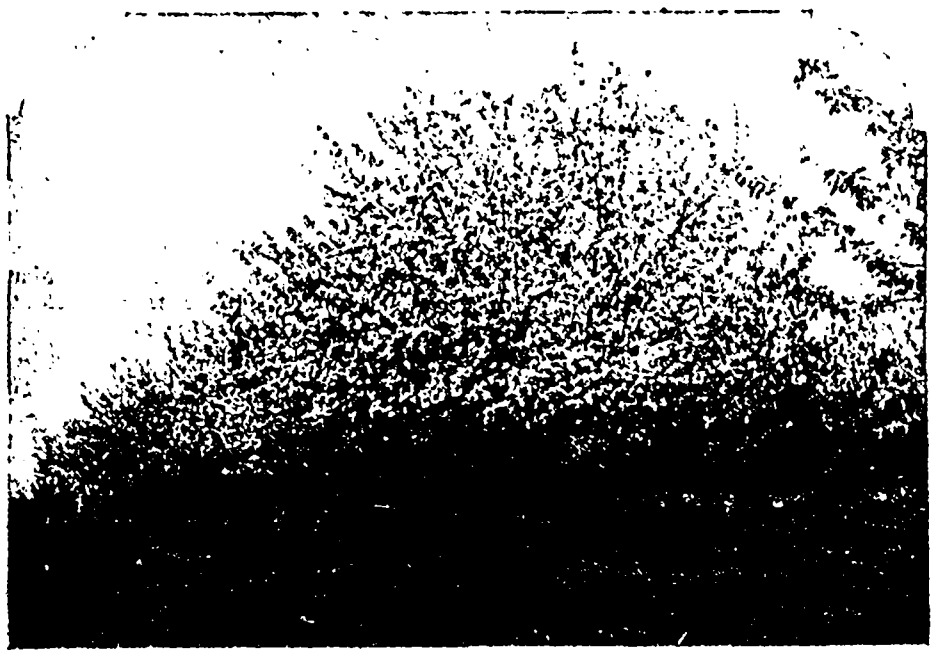

A Canadian Apple Orchard Tree in Bloom.

View of the Apple Orchard of Mr. A. M. Smith, St. Catharines, Ont., proprietor of the Dominion Nurseries.

ing somewhat above the level of the ground.

6. Thoroughly examine and clean out the well from time to time, frogs, mice, etc., frequently find therein a watery grave.

7. Don't throw garbage, household slops and the like near the well, the proper place for such is the compost heap.

8. Keep the barnyard *clean*, and in this connection I cannot do better than emphasize the value of air-dried muck as an absorbent.

9. Don't use the well as cold storage for milk, meat, etc. An accident would contaminate the water. Every farmer producing milk should have an ice house and proper accommodation in which to keep the dairy products cool.

10. Never wash the dairy utensils at the well, for such a practice is sure to pollute the water.

WHY ORCHARDS ARE FAILING.

By Charles W. Burkett, Ohio State University.

Experience is one of the most potent factors in our development. It brings facts and causes to our view better than possibly anything else. This point is well illustrated in my mind by an illustration of practical value. An orchard on my father's farm, and not an old orchard either, seemed to be failing, and produced but little merchantable fruit. There was something wrong. This failure or partial failure was not due to insects or lack of care in the usual sense. It never occurred to us that perhaps there was a lacking of fertility in the soil. At the same time, we were growing wheat, adding manure and even commercial fertilizers to get a maximum crop. We had used every method in the development of the field crops, but perfectly neglected the orchard. Not intentionally either, but because we thought that it was not necessary, and that an orchard had an easy time of it anyway.

But soon after I went to college, I studied plant growth, chemistry, etc. My eyes were soon opened. I soon realized that the depletion of the land by the fruit trees is more serious than by annual crops, from this fact: plant foods are locked up for many years in the trunks and branches of the trees, while a large part of the fertilizing elements in the common crops is returned to the soil each year. Besides, the fruit taken off removes plant food that is seldom if ever returned.

It has been estimated that an acre of apples during the bearing season will remove about 49 lbs. of nitrogen, 38 lbs. of phosphoric acid, and 72 lbs. of potash, the value of which would be $12, at the average prices paid for fertilizing material furnishing these ingredients on the market. Is it any wonder, then, that orchards are failing? Taking from the soil that amount of plant food each year, it is only natural that the time soon comes when one gets but a partial crop. In ten years the amount of plant food removed from the soil will amount to $120. Now, for the orchard land to be kept in perfect bearing condition these fertilizing elements must be returned in some form.

We know the value of clover, cow peas, vetches, crimson clover, etc., in adding nitrogen to the soil. Fruit trees require humus. Plow up the orchard and sow clover, then keep the orchard clean and clear of weeds and insects. Humus is added, and at the same time an abundance of nitrogen is supplied to the soil for the use of the trees. It remains then only to use phosphoric acid and potash, which can be readily obtained in the form of acid phosphate and muriate of potash; an average dose of these would be about 300 lbs. of the former, and 200 lbs. of the latter. It would be better to apply the potash and phosphate before the clover is sown, as they will assist in making a full crop of clover, which means the absorption of larger quantities of nitrogen, and the whole mass turned under will improve both the physical and chemical condition of the soil.

