

tage over the mineral of having some humus-forming material. They, however, must first decay before the plant can make use of them. These fertilizers are applied to the surface of the soil and harrowed in, not too deeply, however, as they will find their way downward themselves.

Commercial fertilizers will not build up the land that is deficient in humus. They should, therefore, be used in connection with barn-yard manure, except on muck soils which often give good results for years with nothing but fertilizer. Some mucks require a dressing of barn-yard manure to start the bacteria a-working.

Although the last two plans will prove of great assistance they should always supplement the old plan of applying barn-yard manure.

Bruce Co., Ont.

A. E. WAHN.

THE DAIRY.

Review of Dairy Work at the O. A. C. in 1913.

Editor "The Farmer's Advocate":

Government blue books are frequently regarded as the cemetery of men's thoughts and works, instead of being, as they ought, a record of progress among "live wires"—in this case agricultural "wires." Employees of the Government are largely a law unto themselves, but there is a danger in this as has been pointed out by R. L. Stevenson in one of his charming essays. He says, "If you are to continue to be a law to yourself, you must beware of the first signs of laziness. This idealism in honesty can only be supported by perpetual efforts; the standard is easily lowered, the artist who says 'it will do,' is on the downward path."

The Annual Report of the Ontario Agricultural College is one looked forward to with interest. It gives a brief outline of the progress of scientific agriculture for the province, and for members of the staff, enables them to know what is being done in other departments. In addition to the besetting sin of preachers and professors, there is also among scientific workers the danger of narrowness. President Wilson, in an address at the opening of The American University, at Washington, is reported as saying: "Carlyle had a fancy once of an old professor who was the 'Professor of Things in General.' And I do not see how anybody can be a successful professor of anything in particular unless he is also a professor of things in general, because unless he knows, and has that real vision of how that particular thing is related to all the rest, he doesn't know anything about it." As one glances over the reports of the various professors at the O.A.C., there would seem to be room for one other, what Carlyle called, 'Professor of Things in General', in order to co-ordinate a little more closely the work of the Departments of the College to each other and also to the various farm interests of the Province. This is not written in a fault-finding, carping spirit, but is the expression of thoughts frequently put forward by members of the staff and by others who have the best interests of the College at heart.

All the work of the College should have for its aim, the uplifting of agriculture. Anything less than this is a miserable waste of human effort, time and money. Applying this rule or standard to the work done in the Dairy Department during the past year, what do we find?

The creamery industry is becoming increasingly important to our dairy farmers, so anything which throws light on creamery problems is a distinct help to dairy farmers, hence we find the first division in the report devoted to tests made in the College Creamery on the question of the effect of salt on the yield of butter, as there is a growing demand for saltless butter. Can a creamery man afford to sell saltless butter at the same price which he receives for salt butter? These tests show that the "overrun" was about 3½ per cent. less for saltless butter, hence butter without salt should sell for 3½ per cent. higher price, less the cost of salt, in order to be as profitable as making salt butter. In other words, saltless butter must be sold for ½ to 1 cent per pound higher price than salt butter. This has a direct bearing upon the profits of creamery patrons. Butter kept in cold storage for one to three months in print form showed a shrinkage of ¼ to nearly 2 per cent. Both prints and solids lose moisture in cold storage, hence where butter is stored for one to three months, it must sell for one to two per cent. higher price in order to be as profitable as selling when fresh, to say nothing of the risk in losing fine flavor, and trouble with short weights owing to shrinkage.

Farming and manufacturing are closely allied, one phase of manufacturing is closely identified with that of the dairy, namely, the manufacture of salt. For a long time it was thought Canadian manufacturers could not turn out a grade of salt which could be used in making a fine article of butter and cheese, and in early days our butter and cheesemakers used imported salts. But our Canadian manufacturers rose to the occasion,

and we now have Canadian salts equal to any imported article. Tests made at the O.A.C. Dairy in 1913, confirm this conclusion.

