

was seen struggling near the shore in Urafirth Voe, North-mavine, on the west coast of the main island of Shetland, in April 1881, and speedily captured. Mr. Thomas Anderson, who saw the animal in the flesh, furnished Prof. Turner with a description of its external appearance, and procured the skeleton for the Anatomical Museum of the University of Edinburgh, where it is now preserved, having been fully described in the communication before referred to. The animal was a male about 14 feet long.

14. On the 25th May, 1885, a second Shetland specimen of this species was taken in Voxter Voe, about 13 miles from the spot where the first specimen was secured; it was a male about 15 feet 8 inches long, and is said to have been accompanied by a young one about 7 feet long, which escaped. This specimen, although it was flensed and cut into sections before it reached Prof. Turner, enabled that anatomist to give some very valuable information on the anatomy of the soft parts as well as to supply some deficiencies in his previous description of the skeleton. This he did in a communication to the British Association at the Aberdeen meeting, printed in the 'Journal of Anatomy and Physiology' for Oct. 1885, p. 144 *et seq.* The complete skeleton of this adult male is articulated in the Anatomical Museum of the University of Edinburgh.

15. The most recent occurrence of this species is the specimen referred to in the early part of this communication.

VII.—On *Vulsella*, a Genus of *Acephalous Mollusca*. By ALFRED HANDS COOKE, M.A., Curator in Zoology, Museum of Zoology and Comparative Anatomy, Cambridge.

AT least nineteen recent species of the Genus *Vulsella* have been described. Lamarck, to whom the genus is due, described six (*lingulata*, *hians*, *rugosa*, *spongiarum*, *mytilina*, *ovata*: Anim. sans Vert. ed. 2, vol. vii. p. 266 f.). Conrad added one (*Nuttallii*); one (*Hügelii*) appears due to Parreiss; while Reeve, in the 'Conchologia Iconica,' vol. xi., described eleven new species (*pholadiformis*, *isocardia*, *tasmanica*, *attenuata*, *crenulata*, *limæformis*, *phasianoptera*, *rudis*, *lingua-felis*, *corollata*, *trita*) from the Cumingian collections, the types of which are now in the British Museum.

I am not aware that any note of suspicion, save one, has ever been sounded with regard to the genuineness of any of these so-called species. That was by G. B. Sowerby the elder, in 1825. Writing after Lamarck's work had been

published, and consequently when only six species were known, he says ('Genera,' *Vulsella*), "On account of the irregularity of the shells in this genus we think it must be extremely difficult to distinguish the species, and consequently we believe that several mere varieties are raised to the rank of species." My own opinion, as will be gathered from the detailed examination which follows, agrees strongly with the view here expressed, and the more so because the number of species since Sowerby's time has been more than trebled. That not a single one of the so-called species of Reeve will bear examination will, I think, be admitted by any one who can appreciate what a variable genus means, for his types can be investigated at the British Museum. Here is a case of a genus whose usual habit is to attach itself to various marine plants, growing with their growth and shaping itself with their shape. The inevitable result of this is a never-ending variation, not merely in shape but in size, colouring, marking, and texture; and if we pursue Reeve's system to its logical conclusion we shall have as many different species of *Vulsella* as there are specimens.

But I go further than merely obliterating the Reevian species. I hold that two at least of those of Lamarck, viz. *spongiarum* and *ovata*, are absolutely identical, while the form *mytilina*, Lam., constitutes a passage between these and *lingulata*, from which *hians*, Lam., differs only in point of size. In the case of an "attached" genus there is not only great variation of shape and size, but it will be found that the less a specimen is attached or imbedded (in sponge, seaweed, &c.) the less irregular it is. Specimens taken from a mass of sponge containing hundreds of shells will be more irregular than specimens which occur in less populous or in less confined situations. An instance of this may be given from a mollusk common on our own shores. The well-known *Tapes pullastra*, L., when in a free state, is as regular in shape, size, and sculpture as any other species of the genus; but when it occurs in shells, stones, or clay, as the variety *perforans* (and no one has ever seriously disputed the generic identity of the form with *pullastra*), its shape and texture undergo variations which differ extensively from one another and from the type. The concluding remarks of Rumphius, quoted below under *V. lingulata*, seem to illustrate this point.

