THE SPRUCE BUDWORM.

The insect which is causing most alarm at present in the forests of the province of Quebec is the spruce budworm (Tortrix fumiferana, Clemens). Its depredations were first eported to us by the Hon. W. C. Edwards in 1909, as it was defoliating considerable areas of balsam and spruce in the upper Gatineau region about 100 miles north of Ottawa. It was also reported as defoliating the Douglas fir in British Columbia. During the past season a large number of re-ports and enquiries have been received by the Division of Entomology concerning the defoliation of spruce and balsam in Quebec and of the Douglas fir on Vancouver Island. As the Department of Lands and Forests of the government of the province of Quebec has a body of forest rangers throughout tle province, arrangements were made by Mr. G. C. Piché, Chief Forestry Engineer, to obtain reports from them as to the distribution of the insect, and we drew up a list of questions. The results of this inquiry and of the information which the Division of Entomology has received indicate that the insect is abundant in cer-tain areas from Lake Timiskaming on the west to Lake St. John on the east and is sparingly distributed throughout the whole province down to the International boundary. The most serious devastations have been recorded from the region baving River Desert and the Upper Gatineau on the west to the Rouge River and Lake Ouareau on the east; from the region southeast of Lake St. John; and from the River St. Maurice. In British Columbia, where I visited the infested areas last year and again this year, the most severely infested region is the southeast region of Vancouver Islai ' from Salt Spring Island and Maple Lay south to the Saanich Peninsula. Dr. Fletcher recorded it from Manitoba in 1907, and immature caterpillars which appeared to be the spruce budworm were sent to the Division during the past summer from Brandon, Manitoba. In Quebec it is attacking chiefly the balsam and spruce, but specimens attacking larch and white pine were also received from the Rive: St. Maurice. In British Columbia it is defoliating the Douglas fir and in severely infested localities it will attack other conifers such as hemlock, larch, silver fir, &c. As its name implies its caterpillar feeds upon the buds of the tree, destroying these and thus preventing the further growth of that shoot. After the destruction of the bud it turns its attention to the leaves or needles which are eaten off at their bases after spinning them together by means of silk, the caterpillars thus make loose shelters in which they live. These dead leaves and the defoliated twigs, together with the excreta or frass formed by the caterpillar, give the branches their characteristic reddish brown appearance so that an infested forest seen from a distance appears to have been swept hy fire. The life-history of the insect is of interest. The winter is passed in the caterpillar stage, is a very small caterpillar, we believe, in a little shelter constructed near a bud. In the spring, when the bud begins to swell the caterpillar begins to feed and becomes full-grown towards the end of May and beginning of June. They are then four-fifths of an inch long, of a reddish brown color, and have small light yellow warts on each segment of the body; the sides of the caterpillar are lighter in colour. They transform into brown chrysalids inside the loosely-made shelters. In six to ten days the small brown moth emerges from the chrysalis dr: gging the empty case partially out of the larval shelter. The moths are found from the middle of June to the end of July. Shortly after emergence they deposit their peculiar pale-green scale-like eggs in small oval patches on the undersides of the needles, and they are not conspicuous. The eggs hatch in about a week or ten days and the young larvae feed for a short time on the terminal shoots of the branches before hibernating. During July, when the moths are flying, they occur in enormous numbers about the electric and other lights. This has been specially noticeable in Ottawa, Quebec, and in Victoria, B. C. They are carried considerable distances by the wind, and this method of dispersal accounts for the rapid spread of the insect. The result of our inquiries would indicate that the spread of the insect has been in the direction of the prevailing winds at the time of the year when the moths are flying.