

ON TURBINELLA PYRUM, LAMARCK, AND ITS DENTITION.

By W. H. DALL.

Nothing has been known of the soft parts of this genus, though Gray* characterized the operculum. Troschel obtained an alcoholic specimen with some difficulty, only to find the soft parts in a state of decay which had left no trace even of the radula.†

After many efforts, extending over more than six years, I recently obtained for the National Museum a specimen of the typical form, obtained by Dr. J. Wood-Mason at the Andaman Islands some twelve years ago and sent by the India Museum of Calcutta, through his courtesy, to Washington.

On extracting the soft parts it was found that granular degeneration had progressed to such an extent that nothing could be made out in regard to the viscera or branchiæ; only the tougher parts near the aperture of the shell retained their solidity, and these were so contracted that it was necessary to cut them apart to get any idea of the form of the living animal. The operculum was elongate-oval, with the width less than one-third the length. There was a small part of it free from the integument, but less than in that of *T. cornigera*, which is smaller, more curved, with deeper notches for the columellar plaits on the inner side, with a larger deposit of polished callus on the under side, and altogether heavier and more solid.

The foot appeared, in its contracted state, to be small for the weight of the shell, rather broad and truncate, with bluntly-rounded corners in front and broadly rounded behind. The two corners were folded toward each other under the base, but the tail was not turned under. The sides of the foot were not ornamented with any appendages, but were smooth, except for numerous projecting granulations irregularly disposed and due to small aggregations of crystals of lime under the skin, as in some *Doridida*. These had considerable areas about them where there were no crystals, and were not marked by any coloration. Similar granulations appeared more sparingly on the mantle margin, which was smooth and plain. The color of the animal was whitish, with black or very dark olive-brown streaks, especially near the margin of the foot. There appeared to be a pedal gland. There was a very deep sinus between the cephalic parts and the upper front edge of the foot. The mantle extended to the end of the canal, and the siphon took its origin at some distance behind the anterior part of the edge of the canal-mantle lining. Both were much contracted. The tentacles, as contracted in the spirits of wine, were disproportionately

* Mrs. Gray's Moll., iv, p. 68; Guide, p. 31.

† Geb. der Schnecken, ii, p. 84.

small and short, the tips hardly prolonged beyond the eye, and forming a blunt oblique point. In life, however, they were probably more extended. The mouth was large, circular, and radiately wrinkled. The proboscis long, white, muscular, cylindrical or gently tapering to the point, which was laterally compressed, making the orifice nearly a vertical slit. The gullet was extremely capacious, forming a densely laminated crop, which extended backward as far as the tissues were preserved. There were no jaws. The gills, genitalia, &c., were decayed so as to prevent recognition or description. The radula was disproportionately small and contained about eighty rows of teeth transversely; formula, $1 \cdot 1 \cdot 1$ or $1 \cdot \frac{1}{3} \cdot 1$. Its total length was about 0.2 of an inch, the proboscis being about 2.25 in all. The rhachidian tooth is provided with a wide, doubly arched base and with three cusps, close together, of which the median one is about twice as long as the other two. Laterals simple, broad, strong, with a single cusp. There was no indication of any small outer cusp, such as is figured for *T. cornigera* by Troschel.

The teeth recall those of *Cynodonta cornigera* and differ from them chiefly in the greater width of the rhachidian base and the absence of the denticulations on the outer corners of the laterals. These last were found in two instances by Troschel, who ascribed their absence from Gray's figure by supposing that they were broken or abortive, as occasionally happens.

We may now consider the bearing of our new information on the systematic position of *Turbinella*. It would seem that its characters as derived from the soft parts merely confirm those derived from the shell, by which it has been hitherto classified; a fact less startling but perhaps not less significant than the cases in which the diagnosis from the shell has not been fully borne out by a later knowledge of the complete anatomy.

The typical species of the genus included in *Voluta* by Linné was named *Turbinella* by Lamarek in 1799. It had previously received the catalogue name of *Xancus* from Bolten in 1798, in allusion to its Indian name of sianko or shank-shell. Bolten's name was never defined or illustrated by him, and has merely an historical interest, although five years after Lamarek's paper, Link put Bolten's name on a scientific basis by defining it, as well as Bolten's other name of *Vasum*, for the rough *Turbinellas*, afterward called *Cynodonta* by Schumacher. We may formulate the nomenclature as follows :

TURBINELLA Lamarek.

Historical synonymy :

Mazza, Klein, Tent. Meth., p. 62, 1753—*pro parte*.