The second division of the report deals with Cheese Investigations. Cheese will continue to be for many years a staple product of our dairy farms and factories, although it appears to be on the decline because of two things—less remunerative price, and a poorer by-product, as compared with buttermaking. The percentages of both casein and fat in the milk of patrons delivered to the O.A.C. for cheese manufacture tends downward. In 1908 the averages for casein and fat were 2.39 and 3.67 respectively, while in 1913 they were 2.08 and 3.35, and this in spite of the fact that milk is paid for by test.

The average pounds of milk required to make a pound of cheese by months, from April to October inclusive, were: 11.03, 11.26, 11.10, 11.65, 11.35, 10.39, 9.73. These results correspond with factory experience over the province—a larger amount of milk required to make a pound of cheese in July and August and comparatively high for the whole season as compared with say twenty-five years ago, except for October. The explanation for July and August is, over-ripe condition of the milk, as the percentages of casein and fat in those months were about normal. These tests, along with tests in making vats of milk into cheese from over-ripe milks, which showed a loss of 4.69 lbs. cheese per 1,000 lbs. milk, point to the need of cooling milk in hot weather. This comes right home to every farmer producing milk for cheese manufacture. The loss figured per farm of ten cows producing say 6,000 lbs. milk per month for July and August, means in round numbers a loss of five dollars and in a 100-patron factory, a loss of \$500 for these two months. For the province, it means about \$500,000, which patrons are losing through lack of care in cooling milk. The storing of 10 or 15 tons of ice per farm would save this loss.

Tests of milk containing varying percentages of fat and casein for cheese manufacture, showed a difference of 5½ lbs. more cheese per 1,000 lbs. milk in favor of the higher testing milks. The cheese from the higher testing milk contained a greater percentage of fat, but there was not much difference in the quality of the cheese. The "fat plus 2" plan came nearest to actual cheese relative values of the milks tested of three methods applied to the results of the experiments. High salting (2½ to 2½ lbs. per 1,000 lbs. milk) of curds tended to produce drier cheese, and poorer quality as compared with salting about 2½ lbs. per 1,000. The tendency is for much lighter salting than formerly, which means more cheese and more money for the farmer.

Cheese ripened at a temperature of about 40° F. directly from the hoop, had less shrinkage and scored higher than did similar cheese ripened at

a higher temperature in an ordinary curing-room, where the temperature ranged from 60° to 75° F. The practical lesson for cheesemakers and farmers is to ripen the cheese at as low a temperature as possible, down to at least 40° F., thus saving loss of weight during ripening or curing, besides producing a better quality of cheese which will sell for a higher price, and that means more profit for the patrons, which is none too great at present. The results of tests with pasteurized milk for cheesemaking were not very satisfactory, although the plan suggested by an American Station was followed as closely as possible. Further tests are being made during the season of 1914. A variety of tests were made with soft and fancy cheese, including buttermilk and skim-milk for cheesemaking, which promises a method of profitably disposing of the by-products at creameries. These soft cheeses can be made on any farm at small cost. Stilton and Wensleydale cheese tests indicate that there is some risk in getting these to turn out satisfactorily under our climatic conditions. It is doubtful if we shall be able to make a cheese uniformly so good as the English Stilton.

Tests in Ice-Cream manufacture show that this may be made a profitable "side-line" in creameries, where there is the necessary machinery, plenty of labor and ice or mechanical cold-storage, and a good home market, such as in a nearby town or city. Patrons of creameries may also order ice-cream from their local creamery, and enjoy this dish without having to go to town for it.

The testing of milk and cream always forms a large part of the investigational work in the Dairy Department of the College as there appears to be no end to the problems arising with reference to testing. Farmers, as a rule, are suspicious of the testing, as done by cream buyers particularly. Composite sampling, with a good preservative and where sample bottles are kept corked and cool and free from mould, is a correct method of testing, although there is a strong tendency towards testing each and every delivery of cream, and the doing away with the composite method for cream testing.

