RAT-TAILED MAGGOTS
The Story of Bees from Oxen

C. B. Lewis

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Early in December, Mr. Horace Vendryes, discovered swarms of larvae on the surface of the sludge-beds at the Sewerage Disposal Plant. The discovery of the larvae in such a location is certainly not unusual, but the type of larvae which was discovered is of very great interest structurally and historically. They were the larvae of a syrphid fly of the genus *Eristalis*. Flies of this genus are popularly known throughout the world as "drone flies." The larvae of "drone flies" feed upon decaying matter in shallow pools of water and their structure may be designated as Nature's prototype of diving gear, for these larvae have tube-like, telescoping tails which reach up to the surface of the water and thus conduct air to the creatures submerged below.

Figure 1. Rat-tailed Maggot

In the 18th century, the French naturalist, Reaumur, studied these curious larvae and called them "rat-tailed maggots." They have been popularly known by that name ever since. The body of the larva is seldom extended over two-thirds of an inch in length, but the tail can be extended to four inches.

Reaumur carried out some interesting experiments to determine the extensibility of the tails which he found were actually two tubes, one telescoping inside the other. When the tails were stretched to the limit they were no thicker than horse hairs. If additional water was added, increasing the depth beyond the maximum length of the tail, the larvae either crept up the sides of the vessel or floated nearer the surface and within the reach of the air supply.

In northern climates, species of *Eristalis* over winter in the larval stage, usually frozen in solid cases of ice. When the thaw comes the maggots swim unharmed by the period (which may have been long) of being frozen in. These interesting larvae are frequently seen walking along the underside of the surface film, suggesting flies crawling on the ceiling of a room.

At the end of a larval period the rat-tailed maggot leaves the water. The body shortens and thickens, and the larval skin grows hard and opaque. Two pairs of horns develop on the head and the puparium is thus formed. The two horns provide respiratory organs for the period of transformation to the adult fly which occurs within the pupal cases. This period of transformation in many species of *Eristalis* takes eight to ten days, but we did not ascertain the length of the pupal period for the species which Mr. Vendryes has brought to our attention.

The fly which eventually emerges from the pupal case closely resembles a bee - thus the name "drone fly." This close resemblance to a bee has helped to create one of the most persistent myths - the belief in the "ox-born bee." Drone flies are often seen about the carcasses of animals for they deposit their eggs in the semi-fluid decaying matter. From the earliest times these flies have been

mistaken for honey bees which were believed engendered in the decaying carcasses of large animals. An interesting article in the October, 1942 Number of "Natural History" considers this widespread misconception.

Figure 2. Adult *Eristalis*

Osten Sacken, the Russian scholar who devoted years of painstaking research to the study of this myth, shows how the misconception was shared by peoples in many parts of the world. More than half of the fourth *Georgic* by Virgil is devoted to a detailed description of the most efficient methods of producing bees from oxen. Ovid related how the death of one produces a thousand lives when a slain ox becomes a swarm of bees. In his *Geoponica*, Florentinus goes into minute detail explaining how to produce the finest bees. A bullock, he states, should be beaten to death with clubs and its bruised body shut up in a

room with the windows plastered over. After sprinkling thyme and cassia over the dead bullock, the carcass should be left in the closed room for from two to three weeks. At the end of that period, this ancient writer assures his readers, nothing will be left of the animal except the horns, bones and hair. The flesh will have change to great clusters of honeybees.

Even before the days of the Latin scholars, the Greek writers were referring to the ox-born bee in their epigrams. Archelos called bees "the streaming children of horses, as the bees are of oxen." Because of this fancied connection between bees and oxen, the ancients considered that the best material for smoking bees was ox-dung. In that fascinating catch-all of superstition and early science, the Natural History of Pliny the Elder we learn that if bees die, they can be renewed by burying the carcass of an ox in dung.

Long before the rise of Greece, Egyptians along the mouth of the Nile went through a laborious ritual in producing bees from oxen. They buried the slain bullocks in the ground with only their horns sticking out. The horns were then sawed off. From these openings, as the carcass decayed, the bees were

supposed to fly. Chinese and Japanese writings reveal that the idea of the ox-born bee was current in the Orient at a very early date.

In 1474, a book by Peter de Cresentiis suggested that bees might be "partly produced by bees and partly from decayed oxen", and the myth that a honey-gathering swarm owes its existence to the death of an ox has persisted until comparatively recent times. In fact, in remote sections of the world, it may still be accepted as true. The myth of the ox-born bee is one of those contagious misconceptions which have spread to many parts of the globe. It stands as a monument to the intellectual sloth of mankind. For the simplest kind of an experiment - an attempt to obtain honey from such insects - would at any time have proved its falsity.