

before stated, being 33·52 for the same year. The same diversity is known to exist in all countries; for while Hobart Town agrees pretty well with London, there are some parts of Lancashire in which the fall of rain is as great as at the Hampshire Hills and the north west of Tasmania.—The notes and remarks in the last column speak for themselves, and require no comment.

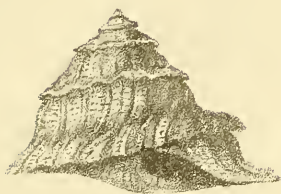
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IV.—*On the Characters of Astele, a New Division in the Family of Trochinæ, or Trochiform Shells; together with the Description of another Species of the same Family.* By WILLIAM SWAINSON, ESQ., F.R.S., &c.  
[Read 8th March, 1854.]

THE more we become acquainted with the innumerable variations under which animal and vegetable life present themselves, the more do we discover the beauty of that portion of the plan of creation by which one form is connected to another, so that by following the chain of affinity, objects the most dissimilar are insensibly connected by intermediate forms, and these will often blend the peculiarities of each so much, that, like the seasons of the year, it becomes nearly impossible to define where one terminates and the other begins.

This gradation in the scale of nature is too well known abstractedly, even to the unscientific, to be enlarged upon in this place. It is the basis of all true science and of all natural classification; and, therefore, every fresh instance of its existence claims the greatest attention from those natu-

PLATE VI.



3.



1.



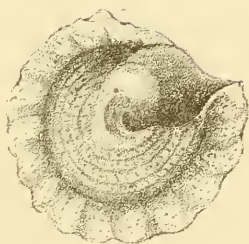
2.



5.



6.



4.

*Astele subcarinata* fig 1. 2.  
*Cariniidea fimbriata* " 3. 4.  
 " *granulata*. " 5. 6.



ralists whose ideas are not chained down to the adoption of old genera only, and who content themselves with merely studying specific differences. But it may be as well to remind dissentients from modern classification, that new objects create new ideas, and that new ideas require new combinations of terms and words to express them. This, in truth, is why new divisions (under whatever name they may be called) are found to be absolutely necessary. Were it otherwise, the *Systema Naturæ* of the immortal Swede should still be the text-book of the Zoologist, and the genera of Lamarck should be termed superfluous.

In no department of nature is the adaptation of our systems to the advanced state of knowledge become more imperative than in the elucidation of the Testaceous Molluscæ. The number of species discovered since the days of Linnæus are probably as 1 to 50, and every day fresh novelties are coming to light, requiring new divisions, new names, and new alterations in our system to make these novelties intelligible.

It is in vain, therefore, that a futile attempt has been made in England to arrange new objects under old names,\* so that the Lamarckian genera may be made to contain anything and almost every thing. It is as vain, I repeat, to attempt to bring us back in these days to the infancy of science as for Mrs. Partington with her broom to stop the advance of the Atlantic.

I have been led into these remarks as introductory to the definition of a new form of the Trochidæ, discovered by Dr. Milligan on the east coast of Tasmania, and of which he was only fortunate enough to procure a single specimen. On a cursory glance it has every appearance of belonging to the beautiful genus *Calliostoma*; † the spire being nearly as

\* *Conchologia Systematica*. London, 1841.

† *Treatise on Malacology*, p. 351.

much elevated as in the generality of that group, while the striæ, and even the colour, so closely resemble those of *Calliostoma Australis*, (*Zool. Journal*, V. 331), that an unscientific observer would take them to be the same. On turning the shell, however, with the mouth or aperture uppermost, it is immediately seen to belong to a different genus. There is not the slightest indication of a pillar; for the umbilicus is so open, that the very point of the apex can be seen through it: while the elevated striæ surrounding it are not only thickened, but granulated in *Solarium*. From that genus, however, it is equally distinct as from *Calliostoma*, because the substance of the shell is altogether perlaceous, although, like *Solarium*, the margin of the aperture or outer lip is thin. Condensing these remarkable characters into a formula, the genus may thus be defined from its shell:—

ASTELE.

*Animal*, unknown.

*Shell*, perlaceous; pyramidical or trochiform; unarmed, body whorl beneath convex.

*Columella*, none.

*Umbilicus*, large, closed only by the terminal whorl of the spire.

*Aperture*, broader than high, the margin of both lips thin.

*Astele subcarinata*. Plate VI., figs. 1 and 2.

Subcarinated astele.

Shell broader than high; whorls above scarcely convex; marked by 6—7 elevated, smooth, convex striæ, which leave a flattened margined rim at the top of each whorl; body whorl beneath marked with concentric grooves, which are decussated near the umbilicus.

