CONUS COROMANDELICUS, SMITH, ITS PROBABLE AFFINITIES, AND SYSTEMATIC POSITION IN THE FAMILY CONIDÆ.

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In September, 1894, the description of a most notable abyssal Cone was published,[1] a species obtained during one of the cruises of H.M. Indian Survey steamship "Investigator," with which the names of Dr. A. Alcock, F.R.S., and the late Professor Wood-Mason are so closely associated. Its locality was "off the coast of Coromandel, lat. 14° 18′ 15″ N., long. 80° 18′ 30″ E., in 80–110 fathoms, and also lat. 15° 4′ 7″ N., long. 80° 25′ 7″ E., in 128 fathoms."

The author, in naming it *Conus Coromandelicus*, adds:—"It belongs to that section of the genus which includes *C. D'Orbignyi*, *cancellatus*, etc., and which have the surface ornamented with transverse grooves and ridges. It is not sufficiently similar to any known species to suggest a comparison."

In 1903 Mr. Frederick W. Townsend was fortunate enough to obtain from two contiguous soundings in the Gulf of Oman, viz., lat. 25° 10′ N., long. 59° 12′ E., at 180 fathoms, and lat. 25° 19′ N., long. 58° 10′ E., at 205 fathoms, a few finer examples than those dredged off the coast of Coromandel; these were associated with *Rostellaria delicatula*, Nevill, also found in the deep waters of the Bay of Bengal, and a fine new *Pleurotoma*, *P. navarchus*, M. & S.

One of the largest of these specimens, evidently adult and quite perfect, and in live condition, measures long. 48, lat. 18, aperture 33 × 6 mm. This is as compared with long. 37, lat. 14, aperture 25 × 3½ mm. in the type.

Recently, when collecting Tertiary fossils in the Barton Beds, between Highcliffe and Hordle, South Hants, I found some good examples of *Conorbis dormitor* (Solander), and a comparison of these with *Conus Coromandelicus* reveals to my mind an alliance of the closest nature possible. We seem, indeed, to possess in these profound depths of the Arabian Sea and North Indian Ocean the direct descendant of a genus (or section of a genus) hitherto deemed extinct, the living analogue, so to speak, of the Barton Eocene *Conorbis* of prehistoric days.

The main differences seem to consist in (*a*) size: *C. dormitor* does not usually exceed 15 to 20 mm. longitudinally, by 7 in latitude; aperture 10 × 2 mm. (*b*) Greater length in proportion to length of

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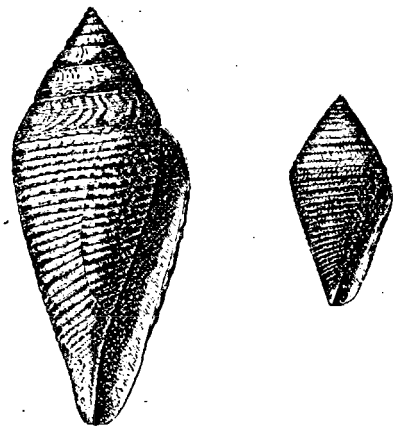
[1] Ann. & Mag. Nat. Hist., ser. vi, vol. xiv, p. 159, pl. iv, figs. 1, 2.

spire in the body-whorl of the recent form, *C. dormitor* being an exact double cone. In all other vital points the closest similitude prevails: both possessing smooth apical whorls, number of these identical, say 7–9, sculpture very akin, allowing for a certain intensification of the surface-pattern, sulcation, and ribbing of the Eocene species, while the live *C. Coromandelicus*, in prime condition, has its costæ and ornamentation of the upper whorls of a more mellowed pronouncement. In form, save for the particular mentioned above under (*b*), they are very similar, the effuse thin outer lip receding at the sinus, and almost indicating Pleurotomid characters to both species, the cone-like aperture being wider in the recent form, which is, in some examples, slightly more produced at the base.

1 2



1. *Conus* (*Conorbis*) *Coromandelicus* (Smith).
2. ,, ,, *dormitor* (Solander).

Conorbis, a genus instituted by Swainson[1] in 1840, was formed to receive the old *Conus dormitor*,[2] Solander, 1766, and consists of but few species, only one other, *C. alatus*, Edwards, existing in the Barton Beds. Three species, *C. marginatus* (Lam.), *subangulatus* (Desh.), and *æquipartitus* (Cossmann), occur, however, in the Middle Eocene (Calcaire Grossier) of the Paris Basin.[3] *Conorbis dormitor* is well figured by Sowerby, Min. Conch., 1821, pl. 301, fig. 2;

[1] Malacology, pp. 149, 312.
[2] Brander's Foss. Hant., p. 23, pl. i, fig. 24. Also Brit. Oligocene and Eocene Moll., by R. Bullen Newton, p. 130.
[3] Cf. "The Eocene and Oligocene Beds of the Paris Basin," by George F. Harris and Henry W. Burrows.