Cresote, formalin and a 3-1 potassium bichromate-corrosive sublimate mixture, all proved to be satisfactory preservatives when properly used.

Reference in the report is made to the Casein-fat test worked out at the O.A.C. Dairy Department and which has already been touched on in the columns of "The Farmer's Advocate."

Owing to the great demand for condensation in the report, none but the essential points are dealt with in each experiment. The tables are for reference only. The Dairy Report occupies a little over 28 pages of the College Report, after a good deal of "boiling down."

O.A.C.

H. H. DEAN.

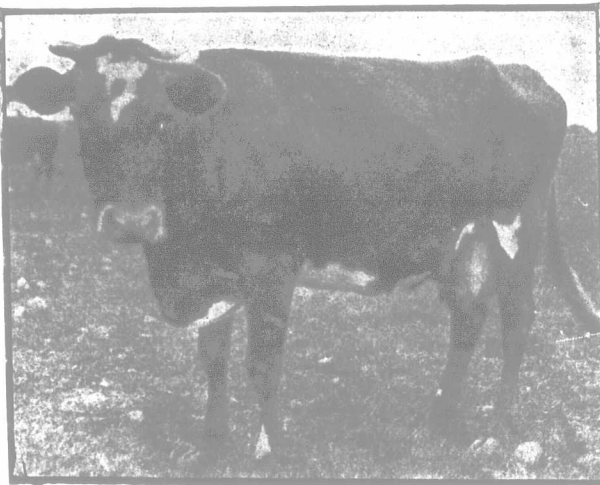
What a Grade Herd is Doing.

In sight of the Ontario Agricultural College and contiguous to a remote corner of the College Farm, one of the Professors of that institution is demonstrating that the gospel there expounded can actually be put into practice on an ordinary farm. With sixty-three acres on which to labor, and with an ordinary outfit of buildings and implements, a herd of grade dairy cattle are annually and daily made to return profits that sum up to a pleasing total. College professors are usually classed in the category of theorists, but when they bring into actual practice

words and actions, there is often some discriminating done at the conclusion of the college year. This power of selection has been carried to the farm, and Prof. J. B. Reynolds, of whom we write, has shown that a grade herd judiciously chosen and wisely fed may be made to return a profit to the owner over and above the expenses connected with the enterprise. This is no startling item of news, but the statements and records kept in connection with the herd show so plainly whence the profits came and why they came that a brief review of their standing should be interesting.

This herd has proven that it is not necessary to have pure-breds with long euphonious or even unpronounceable names in order to be successful. True, it is animals with an extended line of ancestors bred in the blue and noted for their ability to produce and transmit that power, have a more than ordinary value, but no strain of pure-breds has a monopoly on milk production. Grades still have rights to distinction, especially when they perform, and these cows in Prof. Reynolds' herd, with such modest names as Brindle, Cora, Daisy and others quite as unassuming, do themselves credit and prove that where their owners have the will and ability to select and discard a herd may be established at a price within reach of most and with a record of performance that will not dishonor the name of any farm. The test by which a cow qualifies for a place in this herd has been the scales. They are the high court and tribunal before which each individual is tried. The minimum standard is 8,000 pounds of milk per year, and during the last two years eight suspects have been convicted, and, with only two exceptions, sold to the butcher. Henceforth the quality of the milk will be an influencing factor and the Babcock test must be applied, but in the past the product has been sold as whole milk, and so long as it tested 3.5% fat judgment was not passed.

The accompanying table is a resume of the expenses and profits in connection with this herd from April of 1913 to March, 1914, and we are



Brindle.

their power of discernment they sometimes leave the critic without grounds for criticism. This being a Professor of English, that power of discrimination between the gold and dross of literary production is well developed, and when students do not imbibe freely from the fountain of our mother tongue and display it in their