cold water shells, occurs in deep water off Panama in the Pacific, also in Bering Sea and off Alaska.

The genus *Zidona* living from Patagonia northward to Brazil is outstanding on account of the astonishing development of the mantle with resultant deposit of enamel upon the entire surface of the shell. Another feature is the development of an apical spur which may extend more than an inch from the apex.

The genera *Tractolira* and *Enaeta* are indigenous to Central and South American waters, the former on the Pacific side, the latter on both the Pacific and Atlantic shores, also extending into the Caribbean and possibly the Gulf of Mexico. The genus *Lyria* is perhaps more widely distributed than any other genus in the family. It lives in the Antilles, Japanese seas, Australasia, Indian Ocean, east coast of Africa, and elsewhere. The shells are mostly of small size and largely inhabitants of shallow water.

Aulica, a genus containing shells with a large protoconch, is well represented in Polynesia. The shells, furthermore, are large, colorful and often ornamented with numerous spines.

The seas of Australasia are most prolific in providing the greatest assemblage of Volutes. There the genus *Amoria* is most characteristic, its representatives however not being confined to these seas but extending to New Guinea, the Solomon Islands, New Caledonia and into the Indian Ocean. *Cottonia* and *Mamillana* (the latter living in the Bass Straits and elsewhere) together with *Iredalina* and *Pachymelon* (off New Zealand) are genera peculiar to these seas. *Volutoconus* appears to be confined to the waters of northwest Australia.

In Australia, Polynesia and the Indian Ocean region the genus *Cymbium* provides the largest number of individuals as representing the family. Some of these attain mammoth size being placed among the world's largest gastropods.

The fauna of New Zealand, and adjacent waters, constitutes a region generally considered a portion of Australasia. The genus *Alcithoe* which is here dominant reaches its greatest development in number of species and individual numerical superiority. It is significant that such an outstanding type should center in waters which are distinctly temperate. A parallel, the genus *Adelomelon*, is also most abundant in the cooler waters off the east coast of South America. *Alcithoe* belongs to the subfamily *Volutinae* and occurs also in Australia, New Caledonia, and off South Africa. The genus *Fulgoraria* seems to favor Japanese seas as a center of distribution, while *Harpulina* prefers the Indian Ocean.

Off Kerguelen Island in 150 fathoms, more or less, lives the astonishing genus *Provocator*. Between Marion Islands and the Crozets in 1600 fathoms the Challenger Expedition also secured *Guivillia* during the year 1881 and named later by Watson in his report.

European seas and adjacent coasts of Africa provide the habitat of the genus *Cymba* which is entirely peculiar to this region. The shells of this group are provided with an enormous secondary nucleus. *Cymba* occurs in the Canaries and probably also lives off adjacent island groups.

Halia is a highly specialized and interesting genus which occurs only in the Atlantic off the southern coast of Europe. It has been shifted from one family to another in the past but the evidence indicates it to belong in the present family.

FAMILY VOLUTIDAE

Subfamily VOLUTINAE

Genus VOLUTA (Linné) Lamarck 1799

Voluta Lamarck, 1799, Prodrome, p. 70; sole ex. *V. musica.*
Voluta (sp.) Linné: Syst. Nat., ed. 10, p. 729, 1758; ed. 12, p. 1186, 1766.
Musica anonymous, Mus. Calonnianum, p. 18, 1797.
Plejona Roeding, Mus. Boltenianum, p. 39, 1798.
Volutarius Froriep's, Trans. of Dumeril, Zool. Anal., p. 167, 1806.
Harpula Swainson, Zool. Illust., p. 77, 1832, type *V. ebraea.*
Musica Mörch: Cat. Yoldi, p. 124, 1852.
Chlorosina Gray, in Adam's Genera Rec. Moll., 2, p. 617, 1858; sole ex. *V. polyzonalis* Lamarck, now *V. virescens* Solander.
Volutolyria Crosse, J. de C., 25, p. 99, 1877. Fischer, Man. de C., p. 610, 1884.

Genotype: *Voluta musica* Linné.

Range: Tropical and subtropical shores of the Atlantic, the Caribbean Seas and Gulf of Mexico, living; fossil, from the Eocene upward in the Tertiaries of Europe and Antillean region.

Dall considered the Antillean region to be the center of dispersion for this group. In *Voluta musica* and *Voluta virescens,* the nucleus is small, shelly, planorboid and smooth, while in *Voluta ebraea* is of the large bulbous type. Operculum present, horny.

The early species of this group, which occur in the Eocene, resemble more closely the recent *Lyria* than the fully evolved *Voluta.*

Voluta musica musica Linné 1758
(Plate 1, Figure 3)

Voluta musica Linné, Syst. Nat. ed. 10, p. 733, number 370, 1758. Lamarck: Prodr. Nouv. Class. Coq., p. 70, 1799. Reeve: Conch. Icon. plate 8, figs. 18a-18d; plate 9, fig. 18e, 1849. Tryon: Man. Conch., vol. 4, p. 83, plate 24, 1882. Wood: Index Test., p. 107, species 147, plate 21, fig. 147, 1856. Chenu: Man. de Conch., p. 190, fig. 972, 1859.

Alt. 50-92 mm.

Hab. Antilles and adjacent waters. The range of *V. musica musica* and its various subspecies is known only in general way. Specific and accurate locality records, both in the Caribbean and upon African shores are desired. Krebs reported that the largest known specimens were taken on Margarita Island off the coast of Venezuela.

Shell, buff or yellowish white under the usual brownish pattern, six or seven sub-spinose stout ribs at shoulder of whorl; nucleus dark brown; interior of aperture usually white.

This species, the music shell of early writers, was first given a binomial name by Linné. His references to figures include both the subspecies afterwards named by Lamarck *carneolata* and that which is regarded as the typical.

Voluta musica carneolata Lamarck 1811
(Plate 1, Figure 1)

Voluta carneolata Lamarck. Ann. du Mus., 17, p. 67, 1811; Encycl. Meth., plate 379, fig. 4, 1780. Kiener: species plate 29, fig. 2.
Voluta musica var. carneolata. Sowerby: Thes. Conch., vol. 1, p. 219, plate 49, fig. 37, 1847.
Voluta rugifera Lamarck, (considered by Dall as pathological).

Alt. (Sufficient material unavailable to determine average size.)

Hab. Barbados (Rawson); Liberia (Osborne);

Porto Rico (Gundlach).

Shell characterized by the pale, flesh-colored ground, interspersed with markings of rose-orange and nucleus of contrasting light amber color; narrower than *V. musica musica*, usually smaller than *V. musica thiarella*. There are eight to eleven low ribs.

Voluta musica damula Dall 1907
(unfigured)

Voluta musica damula Dall, Smith. Misc. Coll., vol. 48, part 3, number 1663, p. 347, 1907.
Voluta musica, Sowerby: Thes. Conch., vol. 1, pl. 49, fig. 42, 1847.

Alt. 42 mm. (exclusive of nucleus).

Hab. Curacao (Rawson).

Shell small; eight or nine low ribs, slightly nodulous at the shoulder; nucleus, pale brown; ground color whitish with usual tracery; aperture livid pink or sometimes violaceous, with brown spots on outer lip and nine or ten plaits on the columella.

This is easily distinguished by its pale coloration and small size.

Voluta musica guineensis Chemnitz 1795
(Plate 1, Figure 6)

Voluta musica guineensis Chemnitz, Conch. Cab., 11, plate 178, figs. 1717-18, 1795.
Voluta guinaica Lamarck, An. s Vert., ed. Deshayes, vol. 10, p. 395, 1844. Kiener: species p. 26, plate 29, fig. 1.
Voluta musica var. (*Voluta guinaica* Lamarck) Sowerby: Thes. Conch., vol. 1, plate 49, fig. 38.

Alt. (sufficient material unavailable to determine average size).

Hab. Guinea, West Africa.

The revolving color-lines are largely broken by irregular blotches of dark chestnut-brown.

Voluta musica laevigata Lamarck 1811
(Plate 1, Figure 7)

Voluta laevigata Lamarck, Ann. du Mus., 17, p. 67, 1811; Encycl. Meth., plate 379, fig. 2a-b, 1780.
Voluta musica var. laevigata. Sowerby: Thes. Conch., vol. 1, p. 219, plate 49, fig. 36, 1847.

Alt. (sufficient material unavailable to determine average size).

Hab. La Guayra, Venezuela, common (Bartleman); "West Indies" (B. H. Wright).

Shell oval with seven to nine low, hardly nodulous ribs; nucleus brown; surface yellowish color, with crowded dark zig-zag blotches, the parallel brown lines tending to become obsolete; spiral sculpture faint or absent in front of the suture and normal near canal; aperture yellowish pink; outer lip with brown spots, which sometimes project as nodules; columella with eight to thirteen plaits.

Voluta musica plicata Dillwyn 1817
(unfigured)

Voluta plicata Dillwyn, Desc. Cat. Rec. Shells, 1, p. 563, number 152, 1817.
Voluta sulcata Lamarck, Ann. du Mus., 17, p. 68, 1811. Chemnitz: Conch. Cab., 10, p. 151, plate 149, figs. 1403-4, 1788. Sowerby: Thes. Conch., vol. 1, p. 212, plate 53, fig. 87, 1847; not *V. sulcata* Gmelin, 1792 and probably not *V. sulcata* Lamarck, 1788. Tryon: Man. Conch., vol. 4, p. 84, plate 24, fig. 33, 1882.

Alt. (sufficient material unavailable to determine average size).

Hab. "West Indies" (Chamberlain).

Nucleus pale in color; surface white, with fawn colored blotches; oval in shape, of much the same form as *V. musica carneolata*, ribs not nodulous at the suture, characterized by transverse grooves, from end of the last volution to the other.

Voluta musica polypleura Crosse 1876
(Plate 1, Figure 5)

Voluta musica var. polypleura Crosse, J. de C., 24, p. 163, plate 5, fig. 6, 1876.
Voluta polypleura. Tryon: Man. Conch., vol. 4, p. 84, plate 24, fig. 34, 1882.
Voluta chlorosina Lamarck, may be referable to this subspecies. See Ann. Mus. Hist. Nat. (Paris) Vol. 17, p. 66, 1811.

Alt. (sufficient material unavailable to determine average size).

Hab. Antilles?

Nucleus horn color; eleven plaits on the columella, of which three are feeble; aperture whitish. This subspecies differs from the others in the total absence of the brown lines which mimic a musical manuscript.

Voluta musica thiarella Lamarck 1844
(Plate 1, Figure 9)

Voluta thiarella Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 392, 1844. Kiener: species, p. 28, plate 28, fig. 1, 1839. Tryon: Man. Conch., vol. 4, p. 84, plate 24, fig. 31, 1882.
Voluta elongata Chemnitz, has the spire abnormally produced.
Voluta nebulosa Lamarck, merely a color variety of this subspecies.

Alt. (sufficient material unavailable to determine average size).

Hab. West Africa.

In *V. musica thiarella* the spire is well produced. Examination of a long series of individuals will determine the advisability of retaining this name as a valid subspecies.

Voluta musica typica Lamarck 1811
(unfigured)

Voluta typica Lamarck, A. du M., 17, p. 66, 1811; Encycl. Meth., plate 380, fig. 1, 1780. Bonnani, Recreatio Ment. et Ocul., 2, p. 155, fig. 297, 1684 (cited by Linne). Sowerby: Thes. Conch., p. 211, plate 49, fig. 40, 1847.

Alt. (sufficient material unavailable to determine average size).

Hab. Tobago, West Indies (Rawson).

Shell short, wide, buff or yellowish white under the usual brownish tracery, with six or seven subspinose stout ribs at the shoulder of the whorl; nucleus dark brown; sparse spiral sculpture near the canal only; interior of the aperture usually white; outer lip with black spots, pillar lip with nine to eleven plaits. (Dall)

Voluta ebraea Linné 1758
(Plate 1, Figure 8; Plate 2, Figures 11, 15)

Voluta ebraea Linne, Syst. Nat., ed. 10, p. 733, number 372, 1758; ed. 12, p. 1194. Hanley, Conch. Linn., p. 233. Reeve: Conch. Icon., plate 9, figs. 20a, 20b, 1849. Tryon: Man. Conch., vol. 4, p. 84, plate 24, fig. 37, 1882.
Voluta hebraea Gmelin, Syst. Nat., 6, p. 3461, 1792. Lamarck, Ann. du Mus., 17, p. 65, number 20, 1811. Sowerby: Thes. Conch., vol. 1, p. 211, number 43, plate 54, figs. 95, 96, 1847.
Buccinum coronatum Martyn, Univ. Conch., 2, plate 83, 1786.
Voluta turbinata Kiener: Icon., *Voluta*, p. 19, plate 26, fig. 2, 1839. Tryon: Man. Conch., vol. 4, p. 84, plate 24, fig. 40, 1882 (considered by Tryon to be a subspecies).

Alt. 90-150 mm.

Hab. Jamaica (Martini); Pernambuco et Maceio, Brazil, common (Greeley); West Africa (Carpentier, Rich, McGuire, Stearns); Madagascar (Humphrey).

Nucleus (see Plate 26, Figure 181) consisting of three whorls; more or less double-shouldered; suture impressed, slightly crenulated; post-nuclear whorls about four; growth lines irregular, but occasionally well defined; five, very conspicuous, oblique, anterior plaits and about six feeble posterior plaits upon the

columella; aperture more capacious than in *V. musica musica*.

Voluta virescens Solander, 1786
(Plate 1, Figures 2, 4; Plate 2, Figure 12)

Voluta virescens Solander, Port. Cat., p. 26, number 610; p. 136, number 320; p. 174, number 3751, 1786. Martini: Conch. Cab., 3, p. 243, plate 97, figs. 932-3, 1777. Dall: Bull. Mus. Comp. Zool., 18, p. 146, 1899. Reeve: Conch. Icon., pl. 9, fig. 19,* 1849. Tryon: Man. Conch. vol. 4, p. 84, pl. 24, figs. 35. Smith: East Coast Marine Shells, p. 127, plate 51, fig. 10.

Voluta polyzonalis Lamarck: Ann. du Mus., 17, p. 68, no. 27, 1811; Encycl. Meth., ii, p. 379, figs. 1a-b. Sowerby: Thes. Conch. vol. 1, p. 212, pl. 52, figs. 77, 78.

Muriciformes cantinelosus Meuschen: Mus. Gevers., p. 326, 1787.

Voluta fulva Lamarck: Ann. du Mus., 17, p. 68, no. 28, 1811; Encycl. Meth., ii, pl. 382, figs. 3a-b (bleached specimen).

Voluta pusio Swainson, Zool. Illust., vol. 2, plate 181, 1831. Sowerby: Thes. Conch., vol. 1, p. 213, plate 55, fig. 119. Tryon: Man. Conch., vol. 4, p. 84, plate 24, fig. 36, 1882.

Alt. up to 62 mm.

Hab. Mesquital, Texas, south to Nicaragua (Fluck), to Sabanilla and Carthagena, United States of Columbia (Schoot); West Africa (Ward), Guinea coast, etc.

Nucleus whitish; about twelve, moderately strong plaits upon the columella, some of which are ill-defined, particularly the posterior four, which are slightly oblique. The young shell is strongly spirally sulcate, a character gradually lost. An example in the collection of the author is buff colored, spotted with chocolate-brown.

Genus LYRIA Gray 1847

Lyria Gray, 1847, Proc. Zool. Soc. London, p. 141: type *V. nucleus* Lamarck, Ann. du Mus., 17, p. 73, 1811; not *Liria* Gray, Phil. Mag. and Journ., 1824.

Otocheilus Conrad: Amer. Journ. Conch., 1, p. 24, 1865, figd. species *Fulgoraria mississippiensis* Conrad, Journ. Acad. Nat. Sci. Philadelphia, 2nd series, 1, p. 119, plate 13, fig. 1, 1848.

Harpella Gray; in Adam's Genera Rec. Moll., vol. 2, p. 618, 1858; *V. costata* Swainson, not Solander, equal *V. anna* Lesson; not *Harpella* Schrank, 1802, Lepidoptera.

Genotype: *V. nucleus* Lamarck.

Range: Widely distributed in tropical seas, including the Antilles, Australasia and the Indian Ocean.

The group is of ancient origin, being represented by related forms in the upper cretaceous of India and the earliest Eocene of America. Like *Voluta* s.s., the animal possesses an operculum. From *Voluta*, the radula teeth are distinguished by the presence of few cusps. The outstanding shell character is the shelly nucleus, which is small and usually simple. Certain species including the Miocene *Lyria zebra* Heilprin and others from the Eocene, possess the bulbous type nucleus.

Lyria beauii Fischer and Bernardi 1857
Plate 2, Figure 16)

Voluta beauii Fischer and Bernardi, Jour. de Conchyliologie, vol. 5, p. 296, pl. 9, figs. 1, 2 (not pl. 10 as cited in text). Jour. Mal. vol. 8, p. 108 d.f.

Lyria beaui F. and B. Tryon: Man. Conch., vol. 4, p. 102, pl. 31, fig. 137, 1882.

Alt. 70, diam. 30 mm. (holotype).

Hab. Islet of Marie-Galante, near Guadaloup, West Indies (Beau).

*Dall, in his papers, omitted reference to Reeve's figure of this species in the Conchologia Iconica possibly because he suspected that the shell illustrated represents a different race or species from *virescens*. An anatomic study of both Antillean and African examples will eventually determine any existing differences. It may be found advisable to retain the name *pusio* as a subspecies. It was indicated as a wider and shorter form than typical *virescens*. Swainson type of *pusio* was apparently a worn specimen.

Coquille allongée, fusiforme, brillante, solide, pourvue de cotes longgitudinales assez peu marquées; d'un jaune rosé, ornée de lignes transversales brunes, interrompues et rapproachées; sommet petit, obtus, blanc; suture linéaire; 8-9 tours de spire, subanguleux en arriere; dernier tour plus grand que le reste de la spire, renflé vers le centre, atténué en avant; columelle un peu concave, chargée de plis, dont 3 principaux en avant; péristome arqué, légerement réfléchi en dehors, épaissi en dedans, blanchatre et marqué de taches brunes a son bord libre; ouverture allongée, lancéolée; canal assez court.

Lyria cassidula (Reeve) 1849
(Plate 2, Figure 13)

Voluta cassidula Reeve, Conch. Icon., plate 22, figs. 60a-b, 1849. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 270, plate 11, (Thes. plate 260), fig. 130, 1864. Hirase: A Collection of Jap. Shells., plate 112, fig. 4, 1936.
Lyria cassidula. Tryon: Man. Conch., vol. 4, p. 103, plate 31, fig. 138, 1882.

Alt. 25 to 37 mm.

Hab. Japan.

The sculpture is more delicate than in *L. nucleus*, while the longitudinal ribs terminate at the suture in such a manner as to give a crowned appearance to the spire.

Lyria delessertiana (Petit) 1842
(Plate 2, Figure 10)

Voluta delessertiana Petit, Mag. de Zool., plate 57, 1842. Reeve: Conch. Icon., plate 3, figs. 5a-b, 1849. Sowerby: Thes. Conch., vol. 1, p. 216, plate 52, figs. 73, 74.
Lyria delessertiana. Tryon: Man. Conch., vol. 4, p. 103, plate 31, fig. 140, 1882. Maxwell Smith: World-Wide Sea Shells, p. 67, fig. 895, 1840.
Lyria delessertii Petit.: Chenu, Man. de Conch. p. 190, fig. 979, 1859.

Alt. 50-56 mm.

Hab. Tiger Bay and Nosse-Be, north coast of Madagascar.

Five post-nuclear whorls; ground color creamy white suffused with salmon-pink; surface covered with regularly placed, rounded, longitudinal ribs, the interspaces of equal size, filled with parallel interrupted incised lines; about twenty-one ribs upon body whorl; sixteen plaits of varying size upon the columella, the anterior being the strongest, small granular processes adjacent to the terminations of the plaits; fairly prominent posterior canal; shell broadly extended beyond outer lip.

Lyria deliciosa (Montrouzier) 1859
(Plate 2, Figure 18)

Voluta deliciosa Montrouzier, J. de C., 2nd series, 375, 1859. Sowerby: Thes. Conch., vol. 3, 1st. suppl., p. 270, plate 11, (Thes. plate 260), fig. 131.
Lyria deliciosa. Tryon: Man. Conch., vol. 4, p. 102, plate 31, figs. 133-135, 1882.

Alt. 25-30 mm.

Hab. New Caledonia.

Ground color yellowish white, with numerous incised spiral lines, more or less interrupted and most prominent anteriorly; suture puckered; spire with many longitudinal ribs, which tend to flatten out upon the body whorl; nucleus livid flesh color; 3 columellar plaits which are strongest within, very faint plaits upon posterior two-thirds.

Lyria lyraeformis (Broderip)
(Plate 2, Figure 20)

Voluta lyraeformis Broderip, Zool. Journ., vol. 3, p. 83, plate 3, fig. 3. Reeve: Conch. Icon., plate 20, fig. 48, 1849. Sowerby: Thes. Conch., vol. 1, p. 217, plate 49, figs. 45, 46. Chenu, Man. de Conch., p. 190, fig. 978, 1859.
Mitra lyraeformis. Swainson, Zool. Illust., T. 54.
Lyria lyraeformis. Tryon: Man. Conch., vol. 4, p. 103, plate 31, fig. 141, 1882. Maxwell Smith, World-Wide Sea Shells, p. 67, fig. 897, 1940.

Alt. 93 mm.

Hab. East coast of Africa.

Spire much produced; five and one-half whorls; columella possessing many folds or plaits, of which the anterior are the largest.

Lyria multicostata (Broderip) 1827
(Plate 2, Figure 17)

Voluta multicostata Broderip, Zool. Journ., vol. 3, plate 3, fig. 2, p. 82, 1827.
Voluta mitraeformis Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 404, 1844. Reeve: Conch. Icon., plate 3, figs. 7a-b, 1849. Tryon: Man. Conch., vol. 4, p. 103, plate 31, fig. 143, 1882.
Voluta mitriformis Sowerby: Thes. Conch., vol. 1, p. 216, plate 52, figs. 81, 82; plate 55, fig. 109.

Alt. 50-60, diam. 26-30 mm.

Hab. Australian and Javan Seas; common in South Australia, alive on sandbars near low tide at Outer Harbor.

Longitudinal ribs less numerous than in *L. delessertiana*, ribs crossed with spiral bands of chestnut-brown color, together with blotches of the same color; five whorls, excluding the nucleus; suture deep, undulated, somewhat crowned by rib terminations; three major, anterior plaits upon columella and numerous lesser posterior ones. Surface generally flesh color with squarish patches.

Lyria nucleus (Lamarck) 1844
(Plate 3, Figure 32)

Voluta nucleus Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 405, 1844. Sowerby: Thes. Conch., vol. 1, p. 218, plate 55, fig. 116. Reeve: Conch. Icon., plate 18, figs. 41a-b, 1849.
Lyria nucleus. Tryon: Man. Conch., vol. 4, p. 103, plate 31, fig. 136, 1882.
Voluta perdicina Schubert and Wagner.

Alt. 25 to 30 mm.

Hab. North Australia.

Nucleus usually very deep flesh color; six post-nuclear whorls; longitudinal ribs most prominent upon the spire, well rounded, the interspaces narrower and often filled with several parallel lines, which extend more or less over the ribs upon the body whorl; two primary and one secondary anterior plaits upon columella and numerous weak plaits upon the posterior two-thirds; shell pinched anteriorly and forming a keeled shoulder outside the anterior canal.

Lyria queketti Edgar A. Smith 1901
(Unfigured)

Voluta (Lyria) queketti E. A. Smith, Proc. Mal. Soc. London, vol. 4, p. 234, May, 1901.
Alt. 37, diam. 17 mm.

Hab. Taken from the stomach of a fish caught in 40 fathoms about 10 miles from Durban, Natal (Quekett).

Shell ovate-fusiform, solid, pale flesh color, spotted with red; low longitudinal ribs and transverse striae upon whorls, suture deep, the last whorl provided with eleven or twelve longitudinal ribs; aperture elongate, interior light rose color, labrum thickened internally and externally, margin acute; columella with five plaits.

This species is allied to *L. delessertiana* but is smaller, having one whorl less and stouter and fewer costae, which becomes obsolete anteriorly. The characteristic transverse red lines of *L. delessertiana* are entirely wanting in the present species, while the columellar plaits are only five in number, instead of fifteen or more. Faint traces of two additional folds are just observable when the shell is closely examined.

Section HARPEOLA Dall 1907

Harpeola Dall, Smith. Misc. Coll. vol. 48, p. 350, 1907.

Type: "*Voluta*" *anna* Lesson.

Shell like Lyria s.s. but with a channeled suture and shallow posterior sulcus.

Lyria anna (Lesson) 1832
(Plate 2, Figure 14)

Voluta anna Lesson, Illustrations de Zoologie, May, 1832.
Voluta costata Swainson (not Solander) Journ., vol. 17, p. 33. Reeve: Conch. Icon. pl. 21, fig. 51, 1849.
Harpula harpa Swainson: Exotic Conch.
Voluta harpa Deshayes (not of Barnes).
Voluta lyrata Sowerby.

Alt. 54 mm.

Hab. Moluccas and adjacent seas.

Shell oblong-ovate, spire rather short, turrited, somewhat sharp at apex; whorls smooth or very minutely decussately striated, grooved at base, depressly flattened at suture, then longitudinally ribbed, ribs regular, rounded, pointed at the upper extremity; columella many plaited, the three anterior distinct, the remainder small, almost obsolete; surface white, promiscuously sparingly spotted and lineated with light saffron red color.

Genus ENAETA H. and A. Adams 1853

Enaeta H. and A. Adams, Genera of Rec. Moll., II, p. 167, 1853; first species *Voluta cuming̀i* Broderip: Gray, Guide Moll. B. M., p. 34, 1857; sole ex. cited *Lyria harpa* Barnes, equal *Voluta harpa* Barnes non Lamarck, equal *Voluta barnesii* Gray.

Genotype: Enaeta barnesii Gray

Hab. American waters, both Atlantic and Pacific shores.

Shell of small size, heavy, with an operculum similar to Lyria. From the latter genus, the species differ by the denticulation of the outer lip inside the aperture. When adult there is often one dominant denticle near the center of the lip.

Enaeta archeri (Angas) 1865
(Plate 3, figs. 21, 27)

Voluta archeri Angas, P. Z. S. London, 1865, p. 55, pl. 11, figs. 4, 5.
Lyria archeri. Tryon: Man. Conch., vol. 4, p. 104, pl. 31, fig. 144, 1882.

Alt. 32 mm.

Hab. Antilles at Montserrat (archer) and Martinique.

Shell ovate, solid, somewhat recurved at base, longitudinally strongly lirate-costate, the ribs obtuse, slightly sinuous, at the margin small, gradually vanishing, the interstices smooth; pale corneous-brown, the interstices brown, the ribs ornamented with a thin chestnut line; spire somewhat acuminate; whorls six, a little convex, above maculate irregularly with brown; aperture oblong, rather narrow, scarcely two-thirds the length of the shell, pale fleshy within; lip thickened, strongly varicose, toothed within, the margin rather thin, ornamented with black dots; columella three-folded at base, and sculptured above with numerous folds.

Enaeta barnesii (Gray) 1825
(Plate 2, Figure 19)

Voluta barnesii Gray, Zool. Jour. 1, p. 511, note in errata, 1825. Carpenter, Rep. Brit. Assoc. Advanc. Sci. for 1863, p. 554.
Voluta harpa Barnes, Ann. Lyc. Nat. Hist. N.Y., 1, p. 139, pl. 9, fig. 4, 1823: not *V. harpa* Lamarck, Ann. du Mus., 7, p. 74, 1811; nor of Mawe, Linn. Syst. of Conch., frontpiece, fig. 2, 1823. Chenu, Man. de Conch. p. 190, fig. 977, 1859.
Lyria harpa Barnes, Maxwell Smith: World-Wide Sea Shells, p. 67, fig. 896, 1940.

Alt. 35 mm.

Hab. Peruvian coast, northward to Cape St. Lucas, Lower California.

The acute spire, when in fine condition, is the most important character of this species; the ribs are smooth and arcuate in contrast to the tubercular sculpture of *E. cuming̀i*. These two species bear similar color patterns.

Enaeta cumingi (Broderip) 1832
(Plate 3, Figure 24)

Voluta cumingi Broderip, P.Z.S. London, 1832, p. 33. Sowerby: Thes. Conch., 1, p. 213, pl. 55, figs. 105-107, 1847. Tryon: Man. Conch. vol. 4, p. 104, pl. 31, fig. 146; Am. Jour. Sci., 49, p. 227.
Lyria (Enaeta) cumingi H. and A. Adams, Gen. Rec. Moll., 1, p. 167, 1853. Gray: P.Z.S. London, 1855, p. 62.

Alt. 25-37 mm.

Hab. Magdalena Bay, Lower California, southward to Peru. Type locality: Gulf of Fonseca in 9 fathoms.

There are two rows of blunt yet prominent nodules upon the body whorl and one row immediately above the suture. The latter is lightly impressed; outer lip well expanded and thickened posteriorly.

Enaeta cylleniformis (Sowerby)
(Plate 3, Figure 22)

Voluta cylleniformis Sowerby, Thes. Conch., p. 214, pl. 55, figs. 112-113. Tryon: Man. Conch., vol. 4, p. 104, pl. 31, fig. 147.
Lyria (Enaeta) cylleniformis, H. and A. Adams: Gen. Rec. Moll. p. 167, 1853. Gray: P.Z.S. London, 1855, p. 61.

Alt. 18 mm.

Hab. Florida Straits near Bahama Banks.

Shell small, thick, rather smooth, whitish, sprinkled with small yellowish specks; 6 whorls which are contracted posteriorly, granose at the sutures, longitudinally ribbed anteriorly; last whorl large and anteriorly transversely striated; canal reflected; outer lip externally thickened, its internal edge furnished with a small tooth, columella anteriorly furnished with three small teeth.

Enaeta guildingii (Sowerby) 1844
(Plate 3, Figure 23)

Voluta guildingii Sowerby, Proc. Z.S. London, 1844, p. 151; Thes. Conch., 1, p. 214, pl. 55, figs. 110, 111, 1847.
Lyria (Enaeta) guildingii. H. and A. Adams: Gen. Rec. Moll. 1, p. 167, 1853. Crosse: J. de C. 14, p. 115, 1866. Tryon: Man. Conch., vol. 4, p. 105, pl. 31, fig. 148.

Alt. 12.5 mm.

Hab. St. Vincent, B.W.I. (Guilding).

In this species there are six plaits upon the columella, the three anterior ones distinct. The surface is dark purple-brown in color, promiscuously painted with a few red spots. *Enaeta guildingii* and *E. reevei* are the smallest of the group.

Enaeta pedersenii Verrill 1870
(Unfigured)

Enaeta pedersenii Verrill, Amer. Jour. Sci., n. sp., 49, p. 226, 1870. Tryon: Man. Conch., vol. 4, p. 104.

Alt. 25 mm.

Hab. La Paz, west Mexico.

This species is said to differ from *E. cumingi* by having fine longitudinal striation over the whole surface and also transverse sculpture upon the upper whorls. It is also a more slender shell.

Enaeta reevei Dall 1907
(Plate 2, Figure 18A)

Voluta guttata Reeve, Conch. Icon. pl. 22, fig. 56, December 1849; not of Dillwyn. Sowerby: Thes. Conch., vol. 3, p. 270, pl. 11 (Thes. pl. 260) fig. 122.
Lyria guttata Crosse, J. de C., 14, p. 114, 1866.
Enaeta reevei Dall, Rev. Amer. Volutidae, p. 353, 1807.

Alt. 18 mm.

Hab. Honduras (Dyson).

Shell pyramidally oblong, thick, a little recurved at base, spire acuminated, rather sharp at apex; whorls plicately ribbed, ribs gradually fading away;

columella with numerous plaits, two or three anterior most distinct.

Genus NEPTUNIOPSIS Sowerby 1898

Neptuniopsis Sowerby, 1898, Marine Invest. South Africa, no. 5, p. 5.

