

settlers and railways are responsible for most of the fires whose origin is determined. Other causes, including lumbering operations, lightning and incendiarism, account for smaller proportions.

**Losses through Insects and Fungi.**—From 1912 to 1923 the spruce bud-worm caused tremendous damage to the spruce and balsam fir forests in Eastern Canada. In Quebec, it was estimated that 100 million cords of pulpwood were destroyed by this insect, and in New Brunswick the loss was placed at 15 million cords. In this region the active stage of the infestation is now practically over, but the insect is now causing damage in northern Ontario and Cape Breton Island. Other insects though not as destructive as this one, entail a heavy drain on the forest. The hemlock looper and a new species closely related to the spruce bud-worm are causing considerable damage in eastern coniferous forests. During the last few years, dusting by aeroplane has been developed on a practical basis by the Entomological Branch of the Department of Agriculture and promises to be effective in the control of defoliating insects. The loss caused by the various forms of rot and other fungous diseases is probably not less than that caused by insects under normal conditions. The butt rot is especially prevalent in balsam fir, and the value of the hardwoods is also greatly decreased by rot.

**Summary of Losses and Increment.**—The annual consumption of standing timber for use amounts to about 2,900,000,000 cubic feet. At a very low estimate, fire destroys annually about 300,000,000 cubic feet of merchantable timber and the young growth of various ages on 530,000 acres. The destruction occasioned by insects, fungi and windfall is not known, but is estimated at 800,000,000 cubic feet per annum. It may be safely estimated that the forests of Canada are being depleted at the rate of upwards of 4,000,000,000 cubic feet per annum. With about 665,800 square miles of timber in a growing condition, an average annual increment of 10 to 11 cubic feet per acre would be quite possible under forest management and would cover this depletion, but in view of the destruction of young growth which occurs and the deterioration of the forests and the soil, caused by repeated fires, there is little hope that this increment is being produced at the present time throughout Canada, although particular areas are producing greatly in excess of this quantity, and extensive reproduction and rate of growth surveys being conducted by the Dominion Forest Service indicate that the increment is greater than previously anticipated.