

has also ascertained the existence of small red eye-specks at the extremity of the rays of the Asterias.

P. 328. The *specific gravity* of a body, is its weight, compared with the weight of another body, whose magnitude is the same; hence, if a body which occupies any given space in water be contracted into a smaller magnitude, whilst its absolute weight remains the same, it becomes specifically heavier. Supposing the absolute weight of the body of the Nautilus, and also that of its pericardial fluid, to be the same as that of an equal bulk of water, the body, when immersed, would always displace a quantity of water, equal to its bulk. The presence of the pericardial fluid within the body, (i. e. within the Pericardium), or its removal from it into the shell, would not affect the specific gravity of the body, because *the magnitude of the body varies* according as the pericardium is either empty, or distended with its peculiar fluid. But, as *the magnitude of the shell is constantly the same*, whilst the quantity of matter within it varies, as the pericardial fluid enters or leaves the siphuncle, its specific gravity is varied accordingly, being increased, when the fluid enters the siphuncle (compressing the air within the air-chambers), and diminished, when this fluid returns from the siphuncle into the body.

When the animal, preparing to rise, emerges from its shell, and the pericardial fluid, returning from the siphuncle into the pericardial sac, enlarges the body by the distension of this sac, the absolute weight of the body and shell together remains the same, but the specific gravity of the whole is diminished by this increase of the bulk of the body, and the animal floats. When preparing to sink, it shrinks back into its shell, and compressing the pericardial sac, forces its contents into the siphuncle, the bulk of the body is diminished by the collapse of this sac to an amount equal to the difference between the bulk of the distended and contracted sac, the whole becomes specifically heavier, and the animal sinks.

For the sake of simplifying the problem we have supposed the specific gravities both of the pericardial fluid, and of the body of the animal, to be the same as that of water. If, as Mr.