

nor are they especially exposed to shocks that might shake them loose from their hold. And Guthrie is mistaken in saying that their feet are not well adapted for smooth surfaces. It is true that the feet are lacking in any kind of a pad or sucker; and it is not likely that the two or three clubbed or geniculate setæ—the so-called tenent hairs—that in some species project over the usual pair of curved pointed claws, are anything more than tactile in function. But however they manage it, the thirty or forty species that I have observed in life, whether with two claws on each foot or only one, and with or without tenent hairs, could all run nimbly on dry, polished glass, even back downwards; and such a surface is infinitely harder and smoother than any they ever encounter in their natural habitat.

In support of his opinion that the ventral tube is an organ of attachment, Lubbock says that if a *Sminthurus* is laid on its back and a piece of glass is brought within its reach, "the animal will endeavour to seize it with the feet, but at the same time it will project one or both of the ventral tentacles and apply it, or them, firmly to the glass, emitting at the same time a drop of fluid which, no doubt, gives a better hold." This surmise may sound plausible in the particular instance, but an extended observation of the actions of different species as regards the ventral tube leads to another view of the probable function of the organ.

The Collembola are all extremely sensitive to any lack of humidity in their surroundings. Most species, if put into a dry vial, will die and begin to shrivel up within an hour. The only way to keep them alive in captivity for any length of time is to put in the vial some source of moisture such as wet, rotten wood or damp filter paper. Evaporation through the thin epidermis is so rapid, that it appears not unlikely to me that the ventral tube has to do with supplying or regulating the large quantity of moisture the insect requires.

This conjecture seems to be borne out by the conduct of more than one species. For instance, a yellow *Papirius*—(a genus closely related to the *Sminthurus* mentioned by Lubbock) found in the autumn under dead leaves of hardwood forests, stands high on its legs, neither its ventral tube nor any other part of its abdomen normally touching the surface it rests on. In a vial, it has no trouble in walking on the glass in any position; and it remains for hours and even days clinging to the glass, back downwards, by its feet alone, maintaining its hold without any help whatever from the ventral tube.

Of a dozen or so of this species kept in a vial with the usual morsel of moist, rotten wood or damp filter paper, the majority remain thus motionless for long periods. Then suddenly, with startling swiftness, one of them shoots out its ventral filaments on either side of its body, and applies them closely to the glass along their whole length, always—so far as I have observed—where there is a film of moisture on the glass. The filaments, which are tubular and provided with a number of sucker-like glands at the ends, are longer than the insect's entire body, but are evidently stowed away by the smaller apical half telescoping into the larger basal section. After leaving the filaments in contact with the glass for a minute or two, the insect draws them in as swiftly as it shot them out, changes its position slightly, and darts them out again. This performance may be kept up for ten minutes or so, and then finally drawing in the filaments permanently, the insect lapses into quietude again.