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to be the only one whose view refers the tubercle to the office of a muscular fulcrum ; but he has fallen into an error in supposing that it supported the pedicle or muscle of attachment*.

Before concluding this brief account of the internal characters of *Productus*, we must not overlook its mode of articulation, nor the two crescent-shaped bodies often seen on its flat valve. By some these crescent-shaped bodies are supposed to have been produced by certain muscles ; on the other hand, there are many who think that they have been the supports of the labial processes. From the specimen of *Productus comoides*, which is figured by Von Buch, exhibiting a pair of gyrated impressions† (the same are even more obviously displayed on one of my specimens of *Productus giganteus*), I have no doubt that the mollusk of this genus was furnished with spirally-folded labial appendages : I hope to be able however to show clearly in my monograph, that the crescent-shaped bodies did not support these appendages, but, on the contrary, that they were produced by the ovaries. Respecting the articulation of *Productus*, I have long been convinced that it is effected without the presence of teeth or condyles : by taking the tubercle or cardinal muscular support for an articulating instrument, many palæontologists have described the Productuses as dentigerous. I have now examined a number of species, and in every one the hinge plate of the flat valve exhibits nothing but the *cardinal muscular support* ; while that of the opposite valve presents a straight continuous surface, only occasionally broken by a notch caused by the pressure of the part just mentioned‡.

[To be continued.]

VI.—On *Ginnania furcellata*. By GIUS. DE NOTARIS§.

THE celebrated Professor Meneghini, in his excellent work on Mediterranean and Dalmatian Algæ, has justly observed, that the commonest species are often those whose peculiarities of internal structure are, in fact, least known, either because they are supposed to have been already sufficiently illustrated, or because they are regarded, I might almost say, with contempt. Of this number, if I mistake not, is the *Halymenia furcellata* of Agardh, a species common enough on the coasts of England and western France and in some parts of the Mediterranean ; and although

* Annales des Sciences Naturelles, tome xviii.

† Ueber Productus oder Leptæna.

‡ Certain so-called Productuses are known to be dentigerous, but these will be hereafter shown to constitute another genus.

§ Extracted from a paper entitled " Sopra alcune Alge del mare Ligustico." Communicated by the Rev. M. J. Berkeley.

the points which I have taken upon me to explain may have already been partially noticed by others, they appear to me nevertheless capable of further development and worthy of the renewed attention of algologists.

Most important observations on this species have been given us by Agardh, Greville, Kützing and Montagne, but although these authors have certainly illustrated in a masterly way the form of the frond and fruit, they have not explained the structure with all those details which the present state of algology requires.

The elder Agardh, in his 'Species Algarum' (vol. ii. p. 212), showed that the frond of *Halymenia furcellata* consisted of two strata, the outer one membranaceo-fibrous, the inner one more compact, united closely to the former by means of reticulated fibres, from which the fructification is produced, consisting of minute punctiform tubercles, irregularly scattered and placed beneath the exterior membrane of the frond. *Frons e duplici strato componitur, exteriori membranaceo fibroso; medullari compactiori; utroque per fibras reticulatas conjuncto. Tubercula fructifera per totam frondem irregulariter sparsa, minuta et punctiformia sub membrana exteriori nidulantia.*—Agardh, l. c.

Greville, to whom algology owes so many happy innovations, in his 'Algæ Britannicæ,' pp. 163, 164, says: the fructification, in fact, consists of "*minute punctiform globules of seeds imbedded beneath the membranaceous coat of the frond, which is not perforated by any orifice: substance (of the frond) gelatinous and membranaceous, the cavity filled with a pellucid semifluid mass and a fine network of delicate filaments;*" as would naturally result from a cord of fine filaments covered with a membranaceous sheath independent of them.

These definitions are too diffuse and incomplete, and their insufficiency is immediately apparent if we contrast them with the descriptions given a short time since by the celebrated D. Zanardini in his 'Synopsis Algarum in Mari Adriatico hucusque detectarum' (Memorie della R. Accademia delle Scienze di Torino, serie 2. tom. iv. p. 124), and by Montagne in his most interesting Cryptogamic Flora of the Canaries (Histoire Naturelle des Iles Canaries, tom. iii. 2nde partie, p. 162), who, availing himself of the particular characters of the fruit, which I believe he was the first to describe correctly, has proposed to make this species a new genus under the name of *Ginnania*.

