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XIII.—On Agulhasia Davidsonii, a new Palliobranchiate genus and species

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whorls tumid, the other with a long and slender spire and with the whorls somewhat compressed.—H. W.

EXPLANATION OF PLATE V.

- Figs. 1 a, b. Ebor a crassilabra*, Conrad, enlarged to twice and a half. In fig. 1 *a* is seen a circular hole made by a *Natica* or *Buccinum*.
Figs. 2 a, b. Neritina Ortoni, Conrad.
Fig. 3. Nesis bella, Conrad, enlarged.
Figs. 4 a, b. Odostomia?, Fleming: fig. *a*, natural size; fig. *b*, enlarged.
Figs. 5 a, b. Anisothyris obliqua, Conrad: fig. *a*, anterior side; fig. *b*, left side. Natural size.
Fig. 6. Anisothyris carinata, Conrad, left side. Natural size.
Figs. 7 a-d. Anisothyris Hauxwelli, H. Woodw.: fig. *a*, left side, with valves united; fig. *b*, view of interior of left valve; fig. *c*, view of interior of right valve; fig. *d*, valves united, ventral margin, natural size.
Fig. 8 a. Anisothyris cuneata, Conrad, anterior side, valves united, natural size; fig. 8 *b*, right side.
Fig. 9 a. Anisothyris erecta, Conrad, anterior side, valves united; fig. 9 *b*, left side, natural size.
Fig. 10. Anodon Batesii, H. Woodw., left side, natural size.

XIII.—On *Agulhasia Davidsonii*, a new *Palliobranchiate Genus and Species*. By WILLIAM KING, Sc.D., Professor of Mineralogy and Geology in Queen's College, Galway.

[Plate XI. figs. 1-8.]

My friend Mr. Thomas Davidson, F.R.S. &c., has kindly placed in my hands two specimens of an undescribed shell (see Pl. XI. figs. 1-7) possessing some unusual characters; and as he wishes me to describe it, I most willingly undertake what is to me a pleasing duty.

After some consideration I have come to the conclusion that the shell must be regarded not only as a new species, but as typical of a new genus; and as such I am, for the present, disposed to place it in the family Terebratulidæ*.

Genus AGULHASIA, mihi.

Diagnosis.—Areigerous. *Beak* pointed. *Deltidium* closed by a plate fixed to the inner surface of the area. *Foramen* at the cardinal termination of the deltidium. *Loop* short, slightly

* I have elsewhere (Proc. Dublin University Zool. & Bot. Assoc. 1859, vol. i. pp. 517, 518) restricted the family Terebratulidæ to genera with a small loop &c., as in *Terebratula vitrea*; and have included those with a long loop and some other differential characters in a distinct family, which I have named Waldheimiidae, after the typical genus.

reflexed, and attached to the hinge by two crura. *Shell-substance* penetrated by branching tubuli.

This genus is singularly interesting in being the only one of the Terebratulidæ, and, with few exceptions, the only one among the Ancylobrachs*, that has the beak pointed, and its point non-foraminate. In these respects, however, it resembles the Helictobrachiæ genera *Rhynchonella*, *Spirifer*, &c. With the latter it agrees in having a subapical foramen; but it is distinguished from them by the absence of an external plate (divided, or undivided) closing the deltidium. It is true this opening is closed by an internal plate: I consider the latter part, however, to be the homologue of the internal arch, attached to the inner surface of the area, common in Spiriferids, as pointed out in my "Monograph of *Syringothyris cuspidatus*"†. No Ancylobrach, as far as is known to me, possesses any such appendage. A further agreement between *Agulhasia* and many Spiriferids offers itself in the foramen being situated at the cardinal termination of the deltidium. In possessing an area the new genus resembles *Trigonosemus*, *Ismenia*, *Fissurostra*, and some other Ancylobrachs; but in these genera the foramen is situated at the apex of the beak, and the deltidium is usually closed by the ordinary external plate.

Histologically, *Agulhasia* departs from most of the Terebratulidæ in having the singular branching tubulation which, as I have elsewhere made known, characterizes *Terebratulina caput-serpentis*‡.

From the difficulty in examining the microscopic shell-structure of Mr. Davidson's specimens without breaking them, I am unable to say that the tubuli are so numerous and strikingly subdivided as those of the species in which they first occurred to me, though there is some appearance of a close approximation to it.

* I am unacquainted with any other Ancylobrach, except the genus *Stringocephalus*, that has not the beak truncated by a foramen.

† See Ann. & Mag. Nat. Hist. July 1868.

‡ See "Histology of the Test of the Class Palliobranchiata," in Transactions of the Royal Irish Academy, vol. xxiv. part xi. 1869. Fig. 8, Pl. XI., is a copy of a figure in this memoir, representing the branching tubuli of *Terebratulina caput-serpentis*. Their agreement in histological structure suggests a genetic relation between *Agulhasia* and *Terebratulina*; but the areal and apophysial features respectively characterizing these genera do not seem to lend much favour to this view. I have some grounds, however, for suspecting that, different as they are, there is a closer relation between them than would at first sight be admitted. My investigations with reference to this question are not yet completed; so at present I can do no more than merely give expression to a suspicion, which may or may not be hereafter confirmed.

