

giving them, by this means, greater buoyancy, as well as tension.

The tracheæ are kept continually pervious by a curious mechanism: they are formed of three coats, the external and internal of which are membranous; but the middle coat is constructed of an elastic thread coiled into a helix, or cylindrical spiral, (as seen in Fig. 372;) and the elasticity of this thread keeps the tube constantly in a state of expansion, and therefore full of air. When examined under water, the tracheæ have a shining silvery appearance, from the air they contain. This structure has a remarkable analogy to that of the air vessels of plants, which also bear the name of tracheæ; and in both similar variations are observed in the texture of the elastic membrane by which they are kept pervious.*

The tracheæ, in many parts of their course, present remarkable dilatations, which apparently serve as reservoirs of air: they are very conspicuous in the *Dytiscus marginalis*, which resides principally in water; but they also exist in many insects, as the *Melolontha* and the *Cerambyx*, which live wholly in the air.† Those of the *Scolia horticorum* (Fab.) are delineated in Fig. 373, considerably magnified.

If an insect be immersed in water, air will be seen escaping in minute bubbles at each spiracle; and in proportion as the water enters into the tubes, the sensibility is destroyed. If all the spiracles be closed by oil, or any other unctuous substance, the insect immediately dies of suffocation; but if some of them be left open, respiration is kept up to a considerable extent, from the numerous communications which exist among the air vessels. Insects soon

* According to the observation of Dr. Kidd these vessels are often annular in insects, as is also the case with those of plants. He considers the longitudinal tracheæ as connecting channels, by which the insect is enabled to direct the air to particular parts for occasional purposes. Phil. Trans. for 1825, p. 234.

† Léon Dufour, Annales des Sciences Naturelles; viii. 26.