Genotype: *Neptuniopsis gilchristi* Sowerby.

Range: Off Cape of Good Hope.

Shell elongated posteriorly, with ovate body-whorl; nucleus large, bulbiform; aperture rather large, lip slightly reflexed; columella simple, without plaits; operculum much smaller than the aperture, oblong, horny, with the nucleus at the anterior extremity.

Head with large conical tentacles, widely diverging, bearing the eyes on an expansion of their postero external margin; snout rather long, apparently not introvertible. Between the muscular foot and the snout a soft prominence is present probably marking the opening of a pedal gland. Foot large, oblong, double edged in front. Anterior siphon well developed. In the character of the gill, the osphradium, and mucous gland, as well as in the position of the anal, genital and renal orifices, this form is indistinguishable from *Voluta*.

The oesophagus, stomach and intestine form a simple U-shaped bend, and resemble those of *Voluta* and other prosobranchs. An enormous appendix to the oesophagus entirely fills up the anterior body cavity. No peculiarities are presented by the heart or genital organs.

The nervous system at first sight seems to resemble that of *Voluta* and *Cancellaria*, the sub-intestinal ganglia curving round under the oesophagus, and connecting the left with the right pleural. It however differs from these two genera in the relation of the supra-intestinal ganglia, and in this respect more nearly approaches the *Buccinidae*.

Operculum oblong, horny, dark brown with nucleus at the extremity; exterior marked with faint concentric laminae; and with a longitudinal depression in the middle; interior roughly corrugated, with a shining cartilaginous border.

Radula: A single series of tricuspid teeth, no laterals.

The external characters of the soft parts are not at all suggestive of the *Volutidae*; for example, the presence of a large, functional operculum, an uncommon feature in this family, being present only in the genus *Lyria* and closely related genera. The nervous system closely parallels the *Volutoid* type; the intestinal ganglion indicates a position somewhat intermediate between *Adelomelon ancilla* and *Cymba pepo*.

Neptuniopsis gilchristi Sowerby 1898
(Plate 3, Figures 29, 30, 31)

Neptuniopsis gilchristi Sowerby, Marine Invest. in South Africa, number 5, pp. 5-7, plate, fig. a- shell; bc- operculum; d- radula, 1898. M. F. Woodward, Proc. Mal. Soc. London, vol. 4, p. 120, plate 10, figs. 2, 3, 11, 13, 14 (anatomy). Pace, Proc. Mal. Soc. London, vol. 5, p. 25, (anatomy and radula).

Alt. 165, diam. 57 mm.

Hab. Off Cape of Good Hope in 33 fathoms.

Shell elongately ovate, of light substance, rather thin, semi-transparent; of a light pinkish buff-color throughout, covered with a very thin, fine texture olive-brown epidermis; spire rather long, nucleus large, rounded at the base and rising to a blunt point at the summit, slightly tortuous, having much the form of a tulip-bulb; whorls (exclusive of the nucleus) 6, moderately and regularly convex, smooth, longitudinally very finely striated, the striae being rendered somewhat by coarser growth lines; spirally very finely wrinkle-striated; suture impressed; last whorl ovate, about equal in length to the spire, attenuated and slightly produced at the base, but not rostrate; aperture slightly expanded, columella rather straight, without folds or plaits, columella, covered with a thin effused enamel of the same color as the rest of the shell; outer lips slightly reflexed at the margin.

Operculum oblong, horny, dark brown with nucleus at the extremity; exterior marked with faint concentric laminae; and with a longitudinal depression in the middle; interior roughly corrugated, with a shining cartilaginous border. Radula very

small, with a single series of oblong, laterally arcuate teeth, with three proportionally large sharply angular cusps, which are nearly equal; no side teeth.

Except for the bulb-like protoconch the shell might easily be taken for a species of *Neptunea* (Roeding). The operculum is similar to *Fusinus* except that it is smaller than the aperture. The description of the soft parts here given was prepared by Martin F. Woodward, then secretary of the Malacological Society of London.

Genus VOLUTICORBIS Dall 1890

Voluticorbis Dall, Trans. Wag. Free Inst. Phila. vol. 3, p. 75, 1890.
Volutilithes, Swainson: (part) Malac. Treatise, p. 318, 1840. Zool. Illust. 1831, series 2, vol. 2, pl. 53, fig. 2.
Eopsephaea, Fischer: Man. de Conch., p. 607, 1883.

Genotype: *Voluta limopsis* Conrad (Eocene).

Range: Off Cape of Good Hope.

Voluticorbis abyssicola (Adams and Reeve) (Plate 3, Figure 25)

Voluta abyssicola Adams and Reeve, Zool. "Samarang" Moll., p. 25, plate 7, fig. 6 (young). Reeve: Conch. Icon., vol. 6, plate 22, figs. 58a-b (young) 1849. Sowerby: Thes. Conch., vol. 3, 1st. suppl. p. 270, plate 11 (Thes. plate 260), fig. 124 (young). Chenu: Man. de Conch., p. 190, fig. 980, 1859, (young). von Martens: Sudafrik Moll., Jahrb., deutsch, malak, Gesellsch, 1874, p. 140. Tryon: Man. Conch., vol. 4, p. 100, plate 29, fig. 120 (young) 1882.
Volutilithes abyssicola Adams, Genera Rec. Moll., vol. 1, p. 167; vol. 2, p. 618; vol. 3, plate 17, fig. 8. Kobelt: Cat. *Voluta*, Jahrb., deutsch malak. Gesellsch., 1877, p. 312. Watson: Prelim. Rep., part 12, Journ. Linn. Soc. London., vol. 16, p. 327. Voyage H.M.S. Challenger, part Gastropoda, p. 258, plate 15, fig.1 (adult). Kobelt: Illust. Conchylienbuch, plate 22, fig. 8 (young). M. F. Woodward: Proc. Mal. Soc. London, vol. 4, p. 121, plate 10, figs. 4-8, 10, 12 (anatomy). S. Pace: Proc. Mal. Soc. London, vol. 5, p. 28 (external characters of animal). Maxwell Smith: World-Wide Sea Shells, p. 65, fig. 871, 1940.

Alt. 37-90 mm.

Hab. Off Cape of Good Hope in 90-132 fathoms.

Apex small, eroded; eight whorls, flatly convexed, very slightly shouldered below the suture; suture very oblique and strongly marked; about seventy longitudinal riblets or flatly rounded threads following the lines of growth, which last score the whole surface, thirty to forty rather high and broader spiral threads covering the whole surface, entire surface fretted with fine, microscopic scratches; aperture small for the genus, long and narrow, with small, open anterior canal; outer lip with many close set, equal, short, narrow teeth; inner lip spread in a broad thin glaze across the body, slightly oblique, with (about the middle) eight to ten larger or smaller teeth somewhat irregularly distributed.

Section TERNIVOLUTA E. von Martens 1897

Ternivoluta Martens, Archiv. fur Naturgeschichte, 63rd year, vol. 1, p. 177, 1897.

Type: *Voluta (Ternivoluta) studeri* von Martens.

Range: East Australia.

Shell smooth, glossy, with a blunt shoulder angle and moderately projecting spire, and smooth, globular and not very large apex; four rather strong, very oblique columellar folds. Three developed tooth-plates in each row of the radula.

Volutocorbis studeri E. von Martens 1897 (Unfigured)

Voluta (Ternivoluta) studeri E. von Martens, Archiv. fur Naturgeschichte, 63rd year, vol. 1, p. 177, pl. 17, fig. 2, 1897.

Alt. 50, diam. 22 mm.

Hab. East Australia at a depth of 36 fathoms, expedition of the Gazelle.

Shell fusiform-oblong, subrostrate-tapering below, rather thin, sculptured with a series of shoulder nodules and very fine spiral striae, stronger at the base; glossy; pale flesh colored marked with narrow, vertical, somewhat flexuous lines. Spire rather produced, coronate-contabulate; the apex globose, smooth, obliquely coiled, small. Whorls six, slightly concave below the suture. Aperture narrow, the outer margin thickened, white, columellar margin having four large and three smaller somewhat alternating very oblique folds. Throat yellowish. Translated from German.

Genus CALLIOTECTUM Dall 1889

Calliotectum, Dall, Proc. U.S. Nat. Mus. vol. xii, p. 304, 1889.

Genotype: *Calliotectum vernicosum Dall*.

Range: Abyssal, off Ecuador and Galapagos.

Shell with vernicose epidermis, short, undifferentiated canal and no anal notch or fasciole; operculum with apical nucleus, increasing like that of *Fusinus*, but curved instead of straight, though not coiled; animal blind, with a short sac-like proboscis, with no teeth or poison gland.

Calliotectum vernicosum Dall 1889
(Plate 25, Figure 172)

Calliotectum vernicosum Dall, Proc. U.S. Nat. Mus., vol. xii, p. 304, pl. 5, fig. 8, 1889.

Alt. 48, diam. 19 mm.

Hab. Station 2793, Albatross Exp., off coast of Ecuador, in 741 fathoms, mud, and Station 2807, near the Galapagos Islands, in 812 fathoms, coral mud; temperatures in both cases 38.4°F.

Shell slender, fusiform, covered with a brilliant chestnut-brown closely adherent epidermis; whorls seven, without the nucleus, the tip more or less eroded in all the specimens, though living when taken; whorls slightly rounded, not inflated; sculpture chiefly of fine, subequal, flattened, narrow, slightly flexuous transverse plaits, which on the earlier whorls reach forward to the suture, but on the later ones become obsolete near the periphery, and tend to disappear altogether near the aperture on the last whorl of the adult shell; these plaits are separated by narrower rather deep grooves, and end at the suture behind rather bluntly, though they can hardly be said to coronate it; there are thirty-five or forty of the plaits on the penultimate whorl; suture very distinct, slightly channeled, but not deep; there is no anal fasciole; the aperture is shaped like a melon-seed, the outer lip evenly arched, projecting somewhat in front of the periphery, not thickened or reflected, and with no constriction for a canal; body and pillar without callus; the columella straight, very slender, not recurved; siphonal notch extremely shallow, hardly differentiated from the aperture; interior of the aperture polished, smooth, dark brown, the pillar livid white or flesh color; siphonal fasciole, none; lines of growth not prominent, the surface showing obscure faint spiral striae or scratches, but no spiral sculpture.

The soft parts are mostly yellowish white. The foot is wide, rounded-acute behind, double-edged and slightly auriculate in front. The proboscis is small and short. The animal appears to be edentulous.

The figure, though accurate as far as the form is concerned, gives very little idea of the beauty of the brilliant brown epidermis and sharply incised sculpture.

Dall placed this genus under the *Pleurotomidae* (now known as *Turridae*) but Thiele removed it to the present family, placing it near *Iredalina* another genus in which the shells lack columellar plaits. The above description is taken from Dall's paper.

Genus FUSIVOLUTA von Martens 1902

Fusivoluta E. von Martens, Sitzungs beichte der Gesellschaft Natur Freunde zu Berlin, p. 237, 1902.

Genotype: *Voluta* (*Fusivoluta*) *anomala* von Martens.

Range: Off Somaliland, East Africa.

Fusivoluta anomala von Martens 1902
(Unfigured)

Voluta (*Fusivoluta*) *anomala* von Martens, Sitzungs beiche der Gesellschaft Natur Freunde zu Berlin, p. 237, 1902.
Thiele: Handbuch der System, Weichtierkunde (figure included).

Alt. 70, diam. 20 mm.

Hab. "Ost-Afrika, an der Somalikuste, in 463 m Tiefe."

The orignal description is as follows:

Testa fusiformi-turrita, gracilis, imperforata, plicis verticalibis suturam superiorum non attingentibus, superne subnodiformibus, in anfr. ultimo prope aperturum evanescentibus, et libris spiralibus confertis, in anfr. penultimo circa 17 conspicuis, nonnullis duplicatis sculpta, rufescentigrisea, unicolor; apex obliquus, papillaeformis; anfractus 7, primus laevis, globosus, sat magnus, sequentes duo subaequales, plicis abbreviatis exiguis sculpti, ceteri regulariter crescentes, ultimus basi sensim attenuatus. Apertura lanceolata, sat angusta, margine externo recto, integro, pariete aperturali et margine columellari laevibus, non plicatus, rufes centibus, canali breviusculo. Late aperto, retrorsum paulum ascendente, fauce pone marginem externum aurantio-limbata.

Genus VOLUTILITHES Swainson 1831

Volutilithes Swainson, "Zoological Illustrations" 1831, ser. ii, vol. ii, no. 12; also A Treatise on Malacology, 1840.
Eopsephaea Paul Fischer: Manuel Conchyliologie, 1883, p. 607.

Genotype: *Voluta muricina* Lamarck (Eocene, common to the Anglo-Parisian basin).

Distribution in time: Cretaceous (Turonian) to Tertiary (Eocene).

Volutilithes muricina Lamarck 1831
(Plate 25, Figure 177)

Voluta muricina Lamarck, Zoological Illustrations, 1831, ser. 2, vol. ii, no. 12, pl. 53, fig. 1.
Volutilithes muricina Lamarck. R. Bullen Newton: Proc. Mal. Soc. London, vol. 7, p. 100, April, 1906 (figured pl. 12, figs. 1 and 1).

Alt. 65 mm.

Hab. Apparently from Grignon, Eocene of France.

"Shell nearly fusiform, the base narrow and smooth; the upper part with longitudinal, subcostated, spinous plaits; inner lip thickened, the last plait on the pillar very thick, and separated from the others, which are slender and nearly obsolete, by a deep groove."

R. Bullen Newton states that the other species of this genus are very numerous both in the London Clay and in the *Calcaire grossier* of Grignon. He also figures in his paper another species *Volutilithes pertusa* Swainson (both copies of Swainson's figures), which in turn is identical with *Voluta costata* Sowerby (see "Mineral Conchology" 1821, vol. iii, pl. ccxc, figs. 2, 4).

Genus VOLUTOSPINA R. Bullen Newton 1906

Volutospina, R. Bullen Newton, P.M.S. London, vol. 7, p. 103, 1806.
Plejona, Bolten (Roeding): *pars*: Museum Boltenianum 1798, p. 59.
Volutilithes, Swainson: A Treatise on Malacology, 1840, p. 318, non Swainson 1831. M. Cossmann: Essais de Paléoconchologie Comparée, 1899, 3rd livraison, pp. 109, 110 (many species in Cossmann's work).

Genotype: "*Conus spinosus*" Linné.

Distribution in time: Cretaceous (Turonian) to Tertiary (Eocene).

Volutospina spinosus (Linné) 1758
(Plate 14, Figure 106)

Conus spinosus Linneus, Systema Naturae, 10th Ed., p. 715, 1758.
Volutospina spinosus, R. B. Newton, P.M.S.L., vol. 7, p. 103, 1906.

Alt. 40 mm.

Distribution in time: Cretaceous (Turonian)?

Genus IREDALINA Finlay 1926

Iredalina, Finlay, 1926, Proc. Mal. Soc. London, vol. 17, p. 59.

Genotype: *Iredalina mirabilis Finlay.*

Range: Off New Zealand.

Prior to the discovery of the genus *Bathyaurinia* Clench and Aguayo, this appeared to be the first Volute known without even rudimentary vestiges of pillar plaits. Like *Tractolira sparta* Dall, it is a degenerate, abyssal form. Aside from the American forms, which show little real relationship, the likeliest allies are the two isolated genera, *Provocator*, (which is now by some authors considered *Pachymelon*) and *Gulvillea*, both of Watson. The nucleus of *Iredalina* is too worn to be defined with certainty.

Iredalina mirabilis Finlay 1926
(Plate 13, Figure 92)

Iredalina mirabilis Finlay: Proc. Mal. Soc. London, vol. 17, p. 59, figs. on p. 60, 1926.

Alt. 140, diam. 48 mm.

Hab. Off Otago Heads, South Island of New Zealand. Single example in 40 fms.

Holotype in the Finlay collection.

Surface of shell smooth and polished, light; nucleus consisting of three whorls; no sculpture apparent anywhere; shell coated with a thin glossy callus, extending over the whole spire; postnuclear whorls six, slightly convex; columella long and straight, slightly oblique.

Genus PHENACOPTYGMA Dall 1918

Phenacoptygma Dall: Proc. Bio. Soc. Washington, vol. 31, p. 138 (Nov. 29, 1918) (no description). Oldroyd: Marine Shells of the West Coast of North America, Stan. Univ. Publ., Geo. Sci., vol. 2, pt. 1, p. 168.

Genotype: *Phenacoptygma cortezi* Dall.

Range: Off California in deep water southward to Gulf of Panama.

Shell fusiform, with transverse and axial sculpture, elongated canal and apparently simple pillar; the axis in the upper whorls with two well-marked plications.

This shell has the appearance of a Turrid, with the whorls constricted and appressed near the suture and a feeble incurvation of the margin of the lip at the constriction. By grinding away a portion of the apical whorls it was revealed that the axis is furnished with plications which extend to the beginning of the penultimate whorl (Dall).

Thiele apparently was the first writer to associate this with the plait-lacking genera of the Volutidae, which evidently is the correct position.

Phenacoptygma cortezi (Dall) 1908
(Plate 25, Figure 174)

Daphnella (*Surculina*) *cortezi* Dall, Bull. Mus. Comp. Zool. Harvard College, vol. 43, no. 6, p. 292, 1908.

Alt. 39-43 mm. (decollate four and one-half whorled); diam. about 14 mm.

Hab. U.S.S. "Albatross," station 2919, off Cortez Bank, in 984 fathoms, mud, bottom temperature 38°F. U.S.N.M. 110, 613. Also off San Diego, California at station 4353, in 639 fathoms, mud, bottom temperature 39°.

Shell slender, chestnut brown fading to white or yellowish, fusiform, the spire shorter than the aperture, with more than five whorls; nucleus defective; somewhat constricted over the anal fasciole with an appressed suture, periphery

moderately rounded, axial sculpture at the suture of small, little-raised folds, with wider interspaces, not surpassing the width of the fasciole; on the earlier whorls are small, feeble, narrow axial riblets extending to the suture (on the antepenultimate whorl fourteen), with wider interspaces somewhat unequal in width and covering the whole shell; the entire surface is also sculptured with a multitude of fine spiral striae; outer lip thin, hardly arcuate; inner lip smooth, the surface erased; pillar anteriorly rapidly attenuated; anal sulcus shallow and inconspicuous; canal long and wide.

Genus GUIVILLEA Watson 1881

Guivillea, Watson, Voyage of H.M.S. Challenger, part Gastropoda, p. 261, 1881.
Wyvillea Watson: Prel. Rept., part 2, Journ. Linn., Soc. London, vol. 16, p. 332.
Pseudocymbium Cossman: in Essias de Pal. Comp., vol. 3, p. 108, 1899.

Genotype: *Guivillea alabastrina Watson.*

Range: Between Marion Island and the Crozets.

The texture of the shell is extremely delicate, but on the surface rough. Straight columella which is without true teeth, but has an abrupt break on the edge. Suture channeled.

Watson originally named this genus *Wyvillea* in honor of his friend, Sir C. Wyville Thomson. This name, however, proved to have been preoccupied in 1880 by Haswell for a genus of Amphipodous Crustaceans, published in the Proceedings of the Linnean Society of New South Wales, vol. 4, p. 336. Due to this circumstance, he made the least possible change by adopting the older form of his friend's name.

Guivillea alabastrina Watson 1881
(Plate 20, Figure 138)

Wyvillea alabastrina Watson: Prel. Rept., part 12, Journ. Linn. Soc. London, vol. 16, p. 332, 1881.
Guivillea alabastrina Watson, Voyage of his Majesty's Ship, Challenger, part Gastropoda, p. 262, plate 15, fig. 2.
Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 304, plate 18, (Thes. plate 517) fig. 169.

Alt. 162, diam. 77 mm.

Hab. Between Marion Island and the Crozets in 1600 fms. Dredged December 30, 1873.

Animal with enormous bifid foot; in-operculate; shell large, thin, white, alabaster-like in texture; nucleus blunt, twisted; surface minutely granulated, with the appearance of having been dipped in sandy white-wash, and then roughly wiped; whorls five and one-quarter; suture very oblique, deeply impressed and a little canaliculate.

Genus HARPOVOLUTA Thiele 1912

Harpovoluta, Thiele, Deutsche Sudpolar-Expedition, xiii, p. 213, 1912.

Genotype: *Harpovoluta vanhöffeni* Thiele.

Range: Apparently abyssal, "Gaussberg."

Harpovoluta vanhöffeni vanhöffeni Thiele 1912
(Unfigured)

Harpovoluta vanhöffeni Thiele, Deutsche Sudpolar-Expedition, xiii, p. 213, Tafel 14, fig. 1, 1912. Thiele: Handbuch der System, Weichtierkunde (figured).

Alt. 45, diam. 26 mm.

Hab. "Gaussberg."

A partial translation from Thiele's description is as follows:

The species is first of all characterized by its dentition, in that the radula is formed exactly as in Voluta (s.s.?) ..... the central teeth projecting considerably above the other two. The foot is without an operculum, so large that it can hardly be completely drawn back into the shell. According to van Höffen the animal secretes a purple fluid.

The shell is white, smooth, thin, covered with a weak enamel, the spire pointed, whorls rapidly increasing in size toward the last, aperture large. The columella with a slightly projecting somewhat curved edge, without cross folds. The absence of these folds is characteristic of *Harpovoluta* just as *Guivillea* of Watson differs in the form of the shell.

The specimen taken at the "Gaussberg" was in great part covered by "Aktinia," through the removal of which, and the further preparation of the soft parts, the very fragile edge of the aperture was injured and possibly the illustration does not accurately portray its correct shape. The nucleus of the shell is not preserved and therefore the correct number of whorls cannot be determined. Upon the spire, beneath the enamel, a reading glass brings out the fine spiral striae, body whorl without the striae.

Harpovoluta vanhöffeni striatula Thiele 1912 (Unfigured)

Harpovoluta vanhöffeni var. striatula Thiele, Deutsche Sudpolar Expedition, xiii, p. 213, Tafel 14, fig. 2, 1912.

Alt. 25, diam. 14.5 mm.

Hab. "Gaussberg."

Thiele seemed in doubt concerning this form. He stated that the edge of the aperture is hardly thickened but fairly strong, which may indicate that the shell is fully developed. Then the typical spire seems to be more pointed and comparatively higher. The edge of the columella is more strongly twisted and more separated. The edge of the aperture below is less bent. The striae consists of numerous thread-like lines which are especially clear upon the anterior portion of the body whorl.

Genus FULGORARIA Schumacher 1817

Fulgoraria Schumacher: 1817, Essai. Syst., p. 242, 1817.

Genotype: *F. fulminata fulminata* Sowerby.

Range: China and Japan.

The distinguishing characters of this genus are the swollen, bead-like nuclei; the initial whorls being lateral as in *Mamillana*. The shells are somewhat elongated and swollen in the center. Columella plaits varying from one to seven, moderately oblique.

Fulgoraria concinna (Broderip) 1836 (Plate 10, Figure 75)

Voluta concinna Broderip: Proc. Zool. Soc. London., vol. 4, p. 43, 1836. Reeve: Conch. Icon., Mono. Voluta, plate 21, fig. 53, 1849. Crosse: J. de C., vol. 19, p. 302, plate 12, fig. 7, 1871. Sowerby: Thes. Conch., vol. 1, p. 217, plate 51, fig. 66. Tryon: Man. Conch., vol. 4, p. 99, plate 29, fig. 114.

Alt. 100-125 mm.

Hab. Japan.

Nucleus consisting of two whorls, shining, malleated; apex, lateral; post-nuclear whorls four and one-half; suture somewhat puckered; sculpture consisting of light spiral striae, most pronounced near the suture; rounded longitudinal ribs most prominent at the periphery; columella with four weak plaits; ground, yellowish-flesh color, overlaid with a pattern of longitudinal tan streaks, which, where omitted, form faint lighter-colored spiral bands; interior slightly lighter.

Easily recognized by its narrow axial stripes.

Fulgoraria delicata (H. C. Fulton) 1940 (Plate 23, Figure 157)

Voluta delicata Fulton: Proc. Mal. Soc. London, vol. 24, p. 31, plate 2, fig. 2, 1940.

Alt. of Holotype, 46, diam. 18 mm.

Hab. Tosa, Japan.

Nucleus smooth, consisting of two and one-half whorls; post-nuclear whorls, four; sculpture consisting of prominent,

narrow axial ribs, fifteen to sixteen on last whorl, but extending only about half its length; columella, outwardly recurved, with a single spiral plait.

Fulgoraria fulminata fulminata (Sowerby)
(Plate 10, Figure 76)

Voluta rupestris Gmelin, Syst. Nat., p. 3464, 1788. Reeve: Conch. Icon., plate 6, fig. 14, 1849. Tryon: Man. Conch., vol. 4, p. 85, plate 24, fig. 42.
Voluta fulminata Sowerby, Thes. Conch., vol. 1, p. 209, plate 50, figs. 51-53.

Alt. 85 mm.

Hab. China; Japan.

Nucleus bulbous, consisting of one and one-half whorls; post-nuclear whorls, three; suture undulating; sculpture consisting of numerous, incised, broken, spiral lines upon early whorl and spire, more widely separated anteriorly upon body-whorl, their terminations forming crenulated margin upon thickened labrum; longitudinal ribs extending from suture to suture upon spire and at periphery upon first two-thirds of body-whorl; columella with seven plaits, stronger anteriorly; Ground, flesh color, overlaid with a pattern of irregular light chocolate colored streaks; interior light flesh color.

Gmelin's work not now being recognized the less familiar name *fulminata* will have to be used instead.

Fulgoraria fulminata hamillei (Crosse) 1869
(Plate 10, Figure 80)

Voluta hamillei Crosse: J. de C., vol. 17, p. 278, 1869; also vol. 18, p. 97, plate 1, fig. 5 and plate 2, fig. 1, 1869. Tryon: Man. Conch., vol. 4, p. 85, plate 24, fig. 41.

Alt. 150 mm.

Hab. Japan.

Shell, almost smooth, has more prominent zig-zag stripes and lacks the prominent spiral striae of *V. fulminata fulminata*. Lischke in his work on the Japanese Mollusca considered this to be a large, yet immature specimen of *V. fulminata fulminata*.

Fulgoraria hirasei (Sowerby) 1912
(Plate 10, Figure 78)

Voluta hirasei Sowerby, Ann. Mag. Nat. Hist., (8) vol. 9, p. 471, fig. 1, 1912.

Alt. 82 mm.

Hab. Japan.

Nucleus consisting of one and one-half, possibly two whorls; post-nuclear whorls four; suture, well impressed; sculpture consisting of a net-work of longitudinal and spiral raised lines, with, in addition, numerous, low, narrow longitudinal ribs, fading out anteriorly upon body-whorl; about sixteen ribs upon penultimate whorl; outer lip thin, minutely crenulated; columella with two or three very feeble plaits; exterior surface dull, flesh color, ribs slightly lighter; interior dark flesh color.

This is probably the most beautiful species in the genus. It is easily distinguished by the uniform light reddish-brown color and prominent spiral striations.

Fulgoraria megaspira megaspira
(Sowerby) 1844
(Plate 10, Figure 79)

Voluta megaspira Sowerby, Proc. Zool. Soc. London., vol. 12, p. 150, 1844; Thes. Conch., vol. 1, p. 208, plate 48, figs. 31, 32, 1845. Tryon: Man. Conch., vol. 4, p. 95, plate 28, fig. 102.

Alt. 150 to 175 mm.

Hab. Japan.

Nucleus consisting of two whorls; post-nuclear whorls four; suture impressed and bordered posteriorly by a paler ribless zone, which in turn bears oblique growth sculpture; sculpture consisting of spiral striae which extends over the spire and upon body-whorl, mostly posteriorly; longitudinal ribs well rounded, about

twenty-five upon last revolution; columella with four to five weak plaits, the extreme anterior plait being the strongest; ground, flesh color, overlaid with a pattern of zig-zag brown streaks; interior, pale flesh color.

Fulgoraria megaspira daviesi
(H. C. Fulton) 1938
(Unfigured)

Voluta daviesi Fulton, Proc. Mal. Soc. London, vol. 23, p. 56, plate 3, figs. 4, 4A, 1938.

Alt. 90, diam. 33 mm.

Hab. Kii, Japan.

V. daviesi was figured by Y. Hirase in his *Conchological Magazine*, vol. 2, plate 31, fig. 124, 1908, as *V. megaspira*.

The present subspecies spiral sculpture separates it sharply from *V. megaspira megaspira*.

Fulgoraria megaspira mentiens
H. C. Fulton 1940
(Plate 10, Figure 77)

Voluta (Fulgoraria) mentiens Fulton, Proc. Mal. Soc. London, vol. 24, p. 31, plate 2, fig. 1, 1940.

Alt. 116, diam. (of type) 38 mm.

Hab. Tosa, Japan.

Nucleus consisting of two and one-half whorls; post-nuclear whorls five; suture similar to *V. megaspira megaspira*; sculpture consisting of narrow axial costae upon the lower whorls, about nineteen or twenty upon the punultimate whorl; columella with four plaits; aperture more than half the length of the shell; last whorl with three more or less interrupted bands.

According to Fulton *mentiens* is broader than *megaspira*, its whorls increase less rapidly, and the axial folds are stronger and more numerous.

Fulgoraria prevostiana prevostiana
(Crosse) 1878
(Plate 23, Figure 159)

Voluta prevostiana Crosse, J. de C., vol. 24, p. 165, 1878; also J. de C., 27, p. 41, plate 1, fig. 1, and plate 2, fig. 1, 1879. Tryon: Man. Conch., vol. 4, p. 95, plate 30, fig. 132, in part only.
Psephaea prevostiana (Crosse). Grant and Gale: Plio. and Pleist. Moll. of Calif. vol. 1, p. 633, pl. 27, fig. 9, 1931.
Voluta megaspira var. Sowerby, Thes. Conch., vol. 5, 2nd. suppl. pl. 14, (Thes. pl. 513) fig. 144; no description, 1887.

Alt. 140 mm.

Hab. Japan.

A rather thin, high spired, shell with a large body-whorl and obsolete spiral striae on its middle whorls.

Fulgoraria prevostiana clara (Sowerby) 1914
(Unfigured)

Voluta prevostiana clara Sowerby. Ann. Mag. Nat. Hist., (8) vol. 14, p. 481, plate 19, fig. 12, 1914.

Alt.

Hab. Japan.

Shell of a delicate cream color throughout the exterior, entirely destitute of color markings; aperture of a smooth pale fawn color; columella with only one oblique fold, above which upon very close examination the faintest possible indication of a projection may be perceived.

H. C. Fulton thinks this may prove to be a distinct species.

Fulgoraria smithi (Sowerby) 1901
(Unfigured)

Voluta smithi Sowerby, Ann. Mag. Nat. Hist., vol. 8, p. 161, 1901.
Voluta uniplicata Sowerby, Ann. Mag. Nat. Hist., 1900, (7) vol. 5, p. 439, fig. 1, non J. de C., Sowerby and Dickson, 1850.

Alt.

Hab. Japan.

Chiefly characterized by its single columellar plait and thin substance. The writer has not seen this species.

Genus HARPULINA Dall 1906

Harpulina Dall, 1906, Nautilus, vol. 19, p. 143.
Harpula Swainson: Malacol. Treatise, 317, 1840.

Genotype: *Voluta arausaica* Solander.

Range: Indian Ocean.

Shell oval-conic; nucleus papilliform, middle whorl of nucleus largest, more convex; columella with numerous plaits which become largest anteriorly; outer lip thickened within, sharp without.

Harpulina interpuncta interpuncta (Martyn) 1781 (Plate 7, Figure 61)

Voluta interpuncta Martyn, Univ. Conch., col. 4, plate 127, 1787. Reeve: Conch. Icon., pl. 6, fig. 12, 1849. Tryon: Man. Conch., vol. 4, p. 84, pl. 24, fig. 39.
Voluta indica, Sowerby, Thes. Conch., vol. 1, p. 210, pl. 51, figs. 68-70.
Voluta lapponica, Linné, Syst. Nat. ed. 12, 1195.
Voluta lapponica, under Reeve: Conch. Icon. species 12.

