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Eccyliomphalus Scoticus (M'Coy).

Desc. Discoid, flat, of one and a half gradually enlarging, widely separated, spiral whorls; back obtusely subcarinate, rounded, lower side rounded, upper side with a flat space, bounded on each side by one obscure keel, the outer one most distinct; surface crossed by rather distant sharp lines of growth, each pair with four or five much finer intermediate striæ. Diameter 1 inch 5 lines, proportional diameter of last whorl $\frac{5.8}{100}$, height $\frac{3.2}{100}$.

This species is more regularly involute than the *E. Bucklandi* (Portk.), and has the principal keel on the upper side nearer to the beak. There are three or four of the larger striæ in the space of 1 line about the middle of the under side of last whorl.

Not uncommon in the schistose Chazey limestone of Knockdolian quarry, three miles from Ballintrae; also in the calcareous schists of Mullock quarry, Dalquorhan, near Girvan, Ayrshire.

(Col. University of Cambridge.)

XIX.—On some of the Animals of the Chemnitzia which have not been described. By WILLIAM CLARK, Esq.

To the Editors of the Annals of Natural History.

GENTLEMEN,

Exmouth, July 20, 1852.

I BEG to present, agreeably to a notice in the 'Annals,' N. S. vol. x. pp. 22 and 77, an account of several animals of the *Chemnitzia* that have not occurred to naturalists or been very slightly alluded to. My former papers and this will contain descriptions of about twenty species, a number more than fourfold greater than has yet been recorded, and most of which I have this summer re-examined: I propose to follow up the accounts of those that have just been met with by a few short additions and corrections to the several species enumerated in the 'Annals,' N. S. vol. vi. p. 451,^a vol. vii. p. 380, and vol. viii. p. 108.

Before I enter on the descriptive matter, it will be proper to say a word or two in explanation of some of the organs of this very singular genus, which, in my method, includes the *Odosomia* and *Eulimella*, and a few of the species of *Aclis*.

With respect to the organs of the animal, I will first mention the peculiar anterior process styled by most authors the mentum, which I think ought to be considered the muzzle or rostrum, as it is a continuation of the neck, over which a bridge is thrown, formed of the eyes and tentacula; and close under them, but on

the upper part of the base, or hinder portion of the rostrum, is the proboscidal orifice, from which, though a circumstance of the rarest occurrence, I have in three species seen the evolution of that organ, in the *Chem. pallida*, *C. acuta* and *C. plicata*; the animals kept it exerted from half a minute to three minutes. Mr. Alder's figure in the 'Annals,' N. S. vol. vii. p. 464, from a sketch of M. Lovén, gives a very good representation of it; the remaining or terminal portion of the rostrum appears to be mute, and is more or less of its length attached to the animal's foot; in other words, it is less free than the muzzle of the *Rissoæ*, of which I consider it the representative and remnant, and which it will be seen has entirely vanished in *Eulima*. Though authors speak of a mentum in that genus, I can find none; they have, I think, mistaken for it the upper margin or flap of the foot, which in front is divided by a narrow groove: this separation is more or less apparent in most, if not in all, spiral Gasteropoda; it has however little resemblance to the rostrum of the *Chemnitziaë*, which is a long, narrow, thick, distinct, and otherwise variable organ, proceeding from the neck as its continuation, and has much the aspect of a mute rissoidean muzzle; whilst the margins of the foot of the *Eulimæ* and other Gasteropoda, and they are generally present in the *Chemnitziaë*, are to assist flexibility on the march, in the same manner as the digitations of the feet of all animals assist progression. Lovén, who has described the mentum in his genus *Turbonilla*, our *Chemnitzia*, has not, though he has described the animal of *Eulima*, mentioned the presence of a mentum or rostrum in that genus.

The point of issue of the proboscis, from the upper part of the rostrum, is more advanced and visible in *Chem. plicata* than in any other species I have yet examined; it was from this animal that it continued evolved more than three minutes, affording me a sight that falls to the lot of few malacologists. I believe I speak within compass, when I state that I have examined more than a thousand live *Chemnitziaë* of twenty species, yet, except on the three occasions alluded to, I never witnessed its exertion.

