



H. ELTRINGHAM



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*On the brush-organs of the male Ermine Moth,
Spilosoma menthastri Esper.*

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ON THE BRUSH-ORGANS OF THE MALE ERMINE MOTH,
SPILOSOMA MENTHASTRI ESPEL

By H. ELTRINGHAM, M.A., D.Sc., F.R.S.

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WITH THREE TEXT-FIGURES.

My friend Mr. H. M. Edelsten recently called my attention to certain "processes" which he had observed protruding from the abdomen of the male *S. menthastri* Esper, and kindly furnished some examples of the moth for microscopic examination. He informs me that he has long known of the existence of these organs, but is unaware of any published description. I have examined and

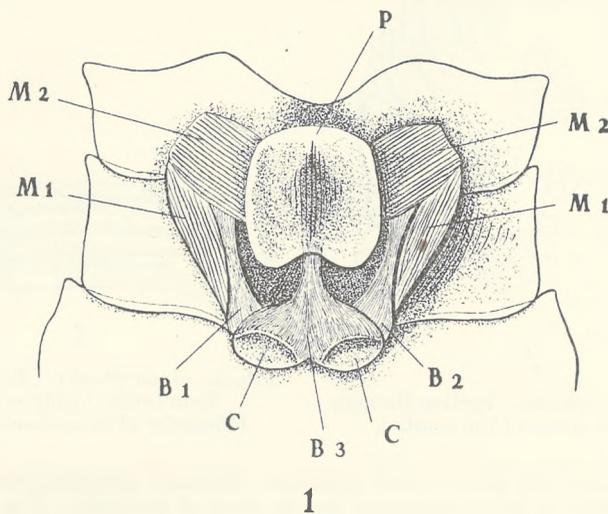


FIG. 1.—*Spilosoma menthastri* Esper. Diagram of brush-organs in male abdomen. B1, B2, lateral brushes. B3, central brush. CC, concavities in bases of brushes. M1, M2, muscles. P, chitinous plate.

made sections of them, and find that they are in fact brushes of a rather peculiar kind. If a specimen be dissected from the dorsal side, and the internal organs carefully removed, a structure, more or less diagrammatically illustrated in fig. 1, is found on the internal ventral surface of the 4th, 5th, and 6th abdominal segments. There are two brushes, B1, B2, with a space between, which is occupied by a third B3, formed from two central tufts closely approximated. A curious feature is the curving of the basal part of the hairs. It would appear that portions of two primitive lateral brushes have curved inwards to form a central tuft, B3. All three tufts are evidently extruded between the 5th and 6th sternites, and there is a thin chitinous plate, P, overlying them, in the interior of the abdomen. The muscular equipment is quite unusual and its action rather difficult to understand. There are two muscle bands, M1, M1, adjacent to the lateral brushes, and two shorter and broader ones M2, M2,

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attached to the sternite and to the chitinous plate. As a general rule muscles attached to insect brushes are so arranged as to provide for withdrawal only, extrusion being effected by internal fluid pressure. In this species, however, the lateral muscles at least would appear to control the extrusion.

The base of the brush apparatus shows two symmetrical concavities, C, C, and there is no special or separate gland for the secretion of the scent material. A section through the base of the brushes has the appearance shown in fig. 2. The hair-sockets are long and membranous, and proximally continuous with a deeply plicate tissue which doubtless allows of great expansion. The inner cavity of the brush-base into which the proximal ends of the sockets open,

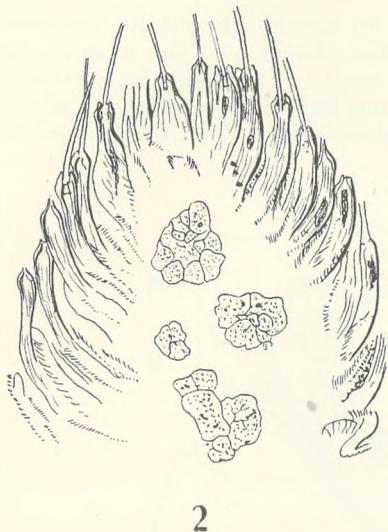


FIG. 2.—*S. menthastris*. Section through basal part of one of the brushes.

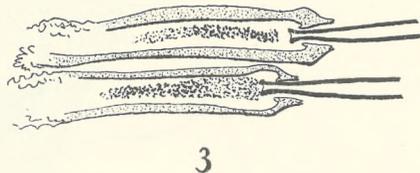


FIG. 3.—*S. menthastris*. Two hair-sockets from brush, highly magnified. (Diameter of brush-hairs .005 mm.)

contains blood and also a few fat-cells. Stained preparations show dark granular matter in the sockets and also in some of the hairs. Fig. 3 represents two sockets under a very high magnification. There seems no doubt that there is a unicellular gland in each socket, secreting, by metabolism from the blood, the scent material. This passes into the hair and must be distributed by osmosis, as there is no sign of a porous cuticle.

So far I have found no brush apparatus comparable with this peculiar structure. In *Phlogophora meticulosa* L. and other moths there are abdominal brushes but these lie in grooves of the cuticle, such grooves being lined with special scent-scales (1925, *Trans. ent. Soc. Lond.*, 1925 : 2). Brushes with glandular hair-sockets are found in certain butterflies as *Hesta lynceus* Drury and *Trepsichrois mulciber* Hübn. (*loc. cit.*, 1915 : 152). These are, however, of a somewhat different structure. I have examined males of the nearly related Buff Ermine moth (*S. lubricipeda*) but can find no similar organs.

