Although most of the damage can be attributed to the spruce budworm, both the western hemlock looper, *Lambdina fiscellaria lugubrosa* (Hlst.), and the false hemlock looper, *Nepytia phantasmaria* (Stler.), were found in considerable numbers, the latter being the more common.

There was little evidence of parasitism or disease in the spruce budworm population. Only 8 per cent of the larvae were parasitized. The most numerous parasite was *Glypta fumiferanae* (Vier.), followed by *Apanteles* sp. No disease of any significance was found. During the plot examinations in August, large numbers of dead larvae were found, but they appeared to have died from starvation.

Egg parasitism was also low. Of 2,243 eggs examined, larvae had hatched from 74.7 per cent, 17.3 per cent were infertile, and only 7.5 per cent were parasitized. The average number of eggs per mass was 45 and as the number of egg masses present ranged from 32 to 742 per 100 square feet of foliage, a heavy population is anticipated in 1955.

Since the spruce budworm in British Columbia has seldom been a serious threat to timber, its population dynamics have never been studied intensively. Previous infestations have declined in a relatively few years with no apparent ill effects on the forests. On the other hand, there has been almost complete loss of foliage for the past two to three years. A high proportion of the buds formed this fall are still alive, but even if they all survive the winter, there is not likely to be enough foliage to support the budworm population next spring. The effect of the additional loss of foliage on Douglas fir trees will not be known for another year or more. Although control by parasites and diseases is not expected to give any relief in 1955, starvation of the larvae may be an important factor in the eventual collapse of the outbreak.

Aerial spraying is not recommended for 1955 because as yet there are no indications of imminent tree mortality. If, however, further studies in 1955 show that the budworm population remains at a high level, that natural control factors are ineffective, and that trees may be expected to die, the situation can be reviewed in the late summer for reassessment in the light of developments in that year.—G. T. Silver and M. G. Thomson.

TABLE I—SUMMARY OF CONDITIONS FOUND IN PLOTS IN THE LILLOOET RIVER SPRUCE BUDWORM INFESTATION, AUGUST AND SEPTEMBER, 1954

Area*	Plot	Stand		Sample Tree			
		Defoliation Estimates (Per Cent)		Actual Defoliation in 1954 Terminals in Per Cent		Egg Masses per 100 Sq. Ft. in Foliage Surface	Percent of Egg Masses with Parasitism[1]
		Total	1954 Terminals	Total	Buds Killed		
South of Joffre Creek	1	23	80	94·5	30·5	304	16·3
	2	20	88	89·0	23·0	198	44·7
	3	18	82	76·0	12·0	386	33·2
Cariboo Trail (I.R. No. 687)	1	33	—	T	T	32	41·6
	2	19	87	96·7	21·7	99	14·6
	3	16	72	87·9	23·7	50	16·7
South of L2679 (Creekside)	1	23	100	90·6	17·5	742	44·2
	2	30	—	T	T	93	27·9
	3	27	100	91·0	21·0	467	34·4
Tenas Lake	1	20	55	67·0	0·0	194	8·9
	2	29	65	97·5	0·0	133	21·4
Rogers Creek	1	32	85	50·0	50·0	186	9·4
	2	29	84	96·0	0·0	586	7·7
4 miles north of Gowan Creek	1	15	53	67·0	0·0	150	2·8
	2	28	78	81·5	11·0	80	14·3
1·3 miles north of Gowan Creek	1	9	27	55·0	1·0	15	0·0
	2	22	69	43·5	47·0	65	12·5

*—Specific localities taken from Pre-emption map, Lillooet Sheet.
T—Very light foliage produced in 1954, no calculation possible.
1—There is a wide variation in the proportion of eggs parasitized in the masses.

Decay of Alpine Fir in the Upper Fraser Region.—Re-analyses of data derived in an earlier study by Bier *et al.* have been completed. The present studies have been designed to interpret the visible characteristics of defective trees and to provide a reliable estimate of net volume recovery from stands. Investigations to date have been confined to spruce-balsam stands east of Prince George.

Trees having forked stems or bearing visible sporophores were found to be completely defective. Twenty-six per cent of the total number of cull trees were included in these classes. Only 8% of the trees free from decay on the stump were highly defective elsewhere in the bole, while 60-76% of those containing trace to large amounts of rot on the stump were culled for reason of excessive defect. Trees 16 in. and over in diameter were in general highly defective. Approximately 32% of the trees 8-14 in., however, were sound and an additional 18% contained only moderate volumes of defect.

No real problem from decay was found to occur in even-aged stands of fir approximately 100 years of age. Most uneven-aged stands, however, contained appreciable defect. Although decay losses in uneven-aged stands averaged 32% (board-foot computations) in the areas sampled, considerable variation in the amount of decay was recorded within and between adjacent stands. Analysis of 20 plots showed that decay losses varied from 6% to 62%. Interpretations based on preliminary data suggest that consideration of site quality together with the age and size of the larger stand computations may be of value in designating areas of excessive defect prior to felling. It is evident, however, that further field investigations will be required to fulfil the objectives mentioned.—R. E. Foster.

Mountain Pine Bark Beetle Study at Windermere Creek.—An outbreak of the mountain pine bark beetle, *Dendroctonus monticolae* Hopk., was first reported in 1949 and, during 1950 and 1951, discoloration of foliage indicated that over 2,000 acres of lodgepole pine were affected in the one large infestation in the Windermere Creek Watershed. The outbreak occurred on extremely dry sites on the slopes of the valley where a relatively thin layer of soil covers bed-rock or in the valley bottom, which consisted of a deep layer of coarse gravel. Many trees on these sites had added as little as two millimetres radial growth over the past thirty years. Mortality of pine irrespective of stand density, stand composition, or elevation varied from 20 to 100 per cent.

Bark beetles prominently associated with *D. monticolae* during the infestation were *Ips radiatae* Hopk., *I. interpunctus* (Eichh.), and *Pityogenes carinulatus* (Lec.), but these were, in, almost all instances, of a secondary nature.

Field work to determine the survival of mountain pine bark beetle populations was carried out during the 1953 field season. The purpose was to record, through bark sampling, the ratio of the number of progeny emerging as adults to number of egg galleries by parent beetles made the previous year. This involved the dating of death of trees sampled and the sampling of the bark of these trees at various heights on the bole.

Trees were selected at representative points throughout the infestation from plots established in 1952. Over ninety trees were felled and the maximum height of attack noted. The distance from this point to stump height was divided into four equal parts to give five sampling points on each tree. At each sampling point one linear foot of the bark was carefully examined for emergence holes and egg galleries.

Considerable difficulty was encountered in the evaluation of growth patterns and the dating of the dead trees, and 15 per cent of them were deleted from the analysis due to uncertainty of the actual year of attack; since most of these