

from the tube of the parent after it was one third of a line in length, and consisted of ten annuli, including the head, from which projected ten tentacles.—*Proc. Acad. Nat. Sc. Philad.* Sept. 20, 1870.

Note on transversely striated Muscular Fibre among the Gasteropoda.
By W. H. DALL.

In studying the radula of a species of *Acmæa* (probably *A. borneensis*, Rve.) obtained by Prof. A. S. Bickmore at Amboyna, I noticed, on placing the structure under a power of 100 diameters, that certain of the muscular fibres which adhered to it, when torn from the buccal mass, had a different appearance from the others. On increasing the power to some 800 diameters, it was at once evident that the different aspect of these fasciculi was caused by fine, but clearly defined, transverse striation. Suspecting that it was an optical delusion, caused by a very regular arrangement of the nuclei of the fibres, I subjected the muscle to various tests and to still higher magnifying-powers. I also introduced under the same glass some of the voluntary dorsal muscles of a small crustacean, for comparison. The structure of the ultimate fibres in both appeared to be similar. These seemed to be composed of a homogeneous tube or cylindrical band of translucent matter, with nuclei interspersed at irregular intervals. In neither was there any appearance of separation into transverse disks, as is seen in the striated muscles of vertebrates. That the striated appearance was not due to contraction and folding of the muscle was evident upon taking a side view of one of the fibres, when the striæ on each side, as well as the intervening elevations, were seen to correspond exactly to each other.

The only perceptible differences between the muscles of the crustacean and the striated muscles of the mollusk appeared to be that the latter were much more finely striate, the striæ being six to eight times as numerous as in the former, in the same space. No difference between the striated and non-striated muscles of the *Acmæa* could be observed, except in the fact of the striation. In both the nuclei were irregularly distributed. The appearance of the striated fibre reminded one of a string of rhombic beads, which bore no relation to the position of the true nuclei. The striated fibres appeared, after a careful dissection of the parts in a number of specimens, to be the retractors of the radula; they were longer and in narrower bands than the non-striated fibres, and comparatively much fewer in number. The striation was most evident toward the middle of the fibres, and became evanescent toward their extremities.

Lebert and Robin (Müller's Arch. f. Anat. und Phys. 1846, p. 126) state that the primitive muscular fasciculi of invertebrates often have the nuclei and intervening clear spaces "arranged in such regular order that they might, at the first glance, be mistaken for transversely striated muscular fibres. The latter, however, are actually found in one acephalous mollusk, *Pecten* (and probably in *Lima* also), and some annelids," and are constantly present in the

voluntary muscles of Crustacea and Insecta. In the further researches of M. Lebert (Annales Sci. Nat. 1850, t. xiii. p. 161) he observes that there is nothing extraordinary in the discovery of transversely striated muscular fibre in Polyzoa (*Eschæra*) by Milne-Edwards, and in *Actinia* by Erdl, since "the further we have pursued the study of the comparative histology of muscular fibre, the more convinced we have become that transversely striated muscular fibre is to be found in a large number of animals of very inferior organization, without regard to their more or less advanced position in the animal kingdom."

Striated muscular fibre has lately been shown to exist in the "tail" or appendix of *Appendicularia* by Moss (Trans. Linn. Soc. vol. xxvii. p. 300). It was already known to exist in *Salpa* (Eschricht, Ov. Salperne), in the articulated Brachiopoda (Hancock, Trans. Roy. Soc. 1857, p. 805), and in *Pecten* (Lebert, Annales Sci. Nat. 1850, sér. 3. t. xiii. p. 166; and Wagner, Lehrb. d. vergleich. Anat. 1847, t. ii. p. 470), as well as in *Eschæra* (Milne-Edwards, Annales Sci. Nat. sér. 2. t. iv. p. 3). I believe, however, that this is the first instance in which it has been shown to exist in the class Gasteropoda; and this, as well as the rarity of such cases among the lower invertebrates, is a sufficient apology for bringing forward such an isolated fact. Other duties have not yet permitted me to determine whether this phenomenon is constant throughout the genus, or whether it does or does not occur among allied genera.—*Silliman's American Journal*, Feb. 1871.

On Bud-formation in Gymnocladus and other Plants.

By THOMAS MEEHAN.

The author said that last year he had called the attention of the Academy to the fact that *Gymnocladus* and some other plants had a series of buds, not in the usual order of *phyllotaxis*, accordant with the leaves, as we have believed axillary buds ought to be, but in a direct line one above another, and that in these cases the upper bud, the one the furthest removed from the axil, was the strongest bud. He had overlooked the fact, long known to botanists, until pointed out by Dr. Engelmann, that *Lonicera* had this longitudinal string of buds; but in this case the largest bud was the one nearest the axil. He had since noted that these buds all followed the same law in this, that it was the large buds which had a flower-producing character, while the small ones were those which continued the axial growth.

By the help of this last observation, he was now able to explain some facts in Solanaceous plants which he believed had not hitherto been understood. It was well known that many of these had a habit of producing their flower-scapes at varying positions between the nodes, and not at the nodes, as is usual with most flowering plants. He exhibited specimens of the common cherry tomato, in which a few of the flower-clusters sprang apparently opposite to a node, but the majority were at least one-fourth of the way down to the node below,—also other species of the genus, in which the flower-



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