My impression, formed by the comparison of dozens of specimens with one another, is that the recent species of *Vulsella* may be reduced to at most three. The free or unattached form is the well-known *lingulata*, in which the shell not only attains its maximum of size, but develops the

characteristic red longitudinal lines to the greatest extent, and is at the same time freest from those scaly foliations which so often denote a cramped and distorted growth. Next comes the form figured by Delessert as the Lamarckian *rugosa*, in which the beaks are prominent, the surface scaled, but there is no manifest distortion; the general shape may be compared to that of a *Septifer nicobaricus*. Finally come the great mass of the "species," the names given, mainly by Reeve, to the inevitably varying shapes of the attached or confined shells, of which *spongiarum*, Lam., may be regarded as the type; *ovata*, Lam., representing the extreme of compression and distortion.

A detailed list of the "species" follows.

1. *Vulsella pholadiformis*, Reeve (Conch. Icon. vol. xi. *Vulsella*, pl. i. fig. 1).

Hab. Ceylon (*E. L. Layard*).

Type (the only specimen known) in Brit. Mus.

Manifestly a debased and distorted shell, probably taken from a crack or hole in a rock where it had not room to expand. Sculpture, where any can be detected, the same as in the form *spongiarum*, Lam. The "species" doubtless belongs to that form.

2. *Vulsella isocardia*, Reeve (Conch. Icon. *ut sup.* pl. i. fig. 2).

Hab. Red Sea (*Reeve*), Suez! (*Issel*, Malac. del Mar Rosso, p. 100; *MacAndrew*, Ann. & Mag. Nat. Hist. 1870).

Type in Brit. Mus.

"The surface of this species," remarks Reeve, "is almost wholly overlaid with a plaiting of finely pointed scales, the umboes being convoluted inwards as in *Isocardia*." It is to be remarked, however, that the scaly surface of the shell is more or less a characteristic of the whole genus, while the position of the beaks, and the amount of curvature which they describe, depend upon the compression to which the shell is subjected in its various stages of growth. Belongs to the form *spongiarum*, Lam.

3. *Vulsella tasmanica*, Reeve (Conch. Icon. *ut suprâ*, pl. i. fig. 3).

Hab. Tasmania (*Reeve*; *Tenison-Woods*, in Proc. Royal Soc. Tasm. 13 Mar. 1877), S. Australia (*id. ib.*), Port Jackson (*Angas*, in P. Z. S. 1867, p. 930).

Type in Brit. Mus.

Shape inclining towards that of *isocardia*, i. e. more

rounded than *spongiarum*, with the want of scaly sculpture that characterizes *mytilina*. This latter fact, however, is of no account, as the type specimen is an old one (cf. *trita* below), and the scales have probably been rubbed off. Tenison-Woods (*ut sup.*) distinctly says it is "squamoso and closely striate."

The Tasmanian and S. Australian form of *spongiarum*; Lamarck calls it *ovata* (see no. 18).

4. *Vulsella mytilina*, Lamarck (An. sans Vert. ed. 2, vol. vii. p. 268).

Chemnitz, Conchylien-Cabinet, 1782, tab. ii. figs. 8, 9.

Vulsella mytilina, Reeve, Conch. Icon. *ut sup.* pl. i. fig. 4.

Hab. — (Lam.), Red Sea (*Rüppell*), Suez (*Issel*, *MacAndrew*).

Why Reeve should have substituted his obscure Latin description for Lamarck's decidedly clearer one I cannot understand. His figure is from a wretchedly worn specimen, which is in the British Museum. Lamarck's memorandum, "grande coquille blanche, ayant des stries d'accroissement transverses et concentriques," exactly describes the appearance of this shell, which I regard as a well-marked variety of *lingulata*, distinguished from all other varieties by its greater size, its comparative smoothness of surface, its slightly greater rotundity, and its want of colouring. It is the *Mya vulsella minor* of Chemnitz, "der kleinere Bartkneiper," "die kleinere Kornzange" of the same author, who recognizes its close affinity to *lingulata* by referring to Rumphius's description of it. Now Rumphius only recognizes *lingulata*.

5. *Vulsella attenuata*, Reeve (Conch. Icon. *ut sup.* pl. i. fig. 5).

Hab. Red Sea (*Reeve*), Suez (*Issel*, *MacAndrew*).

Type in the Brit. Mus.

An obvious link between *lingulata* and *mytilina*, having the general shape, even to exaggeration, of the former, and the absence of marked sculpturing of the latter.

