

from data supplied by the Infestation Control Division of the Ministry of Agriculture, Fisheries and Food, the Department of Agriculture for Scotland and the Pest Infestation Laboratory of the Department of Scientific and Industrial Research. All the beetles were submitted to me for identification.

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HARVESTMEN (ARACHNIDA, OPILIONES) FROM THE ISLAND OF COLONSAY, INNER HEBRIDES

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From August 17th-27th I made collections of Opilionids from various situations in the vicinity of Kiloran, Isle of Colonsay. The animals were either collected by hand or taken from pit-fall traps. The latter were one pound jam jars sunk so that their upper surface was flush with the surface of the soil. A small quantity of formalin was added to each. In the following list grid references are given from the Ordnance Survey One Inch to One Mile Map (7th Series), Sheet 51. Unless otherwise indicated the collections were made by hand.

PHALANGIIDAE

Lacinius ephippiatus (C. L. Koch), two taken from 3 traps set 19-21.viii in pine stand in Estate Wood (393966); one from 3 traps in oak-birch wood to the east of the island (408963), 21-24.viii; three from 2 traps set beneath sycamore-beech stand at edge of oat-field (393971), 24-27.viii; one from 2 traps in spruce wood (396972), 24-27.viii.

Mitopus orio (F.) one at Bealach a' Mhuilinn (388977) walking over stones, 19.viii; two from *Calluna-Erica* heath (402968), 22.viii.

Oligolophus agrestis (Meade) one from oak litter (408963), 21.viii; one from *Calluna-Erica* heath (402968), 22.viii.

O. tridens (C. L. Koch), one from 3 traps under sycamore-beech wood at edge of oat-field (393971); ten from 2 traps in spruce wood (396972), 24-27.viii; six from 2 traps at edge of oat-field (397973) 24-25.viii.

Phalangium opilio L., four in 3 traps on heather moor (402968), 22-24.viii; one on stones by Loch an Sgoltaire (389974), 19.viii.

Opilio parietinus (Deg.), one taken in 3 traps on heather moor (402968), 22-24.viii; two caught by hand in same locality, 22.viii.

NEMASTOMATIDAE

Nemastoma lugubre (Müll.), one from 2 traps at edge of oat-field (397973), 24-25.viii.

Mitopus, both species of *Oligolophus*, *Phalangium* and *Nemastoma* are widespread on the mainland and have been recorded from a number of the Hebridean islands (Bristowe, 1949). In contrast, the records for *Lacinius* are sporadic with the present one the first for the Hebrides. *Opilio parietinus* probably provides the most interesting record as this species has not previously been found as far north as Colonsay.

REFERENCE

Bristowe, W. S., 1949, The distribution of harvestmen (Phalangida) in Great Britain and Ireland, with notes on their names, enemies and food, *J. Anim. Ecol.*, **18**:100-114.

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September 28th, 1959.

OBSERVATIONS ON THE ENDOCRINE CONTROL OF DEVELOPMENT OF THE LARVAE OF CERTAIN CALLIPHORIDAE (DIPT., CYCLORRHAPHA)

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INTRODUCTION

Hypertrophy of the lateral parts of Weismann's ring, now recognised as the thoracic glands, was first described by Burt (1937) in the prepupa of *Calliphora vomitoria* L. He, and later Vogt (1942a, 1942b, 1943), related hypertrophy of the lateral ring cells to the growth of imaginal discs. Evidence produced by these workers and others, e.g. Haskins and Enzmann (1938) and Bodenstern (1943), indicates that the growth of imaginal discs in feeding Cyclorrhaphan larvae is continuous and unrelated to the humoral cycles controlling the first and second moults. Bodenstern (1950) stated that 'purely larval organs grow by an increase in cell size whereas the presumptive imaginal organs grow by cell multiplication'. He was referring to *Drosophila*, but this statement is probably applicable to all Cyclorrhaphan larvae. In the third instar, after the cessation of feeding, the thoracic glands are activated and promote development and differentiation of anlagen and puparium formation. In the experimentally produced absence of thoracic gland hormone, growth of anlagen ceases in the post-feeding third instar larva and the puparium does not form (Burt, 1938; Possompes, 1953). It is apparent that the growth of anlagen is independent of humoral stimuli up to a certain stage in development, but beyond this stage a humoral stimulus is required for further growth and for the differentiation of these rudiments to their adult form.

A facultative diapause occurs in the third instar of *Lucilia caesar* L. after the cessation of feeding and before puparium formation. The onset and termination of diapause are determined by factors in the external environment of the larva. Growth by cell multiplication proceeds in the imaginal discs until the onset of diapause when all mitotic activity ceases. At the termination of diapause mitotic activity is resumed. The arrest of imaginal disc growth in the diapause larva is comparable to the halt in development in a *C. vomitoria* larva deprived of thoracic gland hormone. The immediate cause of the arrested development in *L. caesar* diapause is, therefore, apparently due to the absence of thoracic gland hormone.

To test this hypothesis observations were made on the relationship between the development of the thoracic glands and wing buds in the non-diapause species *C. vomitoria* and in diapause and non-diapause larvae of *L. caesar*. Wing buds were chosen as representative imaginal discs because of their size, accessibility and the ease with which they can be measured. The relative sizes of corpora cardiaca and corpora allata in the *L. caesar* larvae were also ascertained in order to confirm the parallelism between the chronological sequence of neurosecretory activity and the size of the corpora innervated by neurosecretory cells which has been noted in other species by several observers. Arvy & Gabe (1952), for example, record a great increase in the volume of the corpus cardiacum at the time of the imaginal moult in Odonata. Increase in the size of the corpus cardiacum and the corpus allatum following each discharge of neurosecretory cell product is described in *Bombyx mori* by Bounhiol, Arvy & Gabe (1953). In *Tenebrio* Arvy & Gabe (1953) observed an increase in the size of the corpora cardiaca and allata throughout the larval life with a sudden increase during pupation at the same time as transport of neurosecretory material intensifies.

THORACIC GLAND NUCLEI AND WING BUDS OF *C. VOMITORIA* THIRD INSTAR LARVAE

Method.—A culture of 50 *C. vomitoria* larvae was prepared. Two days prior to the cessation of feeding and thereafter at 1-day intervals, until the residue had all pupated, groups of one to four larvae were removed and killed. These were dissected and the internal organs fixed by irrigation of