

Grasshoppers in all instars (Fig. 2, O) would be a potential threat to potatoes in the Cariboo were it not that they appear to feed on other plants more readily. Caterpillars (Fig. 2, P) taken in 1952 and 1953 were usually of the bertha armyworm, *Mamestra configurata* Wlkr., a species that may approach damaging numbers in small areas, as in 1951. In that summer a disease, a polyhedrosis to judge by the symptoms, reduced the numbers to insignificance within a few days. Growers report this as occurring whenever the bertha armyworm becomes locally numerous.

The following list gives the insect groups other than flea beetles in order of average percentage of total numbers taken: *Empoasca* spp., 48.0; other leafhoppers, 15.4; plant bugs, 14.4; apterous aphids, 9.7; predatory Hemiptera, 2.4; grasshoppers, 2.2; caterpillars, 1.7; alate aphids, 1.2; whiteflies, 1.2; psyllids, 1.2; lacewings, 0.8; *Scaphytopius dubius*, 0.5; spittlebugs, 0.5; treehoppers, 0.4; ladybird beetles,

0.4. The order bears little relation to their importance to the crop, however, and the list is given as a record only.

Although the populations in fields fluctuated in concert, there was nonetheless a tendency for individual fields to have distinctive populations, influenced by size, surroundings, condition of the potato plants, and the presence of weeds.

The population graphs indicate that the most effective period for a single application of a general insecticide is probably the last week in July, when most of the groups were at or approaching a subpeak, as the first summer generations matured. Control measures in the week of July 15 would be equally effective, especially against aphids, but would probably need repeating about August 19. An application at this time would be especially useful against *E. subcrinita*, for it is larvae from eggs laid by adults emerging in mid August that have caused commercial damage.

Numbers of Collembola in a Swarm

At a previous meeting of this society I mentioned the way in which Collembola sometimes aggregate.

On 23 April, 1951, I was given a glass jar containing Collembola with the report that they were taken from a cabin on the North Shore Mountains of Vancouver, the day before. The owners of the cabin, going up for the week-end, had found the floor covered, as they said, by a layer of these insects one half inch deep. With a piece of paper, they scooped some into a glass jar and brought the jar down next morning. They were terrified of the carpet of insects and sat up in chairs all night for fear of being eaten alive if they dared to lie down on beds to sleep. The winter's snow lay deep on the ground and the Collembola must have moved up through it and invaded the cabin.

The insects were spread out on a large sheet of paper and air-dried under laboratory conditions. When thoroughly dry, they were weighed and counted. They were 56 c.c. in volume, and weighed 14.207 grams.

Six samples of 100 at a time were weighed on a chain balance and averaged, and a total of 1,261,369 was reached for the entire mass. The insects were kindly identified for me by Mr. Lionel Wade of our University (who wrote a Master's thesis on the Collembola of the lower Fraser Valley), as "*Hypogastrura pseudarmata* (Folsom), family Poduridae, a mottled dark blue species extending from British Columbia to California".

What I take to be this species was sent in in quantity some years ago in early spring from a greenhouse near New Westminster and from Stanley Park Greenhouses; in both places the insects were reported to form so thick a layer on the floor that they gummed up the ordinary corn brooms and had to be shovelled out with a coal shovel.

It is of interest to speculate on the causes of such vast numbers of this insect suddenly appearing from apparently nowhere and as to their final disposition.—G. J. Spencer, *University of British Columbia*.