

air. The mixture of gases is quickly cooled to avoid decomposition and then passed into an oxidising chamber, the dioxide being then converted into the tetroxide of nitrogen. As an absorbent slaked lime is used, resulting in the formation of nitrate of lime. The first attempt to apply this method on a large scale was made by Bradley and Lovejoy at Niagara. By using soda as a base, nitrate of soda was formed, but owing to difficulties in the operation of the plant the enterprise was not financially successful. The first mentioned process, which was based on that employed by Bradley and Lovejoy, is known as the Berkeland and Eyde process, and is in operation at Notodden and Telemarken in Norway. At Telemarken it is estimated that 220,000 horsepower will be available for the generation of electric energy. As in the case of lime nitrogen or cyanamid, nitrate of lime must be protected from wet, but the latter material is also hydroscopic in character, i. e., it draws moisture from the surrounding atmosphere. To offset this tendency quick lime is sometimes added to the material to keep it in a dry condition, and probably satisfactory means will yet be discovered to remove many of the detrimental features, which these new nitrogenous fertilizers possess.

(To be continued.)

## HORTICULTURE.

### Fruit Growing Possibilities in the North.

Editor "The Farmer's Advocate":

The planting out of 75 acres of apple trees on St. Joseph's Island, near the Soo, has considerably widened the fruit belt of Ontario. The northern limit of commercial-apple growing has been set as the territory around the southern shore of Georgian Bay or possibly a little further north. But extending the area for the successful growing of fruit to the district around the Soo has not been undertaken without careful consideration of the results of experimental planting, which has been carried on by some able and enthusiastic men of that vicinity. In following up the experimental work, I was employed by the experimental board to make what observations I could as to the possibility for fruit growing in Northern Ontario. These observations resulted in the following conclusions: Winter injury is responsible for the majority of the unsuccessful plantings and is of no consequence on trees of the harder varieties which had not previously been injured. Making use of the methods of prevention for the various forms of winter injury has been followed by excellent results. Borers and mice have been quite effective in their efforts to keep the fruit belt within its previously mentioned limits and it seems there is yet to be discovered some satisfactory means for their control. Recently a nursery has been started on the Island and this should prove of great value in increasing the longevity and hardiness of the trees. The trees do not grow to the size of those in Southern Ontario. For this reason, as well as for the added protection, closer planting can be followed.

St. Joseph's and Manitoulin Islands stand apart from the other sections in the variety of fruits that can be successfully grown. They not only thrive under domestic conditions in which the trees are carefully coddled, but also when given the more general care of the commercial orchard. The 75 acres previously mentioned were planted last spring to McIntosh, Duchess, Dudley, Wealthy and crabapple. Several acres were interplanted with gooseberries and currants. This comparatively large planting has been undertaken by two companies operating from the Soo. It was carried out only after careful investigation of the orchards in bearing which were proving the adaptability of several varieties to the Island conditions. In the selection of the lighter soils, killing back was found to be very much lessened. The sandy soils dry out more quickly than the clay and check a late, sappy growth. Protection is the word to be given the greatest consideration in prevention of winter injury in its many forms. As a protection against sunscald, the northerly slope increases in virtue as one goes north. The much commented on windbreak has certainly proved a valuable weapon in the fight against winter injury and has established itself as a necessary feature of the orchard. The cold, dry wind of the north is the most serious agent in the evaporation of moisture from the trunk and branches. The variety question is the solution to many of the winter injury problems and much credit is due Chas. Young, of Richard's Landing, for the work he has undertaken in the testing of varieties. Those of special merit are McIntosh, Duchess, Hibernial, Dudley, and Martha, Whitney and Hyslop crabapples.

In each of the five northern districts there were generally one or two men who were successfully growing the small fruits. The prices received for fresh fruits in the North is a surprise

to those accustomed to Southern prices. When one considers the demand and high prices for these it is remarkable how few there are who have barely enough to supply themselves much less the local trade. Any of the commercial varieties of gooseberries and currants will succeed admirably in Northern Ontario. Strawberries, while being more widely planted, often rewarded the grower with a poor crop. Usually this was brought about by neglect in the selection of varieties and again by lack of protection during the winter. This again illustrates how few people give consideration to a change of conditions and the means at their hands to remedy the situation. A late strawberry, as a rule, can be depended upon as hardy, for it is in the freezing of the blossom that the fruit suffers most from frost. Beder Wood, Parsons and Haverland varieties were found satisfactory in a variety of conditions. Protection may be had by the use of strawy manure in the locations where the snow does not lie in winter. Some very interesting developments in the use of sunbreaks were noticed in connection with the red raspberries. It is doubtful if this fruit can be grown commercially north of St. Joseph's Island as it was only seen to produce fruit in well-protected and closed-in gardens. In the open it would invariably freeze back to the ground except in very favorable seasons. In several cases, when the patch was situated on the north of shelter, whether on the fringe of bush or buildings, the plants close to protection showed least signs of injury, while those further out evidenced very clearly the ill effects of the strong spring sun.

A man might be easily duped into believing that raspberries could be grown without protection because of the variance of the seasons, as some are much more favorable than others. Concerning varieties of raspberries, it would be impossible from information gathered this past season to form any accurate opinion. The observations were so contradictory. The Columbian raspberry, a variety stated by Mr. Macoun, of the Central Experimental Farm, to be subject to winter killing, was the only raspberry which I found to be uniformly hardy over the entire territory. People would say that they had tried other varieties time and again without success. Of course, the killing of the other varieties may have been accidental, thus making the statement of little value. At least, whatever variety is preferred, the protection derived from a sunbreak will be largely influential in determining a successive crop of fruit.

