tain a *pericardial fluid*, the place of which is alternately changed from the pericardium (p, p.) to the siphuncle (n.), we shall find in these organs an hydraulic apparatus for varying the specific gravity of the shell; so that it sinks when the pericardial fluid is forced into the siphuncle, and becomes buoyant, when the same fluid returns to the pericardium. On this hypothesis also the chambers would be permanently filled with air alone, the elasticity of which would admit of the alternate expansion and contraction of the

encrusted, and distended in a manner which illustrates the action of this organ. (Pl. 32, Fig. 2, a. a¹. a². a³. d. e. f, and Fig. 3, d. e. f). The fracture at Fig. 2, b. shews the diameter of the siphuncle, where it passes through a transverse plate, to be much smaller than it is midway between these Plates (at d. e. f.). The transverse sections at Fig. 2, a. and b., and the longitudinal sections at Fig. 2, d. e. f. and Fig. 3, d. e. f., shew that the interior of the siphuncle is filled with stone, of the same nature with the stratum in which the shell was lodged. These earthy materials, having entered the orifice of the pipe at *a* in a soft and plastic state, have formed a cast which shews the interior of this pipe, when distended, to have resembled a string of oval beads, connected at their ends by a narrow neck, and enlarged at their centre to nearly double the diameter of this neck.

A similar distension of nearly the entire siphuncle by the stony material of the rock in which the shell was imbedded, is seen in the specimen of Nautilus striatus from the Lias of Whitby, represented at Pl. 33. The Lias which fills this pipe, must have entered it in the state of *liquid mud*, to the same extent that the *pericardial fluid* entered, during the hydraulic action of the siphuncle in the act of sinking; not one of the air chambers has admitted the smallest particle of this mud; they are all filled with calcareous spar, *subsequently* introduced by gradual infiltration, and at *successive periods* which are marked by changes