

V. *Notes on the Subgenus Cylinder (Montfort) of Conus.*

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Read before the Microscopical and Natural-History Section,
February 16, 1885.

FEW genera stand out more naturally and prominently in the animal kingdom than the large assemblage of Mollusca associated under the name of *Conus* (L.). Few fall so naturally into subdivisions and, as a rule, present such well-marked specific differences. Recognized as they all are at a glance by the inversely conical shell, with lengthened narrow aperture and simple inner lip, they are, with but one exception, natives of tropical or subtropical seas, the exception being a not uncommon S. Mediterranean shell (*C. mediterraneus*, L.). They approach in form, through *C. Orbigny*i and others of the section *Leptoconus*, to the Pleurotomæ, especially shells of the section *Genota*, e. g. *mitriformis* and *papalis*; and, on the other hand, through *C. mitratus*, of the subgenus *Hermes*, to the anomalous genus *Dibaphus*, and, through that, again, to the *Mitres*.

This is as regards the form only: for the mollusc itself differs in some important particulars, and hence the Cones are classed by themselves in the suborder Toxifera, of Gasteropoda Pectinibranchiata, differing from the other allied suborder Proboscifera—to which the Pleurotomæ and *Mitres*, just alluded to, belong—by the proboscis being furnished with a tube containing bundles of sharp, needle-like, barbed teeth at the end, instead of the usual lingual band, covered with short teeth. This tube, according to Adams, is extended below, at right angles to the cavity,

into a conical prolongation, provided with two series of hooked and subulate teeth. Indeed, the bite of *C. textile*, *C. aulicus*, and *C. marmoreus* is most severe, especially as it is supposed that venom is introduced into the wound, causing great difficulty in healing, while the pain continues intense for a long period.

Many monographs and illustrated descriptions of this diversified genus have been published, the best known being Reeves's 'Conchologia Iconica,' vol. i. (1843-44), with a Supplement of 8 plates, dated some years later, 337 species being described in all, and Sowerby's 'Thesaurus Conchyliorum' (1869), forming vol. iii. of the work, 450 species.

Kiener, 'Coquilles Vivantes,' 324 species.

Weinkauff, in Küster's continuation of Martin and Chemnitz's 'Conchylien Cabinet' (1875), describes 411 species.

The latest monograph is that of Mr. G. W. Tryon, jun., of Philadelphia (published 1884), in which about 450 species, not including varieties, are recognized. He bases his classification on Weinkauff's Catalogue, dividing the genus into seventeen sections, of which the Texti, forming the last or 17th group, are equivalent to the subgenus *Cylinder*, of Montfort, now under discussion.

Most conchologists, however, including the brothers Paetel, in their 'Conchylien Sammlung,' 2nd ed. 1884, still follow the lines of Messrs. H. & A. Adams, as given in their recent 'Mollusca' (1858), and which appears to me to be simple and less artificial. As all agree, however, in the limitation of the group now under discussion, it is out of place to enter into the merits or demerits of the various plans proposed for the arrangement of the whole genus.

Out of 450 species known of *Conus*, but 26 are catalogued by H. & A. Adams, as appertaining to *Cylinder*;

but in Sowerby's 'Thesaurus' (1870) 36 are mentioned. Tryon, of Philadelphia, in his elaborate monograph just alluded to—the 'Manual of Conchology,' vol. vi.—calls but 17 of these true species, with 10 subspecies, and also cites 12 slight varieties, classed almost as synonyms, the total number of named forms coming up to 39. Of these 37 are exhibited in the present collection.

The subgenus *Cylinder* may be briefly thus characterized:—

Shell subconic, smooth, or very lightly striated; spire elevated; whorls never coronated, numerous; body-whorl ventricose, notched at the suture; aperture effuse at the fore part.

"The species," writes Mr. Arthur Adams, "of this section are all very rich in the style of their colouring, and a somewhat similar reticulated kind of pattern runs through the entire series."

Some very widely differing Cones, *e. g.* *C. archithalassus*, *ammiralis*, *acuminatus*, and *cordigerus* (a var. of *nobilis*) among the Leptoconi, and *C. arachnoideus* and *C. nicobaricus*, among the Marmorei have a similar reticulated pattern. All these differ, however, materially in form, either, as in the last section mentioned, by the coronation of the whorls, or, in the former, by the grooved and sculptured spire, and more truly conical shape.

The only species which presents any difficulty at first sight is a variety of *C. cordigerus* (Sowb.), which, in the specimen exhibited, approaches so nearly to *C. omaria*, as to suggest a mimetic principle among the molluscs similar to that which is known to exist in other branches of the Animal Kingdom.

