

white pioneers, although they do not figure in the statistics. The big game is of interest to other citizens for sport and pleasure, and incidentally an important source of direct revenue to the provinces from hunting licences, as well as to railways, hotels, guides, arms and ammunition manufacturers, outfitters, and local tradesmen. Most of the fur-bearing species are carnivores, and wolves, foxes, and cougars prey to some extent upon domestic stock and poultry. Some of the rodents, as muskrat and beaver, are valuable fur producers; a few of them are eaten by man, but far more (rabbits, squirrels, lemmings and native mice) are essential as food for fur bearers, and in settled districts mice, ground squirrels, pocket gophers, and woodchucks may become pests to forests and cultivated crops. Even the tiny shrews (*Sorex* and *Blarina* species), including the pygmy shrew (*Microsorex hoyi*), the smallest mammal known in North America, if not in the world, have recently been found important to forestry, helping to control the spruce sawfly and perhaps other species of insects, by feeding on the larvæ or cocoons which are found under fallen leaves in the forests.

Insects.—The Entomological Branch, Department of Agriculture,²¹ issued a statement in 1934, that from 1919 to 1923 the control of native grasshoppers made necessary the expenditure of \$1,750,000 in the provinces of Manitoba, Saskatchewan, and Alberta, and it was estimated that crops worth \$80,000,000 were saved by these measures. The wheat-stem sawfly in 1926 caused losses in Saskatchewan alone estimated at \$12,000,000. The spruce budworm during the past twenty years has destroyed more than two million cords of spruce and balsam in Eastern Canada, three times as much as was destroyed by fire in the same time. A conservative estimate is that the annual devastation in Canada from insect enemies is considerably more than \$100,000,000. Other insects and their larvæ, wire-worms, cut-worms, corn-borer, codling moth, larch sawfly, potato bug, etc., are continually working on farm and garden crops, orchards, and forests, and continued efforts are needed to keep this section of our fauna in check. One method is biological, by the introduction of natural enemies of the forms inimical to human affairs. As with many other "cures", the introduction of exotic species may be worse than the disease, as was found by bringing the English sparrow and starling into North America, but considerable success has been met in the introduction of parasitic insects which control certain other harmful kinds.

Fish.—The value of the commercial fisheries industry to Canada is shown in Chapter XI of this volume. The value of the game fishes is difficult to estimate, but they form a large and important food asset, provide, when well managed, healthful recreation to a large section of our citizens and attract many tourists and sportsmen from other parts of Canada as well as from outside our borders.

Conservation of Native Faunas.

The importance of the native faunas of Canada, both on account of their intrinsic values as food and fur and their indirect values as living biological influences on agriculture, forestry, water powers, and irrigation, should not be overlooked. During recent years, a realization of the rapid depletion of natural resources of all kinds has come to the peoples, states, and provinces of North America, and they have begun to take stock of the permanent values of their wild life heritage, and to consider the necessity of intelligent conservation.

The panther and the elk were long ago exterminated in Eastern Canada, the

ave disappeared from nearly all areas near civilization.