Alt. 62-85 mm.

Hab. Indian Ocean.

Nucleus consisting of two and one-half to three whorls, shining, slightly tilted; post-nuclear whorls five, suture irregular, puckered; sculpture consisting of numerous, closely-spaced, longitudinal ribs upon the spire, gradually diminishing in size and hardly discernible upon the penultimate whorl; ribs extending from suture to suture upon the early whorls; spiral striae fine, most apparent anteriorly upon the body whorl and adjacent to the suture; columella with seven plaits; ground color old ivory, overlaid with numerous, spiral, chestnut-colored, linear spots, together with larger blotches of pale brown color, often longitudinal. In mature specimens, the outer lip extends considerably upon the spire.

Harpulina interpuncta undata (Martyn) 1792 (Plate 7, Figure 60)

Voluta undata Martyn, Univ. Conch., vol. 4, table 3, plate 127, 1792.
Voluta interpuncta Martyn, Reeve: Conch. Incon., plate 4, fig. 12, 1849.

Alt. 75. mm.

Hab. Indian Ocean.

Differs from *interpuncta interpuncta* in that the color pattern consists of fewer chestnut linear markings together with conspicuous, broader zig-zag streaks which extend prominently upon the spire.

Harpulina arausaica (Solander) 1786 (Plate 8, Figure 62)

Voluta arausaica Solander, Port. Cat., p. 26, number 611, p. 186, number 3965, 1786. Fischer, J. de C., p. 274, 1871.
Voluta vexillum Chemnitz: Conch. Cab., vol. 10, p. 152, vignette 20, figs. a, b, plate 13, fig. 32, 1849. Sowerby: Thes. Conch., vol. 1, p. 210, plate 50, figs. 54-56.
Voluta vexillum. Lamarck: An. s. Vert., ed. Deshayes, vol. 10, p. 402. Tryon: Man. Conch., vol. 4, p. 85, plate 31, fig. 153, 1882.
Vexillum broc.(?) Martyn: Univ. Conch. Pl. 82, 1792.

Alt. 75-100 mm.

Hab. Indian Ocean: Amboyna.

Shell ovate, subfusiform, thick, smooth, shining, whitish, with more or less numerous orange-red narrow bands; spire conical, with small pointed apex; the last four whorls crowned with rather remote and

compressed tubercles; columella with from six to eight plaits, the three posterior very small, the two or three anterior generally thickened. This shell is commonly called the Flag Volute.

Harpulina loroisi (Valenciennes) 1863
(Plate 8, Figure 64)

Voluta loroisi Valenciennes, J. de C., vol. 2, p. 72, 1863. Sowerby: Thes. Conch., vol. 5, 2nd. suppl., p. 276, plate 12 (Thes. plate 261), fig. 138. Crosse: J. de C., vol. 19, p. 292, 1871. R. Winkworth: Proc. Mal. Soc. London, vol. 22, p. 19, fig'd on same page, 1936.

Alt. 79, lat. 40 mm. (Holotype); alt. 76, lat. 35 mm. (Winkworth specimen).

Hab. Seas between India and Ceylon; dredged in 20 fathoms, fine sand, south of Manapad.

The small apex, longitudinally ribbed young whorls and slight sculpture of the body whorl, agree well with *H. interpuncta interpuncta*. It has, however, none of the typical markings of the latter species, but dark brown, longitudinal stripes on dark orange ground; it is also more elongated. (Sowerby's figure is misleading as to proportions). The columellar folds are slight and six in number.

Genus ALCITHOE H. and A. Adams 1858

Alcithoe H. and A. Adams, 1858, Genera Rec. Moll., vol. 1, p. 164.

Genotype: "*Buccinum arabicum*" Martyn, now *Alcithoe arabica* (Martyn).

Range: Australasia; South Africa; East Africa; Japan.

Shell ovately fusiform; spire produced; apex papillary; aperture ovate, wide; inner lip with a spreading callus, outer lip dilated, subreflexed; columella usually with four, more rarely five to seven, oblique plaits.

Important features include the secondary scaphelloid nucleus, the deep and broad anterior notch of the aperture, the dilated aperture and in the genotype the reflexed aperture.

Alcithoe africana africana (Reeve) 1856
(Plate 8, Figure 65)

Voluta africana Reeve, Proc. Zool. Soc. London, 1856, p. 2, plate 33, figs. 3, 4. Tryon: Man. Conch., vol. 4, p. 95, plate 30, fig. 127, 1882. (Copy of Reeve) Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 303, plate 17, figs. 165, 166 (original). E. A. Smith, Proc. Mal. Soc. London, vol. 4, p. 233, 1901.

Alt. 50-65 mm.

Hab. Southeast to South Africa.

Apex obtuse; spire moderately elevated; suture impressed; whorls angulated, the angle tuberculated; shell contracted anteriorly; three plaits on columella; dark colored spiral interrupted bands continued over labrum and visible inside the lip. A distinguishing character is the dark, chocolate-brown posterior blotch upon the inner wall of the aperture.

Alcithoe africana rietensis (Turton) 1933
(Unfigured)

Voluta africana rietensis Turton, J. C., vol. 19, p. 370, 1933.
Voluta africana ponderosa Turton, Marine Shells Port Alfred, south Africa, number 329, p. 44, 1932. non *V. ponderosa* Solander, Cat. Port. Mus., 25 and 189, 1786.

Alt. 62.5 mm.

Hab. Off Port Alfred, and Durban (40 fathoms), South Africa.

"This is of a different shape from the others, the whorls being strongly shouldered, and wider at the periphery, with fewer and larger tubercles, about eight on the last whorl. The size is 66 x 42 mm., including tubercles, but I have seen larger rubbed specimens; some fine spiral lines are just visible."

Turton further states that this may eventually prove to be a distinct species.

Alcithoe africana beckeri (Turton) 1932
(Unfigured)

Voluta africana beckeri Turton, Marine Shells of Port Alfred, p. 44, 1932.

Alt. 60, diam. 30 mm.

Hab. South Africa.

This is a narrow variety with a much sharper spire. Rare.

Alcithoe arabica (Martyn) 1784
(Plate 8, Figure 63)

Buccinum arabicum Martyn, Un. Con. 11, fig. 52.
Fulguraria arabica. Suter: Man. N. Zeal. Moll. p. 445, plate 48, figure 5, 1915.
Alcithoe arabica. Powell: Shellfish of N. Zeal. p. 81, plate 1, figure 7, 1937.
Voluta pacifica Solander, Port. Cat., p. 190, number 4039. Reeve: Conch. Icon., plate 17, fig. 38b (not 38a), 1849. Sowerby: Thes. Conch., vol. 1, p. 205, plate 48, fig. 25. Tryon: Man. Conch., vol. 4, p. 94, plate 28, figs. 97, 98, 1882.

Alt. 82-112 mm.

Hab. Auckland and North Island, New Zealand.

Nucleus consisting of two and one-half whorls, apex pointed; post-nuclear whorls four to four and one-half; suture distinct; nine strong nodules on the body whorl, on the penultimate whorl, less distinct, replaced on earlier whorls by riblets, which extend from suture to suture; four to five plaits on the columella; outer lip sometimes extended to correspond with the adjacent tubercle.

Alcithoe calva Powell 1928
(Unfigured)

Alcithoe calva Powell, Trans. New Zealand Inst., vol. 59, p. 362, 1928. Shell Fish New Zealand, p. 81, species 1086, 1937.

Alt. 173, diam. 64 mm. (holotype).
Alt. 177, diam. 64 mm. (paratype).

Hab. Off Cape Campbell, Marlborough in 40-50 fathoms (H. Hamilton, 1925). Castlecliff, Wanganui (Upper Pliocene) one example (A.W.P.B. 1927). All New Zealand.

Shell very large, narrow and elongated. Whorls eight and one-half. Protoconch scaphelloid, moderately large, two and one-half smooth whorls. Post-nuclear whorls smooth, devoid of sculpture except in rare instances where spire-whorls are faintly shouldered, showing traces of axial costae. Spire tall, half the height of aperture, whorls slightly convex. Body-whorl elongate, sub-cylindrical, gradually contracted below to rounded fasciole, not marked off by usual ridge. Aperture long, rather narrow with shallow notch below. Outer lip thickened, reflexed above, ascending about one-third height of penultimate whorl. No projecting callus-plate on columella which is straight, tapering to a sharp point below, with six comparatively weak, very oblique plications; upper one more or less rudimentary. Inner lip spread as a thin glaze broadly overy body-whorl.

Color pale buff, ornamented with indistinct irregular light brown zig-zag lines. Interior of aperture pinkish-fawn.

Most specimens have the outer surface badly eroded.

Holotype and 21 paratypes in Dominion Museum, Wellington, New Zealand.

Powell states that this species differs from *swainsoni* in the elongated shape, weak columella plications, shallow anterior siphonal notch, and absence of projecting columellar callus-plate. Another related species, *larochei* Marwick, is distinguished by its broadly-fusiform shape and fewer and stronger columellar plications.

Both *larochei* and *calva* occur commonly at Cape Campbell but do not seem to intergrade.

Alcithoe depressa (Suter) 1908
(Plate 8, Figure 67)

Fulguraria depressa Suter, P.M.S.L., vol. 8, p. 182, pl. 7, f. 11, 1908. Suter: Man. of N. Zeal. Moll., p. 447, pl. 48, fig. 7, 1913.
Alcithoe depressa Powell: Shellfish of N. Zeal. p. 81, species 1082, pl. 12, fig. 1, 1937.

Alt. 80, diam. 41 mm. Angle of spire 50°.

Hab. Spirits Bay, North Island (C. Cooper, Captain Bollons), New Zealand.

Shell moderately large, ovate, solid, with a short spire and a large aperture, the last two or three whorls with nodules on the angle of the shoulder, with a few brown zig-zag lines. Sculpture: The penultimate whorl with a row of distant roundish nodules above the suture, the body-whorl with a row of elongated prominent nodules on the angle of the shoulder, their number being about 8 or 10. Color yellowish-white, with a few longitudinal fulvous zig-zag bands, indistinctly arranged in 3 spiral bands on the body-whorl and a fourth above the fasciole, outer lip with a few brown spots. Spire low, conoidal, its height about one-third of the aperture. Protoconch much worn and the nucleus lost in examples available. Whorls about 7, the last very large, the upper whorls slightly convex, the last two broadly shouldered, the slope, flattish, body-whorl flatly convex at the periphery and somewhat contracted below; the fasciole broad, hardly raised, flattish. Suture distinct but not deep. Aperture high, triangular, narrow above, widened below, with a narrow upper channel, very broadly truncated and rather deeply notched at the base. Outer lip oblique, its upper part nearly straight, the lower moderately curved, much thickened, rounded, smooth, but not reflected, retrocurrent toward the suture. Columella subvertical, straight, with 5 or 6 somewhat inequidistant subequal strong and flat plaits, sometimes with an additional small plait above; the columella slightly twisted below and produced into a narrowly rounded beak, extending beyond the inferior end of the outer lip. Inner lip thin, spreading broadly over the body and the lightly convex wall, with a rounded raised outer edge below.

Alcithoe festiva (Lamarck) 1822
(Plate 9, Figure 69)

Voluta festiva Lamarck, An. s. Vert., vol. 7, p. 347, 1822; 2nd ed., vol. 10, p. 404, 1844. Kiener: Icon. Coq Viv., p. 31, plate 22, fig. 2 (type, half-grown), 1839. Kuster, Conch. Cab., 2nd ed., Vol. 5, Pt. 2, p. 184, plate 38, fig. 4 (copy of Kiener), 1841. Sowerby: Thes. Conch., vol. 1, p. 218, plate 52, figs. 79, 80, (original from Lamarck's type). Reeve: Conch. Icon., vol. 6, plate 12, figs. 28a-c (28a, adult, b and c young), 1849. Chenu: Man. de Conch., p. 188, fig. 960 (after Reeve), 1859. Tryon: Man. Conch., vol. 4, p. 95, plate 30, fig. 125 (after Reeve), 1882.

Alt. 100-125 mm.

Hab. Southeast Africa, Natal coast (Sowerby).

Nucleus consisting of one and one-half whorls; post-nuclear whorls, four to five, with obtuse, longitudinal ribs, which are nearly obsolete at the suture; last whorl, transversely striated; columella with three oblique, anterior plaits.

Said to be one of the rarest Volutes.

Alcithoe gracilis (Swainson) 1821
(Plate 9, Figure 74)

Voluta gracilis Swainson, Journ. Sci., vol. 17, p. 32, 1821. Reeve: Conch. Icon., plate 17, fig. 40, 1849. Sowerby: Thes. Conch., vol. 1, p. 206, plate 55, figs. 177, 188. Suter: Man. New Zealand Moll., p. 448, plate 48, fig. 8, 1913-15. Powell: Shell Fish New Zealand, p. 81, species 1088, plate 12, fig. 4, 1937.

Voluta pacifica gracilis Swainson. Tryon: Man. Conch., vol. 4, p. 94, plate 28, fig. 99, 1882.

Alt. 55, diam. 23 mm.

Hab. New Zealand; also occurs in the Castlecliff fossil beds.

Nucleus consisting of two whorls; post-nuclear whorls, four; suture, moderately impressed; nodules upon periphery comparatively indistinct, about twelve upon body whorl; surface with occasional, partly oblique broken, incised lines, which are most apparent upon the spire and upon

the last whorl adjacent to the suture; ground color, ivory, overlaid with a pattern of zig-zag, chestnut brown lines, forming three darker zones on the body whorl; four primary, anterior plaits, and one secondary posterior plait, base of the columella oblique; furrows upon the parietal wall, covered with callus, and running parallel with the axis; outer lip thickened and extended.

The line of descent of *A. gracilis* has for long been separated from that of *A. arabica*, and probably came through *A. finlayi* of Awamoan age.

The height of the spire varies from less than half to about two-thirds that of the aperture. Sometimes the shoulder nodules are present on the body whorl, but often they are quite obsolete.

Alcithoe hedleyi Murdock and Suter 1906
(Plate 23, Figure 158)

Fulguraria (Alcithoe) Hedleyi Murdoch and Suter, Trans. N. Zeal. Inst. vol. 38, 1905 (1906), 288, pl. 23, figs. 20, 21.
Fulguraria Hedleyi. Suter: Man. N. Zeal. Moll. p. 448, pl. 20, fig. 7, 1913.
Alcithoe hedleyi (M. and S.). Powell: Shellfish of N. Zeal. p. 81, species 1089.

Alt. 61, diam. 18 mm. (Holotype).

Hab. Off Great Barrier Island, in 110 fathoms (type locality); four miles west of Cuvier Island, in 44 fathoms (Captain Bollons). Holotype in the Dominion Museum, Wellington.

The original description is as follows:

Shell elongato-fusiform, spire rather long, acuminate, costate; body-whorl smooth, with fine longitudinal zig-zag markings; columella with 4 plaits. Sculpture: The protoconch has 1 or 2 spiral threads; the following whorls of the spire are distantly axially costate, the costae extending over the lower two-thirds of each whorl, 10 on a volution; a few costae are situated on the body whorl above the aperture, but the remainder is smooth; growth-lines are visible on all the whorls, more distinct and close together on the last whorl; with a lens a number of spiral lines may be distinguished below the shoulder of the whorls. Color: No live specimens having been obtained, it is impossible to guess the color of the shell, which is most likely light fulvous; fine longitudinal brown zig-zag lines ornament all the whorls, except the protoconch. The spire is much shorter than the aperture, conical, acuminate but obtuse. Protoconch consists of 2 slightly bulbous whorls; the nucleus is slightly lateral, smooth; the second whorl has one or two spiral threads. Whorls 7, shouldered, first slowly then rapidly increasing in height. Suture distinct, but not impressed, retrocurrent on reaching the aperture. Aperture high and narrow, slightly canaliculated at the upper angle, very little narrowed at the base, where it is broadly truncated and sinuated. Outer lip forming a very light curve, nearly straight, thickened and rounded above, thinner near the base, smooth, not expanded. Columella very slightly excavated near the middle, with 4 almost equidistant and very oblique strong plaits, all of nearly equal size, narrowed below into a sharply rounded beak, which extends beyond the basal margin of the outer lip. Inner lip thin, shining, broadly expanded on the body whorl, and with a few longitudinal striae, narrower upon the pillar.

Soft parts unknown.

Alcithoe jaculoides Powell 1924
(Plate 8, Figure 66)

Alcithoe arabica, subspecies jaculoides Powell, Proc. Mal. Soc. London, vol. 16, p. 108, figs. 1-3, 1924.
Alcithoe jaculoides. Powell: Shell Fish New Zealand, p. 81, species 1081, plate 12, fig. 5, 1937.

Alt. 109, diam. 41 mm.

Hab. Off Whakatane, Bay of Plenty, in 40-50 fathoms, and Cuvier Island in 40 fathoms, New Zealand.

Shell large, solid, fusiform. Whorls seven and one-half. Protoconch moderately large, of two and one-half smooth bulbous whorls; the following three whorls showing faint to moderately strong axial costae, and the remaining two, prominently shouldered with a row of strong, laterally

compressed nodules on the keel of the shoulder, which is slightly concave. Last whorl with about eight nodules. Body whorl inflated at the middle, but much contracted below. Fasciole flattened, inconspicuous, very slightly curved, and but little raised. Suture not deep. Aperture high, much narrower than in *A. arabica*. Outer lip thickened, rounded, and outwardly reflexed, especially above the shoulder where it joins the body whorl. Color, yellowish-white, ornamented with chestnut colored, zig-zag lines, becoming heavier at regular intervals, forming five bands on the body whorl; one just above the shoulder and four equally disposed below. Some specimens are entirely covered and others partially with a dark, reddish-brown coating. Spire high, conic, its height equal to about half the height of the aperture; columella vertical; produced to a sharp point below; with five strong and nearly equidistant plaits. Total absence of any expansion of the callus on the columella, which in *A. arabica* forms an extended, flattened plait with a clean, free edge. In the case of juvenile *A. arabica*, this plait is not always well developed, but in all the specimens examined of *A. jaculoides* the plait is wanting. The inner lip spreads as a thin glaze broadly over the body whorl, right to the base of the columella, and finishes about the center of the faciole, but not abruptly, and without leaving any defined ridge.

Alcithoe johnstoni Powell 1928
(Unfigured)

Alcithoe johnstoni Powell, Trans. New Zealand Inst., vol. 59, p. 363, 1928. Powell: Shell Fish New Zealand, p. 81, species 1083, 1937.

Alt. 169, diam. 65 mm.

Hab. Off Cuvier Island, New Zealand, in 44 fathoms.

Shell very large, elongate, inflated below. Whorls eight and one-half. Protoconch scaphelloid, moderately large, of two and one-half smooth whorls. Postnuclear spire-whorls angled at center and prominently nodulous. Penultimate whorl with eleven strong laterally compressed nodules. Shoulder sloping slightly concave. Body-whorl large, inflated, smooth and devoid of nodules, merged into fasciole without any defining ridge. Spire rather short, less than half height of aperture. Aperture long, expanded at center, contracted above and below. Anterior siphonal notch shallow. Outer lip thickened and reflexed, uniformly broadly arched, ascending over half height of penultimate whorl. No projecting callus plate on columella, which is straight, tapering to a sharp point below, with five strong, oblique, plications. Inner lip spread as a thin glaze broadly over body-whorl. Color pale pinkish-buff, covered with a network of reddish-brown zig-zag lines, becoming heavier and blotched at regular intervals, forming definite spiral bands, two on spire whorls, four on body-whorl. Parietal callus and interior of aperture uniform pinkish-buff.

Holotype in Powell collection and two specimens in the collection of Dr. E. N. Drier, Auckland.

This species is named in honor of Captain Fred Johnston of S. S. "Thomas Currell" who obtained the specimens. It resembles *jaculoides* in form of spire and columella but differs in the smooth inflated body-whorl and broadly arched outer lip.

Alcithoe kreuslerae Angas 1865
(Plate 9, Figure 73)

Alcithoe kreuslerae Angas, Proc. Zool. Soc. London, 1865, p. 55, plate 2, fig. 3 (or 5?). Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 299, plate 16 (Thes. plate 515), fig. 150. Tryon: Man. Conch., vol. 4, p. 94, plate 30, fig. 124, 1882.

Alt. 90, diam. 40 mm, or less.

Hab. Gleneld, near Adelaide, South Australia; Lobster pots at Encounter Bay.

Shell of medium size; pale reddish-yellow, with three bands of orange-brown maculations; plicately nodulous on angulations; spire turreted, one-third length of shell; whorls smooth, angulated in the middle, outer lip simple; columella scarcely straight, four folds.

Alcithoe larochei Marwick 1926
(Unfigured)

Alcithoe larochei Marwick: Trans. New Zealand Inst., vol. 56, p. 294, pl. 63, fig. 6, 1926. Powell: Shell Fish New Zealand, p. 81, species 1087, 1937.

Alt. 98, diam. 46 mm.

Hab. Off Opotiki, New Zealand, 30 fathoms.

Shell large and strong, broadly fusiform. Spire conic, one-third length of aperture. Nucleus scaphelloid, of about two and one-half rather worn whorls, apex flattened, last turn with indications of blunt axials and fine spirals. Postembryonic whorls five, convex on spire with flattened steep shoulder; body inflated, contracting fairly quickly to large well-defined fasciole bounded by ridge. Sculpture: first three whorls with about eighteen rather low curved axial ribs, later ones slightly angled, last two whorls smooth except for strong growth-lines. Aperture large, dilated, deeply notched below. Outer lip lightly convex, thickened, reflexed, ascending high on penultimate whorl. Columella with four strong folds. Inner lip thin, spread well out from aperture, not raised in fasciolar region.

According to Marwick the holotype (later deposited in the Auckland Museum) was forwarded to him by W. La Roche of Auckland. It resembles *Pachymelon lutea* Watson at first sight, but is easily distinguished by the deep anterior notch and the different outline of the spire. The species is closely related to *Alcithoe swainsoni* but is more squat. A specimen from Castlecliff in the Geological Survey of New Zealand collection is fairly close to *A. larochei*, but is less inflated and has a small pad on the fasciole.

Alcithoe perplicata (Hedley) 1902
(Plate 9, Figure 68)

Voluta perplicata Hedley, Rec. Australian Mus., vol. 4, number 7, p. 309, fig. 23, 1902.

Alt. 75, diam. 32 mm.

Hab. Either near the Great Barrier Reef or on one of the Atolls of the Coral Sea.

Shell broadly fusiform, concave beneath the suture, angled at the shoulder, tapering to the base, solid, glossy; ground color white, with numerous, distant, waved, narrow longitudinal orange lines; about nine longitudinal ribs, terminating suddenly in blunt tubercles on the shoulder, these tubercles continued on the upper whorls; whorls six, of which three constitute the nucleus, the latter oblique to the axis of the remainder and causing the first adult whorl to be more immersed at one side; aperture narrow, columella with six plaits, becoming smaller posteriorly.

Related to *A. thatcheri* McCoy. It resembles that species in the remarkable multiplication of the columellar plaits and in general size, shape and color-pattern with narrow, flexuous stripes.

Alcithoe ponsonbyi (Edgar A. Smith) 1901
(Plate 9, Figure 71)

Voluta ponsonbyi Edgar A. Smith, Proc. Mal. Soc. London, vol. 4, p. 231, figured same page, 1901.

Alt. 57, diam. 29 mm.

Hab. Ten miles off Durban, Natal, in 40 fathoms.

Nucleus consisting of two, convex whorls, hardly distinguishable in color from the remainder of the shell; postnuclear whorls three, strongly shouldered, forming twelve short nodules upon the body whorl and spire, the interspaces rounded, spire turrited; spiral striae most apparent between the shoulder and suture; three indistinct anterior plaits and a few feeble posterior ones; ground color cream, overlaid upon the spire with almost uniform yellowish-rose color; below the periphery upon the body whorl, six bands of the same yellowish-rose color, with touches of orange upon them, the interspaces covered with an irregular pattern of yellow and brown; extremities of nodules touched with dark brown; canal very short, inner lip touched with color inside the terminations of the bands.

Holotype in the British Museum; present description and figure taken from

a specimen in the collection of the author.

Alcithoe swainsoni swainsoni Marwick 1926
(Plate 9, Figure 72,
nuclei Plate 24, Fig. 161)

Voluta elongata Swainson, Exot. Conch., 1821, pl. 20, 21.
Scaphella elongata Swainson, Exot. Conch., ed. Hanley, 23, pl. 20, 21.
Voluta pacifica var. elongata Swainson, M.N.Z.M., 62; T.N.Z.I, 16, 225.
Scaphella pacifica var. elongata Swainson, Index 74.
Alcithoe swainsoni Marwick, Trans. N. Zeal. Inst., vol. 56, p. 294, 1926. Powell: Shell Fish New Zealand, p. 81, species 1084, pl. 12, fig. 3, 1937.

Alt. 170, diam. 60 mm.

Hab. New Zealand, especially in the south, sandy beaches; holotype from Bay of Islands; Kermadec Islands. Fossil in the Pliocene, Miocene, and Oligocene of New Zealand.

Distinguished from *arabica* by its more elongate form, the convex, not shouldered whorls, and the almost total absence of nodules. Sculpture consisting of broadly rounded and low axial costae on the three whorls below the protoconch, sometimes obsolete; the lower whorls are irregularly axially plaited, the plaits sometimes prominent and flatly convex, the whole shell ornamented with fine growth-lines. Color the same as in *arabica*. Spire usually somewhat higher than half the height of the aperture. Whorls moderately convex, the body-whorl but moderately ventricose. Suture compressed and wrinkled. Outer lip as in *arabica*. Columella with four to six plaits, five being the usual number.

Alcithoe swainsoni motutaraensis
Powell 1928
(Unfigured)

Alcithoe swainsoni motutaraensis Powell, Trans. New Zealand Inst., vol. 59, p. 361, 1928. Powell: Shell Fish New Zealand, p. 81, species 1085, 1937.

Alt. 93.5, diam. 42.5 mm. (holotype).
Alt. 74, diam. 33 mm. (paratype).

Hab. Motutara and Muriwai Beach, west Coast, Auckland, New Zealand. Type locality Auckland, New Zealand.

Shell solid, moderately large. Whorls five, exclusive of damaged protoconch. Spire low, conic, less than one-third height of aperture. Post-nuclear spire-whorls faintly nodulous, angled below towards lower suture, body whorl devoid of nodules. Suture almost on a line with shoulder tubercles, which are rather small, regularly spaced, and laterally compressed. Shoulder steep, almost straight. Body-whorl large, inflated. Fasciole prominent, marked off by defined ridge. Aperture large, open, deeply notched below, sub-angled above towards posterior notch. Outer lip thickened and reflexed, ascending less than one-third height of penultimate whorl. Columella vertical with large projecting callus-plate and six plications, upper two weak, lower four very strong. Inner lip spread as a thin glaze broadly over body-whorl, with prominent callosity towards posterior notch. Color uniform pinkish-buff, with a very obscure pattern in the form of zig-zag lines of darker buff, entirely absent towards outer lip. The paratypes show no traces of color pattern.

Alcithoe thatcheri (McCoy) 1868
(Plate 9, Figure 70)

Voluta thatcheri McCoy, Ann. Mag. Nat. Hist. 1868, p. 54, pl. 11, fig. 1. Sowerby: Thes. Conch. vol. 5, 2nd suppl., p. 299, pl. 15, (Thes. pl. 514) fig. 147; Proc. Zool. Soc. London, 1869, p. 561; J. de C. 1873, p. 38. Tryon: Man. Conch., vol. 4, p. 96, pl. 30, fig. 126.

Alt. 100-125 mm.

Hab. Bampton Reef, N.W. New Caledonia.

Shell elongated; nucleus of five whorls; followed by three post-nuclear whorls, the last bluntly angulated and tuberculate at the periphery; the surface irregularly marked with indistinct bands and spots; columella with eight plaits;

interior and base of columella tinged with pink.

Section ERICUSA Adams

Alcithoe fulgetrum fulgetrum
(Broderip) 1825
(Plate 16, Figure 108)

Voluta fulgetrum Broderip, Zool. Journ., vol. 2, p. 35, April, 1825. Sowerby: Thes. Conch., vol. 1, p. 207, plate 48, figs. 33, 34. Tankerville Cat., app., p. 28, plates 4, 5, 1825. Reeve: Conch. Icon., plate 6, fig. 13, 1849. Tryon: Man. Conch., vol. 4, p. 96, plate 28, figs. 104, 105, 1882. Chenu: Man. de Conch., p. 188, fig. 973, 1859 (slightly immature). Maxwell Smith: World-Wide Sea Shells, p. 66, fig. 882, 1940 (slightly immature).
Scapha fulgetrum. Verco: Combing the Southern Seas, p. 16, plate 1, fig. 4, 1935.

Alt. 100-140 mm. very variable in size, mature shell may only measure 75 x 37 mm.

Hab. South Australia. Lacepede Bay to Gulf St. Vincent and Spencer Gulf. Alive on sandbars which are covered by about 18 inches of water at low spring tide. Taken alive from lobster pots.

Nucleus (see Plate 26, Figure 185) of two and one-half whorls, large, white, shining, slightly malleated; post-nuclear whorls, four; suture strongly impressed; first two and one-half whorls with fine spiral striae, together with growth lines, forming slight reticulation; growth lines dominant upon body whorl; ground color, yellowish flesh, with very angular, flame-like, chestnut streaks; columella with three moderate plaits.

In 1912 Verco described a pure white form which he called *var. alba.*

Alcithoe fulgetrum connectens (Verco) 1912
(Unfigured)

Scaphella fulgetrum connectens Verco, Trans. Roy. Soc. South Australia, vol. 36, p. 224, pl. 11, fig. 3.
Ericusa fulgetrum connectens Verco: Combing the Southern Seas, p. 16, pl. 1, fig. 6, 1935.

Alt.

Hab. South Australia, same localities as typical.

Shell with two broad purple-brown bands, and one narrow sutural band upon body whorl; the three bands connected by narrow, irregularly shaped streaks of the same color.

Alcithoe fulgetrum lunisligata
(Verco) 1912
(Unfigured)

Scaphella fulgetrum lunisligata Verco, Trans. Roy. Soc. South Australia, vol. 36, p. 224, pl. 11, fig. 1912.
Ericusa fulgetrum lunisligata Verco: Combing the Southern Seas, pl. 1, fig. 5, p. 16, 1935.

Alt. 136 mm.

Hab. Great Australian Bight (Verco).

Alcithoe fulgetrum punctosligata
(Verco) 1912
(Unfigured)

Scaphella fulgetrum punctosligata Verco, Trans. Roy. Soc. South Australia, vol. 36, p. 224, pl. 11, fig., 1912.
Verco: Combing the Southern Seas, p. 16, pl. 1, fig. 9, 1935.

Alt.

Hab. Great Australian Bight (Verco).

Shell small, color pattern consisting of small, widely separated, dark round spots, upon two spiral bands.

Alcithoe fulgetrum tricincta (Verco) 1912
(Unfigured)

Scaphella fulgetrum tricincta Verco, Trans. Roy. Soc. South Australia, vol. 36, p. 224, pl. 11, fig., 1912.

Fricusa fulgetrum tricincta Verco: Combing the Southern Seas, p. 16, pl. 1, fig. 7, 1935.

Alt.

Hab. Great Australian Bight (Verco).

Easily separated by the comparatively uniform ground color, together with three broad bands of chocolate brown upon the body whorl and one band upon the whorls of the spire. On the first post-nuclear whorl the band is replaced with spots. The subsutural flames may unite to form a third spiral band.

Alcithoe fulgetrum unicincta (Verco) 1912
(Unfigured)

Scaphella fulgetrum unicincta Verco, Trans. Roy. Soc. South Australia, vol. 36, p. 224, pl. 11, fig., 1912.
Fricusa fulgetrum unicincta Verco: Combing the Southern Seas, p. 16, pl. 1, fig. 8, 1935.