The *geographical* distribution of *Cylinder*, so far as known, is almost exclusively eastern, many species being found ubiquitously in the eastern tropics, from E. Africa

to Ceylon, Mauritius, the Philippines, and New Caledonia. Two species, or forms of one (*C. victoriae* (Reeve) and *complanatus* (Sowb.)), occur in Australia; *C. pyramidalis* (Lam.) is also a native of the same seas; *C. racemosus* (Sowb.), an unique form in my collection, is from the Sandwich Isles; *C. lucidus* (Mawe) from the west coast of Central America; and a doubtful form, *C. Dalli* (Stearns), recently described from a single specimen, is reported from the Gulf of California. This shell, apparently, from the figure, a variety of *C. textile* (L.), is especially interesting as affording a western habitat for a species very universally distributed in the east, but not known before to impinge on American shores

The *locality* in which these Molluscs are found, in common with others of the family, is in fissures of rocks, especially in coral-reefs, where they lead a predatory existence, feeding on other Mollusca &c.

After a very careful study of the Protean forms of the Textile Cones, the forms would seem to come under five heads, the first head having three divisions. I propose to class them as follows:—

I. TEXTILIA.

a. *vera*.

b. *abbates*.

c. *pyramidalia*.

II. RETIFERI.

III. LUCIDI.

IV. AULICI.

a. *crocati*.

b. *episcopi*.

V. AUREI.

Of these the first and fourth, as might be expected,

harbour the largest number of species, the second and third containing one species apiece, and the last two or three species.

I. TEXTILIA.

a. *vera*.

Shell yellow-brown, with undulating longitudinal lines of umber, interrupted by triangular white spaces; spire raised, similarly marked.

Under this I group the well-known *C. textile* (L.), the "Field of the Cloth of Gold" of the old conchologists: an exceedingly variable shell, whose forms and limitations it is almost impossible to define. It abounds in all eastern tropical seas, and, as before observed, a form, the *C. Dalli* (Stearns), has been detected once on the Californian coast.

The named forms of *C. textile* are as follows:—

- i. *tigrinus* (Sowb.). More or less destitute of the brown bands and brown longitudinal markings.
- ii. *vicarius* (Lam.). Pattern coarser and larger in detail, greater preponderance of white triangular patches.
- iii. *verriculum* (Reeve). Short and stumpy, and coarsely marked.
- iv. *concatenatus* (Sowb.). Like No. iii., but of simple zigzag marking.
- v. *scriptus* (Sowb.). A delicately striated form, more finely marked than *canonicus*, but otherwise similar.
- vi. *canonicus* (Brug.). No brown markings, more finely marked than *vicarius*; a very distinct and well-known form.
- vii. *condensus* (Sowb.). A beautiful small shell, with constant pink tinge, marked as *scriptus*.

- viii. *corbula* (Sowb.). Of very effuse growth, ventricose, confusedly marked.
- ix. *euctrios* (Melvill & Sowb.). Similar to *corbula*, but of different shape, and the markings more regular. Unique in my collection. Locality unknown.
- x. *Dalli* (Stearns). Of lighter build. Spire convex; mouth roseate. California. Unknown in European collections as yet.

All these, except *tigrinus*, are called actual species by most authors; but it seems best to merge them as varieties.

b. *abbates*.

The texture and markings finer, and spire, as a rule, more depressed than in the first group.

C. abbas (Brug.). Very beautifully and intricately marked with smaller reticulations; very distinct from any other species.

C. panniculus (Lam.). Perhaps a form of *abbas*.

Var. *textilinus* (Kiener). Of more pyriform shape, but similar markings. I possess Kiener's original type.

C. archiepiscopus (Hwass). Very richly and minutely ornamented.

C. panniculus seems to connect this and *abbas*: it is, in fact, with some hesitation I keep them separate.

C. Victoriæ (Reeve). Of much lighter growth than any of the preceding; the greyish flames peculiar. From Australia. It is a most distinct species.

Var. *complanatus* (Sowb.). Only a more ventricose, squarely based variety of *C. Victoriæ*.

c. *pyramidalia*.

It is in this group that the Textile group reaches its

maximum of beauty and perfection. The lengthened and graceful pyramidal shape and straight lip amply characterize it.

