

revive, and increase rapidly in numbers. There are five or six generations of wingless females, all of which bear young without the intervention of males. About the middle of July some winged females are produced which leave the roots and fly to other vines, when each one lays a few eggs of two different sizes and then dies. In about a fortnight perfect males and females are produced from these eggs, the females from the larger eggs; they are born for no other purpose than the reproduction of their kind, and are without means of flight, of taking food or excreting. Each female lays one egg from which comes an egg-bearing wingless mother, thus beginning again a new cycle of existence. It has

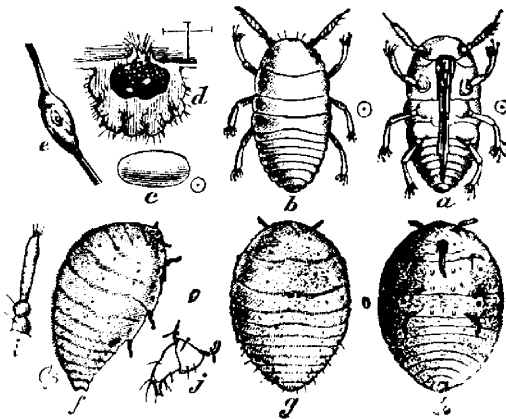


FIG. 996.—PHYLLOXERA.

been also discovered that the winged females are not actually necessary for the perpetuation of the species; for some of the wingless underground form lay a few eggs of two sizes from which males and females are produced. The use then of the winged females seems only to be to secure the distribution of the species; for these winged females which begin to appear in July continue to appear through the rest of the season and are most abundant

in August.

If to the above we now add that occasionally the underground form leaves the roots and produces galls on the leaves, we have a general outline of the whole life-history of this species. In Canada the injury from the Phylloxera is seldom serious. The form on the leaves is occasionally rather abundant in the Western part of Ontario; but the root-inhabiting form has been seldom complained of or even observed.

Some years ago Dr. Saunders saw a vineyard of Clinton vines severely attacked in the neighborhood of London, Ontario. The result was that most of these vines died, but such an attack as this in Canada is quite exceptional.

**Remedies.**—Numerous experiments have been tried in this country and all others which the Phylloxera has invaded, to find some means of fighting it successfully, but up to the present nothing quite satisfactory has been discovered. Flooding the vineyard has been adopted where practicable in Europe, and the use of bi-sulphide of carbon which is forced into the ground about the roots by means of a special instrument. In this country the only remedy which has been found necessary is the destruction of badly infested vines or the removal of gall-bearing leaves from those which are less seriously attacked.

JAS. FLETCHER.

*Entomologist Central Experi'l Farm, Ottawa.*