Alt.

Hab. Great Australian Bight (Verco).

Verco's figure of this subspecies illustrates a greenish shell with one anterior dark band upon the body whorl but in some specimens there is an additional band upon the spire.

Alcithoe fusiformis (Swainson)
(Plate 20, Figure 137)

Voluta fusiformis Swainson, append. to Bligh Cat., (teste of Reeve) not of Kiener. Reeve: Conch. Icon., pl. 3, fig. 6, 1849. Sowerby: Thes. Conch., vol. 1, p. 208, pl. 54, fig. 100. Tryon: Man. Conch., vol. 4, p. 95, pl. 38, fig. 103.
Voluta sowerbyi (Pars) Kiener.

Alt. 150-175 mm.

Hab. Australia and Tasmania.

Nucleus comparatively small, one and one-half whorls, apex tilted, major whorl dome-shaped; post-nuclear whorls five; suture moderately impressed; sculpture consisting of fine spiral striae and irregular longitudinal growth lines; ground color dark cream, frequently overlaid with iron stains; ornamented with brown zig-zag lines; outer lip thickened and extended posteriorly upon spire; color pattern extending more or less upon parietal wall but covered with callus; three primary anterior plaits and one secondary posterior plait on columella.

Alcithoe papillosa papillosa (Swainson)
(Plate 16, Figure 109-110)

Voluta papillosa Swainson, app. to Bligh Cat. Sowerby: Thes. Conch., vol. 1, p. 207, plate 48, fig. 30. Tryon: Man. Conch., vol. 4, p. 96, plate 28, fig. 106, 1882.
Voluta papillaris Reeve, Conch. Icon., plate 4, fig. 10, 1849.

Alt. 100-125 mm.

Hab. Encounter Bay, and Kangaroo Island, Australia (100 fathoms); 25 miles off coast of New South Wales in 1900 fms. (Brazier); off north coast of Tasmania (Cox); Fiji Islands (Sowerby).

Nucleus of two whorls; post-nuclear whorls, three, the last large and oval; surface smooth, reticulated with very fine, fulvous lines, and with interrupted, transverse chestnut-yellow bands; spire short; outer lip with margin thickened; inner lip thick, spread; columella with three to five plaits.

Alcithoe papillosa kenyoniana (Brazier) 1907
(Unfigured)

Voluta papillosa kenyoniana Brazier, Proc. Malac. Soc. London, vol. 7, p. 6, 1907. Verco, Combing the Southern Seas, p. 16, pl. 1, figs. 14-17, 1935.

Alt.

Hab. Great Australian Bight (Verco).

This subspecies is solid, ponderous,

and differs from the type in being longitudinally costate, excepting on the last half of the body-whorl. Ribs numerous on the upper whorls. The columella is swollen in the middle, with three strong plaits and a fourth obscure one below, as in *papillosa papillosa*.

Genus PACHYMELON Finlay 1926

Pachymelon Marwick, Trans. N Zeal. Inst. vol. 56, p. 266, 281, 1926.

Genotype: "*Cymbiola*" *lutea* Watson.

Range: Waters off New Zealand.

A highly specialized genus, the shells provided with a shallow sinus.

Pachymelon lutea Watson 1882
(Plate 13, Figure 91)

Cymbiola lutea Watson, Voyage H.M.S. Challenger, part Gastropoda, p. 255, plate 15, fig. 3, 1882: Jour. Linn. Soc. London, vol. 16, p. 331, part 12.
Pachymelon lutea Watson. Powell: Shell Fish of New Zealand, p. 81, species 1087, 1937. Suter: Man. New Zealand Moll., p. 449.
Voluta lutea Watson. Sowerby: Thes. Conch., suppl. pl. 18 (Pl. 517) fig. 172.

Alt. 68 mm.

Hab. Cookian faunal province (Powell); 200 miles west of Cape Farewell, New Zealand, 275 fms. (Challenger Expd.)

Shell fusiform, strong, pale buff, with a high blunt spire, large aperture, slightly reverted outer lip, and four teeth on the pillar. Sculpture: Longitudinals, on the upper whorls there are a few slight narrow ribs which are almost obsolete on the later whorls; the lines of growth are many and hair-like. Spiral, quite obsolete. The columellar swelling in front is very small and slight. Color ashy white over pale buff, entirely without gloss, the outer lip and the body-glaze are rich buff, paler inwards. Spire high, a little irregularly bent, subscalar. Apex blunt, mamillary, impressed. Whorls six and three-quarters; they are convex above, contracted into the suture, perpendicular below; after the first three they increase rapidly; the last is slightly ventricose, long, attenuated in front. Suture oblique, slightly impressed, irregular. Aperture long, but not wide, oblique, with its two sides nearly parallel, bluntly pointed above, ending below in a broad, shallow, slightly emarginated, minutely bordered canal. Outer lip patulous, thin, but expanded and rounded on the edge; it rises on the penultimate whorl at its junction, and is here drawn back into a slight sinus with a very reverted edge. Inner lip spreads widely as a thin glaze on the body; above it is scarcely convex, hardly concave in the middle, perpendicular below, where are four not strong, equal, concealed pale-colored, very oblique teeth (Watson).

Pachymelon wilsonae Powell 1933
(Plate 23, Figure 160)

Pachymelon wilsonae Powell, Recs. Australian Mus., vol. 1, p. 204, 1933. Shell Fish New Zealand, p. 81, 1079, 1937, plate 12, fig. 6.

Alt. 112, diam. 47 mm.

Hab. Chatham Islands, New Zealand "very rare" (Powell).

GENUS COTTONIA Iredale 1934

Cottonia Iredale, South Australian Naturalist, vol. 15, no. 2, p. 57, March, 1934.

Genotype: *Scaphella danneviği* Verco now *Cottonia nodiplicata* Cox.

Range: Western Australia; Great Australian Bight.

Iredale's description is as follows: A genus of the *Volutidae* (sensu latissimo) large, thin, elongate oval, large apex, deciduous at an early stage, two or three whorls remaining, outer lip thin, fragile, columella with three long plaits.

When Verco described this very fine shell he overlooked *Voluta nodiplicata* Cox from Rootnest Island, West Australia, and these two have since been regarded as

conspecific. Cotton and Godfrey used Cox's name and placed the species under *Alcithoe*, but the typical species of that genus is smaller, the shell more solid, the outer lip strong, and has a very small, persistent apex, a character of great importance. Compared with the Rottnest shell, the present species is comparatively narrower, the nodules stronger, and it should be kept separate until more Western shells are available. These may be related to such fossils as *Voluta alticostata Tate* and *V. heptagonalis* Tate.

Cottonia nodiplicata (Cox) 1910
(Plate 20, Figure 135)

Voluta nodiplicata Cox, Proc. Malac. Soc. London, vol. 9, p. 146, fig. on p. 147, 1911 (paper read in 1910).
Scaphella danneviği Verco: Trans. Roy. Soc. Sou. Aust. vol. 36, 1912, p. 225, pl. 13, figs. 1, 2 (in color).
Cottonia danneviği Verco: Combing the Southern Seas, p. 16, pl. 1, figs. 12, 13, 1935.

Alt. 125-163 mm., holotype 125 x 80 mm.

Hab. Cox's type locality: Rottnest Island, Western Australia, dead shell from an excavation; Verco's locality: 77-105 fathoms 90 miles West of the meridian of Eucla, Great Australian Bight; Newland Head, rare.

Shell rather large, fusiformly ovate, rather thin, of a uniformly yellow cream color, without any trace of color markings; whorls? (spire broken); body-whorl ovate, rather inflated, exhibiting at the upper part eleven moderately prominent rounded plicae, which are nodose about half an inch from the suture, and gradually become obsolete about the middle of the whorl; above the tubercles, which are dark colored, the whorl is slightly concave, so that a rounded angulation is formed by the tubercular prominences; the surface exhibits fine lines of growth, which are most distinct near the suture and between the plicae; columellar folds three in number, well defined, but not conspicuously prominent, the anterior forming the lower columellar margin; outer lip not thickened (immature) showing only a broad shallow anterior notch or sinus. Length (of last two whorls) 125, diam. 80 mm.

The holotype, long a unique specimen, was procured from excavations raised during the construction of a pier on Rottnest Island, twelve miles northwest of Fremantle. Sir Verco's figure shows a specimen which also lacks the nucleus and has an equally thin lip, the color being apparently iron-rust brown.

Genus AULICA Gray 1847

Aulica Gray 1847, Zool. Proc. H. and A. Adams, Gen. Rec. Moll. vol. 1, p. 160, 1858.
Cymbiola Swainson, Zool. Illust. Ser. 2, vol. 2, pt. 19, pl. 87, 1832.
Scapha Gray, 1847 (partim., not Klein or Humph.) Zool. Proc., p. 131.
Vespertilio Klein, Ostra. 76, 1753 (non binomial).

Genotype: *Aulica aulica* Solander.

Range: Pacific Seas, especially Polynesia.

Nucleus very large, of *Cymbium* (*Melo*) type; shell usually large, often glossy, more or less spinous, ponderous, broad and strongly shouldered; patterned.

Aulica aulica (Solander) 1825
(Plate 13, Figures 94, 97)

Voluta aulica Solander, in Mss., Sowerby: Tankerville Cat., app. p. 19, plate 3, 1825. Reeve: Conch. Icon., plate 2, figs. 4a-d, 1849. Sowerby: Thes. Conch., vol. 1, p. 198, pl. 46, figs. 9-12. Tryon: Man. Conch., vol. 4, p. 87, pl. 26, figs. 61, 62, 1882.

Alt. up to 130 mm.

Hab. Sooloo Archipelago.

Nucleus consisting of three and one-half whorls, slightly granose; post-nuclear whorls, two and one-half, polished, of one color; suture moderately impressed; sculpture consisting of fine spiral striations; whorls most frequently slightly

shouldered, tuberculated at the angle, tubercles compressed, a little descending; columella strongly four-plaited; ground pale yellow or flesh color, variously painted with scarlet red blotches and fine longitudinal lines.

Solander's manuscript description is as follows: Spira apice mammillari aulica. Voluta emarginata, oblonga, inermis, albo luteoque nebulosa, spira conica; anfractibus oblique planis; mamilla laevi; columella quadruplicata.

Aulica bednalli (Brazier) 1879
(Plate 14, Figure 98)

Voluta bednalli Brazier, Proc. Linn. Soc., New South Wales, vol. 3, p. 81, 1879. Pace: Proc. Zool. Soc. London 1880, p. 418, Pl. 40, fig. 1. Sowerby: Proc. Mal. Soc. London, vol. 1, p. 49, 1895 (note and colored illustration); Thes. Conch., vol. 5, 2nd suppl., p. 304, pl. 18, (Thes. pl. 517), fig. 171. Tryon: Man. Conch., vol. 4, p. 89, pl. 26, fig. 66, 1882.

Alt. 80 mm.

Hab. Port Darwin, Torres Straits, North Australia (Bednall).

Shell narrowly elongately ovate, solid, white, with four narrow transverse red or bright orange bands on the last whorl, the upper band close next the suture, the other three at equal distances down the whorl, which are crossed by about twelve similar, narrow, longitudinal, zig-zag bands of the same color, showing a tendency to spread into irregular spots between the second and third transverse bands; whorls six, flatly convex, marked with fine longitudinal striae or lines of growth, which are more prominent on the upper whorls; the last whorl more than two-thirds the length of the shell; spire elevated, apex papillary and obtuse; aperture somewhat narrow, white within, columella nearly straight, furnished with four plaits, the two upper ones the largest and least oblique, the two lower ones very oblique; outer lip simple (Angas).

Aulica cathcartiae (Reeve) 1856
(Plate 24, Figure 167)

Voluta cathcartiae Reeve, Proc. Zool. Soc. London, 1856, pl. 33, figs. 5, 6. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 301, pl. 16 (Thes. pl. 515), fig. 158. Tryon: Man. Conch., vol. 4, p. 88, pl. 27, fig. 79, 1882.

Alt. 82 mm.

Hab.

Apex obtuse; spire short; shell orange-yellow, overlaid with three, interrupted bands of purplish black spots; surface of body whorl covered with longitudinal undulating reddish-brown lines; columella with four plaits.

The unique type of this handsome species is now in the collection of the Natural History Museum at Dijong (Sowerby).

Aulica cymbiola (Chemnitz) 1788
(Plate 17, Figure 113)

Voluta cymbiola Chemnitz, Conch. Cab., vol. 10, p. 141, plate 118, figs. 1385, 1386, 1788. Reeve: Conch. Icon., plate 19, fig. 46, 1849. Sowerby: Thes. Conch., vol. 1, p. 192, plate 51, figs. 75, 76; Tankerville Cat., plate 3, fig. 1. Tryon: Man. Conch., vol. 4, p. 99, plate 29, figs. 118, 119, 1882.

Voluta corona Chemnitz: Conch. Cab., vol. 10, p. 142, plate 148, figs. 1387, 1388, 1788. Sowerby: Thes. Conch., vol. 1, p. 193, plate 55, figs. 120, 121. Chenu: Man. de Conch., p. 187, fig. 947, 1859. (This may eventually prove to be a valid species. The lack of sufficient material prevents this question from being decided at the present time.)

Voluta coronata Kiener: 1839, Monog. T. 41, fig. 1. Chenu: Man. de Conch., p. 186, fig. 948, 1859.

Alt. 60 mm.

Hab. Moluccas (Spice Islands).

Nucleus consisting of two and one-half whorls, apex low, very obtuse; postnuclear whorls, two or three; suture more

or less channeled and unevenly covered by curved, spiny processes, which are extensions of growth; sculpture consisting of fine growth lines, which become coarsest between the periphery and suture of the body whorl; rather long, sharp, hollow spines at the periphery, seven upon body whorl; spiral striae fine; columella with four primary plaits, often two, secondary, indistinct plaits; ground color and interior, yellowish-white, overlaid with pale buff and dark chestnut, longitudinal lineations, which are closely spaced below the suture; outer lip thin.

Aulica deshayesi (Reeve) 1854
(Plate 17, Figures 115-116)

Voluta deshayesi Reeve, Proc. Zool. Soc. London, 1854, p. 73, Moll., plate 26. Tryon: Man. Conch., vol. 4, p. 88, plate 26, fig. 63, 1882.

Alt. 75-100 mm.

Hab. North coast of New Caledonia; northeast Australia; Clipperton Island, Galapagos (Miss Cooke).

Nucleus consisting of three and one-half whorls, slightly granose; postnuclear whorls, two and one-quarter; suture irregular in that it follows from nodule to nodule, particularly adjacent to the body whorl, slightly channeled; eight spiny nodules upon body whorl; light interrupted spiral striae and rather fine longitudinal growth lines; ground color light ivory, overlaid with uneven zones of orange-brown; columella with four plaits.

An abnormal example, in the collection of the author, is illustrated on plate 17, fig. 116.

Aulica exoptanda (Sowerby) 1849
(Plate 14, Figure 100)

Voluta exoptanda Sowerby, ms. in Reeve, Conch. Icon., plate 10, fig. 22, 1849. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 271, plate 12, (Thes. plate 261) fig. 136. Tryon: Man. Conch., vol. 4, p. 91, plate 26, fig. 72, 1882.

Alt. 105, diam. 48 mm.

Hab. Port Elliot and Port Lincoln, south Australia, frequently inhabited by hermit crabs.

Shell, cylindrically oblong, somewhat olive shaped, spire short, conical, obtusely papillary at the apex, whorls smooth, slanting round the upper part then rather swollen, and gradually attenuated; columella strongly four-plaited; aperture rather narrow and of a rich orange color, lip but little thickened; surface pale rose-orange, faintly two-banded, densely, promiscuously painted throughout with sharply waved, fine chestnut-red lines; columella richly colored like the interior.

Aulica guntheri guntheri
(E. A. Smith) 1886
(Plate 14, Figure 104)

Voluta guntheri Smith, J. C., 1886, vol. 5, p. 62. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 302, plate 17 (Thes. plate 516), figs. 162, 163.

Alt. 43, diam. 22 mm.

Hab. West Australia.

Shell small, solid, white, whorls, six; ornamented with numerous, irregular, dark-yellow longitudinal color-lines; periphery angulated and ornamented with a series of sharp tubercles; spire short; columella white, with four plaits; interior of labrum, white.

Aulica guntheri adcocki (Tate) 1888
(Unfigured)

Voluta guntheri var. adcocki Tate, 1888.

Alt. 53, diam. 25 mm.

Hab. Middleton to St. Francis Island, Australia, not common.

Shell small, yellowish-white, with wavy, narrow, chestnut, spiral lines; two chestnut spiral bands on body whorl; a spiral row of elongate tubercles on periphery; mouth oval-elongate; outer lip thickened internally bevelled off to a fine edge; columella with four folds, oblique,

increasing from below upwards.

Aulica imperialis (Lamarck) 1844
(Plate 15, Figure 107)

Voluta imperialis Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 385, 1844. Reeve: Conch. Icon., plate 16, fig. 56, 1849. Sowerby: Thes. Conch., vol. 1, p. 194, plate 54, fig. 102. Tryon: Man. Conch., vol. 4, p. 88, plate 26, fig. 65, 1882.
Voluta imperialis Solander: Port. Cat., p. 183, number 3913, 1786.

Alt. 125-200 mm.

Hab. Philippines.

Nucleus consisting of four whorls, shining, smooth, suture lightly impressed, flesh or orange color; post nuclear whorls, two and one-half, provided at the periphery with prominent, incurved hollow spines, eleven upon body whorl; last whorl very large, slightly reflected anteriorly; suture provided with secondary, indistinct tubercles the latter much closer together than the spines upon periphery; sculpture consisting of rather prominent growth lines, forming irregularly shaped, longitudinal ridges; ground light flesh color, overlaid with chestnut-brown blotches and fine zig-zag lines, forming usually two wide, ill-defined bands below the periphery on the body whorl; interior and columella area orange-yellow color; columella with four plaits of which the anterior is almost vertical; anterior canal short.

Aulica innexa (Reeve) 1849
(Plate 17, Figure 119)

Voluta innexa Reeve, Conch. Icon., plate 4, figs. 9a-b, 1849. Sowerby: Thes. Conch. vol. 3, 1st suppl., p. 271, plate 12, (Thes. plate 261), fig. 137.
Voluta rutilla var. innexa Reeve, Tryon: Man. Conch., vol. 4, p. 87, plate 25, fig. 54, 1882.

Alt. 100 mm.

Hab. Louisiade, near New Guinea.

Shell oblong-ovate, spire rather short; whorls smooth, slanting round the upper part and slightly angled, nodulously tubercled at the angle; columella strongly four-plaited; flesh white, longitudinally very finely knitted throughout with fine scarlet-brown lines; three narrow darker bands of color (Reeve).

Aulica luteostoma (Chemnitz(1795
(Plate 14, Figure 99)

Voluta luteostoma Chemnitz, Conch. Cab., vol. 11, plate 177, figs. 1707, 1708. Reeve: Conch. Icon., plate 20, fig. 47, 1849. Sowerby: Thes. Conch., vol. 1, p. 93, plate 51, fig. 59.
Voluta luteostoma Deshayes in Lamarck, An. s. Vert., ed. Deshayes, 10, 409, Tryon: Man. Conch., vol. 4, p. 88, plate 25, fig. 58, 1882.
Voluta chrysostoma Swainson, Exotic Conch., T. 45.

Alt. 62 mm.

Hab. East Indian Seas.

Nucleus consisting of three, smooth, pale colored whorls; post-nuclear whorls, three, subangular, crowned with short, acute vaulted spines, last whorl very large; shell turbinated, thick, smooth, whitish with angularly, flexuous, dark chestnut lines and continuous angular spots; spire short; aperture elongated, broader anteriorly, golden yellow within; outer lip, rounded, somewhat thickened; columella with four distinct plaits.

Aulica magnifica (Chemnitz) 1795
(Plate 14, Figure 101)

Voluta magnifica Chemnitz, Conch. Cab., vol. 11, p. 8, plates174, 175, figs. 1693, 1694. Reeve: Conch. Icon., plate 1, fig. 2, 1849. Sowerby: Thes. Conch., vol. 1, p. 200, plate 54, fig. 103.
Voluta magnifica Lamarck, An. s. Vert., ed. Deshayes, 10, p. 397. Tryon: Man. Conch., vol. 4, p. 89, plate 26, fig. 70, 1882.

Alt. 150-300 mm.

Hab. Australia.

Nucleus consisting of three whorls, very obsoletely granulose; post-nuclear whorls, three, ventricose, the last being extraordinarily large; shell rather thin, pale fulvous color, with three broad, orange-chestnut bands, marked with white and fuscus spots; aperture oblong, very large, posteriorly acuminated, wider in the middle; columlella with four, distinct, orange-colored plaits.

A beautiful species, one of the largest of the genus. Peculiar to the coast of Australia, south to the Tropic of Capricorn. It is found in some Australian estuaries according to Sowerby.

Aulica maria-emma (Gray) 1859
(Plate 14, Figure 103)

Voluta maria-emma Gray, Proc. Zool. Soc. London, 1859, p. 230, T. 48. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 271, plate 12, (Thes. plate 261) fig. 133. Tryon: Man. Conch., vol. 4, p. 91, plate 26, fig. 74, 1882.

Voluta grayae Crosse, J. de C., 19, 287, 1871. Tryon: Man. Conch., vol. 4, p. 91, 1882.

Alt. 140 mm.

Hab. Northwest Coast of Australia (Cox).

The original description is as follows:

Shell ovate, fusiform, pale brown, with narrow, deeply-waved, longitudinal, dark-brown lines, forming four more or less distinct, interrupted, spiral bands, consisting of the broader and straighter portions of the longitudinal lines; nucleus large, subcylindrical, with a regular spiral, smooth and rounded apex, without any crenulation near the suture; spire conical; whorls rather ventricose; outer lip rather arched.

It combines the characters of several species. It has the large, regular, smooth-whorled, spired nucleus, of *S. aulica, S. deshayesii, S. luteostoma,* etc., the fusiform shape of *S. rutila,* and especially of the smooth variety of *S. aulica* but it is entirely differently colored from both of them and all the large species of the genus, the coloring resembling that of *A. undulata*. Indeed some conchologists, to whom I have shown the specimen, have regarded it as a very large specimen of the latter species, which has lost its external polished coat, and with a larger nucleus than usual.

A careful examination of the shell at once shows the fallacy of such an idea. The form and structure of the nucleus are entirely unlike that of the genus *Amoria*. The shell is entirely destitute of any polished coat, which is the character of that genus, as is proved by the examination of the body whorl near the inner lip; for, though the very thin inner lip is almost entirely destroyed, yet the groove which indicates its extent is well marked by a rather broad impressed line, defining its limits and showing that it was not even extended over the lower part of the body whorl of the shell, much less over the extreme surface of it.

Gray named this species after his wife, Maria-Emma Gray, who was the author of "Figures of Molluscous Animals for the use of Students" and also an industrious collector of shells.

Aulica nivosa (Lamarck) 1844
(Plate 17, Figure 121)

Voluta nivosa Lamarck, An. s. Vert., edit. Deshayes, vol. 10, p. 389, 1844. Reeve: Conch. Icon., Plate 7, fig. 17, 1849. Tryon: Man. Conch., vol. 4, p. 86, plate 25, fig. 53, 1882.

Voluta nivosa Broderip in Sowerby, Thes. Conch., vol. 1, p. 200, plate 51, figs. 63, 64.

Alt. 62-88 mm.

Hab. Garden Island, Australia.

Nucleus consisting of three whorls, the latter two provided with low, nodulous processes upon the summit, often whitish in contrast to the dark surface; post-nuclear whorls, three, slightly carinated; suture, regular, descending anteriorly adjacent to body whorl; sculpture of fine growth lines, together with feeble, spiral striae; columella with four plaits, the

anterior plait descending, the three posterior oblique; ground color, dirty white; showing through cafe-aulait color as white flecks; two indistinct darker bands below the periphery and longitudinal streaks of brown above and extending upon the spire.

Aulica nobilis nobilis (Solander) 1786
(Plate 16, Figures 111-112)

Voluta scapha Gmelin, Syst. Nat., 3468, 1788. Reeve: Conch. Icon., pl. 16, fig. 37, 1849. Sowerby: Thes. Conch., vol. 1, p. 194, pl. 46, figs. 1, 2; pl. 48, fig. 35. Tryon: Man. Conch., vol. 4, p. 89, pl. 26, fig. 68, 1882. Chenu: Man. de Conch., p. 186, fig. 953, 1859. Maxwell Smith: World-Wide Sea Shells, p. 66, fig. 887, 1940.
Voluta nobilis Solander, Port. Cat., p. 6, number 89; p. 172, number 3711; p. 183, number 3926, 1786. Martini: Conch. Cab., 3, figs. 774-6.

Alt. 85-125 mm.

Hab. Polynesia; Singapore, on the reefs (H. Cuming); China.

Nucleus consisting of four whorls; suture lightly impressed, apex obtuse; post-nuclear whorls, two; suture, rather deep, slightly channeled; sculptrue consisting of fine growth-lines, which become raised and rib-like at the suture, where they are curved and occasionally form blunt low nodules; ground, dark flesh color, overlaid with a pattern of zig-zag lines and blotches of chestnut brown; nucleus often darker brown; brown spots often present upon labrum and upon posterior "wing"; columella with four plaits, the anterior plait extending to the recurved anterior end; parietal wall generously overlaid with white callus; interior, very pale flesh color.

Aulica nobilis fasciata (Schubert and Wagner) 1829
(Unfigured)

Voluta fasciata Schubert and Wagner, Conch. Cab., T. 216, figs. 3029, 3030, 1829.

Alt. 85-125 mm.

Hab. Same as preceding.

The banded form.

Aulica norrisi (Gray) 1838
(Plate 17, Figure 117)

Voluta norrisi Gray, Jardine's Annals, 1, p. 414, 1838. Tryon: Man. Conch., vol. 4, p. 86, plate 25, fig. 55, 1882.
Voluta norrisi. Sowerby: Proc. Zool. Soc. London, p. 150, 1844; Thes. Conch., vol. 1, p. 201, plate 51, fig. 65. Reeve: Conch. Icon., plate 7, fig. 15, 1849.

Alt. 62-75 mm.

Hab. Dupuch's Island, Australia.

Nucleus consisting of three whorls, the latter two sculptured with low nodules, placed midway between the sutures; post-nuclear whorls two and one-half; suture undulating; whorls strongly shouldered, forming eleven, low, spiny, processes, similar projections upon penultimate whorl; sculpture consisting of growth lines, emphasized by brownish lines which are most prominent above the periphery; columella with four plaits; parietal wall keeled anteriorly; ground color buff, overlaid with grayish-brown blotches, forming indistinct bands; interior shading from a dark-brown labrum to pale grayish-brown; columella tinted with peach color.

Aulica piperata (Sowerby) 1844
(Plate 18, Figure 122)

Voluta piperata Sowerby: Proc. Zool. Soc. London, 1844, p. 150. Reeve: Conch. Icon., plate 7, figs. 16a-b, 1849. Chenu: Man. de Conch., p. 186, fig. 954, 1859.
Voluta piperita Sowerby, Thes. Conch., vol. 1, p. 199, plate 51, fig. 62. Tryon: Man. Conch., vol. 4, p. 87, plate 26, fig. 60, 1882.
Voluta macgillivrayi Cox, Zool. Proc., T. 47, fig. 9, 1873. Tryon: Man. Conch., vol. 4, p. 87, plate 27, fig. 76, 1882.

Voluta ceraunia Crosse, J. de C., 3rd series, 20, 148, T. 4, fig. 1, 1880. Tryon: Man. Conch., vol. 4, p. 87, plate 27, fig. 78, 1882.

Alt. 62-75 mm.

Hab. Woodlock Island; New Georgia, Solomon Islands (Brazier).

Nucleus consisting of three and one-half whorls; the latter one and one-half whorls faintly nodulous; post-nuclear whorls two and three-quarters; suture very lightly impressed; sculpture consisting of fine growth lines; columella with four plaits, the anterior descending, the three posterior oblique; ground color, cream, patterned with rather widely spaced, brownish blotches, forming upon the body whorl three or more poorly defined bands; aperture large; columella and aperture brilliant pink-orange.

Aulica punctata (Swainson) 1822
(Plate 18, Figure 128)

Voluta punctata Swainson, Zool. Illust., series 1, plate 161, 1822. Cox, in J. de C., vol. 19, p. 77, plate 5, fig. 2, 1871. Reeve: Conch. Icon., plate 21, species 52, 1849. Sowerby: Thes. Conch., vol. 1, p. 198, plate 53, figs. 89, 90; vol. 5, 2nd suppl., plate 15 (Thes. plate 514) fig. 149. Tryon: Man. Conch., vol. 4, p. 89, plate 27, fig. 80, 1882.

Alt. 75 mm.

Hab. East Australia; Bellinger River and Port Jackson, Australia; southern coast of New Caledonia.

Shell nearly oval, thickish, smooth, pale fulvous with darker, squarish spots disposed in rows, and sprinkled over with dots of the same color; spire rather short, conical, with an obtuse apex, whorls, few, the last with small tubercles posteriorly; columella with four distinct white folds.

Aulica pulchra pulchra (Sowerby) 1825
(Plate 18, Figure 124)

Voluta pulchra Sowerby, Tankerville Cat., app. p. 28, plate 4, fig. 2, 1825. Reeve: Conch. Icon. plate 21, fig. 54, 1849. Sowerby: Thes. Conch, vol.1, p.199, plate 51, fig. 61. Chenu: Man. de Conch., p. 190, fig. 969. Tryon: Man. Conch., vol. 4, p. 86, plate 25, fig. 50, 1882. Maxwell Smith: World-Wide Sea Shells, p. 65, fig. 875, 1940.

Alt. 68 mm.

Hab. Great Barrier Reef, Australia; Heron Island, Australia (MacGillvary).

Nucleus consisting of three and one-half whorls, covered with fine spiral striae and longitudinal riblets; ground color and riblets whitish, the remainder pale corn-yellow; post-nuclear whorls three; suture moderately impressed; body whorl with nine, regularly placed, slight recurved nodules at the periphery; similar nodules upon the spire; spiral sculpture consisting of fine striae; ground color china white with a violet cast, overlaid with a violet-rose and pale orange pattern, leaving pyramidal spaces of the ground color showing through, these in turn, regularly accented by the presence of dark, longitudinal, chocolate colored dots and streaks.

Aulica pulchra wisemani (Brazier) 1871
(Unfigured)

Voluta wisemani Brazier, J. de C., vol. 19, p. 78, plate 5, fig. 1, 1871. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 297, plate 14 (Thes. plate 513) fig. 139. Tryon: Man. Conch., vol. 4, p. 86, plate 25, fig. 51, 1882.

Alt. 73 mm.

Hab. Northeast Australia.

Aulica rutila rutila (Broderip) 1825
(Plate 18, Figure 125)

Voluta rutila Broderip, Zool. Journ., vol. 2, p. 30, T. 3, 1825, Reeve: Conch. Icon., plate 4, fig. 8, 1849. Sowerby: Thes. Conch., vol. 1, p. 200, plate 46, figs. 5, 6. Tryon: Man. Conch., vol. 4,

p. 87, plate 25, fig. 56, 1882. Chenu: Man. de Conch., p. 186, fig. 952, 1859. Maxwell Smith: World-Wide Sea Shells, p. 66, fig. 886, 1940.

Alt. 75-88 mm.

Hab. Northeast Australia; New Guinea (Brazier).

Nucleus consisting of three whorls, slightly nodulous at periphery; suture rapidly descending adjacent to final whorl, whitish, shining; post nuclear whorls two and one-half, undulating, slightly channeled; spire short, whorls concave between slightly keeled periphery and suture; body whorl bluntly keeled at periphery and showing indistinct nodules; ground color light ivory, overlaid with streaks of yellowish brown, and forming several, irregular, rusty-red bands; sculpture consisting of indistinct spiral striae and fine longitudinal growth lines; columella with four plaits; interior flesh color, color pattern extending inside the parietal wall posteriorly.

