This Papirius makes use of its ventral filaments also when washing itself, which it does frequently, very much like a cat. From its mouth it exudes a small, bright drop of liquid, and taking it on the claw of one of the forelegs where it looks like a gleaming boxing glove—it rubs it briskly over its antennæ, head and legs. Sometimes it transfers the drop to the claw of one of the second pair of legs so as to reach farther down the body. The drop often remains unbroken during these proceedings, and with laudable economy, is then returned to the mouth and swallowed again. The washing operation almost invariably ends by the swift extrusion of a short piece of one of the ventral filaments, which is also apparently rubbed over with the remains of the drop; or moisture is transferred between it and the mouth. But the action is so rapid that I have never been able to make out exactly what occurs.

Guthrie observes of Orchesella zebra, which one morning after a shower he found in great numbers on the moist surface of stumps in the woods, that "they moved about fitfully at time, but often stopped and squatted down to bring the ventral tube into contact with the moisture." And some additional light is thrown on the use of the organ by watching the conduct of Achorutes socialis Uzel in a vial. The ventral tube in this species is simply a low cleft protuberance, which on opening, exposes a wet, sucker-like disc. When the vial containing a number of newly caught A. socialis is laid on its side, the insects first run around busily in every direction, maintaining their hold on the glass in every position without any assistance from the ventral tube. But every now and then, one of them opens the tube, and applies the disc to the glass. It still keeps its legs going, but now can only drag itself along slowly, as the attachment to the glass greatly impedes its way. In a few moments it withdraws the disc-sometimes leaving a trace of moisture on the glass,closes the tube, and runs off briskly as before, only to repeat the action a little later on. After awhile, the insects quiet down, and come to rest closely packed side by side all around the circumference of the bottle. Many of those that are hanging back downwards are seen to have the ventral tube applied to the glass; but this cannot be merely for support, for the insects resting on the lower side of the bottle, where no attachment is necessary to maintain their position, are found, with few exceptions, to have their tubes in contact with the glass also. And a few hours later the still, motionless insects all around the bottle are discovered to be holding by their feet alone, with their ventral tubes without exception all closed.

To me, the evidence points strongly to the conclusion that the ventral tube is not primarily intended to maintain the insect's hold, and the probability is great that it acts as a kind of regulating valve, controlling and supplementing the supply of moisture.

Nor does the suggestion that the ventral tube is a breathing organ seem any better founded than the "attachment theory." The fact that the Collembola—with the exception of one or two genera of the Symphypleona—are without air tracheæ might seem to lend weight to the hypothesis. But Sminthurus and one or two others which alone have a tracheal system, also have the most highly developed type of ventral tube with long, extensible filaments, and it is against all the economy of nature that two distinct sets of apparatus should be provided for the same purpose.