

- IV. "On the Aquiferous and Oviducal System in the Lamellibranchiate Mollusks." By GEORGE ROLLESTON, M.D., F.L.S., Linacre Professor of Anatomy; and C. ROBERTSON, Esq., Demonstrator of Anatomy, Oxford. Communicated by Dr. ACLAND. Received August 20, 1861.

(Abstract.)

After recapitulating the views which have been held by various authors as to the means by which certain Lamellibranchiata are enabled to distend their muscular foot, the authors of this paper proceed to make a retraction of the opinions they put forward as to the oviducal system in these mollusks in a paper read before the Royal Society, February 3, 1859. But, though they have some reason to agree with M. La Caze Duthiers's views, as expressed in a paper read before the Royal Society, December 15, 1859, so far as the oviducal outlet is concerned; they are not prepared to coincide with that writer in denying altogether the existence in these animals of an aquiferous system distinct from their blood-vessels. Upon this point their views remain much the same as those they enunciated in their paper already referred to, and they may be briefly summed up thus.

They hold that, side by side with, and yet distinct from, the blood-vascular system in the Lamellibranchiata, there exists another system of tubes forming an aquiferous tree, the trunk of which serves as an outlet for the generative products, whilst many of its branches spread throughout the foot into regions not occupied by the organs of reproduction. This system is such an one as the perivisceral chamber has been shown to be by Mr. Hancock in the 'Philosophical Transactions' for the year 1858, spreading itself into ramifications, some of which are, whilst others are not, in connexion with the reproductive glands. The authors allow, and indeed show in the way of experiment, that it is possible for the water in which the animal lives, to become intermingled with the blood within its vessels by the route of the organ of Bojanus, and it will be seen from what has even already been said, that they suppose the aquiferous system to be fed with water by transudation of that fluid from the blood-vessels.

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They begin by describing three sets of experiments in the way of injections, to show that water can find its way into the pericardial blood-lacunæ through the organ of Bojanus; and from thence into the vessels which carry the systemic blood towards, and only into those which carry it *towards*, the gills.

The results of two other sets of experiments are next adduced in proof of the non-existence in the blood-vascular system, first, of any lacuna save in this pericardial space; and, secondly, of any communication with the exterior by pores, save such as the two sacs of the organ of Bojanus may be held to represent upon a gigantic scale.

What is new, however, in this part of the paper, is not so much the conclusions as the methods the authors have adopted for demonstrating them.

In proceeding to argue for the existence of a system of tubes distinct from the blood-vascular system, the authors begin by contrasting the appearance which the non-generative part of the foot presents when it is injected, as it is easily, from the orifice which serves as generative outlet, with that which it presents when injected from the blood-vessels.

Secondly, they show that it is possible when the blood-vessels are already fully occupied by an injection of one colour to cause a second, or when the artery and the vein have been filled with differently coloured fluids, a third system of vessels to make their appearance throughout the foot-mass by throwing a differently coloured injection into the oviducal outlet.

Thirdly, microscopic examination of animals thus treated excludes the idea that the fluid thus interposed between and amongst blood-vessels has found its way simply into interstitial spaces left between them and the tissues, as it shows that it is contained within a system of tubes as well defined and limited off from the surrounding tissues, as is the fluid which has been thrown into the blood-vessels themselves.

That the water which has been shown to enter the body by the intermediation of the organ of Bojanus finds its exit by the same route, the authors believe to be rendered in the highest degree improbable, by the fact that they have found it impossible to make fluid pass in the direction this hypothesis postulates; that is, from the blood-vessels, into the pericardium.

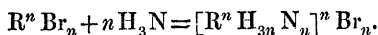
Similar improbability attaches to a view which supposes a fluid of such chemical and such morphological characters as the blood of the Lamellibranchiata, to suffer dilution to such an extent as the observable distention of their foot would necessarily imply; and which argues from phenomena noticed on the sudden removal of the animal from the water, as though they could be regarded as identical with normally occurring physiological processes.

As their injections seem to them to prove the existence of a system of vessels distinct from and yet in most close apposition to the blood-vessels, and permeating the several tissues of the body in company with them, the facts of the case seem to the authors to necessitate the belief that a transference of fluid takes place, as in other organisms, from the latter to the former set of vessels.

The animals experimented upon were Unionidæ of the two species, *Anodonta Cygnea* and *Unio margaritifera*.

V. "Notes of Researches on the Poly-Ammonias."—No. XVI.
Triatomic Ammonias. By A. W. HOFMANN, LL.D., F.R.S.
Received July 5, 1861.

In a short paper which I had the honour of submitting to the Royal Society about a year ago, I endeavoured to delineate the general results to which my experiments on the Polyatomic Bases had led me. I showed that the construction of these bodies may be accomplished in two essentially different ways. In the first place, a number of ammonia-molecules may be joined by the insertion of a polyatomic radical, the atomicity of the radical determining the number of the ammonia-molecules thus united.



Examples of compounds formed upon this principle have been furnished by my researches on the phosphonias.

Again, the accumulation of the ammonia-molecules may be attempted by increasing the number of polyatomic radicals of given atomicity used as binding material. It is obvious that theoretically any number of ammonia-molecules may be held together by diatomic molecules, provided we appropriately increase the number of the latter.