6. *Vulsella lingulata*, Lamarck (An. sans Vert. ed. 2, vol. vii. p. 269).

Lister, Hist. Conch. tab. 1055, fig. 10 (1685). He called it *Musculus κερῶδης*, the comb-shaped muscle, and, curiously enough, regarded it as a freshwater shell, placing it upon the same *mantissa* as such "*cochleæ et bivalvia aquæ dulcis*" as *Paludina contecta*, *Melania amarula* (which he calls *Buccinum aculeatum*), and a large *Pirena*.

Rumphius, 'Amboinsche Rariteitkamer,' pl. xlvi. A (1705). A very interesting description of the habitat of the shell is subjoined, which I will translate:—"These are smaller [than some bivalve which I cannot make out], about a finger long, with folded and notched edges, on the outside dark grey and scaly, some pure reddish; the upper valve has a raised back; with the lower valve they embrace the little sticks or reeds [does he mean seaweeds and sponges or brackish-water plants?] which have stood about half a year in the sea. This is done by their many little feet or little arms, which embrace the edges of these sticks in the same way as we see at the roots of *Polypodium*. On these reeds they grow in masses, one upon the other, so that we have to cut off the sticks with them, *but the most beautiful are those which grow singly*. They are also found on the roots of all kinds of *Mangium fruticans*, but these are sharp and very much notched."

Gualtieri, 'Index Testarum,' tab. xc. fig. 4 (1735). He describes it as "*Concha longa incurvata, striis seu lineis undatim signata, obscure tophacea, intus argentea*." The shell figured is not so large as the type, but is quite unmistakable.

Linnæus, Mus. Tessinianum, no. 1, p. 116, tab. vi. fig. 3, *Pinna lingulata, linguiformis, subfalcata*.

Linnæus, Syst. Nat. ed. 12, p. 1113, *Mya vulsella*.

Chemnitz, 'Conchylien-Cabinet,' 1782, tab. ii. figs. 10, 11, gives it the familiar names of der grössere und grösste Bartkneiper, die Korn-, Haar- oder Bartzange, die Bohnenschöote (Valentyn, Verhandelng, 1754, had called it "die Bohnenschöoten doublette"). He says it is "fünf Zoll drey Linien lang, beynahe anderthalb Zoll breit."

Born, Mus. Cæs. Vindob. Test. p. 22, *Mya vulsella* (not figured).

V. lingulata, Lamarck, Anim. sans Vert. ed. 2, vol. vii. p. 267.

Sowerby, Genera (1820-25), "The Hound's-ear Oyster," gives three figures, all as of *lingulata*, but two are of the form *mytilina*, while a figure of a cluster is of *rugosa*.

Wood, 'Index Testaceologicus' (Hanley), *Ostrea*, fig. 84.

Crouch, Introd. to Lamarck's 'Conchology,' p. 21, pl. xii. fig. 10.

Reeve, Conch. Icon. vol. xi. *Vulsella*, pl. i. fig. 6.

V. hians, Lamarck (not Reeve), *ut sup.* p. 267. no. 2.

Hab. Indian Ocean (*Lamarck*), Suez (*Issel, Fischer*, Journ. de Conch. 1871, p. 212).

7. *Vulsella rugosa*, Lamarck (An. sans Vert. ed. 2, vol. vii. p. 269).

Vulsella rugosa, Delessert, tab. xviii. fig. 3 ; Hanley, Recent Shells.

Hab. —? (*Lam.*), Red Sea, Suez (*Issel*, *MacAndrew*), Persian Gulf (*MacAndrew*, MS.).

Not the *V. rugosa* of Reeve (Conch. Icon. pl. i. figs. 7, 8). Lamarck describes his *rugosa* as follows:—

“*V. testa oblonga, subarcuata, planulata, rugis longitudinalibus, striisque transversis arcuatis, rugas decussantibus*,” from which little could be made out, were not the following addition made:—“Celle-ci est plus aplatie que celle qui précède (*hians*, *Lam.*), non ou presque point baillante, et a le bord antérieur très courbé.” Now Reeve’s figures represent a shell by no means “courbé,” either on the anterior or the posterior edge, while his fig. 7, instead of being broader, is considerably narrower than his idea of Lamarck’s *hians*. The true *rugosa* of Lamarck is that figured by Delessert (unfortunately the only *Vulsella* he figures), and corresponds exactly to that form described by Reeve as *corollata* and, with very slight modifications, as *phasianoptera*.

