

As to the purpose of the circulation in the animal's economy, it appears, from the experiments of Mr Lister, "to be the great agent in *absorption*, and to perform a prominent part in the obscure processes of growth; and its flow into the stomach of the polypi seems to indicate that in the very simple structure of this family it acts also as a solvent of the food.—The particles carried by it," continues Mr Lister, "present an analogy to those of the blood in the higher animals on one side, and of the sap of vegetables on the other. Some of them appear to be derived from the digested food, and others from the melting down of parts absorbed; but it would be highly interesting to ascertain distinctly how they are produced, and what is the office they perform, as well as the true character of their remarkable activity and seemingly spontaneous motions; for the hypothesis of their individual vitality is too startling to be adopted without good evidence."*

This sort of circulation is not to be confounded with those aqueous currents which flow over the surfaces of the external organs of the ascidian polypes.† It has been already stated

* Phil. Trans. 1834, p. 377.

† Dr Grant repeatedly asserts that the tentacula of the hydraform polypes are also ciliated, and I would not have dared to controvert this statement, although my own observations had long ago satisfied me of its incorrectness, had it not been at variance with the observations of others who have especially directed their attention to the subject. Raspail states that he was not able to discover anything analogous to cilia on the tentacula of the Hydra, (*Org. Chem.* p. 293;) and Dr Sharpey says, that in the form of polype "which exists in most true species of Sertularia, Campanularia, and Plumularia, and in allied genera, the tentacula or arms are destitute of cilia, and incapable of giving an impulsion to the water."—*Cyclopædia of Anat. and Physiology*, Vol. i. p. 611. The observations of Mr Lister are equally decisive. Phil. Trans. 1834, p. 377.

Raspail maintains that there are really no cilia, but that the appearance of them is occasioned by currents of fluid aspirated or drawn to and within the body, and expired or driven from it, and these currents are said to be produced by the difference of temperature between the fluid in the body and exterior to it. "A happy conjecture led me to consider these vibratory cilia as being merely streams of a substance either inspired or expired, but at any rate of a different density, and consequently of a different refractive power from the surrounding medium." P. 293.—"The cilia of a respiratory organ are, then, the effect of a difference of density between the water expired, and that in which the animal swims. Now there is no difficulty in admitting that, since caloric is disengaged in the respiration of animals of a superior order, it may also be disengaged, although, if we may so speak, in a microscopic proportion, during the act of