Rapum et murex, sp. Humphrey, Mus. Cal., 1797.

Xancus Bolten, Mus. Bolt., p. 134, 1798. *Ib.*, 1819, p. 94.

Actual synonymy :

- Turbinella* Lam., Prodr., pp. 73, 91, 1799, sole ex. *V. pyrum* L.
Turbinellus Cuvier, Anat. Comp., 1800; Lamarck, 1801, &c.
Turbinella Bosc, Hist. des Moll., vol. v, p. 33, 1802.
Xancus Link, Beschr. Rost. Samml., iii, p. 116, 1807.
Turbinellarius Duméril, Zoöl. Analyt., p. 166, 1806.
Turbinella Schumacher, Essai, p. 240, 1816.
Mazza H. & A. Adams, Gen. Rec. Moll., 1, p. 156, 1853.
Scolymus Deshayes in Lam. ed. ii, ix, p. 375, 1843, not of Swainson.

The sole example and type of Lamarck was the *Voluta pyrum* of Linné. A number of species has been added since, the distinctness of most of which is somewhat doubtful.

The second group, which is very closely allied to the typical *Turbinellas*, and which can hardly rank above a subgenus, was named by Link who adopted the earlier catalogue name given by Bolten and supplied a definition.

VASUM Link.

Historical synonymy :

- Vasum* Bolten, Mns. Bolt., p. 56; 1798; Ed. 1819, p. 40.

Actual synonymy :

- Vasum* Link, Beschr. Rost. Samml., iii, p. 119, 1807.
Cynodonta Schumacher, Essai, p. 73, 1816.
Cynodona Schumacher, l. c., p. 241, 1816, Err. typogr.
Scolymus Swainson, Malac., pp. 78, 304, 1840. Not Deshayes, 1843.
Volutella Perry, Conch., plate xxvi, 1811.
Clava Fabricius, Fortegn., p. 79, 1822; fide Herrmannsen Suppl., p. 31.

Link's first species was *Voluta ceramica* of Linné, which with *V. cornigera* may be taken as types of the group.

It might appear at first sight as if there was little in common between the rugged nodose *Vasum* and the smooth rounded *Turbinella*, but when the different species are all taken into account it is evident that the distinguishing characters are not such as are usually considered of high systematic value. Even *T. pyrum* is often marked with rows of small nodules on a series of two or three revolving ridges; the length of the canal and the form of the shell vary within wide limits within the genus and even with the typical species. The soft parts, dentition, and opercula do not differ more than we might find between species of accepted genera in other groups, and the characters of the subgenus *Vasum* are, as compared with those *Turbinella* proper, of degree and not of kind.

To summarize them briefly it may be said that *Turbinella* is characterized by a generally longer canal and smoother surface, more ovate operculum and lighter colored shell and, perhaps, by unicuspid lateral teeth; *Vasum*, by a nodose or cancellate surface, shorter canal and more pyramidal shell, narrower and heavier operculum and, perhaps, by bicuspid laterals.

The family should take the name of *Turbinellidae*, from its original genus and most distinctive type, and this has been the general usage of malacologists.

FIGURES. (Plate XIX, this volume).

TURBINELLA PYRUM Lam.

1. Rhachidian and one lateral tooth.
2. End of siphonal fold, the right mantle edge cut away to show the internal fold.
3. Extremity of proboscis from above.
4. Extremity of left tentacle, with eye.
5. General outline of radula.
6. *Turbinella pyrum* Lamarck, crawling.

A REVIEW OF THE AMERICAN "GOLDEN WARBLERS."

By ROBERT RIDGWAY.

In a short paper* published in the Proceedings of the Biological Society of Washington, vol. iii, pp. 1-4, I briefly characterized a new form of this group from the island of Cozumel, Yucatan, under the name of *Dendroica petechia rufivertex*. The birds of this group being much confused, it was found necessary, before the status of the Cozumel bird could be determined, to carefully examine all the material available (embracing considerably more than one hundred specimens from tropical America, besides a very extensive series of *D. aestiva* from North America); and as the results of this examination may be of interest, a brief synopsis is herewith presented, together with a fuller diagnosis of the Cozumel form, and also another new one from Lower California and western Mexico:

+ DENDROICA PETECHIA RUFIVERTEX.

Dendroica petechia rufivertex, RIDGW. Proc. Biol. Soc. Washington, vol. iii, Feb. 26, 1885, p. 1.