The facts which Zanardini mentions would indeed have but slight connexion with the matter before us, having been suggested by the analysis of the frond of the variety *cartilaginea* from the Adriatic (Syn. Alg. &c. l. c.),—which, according to the observations and specimens with which Professor Meneghini has kindly

favoured me, must be referred to *Nemostoma dichotoma*,—were it not that the error into which Zanardini was drawn in considering with Agardh (Spec. Alg. l. c.) *Nemostoma dichotoma* as a variety of *Halymenia furcellata*, proves the close analogy of structure which subsists between the two species in question, and this analogy is of itself sufficient to substantiate the inexactness above alleged.

Neither, in the ‘*Algæ Maris Mediterranei et Adriatici*’ (pp. 95, 96) has the celebrated J. Agardh described *Halymenia* with greater precision under the following characters :—*Frons filis interioribus varie intertextis versus superficiem in cellulas rotundatas anastomosantes, extus cellularum granulosa strato sæpe tectas abeuntibus, constituta. Fructus duplex? Favellidia infra stratum externum nidulantis, frondis dissolutione elabentia (?) intra perisporium arctissime circumdans tenacissimamque congeriem sporarum obovatarum foventia. Sphærosporæ* Terms which are perhaps not quite applicable to all the species of the genus, and still less to our plant, which is scarcely at all indicated. Besides which, a serious omission is to be imputed to him in not having noticed, perhaps deliberately, the observations published on the subject by Montagne; and although I allow that he might not be able to adopt his views, yet at any rate he was bound to cite them, either to discuss their merits or show their inconsistency.

Montagne, as I said before, has described the structure of the fruit with great exactness, which really incloses nuclei composed of slender radiating sporiferous threads. *Nucleus e filis constat articulatis numerosissimis quoquoersum irradiantibus in articulo quorum extremo sporidium oblongum gigartioideumve continetur. Membrana tenerrima tenuissime punctulata, diaphana, ad maturitatem fructus massam filorum investit*; but with regard to the frond, when he says—*intus filamentis constans intricatis, hyalinis, e cellulis periphericis membranæ corticalis, ut videtur, oriundis, vel saltem ad easdem spectantibus*—he either knew not how to draw the characters, or has not expressed himself with the necessary clearness.

Lastly, Kützing in his recent and admirable publication, ‘*Phycographia Universalis*,’ has also made *Halymenia furcellata* a new genus with the name of *Myelomium*, defined in the following terms :—*Phycoma filiforme lubricum, dichotomum, solidum, ex stratis tribus formatum, corticale crassiusculo subparenchymatico, intermedio laxe fibroso, medio ex fibris parallelis longitudinalibus numerosis dense conjunctis compositis*. Of the fruit no notice is taken. However censurable such slightly framed generic characters may be from any one, it fills one with astonishment to see how some authors allow themselves to be governed by the mania

for multiplying genera, although they are unable to support them by characters of weight or based on sound principles.

It is hardly necessary to add that the Mediterranean species, the Livornian at least (as well as the Algerine enumerated by the celebrated Montagne in his *Cryptogames Algériennes*, 'Annal. des Scienc. Natur.' 2^{de} sér. tom. x. p. 257, collected unquestionably by Roussel), is in all parts conformable to the oceanic species, of which I have often received splendid specimens from Lenormand, Godey and Auniet, for which reason I shall dispense with recalling their habits and forms. I will only remark that the frond and its divisions are perfectly cylindrical when first taken out of the water, but wither when exposed to the air, and assume a prismatic triangular or quadrilateral figure, the angles of which are very prominent, the sides depressed and channeled.

At first sight, under the microscope, one would say it was entirely composed of round elliptic or oval cells, whether isolated or ranged above one another in parallel rows; but in vertical as well as horizontal sections, the innumerable filaments which form the central part are easily detected: by taking small slices of the frond in the direction of its greatest diameter and putting them under the microscope, the mode of growth is at once apparent. They thus form a cord, or I might rather say a fascicle, which, like the mealy part of the thallus of some lichens, occupies the centre of the frond, extending even to the furthest divisions. In their course they are repeatedly dichotomous and form two sets of branches, the one directed upwards, the other bent in a horizontal direction, so as to unite by their clavate extremities, which are once or twice divergent and bifurcate, with the peripheric stratum of the frond.

The form of the filaments is rather compressed, the diameter being often unequal and slightly thickened at the commencement of each dichotomy and at their extremities, which inclose a coloured substance, but are themselves diaphanous and completely colourless. In some of them I have been able to determine the presence of lateral branches of various lengths descending in a winding course towards the inferior part of the frond. I also thought I discovered in the filaments, more especially in the points where they became bifurcate, traces of partitions; and I can declare, without hesitation, that the superficial cells, from which the walls of the frond spring, originate from the claviform and divergent extremity of the centrifugal branches. I must not omit to remark, that the cells of the peripheric stratum do not all communicate directly with the horizontal threads; if I am not mistaken, those extremities, in which constrictions frequently occur in the form of articulations, may give rise to new cells, which

being afterwards compressed and ending together in the circumference of the frond assist in strengthening the superficies.

