

depleting our forest resources. In 1923 there were unusually disastrous fires, chiefly in Eastern Canada. A total area of over 6,000,000 acres was burned over with a loss of approximately \$46,000,000.

Speaking generally, there are, annually, two periods in Canada when the forest fire hazard is highest—in the spring, after the disappearance of the snow, when the forest floor is dry and the green underbrush has not yet developed, and again in the fall when the herbaceous growth is dead and the ground covered with dry leaves.

Statistics compiled by the Dominion Forest Service from reports received from the various provincial and private forest protective organizations, show that during the ten-year period, from 1925 to 1934, 85 p.c. of all fires reported were due to human agencies and were, therefore, preventable. The remainder were attributed to lightning or other natural causes. Campers, settlers, smokers 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 these regions the active stage of the infestation is now practically over, but the insect is 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 recent 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 certain defoliating insects under certain conditions. Perhaps the most effective means of controlling destructive forest insects is by the introduction of parasites. The Entomological Branch of the Dominion Department of Agriculture has developed this means of attack with marked success in the case of the larch saw fly and has recently secured from Europe some millions of parasitic insects which are being liberated in the forests infested with the spruce saw fly. 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 2,970,000,000 cubic feet. During the latest ten years fire has destroyed annually about 261,000,000 cubic feet of merchantable timber and the young growth of various ages on 873,327 acres. The destruction occasioned by insects, fungi and windfall is not known, but is estimated at 700,000,000 cubic feet per annum. It may be safely estimated that the forests of Canada are being depleted at the rate of upwards of 4,158,000,000 cubic feet per annum. With about 600,000 square miles of accessible 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. 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. Nevertheless, extensive reproduction and rate-of-growth surveys being conducted by the Dominion Forest Service indicate that the increment is greater than previously estimated.