LEPIDOPTEROUS GALLS COLLECTED IN THE VICINITY OF TORONTO.

BY DR. WM. BRODIE, TORONTO.

Gnorimoserema (Gelechia) Gallaesolidaginis, Riley.

(The Low Solidago Gall.)

Galls usually on the lower third of the stems of *S. Canadensis*, occasionally on the upper third, rarely at the summit of the stem. The galls vary in form from spindle form to prolate and oblate spheroid; and in size from 10 x 21 mm. to 18 x 30 mm.

When young the producer larvæ are confined in small cells, but when mature the cells are large, retaining the form of the exterior of the gall, the larvæ moving freely about feeding on the interior surface.

Some observers say the interior of the gall is lined with silk. I have never found this, but preparatory to the exit, the mature larva before pupating constructs a silken hammock in the upper end of the gall, at right angles to the axis of the gall, and opposite the aperture of exit. The larva resting in this hammock bites out a hole to the epidermis of the gall, which is carefully left. This hole is bevelled towards the outside, and then neatly filled up with the material gnawed out, mixed with a silk-like substance, doubtless from a gland, which forms a tight-fitting, hard plug which cannot be pushed in from the outside, but is easily pushed out from the inside.

The mature pupa places itself on the hammock, and using a part of it as a fulcrum, pushes out the plug, and enters on mature life.

A fair instance of the mental make-up of insects evidences two important attributes of mind, memory and choice.

I have kept up a somewhat continuous acquaintance with this common Solidago gall, its producer, and parasites since the summer of 1856. I have found it in Essex, London, Owen Sound, Bruce Peninsula, Manitoulin, St. Catharines, Napanee, Temagami and Algonquin Park. It is common in Muskoka, we may say common throughout Ontario.

Although most common on *S. Canadensis*, it is occasionally found on *S. nemoralis* and *S. serotina*.

From Manitoba, Saskatchewan and Alberta I had galls sent to me collected from some species of Solidago, which in structure were similar to Toronto galls. But as I failed in rearing producers, identity was uncertain, although the parasites were the same as Toronto species.

Records of annual collections of galls, from 1876 to 1896, showed the time of emergence of the producers to be from about Aug. 20 to Sept. 1, in each year.

January, 1909

In a collection of over 100 galls, made about 12 miles east of the city, from Sept. 1 to Sept. 15, 1886, all the producers had emerged. About 50% of the galls were parasitized, principally by *G. gelechiae*. These, from 12 to 20 pairs from each infested gall, emerged during the last week of September and the first week of October, 1886. I find they always leave the gall before winter.

The *Pimplas* began to emerge April 17, 1887. Seven pupæ of an *Ichneumonoid* were put in a separate jar, the imagoes began to emerge June 1, 1887, but from one pupa there emerged an *Ormyrus*, proving this *Ormyrus* to be a secondary.

From a collection of galls made at Grimsby in May, 1892, the growth of 1891, *Pimplas* emerged from June 1 to June 13, 1892. At this last date galls of the year were fully grown.

The moths pass the winter in some secure dry place, such as under the bark of dead trees. I have kept specimens over winter several times in my cellar, the following season they pair and oviposit on Solidago plants when they are less than half-grown.

The most common primary parasites are the "Inflating Chalcid," of Riley; *Copidosomagelechio*, of Howard, which emerges the same season, usually in September; it is not likely they find another host of the season, but hibernate in the imago form. The inflated skin of the producer larva is like a sack full of the larvæ and semipupæ of the parasite.

Two common parasites are *Pimpla inquisitor* and *Pimpla pteralis*, the last not quite as common; and that ubiquitous scourge of leaf-eating insects, *Cryptus extrematis*, not rare. These, with an *Ichneumonid*, not yet identified, are the primary parasites I have had from this gall.

The only secondary parasite which I have found in this gall-life system is that world-wide regulator of life-relationship in the insect world, *Dibrachys boucheanus*.

I found this secondary in the galls collected near Grimsby and in a lot collected near Prescott. The occurrence of this secondary in the Solidago gall may be of much economic importance, for, as *Dibrachys* is a check on the primary parasitism of the codling moth, the co-host relationship may be favourable to the secondary or otherwise.

The agency of parasitism is powerful, and should not be discounted by economic entomologists, and while destroying the injurious, it is wise to utilize the safeguards which nature has provided. It is, unfortunately, true that we know of but few cases in which plant-eating species can be successfully combated while in the imago form.