All the *Chemnitziaë* have a semitubular fold more or less developed in the mantle, which, though it issues at the upper angle of the aperture, close to the debouchure of the rejectamental orifice, appears more like a branchial one than for fæcal functions. In the true *C. acuta* it is largely exerted and very conspicuous. Can this fold be analogous to the process I have described at the same point in many of the *Rissoæ*? Can it have the double, though apparently incompatible, duties of depuration, and to supply the animal, when the operculum on certain exigencies is required to be nearly closed, with the branchial

fluid? Can all the Gasteropoda, at the upper angle of the aperture on the right side, have branchial conduits independent of the reception of the water into the respiratory vault, under the lax mantle, by the protrusion of the neck and head of the animal?

The presence of a proboscis brings this genus very near to the *Canalifera*; but the *Eulima* are still nearer, as they have no head or rostrum, and the proboscis issues nearly at the fork between the tentacula, as in the Muricidal families. This statement renders it necessary to cancel that part of one of my papers wherein I doubt the evolution of a strict proboscis, but after what I have seen that question is set at rest.

The rostrum varies greatly in the proportions of its arcuations, scissions, and points of attachment to the foot; in the *Chem. undentata* it is plain and truncate, in *C. acuta* it forms an open subcircular channel with a cochleariform termination, and in *Chem. conoidea* it is cloven nearly to the base, simulating a second pair of tentacula.

I have omitted to remark that the orifice of the rostrum is not precisely in the position of the proboscidal fissure of the *Muricide*; it is not quite so low in the fork, though exactly under the tentacula at the point of the invasion of the neck, and its continuation, the rostrum, by those organs; this position is proved by the proboscis when evolved lying upon the rostrum, and by its breadth equalling that of the neck, a point I formerly doubted, and entirely hiding that organ from view. This leads me to say, that for the fourth time, a few days since, I witnessed the emission of the proboscis from a specimen of one of the slender varieties of *Chem. acuta*: I had an excellent view, as the animal exerted and withdrew it several times, which was not the case before; it was not quite so slender at the point, nor so much arcuated as in Mr. Alder's figure; its orifice was perfectly seen.

From the above remarks and the descriptions that follow, together with those recorded in former papers, which comprise animals of the genera *Chemnitzia*, *Odostomia*, and *Eulimella* of modern authors, I submit to naturalists the propriety of merging the two latter in *Chemnitzia*, an appellation that fortunately has no other significance than that of compliment to a laborious author in this branch of natural history. The similarity of the organs of the animals of the three genera, so far from affording essential generic characters, does not suffice without the assistance of the shell for specific distinction. Surely the *Chem. rufa* and *C. elegantissima* should not be separated from the smoother *Chem. Scillæ* and *C. acicula*, merely because the one is smooth and the other ribbed: if so, to be consistent, it would be necessary to separate the smooth *Chem. pallida* from

the ribbed *Chem. decussata* and *interstincta*. As to the spiral fold, all the *Chemnitzia* have it, though in many it does not come into the limits of visibility; but is that a reason to separate precisely congeneric animals? The tooth or fold, according to the species, is as often absent from view in the aperture as present, and it is curious that this condition is not unfrequently seen in the *same species*. I would ask then, are the inhabitants of such shells to be consigned to *Chemnitzia* or *Odostomia*? *Chemnitzia*, even including the *Odostomia* and *Eulimella*, is not so abundant in species as to supply an excuse for dividing them, to assist arrangement into genera that have names, but no distinct generic qualities. I think that in the most numerous tribes, judicious grouping would be more scientific than the formation of effete genera.

It is necessary to offer a remark which is applicable to all the Mollusca, especially to the minute ones, and peculiarly so to the *Chemnitzia*. Great care must be taken to distinguish between *bond fide* specialties and those apparent ones brought on by an uneasy condition of the animal, which ought always to be described on the undisturbed march, when all the organs are naturally deployed, as at rest they are contracted; and violent exertion, which often arises when the animal in creeping arrives at the level of the water in the glass in which it is confined, or meets with an impediment, has the effect of producing unnatural forms: for example, the foot is often made to appear deeply emarginate or hollowed out by the excessive protrusion of the auricles, and the termination of the rostrum is in like manner distorted by the right and left points being exerted beyond nature; but all these forced positions vanish on the deliberate march. A neglect of these maxims has occasionally led me into errors, which will be noticed under their respective heads; I will not call them trifling, as perhaps on such, the distinctness of a particular species might hinge.

Chemnitzia acicula.

Eulima acicula, Philippi.

Eulimella acicula, auct.

Eulimella affinis, nonnull.

