time on much like the oat-smut fungus. It will be seen, therefore, that at sowing-time the fungus is *inside* the kernel as mycelium and not adhering to the *outside* as a spore. Seed-disinfection with chemicals is therefore useless, since anything which would penetrate into the seed to reach and kill the mycelium would also kill the grain. A method has been found of treating the seed with hot water for a few minutes, by which the fungus can be killed without material injury to the grain. The operation is a rather delicate one, however, since the temperature must be kept within very narrow limits, otherwise the treatment will be ineffective, or, on the other hand, the germinating power of the grain will be destroyed. The method, therefore, is only applicable to small quantities of seed, such as may be used to seed a plot to furnish the general seed-supply for next season. As this disease is not serious in the Province, details for treating the seed are not given here, but will be furnished on application to the Plant Pathologist.

INJURIOUS INSECTS.

It has been estimated that the annual loss to farm crops in Canada from the ravages of insect pests is somewhere in the neighbourhood of $50,000,000. It is therefore obvious that every farmer or fruit-grower should be acquainted with the most improved methods of combating his insect foes. In order to intelligently apply such remedies, however, it is necessary for him to know something about the insects themselves, their structure and life-history.

A knowledge of the structure of insects is essential, for upon this depends, to a very large extent, the methods adopted for their control. For this purpose insects are divided into two main classes: (1) Sucking-insects, and (2) biting-insects.

To the sucking-insects belong the aphides, leaf-hoppers, mealy bugs, etc., whose mouth-parts are modified into a long sucking-tube, with which they pierce through the skin of the food-plant and suck up the juices within. Stomach-poisons would be of no avail against insects of this class, so some material must be applied that will kill them by contact. All insects breathe through tiny openings in the sides of their bodies. It is the object of contact sprays to close up these openings by covering them with a film of the spray, or else destroy them by the caustic action of the spray upon their bodies.

Biting-insects include all those forms that chew and swallow their food. The various leaf-eating caterpillars belong to this class. As these insects actually take portions of their food-plant into their systems, they can be controlled by the use of stomach-poisons, like arsenate of lead. Soft-bodied biting-insects may sometimes be destroyed by the use of contact sprays.

A knowledge of the life-history of any insect pest is necessary in order to tell at what period in its life it can be most readily destroyed. Insects, during the course of their development, pass through the following stages:—

(1.) The first is the egg stage, during which the insect is usually invulnerable to attack with sprays.

(2.) The egg hatches into what is known as the larva. If the adult insect is a fly, the larva is called a maggot; if a moth or butterfly, a caterpillar; if a beetle, a grub; other larvæ have no special names. The larval stage is the growing and feeding period of an insect's life, when the most injury is done, and is usually the time when they can be most conveniently destroyed.

(3.) The third stage is the pupal or resting period, during which the insect remains quiescent and takes no food. In this stage the larval organs change to those of the perfect or adult insect.

(4.) The fourth stage is the adult or perfect form. The adult insect is usually winged, and during this period there is no further growth, only sufficient food being taken to maintain the vital activities of the insect.

Some insects have no pupal stage, and the second period in their life is called a nymph instead of a larva. Examples of this class of insects are grasshoppers, scale-insects, aphides, and others. Examples of those having all four stages are the tent-