COMPOSITE MILK TESTING.

By L. A. Zufelt, Instructor in Milk Testing, Kingston Dairy School.

That the present system of pooling milk for cheese factories is unjust few will dispute, and a growing demand is manifest throughout the country for some other and better way of determining the value of milk than by its weight alone. That the Babcock test forms the basis of the true value of milk, whether we use the fat alone or make allowance for the other constituents, I think all are agreed. One reason, and to my mind the main one, why this system is not more generally adopted is, not so much a question of its correctness, but to the want of confidence on the part of the patrons in the ability of the cheese-maker to properly conduct the test.

The object of this paper is, therefore, not so much to discuss the relative values of the different systems, but rather to give some information as to the best way to conduct the test commonly known as the "composite test."

The person who is to conduct the test must make up his mind to be accurate. It will never do to take anything for granted, or to guess at results. He must conduct his work in such a way that when it is completed he can say with certainty that it is correct. A glass jar holding from 8 to 16 ozs., with a large neck, should be provided for each patron, properly labelled with the name or number so as to be easily distinguished. In order to preserve the samples, add from 5 to 10 grs of bichromate of potash to each jar the first morning. This amount will be quite sufficient to preserve them for one or two weeks. Great care should be observed in taking the samples of milk from the weigh can, and to see that the milk is well stirred up and a fair representative sample taken each morning. The best utensil to use is, I think, a small dipper which holds about one ounce, having a handle sufficiently long to reach to the bottom of the can. Some prefer using what is called a "milk thief," but for all practical purposes the small dipper will be found to be quite as accurate and much more convenient. Each morning, after adding a fresh sample of milk, the jar should be gently shaken by a rotary motion, to wash down any cream which may adhere to the sides. Avoid churning them up and down, as this causes a separation of the fat and makes it very difficult to obtain correct results. After the milk is all received for the morning, place the jars in as cool a place as the factory affords. In testing, shake each jar separately before taking the sample with the pipette, and if the cream has become hard or slightly churned, place them in a warm water bath until the cream becomes liquefied, but after the samples are placed in the Babcock bottles they should be cooled again, otherwise the acid will burn the fat and destroy the test. Be sure you get the cream and milk well mixed before sampling for the Babcock; otherwise the result will not be correct. Use about the same amount of acid as in testing ordinary milk, but the bottles require to be shaken a little longer, and also to be revolved in the machine at least five minutes before adding the hot water. If the test is made every one or two weeks, credit the patrons with the number of pounds of milk sent for that time, with the percentage of fat found in each. Then it is a very simple matter to calculate the number of pounds of fat contained in each patron's milk, and this amount forms the basis of payment.

The advantages of this system are many. A very marked improvement will take place in the quality of the milk sent to the factory. It will do away with any desire which some may have for tampering with the milk in the hope of increasing their revenue. The effect on the cheese maker will also be beneficial, as the factorymen will insist on having intelligent men who can not only carry on the test with accuracy, but manufacture the milk received into a first-class article. The day is fast approaching when any and everybody will not be allowed to hold an important position where a slight mistake or a neglect of duty will mean a loss of hundreds of dollars to the farmers. The cheese-makers of the future must be men, educated for their calling; men who have brains and are able to keep abreast of the age in which they live.

THE FARMER AND THE EXPERIMENT STATION.

By F. C. Sears, Director Nova Scotia School of Horticulture.

There seems to be a wrong conception, on the part of many farmers, as to what constitutes the legitimate work of the experiment station. Not long since the writer heard a prominent fruit grower criticizing the management of the Central Experimental Farm, because the methods used there were not such as, in his opinion, would prove profitable to the ordinary farmer. And this same kind of criticism is often heard, and that too from men who ought to understand better the object of experimental work. It is not supposed that experiment station officers will follow the old ruts in farm and orchard practices, those which have been found profitable to the ordinary farmer, nor is it desirable that they should. Indeed the stations are created for the express purpose of doing just the reverse, of testing new grains and fruits and of planning new rotations and new methods of tillage; then by careful investigations, carried on for a series of years, of determining the value of these to the general farmer.

And the stations are of value to the farmer *because* they do what he himself is prevented from doing both by lack of means and in many cases by lack of training. The station officer is, or should be, a trained specialist, who brings to his work a knowledge of what has been accomplished in his chosen field and of the methods by which this was attained. He is therefore better able to plan further investigations, to take observations and to draw conclusions from the results. And his investigations are the more likely to be properly carried out and his results the more likely to be conclusive, because he is not hampered in his work by the question of whether the yield from his land will pay in dollars and cents.

Of course every farmer can and must experiment for himself in certain lines. He must study his own soil and adapt the general principles laid down by the station officers to his individual