will become a student of sanitation and hygiene, and of the processes by which the cow, properly fed, stabled and cared for, turns the crops of his fields into the most perfect human food. He will further study this expression of the work of the life of his cow, this milk, in its composition, its preservation and its bountiful possibilities of being converted into other foods for man's sustenance and enjoyment. Therefore, from this short recapitulation of what the good, well-informed dairyman means to himself, will anyone now claim that I spoke unadvisedly when I gave him the past-master rank in American agriculture?

"Fourth, the man who has learned all these things, or such of them as he honestly may learn and put into practice, will have become a better and broader man. He will have enlarged and developed himself in the development of his cow, and it is no reflection upon good men of this country to say that certainly the intellectualization of the dairyman and his household, and his neighbor and his household, into the most advanced type of citizenship is the profoundest thing the dairy cow can do."

Milk Powder.

Now that practical processes have been invented for the conversion of milk into powder, the question of the possibilities of such a business demands the attention of all creamery proprietors and managers. The great difficulty in most manufacturing businesses is the proper utilization of by-products. Now, separated milk in creameries is practically a waste material. It fetches on the average a price of one penny per gallon. It can only be sold in the immediate neighborhood of the creameries, as carriage to a distance is not possible at such a price. The processes referred to get rid of practically the whole of the water contained in the milk, and the residue of milk powder amounts to only about a tenth of the weight of the milk. Even were it possible to send the separated milk economically to a distance, the heavy cost of the packages required would be a very serious drag on the business. But the milk powder may be forwarded in any ordinary light commercial package that can stand the strain of a railway journey. For wholesale purposes it may be packed in bags, like flour, at practically no cost whatever. The trade being a perfectly practical one, the next great question is, what are the probabilities of finding a successful market for the product? And it seems to us that if milk powder is properly placed on the market, it will find innumerable profitable outlets. It will be used in enormous quantities by biscuit manufacturers, and will be found, we think, a more valuable article than those patent milk preparations so largely advertised, and which consist of the precipitated casein of milk with the valuable milk salts washed out of it. It will be used by bakers and confectioners, to a large extent, in the manufacture of milk bread, cakes and pastry of various sorts. As it will keep for any length of time, it will obviously be invaluable on board ship. We have spoken hitherto of powder from separated milk, but, of course, whole-milk powder can be quite as easily made, and would find a ready market for most of the above purposes, and also, and especially, for the feeding of infants. Being absolutely sterile, it would, as numerous experiments have shown, be eminently suitable for this purpose, and its general use would render municipal and other sterilized milk depots unnecessary. We anticipate that separated milk powder, combined with a certain proportion of oily material to replace the abstracted cream, would be used extensively by agriculturists for the feeding of calves. There remains the question of what would be the best method of placing the new product before the consumer. The market for it has, of course, still to be developed. Obviously the individual creamery proprietor would be at a disadvantage in making a market for his limited produce, and we think some sort of a combination, organized with sufficient capital to handle the whole produce and to do all the advertising necessary, would best meet the necessities of the case. It would not be possible to obtain fancy prices for milk powder, and those interested would be best advised to cultivate a wide market at moderate profits. Certainly the days are near an end in which the only use that can be found in most districts for such an invaluable food substance is the feeding of pigs.—[Creamery Journal (Eng.).

According to a published report there has been a falling off of nearly $2,000,000 in the value of the cheese and butter exports from Montreal for the season just closed, as compared with last season. The figures for this season are $25,000,000, or a total of $18,500,000 for cheese and $6,500,000 for butter. The decrease has been in cheese. The exports of butter show a substantial increase over those of 1903. Last year cheese values were much higher than this year, so that the total quantity of cheese exported is not as much below that of a year ago as the decrease in value would indicate. Nevertheless, the decrease so far as quantity is concerned is no small one, totalling about 388,000 boxes. The increase in butter exports over last year is about 150,000 packages.

Powdered Sterilized Milk.

