me. When a dead area forms on any part of a tree, and becomes water-soaked, as regularly happens, it forms an ideal place for black rot fungous spores to germinate. Once the disease gets an entrance these conditions favor its growth, and little by little it attacks the healthy bark until finally the tree is girdled and all above the area dies.

Means of control.—Those who are setting out young orchards should take great care to select only such commercial varieties as are proven to be hardy enough for the district. In orchards that are established already cankers on the trunk and main branches should be cut out with a draw-knife to the healthy bark, (only the dead bark need be removed) and the part washed with spring strength of lime-sulphur, or with 1 lb. bluestone dissolved in about 16 gals. of water, and then painted over either with white lead diluted with linseed oil or with gas tar, the latter being much cheaper, but possibly a little too severe for young trees. Smaller cankers may be scraped with a hoe to remove loose bark, and then covered with tar to keep the moisture out. The exclusion of moisture is very important, and often enables the tree to heal the bark all around the canker. Careful spraying of orchards at the times ordinarily recommended does much to keep the trees healthy, and prevent canker spores from getting a lodgment. In the first application before the buds burst the trunks and main branches should be as carefully sprayed as the rest of the tree.

APPLE SCAB OR BLACK SPOT ON THE APPLE.

This is the most common disease found in apple orchards. It attacks both the fruit and the leaves causing dark colored areas on the latter, and the death of the part thus affected. Certain varieties such as Snow and McIntosh are much more subject to the disease than others, some of which, like Golden Russett and Blenheim, are almost immune. Wet, cold weather in May and early June is very favorable to the disease, whereas fine warm weather prevents its development. Apple scab not only does damage by disfiguring and sometimes deforming the fruit so that is unsalable, but also by attacking the stems while the fruit is very small, and so weakening them that it falls prematurely. Furthermore it sometimes injures the leaves to such an extent that these are not able to manufacture a sufficient amount of nourishment to keep the tree vigorous and prepare fruit buds for the next season. Crab apples occasionally are almost defoliated by the scab. The spores of the disease are carried by the wind in spring to the young leaves, and careful examination will show infested areas on them by the time the bloom has appeared. This fact is very important when considering control measures. From this date until a week or two after the blossoms have fallen the disease spreads very rapidly, and attacks the forming young fruits and their stems as well as the leaves. After the apples are a little larger than a marble they are not nearly so liable to attack, probably because of the warmer and dryer weather which is unfavorable to scab. Occasionally as happened this year in some districts there is a new outbreak in August and September if the weather is wet and cool. Orchards situated along the St. Lawrence always seem to be specially subject to the disease.

Means of control.—In all the main apple districts of the province, apple scab is very easily controlled by a thorough application of either lime-sulphur diluted 1 to 30 or 40 (specific gravity 1.009 or 1.008) or Bordeaux mixture 4.4.40, just before the blossoms burst, and again immediately after the blossoms have fallen. The former correspondends to the application for bud moth, tent-caterpillars and other early biting insects, and the latter to the one for coldling moth and plum curculio on the apple and pear. In districts like the St. Lawrence Valley I should supplement these applications by a later one about two weeks after the codling moth spray, and in seasons like this, by another about the middle of August.

Pear scab can also be controlled by these same sprayings, but they must be very thorough, especially in Flemish Beauty pears. Lime-sulphur should be diluted somewhat more, say 1 to 45 or 50 instead of 1 to 30 or 40 for pears, as the foliage is more suspectible to spray injury.

If we now sum up the spraying of apple and pear orchards we shall find that the average orchard only requires three thorough applications under ordinary conditions to control satisfactorily both insect pests and fungous diseases. The first of these should be with lime-sulphur (1.03) specific gravity or stronger) to which Black Leaf 40 may be added if necessary for aphids, and should be applied just before buds burst, though, if aphids are not considered, spraying may be done from one to two weeks earlier. This early application will control, as we have seen osyter-shell and San Jose scale and blister mite, and to some extent will prevent canker. It may also help somewhat against apple scab.

The second application should be with 2 or 3 lbs. arsenate of lead to every 40 gallons of lime-sulphur diluted 1 to 30 or 40 (specific gravity 1.009 or 1.008) or Bordeaux mixture (4.4.40) and should be supplied just before the blossoms burst. This application will control bud moth, tent-caterpillars, canker worms and many other biting insects, and is very important also in preventing apple scab and leaf-spot, a disease that I have not thought it necessary to discuss because of the small amount of damage it usually causes.

The third spraying should be with the same mixture as the second, but the more dilute strength of lime-sulphur should be used. This is usually the most important application because upon it depends entirely the control of codling moth, and to a large extent that of plum curculio. It is also the chief application to prevent apple scab and leaf-spot. Too great care cannot be given to this application.

PEAR BLIGHT.

Pear blight, fire blight or twig blight is such a big subject that I have not time to discuss it further than to say that spraying is of very little value against it, and the proper method to follow is to watch for its first appearance on young apple and pear trees, and cut out diseased branches promptly, never letting it get a start on you. In cutting be sure always to choose a place nearly a foot below where the disease appears to have reached, because if you do not make sure that you are below it, the disease will continue to run down. Tools should be disinfected in formalin diluted with about four times its own bulk of water, for otherwise if you happen to cut through a diseased area the tools will give the disease to the next branch you cut. The trees should be examined every week or so, and every new case removed. Remember that insects carry the disease, and that the freer the trees are the less chance the insects themselves have to get contaminated. It is doubtful whether it is practicable to attempt to control the blight in large apple trees. It is well in this case to note what varieties are most subject to it, and avoid planting those varieties.

Making Cider Vinegar.