It was my privilege while travelling through this country to observe some of the worst cases of winter injury and it would have been impossible not to have formed some impressions as to causes and prevention. Besides, what I have said as to the influence of sunbreaks, windbreaks, soils, aspect and elevation in minimizing the extent of winter injury, the fact that apples are being produced in Manitoulin proves to us that much of the injury found in lower Ontario might be largely overcome by observing a little care in a few of the above points. Trees are producing

fruit in Manitoulin without a trunk and with very little pruning other than that will make a more compact form. The rows are interplanted with deciduous and evergreen trees, showing that considerable advantage is derived from shading and checking of evaporation. Thus, while a few years ago people did not consider that fruit could be grown in the north, it is now being demonstrated that it is not the extreme cold that hinders production of fruit as much as inattention to the means at hand for combating the many forms of winter injury.

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## THE APIARY.

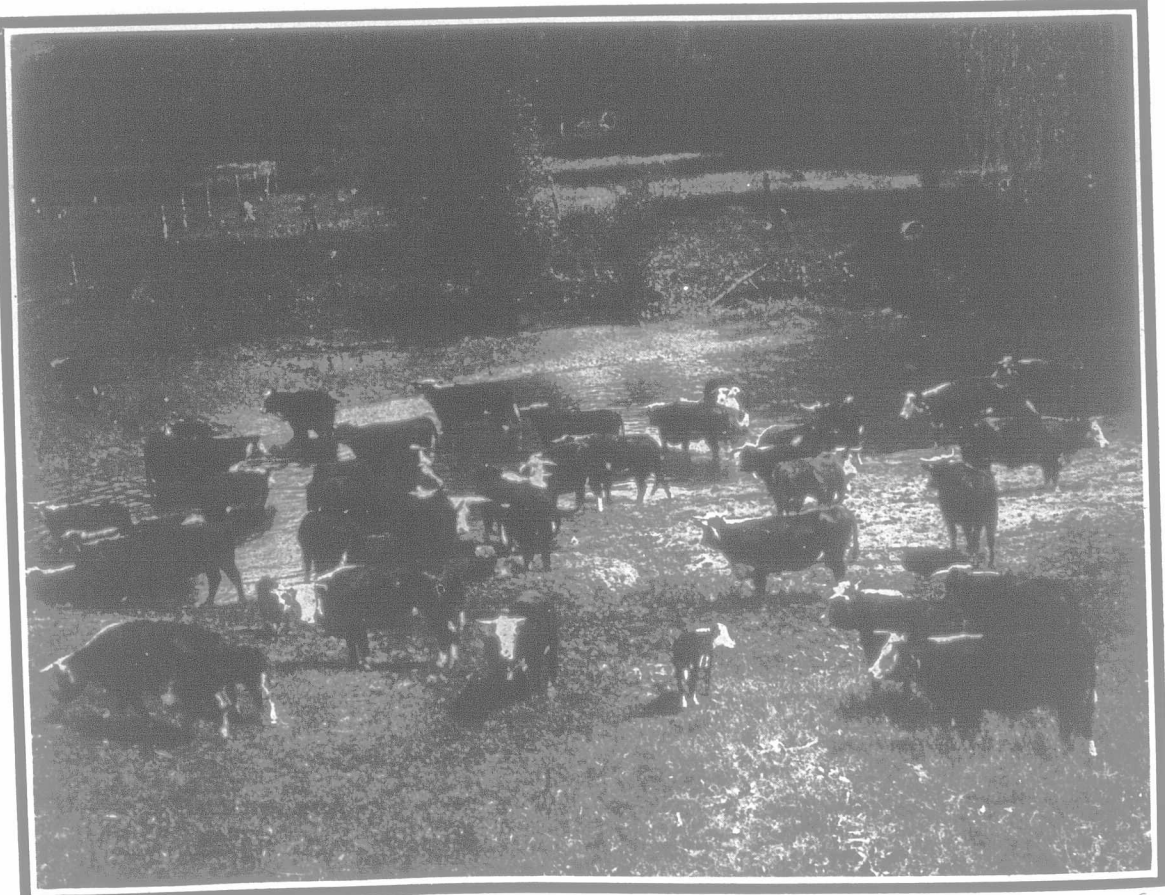
### Bee-keeping, Intensive Agriculture

When it comes right down to real intensive agriculture beekeeping wins in a walk. The profits from an acre or two of land, often poor land at that, are frequently enormous, it requiring four figures to express them. The beekeeper may get a stinger or two thrust through his epidermis, but the man who understands the business thoroughly, embarks upon it on a small scale at first, learns it and grows up with it, seldom is "stung" as applied to the financial end of the business. A commencement may be made on a very small capital—a few colonies costing only a trifling sum. The outlay for land is small, and no costly stables are required, most beekeepers, with a little extra precaution, wintering their bees outside. It costs little to operate the apiary, no extra labor being needed most of the year. The bees feed over wide areas and the raw material is thus the cheapest on earth, and to the man who enjoys leisure beekeeping offers great opportunities, for only during four or five months of the year is it necessary to work hard; however during the summer season in large apiaries everyone must be up and doing. There will be swarms galore unless swarming is controlled by giving the bees plenty of room in the spring to raise brood and putting supers on early and also queen cells should be cut out. It is absolutely necessary that the beekeeper knows the condition of every colony just as well as the stockman knows the condition of each individual animal in his stalls. Bees soon get to know the person who cares for them and rarely is it that a judicious apiarist gets into an argument with his insect money-makers, the best and steadiest workers in the world. They may have "hot feet" but they turn in the "cold cash." There is a growing market for honey, one of the wholesomest products of the farm. Keep bees.

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Herefords, the Great White-faced Grazers.