SUBSP. CHAR.—Similar to *D. petechia ruficapilla* (Gmel.), of St. Thomas and other Lesser Antilles, but with shorter wings and tail, and rather more intense coloration.

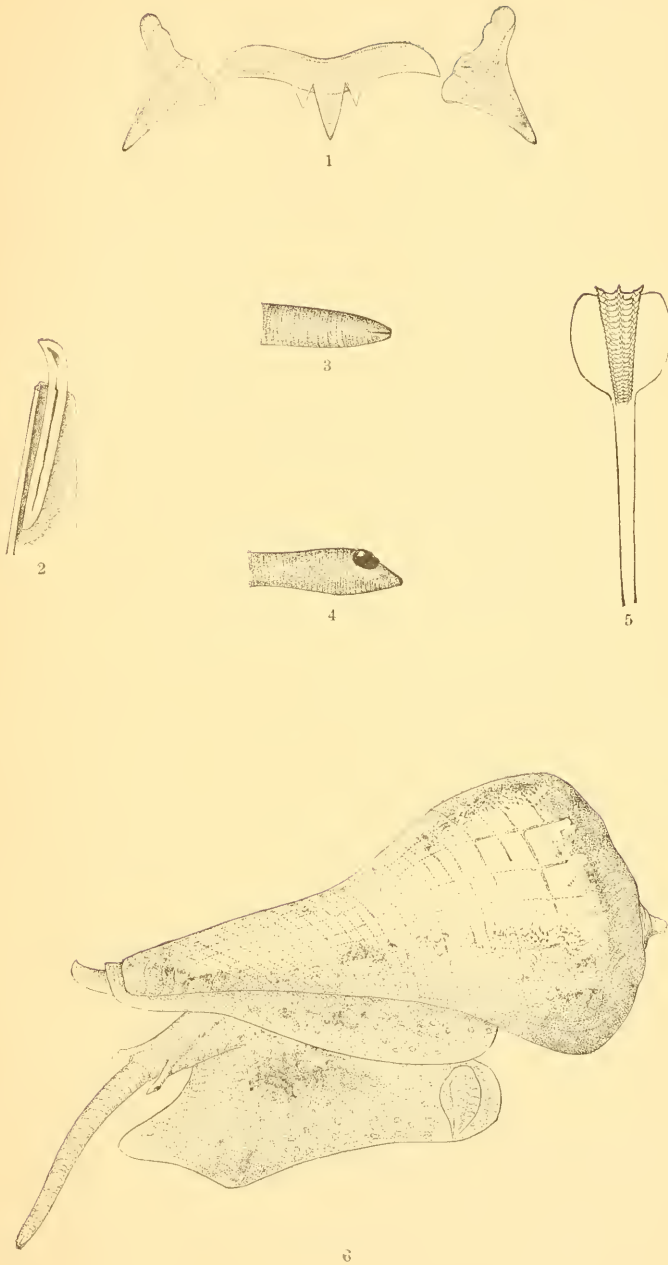
Adult ♂ (type No. 102508, U. S. Nat. Mus., Cozumel I., Yucatan, January 28, 1885; J. E. Benedict and T. Lee): Whole crown orange-rufous, the feathers rich gamboge-yellow basally. Nape, back, scapulars, and rump bright yellowish olive-green; upper tail-coverts similar, but edged with yellow. Wings blackish dusky, the feathers broadly margined with olive-yellow (almost pure yellow on the coverts and tertials). Outer webs of rectrices dusky, edged with olive-green; inner webs chiefly bright primrose-yellow. Lower parts, including whole side of head, very rich fine gamboge-yellow, the jugulum, breast, sides, and flanks broadly streaked with rich chestnut-rufous; throat with much smaller and indistinct streaks. Wing, 2.40; tail, 2.05; culmen, .55; bill from nostril, .30; tarsus, .80; middle toe, .45.

* "Descriptions of some new species of birds from Cozumel Island, Yucatan."

EXPLANATION OF PLATE XIX.

(*Turbinella pyrum*, Lamarek, p. 345-347.)

- Fig. 1. Teeth, rachidian, and laterals.
- Fig. 2. End of siphonal fold, the right mantle edge cut away to show the internal fold; natural size.
- Fig. 3. End of proboscis, from above; natural size.
- Fig. 4. Extremity of left tentacle, as contracted in spirits, showing eye, enlarged.
- Fig. 5. General form of radula, greatly magnified.
- Fig. 6. *Turbinella pyrum*, Lam., crawling, one-half natural size. Restored from an alcoholic specimen.



TURBINELLA PYRUM, LAMARCK.