Dr. Carl Jansen describes the following process: The milk, skimmed or not, perfectly free from all impurity, is sterilized. It is then submitted to a sort of fermentation, the active agent of which is a non-figured ferment—residuary product from the vital action of individual microbes such as the dispora caucasica or caseases, which act on the caseous matter and dissolve it. The use of this kind of diastase, utilized instead and in the place of the organized bodies themselves, from which it comes, has the advantage of limiting the very variable fermenting products when the bacteria themselves attack the elements of the milk. On the other hand, when one wishes at a given moment to arrest the activity of these latter, a high temperature is necessary which can alter the choice qualities in these products, while a moderate heat is sufficient to destroy the ferment in question. Milk thus changed is condensed, put into moulds, dried, and finally reduced to powder.

Milk flours are, as a rule, constituted of a mixture of milk more or less skimmed, and condensed in the vacuum at a low temperature with a variable quantity of wheat flour previously submitted to a saccharizing process by the combined action of heat and a weak acid. Under these conditions the amylaceous matter is transformed into more easily assimilable substances—dextrine and glucose—which, from the point of view of nutritious functions, replace the hydrocarbonate element, which is the fat of the milk.

Flours which are rich in nitrogen can also be used, such as flour from beans, peas, haricots, bread flour, malt, etc.

Milk flour, according to the German chemical agenda, would consist of the following ingredients:

Water and volatile bodies...	5	to 10	per cent.
Salts	1.5	to 3	per cent.
Fatty matters	4	to 7	per cent.
Albuminoid matters	9.5	to 18	per cent.
Hydrates of soluble carbons	35	to 55	per cent.
Hydrates of insoluble carbons	15	to 55	per cent.
Cellulose	0.5	to 1	per cent.

GARDEN AND ORCHARD.

Mr. James on Flower Culture.

That the culture of flowers in Canada gives promise of developing into an industry of no mean proportions has been amply proved during late years by the wonderful success which has been achieved by certain Canadian floriculturists. Among these it is only necessary to mention the Dale Company, of Brampton, Ont., whose trade in roses has extended beyond Canada to the large American cities across the border, and Mr. H. H. Groff, of Simcoe, Ont., who has built up a continental reputation as a breeder of gladioli, and has gained the most extensive trade in these flowers in America.

In the course of a comprehensive address on "Horticulture in Ontario," delivered by Mr. C. C. James, Deputy Minister of Agriculture for Ontario, at the recent Fruit, Honey and Flower Show in Toronto, this point was dwelt upon as one worthy of attention. With the establishing of new ideals, as a consequence of the present advanced stage of agricultural effort in Canada, Mr. James noted the increasing tendency to grow flowers, both for home adornment and as a business. All over America, he said, the flower business is expanding, and along with it the production of earlier and finer vegetables under glass. Already in Ontario the supplying of roses and other favorites to American cities has become a permanent business, and a business which is likely to continue, since our climate is especially suitable to the production of flowers, which remain fresh longer than those grown in districts farther to the south.

From the strictly utilitarian value of flowers as an opportunity for commerce, Mr. James passed on to a consideration of their worth from a moral and æsthetic standpoint. Their culture should be encouraged, because of their effect upon the moral nature—one of many reasons. If boys and girls were surrounded more completely with flowers the effect upon public morals would soon be appreciable. They are nature's most beautiful and powerful agents for the development of the intellectual, moral and æsthetic faculties, hence parents and teachers should make a greater effort to have them continually in the homes and in the schools.

To Subscribers:

Please renew your subscription for 1905 at once, so as to save the extra rush of office work the last of the year and first of Januar .

Wooplaw Stow, Midlothian, Scotland,
November 21st, 1904.

Please find $1.50, for which send "Farmer's Advocate" to WILLIAM RODGER.

P. S.—The "Farmer's Advocate" is a colonizer.

Spraying to Control San Jose Scale.