Aulica rutila ruckeri (Crosse) 1867
(Plate 18, Figure 129)

Voluta ruckeri Crosse, J. de C., vol. 15, p. 144, 1867, and vol. 16, p. 97, pl. 1, fig. 1, 1868. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 299, pl. 15 (Thes. pl. 514), fig. 148. Tryon: Man. Conch., vol. 4, p. 87, pl. 27, fig. 75, 1882.

Alt. 65 mm.

Hab. New Georgia, Solomon Islands (type locality).

Distinguished from *rutila rutila* by the shorter spire, smaller nucleus and presence of constricted labrum. Intermediate examples indicate the inadvisability of considering this a valid species.

Aulica rossiniana (Bernardi) 1859
(Plate 14, Figure 102)

Voluta rossiniana Bernardi, J. de C., vol. 7, p. 377, 1859; also vol. 8, p. 127, pl. 1, fig. 1, 1860. Tryon: Man. Conch., vol. 4, p. 88, pl. 26, fig. 64, 1882.

Alt. 175 mm.

Hab. Isle of Pines, New Caledonia.

Nucleus consisting of four whorls; apex low; post-nuclear whorls three; suture undulating, particularly upon body-whorl; sculpture consisting of rather fine growth-lines and indistinct broken spiral and oblique striae, together with a few broken incised lines, widely spaced; ground color and interior ivory, overlaid with a yellowish brown pattern, forming irregularly shaped triangular tent-like markings of ivory; aperture broad; columella with five, sharp, rather elevated plaits, the anterior plait descending vertically in a long sweep to the anterior termination; peripheral spines comparatively short, partially hollow, rather sharp, each one extended anteriorly upon the body whorl to form a longitudinal rounded rib, the latter extending only half way to the anterior end.

Aulica scafa (Solander) 1786
(Plate 17, Figures 118-120)

Voluta scafa Solander, Portland Cat., 1786, no. 969a, p. 136.
Voluta volva Gmelin, Syst. Nat. Ed. 13, p. 3457, 1791.
Voluta punctata Kiener (not Swainson).
Voluta flavicans Gmelin, Syst. Nat., p. 3464, 1788. Reeve: Conch. Icon., pl. 19, fig. 45, 1849. Tryon: Man. Conch. vol. 4, p. 91, pl. 26, fig. 71, 1882.
Voluta volvacea Lamarck, Ann. Mus. Hist. Nat. (Paris) vol. 17, 1811. Sowerby: Thes. Conch. vol. 1, p. 195, pl. 46, figs. 3-4; also pl. 51, fig. 61?; vol. 3, 1st suppl. p. 269.
Voluta signifer Broderip, Proc. Zool. Soc. London, 1847, p. 232. Tryon: Man. Conch. vol. 4, p. 91, (according to Tryon *V. signifer* is an elongated *flavicans* with a lip not quite mature).

Alt. 65-80 mm.

Hab. Tasmania; Straits of Magellan?

Nucleus consisting of three whorls, the first sculptured with rounded nodules, tilted; post-nuclear whorls three, the last very large and posteriorly obtusely subangular; provided with about six, rather sharp, partially open or closed spiny processes; shell smooth, surface silk-like, ground color including nucleus ivory, overlaid with dull brown, widely spaced blotches; suture adjacent to body whorl irregularly crossed by raised and curved extensions of growth lines, the terminations of the latter forming a wavy, incised line upon the pun-ultimate whorl, adjacent to the aforementioned suture; aperture large, broad; columella with four strong plaits.

Aulica sophia (Gray) 1846
(Plate 17, Figure 114)

Voluta sophia Gray, Ann. Mag. Nat. Hist., series 1, 1846, vol. 18, p. 431. Reeve: Conch. Icon., pl. 10, fig. 21, 1849. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 270, pl. 12 (Thes. pl. 261) fig. 132. Cox: Dist. Australian Volutes, p. 17. Crosse, J. de C., 1871, vol. 19, p. 279, species 13.
Voluta (Scapha) sophia Gray, Angas: Proc. Zool. Soc. London, 1864, p. 52, species 13.
Voluta (Vespertilio) sophia. Kobelt: Jahrb., deutsch. Malak. Gesellsch., 1877, p. 304, species 12.
Aulica sophia. Brazier: (Chevert Expd. Shells) Proc. Linn. Soc. New South Wales, vol. 1, p. 205, number 23.
Voluta (Vespertilio) sophiae. Tryon: Man. Conch., vol. 4, p. 87, pl. 25, fig. 57, 1882.

Alt. 62 mm.

Hab. Port Essington, North Australia; Torres Strait, from low water to 30 fathoms (Brazier).

Nucleus large, tilted, consisting of about three whorls, nodules at periphery bead-like, about sixteen upon the final whorl; suture well impressed; post-nuclear whorls about three; eight nodules to the whorl; suture interrupted; sculpture consisting of fine spiral striae and closely spaced growth-lines; columella with four primary plaits and one or two plait-like processes extending anteriorly, but somewhat oblique, upon the wall.

The presence of four rows of distant chestnut-red spots constitute the chief difference between this species and *V. norrisi*.

Aulica translucida (Verco) 1896
(Unfigured)

Voluta translucida Verco, Trans. Royal Soc. South Australia, vol. 20, p. 217, pl. 6, figs. 4, 4a, 1896.

Alt. 40, diam. 16 mm.

Hab. Backstairs Passage, Newland Head; Yatala Shoal, 6-22 fathoms, rare.

Shell very thin, translucent, smooth, glistening; a narrow spiral reddish-brown line close beneath the suture; axial, narrow, curved reddish-brown lines, about sixteen in body whorl, composed of minute zig-zags or of small spirally elongated spots; two indefinite spiral color bands encircle the whorl; four post-nuclear whorls, slightly convex; aperture narrowed above by the fold of the outer lip, dilated below, basal notch wide, shallow; outer lip thin, convex; columella with four folds.

Aulica tissotiana (Crosse) 1867
(Plate 18, Figure 123)

Voluta tissotiana Crosse, J. de C., vol. 15, p. 195, pl. 6, fig. 6, 1867. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 301, pl. 16 (Thes. pl. 515), fig. 157.

Alt. 92, diam. 49 mm.

Hab. North Australia (Fischer), dubious.

Shell elongate ovate, thick, shining; irregularly painted with zones of brown spots; spire moderately elevated; nucleus blunt; suture impressed; aperture moderately wide; interior yellowish; columella with four plaits.

Allied to *V. scapa* of which it is possibly a subspecies.

Aulica vespertilio vespertilio (Linné)
(Plate 19, Figures 131-132;
Plate 18, Figure 126)

Voluta vespertilio Linné, Syst. Nat., ed. 12, p. 1194, number 428. Reeve: Conch. Icon., pl. 5, fig. 11a, 1849. Sowerby: Thes. Conch., vol. 1, pl. 47, figs. 15, 21, 22. Wood: Index Test., p. 107, pl. 21, fig. 151, 1856. Tryon: Man. Conch., vol. 4, p. 86, pl. 25, fig. 43, 1882.

Alt. 75-120 mm.

Hab. Indian Ocean; Moluccas; Papua, Madras, India (Melvill and Standen).

Nucleus (see Pl. 26, Fig. 185) consisting of three and one-half whorls, broadly shouldered; nodules rounded, blunt, prominent; about nine to the last whorl; sculptured with spiral striae; apex low; postnuclear whorls two and one-half; suture undulating; growth lines prominent; seven conspicuous recurved spines upon body whorl, spines short but sharp upon spire; columella with four plaits; outer lip thickened, usually darker inside; aperture whitish; ground color variable, usually ornamented with an irregular, zig-zag pattern and a tendency toward indistinct bands.

This shell commonly known as the Bat Volute was thought to have been named thus by Linneus on account of its resemblance to the hooked claws on a bat's wing.

Aulica vespertilio mitis (Lamarck) 1844
(Plate 19, Figure 130)

Voluta mitis Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 388, 1844. Reeve: Conch. Icon., pl. 5, fig. 11c, 1849. Sowerby: Thes. Conch., vol. 1, pl. 47, figs. 18, 23? Tryon: Man. Conch., vol. 4, p. 86, pl. 25, fig. 49, 1882.

Alt. (of specimen figured by Reeve) 102 mm.

Hab. Eastern Seas.

This subspecies attains an oblong cylindrical form, with tubercles partially obsolete.

Aulica vespertilio pellis-serpentis
(Lamarck) 1844
(Plate 25, Figure 173)

Voluta pellis-serpentis Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 386, 1844. Reeve: Conch. Icon., pl. 5, fig. 11d, 1849. Sowerby: Thes. Conch., vol. 1, pl. 47, fig. 16. Tryon: Man. Conch., vol. 4, p. 86, pl. 25, fig. 46, 1882. Watson: Challenger Rept., part Gastropoda, p. 254, 1885.

Alt. (of specimen figured by Reeve) 115 mm.

Hab. Eastern Seas.

In this form the color is more elaborately reticulated, and has little indication of the triangular and tortuous lines which distinguish the other subspecies.

Aulica vespertilio lineolata (Kuster) 1841
(Plate 25, Figure 175)

Voluta lineolata Kuster, Conch. Cab., (ed. Kuster), p. 190, T. 36, fig. 6, 1841. Tryon: Man. Conch., vol. 4, p. 86, pl. 25, fig. 52, 1882.

Alt. 75-120 mm.

Hab. Eastern Seas.

Aulica vespertilio serpentina
(Lamarck) 1844
(Plate 18, Figure 127)

Voluta serpentina Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 390, 1844. Reeve: Conch. Icon., pl. 5, fig. 11b, 1849. Sowerby: Thes. Conch., vol. 1, pl. 47, figs. 17, 19, 20, 23. Tryon: Man. Conch., vol. 4, p. 86, pl. 25, fig. 47, 1882. Kuster: Conch. Cab., (ed. Kuster), p. 190, species 44.
Voluta vespertilio Linné, Chenu: Man. de de Conch., p. 186, fig. 950, 1859. Maxwell Smith: World-Wide Sea Shells, p. 66, species 880, 1940.

Alt. (of specimen figured by Reeve) 111 mm.

Hab. Eastern Seas.

Of more oblong growth, less strongly tubercled than the other subspecies. It is marked with thin tortuous lines of painting, varying from dark olive-brown to bright scarlet or orange.

Aulica verconis (Tate) 1892
(Plate 24, Figure 166)

Voluta Verconis Tate, Trans. Proc. and Report of Royal Society of South Australia, 15, p. 125, 1892.

Alt. 23.5-34 mm.

Hab. 13 fathoms in Yankalilla Bay, St. Vincent Gulf; 30 fathoms off Corney Point, Spencer Gulf (both by Verco); Investigator's Straits, dead shells (Zietz, in S. Aust. Museum), also in 22 fathoms (Verco).

Elongate fusiform, spire turrited, short; aperture about two-thirds the total length.

Nucleus of two and one-half smooth whorls; spire whorls three and one-half, the anterior ones angulated antemedially and nodosely-plicate on the angulation, extending to the anterior suture, but evanescent towards the posterior suture. Body-whorl with ten nodosities on the periphery, abruptly terminating plications, which occupy the median area; at about the anterior fourth the suture commences to ascend on the penultimate whorl, finally attaining to the angulation; outer lip incrassated, but bevelled off inside to a thin simple edge; columella with four plications.

The sculpture consists of axial linear grooves, hardly visible by the unaided eye, and transverse wavy-striae; the latter occur on the spire-whorls and the shoulder of the body-whorl, and are visible only by the aid of a lens.

The color is whitish, with intricate linear fulvous markings; chestnut spotted around the posterior suture, and on the body-whorl, also about midway between the angulation and the front.

In its general characters this species resembles a dwarf *V. kreuslerae* Angas, being about one-third of its size; from which it differs by its proportionately shorter spire (the ratio of the total length to that of aperture in *V. kreuslerae* is 100 to 52), more angulated whorls, by the ascension of the anterior part of the body-whorl on the spire, and by its wavy-striated surface. The last character, which it has in common with *Volutoconus coniformis* Cox, is very exceptional in the genus.

Genus VOLUTOCONUS Crosse 1871

Volutoconus Crosse, 1871, J. de C., vol. 19, p. 306.

Genotype: *Voluta coniformis* Cox.

Range: Australia.

Shell oblong, subcylindrical, longitudinally and transversely striate; spire short and obtuse; columella plaits consisting of four slightly developed teeth.

Volutoconus coniformis (Cox) 1871
(Plate 20, Figure 139)

Voluta coniformis Cox, J. de C., vol. 19, p. 74, pl. 4, fig. 1, 1871. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 298, pl. 15 (Thes. pl. 514) fig. 145. Tryon: Man. Conch., vol. 4, p. 100, pl. 30, fig. 129.

Alt. 70 mm.

Hab. Nichol Bay, northwest Australia.

Shell solid, yellowish brown, with three faint broad chestnut bands together with irregular or triangular large and small spots and blotches; spire low; six convex whorls; four plaits on columella.

Genus CALLIPARA Gray 1855

Callipara Gray, 1855, Zool. Proc. p. 62.

Genotype: *Callipara bullata* Swainson.

Range: South Africa.

Shell oblong, subcylindrical; spire short; nucleus small; columella with three plaits.

Callipara bullata (Swainson) 1829
(Plate 20, Figure 136)

Voluta bullata Swainson, Zool. Illust., series 2, vol. 1, pl. 15, 1829. Reeve: Conch. Icon., pl. 21, fig. 55, 1849. Sowerby: Thes. Conch., vol. 1, p. 206, pl. 53, fig. 88. Tryon: Man. Conch., vol. 4, p. 100, pl. 29, fig. 116, 1882 (copy of Sowerby). Chenu: Man. de Conch., p. 188, fig. 956, 1859. Maxwell Smith: World-Wide Sea Shells, p. 66, fig. 892, 1940.

Alt. 60 mm.

Hab. Port Elizabeth (Sowerby), Algoa Bay (Reeve), South Africa.

Shell smooth, rather thin; patterned with chestnut spots and angular and undulated lines; spire short, obtuse; whorls four and one-half, the last very large.

This species externally resembles *Conus bullatus* Linné.

Genus CYMBIUM (Bolten) Roeding 1798

Cymbium Bolten (Roeding), Catalog 1798.
Melo Humphrey: Mus. Calonn., 1797. Sowerby: Genera of Shells, 1827, also other authors.

Genotype: *Melo diadema* Lamarck, now *Cymbium cithara cithara* (Sol.) Lamarck.

Range: Indian Ocean, Polynesia and adjacent seas.

Shell large, ventricose, thin; spire short; nucleus very large, obtuse, shining (Dall designates the *Melo*-type nucleus to include all species of *Melo* and *Voluta scapha*, *V. magnifica* and *V. imperialis*); aperture wide, outer lip simple, acute; axis almost or quite pervious and instead of a central, solid pillar provided with a thickened process corresponding to a very slender and twisted columella; plaits very oblique; shell obliquely truncated anteriorly.

Cymbium aethiopica aethiopica (Linné) 1766
(Plate 22, Figure 150; also frontpiece)

Voluta aethiopica Linné: Syst. Nat., 1195, 1766.
Melo aethiopicus. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 272, pl. 4 (Thes. pl. 262) fig. 33; vol. 1, pl. 81, fig. 9; pl. 82, fig. 13, 14, 19. Reeve: Conch. Icon.

Alt. 150-300, diam. 100-150 mm.

Hab. Indian Ocean, Philippines, Japan.

Shell sub-ovate, ventricose, of yellowish-cinnamon color; spines short, frequent, suberect; columella with from three to four plaits; epidermis thin, of a greenish-brown color.

Cymbium aethiopica broderipii (Gray) 1834
(Plate 22, Figure 147)

Voluta broderipii Gray. Griffith's Anim. King., vol. 12, T. 26, 1834.
Melo broderipii Sowerby: Thes. Conch., vol. 1, p. 415, pl. 83, figs. 26, 27.
Melo aethiopica var. broderipii Tryon: Man. Conch., vol. 4, p. 81, pl. 23, figs. 20, 21, 1882.
Melo regius Broderip (non Schubert and Wagner).

Alt. 200 to 350 mm.

Hab. Manila Bay, Philippines.

Shell very ventricose, tumid, whitish, and inscribed with stripes and spots of a reddish-chestnut color; spines short, open and thickly set; columella with four plaits; epidermis brownish, thin. This supspecies varies much in size and color, but the spire is usually well produced. When very old, individuals seem to lose the power of secreting spines.

Cymbium aethiopica nautica (Lamarck) 1844
(Plate 22, Figure 151)

Voluta nautica Lamarck, An. s. Vert., ed. Deshayes, 10, p. 374, 1844.

Melo nauticus. Sowerby: Thes. Conch., vol. 1, p. 414, pl. 32, figs. 10-12.
Melo aethiopica var. nautica Tryon: Man. Conch., vol. 4, p. 81, pl. 23, fig. 19, 1882.

Alt. 150-200 mm.

Hab. Polynesia?

Spines close set, converging toward the apex.

Cymbium aethiopica regia (Schubert and Wagner) 1829
(Plate 22, Figure 153)

Melo regia Schubert and Wagner, Conch. Cab., 12, 13, T. 218, fig. 3038, 3039, 1829.
Melo regius. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 273, pl. 4, (Thes. pl. 262), fig. 31.
Melo aethiopica var. regia. Tryon: Man. Conch., vol. 4, p. 81, pl. 23, fig. 18, 1882.

Alt. 150-300 mm.

Hab. Polynesia.

Shell yellowish-brown with zones of white blotches (Tryon).

Cymbium cithara cithara (Solander) 1786
(Plate 22, Figure 146)

Voluta cithara Solander, Portland Catalogue, p. 96, 190, year 1786.
Voluta diadema Lamarck, An. s. Vert., 5 edit. Deshayes, 375, year 1844.
Melo diadema. Tryon: Man. Conch., vol. 4, p. 81, pl. 23, figs. 22, 23, 1882.
Voluta amphora Solander, Port. Cat., p. 30, number 708; p. 191, number 3874, 1786. Martini: Conch. Cab., 3, 780.

Alt. 150-325 mm.

Hab. Indian Ocean; Australia.

Nucleus consisting of three and one-half whorls, apex, elevated; whorls ornamented with low, closely placed axial riblets; two post-nuclear whorls; suture channeled, surface sloping downward from periphery to suture; sculpture consisting of fine, oblique broken, spiral striae and fine irregular growth-lines; eight or more hollow-pointed spines upon periphery of last whorl, additional spines upon penultimate whorl; columella with three plaits; ground color ivory, marked with chestnut, often forming interrupted zones, connected by zig-zag markings.

Cymbium cithara armata (Lamarck) 1844
(Plate 21, Figure 140)

Voluta armata Lamarck, An. s. Vert., ed. Deshayes, 376, vol. 5, 1844. Tryon: Man. Conch., vol. 4, p. 81, pl. 23, figs. 24, 25, 1882.
Melo armatus. Sowerby: Thes. Conch., vol. 1, p. 414, pl. 82, fig. 15, pl. 83, figs. 21, 22.
Voluta cithara Solander, Port. Cat., pgs. 96, 190, 1786.

Alt. 175 mm.

Hab. Eastern Seas.

Spines longer, less distant and more numerous than in *cithara cithara*, also continued to the edge of the last whorls.

Cymbium cithara umbilicatus (Broderip)
(Plate 22, Figure 148)

Melo umbilicatus Broderip in Sowerby, Thes. Conch., vol. 3, 1st suppl., p. 273, pl. 4 (Thes. pl. 262), fig. 32, vol. 1, pl. 82, fig. 18; pl. 83, figs. 29, 30.
Voluta ducalis Lamarck, An. s. Vert., ed. Deshayes, 10, 377.
Melo diadema var. ducalis. Tryon: Man. Conch., vol. 4, p. 81, pl. 23, fig. 26, 1882.
Melo mucronatus Brod.-Sowb. 1855.

Alt.

Hab. Australia.

In this subspecies the spines are, except in the young state, long, and the shoulder on which they rest high above the apex, leaving it in a hole or umbilicus.

Cymbium melo (Solander) 1786
(Plate 21, Figure 143;
Plate 26, Figure 184)

Voluta indica Gmelin, (non Sowerby), Syst. Nat., 3467. Chenu: Man. de Conch., p. 186, fig. 946, 1859.
Melo indicus. Sowerby: Thes. Conch., vol. 1, p. 413, plate 81, figs. 1-5.
Voluta melo Solander, Port. Cat., p. 41, number 969, 1786. Martini, Conch. Cab., 3, figs. 772, 773.
Melo indica. Tryon: Man. Conch., vol. 4, p. 80, pl. 23, fig. 14, 1882.

Alt. 150-275, diam. 82-200 mm.

Hab. Indian Ocean.

Shell very ventricose, ovate, globose, yellow, yellowish-red or ruddy-orange, tessellated with chestnut spots or stripes, disposed for the most part in transverse lines which gird the body whorl; spire entirely covered in full-grown shells, in old individuals, also the apex; in young shells, the latter always bare and prominent.

A juvenile shell is shown in figure 143, the nucleus not yet immersed by the spire.

Cymbium miltonis (Gray) 1834
(Plate 22, Figure 154)

Voluta miltonis Gray, in Griffith's Anim. King., vol. 12, T. 29, 1834.
Melo miltonis. Sowerby: Thes. Conch., vol. 1, p. 415, pl. 83, figs. 24, 25.
Melo diadema miltonis. Tryon: Man. Conch., vol. 4, p. 82, pl. 23, fig. 28, 1882.
Melo cylindratus Broderip 1855.

Alt.

Hab. Swan River, Australia.

Shell subcylindrical, thin, whitish or pinkish, boldly painted with angulated stripes and spots, which have sometimes a flamy or lightning-like character in their shape. The spire, somewhat produced, is adorned with shortish, sharp spines, broad at their bases and incurved towards the apex at their points. Pillar is three-plaited, though there is sometimes a trace of a fourth plait, as is the case in many species. The junction of the upper extremity of the outer lip, with the body of the shell, is at a lower point than any of the preceding species, and hence we find the spire more produced (Broderip).

Cymbium tessellata (Lamarck) 1844
(Plate 22, Figure 152)

Voluta tessellata Lamarck, An. s. Vert., ed. Deshayes, 10, 377, vol. 5, 1844.
Melo tessellatus. Sowerby: Thes. Conch., vol. 1, p. 413, pl. 71, figs. 6-8.
Voluta haustrum Solander, Port. Cat., p. 137, number 3054, 1786. Martini, Conch. Cab., 3, 781.
Melo tessellata. Tryon: Man. Conch., vol. 4, p. 80, pl. 23, fig. 15, 16, 1882.

Alt. 150, diam. 100 mm.

Hab. Indian Ocean. China.

Shell ventricose, of a straw or sulphurous color, banded with three and sometimes two zones of tessellated spots. The spines which are broad at the base and decumbent, converge towards the apex, the tip only of which, in fine specimens, rises above them. Epidermis greenish brown and thin.

Genus CYMBA Broderip 1826

Cymba Broderip, 1826, in Sowerby's Genera of Shells.
Cymbium Klein: 1753 (non-binomial).
Yetus Adanson, 1757 (non-binomial).

Genotype: *Cymba proboscidalis* Brod.

Range: West Africa to southern Spanish shores of the Mediterranean; Portugal, Canaries.

Shell oval-oblong, ventricose, thin; suture or adjacent whorl usually channeled or turrited; nearly involute; nucleus large, globular, forming an obtuse papillary apex; whorls few, forming a flat edge around the nucleus; aperture oblong, wide; columella twisted, with several oblique plaits; outer

lip thin, simple.

The group is viviparous and the soft parts too large to entirely enter the shell.

Cymba cisium cisium (Lamarck) 1844
(Plate 21, Figure 141)

Voluta cisium Lamarck, An. s. Vert., ed. Deshayes, 10, 380, 1844.
Cymbium cisium. Tryon: Man. Conch., vol. 4, p. 79, pl. 22, fig. 7, 1882.
Cymba cymbium Linné et Auct, Sowerby: Thes. Conch., vol. 1, p. 410, pl. 79, figs. 6, 10; pl. 80, figs. 21, 26.
Cymbium cymbium. Tryon: Man. Conch., vol. 4, p. 79, (designations dubious). Chenu: Man. de Conch., p. 186, fig. 941, 1859.

Alt. 75-125 mm.

Hab. West Africa.

Shell irregularly ovate, marbled with white and brownish red, covered with a thin brown epidermis, which is coated for about one-third of the shell, with the enamel-like glaze, which takes its commencement near the pillar. The spire is deeply channeled and carinated, exposing the subglandiform apex, and forming with the subreflected, sharp upper border of the body whorl, a wide, spiral excavation. The upper edge of the outer lip recedes from the spire. The pillar, which is very much curved, has three plaits, and is bordered on the basal half, with a rich chestnut longitudinal band (Broderip).

Cymba cisium gracilis Broderip 1847
(Plate 22, Figure 149)

Cymba gracilis Broderip in Sowerby, Thes. Conch., vol. 1, p. 410, pl. 79, fig. 15; pl. 80, fig. 24, 1847.
Cymbium gracile, Tryon: Man. Conch., vol. 4, p. 79, pl. 22, fig. 5, 8, 1882.

Alt. 75-125 mm.

Hab. West Africa.

Shell, subcylindrical, clouded with white and reddish. The spire somewhat excavated, and the subglandiform apex conspicuous. The area much less, and the channeling much shallower than in *C. cymbium* (*C. cisium cisium*); the pillar, which has four plaits, much straighter, the aperture narrower, and the whole shell more slender and symmetrical. The sharp upper border of the lip is very much inflected towards the spire, and the shell is covered with a thin, brown epidermis, which is covered with the enamel-like glaze for about one-third of the shell, beginning near the pillar (Broderip).

Cymba pepo pepo (Solander) 1786
(Plate 21, Figure 144)

Voluta pepo Solander, Port. Cat., p. 87, number 1940; p. 100, number 2204, 1786. Martini, Conch. Cab., 3, figs. 768-770.
Voluta neptuni Gmelin, Syst. Nat., ex parte, fide Pfeiffer 3467, 1791-92.
Voluta navicula Gmelin, Syst. Nat., 3467, 1791-92.
Cymba neptuni Broderip in Sowerby: Thes. Conch., vol. 1, p. 407, pl. 79, figs. 14, 17; pl. 80, fig. 23.
Cymbium neptuni. Tryon: Man. Conch., vol. 4, p. 80, pl. 22, figs. 9-12; pl. 1, fig. 3, 1882.
Cymba patula Broderip in Sowerby: Thes. Conch., vol. 1, p. 408, pl. 79, fig. 7.
Cymba tritonis Broderip in Sowerby: Thes. Conch., vol. 1, p. 408, pl. 80, fig. 25.
Cymbium patulum. Tryon: Man. Conch., vol. 4, p. 80, pl. 22, fig. 11, 1882.
Cymbium navicula Gmelin. Tryon: Man. Conch., vol. 4, p. 80, 1882.

Alt. 150-250 mm.

Hab. West Africa.

Shell ovate, tumid, ventricose, of a browhish-red, covered with a strong brown epidermis, over which an enamel-like glaze is extended from the pillar over about a fourth part of the shell, leaving the epidermis of the back uncoated. In full grown specimens, the spire and apex are entirely concealed, and the upper border of the body whorl, which is carinated and somewhat reflexed, overhangs both, so as to form an open, somewhat round concavity. The pillar is four plaited (Broderip).

Cymba olla (Linné) 1766
(Plate 21, Figure 145)

Voluta olla Linné, Syst. Nat., 1196, 1766.
Cymba olla Linné. Sowerby: Thes. Conch., vol. 1, p. 410, pl. 79, figs. 3, 4, 11.
Cymbium olla Linné. Tryon: Man. Conch., vol. 4, p. 80, pl. 22, fig. 13, 1882. Reeve: Ann. Mag. Nat. Hist., 3rd series, 7, p. 273.

Alt. 80-125 mm.

Hab. Spanish shores of the Mediterranean; Portugal; Canaries; northwest Africa.

Shell ovate, ventricose, pale fulvous, covered with a thin pale-brown epidermis, which is covered with an enamel-like glze from near the pillar to about two-thirds of the shell. The sub-conical apex is exposed as well as the spire, which last, together with the upper part of the body whorl is rounded and deeply channeled. Pillar with two plaits (Broderip).

Cymba proboscidalis Broderip
(Plate 21, Figure 142)

Cymba proboscidalis Broderip in Sowerby, Thes. Conch., vol. 1, p. 409, pl. 79, fig. 2; pl. 80, figs. 22, 27. Chenu: Man. de Conch., p. 186, fig. 943, 1859.
Voluta proboscidale, Lamarck, An. s. Vert., ed. Deshayes, 10, p. 382. Tryon: Man. Conch., vol. 4, p. 79, pl. 22, figs. 1-4, 1882.
Cymba porcina Lamarck, An. s. Vert., ed. Deshayes, 10, p. 383, 1811. Broderip in Sowerby: Thes. Conch., vol. 1, p. 409, pl. 79, figs. 1, 5, 9, 16, 18; pl. 80, fig. 20. Chenu: Man. de Conch., p. 186, fig. 940, 1859. Tryon: Man. Conch., vol. 4, p. 79, pl. 22, figs. 3, 4, 1882.
Cymba rubiginosa Swainson, Exotic Conch., T. 28, Sowerby: Thes. Conch., vol. p. 409, pl. 79, figs. 12, 13; pl. 80, fig. 19.
Cymbium rubiginosum Swainson. Tryon: Man. Conch., vol. 4, p. 79, pl. 22, fig. 6, 1882.

Alt. 25-300 mm.

Hab. West coast of Africa.

Shell elongated, somewhat cylindrical but ventricose towards the middle, reddish yellow, which becomes paler in full-grown specimens, covered with a dark brown epidermis which is entirely coated in adults with the enamel-like glaze. The spire and apex are almost entirely obliterated in full-grown individuals, and the reflected upper border of the body whorl exposes a wide, somewhat excavated, snout-like area, from which the species obtains its name. The pillar has four plaits, the last being comparatively small (Broderlip).

Genus MAMILLANA Crosse 1871

Mamillana Crosse, 1871, J. de C., vol. XI, 3rd series, p. 308.

Genotype: "*Voluta*" *mamilla* Gray.

Range: Australasia.

The distinguishing feature is the remarkable development of the nucleus. The shells are large in size; the columella with few oblique plaits.

Mamillana mamilla (Gray)
(Plate 19, Figure 133;
Plate 24, Figure 163)

Voluta mamilla Gray, in Sowerby, Thes. Conch., vol. I, p. 207, pl. 1, figs. 57, 58 (juvenile) Gray: Proc. Zool. Soc. London, pl. 45, 1859. Reeve: Conch., Icon., pl. 19, fig. 44, 1849. Tryon: Man. Conch., vol. 4, p. 101, pl. 29, fig. 122. J. C., vol. 13, p. 278, note upon dead shells obtained from the lobster pots and inhabited by a large hermit-crab. J. de C., vol. 49, p. 10, 1901. Includes a fine engraving of an adult specimen from the collection of C. E. Beddome.

Alt. 150-200 mm.

Hab. Kangaroo Island, Australia; Tasmania (Angas). Bass Straits, North Australia; Western Port, Victoria.

Nucleus (see pl. 26, fig. 183) consisting of one gigantic mamilliform whorl, with apex on one side; surface wrinkled;

post-nuclear whorls, two and one-half; suture distinct; surface covered with strong, longitudinal growth lines; outer lip thin, china-like, extending upon the penultimate whorl almost to suture; columella oblique, with three, feeble plaits; heavy posterior wall callus; ground color brownish gray, overlaid with a sparse pattern of tan, forming designs resembling pyramids and arrows; nucleus, colored a dirty yellow; the aperture, whitish yellow; a broad zone of this color extends upon surface of body whorl; columella milky orange.

The nucleus of this shell was reported thus by Reeve in his Conchologia Iconica: "This shell is in a very immature state, and there can be little doubt of the swollen apex being a malformation."

