

out-of-doors, and was half buried in the soil. The eggs began to hatch on October 29, and they had all hatched within four days.

#### NUMBER OF BROODS.

Our observations show that the moth is single-brooded in Alberta, though a tendency to aestivate gives the impression, in some years, that there are two distinct broods. The summer of 1914 was exceptionally hot in Alberta. Our trap recorded two well-marked flights that year, the first lasting till the end of July and the second extending from about August 20 till September 12 (fig. 6). From the temperature curve on the chart it will be seen that there was the least activity during the protracted hot spell in late July and August.

In 1915, the flight was more continuous (fig. 7), though the temporary diminution during August corresponds fairly closely with the rise in temperature recorded during that month.

Local disturbances, such as wind or rain, caused variations in nightly captures, and the charts do not show as plainly as we could wish the evident relation of the flight of this moth to temperature.

We imagine that the two distinct flights of moths recorded by Gillette (1904) in Colorado resulted from an accentuation of this tendency to aestivate. He describes the first flight, which extended from April 16 to July 10, as being more abundant than the later flight from September 13 to October 12, of which occasional specimens only were seen. From the adults of the first flight he was unable to obtain developed ova, whereas most of the females from the second flight contained mature eggs.

This condition regarding the ova is identical with that found in Alberta, and the following observations will, we think, throw some light on the matter.

Towards the end of July a number of captured female *E. auxiliaris* moths were placed in separate pill boxes, and were fed on dilute molasses. These belonged to our first flight, and at the time of capture no female moths contained developed ova. During October three of these laid eggs. The eggs were sterile, but they were laid after the last moths of the second flight had been taken at lights, and at the same time as moths captured during this second flight were laying eggs also.

Cooley (1908) considered it improbable that this species is double-brooded in Montana.

The only occasion upon which we have observed copulation was on August 27, 1914. The female was boxed and laid over 1,000 fertile eggs between September 1 and September 10.

#### NATURAL ENEMIES.

As with most of our common pests we are saved from considerably more extensive and frequent outbreaks of the Army Cutworm by its enemies. The most important of these are other insects which, either as predators, feeding from time to time upon such cutworms as they capture, or as parasites, living inside cutworms, kill more of them every year than we can hope to with all of the means at our disposal.

During 1915 we found the following enemies destroying army cutworms in southern Alberta.

#### PREDATORS.

*Calosoma tepidum* (fig. 8). It is probable that this large ground beetle, especially when in the larval stage—"the cutworm lion"—is the most useful predacious enemy of the Army Cutworm. Although we do not know as yet the