C. pyramidalis (Lam.). "A species," writes Tryon, "often misunderstood. Its lengthened form and simple interlaced network fully distinguish it." A var. *convolutus* has been described of more brilliant colouring. There can be no doubt but that this species, through the var. *tigrinus*, is connected with the true *Textilia*.

C. telatus (Reeve). Is more conical than most of the Textile Cones. In the British Museum this is placed among the *Leptoconi*, next to *ammiralis*, which, in its markings, it much resembles.

C. Paulucciæ (Sowb.). Allied on the one hand to *C. aureus* and on the other to *C. gloria maris*. Of very straight pyramidal growth, very richly and handsomely marked with warm chestnut and orange. A native of Mauritius, it was only recently (1877) described by Mr. G. B. Sowerby, from a specimen in the collection of the Marchioness Paulucci, at Florence. Three or four specimens besides the type are known, one of which is here exhibited.

C. gloria maris (Chemn.). Larger, very gradually tapering; mouth very straight and long; spire squarely elevated; reticulations exceedingly fine, regular, and minute; orange blotches not so conspicuous proportionately. To this I will refer later.

C. legatus (Lam.). A distinct form, not, to my mind, the young of *canonicus*, to which Tryon assigns it. Noticeable, by great prominence in the longitudinal chocolate blotches, with a suffusion of pink, which

is always present in the species, over the whole shell, and by its somewhat compressed conical shape.

II. RETIFERI.

C. retifer (Menke) = *solidus* (Sowb.). One species only. Amply characterized by its pyriform outline, great solidity, and coarse reticulations. Native of Eastern seas.

III. LUCIDI.

C. lucidus (Mawe) = *reticulatus* (Sowb.). The only species. Very peculiar in its more conical shape, areolate and regular marking, and violet aperture. The locality also is curious: La Plata Island, west coast of Central America.

IV. AULICI.

Shells, as a rule, narrow in proportion to their length; spire rounded, elevated, marking, on most of the species, very bold and distinct dark chestnut or chocolate-brown blotches, alternating with lines of large white spots interlaced with coarse network.

a. *crocati*.

Surface orange-yellow, often nearly suffusing the entire shell. Though the type (*C. crocatus*) is distinct enough, it is connected by intermediate gradations with the Aulici proper.

C. colubrinus (Lam.). Yellow, with oblong white spots. A very uncommon and curious species.

C. crocatus (Lam.). A very handsome orange-yellow conical species, with white spots and markings broader than long, very variable in their disposition. Some specimens are almost unicolorous yellow. This species, at first sight, has less resemblance to

the Textile Cones than any other of the group.
Native of Ceylon.

C. racemosus (Sowb.). Shell brownish orange, solid, smooth; spire convex, with obscure articulated brown and white revolving lines and clusters of triangular white spots sparingly agglomerated. Unique in my collection; formerly in that of Mr. Bewley, of Liverpool, and subsequently in S. Prevost's, of Alençon.

b. *episcopi*.

Under this head come a very variable assortment of shells, grouped mostly, but, I think, wrongly, by Tryon under the head *C. omaria*, with the exception of *aulicus* and *Elisæ*.

C. Elisæ (Kiener). Shell very closely reticulated with chocolate-brown, so as to appear like a uniform brown surface with innumerable white specks. From Madagascar. A very distinct species, though somewhat like *C. racemosus*.

C. prælatus (Hwass). Always suffused and clouded with grey; very distinct.

C. magnificus (Reeve). A truly magnificent species, very variable, but always recognizable. In form like *episcopus*, with very obtuse spire marked as in the body of the shell in a regular continuation; shell pink, much suffused with dark chocolate and very delicate reticulation. From the Philippines.

C. episcopus (Hwass). Variable, and no doubt allied to *omaria*, but the greater size and greater boldness in marking are always sure to distinguish it. Native of all Eastern seas.

C. omaria (Hwass). Very variable. Among the specimens exhibited are some resembling *C. cordigerus*

(Sowb.), and others like *C. nocturnus* and *Bandanus* in other sections, to which I provisionally give the name *marmoricolor*. Another specimen, again, resembles *C. magus*, a variable Eastern species, here called *magoides*. A detailed description of this species seems impossible.

C. pennaceus (Born.) is a variety.

C. rubiginosus (Hwass) is likewise a variety, but both are more constant than some of the forms of the type.

C. Madagascariensis (Sowb.). Though placed by Tryon as a variety of *C. archiepiscopus*, it is far removed from that species, and really approaches *C. omaria*. It is a small, neatly marked, very finely reticulated species, native, as its name implies, of Madagascar.