Mamillana roadnightae (McCoy) 1881
(Plate 19, Figure 134)

Voluta roadnightae McCoy, Ann. du Mus., 5, series 8, 89, T. 7, figs. 1, 2, 1881. Tryon: Man. Conch., vol. 4, p. 96, pl. 30, fig. 128. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 298, pl. 14 (Thes. pl. 513) fig. 143. Mrs. Agnes Kenyon: Proc. Mal. Soc. London, vol. 3, p. 267; vol. 5, p. 10. (note on type specimen). W. T. Blanford: Proc. Mal. Soc. London, vol. 4, p. 184 (fate of type specimen).

Alt. 100-150 mm.

Hab. Red Bluff on the Ninety-Mile beach, Gippsland, south coast of Victoria, Australia (type locality).

Nucleus mammilliform, consisting of one and one-half swollen whorls, wrinkled; post-nuclear whorls, three and one-half, spire and first quarter of body whorl ornamented with numerous longitudinal ribs, which, upon the spire, are most prominent between the periphery and anterior suture, the ribs crossed by undulating spiral ridges which are most conspicuous between periphery and suture and anteriorly upon body whorl; surface with a silk-like lustre, ground color ivory white, columella area stained with peach color; two oblique posterior plaits and one anterior projection which extends posteriorly and outwardly to form the short canal; labrum whitish, thickened, reflexed.

Genus AMORIA Gray 1855

Amoria Gray, Zool. Proc. 1855, p. 64.
Scaphella Swainson, Zool. Ill. Series 2, vol. 2, pt. 19, pl. 87, 1832.

Genotype: "*Voluta*" *undulata* Lamarck.

Range: Seas of Australia.

Larval shell membranous, with a pointed styliferous nucleus; surface of adults usually smooth; suture usually rather indistinct.

Amoria canaliculata (McCoy) 1869
(Plate 4, Figure 38)

Voluta canaliculata McCoy, J. C., vol. 8, p. 202, 1869. Tryon: Man. Conch., vol. 4, p. 93, pl. 28, fig. 95, 1882.
Voluta harfordi Cox, Proc. Zool. Soc. London, 1869, p. 358, pl. 26, figs. 2, 2b. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 303, pl. 18 (Thes. pl. 517), fig. 170.

Alt. 42 mm.

Hab. Port Denison, Queensland; East Australia.

Apex obtuse; spire short; shell solid, polished, white, spotted with four pale spiral bands and longitudinal color-lines; suture deep, the edge channeled; whorls convex, the last angulated; aperture, elongated; columella with four conspicuous plaits.

Amoria caroli (Iredale) 1924
(Plate 4, Figure 36, 40)

Voluta caroli Iredale, P. L. Soc. N.S.W., XLIX, pt. 3, p. 258, 1926.
Voluta maculata Swainson, Appendix to Bligh Cat. Shells, p. 11, 1822; Exotic Conch. p. 23, pl. 38, pt. 5, Jan. 12, 1835. Reeve: Conch. Icon., vol. 1, p. 196, pl. 53, figs. 85, 86. Tryon: Man. Conch., vol. 4, p. 93, pl. 25, fig. 59, 1882. Sowerby: Thes. Conch. vol. 1,

p. 196, pl. 53, figs. 85, 86.

Alt. 55 mm.

Hab. Queensland, Australia.

Shell oblong, thickish, smooth, shining, fulvous, with several transverse bands formed of squarish chestnut spots; spire short, obtuse, with a large papillary nucleus of three and one-half to four volutions, the two remaining volutions only having the spots, and the last being posteriorly somewhat ventricose; aperture straight, lengthened, rather broad, fulvous within; columella with four distinct white folds (Sowerby).

Amoria ellioti (Sowerby) 1864
(Plate 4, Figure 39)

Voluta ellioti Sowerby, Court Journal, August 27, 1864 (adv. includes name, figures 1, 2, 3, description and distribution); J. de C. vol. 12, p. 338, 1864, also vol. 13, p. 25, pl. 3, fig. 19, 1865; Ann. Mag. Nat. Hist. 14, p. 263, 1864; Thes. Conch. vol. 2, 1st suppl., p. 272, pl. 11, figs. 126, 127, 1864. Tryon: Man. Conch. vol. 4, p. 92, pl. 30, fig. 123, 1882. Tomlin: Proc. Malac, Soc. London, vol. 24, p. 145, 1941.

Alt. 100 mm.

Hab. Australia.

Nucleus of three and one-half whorls, often two shades of flesh color; smooth, shining; suture moderately impressed; first post-nuclear whorl rapidly descending at suture; shell fusiform in shape, solid; outer lip thin; interior fawn color with a broad white zone adjacent to the outer lip; columella with four oblique plaits.

Amoria jamrachi Gray 1864
(Plate 24, Figure 164)

Amoria Turneri Jamrachi Gray, Ann. Mag. Nat. Hist., Sept. 1st, 1864.
Voluta jamrachi Gray, Sowerby: Thes. Conch. vol. 5, 2nd suppl., p. 298, pl. 14 (Thes. pl. 513), fig. 142.

Alt. 55, Lat. 24 mm.

Hab. West Australia.

According to Sowerby, this is an easily recognized species, and not to be confounded with *turneri* or *ellioti*. It appears to be characterized by the comparatively short spire. Sowerby's figure indicates a posterior projection upon the outer lip. In the same figure, the four columellar plaits are ill-defined.

Amoria gatliffi (Sowerby) 1910
(Plate 5, Figure 41)

Voluta gatliffi Sowerby, Ann. Mag. Nat. Hist., ser. 8, vol. 6, p. 611, fig. 1910.

Alt. 95, diam. 35 mm.

Hab. Port Keats, Northern Territory, Australia.

The original description is as follows:

Shell oblong, smooth, with only faint longitudinal striae or growth-lines; pale flesh or cream color, conspicuously marked with reddish-brown irregularly waved longitudinal streaks, which partly coalesce, forming two broken chain-like transverse bands, with strong mostly angular markings and here and there diamond-shaped spaces. Spire acuminated, rather sharp at the apex, then slightly convex; whorls smooth, very slightly convex; suture distinct, filled with a thin enamel, forming a light orange band. Body whorl long, rather cylindrical in form, tapering slightly at each end. Columella furnished with four very oblique plaits, and a prominent ridge crossing obliquely from the base of the shell and entering the aperture above the plaits gives the appearance of a fifth. Interior of the aperture smooth, shining, stained with orange-brown.

Possibly a subspecies of *pallida*. Certainly close to *pallida damoni*.

Amoria kingi (Cox) 1871
(Plate 4, Figure 37)

Voluta kingi Cox, J. de C., vol. 19, p. 76, pl. 4, fig. 2, 1871. Tryon: Man. Conch., vol. 4, p. 92, pl. 27, fig. 86, 1882. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 299, pl. 15 (Thes. pl. 514) fig. 146.

Alt. 75 mm.

Hab. King's Island, Bass Straits, Australia (Cox).

Post-nuclear whorls four; suture impressed; spire short; whorls convex, body whorl swollen, constricted anteriorly; aperture narrow; columella with four plaits; ground color yellowish, aperture orange; outer lip thickened.

Amoria macandrewi (Sowerby)
(Plate 5, Figure 45)

Voluta macandrewi Sowerby, Thes. Conch., vol. 5, 2nd suppl., p. 297, pl. 14 (Thes. pl. 513), figs. 140, 141. Tryon: Man. Conch., vol. 4, p. 179, pl. 53, fig. 536, 1882.

Alt. 55, Diam. 24 mm.

Hab. West Australia.

Shell subcylindrical, white, painted longitudinally with undulating brownish-yellow lines; spire conic, short, apex acute; whorls six, the three nuclear whorls convex, somewhat pellucid; columella with four plaits.

Amoria marmorata (Swainson) 1821
(Plate 5, Figure 46)

Voluta marmorata Swainson, Exotic Conch., 1st ed., part 1, August, 1821. Reeve: Conch. Icon., pl. 13, figs. 31a-b, 1849. Sowerby: Thes. Conch., vol. 1, p. 192, pl. 46, fig. 8. Tryon: Man. Conch., vol. 4, p. 92, pl. 28, fig. 89, 1882.

Alt. 100-165 mm.

Hab. East coast of Australia.

Nucleus of three whorls, apex moderately obtuse, suture slightly impressed, surface shining; post-nuclear whorls three and one-half; suture slightly channeled; sculpture consisting of fine, wrinkle-like surface of silky texture, with numerous, closely spaced, irregularly sized longitudinal growth lines, which become slightly nodulous and curved at the suture, forming low, occasionally sharp, nodulous spines at the periphery; the spines usually most prominent upon the spire and first quarter of the body-whorl; ground color ivory, overlaid with light chestnut-brown and bluish-gray blotches, forming several fairly distinct bands upon the body whorl; aperture five-sixths the length of the shell, yellowish inside; columella with four plaits, the anterior descending; shell slightly reflected anteriorly.

Amoria pallida pallida (Gray) 1834
(Plate 4, Figure 33;
Plate 5, Figure 43)

Voluta pallida Gray, Griffith's Animal Kingdom, Moll., T. 30, fig. 4, 1834. Maxwell Smith, World-Wide Sea Shells, sp. 873, p. 65, 1940.
Voluta volva Chemnitz, Conch. Cab. vol. 10, p. 143, pl. 148, figs. 1389-90. Reeve: Conch. Icon. sp. 24, pl. 11, fig. 24. Sowerby: Thes. Conch., vol. 1, pl. 53, fig. 91. Tryon: Man. Conch. vol. 4, p. 93, pl. 28, fig. 90, 1882.

Alt. 75 mm.

Hab. West Australia (abundant).

Shell whitish, often bandless, when present the yellow bands very indistinct together with a few longitudinal pale orange striations; interior yellowish brown or coffee-colored.

Amoria pallida damonii (Gray) 1864
(Plate 5, Figure 44)

Amoria turneri damonii J. E. Gray, Annals and Magazine of Nat. Hist. 3rd series, XVI, p. 238, Sept. 1864.
Amoria damonii Gray. Hedley: Proc. Roy. Geogr. Soc. Australasia, S. Aust. branch, 1916-18.

Alt. 65 mm.

Hab. Australia.

Shell with close angular intersecting lines, forming crowded triangular spots on the surface; the sutural callosity very dark.

The holotype was sent to the British Museum by Damon and was said to be marked much like *Oliva texturata*. Gray considered *damonii* near *reticulata*, differing chiefly in being more ventricose. Hedley apparently considered it a valid species. Not having access to the latter reference the author considers it best to assign *damonii* to a subspecific position pending further investigation.

Amoria pallida reticulata (Reeve) 1843
(Plate 5, Figure 42;
Plate 7, Figure 59)

Voluta reticulata Reeve, Proc. Zool. Soc. London, 1843, p. 144. Conch. Icon. pl. 11, figs. 25a-b, 1849. Sowerby: Thes. Conch., vol. 1, pl. 53, fig. 94; also vol. 1, p. 197. Tryon: Man. Conch. vol. 4, p. 94, pl. 28, fig. 93, 1882. Chenu: Man. de Conch., p. 188, fig. 966, 1859. Maxwell Smith: World-Wide Sea Shells, p. 65, figs. 876, 1940.

Voluta reevei Sowerby, Thes. Conch. vol. 3, 1st suppl., p. 269, pl. 49, figs. 47, 48 (apparently merely a broader form).

Alt. 75-110 mm.

Hab. West Australia.

Shell rather thin, pale ivory color, overlaid with three chestnut zones, forming tent-like patterns on the ground, interspaces also indistinctly patterned in the same manner; closely spaced, longitudinal dark streaks in front of the suture; spire short; aperture rather wide; columella with four plaits.

Amoria pallida turneri (Gray) 1834
(Plate 14, Figure 105A)

Voluta turneri Gray, in Griffith's Animal Kingdom, Moll., pl. 40, fig. 1, 1834. Reeve: Conch. Icon., pl. 12, figs. 27a-b, 1849. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 271, pl. 11 (Thes. pl. 260), fig. 129. Tryon: Man. Conch., vol. 4, p. 92, pl. 27, fig. 85, 1882. Chenu: Man. de Conch., p. 188, fig. 964, 1859. Maxwell Smith: World-Wide Sea Shells, p. 65, fig. 878, 1940.

Alt. 65 mm.

Hab. Australia.

Nucleus of about three whorls, large; suture lightly impressed; suture of remaining whorls somewhat undulating, crossed by terminations of the longitudinal color lines, which turn back and form V-shaped ornamentations; interior shading to dark orange-brown well inside; columella with four rather fine plaits.

Further examination, particularly of the soft parts, may prove this to be a valid species, as indicated by various authors. The peculiar color-pattern, together with the fine columellar plaits are the chief distinguishing characters of the shell.

Amoria praetexta (Reeve) 1849
(Plate 6, Figure 47)

Voluta praetexta Reeve, Conch. Icon., pl. 12, figs. 29a-b, 1849. Sowerby: Thes. Conch., vol. 3, 1st suppl., p. 271, pl. 11, (Thes. pl. 260) fig. 125. Tryon: Man. Conch., vol. 4, p. 94, pl. 28, figs. 94, 96, 1882.

Amoria turneri cumingii Gray, Ann. Nag. Nat. Hist., Sept. 1864. Tomlin, P.M.S.L., vol. 24, p. 145, 1941.

Alt. 37-50 mm.

Hab. North Australia.

Nucleus of three and one-half whorls, smooth, shining, suture very lightly impressed; post-nuclear whorls two and one-half, the first rapidly descending; ground color milky white, overlaid with golden-brown tracings, forming series of small tent-like markings of varying size; columella with three plaits.

Amoria spenceriana Gatliff 1908
(Plate 25, Figure 176)

Voluta (Amoria) spenceriana J. H. Gatliff, Victorian Naturalist, vol. 25, no. 5, September 10, 1908 (figured on pl. 4).

Alt. 55, diam. 21 mm.

Hab. North Queensland (J. F. Bailey).

Shell white, fusiform, smooth, polished, apex blunt, spire short, whorls six and one-half, including the nucleus; suture well defined on the later whorls, and becoming strongly channeled at the aperture; outer lip anteriorly expanded, edge acute, body whorl somewhat inflated at the upper portion; columella with three ascending plaits. Marked sparsely with light yellowish-brown, a few irregular lineal markings running down from the suture, and two series of broad equidistant bands of distant zig-zag lines on the body whorl; spotted below the suture, spots ceasing on the penultimate whorl, the remaining spiral whorls being without markings; salmon tinted in the interior.

According to Gatliff this species may readily be distinguished from its congeners by its expanded lip, only having three plaits, its short spire, also the outline and marking.

Its nearest ally appears to be *Amoria canaliculata* McKoy but E. A. Smith of the British Museum, who examined *spenceriana* considered it to be a valid species. It was named in honor of Professor W. Baldwin Spencer, one time president of the Field Naturalist's Club of Victoria. Holotype in the Gatliff collection. In the Australian National Museum there are two examples, without definite locality, which were purchased from Thatcher in the year 1880. They are larger and more solid than the holotype.

Amoria undulata undulata (Lamarck) 1844
(Plate 6, Figure 52)

Voluta undulata Lamarck, An. s. Vert., ed. Deshayes, vol. 10, p. 401, 1844. Reeve: Conch. Icon., pl. 11, fig. 26, 1849. Sowerby: Thes. Conch., vol. 1, p. 196, pl. 48, figs. 28, 29. Tryon: Man. Conch., vol. 4, p. 92, pl. 28, fig. 88, 1882. Chenu: Man. de Conch., p. 188, fig. 965, 1859. Maxwell Smith: World-Wide Sea Shells, p. 65, figs. 879 a-b, 1940. Watson: Voyage H.M.S. Challenger, part Gastropoda, p. 257, 1885.

Alt. 75-85 mm.

Hab. South Australia; Tasmania.

Nucleus small, planorboid, smooth, channeled, pale color; beginning of the first post-nuclear whorl indefinite; suture lightly impressed; exterior surface ordinarily cream white, but often subject to iron-colored stains, surface covered with a pattern of separated, undulating, chestnut-brown lines, which extend upon the spire to the nucleus; columella with four strong, well-rounded, primary plaits, the anterior slightly descending, occasionally with one or two additional secondary plaits, always between the three, posterior, primary plaits; labrum, well-thickened and externally forming several, longitudinal growth-layers, the external pattern hardly extending over this area, also sometimes showing an independent pattern; interior of the shell, cantaloupe orange color.

Amoria undulata angasii (Sowerby)
(Plate 6, Figure 48)

Voluta angasii Sowerby, Thes. Conch., vol. 3, 1st suppl., p. 271, fig'd. vol. 1, pl. 48, fig. 29. Tryon: Man. Conch., vol. 4, p. 92, pl. 28, fig. 87, 1882.
Voluta (Amoria) angasi Angas: Port Jackson Moll., Proc. Zool. Soc. London, 1867, p. 193, number 43.

Alt. 75 mm.

Hab. Australia, the metropolis being Port Lincoln.

A more compact and angulate shell than *S. undulata undulata*. Sowerby's figure shows three distinct, overlaid, revolving zones of darker color.

Amoria undulata sclateri (Cox) 1869
(Unfigured)

Voluta sclateri Cox, Proc. Zool. Soc. London,

1869, p. 358, pl. 26, fig. 3. Sowerby: Thes. Conch., vol. 5, 2nd suppl., p. 302, pl. 17 (Thes. pl. 516), fig. 164. Tryon: Man. Conch., vol. 4, p. 92, pl. 27, fig. 83, 1882.

Alt. 75 mm.

Hab. Tasmania.

Shell pure white, without markings. This may be merely an albinistic form but it appears advisable to retain the name pending further investigation.

Amoria zebra zebra (Leach) 1814
(Plate 6, Figure 55)

Voluta zebra Leach, Zool. Misc., vol. 1, pl. 12, fig. 1, 1814. Swainson: Zool. Ill. Ser. 2, vol. 2, pt. 19, pl. 87, 1832. Tryon: Man. Conch., vol. 4, p. 93, pl. 28, fig. 91, 1882. Sowerby: Thes. Conch., vol. 1, p. 195, pl. 53, figs. 83, 84.
Marginella radiata Lamarck: An. s. Vert., ed. Deshayes, 10, p. 436.
Voluta stragulata Schubert and Wagner, suppl. Conch. Cab. of Martini and Chemnitz, 1829.

Alt. 37-40 mm.

Hab. East Coast of Australia.

Nucleus of the bulbous type, whorls three, the last greatly developed upon one side, shining; post-nuclear whorls, two and three-quarters; suture irregular, more or less lightly channeled; ground color ivory, overlaid with longitudinal closely spaced, parallel, dark reddish-brown lines, which occasionally meet; four, primary anterior plaits on columella, secondary posterior plait present.

Amoria zebra lineata (Leach) 1814
(Plate 6, Figure 50)

Voluta lineata Leach, Zool. Misc., vol. 1, T. 12, fig. 2, 1814. Reeve: Conch. Icon., pl. 18, figs. 43a-b, 1849. Chenu: Man. de Conch., p. 188, figs. 961, 963, 1859. Maxwell Smith: World-Wide Sea Shells, p. 66, fig. 881, 1940.

Alt. 35-40 mm.

Hab. Australia.

Differs from *S. zebra zebra* in the possession of fewer and more separated longitudinal lines, which do not usually meet. Individuals of this subspecies are often broader and more compact than the typical shell.

Subfamily AURINIINAE*

Genus ADELOMELON Dall 1906

Adelomelon Dall, 1906, Nautilus, vol. 19, number 12, p. 143. *Scaphella, Cymbiola*, etc., of authors, not of Swainson, 1832.

Genotype: "*Voluta*" *ancilla* Solander.

Range: The Americas, principally South America.

Adelomelon ancilla (Solander) 1786
(Plate 25, Figure 171)

Voluta ancilla Solander, in Port. Cat., p. 137, number 3061, 1786. Founded on D'Avila's "grand Buccin Magellanique) vol. 1, pl. 8, fig. s, number 181, p. 140, 1767; *cf.* also Diderot. Encycl. Recueil des Planches, 6, pl. 67, fig. 9, 1768. Favanne: Conchyl. pl. 28, fig. E, 1780. Kammerer: Cat. Rudolstadt, pl. 7, fig. 1, 1786.
Voluta magellanica Chemnitz: Conch. Cab., 10, pp. 138-39, 1788, *ex parte*, figs. excl.
Voluta spectabilis Gmelin: Syst. Nat., 6, p. 3468, number 142, 1792.
Voluta ancilla. Lamarck: Ann. du Mus., 17, p. 69, 1811. Deshayes: Encyl. Meth. pl. 385, fig. 3, 1816. An. s. Vert., 7, p. 343, 1822. Gould: Exped. Shells, Wilkes Exped., pl. 20, fig. 258, 1852.
Voluta magellanica. Lahille: Rev. Mus. de la Plata, 6, p. 315, *ex parte* (? plate 7, figs. 149, 154, pl. 8, fig. 175), 1895.
Voluta (Cymbiola) ancilla. Chenu: Man. Conchyl., 1, p. 189, fig. 958, 1859.
Adelomelon ancilla. Dall: Nautilus, vol. 19, number 12, p. 143, April, 1906.
Voluta (Cymbiola) ancilla. Kobelt: Cat.

*Scaphella having been discarded it is necessary to select a new subfamily name as a receptacle for certain genera. The Adams Brothers genus *Aurinia* provides the foundation for the name *Auriniinae*.

Voluta, Jahrb. deutsch. malak. Gesellsch., p. 310, species 61, 1877.
Adelomelon ancilla Solander, Dall: "A Review of the American Volutidae," p. 355, 1907.
Cymbiola ancilla Solander, Pace: Proc. Mal. Soc. London, vol. 5, p. 28, 1902 (Anatomy and radula).

Alt. (See Chemnitz's figures).

Hab. Straits of Magellan. It may be that the veritable *ancilla* does not extend to the upper Argentine coast. The specimens in the U.S. National Museum agree exactly with the figures of D'Avila and Lamarck, and come from the Straits of Magellan.

Shell lighter in weight, broader, spire shorter, body-whorl longer than *magellanica*. While *ancilla* is an old species adequate material for study is at present unavailable. An examination of a long series of specimens may reveal that *magellanica* is merely a subspecies of *ancilla*.

Adelomelon beckii (Broderip) 1855
(Plate 23, Figure 156)

Voluta fusiformis Kiener, Icon. Coq. Viv., *Voluta*, p. 41, pl. 49, 1839; not of Defrance, 1829, or Brocchi, 1814, nor of Swainson, 1822.
Voluta festiva d'Orbigny, Voy. Amer. Mer., 5, p. 426, 1841; not of Lamarck, 1822.
Voluta beckii Broderip, Proc. Zool. Soc. London, 1836, p. 43; *ibid.*, 1855, p. 58. Sowerby: Thes. Conch., number 30, p. 205, pl. 54, fig. 104, 1847. Tryon: Man. Conch., vol. 4, p. 97, pl. 29, fig. 109, 1882.
Voluta fusiformis. Lahille: Rev. Mus. de la Plata, 6, p. 298 (extras p. 8), pl. 1, figs. 14, 15; pl. 3, figs. 16-23; not pl. 4, 1885; also var. *connexa*, p. 300, pl. 3, figs. 19, 20 (var. *ornata* excl.).
Voluta (*Cymbiola*) *becki*. Strebel: Zool. Jahrb., 24, heft 2, p. 97, pl. 8, fig. 33, pl. 10, fig. 55, 1906.
Adelomelon beckii. Dall: "A Review of the American Volutidae," p. 360, 1907.

Alt. 350 to 375 mm.

Hab. Argentine coast, especially toward the north; Falkland Islands.

Nucleus small; spire sub-acute, shell rather thin for its size; similar to *A. ancilla*; plaits behind edge of columella ill-defined, with central portion more excavated than in *A. ornata*.

Adelomelon brasiliana (Solander) 1786
(Plate 11, Figure 84)

Voluta brasiliana Solander. Port. Cat., p. 186, number 3958, 1786.
Voluta colocynthis Brasiliana Solandri Chemnitz: Conch. Cab., 11, p. 10, pl. 176, figs. 1695, 1696; 1795.
Voluta colocynthis Dillwyn: Cat. Rec. Shells, 1, p. 574, 1817. Lahille: Rev. Mus. de la Plata, 6, p. 307 (extras p. 10, 1895; with varieties: *lactea*; *intermedia*; *globosa* (not *V. globosa* Dillwyn, Cat. Rec. Shells, p. 569, 1817); *depressa* (not *V. depressa* Lamarck, Ann. du. Mus., Paris 1, p. 479, 1802); *pseudomagellanica*; *carinata* (not *V. carinata* Zekeli, 1852); *subcarinata*; *alternata* and *spirabilis*.
V. brasiliana d'Orbigny: Voy. Amer. Mer., 5, p. 424, pl. 60, figs. 4-6, 1841. Kiener: Icon. Rec. Shells, *Voluta*, p. 31, pl. 30, 1839. Sowerby: Thes. Conch., p. 204, number 28, pl. 54, fig. 98, 1847. Reeve: Conch. Icon., pl. 15, fig. 34, 1849. Tryon: Man. Conch., vol. 4, p. 98, pl. 29, figs. 113, 115 (only), 1882.
Voluta (*Cymbiola*) *brasiliana* Crosse: J. de C., 19, p. 300, 1871. Strebel, Zool. Jahrb., 24, heft 2, p. 92, 1906.
Adelomelon brasiliana Dall: "A Review of the American Volutidae," p. 361, 1907.

Alt. Up to 200 mm.

Hab. Shores of eastern South America from Rio Grande do Sul, Brazil, to the mouth of the La Plata and south to the Rio Negro in Patagonia; Maldonado Bay, Uruguay, young in 10 fathoms sand (Dall).

Shell globosly ovate, spire very short, whorls rudely marked with lines of growth; columella two-plaited; aperture wide, open; color light yellow; aperture milky orange.

According to M. d'Orbiguy the Nidimental capsules of this species are three inches in length.

Adelomelon ferussacii (Donovan) 1824
(Plate 12, Figures 87-88)

Voluta ferussacii Donovan, Nat. Repos., 2, pl. 67, 1824. Reeve: Conch. Icon., pl. 10, fig. 25, 1849. Sowerby: Thes. Conch., vol. 1, p. 203, pl. 46, fig. 7, 1847.
Voluta rudis Gray, in Griffith's Cuvier, 13, pl. 30, fig. 1, 1834.
Voluta brasiliana (*pars*). Tryon: Man. Conch., vol. 4, p. 98, pl. 30, fig. 131 (*ferussacii*) and pl. 29, fig. 3 (*rudis*), 1882.
Voluta (*Aulica*) *ferussacii* Crosse: J. de C., 19, p. 286, 1871.
Voluta oviformis Lahille: Rev. Mus. de la Plata, 6, p. 313 (extras, p. 20), pl. 2, figs. 53-56; pl. 7, figs. 121-131; pl. 10, figs. 4-9, 1895; with varieties *longiuscula* and *fratercula* Lahille.
Voluta (*Cymbiola*) *ferussaci* Strebel: Zool. Jahrb., 24, p. 100, pl. 9, figs. 46, 46a, 48, 49, 1906.
Adelomelon ferussacii Dall: "A Review of the American Volutidae," p. 362, 1907.

Alt. up to 125, diam. 87 mm.

Hab. Coast of Patagonia (Ihering and Lahille); Puerto Gallegos (Strebel); eastern part of Magellan Straits (Cunningham); Punta Arenas (Mulach).

Donovan's original type is described as having only two plaits. This specimen apparently had been "over-cleaned" with acid. Possibly the secondary plaits were obliterated. Its nearest ally is *A. brasiliana*.

Adelomelon magellanica (Lamarck) 1811
(Plate 11, Figure 83;
Nepionic shell Plate 25, Figure 170)

Voluta magellanica Chemnitz: Conch. Cab., 10, pp. 138-39, 1788, *ex parte*, pl. 148, figs. 1383, 1384. Gmelin: Syst. Nat., 6, p. 3465, number 110, *ex parte*, 1792.
Voluta magellanica Lamarck, Ann. du. Mus., 17, p. 69, 1811. Encycl. Meth., pl. 385, figs. 1a, 1b, 1816. An. s. Vert., 7, p. 344, 1822. Wood, Ind. Test., ed. 1, p. 101, pl. 21, fig. 168, 1825 (after Chemnitz and Lamarck).
Voluta gracilis Wood; Ind. Test., Suppl., pl. 3, *Voluta*, fig. 2, 1828; ed. Hanley, p. 209, pl. 3, fig. 2, 1856; (not *Voluta gracilis* Swainson, Journ. Sci., 17, p. 32, Exotic Conch., pl. 43, 1821; nor of Gray, in Griffith's Cuvier, p. 601, pl. 40, fig. 4, 1834).
Voluta ancilla. Kiener, Icon. Coq. Viv., *Voluta*, p. 39 (plate 52 by error, really plate 51), 1839; not *V. ancilla* Lamarck.
Voluta magellanica. Gould: Exped. Shells, Wilkes Exped., p. 278, pl. 20, fig. 357, 1852 (animal fig'd).
Voluta bracata Rochebrune and Mabille, Miss. Cap Horn, p. 48, number 72, 1889. Identical with the preceding.
Voluta ancilla. Reeve: Conch. Icon., mono. *Voluta*, pl. 17, fig. 39, 1849. Tryon: Man. Conch., vol. 4, p. 97, pl. 29, fig. 110, 1882; not of Gould, 1852.
Scaphella (*Voluta*) *arnheimi* Rivers, Proc. Cal. Acad. Aci., 2nd series, 3, July 14, 1891.
Voluta ancilla. Lahille: Rev. Mus. de la Plata, 6, p. 311 (21 of extras), *ex parte*, pl. 1, figs. 9, 10; pl. 2, figs. 63, 64; pl. 8, figs. 159, 173-183, 184-192, 1895; also var. *typica* Lahille, p. 312, pl. 11, fig. 5; vars. *ponderosa*, *elongata* (pl. 11, fig. 2), inflata and (?) expansa Lahille, p. 313; and var. (?) *abbreviata* Lahille, p. 314, 1895; Strebel, Zool. Jahrb., 24, number 2, p. 92, 1906.
Voluta bracteata "Rochebrune" Strebel, *l. c.* = *V. bracata* Rochebrune and Mabille.

Alt. 125-165 mm.

Hab. Uruguay and from about south latitude 43° on the Argentine coast, south to the Straits of Magellan, from low water mark to 77 fms., usually on sandy bottom in which the animals burrow. Falkland Islands, Lively Island, York Bay and Port William. Burnt Island, Orange Harbor on sandy bottom (Dall).

This is a variable shell, but heavier, on the whole, more slender, with a longer spire and shorter body-whorl than *A. ancilla*.

Dall indicated the confused state of the synonomy and thought it might be best to discard the name *magellanica*. In this case, Rochebrune's name of *bracata* is probably the earliest which could be used for the species.

The ovicapsule with the nepionic shell has been figured by Dall in the Proc. of the United States National Museum, pl. 9, figs. 5, 6, 1889.

Adelomelon martensi (Strebel) 1906
(Unfigured)

Voluta martensi Strebel, Zool. Jahrb., 24, number 2, p. 124, pl. 9, figs. 34, 35, 42-44; pl. 10, figs. 56, 56a, 1906.
Adelomelon martensi. Dall: "A Review of the American Volutidae," p. 357, 1907.

Alt.

Hab. "Peru" Coll. Godeffroy, in Hamburg Museum; Huelmo, Chile, near, Puerto Montt, about south latitude 40°, near extreme low water, Coll. Dunker; Argentina, somewhat south of the estuary of Rio La Plata, 184 miles southeast of Cape Corrientes in 100 fathoms, Strebel; east-northeast of Cape Delgado (south latitude about 43), Argentina in 48 fathoms, sand; U.S.S. *Albatross* (young shells).

Dall stated that he had not seen the above species in the adult state, which, by Strebel's rather rude figures, would seem to be very similar to a well preserved, somewhat thin and inflated form of *A. magellanica*. The young specimens which agree with Strebel's figure, bear the number 96,177 in the U.S. Natural Museum.