Woodward, Recent and Fossil Shells, pl. vii, fig. 2; also Mon. Pal. Soc., 1856, p. 200, pl. xxiv, figs. 11*a*, 11*c*.

Conorbis, judging by the only test that can be applied to it, viz. the conchological, almost runs into certain species that have been assigned to the genus (or subgenus of *Pleurotoma*) *Genota*, H. & A. Adams.

The type, *G. mitræformis* (Wood), a recent species from East Indian seas, is not so akin as others more recently described by Watson and Dall under the names *Pleurotoma* (*Genota*) *atractoides*,[1] Watson, from the Philippines, and *P. viabrunnea*, Dall, collected in the New World tropics during the "Blake" expedition. With these should be associated *Pleurotoma amphiconus*, J. de C. Sowb., a fossil shell of the closest relation to both the species chiefly now under discussion. Here the aperture is narrow and conoid, and it would not be a matter of surprise to see some future palæontologist placing this species in the same genus that was formed to include *C. dormitor*.

It may not, indeed, be out of place to give two quotations by the late Dr. Searles V. Wood & F. E. Edwards,[2] in speaking of the analogies and appearance of this species: "In the elevated conical spire, the almost semicircular form of the outer lip, and the produced base of the whorls, it presents the closest analogies with that section of the *Pleurotomæ* formed of *P. prisca*, *amphiconus*, *linearis*, and similar species. Indeed, so closely does it approach to some of them that, judging from external characters only, it is difficult to decide to which genus it should be referred. The straight, narrow aperture, however, is entirely that of a Cone, and indicates a necessity that the animal, in order that it might withdraw into the inner whorls, should be enabled to enlarge the space within the shell, a necessity which was met by the power of absorption possessed by the animal. The curvature of the outer lip is all quite distinct in its character from the sinus in the outer lip of the *Pleurotomidæ*."

And again: "In the well-known Eocene species,[3] *C. dormitor*, Sol., for instance, the shell outwardly possesses quite as much of the character of a *Pleurotoma* as that of a Cone; and Mr. Swainson has, in fact, taken it as the type for a genus which he has named *Conorbis*, and which, in his circle of affinities of the *Conidæ*, he regards as the representative of the *Pleurotomidæ*. This division depends entirely on the external characters of the shell; no living representative has, I believe, been found, and the animal is therefore unknown. It is certain, however, that it was a true Cone, for, on breaking a specimen, the inner whorls will be found reduced by absorption to a membrane-like thinness, and the capability to effect this is not, I believe, possessed by the animal of *Pleurotoma*. The proposed genus, *Conorbis*, is not well defined by its author, and is not generally received, although it may be adopted as a section of *Conus*. The characters appear to be

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[1] Rep. Challenger Exped., Zoology, vol. xv, p. 301, pl. xx, fig. 8.
[2] Mon. Pal. Soc., 1856, p. 301.
[3] L.c., p. 118.

the elevated conical apex, produced base representing the canal which distinguishes the *Pleurotomæ*, the condition of the outer lip, which is not thickened within, and so strongly arched as to be almost semicircular in form, the deep wide sinus, which divides the posterior extremity of the outer lip from the suture, and exactly resembles the notch by which the *Pseudotomæ* (a section proposed by Bellardi) are distinguished, and the elevated, reflected anterior margin of the columellar lip, forming the right wall of the anterior canal."

To sum up, I would venture to propose that the Swainsonian name *Conorbis* be applied to *C. Coromandelicus*, Smith, subgenerically, as an isolated recent form, its place being between the subgenus *Hermes*, Montfort (in which *C. tendineus*, Hwass., is one of its nearest allies), and the section *Genota*, H. & A. Ad., of *Pleurotoma*

I have mentioned that Mr. Townsend dredged these Cones alive; but the soft parts were not, unfortunately, retained. It is much to be hoped that the next examples procured will be able to be fully anatomically examined and reported on, as especially to be compared with the animal of *Genota*. Indeed, in no assemblage of Gastropoda are our attempts at classification and demarcation of genera or subgenera so apt to become futile as in the wonderful wealth of forms exhibited by the Pleurotomidæ, both recent and fossil. What is wanted for this family is a specialist to concentrate the whole of his lifework upon it, and it alone. The number of new forms, mostly abyssal, increases yearly, and very likely there exist further links to bind the two groups we have been discussing, *Conus* and *Pleurotoma*, together in more than one way.