Inhabits Tasmania. (Mus. Dr. Milligan).

Colour pale fawn, or issabella, clouded with faint transverse waves of rufous.

Margin of the body whorl, slightly carinated; there is a depression between the margin and the second elevated striæ on the upper surface, the first, or that next the margin, being very slender. The striæ beneath assume the appearance of grooves, which are wider apart as they approach the umbilicus; and the three more immediately adjoining are crossed by transverse striæ, which produces a granulated appearance, somewhat similar to that of *Solarium perspectivum*.

There are no longitudinal striæ, however slight, on the surface. The umbilicus is pure white, and the inner surface of the aperture reflects the striæ on the upper surface.

*Obs.*—The union of characters thus afforded between this new form and *Solarium* induces me to think that the two genera should follow each other without the intervention of *Monodonta* and its subgenera, as *Elenchus*, &c.

In the same collection with the above interesting shell I observed another of the same natural family, which, as I have never met with it before, and as being in all probability peculiar to this Island, I shall now describe;—

It belongs to a division of those Trochidious shells which, as having a thick calcareous operculum, have long ago been separated under the name of *Canthorbis*,\* in contradistinction to that of *Trochus*, where the operculum, or lid of the animal, is invariably thin and horny.

*Carinidea fimbriata*. Plate VI., figs. 3 and 4.

The Fringed ridged Trochus.

Shell higher than broad, marked above with narrow uniform longitudinal ribs, crossed by delicate imbricated striæ; suture

\* Swainson's Shells and Shell Fish. Lardner's Cyclopaedia, page 349.

dilated into a thin prominent undulated fringe, plaited into large and regular folds.

Inhabits Flinder's Island, Bass's Straits, and the north-east coast of Tasmania, (Mus. Dr. Milligan.)

Shell about  $1\frac{1}{4}$  inches broad and 1 inch high, of a uniform fulvous white or light fawn, destitute, like the other species of this group, of any bright colours or distinct markings.

The transverse striæ, on the upper surface, are slender, very irregular, or rather undulated, and are imbricated by the lines of growth, which are very near each other; equally irregular are the striæ on the under surface of the body whorl, occupied by the fringe: but those in the centre are regular and concentric, and are from five to six in number. The umbilicus is quite closed, although concave in the middle, and in old shells its enamel forms a prominent elevated rim all round the aperture. The plaiting of the sutural fringe is only half as many in number as are the longitudinal ridges.

2 *Carinidea granulata*. Plate VI., figs. 5 and 6.

Granulated ridged Trochus.

Shell trochiform, suture depressed, or more or less carinated, upper half of the whorls with obliquely waved ribs; lower half with transverse series of granules, body whorl beneath slightly convex; the margin more or less carinated.

Inhabits Flinder's Island and Bass's Straits, (Dr. Milligan).

Shell resembling a Trochus in general appearance, neither the suture nor the body whorl being very decidedly carinated, except when in a young state. It nevertheless truly belongs to this genus, both by the concave, but not perforated, umbilicus, and by the strong calcareous operculum. Its full size never exceeds  $\frac{1}{2}$  of an inch broad, and  $\frac{7}{16}$  high. The granulated appearance of the lower portion of each

whorl is remarkable; in some lights the granules seem like a forked continuation of the upper plaits, or ribs; but in others, they look like a cross series of granules disposed in latitudinal rows, parallel with the suture.

The underside of the body whorl exhibits from five to six of these granulated striæ, parallel to the margin, which is but slightly carinated in the full-grown shell, but much more so in the young, yet without being dilated.

The colour is pale straw, the operculum is white, the lunate depression at the umbilicus very conspicuous, and the under part of the body whorl nearly flat.

*N.B.*—There are, I suspect, two, if not three, other species in Dr. Milligan's collection, but they are so encrusted with *Serpulæ*, &c., that I am fearful of describing them.

### 3. *Carinidea acuta*.

#### Sharp-edged Trochus.

Shell small, longitudinally plicated and transversely granulated at the lower suture and margin of the body whorl, with a sharp prominent and flattened rim.

Inhabits under stones in Burial Island, Port Arthur. Rather smaller than *C. granulata*, which it so closely resembles, that it may probably be but a variety.

The carinated line, however, is much more prominent on the suture than is usual in the young of the last species, and that round the body whorl is not only more sharply carinated, but absolutely dilated, and partially obsolete undulated.

I have not access at present to more than two specimens, and have therefore some hesitation in giving it as a new species.