Adelomelon ornata (Lahille) 1895
(Unfigured)

Voluta fusiformis ornata Lahille, Rev. Mus. de la Plata, 6, p. 299, (extras p. 9), pl. 4, figs. 24-26, 1895; not pl. 3, figs. 16, 17.
Adelomelon ornata Lahille: Dall, "A Review of the American Volutidae) p. 359, 1907.

Alt. 105 mm.

Hab. Coast of Argentina, near the La Plata Estuary.

Aside from the zig-zag vertical streaks of brownish coloration, this species has little in common with *A. beckii*.

Nucleus large, blunt, irregularly coiled; shell solid, with strong spiral sculpture; columella with two distinct plaits behind the one which forms the edge of the columella.

Adelomelon paradoxa (Lahille) 1895
(Unfigured)

Voluta paradoxa Lahille, Rev. Mus. de la Plata, 6, p. 29, pl. 2, fig. 68; pl. 5, fig. 41; pl. 7, figs. 139, 147; pl. 12, figs. 17-21, 1895.
Adelomelon paradoxa. Dall: "A Review of the American Volutidae," p. 362, 1907.

Alt. up to and over 175, diam. 88 mm.

Hab. Coast of del Sur, Argentina.

Last whorl with variegated zig-zag brown markings. According to Lahille, the young shell is different from any of the other species, that it cannot be properly united with any other. The young shell attains a length of 55 mm. and a diameter of 40 mm. It has three plaits, the two posterior most prominent. The weight is slightly more than one-half than that of *A. ancilla*.

Adelomelon subnodosa (Leach) 1814
(Plate 12, Figure 86)

Voluta subnodosa Leach, Zool. Misc., 1, pl. 8, 1814. Sowerby: Thes. Conch., vol. 1, p. 203, pl. 47, fig. 24, 1847.
Voluta ancilla. Sowerby: Thes. Conch., vol. 1, p. 203, pl. 54, fig. 101, 1847; (not *V. ancilla* Solander or Lamarck). Hanley's Wood's Ind. Test. Suppl., p. 209, pl. 3, *Voluta*, fig. 1, 1856. Kiener: Icon. Coq. Viv., *Voluta*, p. 39, pl. 52, 1839.
Voluta magellanica. Kiener: *loc. cit.*, p. 40, according to the description.
Voluta magellanica. Reeve: Conch. Icon., pl. 14, figs. 33a, 33b, 1849, not of Lamarck.

Voluta magellanica. Tryon: Man. Conch., vol. 4, p. 97, pl. 29, figs. 107, 108 (copied from Sowerby's figs. 101 and 24) 1882.
Voluta ambigua. Lahille: Rev. Mus. de la Plata, 6, p. 317 (27 of extras) pl. 8, figs. 163-6, pl. 11, figs. 6, 9, 11; pl. 11, figs. 11-15, 1895, not *V. ambigua* (Solander) Sowerby: Min. Conch., 4, p. 135, pl. 399, fig. 1, 1823, or of Maton, Lin. Trans., 1807, or Lamarck: Ann. du. Mus., 17, p. 77, 1811.
Voluta ambigua vars. *constricta, pseudotuberculata, subnodosa* and *typica*, Lahille, *l. cit.*, pp. 27-29.
Voluta magellanica. Strebel: Zool. Jahrb., 24, number 2, p. 127, pl. 8, figs. 17-24, 26-32; pl. 9, figs. 36, 41; pl. 10, figs. 53, 54, 59, 1906.

Alt. 140 mm.

Hab. Argentine coast, near the mouth of the Rio La Plata, from low water to ten fathoms, burrowing in sandy bottom; south to Magellan Straits (Punta Arenas, etc.), and Woodcock Island, Tierra del Fuego; Falkland Islands at Port Stanley.

Adelomelon tuberculata (Swainson) 1821
(Plate 11, Figure 85)

Voluta tuberculata Swainson, Exotic Conch., p. 19, pl. 29, 1821. Wood: Ind. Test. Suppl., *Voluta*, number 22, 1828. Kiener: Icon. *Voluta*, p. 63, pl. 31, 1839. Sowerby: Thes. Conch., vol. 1, p. 204, pl. 1, figs. 49, 50, 1847.
Voluta (Cymbiola) tuberculata Swainson: Exotic Conch., ed. 2, p. 19, pl. 29, 1841. Catlow: Conch. Nomen., p. 306, number 56, 1845. Strebel: Zool. Jahrb., 24, heft 2, p. 102, pl. 9, figs. 38, 39, 47, 1906.
Voluta americana Reeve, Proc. Zool. Soc. London, p. 2, pl. 33, figs. 1, 2, 1856. Tryon: Man. Conch., vol. 4, p. 94, pl. 28, figs. 100, 101, 1882 (nepionic shell).
Voluta cleryana Petit: J. de C., 5, p. 182, pl. 6, figs. 3, 4, 1856; Crosse, *ibid.*, 19, p. 294, 1871 (young undeveloped specimen).
Voluta tuberculata Lahille, as of Wood, with varieties *ferruginea, decipiens, fulgurea* and *pseudofusiformis*, Rev. Mus. de la Plata, 6, pp. 340-42 (extras, pp. 30-32) pl. 1, figs. 12, 13; pl. 7, figs. 140-146; pl. 12, figs. 3-6, 1895.
Adelomelon tuberculata. Dall: "A Review of the American Volutidae," p. 360, 1907.

Alt. up to 150, diam. 100 mm.

Hab. Southern Patagonia and northward on the Argentine coast, and, in deeper water, to Cape San Thome, Brazil, about south latitude 22°.

According to Lahille, this species has from three to five plaits upon the columella. The species seems closely related to *A. brasiliana* and *A. beckii*.

Adelomelon mangeri (H. B. Preston) 1901
(Plate 12, Figure 89)

Cymbiola mangeri Preston, Proc. Mal. Soc. London, vol. 4, p. 237, 1901 (fig. shell, p. 237).

Alt. 103, diam. 56 mm.

Hab. Falkland Islands.

Holotype in the British Museum.

Shell irregularly fusiform; spire long and deformed; whorls about six, sharply increasing, rounded, marked with very irregular growth-lines, but destitute of other sculpture; sutures very irregular; texture of the shell, rather horny, or cretaceous, externally weathered, interior glazed; columella folds, three; callous, broadly expanded.

The nearest allies of this form are *ancilla, magellanica* and *brasiliana*. It differs, however, from the two latter, by the length of its spire, and by the absence of nodulations. Moreover *magellanica* has very distinct, though irregular, color markings, while the present species is entirely destitute of painting, and presents a very worn, and weathered appearance, which seems to be quite normal, but is exceedingly characteristic. The form of *mangeri* distinguishes it readily from *ancilla*.

Genus BOREOMELON Dall 1918

Boreomelon Dall, Proc. Biol. Soc. Wash.,

vol. 31, p. 137, 1918.

Genotype: *Scaphella stearnsii* now *Boreomelon stearnsii* Dall.

Range: Bering Sea; Alaska; Gulf of Panama; mostly in deep water.

Although Dall designated *Boreomelon* as a subgenus it is advisable to raise this to generic rank and also include "*Adelomelon*" *benthalis* another cold water shell which lives off the west American coast in the Pacific.

Boreomelon benthalis (Dall) 1895
(Plate 26, Figure 179)

Scaphella benthalis Dall, Proc. U.S. Nat. Mus., 18, number 1034, p. 13, 1895.
Adelomelon benthalis Dall: "A Review of the American Volutidae" p. 357, 1907.

Alt. 125, lat. 60 mm.

Hab. Gulf of Panama, at station 3360, in 1672 fathoms (3087 meters), sandy bottom; dredged by the U.S.S. *Albatross* (Dall).

This species, not withstanding the type specimen is decorticated, seems sufficiently distinct in form to be separated specifically from the southern congeners. The whorls are rounder, more nearly tabulate in front of the suture, and with a more rapidly tapering and acute spire (Dall).

There are three indistinct plaits upon the columella, the middle one most perceptible. Interior of the aperture pale flesh color; five whorls beside the nucleus; no operculum.

Boreomelon stearnsii (Dall) 1872
(Plate 12, Figure 90)

Scaphella stearnsii Dall, Proc. Cal. Acad. Sci., 4, October, 1872, p. 270, pl. 1, fig. 1. Proc. U.S. Nat. Mus., 24, number 1264, p. 517, pl. 35, fig. 4, March, 1902.
Voluta stearnsii. Tryon: Man. Conch., vol. 4, p. 97, pl. 30, fig. 130.
Adelomelon stearnsii Dall: "A Review of the American Volutidae," p. 363, 1907.
Boreomelon stearnsii Dall: Bulletin 112, U.S. Nat. Mus. p. 86, 1921. Keep-Baily: West Coast Shells, p. 220, 1935.

Alt. 112-150 mm.

Hab. Shumagin Islands, Alaska, and westward to Captain's Bay, Unalaska, in 40 to 100 fathoms, rocky and muddy bottom; temperature of bottom water 37° to 41° Fahr. Also in Bering Sea, northward to the line of floating ice in winter, on sandy and muddy bottoms, in 61 to 350 fathoms; U.S. steamer *Albatross*.

While the shell characters of this species are distinctly dissimilar from the South American species, the gross anatomy and dentition do not differ from *A. magellanica* except in small details. *A. benthalis* Dall, its nearest relative, lives in the Gulf of Panama, more than 5000 sea-miles distant.

Genus MIOMELON Dall 1907

Miomelon Dall, "A Review of the American Volutidae," p. 365, 1907.

Genotype: *Volutilithes phillppiana* Dall, now *Miomelon phillppiana* Dall.

Shell with rather elevated spire, somewhat excavated in front of the suture, with more or less obvious axial ribbing and spiral striation; a delicate periostracum, the canal rather straight; the pillar with few rather slender plaits, the anterior larger; the animal has no operculum, the verge is situated just behind the right tentacle, small, clavate, with a smaller conical distal appendix; the radula has a single series of teeth, each with three subequal tusk-like cusps (Dall).

Miomelon philippiana Dall 1889
(Plate 25, Figure 169)

Volutilithes philippiana Dall, Proc. U.S. Nat. Mus., 12, p. 313, pl. 9, fig. 4, 1889.
Adelomelon (*Miomelon*) *philippiana* Dall: "A Review of the American Volutidae," p. 365, 1907.

Alt. 36.5 mm.

Hab. Dredged by the U.S. Fish Commission steamer *Albatross* off the southwest coast of Chile, at station 2791, south latitude 38° 08' and west longitude 75° 53', in 677 fathoms, mud, bottom temperature 37.9° Fahr. (Dall).

Holotype in the United States National Museum, number 97,128.

Shell (not fully adult) small, elongated, fusiform; color dark with pale band in front of suture; nucleus small; whorls six, probably more when adult; sculpture of rounded grooves; interspaces flattened, narrow but wider than grooves; lines of growth fine and regular; pillar thin, sharp and nearly straight; canal wide; single prominent, fine sharp plait just behind edge of pillar, also two smaller subequal plaits. For more detailed description reference should be made to Dall's paper.

But a single specimen was obtained. The nucleus was eroded so that its exact character remains in doubt.

This unique shell belongs to a group of which the other species appear to be extinct: *A. triplicata* Sowerby, *A. domeykoana* Philippi and *A. gracilior* Ihering (new name for *Voluta gracilis* Philippi, 1887, not of Lea, 1833); and perhaps also *Voluta D'Orbignyana* Philippi. It is distinctly a localized group proper to the south coast of South America, both recent and fossil.

Dall stated that the name *gracilis* being several times preoccupied, the present name *philippiana* may possibly also be applied to the tertiary fossil (*gracilis*), if and when that species is proved to be identical with the present species.

Genus TRACTOLIRA Dall 1895

Tractolira Dall, 1895, Proc. U.S.N.M. 18, number 1034, p. 12.

Genotype: *Tractolira sparta* Dall.

Range: Gulf of Panama, northward to Acapulco, Mexico.

Another degnerate, abyssal genus. The radula is marked by the same tusk-like cusps, which occur in the section *Miomelon*.

Dall considered *Voluta alta* Sowerby, a species in the Chilean tertiaries as a normal relative.

Tractolira sparta Dall 1895
(Plate 26, Figure 178)

Tractolira sparta Dall, Proc. U.S.N.M., 18, number 1034, p. 13, 1895. Smith, Misc. Coll., vol. 48, part 3, p. 366, 1907.

Alt. 60; of last whorl 43; of aperture, 28; diam. 19 mm.

Hab. Gulf of Panama to latitude of Acapulco, Mexico, 1672-2232 fathoms.

Shell elongate, slender, with a greenish or ashy adherent epidermis (more or less eroded near the apex in all the specimens); about six whorls; nucleus apparently as in *Scaphella* (*Amoria*), large, with an apical spur; whorls drawn out, rounded, with a distinct suture, the upper whorls at first smooth, then with irregular partly obsolete, transverse wrinkles, some of which cross the whorl, but which are too irregular to call ribs; surface everywhere sculptured with numerous, even, fine, flattish spiral threads, with equal or slightly wide interspaces, and with well marked, but not regular lines of growth; aperture sub-ovate, rather wide in front, the outer lip simple and hardly thickened; the throat white, a thin wash of callus on the body, the pillar thin, pervious, short; the canal short and wide, with hardly any siphonal fasciole; operculum absent.

Genus ZIDONA H. and A. Adams 1853

Zidona H. and A. Adams, 1853, Genera of Rec. Moll., vol. 1, p. 161; 2, p. 618, 1858. Fischer: Man. de Conch., p. 605, 1883. Cossman: Essais Pal. Comp., 3, p. 104, 1899.

Volutella d'Orbigny: Voyage of the American Mer, 422, 1841; *V. angulata* Swainson, sole ex., not *Volutella* Perry, 1811, nor Swainson 1830.

Genotype: *V. angulata* Swainson.

Range: Southeast coast of South America.

Separable on account of the extension of the mantle and modification of the shell; nuclear portion of the shell similar to that of *Adelomelon*. d'Orbigny carefully figured the soft parts.

Zidona angulata (Swainson) 1821
(Plate 13, Figures 93, 96)

Voluta angulata Swainson, Exotic Conch., 1, pls. 3 and 4. Sowerby: Thes. Conch., vol. 1, p. 202, pl. 47, figs. 13, 14, 1847. Reeve: Conch. Icon., pl. 15, fig. 35, 1849.
Voluta nassica Schubert and Wagner, Suppl. bd. Conch. Cab., 12, p. 10, pl. 217, figs. 3031, 3032, 1829.
Voluta dufresnei Donovan, Nat. Repos., 2, pl. 61, 1823.
Volutella angulata d'Orbigny: Voyage American, 5, p. 423, pl. 60, figs. 1-3, 1841. Gray: Guide Moll. British Mus. p. 35, 1857.
Voluta angulata. Wood: Index Test. Suppl., Voluta number 21, 1828. Kiener: Icon. Coq. Viv., Voluta, p. 65, pl. 38, 1839. Tryon: Man. Conch., vol. 4, p. 98, pl. 29, figs. 112, 121, 1882. Lahille: Rev. Mus. de la Plata, 6, p. 305, (extras, p. 15), pl. 1, figs. 5-8; pl. 2, figs. 69-78; pl. 6 and pl. 9, 1895.
Voluta (Volutella) angulata. Crosse: J. de C., 19, p. 301, 1871; Tryon: Struct. Syst. Conch., 2, p. 164, 1883.
Zidona angulata. H. and A. Adams: Genera Rec. Moll., vol. 1, p. 161, 1853; 2, p. 618, 1858. Fischer: Man. Conchyl., p. 605, 1883.

Alt. Sometimes exceeds 175 mm. in length. Diam. 125 mm.

Hab. Southeast coast of South America; Rio Grande Do Sul, Brazil, south to the Bay of San Blas, Patagonia, on sandy bottom in comparatively shallow water.

Lahille described several varieties. Outstanding characters of the shell include the wide disposition of the enamel upon the spire, the broad shoulder and the three, widely spaced, indistinct plaits upon the columella. In well-developed examples there is often an apical spur of callus, which may reach a length of more than one inch beyond the apex, this however is often missing in damaged or juvenile specimens.

Genus PROVOCATOR Watson 1881

Provocator Prel. Rept., part 12, Journ. Linn. Soc. London, vol. 16, p. 329, 1881.

Genotype: *Provocator pulcher* Watson.

Range: Between Kerguelen and Heard Islands (Watson).

Provocator provocator (Sowerby)
(Plate 13, Figure 95)

Voluta provocator Sowerby, Thes. Conch., vol. 5, 2nd suppl., p. 305, pl. 18 (Thes. pl. 517), fig. 173.
Provocator pulcher Watson, Prel. Rept., part. Journ. Linn. Soc. London, vol. 16, p. 330, 1881. Voyage H.M.S. Challenger, part Gastropoda, p. 260, pl. 13, fig. 5, 1885.

Alt. 87, Diam. 45 mm.

Hab. Off Cumberland Bay, Kerguelen, in 105 fms.; also between Kerguelen and Heard Islands in 150 fms.

Shell smooth, fusiform, rather thin, with a high, sharp, slightly enameled apex, a contracted and elongated base, a straight two-toothed pillar, a large mouth, a prominent angulated and patulous outer lip, and a strongly marked sinus at the enameled suture. Sculpture: Longitudinals, the smooth surface is scored with fine hair-like flexuous lines of growth. Spirals, there are some lines in the substance of the shell which are best recognized without a lens, there are also some irregular white lines connected with some slight thickening of the glaze; below the scar of the sutural sinus is an obsolete angulation. Besides all this, the surface of the enamel of the shell is obsoletely tubercled obliquely. Color rich buff, thinly overlaid with a whitish glaze; this for some distance below the suture is covered with a dullish buff

enamel. Spire high, conical, subscalar. Apex small and sharp, being originally mamillated, but subsequently eroded and enamelled. Whorls seven to eight, at the top very slightly shouldered and angulated, then flatly convex. Suture oblique, completely buried in a thick coat of glaze which fills the sutural angle and which embraces the whole apex. Mouth large, pear-shaped, with a shallow, broad, obliquely truncated canal in front. Outer lip thin and rounded on the edge; it is cut off from the body by a strongly marked sinus, below which it advances prominently into a rounded angle, retreating slightly, but steadily, from this point throughout its whole course; it is straight and slightly contracted above, roundly angulated and patulous below the middle, straight and patulous and cut off backwards from this point to the edge of the canal. Inner lip scarcely convex above, little concave in the middle, direct with a very slight twist and no swelling below; near the edge are two narrow, slight, white, very oblique teeth, of which the upper is sometimes absent: the narrow sharp lamina of the pillar-edge in front is the extreme point of the shell.

This is an extremely peculiar form of great beauty. It is higher and narrower than the measurements would suggest, the outthrow of the outer lip being great, but of short continuance. It has a strong general resemblance to *Eburna glabrata* Linné, or *Eburna vernedei* Sowerby, or other smaller species of that form, of which it simulates the subperipheral band. In *Voluta* (*Amoria*) *pallida* Gray, some of the peculiar features of this species (such as the sutural sinus, the enamelled spire, and the outthrow of the outer lip at its lower corner) are found, though in a much feebler form.

The swelling on the pillar which is characteristic of the Volutes, and is really the scar of the old columellar sinus, is in this species quite absent in front, but is just recognizable on the back of the shell in the flexure of the lines of growth (Watson).

Genus AURINIA H. and A. Adams 1853

Aurinia H. and A. Adams, Genera Rec. Moll. 1, p. 166, 1853. Type *A.* (*Voluta*) *dubia* Broderip (Subgenus of Fulgoraria): Gray in Adam's Gen. Rec. Moll., 11, p. 617, 1858, *ex parte*; Crosse; Jour. de Conchyl., 19, p. 307, 1871; Fischer; Man. de Conchyl., p. 608, Dec. 1883; *ex parte*; Dall: Trans. Wagn. Inst., 111, p. 70, 1890.

Maculopeplum Dall: Nautilus, vol. 19, no. 12, p. 143, April, 1906.

Scaphella (*sp.*) Swainson: Zool. Illust., 2nd series, 11, no. 19, 1832.

Caricella (*sp.*) Conrad: Jour. Acad. Nat. Sci. Phila., 2nd series, 1, p. 120.

Scaphella Dall: Bull. Mus. Comp. Zool., 8, p. 147, 1889; Trans. Wagner Inst. 111, p. 79, 1890.

Voluta (*sp.*) Broderip: Zool. Journ., 111, p. 81, January, 1827.

Fusus (*sp.*) Schubert and Wagner: Conch. Cab., 12, p. 24, 1829.

Volutifusus Conrad: Proc. Acad. Nat. Sci. Phila., 1862, p. 563, March, 1863; sole ex. *Fasciolaria mutabilis* Conrad: Jour. Acad. Nat. Sci., 7, p. 135 1834; Am. Journ. Conch., 11, p. 66, 1866; *V. typus* Conrad, Miocene of North Carolina.

Livonia Gray, olim. H. and A. Adams: Gen. Rec. Moll., 11, p. 617, 1858; not *Livona* Gray, Guide Moll. B. M., p. 156, 1842.

Genotype: *Aurinia dohrni dohrni* (Sowerby).*

Range: Atlantic Ocean off Cape Hatteras, North Carolina, southward to the Gulf of Mexico and including the Caribbean.

This genus is a degenerate descendant from the Eocene *Caricella*. The usually few, indistinct, plaits upon the columella, together with the thin shell and conspicuous *Caricella-like* nucleus are distinguishing features. Another significant detail is the very small size of the radula which has been observed in only one or two species.

Aurinia dohrni dohrni (Sowerby) 1903
(Plate 6, Figure 51)

Voluta dubia Broderip, Zool. Jour., 111, p. 81, pl. 111, fig. 1, 1828; Sowerby, Thes. Conch., 1, pl. 55, fig. 115, 1847; Reeve, Conch. Icon., *Voluta*, pl. 22, fig. 59, 1849.

*The Adams brothers designated *Voluta dubia* Broderip as the genotype of their *Aurinia*. The validity of that species is now very questionable and in view of this fact it appears desirable to designate a new genotype, the most logical choice being *A. dohrni dohrni*.

Fusus tessellatus Schubert and Wagner, Suppl. Bd. Mart. u Chemn., Conch. Cab. (12), p. 24, pl. 219, figs. 3048, 3049, 1829; Kiener, Icon. Coq. Viv., 4, *Fusus*, p. 39, pl. 29, fig. 1; copied in Reeve, Conch. Icon., 4, pl. 14, fig. 53, 1847; not of Zekeli and Pictet Foss. Gosaugeb, 1852.

Voluta (Aurinia) dubia. H. and A. Adams: Gen. Rec. Moll., 1, p. 166, 1853.

Voluta (Volutifusus) dubia. H. and A. Adams: Gen. Rec. Moll., 1, p. 166, 1853.

Voluta (Volutifusus) dubia. Conrad: Am. Jour. Conch., 11, p. 66, 1866.

Voluta mutabilis Tuomey and Holmes: Pleioc. fos. S. Car., p. 128, pl. 27, figs. 5, 6, 1856; not of Conrad, Jour. Acad. Nat. Sci., Phila., 7, p. 135, 1838, and Am. Journ. Sci., 41, p. 346, pl. 11, fig. 7, 1841, Miocene of Maryland.

Voluta (Aulica) dubia. Tryon: Man. 4, p. 90, pl. 27, figs. 77, 81, 1882.

Aurinia dubia. Dall: Bull. Mus. Comp. Zool., 18, p. 151, 1889; Trans. Wagner Inst., 111, p. 80, pl. 7, fig. 4, 1890; Bull. U.S. Nat. Mus. 24, no. 1264, p. 504, pl. 29, fig. 11, 1902.

Aurinia dubia. Dall: "A Review of the American Volutidae," vol. 48, part 3, p. 366, 1907.

Alt. 72 mm.

Hab. Florida Reefs, along the Straits of Florida (Pourtales) in Gulf Stream, off Key West in 50-109 fathoms.

Shell with about three and one-half post-nuclear whorls; suture slightly channeled; surface somewhat reticulated with a pattern of horizontal and vertical striae; low spiral ribs with slightly wider interspaces, most evident anteriorly; three plaits on the columella. Shell often inhabited by hermit crabs.

Aurinia dohrni bermudezi
Clench and Aguayo 1940
(Plate 14, Figure 105)

Aurinia bermudezi Clench and Aguayo, Memorias de la Sociedad Cubana de Historia Natural, vol. 14, p. 90, pl. 16, fig. 3, 1940.

Alt. 59.2, diam. 20.4 mm.

Hab. Bahia de Cochinos, Santa Clara, Cuba in 180 to 190 fathoms.

Holotype in the Museum of Comparative Zoology, number 135245.

Differs from *Aurinia dohrni* Sowerby by being somewhat narrower and possessing two, large, columella plicae.

Aurinia dohrni florida
Clench and Aguayo 1940
(Plate 6, Figure 49)

Voluta dubia Dohrn, Jahrb. d. Malak. Ges., 6, pp. 150-156, pl. 4, figs. 1-3, 1879 non *dubia* Broderip 1828. Dohrn's figure was copied by Tryon in his Man. Conch., pl. 27, fig. 77, 1882.

Voluta dubia. Tryon: Man. Conch., vol. 4, p. 90, pl. 27, fig. 77, 1882.

Aurinia dohrni florida Clench and Aguayo, Memorias de la Sociedad Cubana de Historia Natural, vol. 14, p. 88, pl. 16, fig. 1; text fig. 1, 1940.

Alt. 82 mm.

Hab. Off Punta Alegre, Camaguey Prov., Cuba in 210 fathoms; Lower Florida Keys; off Palm Beach County in 65 to 80 fathoms. The examples are immature, but are undoubtedly this subspecies (Frank Lyman).

The specimens figured by Dohrn are strongly nodulous and costate. This variety is very slender; spire ornamented at the shouldered periphery with short longitudinal riblets; upon the body whorl, the shoulder minus the ribs, barely perceptible; ground color light peach, overlaid with rectangular spots of tan.

Aurinia gouldiana (Dall) 1887
(Plate 23, Figure 155)

Voluta gouldiana Dall, Conch. Exch., 2, p. 10, July, 1887; Bull. Mus. Comp. Zool., 18, p. 154, pl. 29, fig. 3, 1889; Trans. Wagner Inst., 3, p. 81, pl. 7, fig. 2, 1890.

Alt. 69, diam. 25 mm.

Hab. From Cape Fear, North Carolina, south and west to Key West, Florida, in 40 to 509 fathoms.

A portion of Dall's description follows:

Shell rather small, solid, slender, white, brownish plum color, or spirally banded with whitish and claret color, rarely square-spotted in spiral series; whorls moderately full, five and one-half besides the nucleus; sculpture of fine close distinct spiral threads covering the whole surface except the anterior part of the last whorl, where they gradually give way to much stronger and more distant threads, which in some specimens wind into the aperture, as if simulating small plaits; the nucleus is nearly flat, whitish, consisting of one whorl rising a little above the posterior edge of the first post-embryonic whorl, and having a central projecting initial point, but less prominent than in *V. robusta*. The suture is appressed and in the early whorls a little marginated; the first whorl is only strongly spirally striated and convexly rounded; the succeeding whorls have the periphery rippled by a succession of (on the third whorl 22) small waves, with their anterior slope steeper than the other, and which, in some specimens, extend to the last third of the last whorl before becoming obsolete, though ceasing sooner in others; these waves are generally confined to the periphery and vary in strength and number in different specimens, one specimen having only eighteen on the third whorl; the color varies from yellowish white to a ruddy brown with a suggestion of purple in it, which is usually stronger at the suture along the pillar and outer lip, and especially toward the end of the canal. The fresh specimens nearly all show a tendency to spiral banding; one beautiful but half-grown specimen has six narrow pale bands, the second from the suture being on the periphery, with the much wider interspaces of a brownish claret color; this fades slightly, but the white ones do not seem faded. The outer lip is sharp with a dark margin, the throat whitish, the pillar callus yellowish-white; there are, in the very young, four plaits, of which the first and third, counting backward, are fainter than the other two; in adult shells rarely are more than two visible and those are quite faint; there is only a slight glaze on the body whorl; in the adults the nucleus and first whorl are generally so worn as to resemble one of the common round mammillate tips seen normally in many Volutes.

This species is entirely without trace of an operculum, opercular gland, or pad.

Aurinia junonia (Hwass) 1795
(Plate 6, Figure 53)

Voluta junonia Hwass, in Chemnitz' Conch. Cab., 11, 1795, p. 16, pl. 177, figs. 1703, 1704. Lamarck: Ann. du Mus., 7, p. 70, 1811. Swainson: Exotic Conch., 2nd ed., p. 22, pl. 33, January, 1835. Sowerby: Thes. Conch., vol. 1, p. 197, pl. 49, fig. 44, 1847. Reeve: Conch. Icon., pl. 20, fig. 50, 1849.

Voluta (Aulica) junonia Crosse: J. de C., 19, p. 285, 1871. Tryon: Man. Conch., vol. 4, p. 90, pl. 26, fig. 67, 1882.

Scaphella junonia Swainson: Malac., p. 108, 1840. Dall, Bull. Mus. Comp. Zool., 18, p. 148, pl. 34, figs. 5, 5c, 5d, 5e, 1889; Trans. Wagner Inst. 3, p. 79, pl. 7, fig. 9, 1890.

Maculopeplum junonia Dall, Nautilus, 19, number 12, p. 143, April, 1906; Smith. Misc. Coll., vol. 48, part 3, number 1663, "A Review of the American Volutidae," p. 370, 1907. Perry: Marine Shells of S.W. Florida, p. 155, pl. 36, fig. 241, 1940. Smith, East Coast Marine Shells, p. 128, pl. 50, fig. 1; pl. 1, fig. 4, 1941.

Alt. (average) 85 mm. Apparently, the largest specimen known is in the writer's collection, and measures 141 mm. in length.

Hab. From off Cape Lookout, North Carolina in 22 fathoms, south to Cape Sable; Florida Keys, Sanibel Island, north to off Tarpon Springs. This is the only species of the genus that lives in shallow water, but *not* between tide marks.

There are four post-nuclear whorls in this, the largest of recent *Aurinias*. First whorl ornamented with riblets extending from suture to suture, these surfaces slightly broken by spiral sculpture; the spiral sculpture upon subsequent whorls

rather ill-defined; nucleus few-whorled, shining, colored two shades of buff; ground color light ivory, overlaid with numerous chocolate-brown blotches; interior peach color, fading into a flesh-colored zone adjacent to the outer lip; columella with four plaits.

Aurinia neptunia Clench and Aguayo 1940
(Plate 6, Figure 54)

Aurinia neptunia Clench and Aguayo, Memorias de la Sociedad Cubana de Historia Natural, vol. 14, number 1, p. 90, pl. 16, fig. 5, 1940.

Alt. 50.5, diam. 18.1 mm.

Hab. Off Banner Reef, Pedro Bank, 70 miles south of Jamaica, 1880, in 322 fathoms.

Holotype in the Museum of Comparative Zoology, number 119025.

The large nuclear whorls and broad spiral color-bands distinguish this form from other *Aurinias*. Ground color, yellowish straw to ivory, overlaid with broad, chocolate-brown bands.

Aurinia robusta Dall 1889
(Plate 25, Figure 168)

Aurinia robusta Dall, Bull. Mus. Comp. Zool., 18, p. 153, pl. 35, fig. 2, 1889; Trans. Wagner Inst., 3, p. 81, pl. 7, fig. 5, 1890.

Alt. 119, of last whorl 100, diam. 52 mm.

Hab. Straits of Florida, Gulf of Mexico, 119 to 200 fathoms. Also off Cozumel Island in 231 fathoms. Off Punta Allegre, Caibarien, off San Taren Channel; off Saguala Grande, Cuba, 210 to 330 fathoms.

This is a rather stout species with strong nodules on the periphery of the early whorls. Nucleus consisting of one and one-half concave whorls; shell distinguished by its chalky outer layer under a pale epidermis which is eroded like a freshwater shell; color pattern resembling *A. junonia* and young *Conus floridanus*.