The animal inhabits a smooth, bluish white, subhyaline shell of eight flat volutions, and has the reflexed apex, the constant characteristic of the *Chemnitzia*. The mantle is even with the shell, with the exception of the small fold I have alluded to above; the body does not nearly equal half the entire length of the shell. The general colour of the animal throughout is subpellucid frosted white, mixed with minute snowy flakes. The

head or rostrum, called by some naturalists the mentum, is, when fully extended, rather long, very broad, square in front, slightly emarginate in the centre, and on the march is always in advance of the foot, as is usual with the muzzle of the *Rissoæ*; it is grooved the whole length, and the groove is continued towards the neck, just separating the tentacula at their basal centre; at its upper surface, close to the base, is the orifice of the proboscis. The tentacula diverge to almost right angles, and resemble short, broad, minute leaves, each with an opaque white stripe or stamen through the centre; they bevel to a fine edge, and with their large flexible margins can, like all the *Chemnitzia*, simulate the ear-shaped folds characteristic of those organs, which in this species are conspicuous, but the proteiform tips are only slightly developed. The eyes are very black, not quite close to each other, and immersed a little posterior to the internal bases of the tentacula. The foot is rather long, extending to two volutions, very thin, in front bluntly auricled, terminating, when in full march, in an acute point, and carries, on a simple lobe at the junction of the foot with the body, a pyriform light corneous operculum marked with arcuated oblique striæ of growth. The animal is free, creeps with rapidity, and dwells in muddy ground mixed with shelly spoil in 14 fathoms water, off Teignmouth, Devon. Malacologists will perceive that the organs of this animal are in every respect generically the same as those of *Chemnitzia rufa* and *Ch. elegantissima*. This species has never before been observed alive.

I have examined several live specimens of that variety of the present species termed by authors *Eulimella affinis*, and I find that the animal of the two is identical; the only difference is in the shell, which in the '*affinis*' is more taper, and has the whorls more rounded and better defined by the divisional lines.

Chemnitzia clavula.

Eulimella clavula, Brit. Moll.

The animal inhabits a pearly white, but not glossy shell, of five rather rounded volutions, including the moderately reflexed apex; the body is about half the entire length of the shell, with a narrowish, elongated, oval aperture, quite free from angularity. The animal is clear frosted white. Rostrum very narrow, rounded at the end, not bilobed nor grooved, and carried just before the foot; neck greatly protruded, on the march showing an open canal formed of two parallel longitudinal lines. Mantle even, no fold visible. Tentacula short, broad, swelling out behind like a minute wide leaf; the auriform folding nearly disappears on the march; they are not divergent; indeed, I may say, they are

borne so close and straight as almost to hide the rostrum and proboscidal fissure; they may be termed small, short, triangular, and terminate each with two white inflations, that is, one completely apical, the other close below it quite lateral, subsemicircular, and as if soldered to the external sides of the points. I do not recollect having before observed this tentacular peculiarity. The eyes are at the internal bases, not very close together. The foot is a very deceptive organ, from its quality of exhibiting different appearances; it is very little concave in front, and has long tentacular auricles; the margins are thin, often reflexed upwards towards the shell, and it postceally assumes a form varying from the needle point to an obtuse termination, carrying on a simple lobular eminence of the main foot, at its junction with the body, a minute delicate pearl-coloured obliquely striated operculum. The animal is very active and free. Taken with the *Chem. acicula* in the same locality. The animal of this species has hitherto escaped observation.

I stated in the 7th vol. of the 'Annals,' N. S. p. 391, that I considered the *Ch. clavula* a variety of *Ch. acicula*, and confidently predicted no animal would ever be discovered of such variety which would exhibit decided specialties. I believe this error has originated from having had varieties of the *Ch. acicula* sent me for examination instead of the true '*clavula*.' I apprehend this must have been the case, as no one with the true shells can confound the two. Whether I am right or wrong in this conjecture, the acquisition of eight living examples of the *Ch. clavula* proves, that as regards both the shell and animal it is very distinct from *Ch. acicula*.

Chemnitzia scalaris, Philippi.

Chemnitzia rufescens, auct.