In the recent convention of Ontario Fruit-growers at Toronto, it was noticeable that the mention of the San Jose scale struck no note of terror into the heart of the orchardist, not because the scale is less aggressive or destructive, but because by the use of the lime-sulphur wash it can very largely be controlled. This wash, also commonly called the California wash, has had thorough trials, and can be applied during a season when other work is not pressing, and when there is the least surface of the trees to be covered. In connection with the manufacture and application of the mixture, the popular edition of Bulletin 254 of the New York Experiment Station is timely and instructive. The bulletin condensed reads as follows:

Spraying with sulphur washes is at present the most safe and effective method for control of San Jose scale in orchards. This treatment is simpler and more widely applicable than fumigation, safer than spraying with crude petroleum or kerosene emulsion, and more certain than treatment with whale-oil soap. But such spraying is feasible only when the trees are leafless and dormant; since the caustic properties of the compounds formed would destroy the foliage, even if it were practicable to cover such large areas as the leaves would present with a spray so heavy as lime and sulphur, or possible to reach the clustered scales on trunk and branches when protected by foliage. Hitherto, it has been the custom to spray only in late winter or early spring; but the scale infestation has become so general and the area to be treated so extensive in many large orchards that the infested trees cannot all be covered in the short spring spraying season with the thoroughness requisite for success.

Consequently, it seems necessary to simplify and shorten the process of spraying or to extend the season. Of the two, the latter appears more easy of attainment, since there is usually a considerable period in fall and early winter, after the leaves have fallen, when weather conditions permit the hauling of spray apparatus through the orchards, and when it is not yet too cold to make spraying impracticable. Before experiments were undertaken, however, it was uncertain what effect the fall application of sulphur washes would have upon the trees or upon the insects. In preliminary tests made in 1902 by Mr. Parrott, who was then Entomologist of the Ohio Station, it was found that fall treatments with the lime-sulphur-salt wash were as effective against scale as spring treatments, and were not injurious to the few varieties of peaches and plums under observation.

The effect of such sprays on the trees, though, often varies with the weather following the applications, and with the condition of the trees themselves; and a single test cannot be considered a certain index to the value of such treatments. Accordingly, it was determined to repeat the work on more species and varieties of fruit trees, in different localities, and for several seasons; and at the same time to test some modifications of the wash commonly used.

Three orchards were selected, two near Geneva and one near Queens, Long Island. One of these was a very thrifty young orchard of peaches and plums, which had received the best of attention in every respect and contained no scale. The other orchard at Geneva, of apples, pears, crab apples, cherries and plums, was older, was well infested with scale, and had received no treatment for diseases or insects, but had been well cared for otherwise. The third orchard, at Queens, contained only apples and peaches, and showed plainly the effect of scale injury. The sprayed trees in the three orchards numbered 66 large apple trees, 33 pear trees, 257 plum trees, 39 cherry trees, 6 crab apple trees, and 252 peach trees.

The orchard on Long Island was treated during the second week in November, those at Geneva about ten days later. At both places the applications were made on cold days, followed by considerable rain and snow within two weeks.

Five washes were used, made as follows:

BOILED LIME-SULPHUR-SALT WASH.
(Formula I.)

Lime	15 pounds.
Sulphur	15 pounds.
Salt	15 pounds.
Water	50 gallons.

This was prepared in the usual method, by first slaking the lime to a thin whitewash and then adding the sulphur and the salt. These ingredients were distributed thoroughly in the whitewash, and the mixture boiled from one to two hours.

SELF-BOILED LIME-SULPHUR-SALT WASH.
(Formula II.)

Lime	40 pounds.
Sulphur	20 pounds.
Salt	15 pounds.
Water	60 gallons.

This wash was cooked without the direct use of external heat. First, the sulphur was made into a paste with hot water, and was then emptied into a barrel containing forty pounds of lime, which was started to slake with twelve gallons of boiling water. During the slaking process, the barrel was covered to prevent the loss of heat. Occasionally the wash was stirred to secure a more uniform distribution of the sulphur in the whitewash. In twenty minutes after the time that the lime first commenced to slake, enough boiling water was added to make the required sixty gallons of mixture; after which the salt was added and stirred