Aurinia schmitti Bartsch 1931
(Plate 7, Figure 58)

Aurinia schmitti Bartsch, Journ. Washington Acad. Sci., vol. 21, no. 21, p. 539, fig. 1, 1931. Memorias de la Sociedad Cubana de Historia Natural, vol. 14, no. 1, 1940.

Alt. 115, diam. 35 mm.

Hab. South of Tortugas, Florida, in 80 fathoms (type locality).

The original description is as follows:

Shell large, spindle-shaped, exterior covered by an olivaceous periostracum which dehisced upon drying. When the periostracum is removed the general color of the shell is pinkish chalky with the exception of the nucleus, which is pale buff. There are also rows of chestnut-brown spots, which are arranged in spiral series. Two of these occur between the summit and the suture of the turns. The last whorl shows five of these interrupted bands; the first much less developed than the rest, being at some little distance anterior to the summit of the whorl; the next and fifth band is of about the same width, while the third and fourth are fully twice as wide as the second and fifth. The base of the columella is also brown. The front of the shell from the inner columellar edge to the left side of the shell and the same area of the proceeding whorl, are covered with a soiled, smoky gray, somewhat nacreous callus. Inside of outer lip salmon colored, showing the two heavy interrupted bands, and the rest by transmitted light. The nucleus consists of about one turn, which forms a smooth mamillated apex. Postnuclear whorls appressed at the summit, marked by obsolete, rather broad, irregular, axial ribs, which are absent on the first and last turns. They show best on the second and third. The entire postnuclear part of the shell is marked by rather strong incremental lines, particularly so behind the edge of the outer lip. The spiral sculpture consists of numerous fine raised threads, which are of almost

equal strength and spacing on the early whorls, but become less so on the later whorls; on the last they are a little stronger on the basal half than on the posterior portion thereof. Aperture elongate-oval, strongly channeled anteriorly and feebly so at the posterior angle; outer lip thin at the edge, somewhat sigmoid, being protracted in the middle, columella with two strong oblique folds.

Holotype (figured herewith) in U.S. National Museum, no. 382779, has five post-nuclear whorls.

Genus BATHYAURINIA Clench and Aguayo 1940

Bathyaurinia Clench and Aguayo, Memorias de la Sociedad Cubana de Historia natural, vol. 14, no. 1, p. 92.

Genotype: *Aurinia torrei Pilsbry.*

Range: Off Cuba.

Shell elongate, shining, usually shouldered and with nodules or sub-costae whorls. No columellar folds or plaits; radula exceedingly small, (2mm.) consisting of a single row of Rachidian teeth. The mantle very probably envelopes the shell.

Bathyaurinia torrei Pilsbry 1937
(Plate 7, Figure 56)

Aurinia torrei Pilsbry. Naut., vol. 51, p. 37, pl. 4, fig. 1, 1937.
Bathyaurinia torrei Pilsbry. Mem. de la Soc. Cubana de Hist. Nat., vol. 14, no. 1, p. 92, 1940.

Alt. 113, diam. 28 mm.

Hab. Off Cayo Frances, Caibarien, Cuba in 10 fms. Elsewhere off Cuba up to 265 fms.?

Shell fusiform, anterior canal long, glossy; color pale buff, darkening on anterior canal to light salmon; first two whorls white, ornamented with trapezoidal spots of brown fading to rust color below the suture; nucleus consisting of a short projecting point; axial folds most prominent at the shoulder, about fifteen such folds on the penultimate whorl; aperture tinted like exterior.

Bathyaurinia piratica
Clench and Aguayo 1940
(Plate 7, Figure 57)

Bathyaurinia piratica Clench and Aguayo, Memorias de la Sociedad Cubana de Historia Natural, vol. 14, no. 1, p. 93, pl. 15, fig. 2, 1940.

Alt. 93.5, diam. 41.8 mm. (Holotype).

Hab. Off Punta Alegre, Camaguey, Cuba in 210 fathoms.

Holotype in the Museum of Comparative Zoology, no. 135235.

This species appears to differ rather sharply from B. *torrei* by being much larger, possessing finer sculpture and having a broadly rounded and smooth whorl shoulder. The color is pinkish-yellow, much as in *torrei*.

Subfamily HALIINAE

Genus HALIA Risso 1826

Halia Risso, Hist. Nat. Eur. merid. iv, 52, 1826.
Priamus Deshayes, 1838, Lam. edit., ii, viii, 299, 1838.
Halia. Fischer: Monographie du genre Halia, Jour. de Conch; 2nd Ser. III, 141.

Genotype: *Halia priamus* Meuschen.

Range: Atlantic Ocean off Spain, Portugal and probably northwest Africa.

After discussing various pathological and diseased Volutes, Dall suggested that the genus *Halia* may be the last term of degeneration, having lost all of the plaits in its shell and holding much such a relation to *Aurinia* as does *Guivillea* of Watson, also a degenerate type. As in *Harpa* the posterior sinus is not homologous with that of *Turris* but merely permits the passage of a fold in the mantle.

Hermannsen, in 1846, first associated the recent species with the tertiary fossil long known to science as *Bulla helicoides*.

The single recent species was supposed by Meuschen to be a terrestrial mollusc and he accordingly placed it under *Helix*.

After dissecting the soft parts of *Halia* Fischer considered its nearest ally to be the inoperculated *Defrancia* section of the present *Turridae*. Further study may substantiate this claim but as there is still some doubt it has been included in the present paper pending more detailed investigation.

Halia priamus Meuschen 1778
(Plate 24, Figure 165)

Halia priamus Meuschen. Kobelt: Icon. Europ. Meeresconch ii, p. 6. Reeve: Monog. Halia sp. 1, 1963. Pace: P.M.S. London, vol. 5, p. 29, 1902 (Anatomy). Sykes: P.M.S. London, vol. 9. p. 333, 1911. Dall: Tert. Moll. Florida, vol. 3, p. 81. Smith, Maxwell: World-Wide Sea Shells, p. 81, sp. 1124, 1940.
Helix priamus Meuschen, Cat. Mus. Gron. no. 1353, 1778.
Buccinum ficus Martyn: Univ. Conchologist, vol. 111, p. 81.
Ampulla priamus Roeding, Bolten Catalog.
Achatina priamus Lamarck.
Buccinum stercus-pulicum Chemnitz.

Alt. 75 mm.

Hab. Off Spain and Portugal; Porcupine Exp. 1870, sta. 26, 30 (fragments), off Cape Sagres, 45-58 fathoms; off Cadiz; most abundant in bay lying between Cape St. Vincent and Trafalgar; fossil in the Italian Pliocene.

The enamel-like surface of the rather fragile shell indicates an almost complete envelopment by the mantle; surface of shell fulvous-fawn color with below the periphery a series of bands consisting of small square separated chestnut-colored spots; aperture large, notched anteriorly and posteriorly, lip simple. Foot voluminous, proboscis long, indicating an organism phytophagous in habit or if zoophagous living upon fragile organisms, or those partly decomposed.

According to Pace the radula is similar to that of *Amoria*.

The example figured is in the writer's collection.

Subfamily VOLUTOMITRINAE

Genus VOLUTOMITRA Gray 1853

Volutomitra, Gray, 1853, in Adam's Genera of Rec. Moll., vol. 1, p. 172, pl. 19, fig. 2. Type *Mitra grønlandica* Beck; 2, p. 619, 1858. Guide Moll. British Mus., p. 36, 1857. Dall: Bull. Mus. Comp. Zool., 28, p. 145, pl. 34, figs. 6, 7, 1889.
Mitra (Beck) Moller: Index Moll. Gronl., p. 15, 1842. Reeve: Conch. Icon., Mono. Mitra, pl. 15, fig. 106, 1844. Tryon: Man. Conch., vol. 4, p. 124, 1882.

Genotype: *Mitra grønlandica Beck.*

Range: Boreal Seas.

A small, compact group, distinguished by the lack of operculum; shell, small, unicolorous with a dark periostracum and plaited columella; nucleus small.

Volutomitra grønlandica (Beck) 1842
(Plate 4, Figure 35)

Mitra grønlandica Beck, in Möller Index Moll. Gronl., p. 15; 1842. Reeve: Conch. Icon., Mono. Mitra, pl. 15, fig. 106, 1844.
Mitra grønlandica Gray, Tryon: Man. Conch., vol. 4, p. 124, pl. 36, fig. 83, 1882.
Mitra graenlandica Gray, Sowerby: Thes. Conch., Mono. Mitra, p. 25, species 341, pl. 23 (Thes. pl. 374) fig. 519.
Volutomitra grønlandica. H. and A. Adams: Genera of Rec. Moll., 1, p. 172, pl. 19, fig. 2, 1853. Gray: Guide Moll. British Mus., p. 36, 1857. Dall: Bull. Mus. Comp. Zool., 18, p. 145, pl. 34, figs. 6, 7, 1889. Sars: Moll. Reg. Arct. Norv., p. 244, pl. 23, fig. 12, 1878. Maxwell Smith: East Coast Marine Shells, p. 129, pl. 64, figs. 6, 7, 1937.

Alt. 25 mm.

Hab. Greenland coast in 15-200 fms.; Wellington Channel; Iceland; Spitzbergen; Finmark, in 80-100 fms. (Sars); also in the Pleistocene of Britain.

Surface of shell smooth, except for a few course spirals near the canal.

Volutomitra alaskana Dall 1902
(Plate 26, Figure 180)

Volutomitra alaskana Dall, Nautilus, vol. 15, p. 102, 1902.

Alt. 44, diam. maj. 17.5 mm.

Hab. In southern and eastern parts of Bering Sea and the Aleutians in 60 to 85 fms., muddy bottom and southward in constantly deeper water, following the temperature of 39 degrees Fahr. to a point off San Diego, California, in 822 fms. (Dall).

Dall's description is as follows:
Shell fusiform, with about six moderately convex whorls; suture distinct, surface minutely spirally striated, covered with an olivaceous periostracum over a white or yellowish shell; aperture longer than half the total length, with a rather wide canal, callous pillar and body, in the adult, and simple outer lip; the canal with a well-marked siphonal fasciole, and is slightly flexuous; plaits normally four, rarely three or five, strong and rather distant; nucleus almost always eroded. This species differs from *V. grønlandica* in its much greater size, less rufous color, and pervasive fine spiral sculpture, but otherwise is very similar. It was first dredged by the writer (Dall) in the eastern Aleutians, and has since been obtained by the U.S. Fish Commission (Dall).
Apparently heretofore unfigured.

Genus MICROVOLUTA Angas 1877

Microvoluta Angas, Proc. Zool. Soc. 1877, p. 34.

Genotype: *Microvoluta australis* Angas.

Range: Australia and New Zealand.

Microvoluta australis Angas 1877
(Plate 3, Figure 26)

Microvoluta australis Angas, Proc. Zool. Soc. London, 1877, p. 35, T. 5, fig. 2, Powell, Shell Fish New Zeal., p. 81, 1937. Tryon: Man. Conch. vol. 4, p. 105, pl. 31, figs. 151-152, 1882.
Voluta minima Sowerby, Thes. Conch., vol. 5, 2nd suppl., p. 300, pl. 16 (Thes. pl. 515) figs. 152A and B.

Alt. 9, diam. 3.75 mm.

Hab. Port Jackson Head, Australia in 25 fathoms (type locality).

Shell very small, fusiform, solid, shining white; spotted and flamed with double bands of chestnut color; spire elevated, apex obtuse; five and one-half convex whorls; columella with four plaits.

Microvoluta biconica
(Murdoch and Suter) 1906
(Plate 3, Figure 28)

Voluta biconica Murdoch and Suter. Suter: Man. N. Zeal. Moll. p. 363, pl. 18, fig. 4. Powell: Shell Fish of New Zeal., p. 81, sp. 1091, 1937. Finlay: Trans. New Zeal. Inst., vol. 59, p. 242, pl. 43, figs. 13, 15, 1930. E. A. Smith: British Antarctic "Terra Nova" Exp. 1910, vol. 2, no. 4, p. 85, 1915.

Alt. 5, diam. 2.8 mm.

Hab. Off Great Barrier Island, in 110 fathoms; off Cuvier Island, in 37 fathoms; Snares, in 50 fathoms; near North Cape (Terra Nova Exp.); in the Castlecliff Upper Pliocene deposit; all records in the New Zealand area.

Shell very small, white, often with broad zig-zag lines continued down from fulvous color on nodules of first half of body whorl; whorls five; nucleus of one and one-half whorls.

Microvoluta cuvierensis Finlay 1930
(Unfigured)

Microvoluta cuvierensis Finlay, Trans. New Zeal. Inst., vol. 59, p. 242, 1930. Powell, Shellfish of New Zeal., p. 81, sp. 1092, 1937.

Alt. 6.5, diam. 2.7 mm.

Hab. New Zealand (Aupourian faunal province in deep water). Type locality 38 fathoms off Cuvier Island. Also taken in 10 fathoms off Snares Island and in the Castlecliff Upper Pliocene deposit of New Zealand.

Shell differing at sight from *biconica* in its smooth appearance. Axials and spirals are almost obsolete, but there is generally a well-marked peripheral groove on the body-whorl; the strong nodules and spirals of *biconica* are absent. Shell more slender, with a leaner body whorl. Sutural band quite different, in *biconica* there is a stout cord marginning suture with a wide concave shoulder below it; in *cuvierensis* there is a broad low band with merely a narrow groove below it.

This is quite distinct from *biconica*, one specimen of which was taken off Cuvier Island with the holotype.

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Note: All figures are natural size unless otherwise indicated--a vertical line (I) denotes the actual size, when figure is enlarged; a horizontal line (-) indicates reduction in size from original; a plus sign (+) indicates an enlargement.

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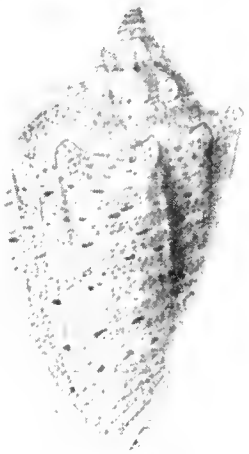

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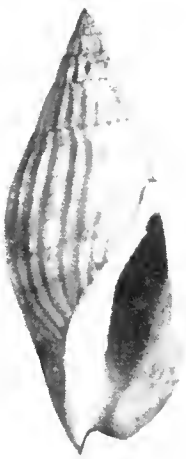

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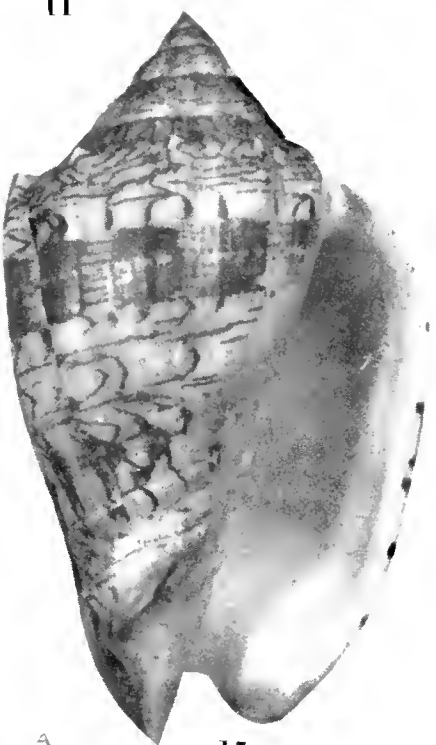

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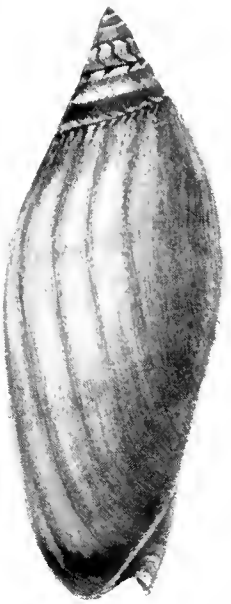

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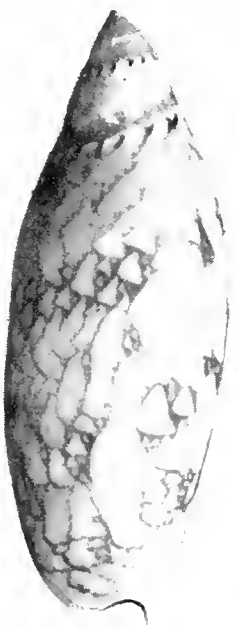

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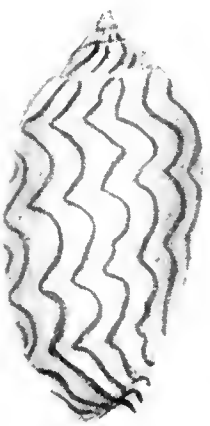

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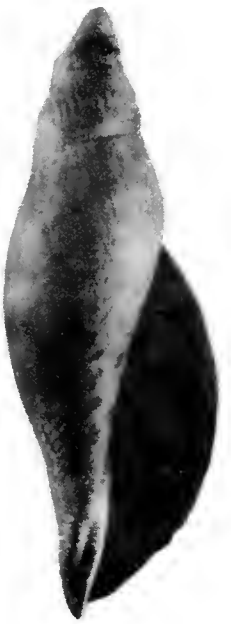

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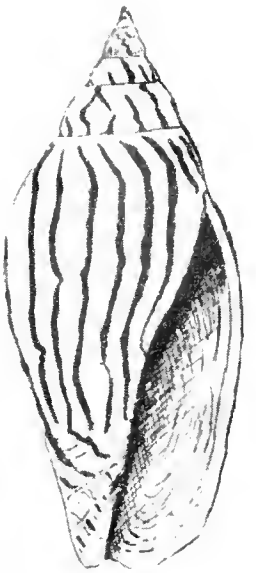

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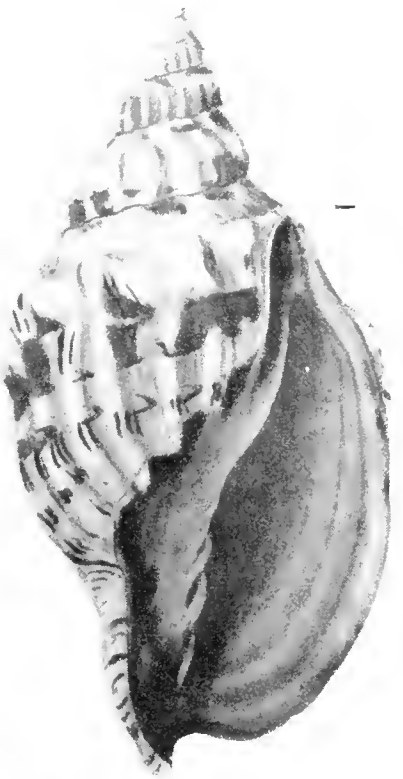

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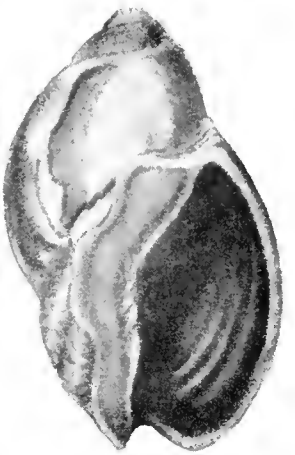

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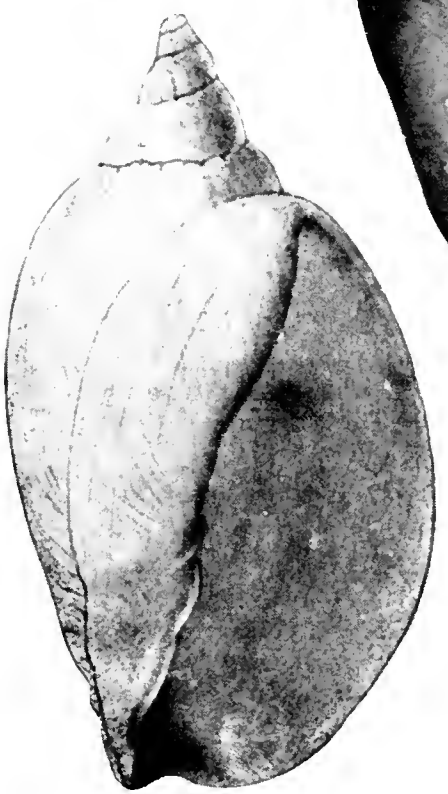

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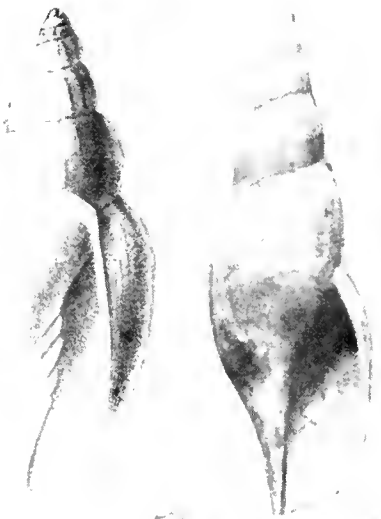

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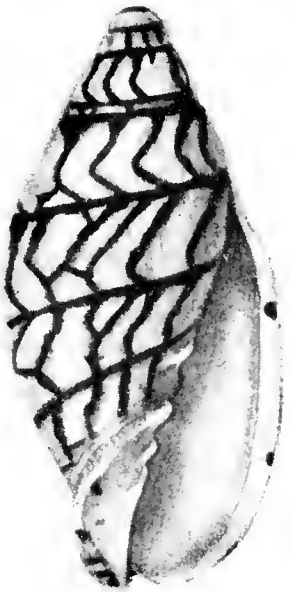

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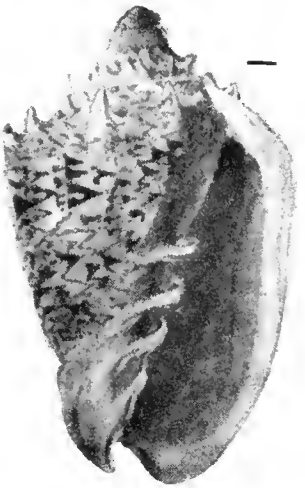

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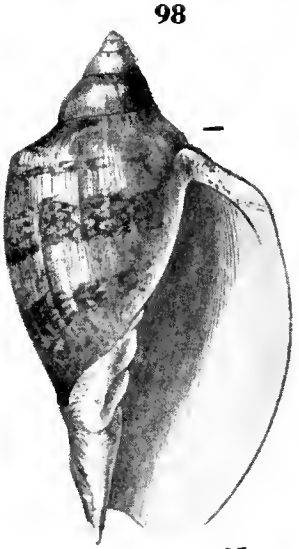

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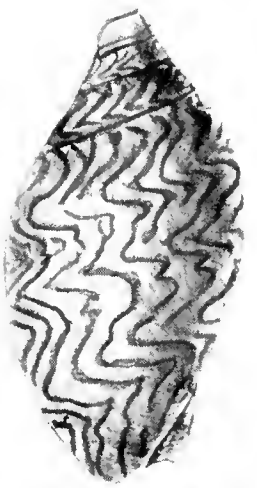

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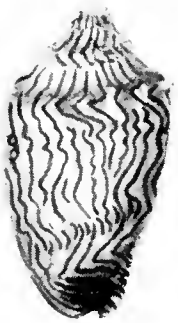

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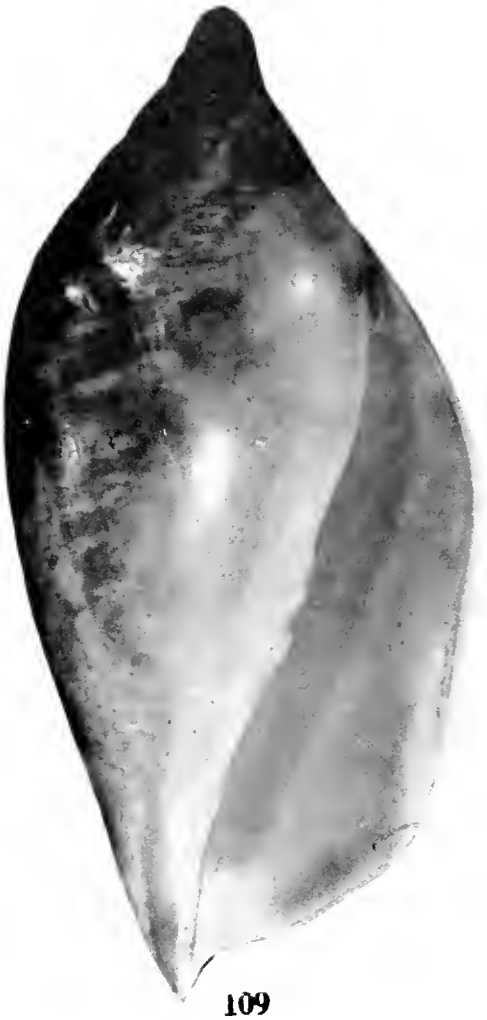

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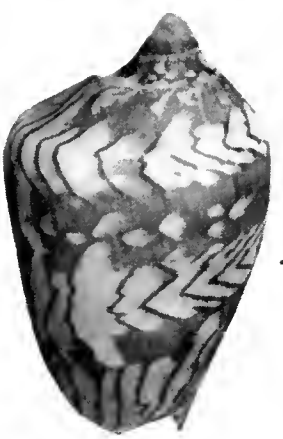

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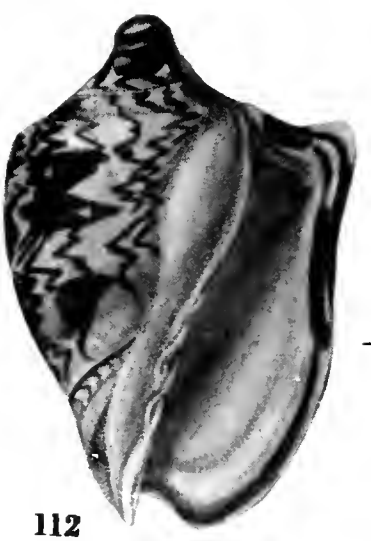

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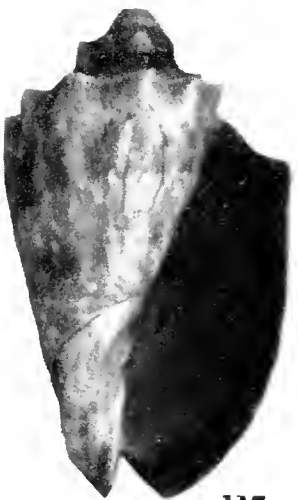

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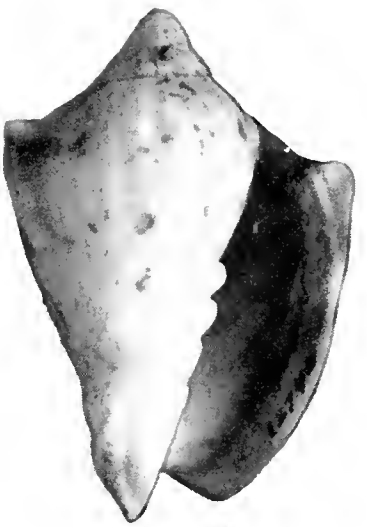

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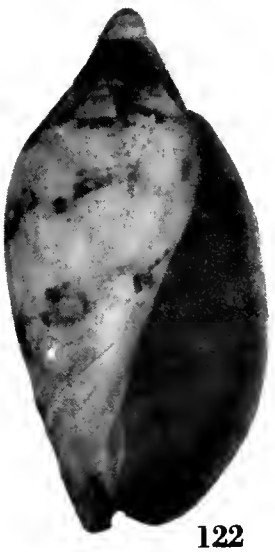

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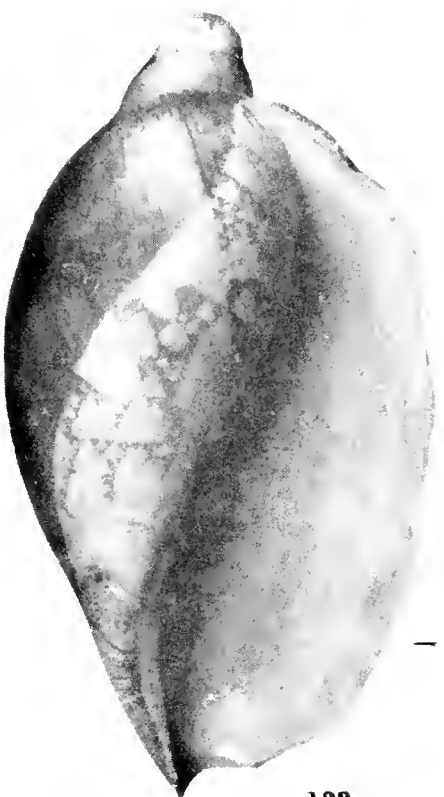

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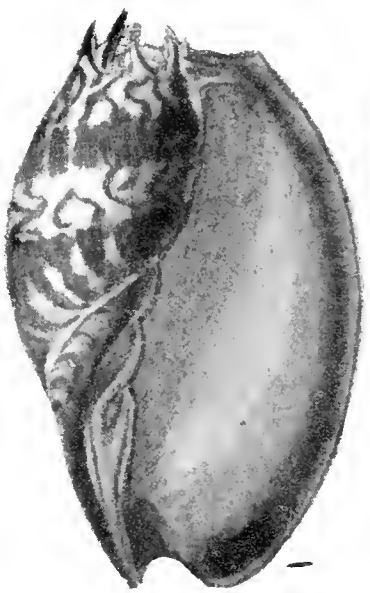

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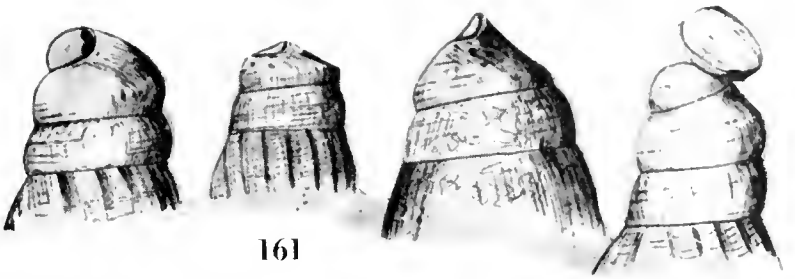

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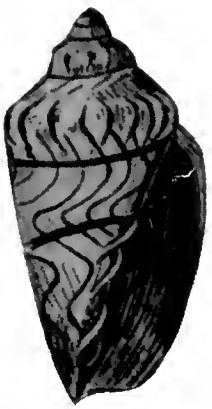

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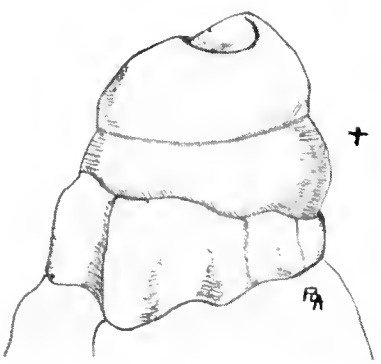

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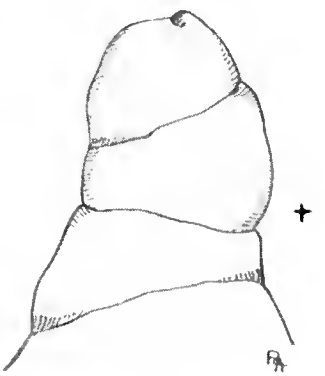

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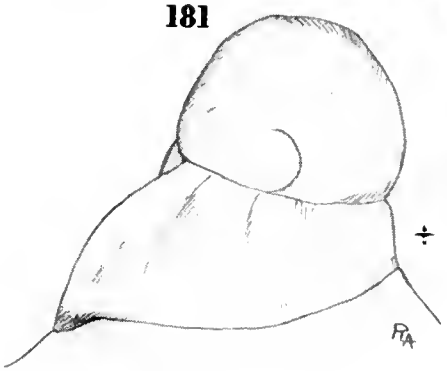

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