C. aulicus (L.). The largest and boldest-marked species of the genus, attaining sometimes a length of nearly 6 inches. It is distinguished by its form and revolving striae, and cannot be mistaken for any species but the next.

C. auratus (Lam.). Merged into *C. aulicus* by Tryon, with which I can hardly agree; the curious zigzag effect of the alternations of warm chestnut-brown coloration and small articulations well represented in the specimen here exhibited, as well as in the plate in Reeve, Conch. Icon., sufficiently serve to distinguish it.

V. AUREI.

Shells subcylindrical, merging into the next subgenus *Hermes*, ribbed transversely; spire elevated, very obtuse, convex.

C. aureus (Hwass). A distinct species, though similar in its markings to *C. Paulucciae* and some others.

C. clavus (Linn.). A very beautiful species, delicately marbled with orange-brown and white reticulations; its form is oblong; spire convex, spotted. Native of Java and the Philippines and New Caledonia. Tryon and Adams place this species in *Hermes*, between *C. Nussatella* and *circumciscus*, but I think it falls more naturally in here.

Besides the foregoing, one more species of the Textile Cones has been lately described, *C. Prevostianus* (Sowb.). The specimen is unique, and I have not seen it, but it would seem to come under the section *Pyramidalia*.

But my chief object in calling attention to the arrangement of the Textile Cones was to compare the *Conus gloria maris* (Chemn.) with its congeners.

Although I placed it near *pyramidalis*, it really stands *per se*, prominent among all of its kindred for beauty of shape and excellence of pattern. As Reeve observes, the reticulations are so fine as to defy the skill of the lithographer. Hence no drawing ever does the species justice.

It was originally described by Chemnitz (Conchylien Cabinet) in the year 1788, "ex Museo Moltkiano;" but the shell seems to have received its name, though no description was published, about the year 1756 or 1758, in the Museum Schluyterianum, Berlin.

The nomenclature of Chemnitz, describing in the pre-binomial era, is not always accepted by writers, but this species will always be especially associated with him, although Hwass is sometimes given as the authority for the name.

The following is the bibliography relating to this species, *C. gloria maris* (Chemnitz):—

- Chemnitz, Conchylien Cabinet, 10. p. 73, t. 143. f. 1324-25.
Bruguère, Encycl. Méthod. p. 756, n. 146, Tabl. pl. 347. f. 7.
Blainville, Dict. des Sciences Nat. tom. x. p. 260.

- Lamarck, Annal. du Mus. vol. xv. p. 438, n. 176.
 Dillwyn, Cat. i. p. 424.
 Wood, Ind. Test. t. 16. f. 134.
 Delessert, Rec. 40. f. 16.
 Sowerby, Tankerville Catalogue, 1825, pl. 8. f. 1, 2.
 Deshayes, Lamarck, 2 ed. xi. p. 126.
 Reeve, Conchologia Iconica, pl. 6. f. 31.
 Kiener, Coquilles Vivantes, p. 326, t. 76. f. 1.
 Sowerby, Thesaurus Conch. pl. 24. f. 526.
 Tryon (G. W.), Manual of Conchology, 1884, vol. 6. pl. 29. f. 90.

There is also a figure of the species in

Chenu, Manuel de Conchyliologie, p. 249, f. 1525.

Dr. S. P. Woodward, in 'Recreative Science' (1860), says :—"The rarest of all Cones, and perhaps of all shells, except the living *Pleurotomaria*, is the *Conus gloria maris*, which those old Pagan Dutchmen worshipped, as did the Greeks the Paphian Venus. Perhaps it was this Cone of which a Frenchman is related to have had the only specimen except one belonging to Hwass, the great Dutch collector, and when this came to the hammer he outbid every rival, and then crushed it beneath his heel, exclaiming, 'Now my specimen is the only one.' Doubtless many traditions respecting this species yet linger in the marts of Amsterdam; with us it is still worth ten times its weight in gold."

In 1825 the elder Mr. Sowerby, in cataloguing the shells of the late Earl of Tankerville—which catalogue formed the medium for the description, for the first time, of many now well-known species—notes, in his preface at the lot 2463, which contained a *gloria maris* :—"We have never seen more than two specimens of this shell, namely, that which is in M. Saulier's collection in Paris, and that which adorns the Tankerville collection."

It will not be out of place now to enumerate the whereabouts of the 11 or 12 specimens known to exist. It is a

curious fact that while nearly every other shell, hitherto highly esteemed, has been brought home in abundance by explorers and collectors, this and one or two others like the *Cypræa leucodon*, *C. princeps*, *C. Broderipii*, *C. guttata*, and *Conus cervus* remain as they were in the days of the Duchess of Portland, the first English collector, in the middle of the last century.