Animal subhyaline white, sometimes of a pale red muddy brown, aspersed with minute opaque snow-white points, inhabiting a white plicated shell of seven or eight volutions, with transverse striæ between the ribs, having the body marked with two or three narrow spiral light reddish brown bands, and two on the penultimate volution; the apex is intensely reflexed on its next neighbour. Mantle even, except emitting a small cloven fold at the upper angle of the aperture. Rostrum deeply notched in front, with the segments gently arcuated. The tentacula are moderately long, strong, and divergent, and exhibit the usual folding auriform phases of their margins, but the varying inflations of the tips are less developed than in many other species; the eyes are black, not very close together, and fixed at the internal bases of the tentacula, which do not entirely coalesce,

being divided by a distinct groove, that is the continuation of one on the rostrum from the point where the cleft terminates. The foot is short, very slightly auricled, and on the march does not extend much beyond the body volution, posteally declining to an obtuse termination, at a little distance from which is the almost simple upper lobe carrying the usual pyriform elliptically striated operculum.

Habitat: shelly mud, in 10 fathoms water, six miles from the shore, off Teignmouth, Devon.

This animal has scarcely been observed, and the only observation as to colour does not quite accord with the live specimens I have examined. I am now inclined to think, contrary to my opinion in the 'Annals,' N. S. vol. vii. p. 387, that there are two varieties of this species: the one scalar, or with turreted sub-angular volutions, which is considered the type, under the title of *Chemnitzia scalaris*; the other, with rounded volutions, has the specific appellation of *C. rufescens*. I have taken both alive, and could detect no difference in the animals, except in colour; the *C. scalaris* being sometimes subhyaline frosted white, at others pale red-brown, and the same variations attend the so-called *C. rufescens*. I may be in error as to the identity of the two, but that is my present impression.

Aug. 10th.—I this day took at the same haul two shells, one of which proved the typical *C. scalaris*, the second was the form termed by authors *C. rufescens*; they were both put in a vase, and being lively, I again saw that their organs were identical.

Chemnitzia fenestrata, auct.

Animal inhabiting a longitudinally plicated and spirally ridged white shell of eight rather flat volutions which bevel from their bases to the sutural lines; the apex has the usual reflexion of the tribe. The general colour of the external organs is a subhyaline frosted white, the internal posterior volutions are a deep red-brown. Mantle even with the aperture, except a small shoot at the upper angle. Rostrum slender, long, flat, barely hollowed at its termination. The tentacula are comparatively long, slender, and fold after the characteristic manner of the race, and have the white inflated tips; they are united at the bases, on which, close together, are imbedded at the internal angles the conspicuous black eyes. The foot in slow march is short, broad and obtuse, but when the pace is accelerated it attenuates and extends to the bottom of the second basal volution; anteriorly it forms a concave sweep, ending on the right and left in very slight auricular points, and posteriorly in a moderate lancolate shape, carrying on a simple lobe, close to its junction with the

body, a light, corneous, pyriform, obliquely striated operculum. This elegant little creature is very vivacious, and free from shyness.

Habitat : muddy ground, in 10 fathoms water, six or seven miles from the land, off Exmouth.

It is one of the unrecorded species.

Chemnitzia obliqua, Alder.

Odostomia diaphana, nonnull.

The animal inhabits a very pale yellow-white smooth shell of four rather tumid volutions, besides the apical reflexion, which is less than usual, the divisional lines are by no means oblique, and the body exceeds the length of the spire ; its colour is a brilliant frosted subhyaline white. The mantle is even, except a conspicuous tubular fold at the upper angle of the aperture. The rostrum is short and cloven in the centre almost to the eyes ; each segment forms an arcuation to each side equal to an angle of 40°. The tentacula are strong, rather long, without much auriform folding, subrotund and taper, terminating with minute circular snow-white spots or inflations on the tips ; the eyes are close together at the internal basal angles ; the great peculiarity attached to the tentacula is, that instead of a moderate divergence on each side the rostrum, they form large arcuations and are carried at right angles with the axis of the shell. Foot thin, rather concave in front, slightly auricled, long and broad, and when fully extended reaches beyond the body whorl, terminating in a distinct bifurcation, which is very apparent in slow march, but on a quicker pace being attained, the fork in some measure decreases in consequence of the greater extension of the foot ; on a small simple lobe, close to the junction of the foot with the body, is fixed an elongated, narrow, corneous, delicate light yellow operculum with close-set oblique striæ of growth.

Taken at Exmouth from a shelly bottom, six miles from shore, in 12 fathoms water. It has hitherto escaped the researches of authors.

I have thought the "*obliqua*," if unconnected with the *Ch. Warrenii* (the *C. decorata* of authors), a doubtful species, but the above description removes all doubts of its not being in *esse*.

Chemnitzia insculpta, Montagu.

