

In addition to the conspicuous organs we have been discussing, the Collembola display several minor structures that no doubt are sense organs of some kind, but what their precise functions are, and indeed what senses the insects really possess, we can only guess. Many species seem to get along quite well without sight, and the eyes of those endowed with vision are very simple constructions compared with the enormous compound eyes of some of the flying insects. The sense of touch—the most primitive of all the senses, and common to every manifestation of life—is doubtless served by the numerous strange “hairs” that cover the insects’ bodies as well as by the antennæ. The very necessary sense of taste it is reasonable to suppose is situated in the mouth. And possibly the closely-allied sense of smell has its seat in the curious depressions each with a “peg” in the centre that sometimes indent the sides of the antennæ, or in the remarkable buds and tubercles often seen on the same organs. But it is hard to divine the use of the strange bladder-like sac that *Achorutes armatus* Nic. can evert from between its last two antennal segments. Equally mysterious are the “post-antennal organs,” those rosettes of scales situated on the head between the base of the antennæ and the eyes in many species. They may be auditory, but, of course, we have no evidence that the insects can hear at all. Another peculiar feature of certain species are the two or three sharp, curved spines that grow out of the last abdominal segment. But whatever use these “anal horns” are to the animal, at least they justify their existence to the puzzled entomologist by helping him in the often difficult task of determining the species.

As the systematic observation of such minute insects in their habitat is practically impossible, and as it is very difficult to keep them in captivity under natural conditions, the details of their life-history are not well known.

The Collembola pass through no larval stage, and undergo no metamorphosis whatever. The white or yellow spherical eggs, about one-eighth of a millimeter in diameter, are generally quite smooth, although Nicolet figures some hairy ones. They are laid singly or in masses like bunches of grapes under bark, among dead leaves and in many other damp situations. The masses often contain from 50 to 100 eggs, and bulk much larger than the body of the insect, but are usually all stuck together with every appearance of being the product of one female. Oviposition apparently takes place only in the dark. Several species lay eggs freely in captivity, but I have never been able to observe the operation; and an English writer says that in 50 years’ study of the insects he has never succeeded in seeing how the eggs are laid. Until some one discovers how to circumvent this coyness of the mother springtail, we shall not know whether, despite appearances, more than one female contributes to the egg cluster, or whether we must accept the decidedly improbable suggestion that the eggs increase in size after laying.

Incubation at room temperature takes from 10 to 35 days, according to the species. The large variation in the size of individuals of the same species taken at the same time points to more than one brood in the season, but they are so difficult to rear that exact data on this point are lacking. In captivity, *Achorutes socialis* Uzel and some other species lay only in the spring, while