ready none too vigorous bees out, and the additional brood reared through this stimulus will not compen sate for the loss. Solid food, placed, say above the combs, cannot so excite the bees; they can only get a little at a time, and the food actually keeps the bees at work in the hive when they might otherwise be fly ing out.

When bees can fly out it is not necessary to feed them the best of granulated honey; maple syrup and coarser or perhaps more properly less impure s weets, will do, as the bees can have frequent discharges.

## COMB OR EXTRACTED HONEY.

Many having a few colonies of bees will wonder what kind of honey they had better take, comb or extracted. This is a difficult question to answer. The locality, the season, the man, and the time he has at his disposal all influence the problem. If the locality is such that honey flows are gradual, extracted honey would be better to take, as slow filling of sections gives an inferior honey. If the bulk of the honey taken be dark, comb honey would be better to take, for dark grades of honey are more salable in comb than in the extracted form. If you are far from railways and the product will have to be shipped long distances by rail and waggon, extracted honey would be better to take.

### THE SEASON.

There are many poor or inferior seasons for honey when no comb honey could be secured for market, and yet extracted honey may be secured in small quantities. This is a strong argument in favor of taking extracted honey.

Now as to the influence the bee-keeper and the time he has at his disposal has: It requires a man of experience to make a success of taking comb honey. He must understand how to keep his colonies strong yet not have them swarm; he must understand his locality, knowing when generally the honey flows commence and their duration; he must have time to watch his bees more closely, as they have to be kept so near the swarming impulse. All things considered, for the average farmer it pays better to take extracted honey.

#### IMPLEMENTS.

The bee-keeper should have all the necessary implements for his operations. The smoker should be in good condition and in first-class working order, so as not to fail him for any critical operation. Old pieces of rag set on fire, and the smoke from them blown upon the bees with one's breath, is often only another method of exciting the bees to anger. When a good smoker has been secured, it should be placed in a sheltered place where moisture will not injure it, either destroying it, or at least preventing it from remaining in first-class order for any length of time. Care should also be taken that any fuel remaining in the harrel will not set fire to surrounding material. A box with a tight cover, in the open yard away from buildings, is a convenient and safe place to keep a smoker.

Honey extractors: there are many designs, and those sold by reliable dealers all have their merits. With them care should be taken to have them perfectly clean for the honey season, and dry at all times of the year. The method of allowing honey in large quantities or drippings to remain in them is a bad one and must end in the injury of the honey and the extracter.

#### WINTER REPOSITORIES.

A great many farmers keep bees in places that are very detrimental to successful wintering. The main reason is ignorance of what really is the best place of crops.

and the conditions required for successful wintering. It will he well before long to give this subject some attention, so that every one can select or construct cheaply such a place for next winter as may be better or best suited for bees. Much winter loss can perhaps be avoided in this way. Just to mention one instance, the room in a house is generally a place *worse* than outside for bees, yet how often do we hear the rematk, "I lost my bees and I do not know why; they were placed in a room in the house and given the best of care,' and it is all blamed on "bad luck."

In the January number of the LIVE STOCK JOUR-NAL, reference was made to an experiment in wintering bees by J. E. Pond. It was G. W. Demaree who conducted the experiment.

#### GET READY FOR THE HARVEST.

The Induana Farmer makes these very sensible remarks about getting ready now for the coming honey harvest :

"Who of our farmer readers do not dislike to take the time in spring and summer, when every moment is so valuable, to put sections together, paint and repair hives, etc.? All this is work that certainly should be done now, during the cold and stormy weather. Think, too, what a pleasure it will be to feel that all is in readiness for swarms, let them come as early as they will. A golden motto for any beekeeper is, have everything ready early, and get all in readiness when it can be done with the least outlay of valuable time."

# Horticultural.

Though the time to prune apple trees varies with conditions, yet the trend of opinion is that early spring is the best season for such work. At this time the wounds heal quickly and prevent rotting. Some have given the time to be when your knife is sharp, but this will only apply to small limbs, and not to the mediam sized ones. Timely work in cutting off the small limbs is what is called for, thereby getting rid of the danger of death to the tree, and lessening the chances of checking its growth. Judicious pruning not only improves the beauty of the tree, but it also strengthens their vitality, and increases their fruitfulness. By pruning, the flow of sap is checked, thereby permitting of its better assimilation. Better fruit also follows. The result of letting the sun and the air in 13 that a better colored, and better ripened fruit is gathered. All dead limbs should be removed ; in erlocking ones separated and the whole tree balanced. Common paint is a good thing to ap ply to wounds left by the removal of large limbs.

## Fungi Injurious to Farm Plants. (Third Paper.)

P.UST (Puccinia graminis.)

This is one of the most subtle and most harrassing enemies in the vast army of low organisms that battl, with other plants under the farmer's care for the possession of their life's fortress; and though they never succeed in gaining supreme power, yet sap them of their vitality and lessen materially the returns to the granary, both in quantity and quality.

It has been held by some few persons that wheat rust was due to mere atmospheric influences, such as dampness, causing the straw to split, and then the action of the air on the iron in the juices of the plant producing the alternate red and black coloring which they called, with some show of reasoning, the red and black oxides. Thorough research and elaborate experiment with the aid of the microscope, has placed it beyond question that rust is to be classed with the long list of injurious fungi so detrimental to the growth of crons.

Though there are many dissenters from the orthodox theory of DeBary, yet owing to the want of proof and experiments to give validity to their statements, we find the leading authorities on the question, with the exclusion of perhaps one or two, accepting the extended researches of DeBary as conclusive proof that the barberry is one of the culprits in fostering this pest. These dissenters, though they may have little doubt that the barberry is not a host for this parasite, and though they endeavor to yick holes in DeBary's researches, are yet wanting greatly in the true Darwinian method of procedure—they do not bring forward any reliablé experiments nor researches to give substance to their theorizing.

It cannot be asserted dogmatically that the barberry is the sole cause of rust, but it may be asserted truthfully, backed by DeBary's extensive experiments, and common observation, that it is one of the nurturers of this pest. In England they have found that the mahonia also serves the purpose. There is no more doubt about the assertion that the barberry plays a part in the life history of this fungus than there is in that of saying that there are others as well. yet undiscovered that serve the same purpose. On the island of Australia there is not a barberry plant to be found, yet they are annually troubled with rust. Some account for this, with a certain amount of plaus ibility, that the spores are so light and produced in such great numbers that they could easily be carried by the wind thousands of miles, but the most likely view is that there are other plants that are capable of performing this function as well as the harberry, but so far they have escaped discovery.

If during the early spring months, say the latter part of May or early part of June, the leaves of the barberry are examined, small yellow patches will invariably be found on the underside of the leaf. Figure I is a cross section of one of these affected leaves, through the yellow patches, which was obtained by the writer after many efforts in this direction, and which has been carefully and truthfully engraved by our artist from a drawing made by the writer while viewing the section through a microscope with lens that magnified sixty-five times. This section was made from the leaf of the ordinary barberry on the and of June. The small circular cases noticeable at the bottom of the cut, which represent the underside of the leaf, contains the small spores that are instrumental in introducing the rust on the grain-stalk in early summer.



Cross section of an affected barberry leaf, magnified 65 times, made and June.

Their size may easily be judged from the engraving, which truly represents them in form as well as size, bearing in mind that these are 65 times larger than the real spores. One of these pockets is shown in the engraving as just bursting, and the spores about to be destributed. It goes without saying that these minute spores, produced in thousands by each leaf, would be easily carried by a slight breeze many miles to wreak