The animal occupies an ivory-white shell of five moderately rounded volutions, with well-marked but not oblique sutural lines ; the three lower whorls at the basal portions have very fine distant either concentrically circular or spiral striæ. The colour

is opaque frosted white, with a rather large patch of dull claret-red on the neck. The mantle has the usual fold at the upper angle of the aperture. The rostrum is short, cloven to the eyes, with the segments arcuating as in *C. obliqua*. The tentacula coalesce at their bases, and are very broad and short, which condition may, in some measure, be owing to the margins not being folded in the auriform fashion on the march; they terminate in very small white slightly inflated tips; the eyes are close together at the internal bases. The foot appeared short and broad as the animal moved in slow march, but perhaps, if the pace had been accelerated, it might have been somewhat extended; in front it is gently concave with blunt auricles, close under which it becomes a little constricted, and terminates in a deep regular emargination carrying on a plain lobe a remarkably thin, light, horn-coloured, narrow, subelongated, obliquely striated operculum.

It inhabits six miles from shore at Exmouth, in a shelly bottom of 14 fathoms water. It has not been examined before.

Chemnitzia Warrenii, Brit. Moll.

Chemnitzia decorata, nonnull.

Animal inhabiting a white subturreted shell of four compressed volutions, with oblique sutures; the basal part of the body whorl being finely, superficially, and irregularly spirally striated. The mantle is even with the shell, but has the power of relaxing itself so as to produce a small conduit at the upper angle of the aperture. The rostrum is short, cloven as far as the eyes, having the segments curved to the right and left; the tentacula are short, triangular, bevelled, not broad, attenuating to a fine point, and armed with small white inflated tips; they are carried in front of the head with an angular divergence of about 75° ; the eyes are close together at the internal united bases. The foot is short, concave in front, slightly auricled, postally terminating obtusely with a light, horny, thin, obliquely striated operculum, seated on a simple lobe that is scarce distinct from the upper part of the foot near its junction with the body.

Habitat as in the two preceding species. This animal is now noticed for the first time.

Chemnitzia interstincta, Mont. et auct.; Annals, N. S. vi. 458.

Animal inhabiting a closely plicated white shell of five and a half flattish volutions, the body not being half the length of the shell; the apex is less reflexed than usual; the aperture has generally a visible tooth, and there are one or two rows of crenæ

or lattice-work on the base, between the ribs, of the three lower volutions. The general colour of the animal, as regards the portion contained in the body whorl, is a frosted rather opaque white. The mantle is even with the shell, scarcely showing a fold at the upper angle of the aperture. The rostrum is very slender, not cloven, but truncate at the end, and as usual on the march precedes the foot. The tentacula are rather long, slender, not particularly divergent, and have but narrow margins for the auriform folds; they are taper, bevelled, and terminate in prominent white tips; the eyes are not very close together at the internal bases. Foot short, narrowish, rarely extending when fully deployed much beyond the body volution, truncate in front or very little concave, with short auricles, and a little contracted below them, carrying on a simple upper lobe, at the junction of the foot with the body, a thin, pear-shaped, light, corneous, obliquely striated operculum; the foot has a rather obtuse though lanceolate termination.

I have reproduced this species, already described by me in the 'Annals,' partly with the view of correcting some slight errors, but principally to place it in immediate view for comparison with its tumid variety, and with the next species, the *Chemnitzia indistincta*, and its variety that has been named *Ch. clathrata*, all of which have been strangely jumbled together; but very large series of both species and their varieties have, I think, enabled me to unravel various misapprehensions. With respect to the shell of the present species, it has only one well-marked tumid variety, which, as regards the animal, differs in no respect from its chief, as the posterior volutions of both, in the shell, are of a dark lead-colour; but the variety is invariably of larger size; the whorls, though the same in number, are more tumid, and the body volution is more than half the whole length of the shell; there is rarely on the body and next turn more than one well-pronounced row of crenæ, and a tooth is always visible in the aperture. I have a fine series of more than twenty examples of the variety, and 100 of the type, all of which have been examined alive.

It is difficult to say whether Montagu's figure represents the shell with the flat or tumid volutions, but as far as the indifferent engraving will allow one to judge, I should guess it to be the tumid variety. I believe, however, all collectors consider the flatter shell the type, it being by far the most abundant. As I find the animals of both absolutely identical, I cannot hesitate to consider the differences of figure as of mere varietal value. The true *Ch. interstincta* has usually a fold in the aperture, but it is not uncommon without it, and these exceptions are multiplied in most collections by an admixture of some half-grown

typical *indistincta* and the variety '*clathrata*,' which are invariably without the tooth; it never exceeds $5\frac{1}{2}$ volutions.

