

ing remedies, the first thing to be considered is the nature of the attack, so that the most appropriate remedies may be made use of. It will be found, upon examination, that all injuries to vegetation by insects, conform to certain general plans in accordance with the



FIG. 1.

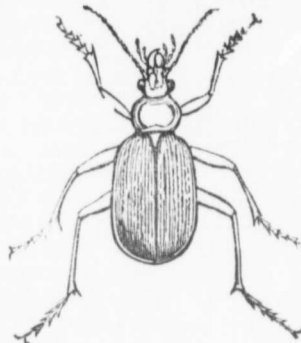


FIG. 2.

form of the mouth parts of the attacking insects, and therefore all remedies must be applied upon broad, general principles, dependent upon these structural characters. The



FIG. 3.

coal oil or carbolic acid are useful, as well as the vegetable insecticide known as "insect powder," or pyrethrum. These remedies which I have mentioned are active remedies; but contrasted with these there is another class of equal importance, which are called preventive remedies, by which steps are taken to prevent anticipated attacks from taking place. Amongst these the most important are the following: High culture, by which a vigorous and healthy growth is promoted—a proper system of rotating crops, by which insects attracted to a locality by a certain crop will not have in that same locality two years running, the same plant to feed upon. Clean farming, by which all weeds and rubbish are prevented from accumulating. Changing the

mouth parts of insects are all made upon one or other of two plans, they are either, 1, in the shape of jaws (Fig. 2), by which the substance of their food is masticated (Fig. 3); or 2. they form a hollow tube, by which the food is sucked up in a liquid condition. (Fig. 4). For insects of the first group, as a Colorado potato beetle, a caterpillar, or a grasshopper, all that is necessary is to apply to the foliage which it is desired to protect, some poisonous material which will not injure the plant, but which, being consumed with the leaves, will destroy the insects devouring them. Such a class of materials we have in various compounds containing arsenic. The best known of these is Paris green. For the second group, in which the insects do not masticate their food, such remedies would be useless, for the insects, having their mouth parts in the form of a long, slender beak or tube (Fig. 4), could pierce through these poisonous substances on the outside of their food, and extract the juices upon which they subsist from below the surface. Well known examples of this second group are the mosquito and the plant-lice, or *Aphides*. For these and similar insects it is necessary to make use of remedies which do not require to be eaten but which act by mere contact with their bodies, or by giving off some volatile noxious principle. For this purpose, preparations of



FIG. 4.

time of planting, s of the year when t ing of "traps" o desirable crops. scattering amongst

Of the insect passing notice, and and insatiable ene that is necessary i powder about the sills and about th not the same habit corners, it is neces the corners and r been found very u the foliage is used i jurious effects upon the best remedy fo pose it may be dil into the heads of insects may be di answerable for. amount of injury, these are the Colc borers, the oyster-

"Second-class numbers as to cau although they may be classed as first- every year. Unde it occurs in most p worm, and wire-w and the canker-wor first-class pests, bu

"Third-class in sufficient numbe of the grape, *Ever* worm, the clouded butterflies.

I will now ref ing the past year i made, are cut-wor ably abundant in a have been tried; b to meet, and altho mended by differen to any remedy so f when they appear i than when, as in remedies which are eumstance which h of these insects is, grown large, and a which have come u made up his mind remedy, it was time The remedy, howev