them by osmosis, a highly improbable conjecture, considering the small surface they allow for such diffusion. Von Seibold (Amtlichen Bericht der 34sten Versalung der deutschen Naturforschen und Aerste, Karlsruhe,. 1859, Seite 211), in describing *D. linearis*, thinks these to be true stigmata and that the larvæ breathe the air found in the intercellular spaces of the roots, first eating into the root and then inserting the sickle-shaped appendages so that the stigmata are placed close to the openings thus made.

The most careful study of this matter has been made by Dr. E. Schmidt-Schwedt (Bul. Ent. Zeit., Bd. XXXI., Heft II., p. 325, Pl. V., figs. 1–11, 1887) upon *Donacia crassipes*, Fab. The cocoons were found in October on the roots of the white water lily (*Nymphea alba*), and were usually found to contain beetles. How these were filled and kept replenished with air was a problem which had never been satisfactorily explained. He soon found an opening toward the end of the cocoon on the side next the root leading into a passage communicating with the air passage in the root, which explained how the cocoon might readily become filled with air coming out from the root and expelling the water. Though not entirely clear, I should judge from the figures and text that he believed this air passage to be a cavity eaten out by the larva. Later, however, he describes and figures the cavities made through the cocoon and into the root tissues by the two appendages. In the cocoons of *D. piscatrix* and *Hæmonia nigricornis* it is clear that the cocoon is entire next to the root, with the exception of a pair of elliptical holes at one end, leading to two corresponding cavities in the roots and very evidently formed by these appendages. I could find no marks of feeding beneath the other ends of the cocoons, and at least the air is replenished if it is not originally taken into the cocoon through these two passages. Dr. Schmidt-Schwedt points out that usually when a plant is thus wounded a corky formation ensues, but that such is not the case in this until the beetle has emerged from the cocoon and the water is admitted, when a cork formation at once takes place and the passage is closed. It seems evident that the larva, breathing as will be further described, merely forms the cocoon close to its body, thus expelling all the air, withdraws the appendages from the two passages and transforms to the pupa, which thus admits the air from the roots and remains open, replenishing the air for the pupa and beetle.

Concerning the structure and function of these larval appendages, he