The type is very common in the coralline district, but the tumid variety is oftener met with in shelly mud.

Chemnitzia indistincta, Mont. et auct.

Chemnitzia clathrata, Brit. Moll.

The animal inhabits a white subopake shell of six or seven, sometimes eight, rounded volutions, with close-set waved longitudinal plicæ that have 3-5 rows of short lines forming a lattice-work between the ribs, sometimes on them, at the bases of the three or four last whorls; the body is not near half the length of the entire shell; the aperture is always destitute of a tooth. The animal in the body volution is pale yellowish subhyaline white, aspersed with minute snow flakes, but the posterior volutions are dark lead-colour, visible through the shell. When the neck is greatly protruded, two parallel longitudinal lines are seen forming an open canal, perhaps for branchial purposes. The rostrum is long, rather narrow, and just rounded at the termination. The tentacula are very short, united at the bases, with their thin margins unfurled on the march, which gives them, instead of the usual auriform figure, a very large, subtriangular, broad, leafy aspect; they terminate in large inflated white tips, and are often delicately powdered with a pale, thin, cloud-like suffusion of excessively minute lemon-coloured points; the eyes are very black, distinct, and close together at the internal bases. The foot is large, thin, subhyaline, either truncate or concave in front, dependent on the will of the animal, with very large auricles, which in progression are used as feelers; the margins of the foot are often reflexed, as if to embrace the sides of the shell; it is long, and when fully extended reaches to the third basal volution, and ends in a needle point; sometimes on each side there is a row of small flake-white spots; it carries on a simple upper lobe, scarcely distinguishable from the mass of the foot, a light corneous, thin, obliquely striated pyriform operculum.

The animal marches with rapidity, and is far more active than the *Ch. interstincta*. It inhabits, with the variety '*clathrata*,' a peculiar district of shelly mud, between the laminarian and coralline zones in 10 fathoms water, off Teignmouth.

That this is Montagu's *Turbo indistinctus* is scarcely doubtful; he says that his examples have six volutions, and no fold in the aperture—that is the number of the ordinary run of specimens; but both the type and variety, when very fine, have $6\frac{1}{2}$ to 8 turns, as our magnificent series will show.

There can be no doubt of the *Ch. indistincta* being distinct from the *Ch. interstincta*; we, in our first accounts, thought otherwise; but the greater number of volutions, the invariable absence of a tooth, the much more diffused lattice-work of the former, and the specific differences of the animals, afford decisive marks of distinction.

We have examined more than twenty live specimens of the typical species, in comparison, often in the same vase, with forty of the variety '*clathrata*,' which only differs from the type, as regards the animal, in having the posterior volutions pale pink, that gives the shell the appearance of being of a still paler pink hue, but in fresh shells the colour is a dull pearly white; this difference in the animals is probably dependent on food: another variation, perhaps the effect of the same cause, is, that the contour of the variety is somewhat less slender than the type; but the similar number of the volutions, the character of the lattice-work, and of the want of the tooth in the aperture of both, together with the identity of the animals, forbid the differences I have noticed to be considered of more value than of mere and not uncommon variations.

Chemnitzia pallida, Mont. et auct.

C. eulimoides, Ann. Nat. Hist. N. S. vol. vi. p. 452; vol. vii. p. 389.

C. rissoides, Ann. Nat. Hist. N. S. vol. vi. p. 455.

Odostomia notata, *O. albella*, *O. dubia*, *O. alba*, *O. nitida*, *O. rissoides*, *O. eulimoides*, *O. glabrata*? auct. variorum.

There is nothing to add to the description in the 'Annals' of the above species, of which several are now alive before me; I have only to observe, that having examined the animals of the annexed so-called species, I am bound to add them to the synonymy of *Chemnitzia pallida*; one, as the papers referred to above will show, of the most variable species as regards the shell; but the animals of all these spurious articles have the unvarying distinguishing character of *C. pallida*, which is absent from all the other *Chemnitzia* that can in any way be confounded with this group,—I mean the liberal, though irregular aspersions of many of their organs with minute sulphur-yellow or gold-coloured spots and points; and above all, the organs of their animals are similar. This species is an inhabitant of all the zones, and receives that impress as to form and size which results from the incidents of the respective localities; these causes have doubtless led to the formation of the pseudo-species, which I think only in some cases can claim even the distinction of varieties.

