

siphuncular action here proposed, whether the fluid alternately admitted to and rejected from the siphuncle be derived from the Pericardium, or from any other source within the body, or even from the sea; in the former case, we have ascertained the existence of a mechanism whereby the movements of the pericardial fluid may be effected, as in the *Nautilus Pompilius*; in the latter cases the mechanism for adjusting the passage of the fluid to and from the siphuncle remains yet to be discovered.

In the case of siphons which are surrounded by unyielding rigid shell throughout their whole extent, (as in the *Nautilus Sypho*,) the elasticity of the air within the chambers cannot aid the muscular power of the siphuncle, in regulating the action of any fluid within that tube; and if the hypothesis suggested (P. 359, Note 1. 9.) respecting this species should be inapplicable to it, and to other animals which have an inflexible shell around the siphuncle, their method of moving the fluid to and from this organ is yet unknown.

In the case of jointed sheaths like those at Pl. 32, Fig. 3, *d*, *e*, *f*, and Pl. 33, each calcareous joint (*e*), if composed of rigid shell, may have articulated with the collars of the adjacent transverse plates (*h*, *i*), so as to form a moveable collar valve, of which the superior margin being raised a little on the *outside* of the upper collar (*h*), would leave an opening between the lower margin of the valve and the *inside* of the subjacent collar (*i*); through this opening air might pass from the contiguous air chamber into the space between the calcareous sheath and membranous siphon, as often as it was emptied of its pericardial fluid, and when this fluid filled the siphon, the air might return by the same passage into the air chamber, and the lower margin of the valve fall into its socket within the lower collar (*i*).

It is possible that in the *Spirula* and other animals that do not withdraw their bodies into the shell, the only function of the air chambers may be to counterbalance the weight of the body, and give it buoyancy; in such cases the use of the siphuncle may be to carry down to the extremity of the shell, and send off into each air chamber, vessels necessary to maintain the vitality of the interior of the shell, and of the transverse septa. The mode of ascent and descent ascribed to the *Nautilus Pompilius* is inap-