Thirdly, It remains to consider the effect of the air (supposing it to be retained continually within the chambers,) *at the bottom* of the sea. Here, if the position of the moving animal be beneath the mouth of the shell, like that of a snail as it crawls along the ground, the air within the chambers would maintain the shell, buoyant, and floating at ease above the body; and the

The air within each chamber remains under compression, as long as the siphuncle continues distended by the pericardial fluid; and returning, by its elasticity, to its former state, as soon as the pressure of the body is withdrawn from the pericardium, cooperates with the muscular coat of the siphuncle, to force the fluid back again into the pericardium; and the shell, thus diminished as to its specific gravity, has a tendency to *rise*.

The place of the pericardial fluid, therefore, will be always in the pericardium, excepting when it is forced into and retained in the siphuncle by pressure of the body on the pericardial sac, during the contraction of the animal within its shell. When the arms and body are expanded, either on the surface, or at the bottom of the sea, the water will have access to the branchial chambers, and the movements of the heart proceed freely in the distended pericardium; which will have great part of its fluid withdrawn at those times *only*, when the body is contracted into the shell, and the access of water to the branchiæ consequently impeded.

The following experiments shew that the weight of fluid requisite to be added to the shell of a Nautilus, in order to make it sink, is about half an ounce.

I took two perfect shells of a Nautilus Pompilius, each weighing about six ounces and a half in air, and measuring about seven inches across their largest diameter; and having stopped the Siphuncle with wax, I found that each shell, when placed in fresh water, required the weight of a few grains more than an ounce to make it sink. As the shell, when attached to the living animal, was probably a quarter of an ounce heavier than these dry dead