

States. As yet I only have had time to refer to a few which appeared to bear more immediately on the objects I had in view, but I hope on some future occasion to return to the subject. In the meantime I must content myself with glancing rapidly over the different countries, taking them in the order adopted in my former addresses, and endeavouring to show the progress making in supplying our deficiencies. Towards these deficiencies I would particularly call the attention of entomologists and terrestrial malacologists, for insects and land shells are of all others the animals whose life and local stations are the most closely dependent on vegetation. In the following notes I am further precluded from entering into details as to the zoological works or memoirs mentioned, by the consideration that they would be superseded by the analysis given in the annual reviews inserted in *Wiegmann's Archiv*, and more especially in our own admirably conducted *Zoological Record*, which so strongly claims the support of everyone interested in the promotion of Zoological Science.

(To be continued.)

### ZOOLOGY

#### Note on Transversely Striated Muscular Fibre among the Gasteropoda.\*

IN studying the radula of a species of *Acmaea* (probably *A. Borneensis* Rye), 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 discs, 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 nonstriated muscles of the *Acmaea* 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 nonstriated 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. and 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.*, t. xiii. 1850, p. 161), he observes that there is nothing extraordinary in the discovery of transversely striated muscular fibre in *Polyzoa* (*Eschara*) 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 organisation, 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. Lin. Soc.*, vol. xxvii. p. 300). It was already known to exist in *Salpa*, (*Eschricht, ov. Salperne*), in the articulated brachiopoda (*Hancock, Tr. Roy. Soc.*, 1857, p. 805), and in *Foelen* (*Lebert, Annales Sci. Nat.* 1850, 3rd ser. t. xiii. p. 166; and *Wagner, Lehrb. d. vergleich. Anat.*, t. ii. p. 470, 1847), as well as in *Eschara* (*Milne-Edwards, Annales Sci. Nat.*, series ii. 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.

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### SCIENTIFIC SERIALS

IN the first paper in the *American Naturalist* for May, Prof. C. F. Hartt opens out quite a new field for investigation in the rock-inscriptions of Brazil, and illustrates it with nine plates of very great interest. The inscriptions occur on the rocks in various districts, and are many of them very rude, representing human and other figures, the sun, moon, and stars, and others very difficult to decipher. Prof. Hartt mentions as a curious circumstance that the hands and feet are always represented by radiating lines, usually only three digits being drawn for each hand and foot; the number rarely reaches four, and never five. This, he thinks may be explained by the fact that many tribes of Brazil are unable to count beyond three or four. The antiquity of these rock paintings and sculptures is undoubted, being mentioned by many ancient writers, as well as by Humboldt and others in more recent times. There can be no doubt that they ante-date the civilisation of the Amazons, and there is a strong probability that some of them, at least, were drawn before the European discovery of America. A short paper, by Dr. F. R. Hoy, on Dr. Koch's *Missourium tetracaulodon*, made by Prof. Owen into a Mastodon, points out several particulars in which Dr. Koch's account of the discovery of the fossil is not to be relied on, especially the inference of the great antiquity of man deduced from it. Mr. J. H. Emerton gives an account of the so-called "Flying Spiders," which are merely blown about by the wind. Among the "Miscellany" is an interesting note by Mr. A. Garrett, on the Distribution of Animals in the South Seas, especially in the Viti Islands. The number is altogether one of unusual interest.

*Archiv für Anthropologie*, 1870, Heft 3. An essay on "Theories of Sexual Generation," by Prof. His, of Basel, is rather historical than speculative, tracing the two principal lines of opinion represented in early science by Hippocrates and Aristotle, as to the respective functions of the two parents, and the mode of transmission of their bodily characteristics to the off-spring. Among modern writers Prof. His dwells especially on Harvey's views. A paper by Dr. Welcker, "On the compressed feet of Chinese ladies," contains careful drawings, showing the shoe, the foot, and the abnormal position of the bones. As complete an account is given as the subject needs from an anatomical point of view. Dr. Jensen, occupied in studying the proportions of the brain in the insane, arranges for this purpose, a "stereoscopic-geometrical drawing apparatus," by the aid of which to produce geometrical drawings on which measurements can be made. Dr. Schaahtausen's dissertation on "Cannibalism and Human Sacrifice," is a valuable, though somewhat undigested contribution to the subject. Among the motives assigned for cannibalism, the principal are hunger, revenge, superstition, such as induces savages to devour a brave warrior to obtain his courage, and lastly, the gluttonous longing for a kind of flesh which is described as appetising. Human sacrifice may sometimes be a relic of early cannibalism, an offering to deities who devour human flesh, or it may be an act of propitiation. There is evidence of the ancient or modern existence of cannibalism in most countries of the world, Great Britain being distinctly included. Even in modern times it occasionally breaks out in the civilised world, but on the whole its frequency among savages, and its general disappearance under improved social conditions, enable the writer, who argues in favour of a steady progression in the civilisation, to put it fairly into his argument.

\* Communicated by the author, from the "American Journal of Science and Arts," vol. i., Feb. 1871.