8. *Vulsella crenulata*, Reeve (Conch. Icon. ut sup. pl. i. fig. 9).

Hab. Red Sea (*Reeve*), Suez (*Issel*, *MacAndrew*).

A name for another of the numerous forms which belong to *spongiarum*, *Lam.* (= *rugosa*, *Reeve*). Closely akin to *isocardia*, *Reeve*. Even *Issel* (*Mar Rosso*, p. 100) remarks on its close relation to *spongiarum*, and hazards the conjecture “forse non ne differisce specificamente.”

9. *Vulsella limæformis*, Reeve (Conch. Icon. ut sup. pl. ii. figs. 10 a, 10 b).

Hab. Port Adelaide, S. Australia (*Reeve*), St. Vincent’s Gulf (*Angas*, in P. Z. S. 1865, p. 653).

Type in Brit. Mus.

A careful examination of the type leads to the conclusion that there is absolutely no specific distinction between this form and *tasmanica*, *Reeve*, + *rudis*, *Reeve*, the Australian and Tasmanian form of the common *spongiarum*, *Lam.*

10. *Vulsella phasianoptera*, Reeve (Conch. Icon. ut sup. pl. ii. fig. 11).

Hab. Australia (*Reeve*). (See no. 13.)

11. *Vulsella rudis*, Reeve (Conch. Icon. ut sup. pl. ii. fig. 12).

Hab. Swan River (*Reeve*), Port Lincoln (*Angas*, in P. Z. S. 1865, p. 653).

The affinities of this form have been laid down under no. 9.

12. *Vulsella lingua-felis*, Reeve (Conch. Icon. *ut sup.* pl. ii. figs. 13 a, 13 b).

Hab. —? (Reeve), Suez (MacAndrew).

Only another name for a form of *spongiarum*, Lam.

The type is in the Brit. Mus., and is, save for the sculpture being cleaner and the shell in better preservation, undistinguishable from *crenulata*, Reeve.

13. *Vulsella corollata*, Reeve (Conch. Icon. *ut sup.* pl. ii. fig. 14).

Hab. Zanzibar (Reeve), Suez (MacAndrew).

This is the *V. rugosa* of Lamarck, and it is extraordinary how Reeve, with Delessert's figure before him, could have redescribed it. Delessert's description of *rugosa* ("comme treillissée par des rugosités longitudinales croisées par des stries d'accroissement arquées") might serve for a translation of Reeve's description of his *corollata* ("concentrically densely laminated, laminæ crenulately scaled"). *V. phasianoptera*, Reeve, is merely a slightly attenuated form of the same species.

14. *Vulsella spongiarum*, Lamarck (Anim. sans Vert. ed. 2, vol. vii. p. 268).

Hab. Indian Ocean? (Lam.), Suez (Reeve, Issel, MacAndrew).

Not the *V. spongiarum* of Reeve. Lamarck's description is as follows:—" *V. testa oblonga, recta, basi subattenuata, intus argenteo-violacescente; rugis transversis concentricis: longitudinalibus obsoletis.*" Reeve, however, on what authority I am puzzled to imagine, describes Lamarck's species thus:—" *Vul. testa oblonga, arcuata, ad basin latiuscula, umbonibus divergentibus, radiatim minutissime crenulento-squamata; fuscescente,*"—that is to say describing the shell as curved, while Lamarck expressly said it was straight, and as being somewhat broad at the base, while Lamarck takes the trouble to remark that the base is somewhat attenuated. Besides this Reeve throws in the diverging umboes, of which Lamarck says not a word; and one would gather from Reeve's description that the striking feature about the striæ was that they were radiating, whereas Lamarck goes out of his way to say that the longitudinal wrinkles are obsolete, while it is the concentric ones that claim attention!

My idea of Lamarck's *spongiarum* is the left-hand shell of the pair figured by Reeve as 13 b. This is the form commonly found, as indeed Reeve there represents it, imbedded in the sponge, whence its name.

Lamarck inquires, "An Chemn. Conch. 6, tab. ii. f. 8, 9?" I have already shown reasons for thinking that this figure represents *V. mytilina*.