Type species, *Agulhasia Davidsonii**, mihi.

Diagnosis.—Inequivalve: *large valve* incurved behind, flatly convex, with sharply turned-down sides, and an ill-defined broad shallow mesial depression; *small valve* slightly and evenly convex; *both valves* finely and numerous ribbed, with their margins strongly crenulated; *marginal outline* wedge-shaped, rather square anteaally, and acutely pointed posteaally; *beak* produced, solid, and well incurved at its point; *area* in the form of an acute isosceles triangle, somewhat convex and well defined; *deltidium* long and narrow—closed, except at the cardinal termination, by the internal plate; *foramen* incomplete and notch-like; *loop* attached by two crura originating close to the teeth, and projecting about one-third of the length of its supporting valve, strongly arched at the front or reflexed portion, and furnished with rather long crural spurs; *muscular impressions* large and strongly marked; *cardinal muscular fulcrum* large, with a central prominence rising out of a deepish cavity; *teeth* massive. *Colour* white.

Agulhasia Davidsonii, in its wedge-shaped outline and ribbing, strikingly resembles young specimens of *Rhynchonella* —; but the latter shell is without an area. There are about twenty ribs on each valve, which become obsolete at the sides. Mr. Davidson's specimens are quite small (Pl. XI. fig. 1), the largest measuring $\frac{2}{8}$ of an inch in length, $\frac{1}{8}$ in width, and $\frac{1}{16}$ in depth: the thickness of their valves, especially in the umbonal region, and the excavated appearance of the muscular scars, are points strongly favouring the view that, small as they are, they represent a species in an advanced stage of growth. The umbonal cavity is nearly filled up with shell-substance.

The long narrow form of the deltidium (Pl. XI. fig. 7 b) causes the area (fig. 7 a) to appear as if divided longitudinally by a linear groove; which part is at once striking and unique. The foramen (fig. 7 c), which appears like a notch in the centre of the cardinal edge of the large valve, is made entire by the juxtaposition of the cardinal edge of the small valve (fig. 2). The area is well defined laterally by each of the sutures (fig. 7 e) which separate it from the inflexed sides (fig. 7 d) of the beak.

The loop (figs. 5 and 6) agrees very closely in form and relative size with that of *Terabratula vitrea*; perhaps its crural spurs are more produced.

The tubuli appear to run in rows, and to be most numerous

* I have much pleasure in dedicating this species to my esteemed colleague Mr. T. Davidson, with whom I have been in a measure more or less associated for a great number of years in elucidating a group of shells the favourite of us both.

in the ribs, from which they branch off laterally towards the furrows.

Mr. Davidson's specimens were taken in from 45 to 50 fathoms water, on the Agulhas Bank, south coast of Africa. The locality has suggested to me the generic name which has been given to the species.

EXPLANATION OF PLATE XI.

Fig. 1. Natural-sized outline of *Agulhasia Davidsonii*.

Fig. 2. Same species, dorsal view, showing position of the foramen.

Fig. 3. Same species, ventral view.

Fig. 4. Same species, lateral view.

Fig. 5. Same species, interior of dorsal valve, showing loop, teeth, and cardinal muscular fulcrum.

Fig. 6. Same species, profile view of the loop.

Fig. 7. Same species; view of the interior of ventral valve and of the upper aspect of the beak, the latter showing the area (*a*), deltidium (*b*), foramen (*c*), inflexed sides of the beak (*d*), and one of the sutures bounding the area (*e*).

Fig. 8. Represents tubuli characteristic of *Terebratulina caput-serpentis*.

I am very much indebted to Mr. Davidson for finishing off my rough sketches of the above figures.

XIV.—*On Fossil Sponge-spicules of the Greensand compared with those of existing Species.* By H. J. CARTER, F.R.S. &c.

[Plates VII.-X.]

THE material which furnished the fossil sponge-spicules from which all the figures, except three, in the accompanying four plates were taken, was found by my kind and intelligent friend Mr. W. Vicary, of Exeter, in the "Upper Greensand" of Haldon Hill, near Exeter, and of Black Down, near Cullompton, respectively,—the former portion in a stratum of greenish-brown, loose, fine sand, about 25 feet thick, and the latter in a rounded pebble of the same nature, more consolidated.

They were brought to my notice by Mr. Vicary and my friend Mr. Parfitt, also of Exeter, who read a valuable paper on them at the meeting of the "Devonshire Association for the advancement of Science, Literature, and Art," in July last, which was subsequently printed in their 'Transactions' for 1870.

The frequently loose state of the whole material, in which the spicules are sometimes almost as numerous as the grains of sand among which they are imbedded, together with their large size, render their extraction with a simple but powerful lens and a hair-pencil a work of time rather than one of difficulty.