Chemnitzia acuta, mihi, Ann. Nat. Hist. N. S. vol. vi. p. 452.

Odostomia acuta, auct.

O. conspicua, Alder?

O. turrita, nonnull.

O. striolata, Alder?

Animal inhabiting a glossy shell of 5-6 rounded volutions of a more or less pale livid red, pinkish, or pearly hue; the apex is greatly reflexed, and the aperture furnished with a conspicuous tooth. The ground colour of the animal is a sordid white, mixed with clouded pale yellow, red, or brown patches and points, which are irregularly distributed on many of the organs; the tissue of the skin is smooth, rarely frosted or breaking into a mottled flaky aspect. The mantle is even, except that at the upper angle of the aperture, there is a very evident folded tubular canal, which I have alluded to in the preliminary observations on the genus. I will only add, Mr. Lowe writes, "pallio ecanaliculato;" M. Lovén says, "processus pallii dexter canaliculatus;" from which it may be inferred that the canal is sometimes present, at others not, or not visible. The rostrum is slender, deeply channelled, or hollowed out its whole length, having a cochleariform termination, and at the upper surface of its base emits the proboscis. The tentacula are moderately long, divergent, subtriangular, bevelled, with the margins only slightly folded, and the tips are less white and inflated than usual; the eyes are rather close at the internal angles. Foot short, opaque white, often aspersed on both surfaces with the varying hues I have spoken of above, deeply hollowed out in front, forming with the angles long auricles, which, when drawn together by the animal, have the appearance of a second pair of tentacula; its postea termination, at the will of the animal, assumes the varying phases of the pointed and obtuse forms, carrying at the junction of the foot with the body, on a simple eminence, a pyriform red-brown or yellowish obliquely striated operculum.

There being some inaccuracies in my account of the *Ch. acuta* in the 'Annals' referred to above, I have reproduced it, as it is an important species embracing several others of doubtful parentage, and some varieties, which latter produce the three following distinct forms. The slender subcylindrical variety passes in all collections for the coralline zone *Ch. plicata*; this is an error: an examination of the animal shows it to be a *Ch. acuta*, differing materially in its organs from the true '*plicata*,' which is essentially a littoral animal, rarely, if ever, found beyond that limit: I have hundreds of examples taken alive. The next form is that of the common livid flesh or pearl-coloured glossy shell

of 5-6 volutions, with a cone of broader basal dimensions; this is the type, and though usually smooth in the aperture, is sometimes furnished with transverse crenæ in the throat; I have four which were examined alive in comparison with the smooth ones, and they are, both in shell and animal, identical; it is difficult to account for the occasional presence of distinct crenæ in the same species. The third form is of the larger size of 6-8 volutions with white shells; these are smooth, though sometimes furnished with striæ in the throat of the aperture; I have several of each, which are so exactly represented by the figure of Mr. Alder's *O. conspicua* in the 'British Mollusca,' that I am induced to consider that species as a large crenated *Ch. acuta*; and it is not improbable that the *O. striolata* of the same author, like the *Ch. turrita*, of which I have spoken largely in the 'Annals,' N. S. vol. vii. p. 392, may be a striated *Ch. acuta*, which are all more or less furnished with spiral striæ on the volutions. I must observe, that the crenated examples of *Ch. acuta* must not be confounded with any variety of *Ch. conoidea*, as the animals of the two are very different; and as regards the shell, the cone of the one attenuates suddenly, whilst in the *Ch. conoidea* it diminishes more gradually and tumidly.

The *Ch. acuta* is by far the most abundant *Chemnitzia* of the South Devon coasts, and is taken in the coralline and muddy shelly districts. Independent of the three principal varieties, each varies greatly in the contour and colour of its individuals; it is, after the *Ch. pallida*, the most variable of the *Chemnitzia*.

Chemnitzia unidentata, Mont.; Annals, N. S. vol. vi. p. 453.

I have lately examined many live examples of this species, and have only to request that for "*head proboscidiiform*"—"rostrum truncate in front, not cloven," may be substituted.

Chemnitzia conoidea, Annals, N. S. vol. vi. p. 453.

Odostomia conoidea, nonnull.

A splendid series of all sizes of this beautiful species has been examined, and I have little more to observe, except that I find it has a slender and tumid variety.

Chemnitzia plicata, Mont.; Annals, N. S. vol. vi. p. 457.