The land of its nativity is known : Jacna, I. of Bohol, Philippines, where the late Mr. Hugh Cuming found two examples, one very juvenile, scarcely more than an inch in length. But its rarity there was so great that, although he employed all the available natives in dredging-expeditions, and the place has been searched frequently since, nothing of the kind has again occurred. Rumour has it that the original very circumscribed locality has been annihilated by an earthquake, but I cannot hear confirmation of this, though it is exceedingly likely, the whole of that region being extremely volcanic.

The total number of specimens known to exist is 12 ; of these half are either immature or in very poor condition.

There are five in this country, disposed as follows :—

Three in the British-Museum Collection at South Kensington. Of these two are the small specimens, one only an inch and a half long, the other a little larger, collected at Jacna by Mr. Hugh Cuming in 1838.

The third is the specimen formerly in the Portland Collection, then in the Tankerville, from whence it passed into the hands of the late Mr. W. J. Broderip, F.R.S., and thence into the National Collection. This is a fine, full-grown, though pale-marked specimen, and is illustrated in Sowerby's 'Catalogue of the Tankerville Collection,' but very highly coloured.

The fourth specimen in this country is in the private collection of the late Mrs. De Burgh, of 61 Eccleston

Square, London, S.W., and is, perhaps, the finest specimen known. Formerly in Mr. Norris's possession, of Preston.

The fifth is the specimen now exhibited, as being in my collection at Prestwich. It is not quite so large as Mrs. De Burgh's or the Tankerville specimen, but as finely marked, and of mature growth. Formerly in Mr. Lombe Taylor's hands, it passed into that of the late Dr. Prevost, of Alençon, and subsequently into mine.

The sixth specimen is in France, but a very poor one, collected by M. Carl Bock in his eastern travels, and which I saw sold with a great deal of competition at Stevens's Auction Rooms in July 1880. It was very water-worn, and with a disfiguring sea-break. It was purchased by Mr. Bryce Wright, of Regent Street, for M. Dupuis, of St. Omer.

The seventh specimen is in Italy. One formerly in the collection of the Hon. Mrs. MacAdam Cathcart, sold to the Marchese Paulucci, of Florence. This specimen is described by Mr. G. B. Sowerby to me as being fairly marked, but filed in the mouth and not in good condition.

The eighth, a very poor, small example, is in the collection of Madame Macaré, of Utrecht, Holland.

In the same country it is also reported that there is a specimen in the Amsterdam Museum; but, on writing for more particulars to Mr. Sowerby, to whom I am much indebted for details, he assures me there is some mistake as to this. There is, however, I believe, one in the Museum at Rotterdam.

The tenth example known, originally in M. de Verreaux's possession, is now in that of the King of Portugal, at Lisbon, to whom it was sold by Mr. Damon, of Weymouth.

In the United States, Mr. Tryon writes me, there is a

good specimen in the American Museum of Natural History, New York ; but I know nothing of its history, or whence it was obtained.

In Australia the fine, full-grown, but pale-coloured shell, formerly in the collection of Mr. J. Dennison, of Liverpool, was, in April 1865, bought by Mr. Lovell Reeve for the Melbourne Museum.

There are, therefore, eleven or twelve specimens at most recorded of the shell not inaptly termed

“THE GLORY OF THE SEA.”

VI. *Memoir of ROBERT ANGUS SMITH, Ph.D., LL.D., F.R.S., F.C.S., &c.* By EDWARD SCHUNCK, Ph.D., F.R.S., &c.

Read April 21st, 1885.

By the death of Robert Angus Smith the Literary and Philosophical Society has sustained a great loss. His was a life of which it is difficult to form a just estimate, on account of the many-sidedness of his character and attainments. His contributions to science and literature will, indeed, always remain accessible to the judgment of posterity, but there is much in his character and his relations to the world which should be recorded ere those who knew him have also passed away. In his case, fortunately, the record may be perfectly unreserved, for here there are no defacing blots to be concealed, no dark shadows to be passed over.

Robert Angus Smith was born in Glasgow, February 15th, 1817, being the twelfth child and seventh son of John Smith, a manufacturer of that city, and of Janet his



Melville, James Cosmo. 1887. "Notes on the Subgenus Cylinder (Montfort) of Conus." *Memoirs of the Literary and Philosophical Society of Manchester* 10, 76–90.

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