15. *Vulsella hians*, Lamarck (Anim. sans Vert. ed. 2, vol. vii. p. 2).

Hab. Indian Ocean? (*Lamarck*).

Here again Reeve has come to complete grief in his identification of the Lamarckian species. That author, by his references to Lister (tab. 1055. fig. 10), to Gualtieri (tab. 90 H), and to Chemnitz (tab. 2. fig. 10), had made it abundantly clear that his *V. hians* was nothing more than *V. lingulata* on a slightly smaller scale. Yet Reeve, with these references before him, and undeterred by the fact that Lamarck gave 58 to 60 millim. as the measurement of his type, figures a thick stumpy shell, which actually measures less than his idea of *spongiarum*, to which Lamarck assigns 44 millim. as the length.

16. *Vulsella trita*, Reeve (Conch. Icon. *ut sup.* pl. ii. fig. 17).

Hab. Red Sea (*Reeve*), Suez (*Issel*).

Only those who have seen the type of this shell (it is in the Brit. Mus.) can realize to what a depth species-makers can descend. Here we have a wretched beach-worn lump, which looks as if it had been at the bottom of the sea for 500 years, and had then been rejected because the sea was ashamed to keep it any longer! No wonder that it is "a more solid species than usual, with no perceptible indication of crenulated scales." One of the many forms of *spongiarum*, Lam.

17. *Vulsella ovata*, Lamarck (Anim. sans Vert. ed. 2, vol. vii. p. 268).

Reniella dilatata, Swainson, Malac. p. 386, fig. 127.

Vulsella ovata, Hanley, Recent Shells (the only *Vulsella* figured).

Hab. Seas of New Holland (*Lamarck*).

Reeve has not figured this species, but has replaced it by his *tasmanica*. I regard *ovata*, then, as the Australian form of *spongiarum*.

18. *Vulsella Nuttallii*, Conrad (Journ. Acad. Nat. Sci. Philad. vii. p. 257, t. xx. fig. 10).

Hab. Friendly Is. (*Conr.*).

"Very irregular, with concentric lamellar striæ near the beaks; cavity of the interior deeply concave towards the hinge, bounded at the other extreme by a concentric ridge, the rest of the inner surface obliquely divided lengthwise by an obtuse rib; 1-½. Possibly a distorted specimen." I take these

remarks from Hanley, 'Recent Shells,' and see no reason to regard the species as anything else than an abnormal form of *spongiarum*, Lam.

19. *Vulsella Hügeli*, Parreiss.

Hab. Coast of New Holland (*Martini*).

I know nothing of this species. From the description in an incomplete monograph of Martini, and from a specimen in the Brit. Mus. (labelled *Hügeli*, d'Essing, India), it would seem not to differ from *spongiarum*, Lam.

VIII.—*Description of an apparently new Species of Scincus from Muscat.* By JAMES A. MURRAY, Curator of the Kurrachee Museum.

Scincus muscatensis.

Snout rather long, longer than that of *Scincus arenarius*, Murray (Vert. Zool. Sind), the space between the eyes being less than the length of the snout. Rostral spatulate, twice as broad as high, rounded behind and in contact with the prefrontal; supranasals separate; nostril between the first labial, the supra- and the postnasal, and the lateral angle of the rostral; two postnasals, the posterior larger; one large preocular or loreal equalling the prefrontal in length, and forming a suture with the hind edge of the second postnasal, the fourth and fifth upper labials, the first superciliary, and a large shield in front of the lower eyelid; the latter five-sided and as broad at the base as it is high; upper labials eight or nine. Prefrontal six-sided, its front angles in contact with the supranasals and rostral, its lateral angles in contact with the postnasals on each side, and the hind angles in contact with the postfrontals. Postfrontals broadly in contact together, rather rounded in front and subtriangular behind; their lateral angles are in contact on each side with the large preocular plate and the hind outer angles form a suture with two thirds only (or the whole in some) of the first superciliary. Vertical once and a half its greatest breadth, extending behind as far as the outer edge of the fourth superciliary.

Dorsal scales 18, reckoned from above the angle of the abdomen; 26 rows round the middle of the body. The fore leg laid forward reaches the eye; the hind leg laid forward reaches the tips of the fingers. Two large preanal shields.

Colours as in *Scincus arenarius*; a mesial dark spot on each scale edged on both sides with yellowish white, forming inter-



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