Would you kindly give me full instructions how to make cider vinegar. We have made vinegar, but it has not come up to my expectations. So I forthwith seize my pen and write off to "The Farmer's Advocate" to be set right upon the subject. L. M. S.

Since you give us no definite statement of defect, we cannot inform you very specifically just what is the matter with your method. For your information, and that of others, we think it best to reproduce an article by Prof. Van Slyke, of Cornell University.

Only ripe apples should be used, possessing a sugar content of not less than 7.5 to 8.5 per cent. Most varieties of apples commonly available possess the requisite amount of sugar when ripe, but not when green. The apples should not be decayed or overripe, because the amount of sugar is lessened in such apples. The apples should be clean when gathered, and if not, they should be made so by washing. The objection to dirt in the apple juice is the danger of introducing forms of fermentation that will interfere with the normal alcholic and acetic fermentations which are desired. One objection raised to washing apples is the liability to remove the germs that cause the desired forms of fermentation. While in our own practice we have not met with such difficulty, it is preferable that the apples shall, if possible, be clean when gathered.

In the grinding and pressing of the apples, care should be taken to observe ordinary precautions of cleanliness. In many cases it is the practice to add water to the apple pomace after pressing, let it stand awhile and press again. This treatment yields an additional amount of juice, which, however, does not usually contain the requisite amount of sugar to make good vinegar, provided the first pressing has been efficient. Avoid the use of juice made from second pressing if you wish to make only high-grade vinegars.

When practicable, it is a good plan to store the freshly-pressed apple juice in some large covered receptacle, and allow it to stand a few days before putting it into barrels. In this way considerable solid matter held in suspension will settle before the liquid is placed in casks. The casks used should be well cleaned, thoroughly treated with live steam or boiling water, and should not be over two-thirds or three-fourths filled with apple juice. The bungs should be left out, but a loose plug of cotton may be placed in the hole to decrease evaporation and prevent dirt and flies getting in. The bung should be left out until the vinegar-making is completed.

When the freshly pressed apple juice is at once placed in ordinary cellars, where the temperature during the winter does not go below 44 or 50 degrees Fahrenheit, the alcoholic fermentation is complete in about six months, assuming that the work is begun in October or November; though 80 to 90 per cent. of the alcohol is formed in half this time or less. By having the fermentation take place at a temperature of 65 to 76 F., the time can be considerably reduced; however, it is not desirable to have the alcoholic fermentation take place much above 76 F., since the loss of alcohol by evaporation is increased. By the addition of yeast to the fresh apple juice the fermentation can be completed in three months or less, especially if the temperature is 65 to 75 F. It is suggested that one ordinary compressed yeast cake, or an equivalent, be used for each five gallons of apple juice, if one desires to use yeast. The yeast cake is stirred up in a cup of water, and after complete disintegration is mixed with the juice. Whatever form of yeast is used, it should be fresh. Vinegar or "mother" should never be added to fresh apple juice or before the alcoholic fermentation is practically completed.

When the alcoholic fermentation is completed, it is well to draw off the clear portion of liquid, rinse out the cask, replace the clear liquid, filling barrel half full, and then adding one-fourth volume of old vinegar. On the surface of this is carefully placed some "mother," prepared as follows: Expose in a shallow, uncovered crock or wooden pail a mixture of one-half old vinegar and one-half hard cider at 80 F. In three or four days the surface should be covered with a gelatinous coating, which is "mother" of vinegar. A little of this carefully removed with a wooden spoon or flat stick should be laid gently on the surface of the mixture of cider and vinegar prepared as described above. Do not stir it in, because the acetic ferment grows only on the surface where it can have an abundant air supply. In three or four days the coating should spread itself over the entire surface. The coating should not be broken or disturbed as long as the acetic fermentation is going along satisfactorily.

The acetic fermentation occupies from three to eighteen months or more, according to the conditions under which the fermentation is carried on. When the apple juice is stored in cool cellars and left there until it becomes vinegar of legal standard, it requires from twenty-one to twenty-four months, or even more. When the alcoholic fermentation is allowed to take place in a cool cellar, and the casks then removed to a warmer place, the time of vinegar formation may be reduced from that given above to fifteen to eighteen months. Where the alcoholic fermentation is hastened by the use of yeast and the acetic fermentation favored by the proper temperature and addition of vinegar "starter," it is possible to produce good merchantable vinegar in casks in six to twelve months.

When the acetic fermentation has gone far enough to produce 4.5 to 5 per cent. of acetic acid, then the barrels should be made as full as possible with vingear and tightly corked, in order to prevent destructive fermentation of acetic acid, and consequent deterioration of the vinegar.

Fruit trees as a rule are in fair condition where cared for, the season having been a good one for general growth, says a paragraph on this subject in the Ontario official crop report. Some correspondents, however, more especially in some of the Lake Erie counties, speak of the serious injury done to orchard trees where the San Jose scale has been neglected. Although considerable spraying is reported to have been done, there is room for more of it. The codling moth was much in evidence, and some of the apples were also spotted and scabby. There has been a considerable surplus of apples, more especially of the earlier varieties. Instances are reported in Western Ontario where it was impossible to find a market for all the fall apples, and thousands of barrels had to be fed to live stock or be left on the ground to rot, after the evaporators were supplied. Even good winter varieties have not commanded satisfactory prices in the orchard. A scarcity of apple barrels has been complained of. There was also a surplus of pears, plums, and cherries of a good salable character, but peaches, although fairly plentiful, were of a poorer quality than usual. Grapes also were very slow in ripening and were not up to their usual quality.

It is not every year that apples hang on the trees till November 20th without being noticeably injured by frost, but such is the case in the vicinity of London this year.