The threads, bent in a horizontal direction, agree closely with the loosely fibrous intermediate stratum of the frond, of which Kützinger speaks in his description.

In short, the enlightened Zanardini, when speaking of his *Halymenia furcellata cartilaginea*, has compared its elements to a group of individuals like *Callithamnion* (*Massa inde dimanans haud inconsulto haberetur pluribus generis Callithamnii individuis constituta, quæ ita conservantur atque contexuntur ut quasi majoris implicationis formam affectare vellent*. Zanard. l. c. p. 124), the principal threads of which gathered together constitute the central part; the extremities of their ultimate branches diverging in a horizontal direction, the peripheric stratum. This notion, setting aside the many differences which separate generically the variety from the species, may not without truth be transferred on comparison from the one to the other.

I have also said that the frond of *Ginnania* is something like the thallus of some lichens, because in many of the fruticulose as well as the foliaceous species of this family, I have seen the filaments of the hypothallus often send out communicating branches into the gonimic stratum, from whose apices spring the vegetating cells or gonidia, bearing precisely the same relation as the superficial cells to the filaments which diverge horizontally in the frond as already described.

The fruit, as I have already remarked, arises more or less copiously, without any order, from the internal superficies of the peripheric cellular stratum: its form is spheroidal, without pedicels; it is of a pale rose-colour, visible to the naked eye by translucence through the outer surface. The walls of the frond become thinner where they are in contact with the fruit, but have no perforations of any kind. When slightly pressed between the object-glasses, the fruit opens at the top and emits one, two or more nuclei of a globular form, whose surface is hispid or echinulate. When divided with the point of a lancet they present a complete wood of short and delicate filaments, undivided, bifid or dichotomous, as if united into fascicles radiating from a common centre. These filaments are cylindrical, slightly clavate, and inclose one, two, or at most three nuclei of liquid endochrome, which is slightly olivaceous and separated by diaphanous intervals, in which I have not been able to trace any indication of dissepi-ments.

I dare not assert whether the spores are formed by the successive evolution of the undivided filaments or by the disarticulation and contemporaneous compression of the coloured nucleus con-

tained in them. The spores are obovate, surrounded by a narrow pellucid border, containing a subtle granular substance. The outer coat of the fruit or perisporium which contains the above-described filamentous nuclei is formed of cells, somewhat large, flaccid and elongated, adhering to the membranaceous stratum, transparent and rose-coloured.

I shall conclude by protesting that I do not wish to constitute myself the censor of others, but it appears to me that the characters adopted by Kützing in the formation of the genus *Myelomium* are rather too incomplete, and that the name of *Ginnania*, proposed anteriorly by the excellent Montagne and supported by the strongest arguments, will nevertheless be preferred at the present day, inasmuch as the caprices and partialities of authors ought not to be sanctioned in contravention of the laws generally agreed on by botanists,

VII.—*Descriptions of four apparently new Species of Longicorn Beetles in the Collection of the British Museum.* By ADAM WHITE, M.E.S., Assistant in the Zoological Department of the British Museum.

[With a Plate.]

SAROTROCERA, White.

ANTENNÆ with the first joint thick, and furnished at the end on the inside with a tuft of hairs; second joint very small, with one or two hairs; third to the seventh joints behind fringed with longish hairs, the hairs on the third and fourth very thickly distributed and extending over a considerable part of the hind edge. Thorax almost as long as wide, the sides nearly parallel, somewhat depressed above, with a short spine on each side. Scutellum somewhat elongated, the sides parallel. Legs with the femora compressed, especially above; the tibiæ much compressed, slender at the base, getting thicker towards the middle, and from that to the end wide, with the sides nearly parallel. Tarsi very wide. Elytra strongly angled, almost aculeated on the shoulders, rounded and simple at the end.

This genus in the system comes close to *Cerosterna*, Dej., with which and *Batocera* it has some characters in common.

The species is from Borneo, whence it was sent by Hugh Low, jun., Esq., after whom I have named it.

Sarothrocera Lowii, White. Pl. I. f. 6. Of a rich brown, slightly tinged with ochraceous; the hairs on the antennæ are of a very dark brown or black; the scutellum is of a pale yellow; the base of the elytra is finely verrucose above, the small warts