Two hundred live specimens of this, I believe, strictly littoral animal have occurred; and I beg that the following sentence, "but I believe it also inhabits the laminarian and coralline districts," may be erased.

Chemnitzia rufa, auct. ; Annals, N. S. vol. vi. p. 457, & vol. vii. p. 386.

Chemnitzia formosa, nonnull. ; and Annals, N. S. vol. vii. p. 387.

I have seen several large specimens in the present month, June 1852 ; the only correction I offer is for, "The head or muzzle proceeds from the coalescing tentacular membrane, forming a sort of head-veil a little beyond the foot," read "*the rostrum* is long, flat," &c. &c.

Chemnitzia fulvocincta, Annals, N. S. vol. vii. p. 387.

The above reference explains all I know of this species, which, with most authors, is a synonym of *Ch. rufa*.

Chemnitzia spiralis, Mont. ; Annals, N. S. vol. vi. p. 457.

Odostomia spiralis, nonnull.

I have no additional observations to make on this species.

Chemnitzia Sandvicensis, Walker, Test. min. rar. ; Annals, N. S. vol. vii. p. 388, and vol. viii. p. 110.

Odostomia dolioliformis, nonnull.

I have nothing more to offer on this species.

Chemnitzia decussata, Mont. ; Annals, N. S. vol. viii. p. 111.

Odostomia decussata, nonnull.

Chemnitzia elegantissima, Mont. ; Annals, N. S. vol. viii. p. 112 ; Brit. Moll.

I request that the following sentence may be added to the descriptive matter :—The *Ch. elegantissima* is never marked with purple streaks as in *Ch. pusilla*, and the tentacula are carried more in a line with the body than in that species ; the shell is also more taper and of a more opaque sordid texture, but recent examples must be compared to see the value of this distinction.

Chemnitzia pusilla, Philippi ; Annals, N. S. vol. viii. p. 113.

The addendum to the preceding species will apply to this ; I have only to observe, that the constant variations in colour, contour, and texture of the shells have been verified by the examination of near twenty live individuals of this species.

Chemnitzia Gulsonæ, Annals, N. S. vol. vi. p. 459, and vol. viii. p. 108.

I have searched in vain for a second example of this rare animal ; I am anxious to review it ; however, I do not despair of again meeting with it.

The only other British *Chemnitzia* which I have not seen alive are the *Ch. Barleei*, *Ch. excavata*, *Ch. Scillæ* (*Ch. nivosa*, which is the *Ch. cylindrica* (juv.), and *Ch. truncatula* of authors). Though in a former paper I have included the *Aclis unica* amongst the *Chemnitzia*, it may possibly turn out to be of a different type:—this observation is made without further knowledge on this point; I know pretty nearly its habitat from having found recent shells, but with the animal so collapsed as not to emit the organs. I will make no remark on the *Aclis ascaris* and *A. nitidissima*, as the animals still elude our researches.

I have now stated all that I know, agreeably to my views, of this difficult and interesting genus, and corrected some popular errors as well as those of observation, and particularly many of my own; for however greatly our *amour propre* may suffer by such admissions, there is absolutely no other alternative but to submit to them, which, if omitted, or not made at the proper moment, would leave us pretty much in the same position as the Chancellor of the Exchequer's regiment of conscience-money payers, which curious public fact, illustrative of one of the mysterious operations of the human mind, if properly pondered on, will suggest to us all, in respect of the present and the hereafter, many salutary, important, and high considerations.

I am, Gentlemen, your most obedient servant,

WILLIAM CLARK.

XX.—On the Sloughing of the Spider-Crab (*Maia Squinado*).

By P. H. GOSSE, A.L.S.

AN opportunity having just occurred to me of witnessing the sloughing of a large Crab, I put down the principal points that I observed, hoping that they may throw light upon a subject that has always appeared so full of difficulty; namely, the manner in which the limbs are withdrawn from the exuviae.

As I was out this morning searching for algæ and zoophytes at low water, in the little cove of Hele near this town, I looked into a crevice that formed a small tide-pool beneath a huge overhanging rock. In the remotest corner crouched a Spider-Crab (*Maia Squinado*), face outwards, as is the custom with crabs in such circumstances. On pulling it out, I was astonished and delighted to observe how completely the carapace and the limbs were covered with parasitical zoophytes and algæ. A delicate *Ceramium* was conspicuous among the latter, and the former consisted of *Antennulariæ* and *Plumulariæ* in great profu-