

the department of geography at the Rhode Island Normal School, Providence, R. I.

At University College, Reading, Mr. S. B. McLaren, assistant lecturer in mathematics at Birmingham University, has been appointed professor of mathematics, and Mr. R. C. McLean lecturer in botany.

DISCUSSION AND CORRESPONDENCE

THE NAME OF THE SHEEP MEASLE TAPEWORM

COBBOLD in 1866 described a cysticercus from the muscles of sheep in England and named it *Cysticercus ovis*. The same species was later described by Maddox (1873) under the name of *Cysticercus ovipariens*. Other authors have considered the parasite to be either *Cysticercus cellulosæ*, the intermediate stage of *Tænia solium*, in an unusual host, or *Cysticercus tenuicollis*, the intermediate stage of *Tænia marginata* or *hydatigena*, in an unusual location (muscles instead of serous membranes). Recent investigations by the present writer have proved that the parasite in question is neither *C. cellulosæ* nor *C. tenuicollis* but the intermediate stage of a distinct species of dog tapeworm. The correct name of this tapeworm would, therefore, seem to be *Tænia ovis* (Cobbold, 1866).

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NOTE ON THE ORIENTATION OF BOMBILIUS TO LIGHT

WHILE on the hills east of Berkeley, Cal., I observed, among numerous insects visiting the flowers of certain shrubs, that there were several flies which kept hovering for a considerable time in almost exactly the same position. The flies proved to belong to a species of *Bombilius*. The instinct of hovering is not rare among the Diptera, especially the Syrphidæ, but what especially attracted attention was the accurate orientation of the hovering insects to the rays of light. In all the numerous cases observed the flies had their backs turned toward the sun, and in all cases the hovering occurred in the direct sunlight. Whenever a shadow was thrown upon a hovering fly it immediately darted elsewhere.

Occasionally the flies alighted on the ground, when they rested with the back exposed to the sun as before. When a shadow was thrown on them they would soon fly to a sunnier spot. In a few cases I caused them to orient obliquely to the sun's rays by slowly moving an object so that its shadow was thrown on only half the body of the insect; the body would then be turned so as to face more nearly the center of the shaded region. In basking in sunny spots and in orienting negatively to the rays of light the behavior of *Bombilius* resembles that of the mourning-cloak and other butterflies described by Radl and Parker. Like the mourning-cloak, *Bombilius* under ordinary circumstances is positively phototactic. It will fly or walk toward the light as so many other Diptera do, but when resting on the ground in the sunshine or hovering in the air it assumes a negative orientation. It is of interest to find such striking similarities of behavior in two distantly related orders of insects.

When resting on the ground or hovering, *Bombilius* often darts quickly at passing insects. It is not very discriminating as to the objects of its approach and was several times seen to follow after honey-bees and twice after yellow-jackets. When the fly meets a member of its own species the two often spin around in a rapid whirl, but when a mistake is made the pursuit is immediately abandoned. I have caused *Bombilius* as well as other species of hovering flies to dart after small pebbles that were tossed in the air. This behavior is probably associated with the instinct of mating, since it occurs in non-predatory as well as predatory species.

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SCIENTIFIC BOOKS

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